



# Open Source Used In AsyncOS 14.2 Cisco Secure Email Gateway

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/\* zlib.h -- interface of the 'zlib' general purpose compression library  
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\*/

## 1.5 bzip2 1.0.4

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jseward@bzip.org  
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## 1.7 python 2.5.1

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2.0	1.6	2000	BeOpen.com	no
1.6.1	1.6	2001	CNRI	yes (2)
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2.0.1	2.0+1.6.1	2001	PSF	yes
2.1.1	2.1+2.0.1	2001	PSF	yes
2.2	2.1.1	2001	PSF	yes
2.1.2	2.1.1	2002		
	PSF	yes		
2.1.3	2.1.2	2002	PSF	yes
2.2.1	2.2	2002	PSF	yes
2.2.2	2.2.1	2002	PSF	yes
2.2.3	2.2.2	2003	PSF	yes
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## 1.8 python 2.6

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1.6.1	1.6	2001	CNRI	yes (2)
2.1	2.0+1.6.1	2001	PSF	no
2.0.1	2.0+1.6.1	2001	PSF	yes
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2.2	2.1.1	2001	PSF	yes
2.1.2	2.1.1	2002		
PSF	yes			
2.1.3	2.1.2	2002	PSF	yes
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2.3	2.2.2	2002-2003	PSF	yes
2.3.1	2.3	2002-2003	PSF	yes
2.3.2	2.3.1	2002-2003	PSF	yes
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2.4.1	2.4	2005	PSF	yes
2.4.2	2.4.1	2005	PSF	yes
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A C-program for MT19937, with initialization improved 2002/1/26.

Coded by Takuji Nishimura and Makoto Matsumoto.

Before using, initialize the state by using `init_genrand(seed)` or `init_by_array(init_key, key_length)`.

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```

```
"""
```

```
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```

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```
.. highlightlang:: none
```

```
.. _history-and-license:
```

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```

```
History and License
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History of the software
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```
=====
```

Python was created in the early 1990s by Guido van Rossum at Stichting Mathematisch Centrum (CWI, see <http://www.cwi.nl/>) in the Netherlands as a successor of a language called ABC. Guido remains Python's principal author, although it includes many contributions from others.

In 1995, Guido continued his work on Python at the Corporation for National Research Initiatives (CNRI, see <http://www.cnri.reston.va.us/>) in Reston, Virginia where he released several versions of the software.

In May 2000, Guido and the Python core development team moved to BeOpen.com to form the BeOpen PythonLabs team. In October of the same year, the PythonLabs team moved to Digital Creations (now Zope Corporation; see <http://www.zope.com/>). In 2001, the Python Software Foundation (PSF, see <http://www.python.org/psf/>) was formed, a non-profit organization created specifically to own Python-related Intellectual Property. Zope Corporation is a sponsoring member of the PSF.

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1.6	1.5.2	2000	CNRI	no
2.0	1.6	2000	BeOpen.com	no
1.6.1	1.6	2001	CNRI	no
2.1	2.0+1.6.1	2001	PSF	no
2.0.1	2.0+1.6.1	2001	PSF	yes
2.1.1	2.1+2.0.1	2001	PSF	yes
2.2	2.1.1	2001	PSF	yes
2.1.2	2.1.1	2002	PSF	yes
2.1.3	2.1.2	2002	PSF	yes
2.2.1	2.2	2002	PSF	yes
2.2.2	2.2.1	2002	PSF	yes
2.2.3	2.2.2	2002-2003	PSF	yes
2.3	2.2.2	2002-2003	PSF	yes
2.3.1	2.3	2002-2003	PSF	yes
2.3.2	2.3.1	2003	PSF	yes
2.3.3	2.3.2	2003	PSF	yes
2.3.4	2.3.3	2004	PSF	yes
2.3.5	2.3.4	2005	PSF	yes

2.4	2.3	2004	PSF	yes	
+-----+-----+-----+-----+-----+					
2.4.1	2.4				
	2005	PSF	yes		
+-----+-----+-----+-----+-----+					
2.4.2	2.4.1	2005	PSF	yes	
+-----+-----+-----+-----+-----+					
2.4.3	2.4.2	2006	PSF	yes	
+-----+-----+-----+-----+-----+					
2.4.4	2.4.3	2006	PSF	yes	
+-----+-----+-----+-----+-----+					
2.5	2.4	2006	PSF	yes	
+-----+-----+-----+-----+-----+					
2.5.1	2.5	2007	PSF	yes	
+-----+-----+-----+-----+-----+					
2.5.2	2.5.1	2008	PSF	yes	
+-----+-----+-----+-----+-----+					
2.5.3	2.5.2	2008	PSF	yes	
+-----+-----+-----+-----+-----+					
2.6	2.5	2008	PSF	yes	
+-----+-----+-----+-----+-----+					
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Mersenne Twister

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The :mod:'\_random' module includes code based on a download from <http://www.math.keio.ac.jp/matumoto/MT2002/emt19937ar.html>. The following are the verbatim comments from the original code::

A C-program for MT19937, with initialization improved 2002/1/26.  
Coded by Takuji Nishimura and Makoto Matsumoto.

Before using, initialize the state by using `init_genrand(seed)`  
or `init_by_array(init_key, key_length)`.

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<http://www.math.keio.ac.jp/matumoto/emt.html>

email: [matumoto@math.keio.ac.jp](mailto:matumoto@math.keio.ac.jp)

## Sockets

-----

The `:mod:'socket'` module uses the functions, `:func:'getaddrinfo'`, and `:func:'getnameinfo'`, which are coded in separate source files from the WIDE Project, <http://www.wide.ad.jp/>. ::

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## Floating point exception control

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MD5 message digest algorithm

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L. Peter Deutsch  
ghost@aladdin.com

Independent implementation of MD5 (RFC 1321).

This code implements the MD5 Algorithm defined in RFC 1321, whose text is available at

<http://www.ietf.org/rfc/rfc1321.txt>

The code is derived from the text of the RFC, including the test suite (section A.5) but excluding the rest of Appendix A. It does not include any code or documentation that is identified in the RFC as being copyrighted.

The original and principal author of md5.h is L. Peter Deutsch <ghost@aladdin.com>. Other authors are noted in the change history that follows (in reverse chronological order):

2002-04-13 lpd Removed support for non-ANSI compilers; removed references to Ghostscript; clarified derivation from RFC 1321; now handles byte order either statically or dynamically.

1999-11-04 lpd Edited comments slightly for automatic TOC extraction.

1999-10-18 lpd Fixed typo in header comment (ansi2knr rather than md5); added conditionalization for C++ compilation from Martin Purschke <purschke@bnl.gov>.

1999-05-03 lpd Original version.

Asynchronous socket services

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The :mod:'asynchcat' and :mod:'asyncore' modules contain the following notice::

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UUencode and UUdecode functions  
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Modified by Jack Jansen, CWI, July 1995:

- Use binascii module to do the actual line-by-line conversion  
between ascii and binary. This results in a 1000-fold speedup. The C  
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## XML Remote Procedure Calls

-----

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test\_epoll

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Select kqueue

-----

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Python was created in the early 1990s by Guido van Rossum at Stichting Mathematisch Centrum (CWI, see <http://www.cwi.nl>) in the Netherlands as a successor of a language called ABC. Guido remains Python's principal author, although it includes many contributions from others.

In 1995, Guido continued his work on Python at the Corporation for National Research Initiatives (CNRI, see <http://www.cnri.reston.va.us>) in Reston, Virginia where he released several versions of the software.

In May 2000, Guido and the Python core development team moved to BeOpen.com to form the BeOpen PythonLabs team. In October of the same year, the PythonLabs team moved to Digital Creations (now Zope Corporation, see <http://www.zope.com>). In 2001, the Python Software Foundation (PSF, see <http://www.python.org/psf/>) was formed, a non-profit organization created specifically to own Python-related Intellectual

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All Python releases are Open Source (see <http://www.opensource.org> for the Open Source Definition). Historically, most, but not all, Python releases have also been GPL-compatible; the table below summarizes the various releases.

Release	Derived from	Year	Owner	GPL-compatible? (1)
0.9.0 thru 1.2		1991-1995	CWI	yes
1.3 thru 1.5.2	1.2	1995-1999	CNRI	yes
1.6	1.5.2	2000	CNRI	no
2.0	1.6	2000	BeOpen.com	no
1.6.1	1.6	2001	CNRI	yes (2)
2.1	2.0+1.6.1	2001	PSF	no
2.0.1	2.0+1.6.1	2001	PSF	yes
2.1.1	2.1+2.0.1	2001	PSF	yes
2.2	2.1.1			
2001	PSF	yes		
2.1.2	2.1.1	2002	PSF	yes
2.1.3	2.1.2	2002	PSF	yes
2.2.1	2.2	2002	PSF	yes
2.2.2	2.2.1	2002	PSF	yes
2.2.3	2.2.2	2003	PSF	yes
2.3	2.2.2	2002-2003	PSF	yes
2.3.1	2.3	2002-2003	PSF	yes
2.3.2	2.3.1	2002-2003	PSF	yes
2.3.3	2.3.2	2002-2003	PSF	yes

2.3.4	2.3.3	2004	PSF	yes
2.3.5	2.3.4	2005	PSF	yes
2.4	2.3	2004	PSF	yes
2.4.1	2.4	2005	PSF	yes
2.4.2	2.4.1	2005	PSF	yes
2.4.3	2.4.2	2006	PSF	yes
2.4.4				
2.4.3	2006	PSF	yes	
2.5	2.4	2006	PSF	yes
2.5.1	2.5	2007	PSF	yes
2.5.2	2.5.1	2008	PSF	yes
2.5.3	2.5.2	2008	PSF	yes
2.6	2.5	2008	PSF	yes
2.6.1	2.6	2008	PSF	yes

Footnotes:

(1) GPL-compatible doesn't mean that we're distributing Python under the GPL. All Python licenses, unlike the GPL, let you distribute a modified version without making your changes open source. The GPL-compatible licenses make it possible to combine Python with other software that is released under the GPL; the others don't.

(2) According to Richard Stallman, 1.6.1 is not GPL-compatible, because its license has a choice of law clause. According to CNRI, however, Stallman's lawyer has told CNRI's lawyer that 1.6.1 is "not incompatible" with the GPL.

Thanks to the many outside volunteers who have worked under Guido's direction to make these releases possible.

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/\* parsermodule.c  
\*

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\*

\* This module serves to replace the original parser module written  
\* by Guido. The functionality is not matched precisely, but the  
\* original may be implemented on top of this. This is desirable  
\* since the source of the text to be parsed is now divorced from  
\* this interface.

\*

\* Unlike the prior interface, the ability to give a parse tree  
\* produced by Python code as a tuple to the compiler is enabled by  
\* this module. See the documentation for more details.

\*

\*

I've added some annotations that help with the lint code-checking  
\* program, but they're not complete by a long shot. The real errors  
\* that lint detects are gone, but there are still warnings with  
\* Py\_[X]DECREF() and Py\_[X]INCREC() macros. The lint annotations  
\* look like "NOTE(...)".

\*/

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## 1.11 pcre 7.8

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The basic library functions are written in C and are freestanding. Also included in the distribution is a set of C++ wrapper functions.

## THE BASIC LIBRARY FUNCTIONS

-----

Written by: Philip Hazel  
Email local part: ph10  
Email domain: cam.ac.uk

University of Cambridge Computing Service,  
Cambridge, England.

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## THE C++ WRAPPER FUNCTIONS

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## 1.12 ncurses 5.7

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## 1.13 libjpeg 6b

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=====  
README for release 6b of 27-Mar-1998  
=====

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This software is the work of Tom Lane, Philip Gladstone, Jim Boucher, Lee Crocker, Julian Minguillon, Luis Ortiz, George Phillips, Davide Rossi, Guido Vollbeding, Ge' Weijers, and other members of the Independent JPEG Group.

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### DOCUMENTATION

#### ROADMAP

=====  
This file contains the following sections:

OVERVIEW        General description of JPEG and the IJG software.  
LEGAL ISSUES    Copyright, lack of warranty, terms of distribution.  
REFERENCES     Where to learn more about JPEG.  
ARCHIVE LOCATIONS    Where to find newer versions of this software.  
RELATED SOFTWARE    Other stuff you should get.  
FILE FORMAT WARS    Software \*not\* to get.  
TO DO            Plans for future IJG releases.

Other documentation files in the distribution are:

User documentation:

install.doc     How to configure and install the IJG software.  
usage.doc       Usage instructions for cjpeg, djpeg, jpegtran,  
                 rdjpgcom, and wrjpgcom.  
\*.1             Unix-style man pages for programs (same info as usage.doc).

wizard.doc      Advanced usage instructions for JPEG wizards only.  
change.log      Version-to-version change highlights.  
Programmer and internal  
documentation:  
libjpeg.doc     How to use the JPEG library in your own programs.  
example.c       Sample code for calling the JPEG library.  
structure.doc    Overview of the JPEG library's internal structure.  
filelist.doc    Road map of IJG files.  
coderrules.doc   Coding style rules --- please read if you contribute code.

Please read at least the files install.doc and usage.doc. Useful information can also be found in the JPEG FAQ (Frequently Asked Questions) article. See ARCHIVE LOCATIONS below to find out where to obtain the FAQ article.

If you want to understand how the JPEG code works, we suggest reading one or more of the REFERENCES, then looking at the documentation files (in roughly the order listed) before diving into the code.

## OVERVIEW

=====

This package contains C software to implement JPEG image compression and decompression. JPEG (pronounced "jay-peg") is a standardized compression method for full-color and gray-scale images.

JPEG is intended for compressing "real-world" scenes; line drawings, cartoons and other non-realistic images are not its strong suit. JPEG is lossy, meaning that the output image is not exactly identical to the input image. Hence you must not use JPEG if you have to have identical output bits. However, on typical photographic images, very good compression levels can be obtained with no visible change, and remarkably high compression levels are possible if you can tolerate a low-quality image. For more details, see the references, or just experiment with various compression settings.

This software implements JPEG baseline, extended-sequential, and progressive compression processes. Provision is made for supporting all variants of these processes, although some uncommon parameter settings aren't implemented yet. For legal reasons, we are not distributing code for the arithmetic-coding variants of JPEG; see LEGAL ISSUES. We have made no provision for supporting the hierarchical or lossless processes defined in the standard.

We provide a set of library routines for reading and writing JPEG image files, plus two sample applications "cjpeg" and "djpeg", which use the library to perform conversion between JPEG and some other popular image file formats. The library is intended to be reused in other applications.

In order to support file conversion and viewing software, we have included considerable functionality beyond the bare JPEG coding/decoding capability; for example, the color quantization modules are not strictly part of JPEG decoding, but they are essential for output to colormapped file formats or colormapped displays. These extra functions can be compiled out of the library if not required for a particular application. We have also included "jpegtran", a utility for lossless transcoding between different JPEG processes, and "rdjpgcom" and "wrjpgcom", two simple applications for inserting and extracting textual comments in JFIF files.

The emphasis in designing this software has been on achieving portability and flexibility, while also making it fast enough to be useful. In particular, the software is not intended to be read as a tutorial on JPEG. (See the REFERENCES section for introductory material.) Rather, it is intended to be reliable, portable, industrial-strength code. We do not claim to have achieved that goal in every aspect of the software, but we strive for it.

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The Unix configuration script "configure" was produced with GNU Autoconf. It is copyright by the Free Software Foundation but is freely distributable. The same holds for its supporting scripts (config.guess, config.sub, ltconfig, ltmain.sh). Another support script, install-sh, is copyright by M.I.T. but is also freely distributable.

It appears that the arithmetic coding option of the JPEG spec is covered by patents owned by IBM, AT&T, and Mitsubishi. Hence arithmetic coding cannot legally be used without obtaining one or more licenses. For this reason, support for arithmetic coding has been removed from the free JPEG software.

(Since arithmetic coding provides only a marginal gain over the unpatented Huffman mode, it is unlikely that very many implementations will support it.) So far as we are aware, there are no patent restrictions on the remaining code.

The IJG distribution formerly included code to read and write GIF files. To avoid entanglement with the Unisys LZW patent, GIF reading support has been removed altogether, and the GIF writer has been simplified to produce "uncompressed GIFs". This technique does not use the LZW algorithm; the resulting GIF files are larger than usual, but are readable by all standard GIF decoders.

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## REFERENCES

=====

We

highly recommend reading one or more of these references before trying to understand the innards of the JPEG software.

The best short technical introduction to the JPEG compression algorithm is Wallace, Gregory K. "The JPEG Still Picture Compression Standard", Communications of the ACM, April 1991 (vol. 34 no. 4), pp. 30-44. (Adjacent articles in that issue discuss MPEG motion picture compression, applications of JPEG, and related topics.) If you don't have the CACM issue handy, a PostScript file containing a revised version of Wallace's article is available at <ftp://ftp.uu.net/graphics/jpeg/wallace.ps.gz>. The file (actually a preprint for an article that appeared in IEEE Trans. Consumer Electronics) omits the sample images that appeared in CACM, but it includes corrections and some added material. Note: the Wallace article is copyright ACM and IEEE, and it may not be used for commercial purposes.

A somewhat less technical, more leisurely introduction to JPEG can be found in "The Data Compression Book" by Mark Nelson and Jean-loup Gailly, published by M&T Books (New York), 2nd ed. 1996, ISBN 1-55851-434-1. This book provides good explanations and example C code for a multitude of compression methods including JPEG. It is an excellent source if you are comfortable reading C code but don't know much about data compression in general. The book's JPEG sample code is far from industrial-strength, but when you are ready to look at a full implementation, you've got one here...

The best full description of JPEG is the textbook "JPEG Still Image Data



Compression Standard" by William B. Pennebaker and Joan L. Mitchell, published by Van Nostrand Reinhold, 1993, ISBN 0-442-01272-1. Price US\$59.95, 638 pp. The book includes the complete text of the ISO JPEG standards (DIS 10918-1 and draft DIS 10918-2). This is by far the most complete exposition of JPEG in existence, and we highly recommend it.

The

JPEG standard itself is not available electronically; you must order a paper copy through ISO or ITU. (Unless you feel a need to own a certified official copy, we recommend buying the Pennebaker and Mitchell book instead; it's much cheaper and includes a great deal of useful explanatory material.) In the USA, copies of the standard may be ordered from ANSI Sales at (212) 642-4900, or from Global Engineering Documents at (800) 854-7179. (ANSI doesn't take credit card orders, but Global does.) It's not cheap: as of 1992, ANSI was charging \$95 for Part 1 and \$47 for Part 2, plus 7% shipping/handling. The standard is divided into two parts, Part 1 being the actual specification, while Part 2 covers compliance testing methods. Part 1 is titled "Digital Compression and Coding of Continuous-tone Still Images, Part 1: Requirements and guidelines" and has document numbers ISO/IEC IS 10918-1, ITU-T T.81. Part 2 is titled "Digital Compression and Coding of Continuous-tone Still Images, Part 2: Compliance testing" and has document numbers ISO/IEC IS 10918-2, ITU-T T.83.

Some extensions to the original JPEG standard are defined in JPEG Part 3, a newer ISO standard numbered ISO/IEC IS 10918-3 and ITU-T T.84. IJG currently does not support any Part 3 extensions.

The JPEG standard does not specify all details of an interchangeable file format. For the omitted details we follow the "JFIF" conventions, revision 1.02. A copy of the JFIF spec is available from:

Literature Department  
C-Cube Microsystems, Inc.  
1778 McCarthy Blvd.  
Milpitas, CA 95035  
phone (408) 944-6300, fax (408) 944-6314

A PostScript version of this document is available by FTP at <ftp://ftp.uu.net/graphics/jpeg/jfif.ps.gz>. There is also a plain text version at <ftp://ftp.uu.net/graphics/jpeg/jfif.txt.gz>, but it is missing the figures.

The TIFF 6.0 file format specification can be obtained by FTP from <ftp://ftp.sgi.com/graphics/tiff/TIFF6.ps.gz>. The JPEG incorporation scheme found in the TIFF 6.0 spec of 3-June-92 has a number of serious problems. IJG does not recommend use of the TIFF 6.0 design (TIFF Compression tag 6). Instead, we recommend the JPEG design proposed by TIFF Technical Note #2 (Compression tag 7). Copies of this Note can be obtained from <ftp.sgi.com> or

from <ftp://ftp.uu.net/graphics/jpeg/>. It is expected that the next revision of the TIFF spec will replace the 6.0 JPEG design with the Note's design. Although IJG's own code does not support TIFF/JPEG, the free libtiff library uses our library to implement TIFF/JPEG per the Note. libtiff is available from <ftp://ftp.sgi.com/graphics/tiff/>.

## ARCHIVE LOCATIONS

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The "official" archive site for this software is <ftp.uu.net> (Internet address 192.48.96.9). The most recent released version can always be found there in directory [graphics/jpeg](ftp://ftp.uu.net/graphics/jpeg/). This particular version will be archived as <ftp://ftp.uu.net/graphics/jpeg/jpegsrc.v6b.tar.gz>. If you don't have direct Internet access, UUNET's archives are also available via UUCP; contact [help@uunet.uu.net](mailto:help@uunet.uu.net) for information on retrieving files that way.

Numerous Internet sites maintain copies of the UUNET files. However, only <ftp.uu.net> is guaranteed to have the latest official version.

You can also obtain this software in DOS-compatible "zip" archive format from the SimTel archives (<ftp://ftp.simtel.net/pub/simtelnet/msdos/graphics/>), or on CompuServe in the Graphics Support forum (GO CIS:GRAPHSUP), library 12 "JPEG Tools". Again, these versions may sometimes lag behind the <ftp.uu.net> release.

The JPEG FAQ (Frequently Asked Questions) article is a useful source of general information about JPEG. It is updated constantly and therefore is not included in this distribution. The FAQ is posted every two weeks to Usenet newsgroups [comp.graphics.misc](news:comp.graphics.misc), [news.answers](news:news.answers), and other groups. It is available on the World Wide Web at <http://www.faqs.org/faqs/jpeg-faq/> and other [news.answers](news:news.answers) archive sites, including the official [news.answers](news:news.answers) archive at [rtfm.mit.edu: ftp://rtfm.mit.edu/pub/usenet/news.answers/jpeg-faq/](ftp://rtfm.mit.edu/pub/usenet/news.answers/jpeg-faq/). If you don't have Web or FTP access, send e-mail to [mail-server@rtfm.mit.edu](mailto:mail-server@rtfm.mit.edu) with body  
send [usenet/news.answers/jpeg-faq/part1](news:usenet/news.answers/jpeg-faq/part1)  
send [usenet/news.answers/jpeg-faq/part2](news:usenet/news.answers/jpeg-faq/part2)

## RELATED SOFTWARE

=====

Numerous viewing and image manipulation programs now support JPEG. (Quite a few of them use this library to do so.) The JPEG FAQ described above lists some of the more popular free and shareware viewers, and tells where to obtain them on Internet.

If you are on a Unix machine, we highly recommend Jef Poskanzer's free PBPLUS software, which provides many useful operations on PPM-format image files. In particular, it can convert PPM images to and from a wide range of other formats, thus making cjpeg/djpeg considerably more useful. The latest version is distributed by the NetPBM group, and is available from numerous sites,

notably <ftp://wuarchive.wustl.edu/graphics/graphics/packages/NetPBM/>.

Unfortunately PBPLUS/NETPBM is not nearly as portable as the IJG software is; you are likely to have difficulty making it work on any non-Unix machine.

A different free JPEG implementation, written by the PVRG group at Stanford, is available from <ftp://havefun.stanford.edu/pub/jpeg/>. This program is designed for research and experimentation rather than production use; it is slower, harder to use, and less portable than the IJG code, but it is easier to read and modify. Also, the PVRG code supports lossless JPEG, which we do not. (On the other hand, it doesn't do progressive JPEG.)

## FILE FORMAT WARS

=====

Some JPEG programs produce files that are not compatible with our library. The root of the problem is that the ISO JPEG committee failed to specify a concrete file format. Some vendors "filled in the blanks" on their own, creating proprietary formats that no one else could read.

(For example, none of the early commercial JPEG implementations for the Macintosh were able to exchange compressed files.)

The file format we have adopted is called JFIF (see REFERENCES). This format has been agreed to by a number of major commercial JPEG vendors, and it has become the de facto standard. JFIF is a minimal or "low end" representation. We recommend the use of TIFF/JPEG (TIFF revision 6.0 as modified by TIFF Technical Note #2) for "high end" applications that need to record a lot of additional data about an image. TIFF/JPEG is fairly new and not yet widely supported, unfortunately.

The upcoming JPEG Part 3 standard defines a file format called SPIFF. SPIFF is interoperable with JFIF, in the sense that most JFIF decoders should be able to read the most common variant of SPIFF. SPIFF has some technical advantages over JFIF, but its major claim to fame is simply that it is an official standard rather than an informal one. At this point it is unclear whether

SPIFF will supersede JFIF or whether JFIF will remain the de-facto standard. IJG intends to support SPIFF once the standard is frozen, but we have not decided whether it should become our default output format or not. (In any case, our decoder will remain capable of reading JFIF indefinitely.)

Various proprietary file formats incorporating JPEG compression also exist. We have little or no sympathy for the existence of these formats. Indeed, one of the original reasons for developing this free software was to help force convergence on common, open format standards for JPEG files. Don't use a proprietary file format!

TO DO

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The major thrust for v7 will probably be improvement of visual quality. The current method for scaling the quantization tables is known not to be very good at low Q values. We also intend to investigate block boundary smoothing, "poor man's variable quantization", and other means of improving quality-vs-file-size performance without sacrificing compatibility.

In future versions, we are considering supporting some of the upcoming JPEG Part 3 extensions --- principally, variable quantization and the SPIFF file format.

As always, speeding things up is of great interest.

Please send bug reports, offers of help, etc. to [jpeg-info@uunet.uu.net](mailto:jpeg-info@uunet.uu.net).

## 1.14 openssl 0.9.8q

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### 1.14.2 Available under license :

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=====

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Version 2.0, January 2004

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/\*

```
* $Header: /home/jerenkrantz/tmp/commons/commons-convert/cvs/home/cvs/jakarta-  
commons/httpclient/src/java/org/apache/commons/httpclient/AutoCloseInputStream.java,v 1.9 2004/04/18 23:51:34  
jsdever Exp $
```

```

* $Revision: 291181 $
* $Date: 2005-09-23 14:13:25 -0400 (Fri, 23 Sep 2005) $
*
* =====
*
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* information on the Apache Software Foundation, please see
* <http://www.apache.org/>.
*
*/

```

```
package org.apache.commons.httpclient;
```

```
import java.io.FilterInputStream;
import java.io.IOException;
import java.io.InputStream;
```

```
/**
 * Closes an underlying stream as soon as the end of the stream is reached, and
 * notifies a client when it has done so.
 *
 * @author Ortwin Glueck
 * @author Eric Johnson
 * @author <a href="mailto:mbowler@GargoyleSoftware.com">Mike Bowler</a>
 *
 * @since 2.0
 */
```

```
class AutoCloseInputStream extends FilterInputStream {

/**
 * True if this stream is open. Assume that the underlying stream
 * is open until we get an EOF indication.
```

```

*/
private boolean streamOpen = true;

/** True if the
stream closed itself. */
private boolean selfClosed = false;

/**
 * The watcher is notified when the contents of the stream have
 * been exhausted
 */
private ResponseConsumedWatcher watcher = null;

/**
 * Create a new auto closing stream for the provided connection
 *
 * @param in the input stream to read from
 * @param watcher To be notified when the contents of the stream have been
 * consumed.
 */
public AutoCloseInputStream(
    final InputStream in, final ResponseConsumedWatcher watcher) {
    super(in);
    this.watcher = watcher;
}

/**
 * Reads the next byte of data from the input stream.
 *
 * @throws IOException when there is an error reading
 * @return the character read, or -1 for EOF
 */
public int read() throws IOException {
    int l = -1;

    if (isReadAllowed()) {
        // underlying stream not closed, go ahead
and read.
        l = super.read();
        checkClose(l);
    }

    return l;
}

/**
 * Reads up to <code>len</code> bytes of data from the stream.
 *

```

```

* @param b a <code>byte</code> array to read data into
* @param off an offset within the array to store data
* @param len the maximum number of bytes to read
* @return the number of bytes read or -1 for EOF
* @throws IOException if there are errors reading
*/
public int read(byte[] b, int off, int len) throws IOException {
    int l = -1;

    if (isReadAllowed()) {
        l = super.read(b, off, len);
        checkClose(l);
    }

    return l;
}

/**
* Reads some number of bytes from the input stream and stores them into the
* buffer array b.
*
* @param b a <code>byte</code> array to read data into
* @return the number of bytes read or -1 for EOF
* @throws IOException if
there are errors reading
*/
public int read(byte[] b) throws IOException {
    int l = -1;

    if (isReadAllowed()) {
        l = super.read(b);
        checkClose(l);
    }
    return l;
}

/**
* Close the stream, and also close the underlying stream if it is not
* already closed.
* @throws IOException If an IO problem occurs.
*/
public void close() throws IOException {
    if (!selfClosed) {
        selfClosed = true;
        notifyWatcher();
    }
}

```

```

/**
 * Close the underlying stream should the end of the stream arrive.
 *
 * @param readResult The result of the read operation to check.
 * @throws IOException If an IO problem occurs.
 */
private void checkClose(int readResult) throws IOException {
    if (readResult == -1) {
        notifyWatcher();
    }
}

/**
 * See whether a read of the underlying stream
should be allowed, and if
 * not, check to see whether our stream has already been closed!
 *
 * @return <code>true</code> if it is still OK to read from the stream.
 * @throws IOException If an IO problem occurs.
 */
private boolean isReadAllowed() throws IOException {
    if (!streamOpen && selfClosed) {
        throw new IOException("Attempted read on closed stream.");
    }
    return streamOpen;
}

/**
 * Notify the watcher that the contents have been consumed.
 * @throws IOException If an IO problem occurs.
 */
private void notifyWatcher() throws IOException {
    if (streamOpen) {
        super.close();
        streamOpen = false;

        if (watcher != null) {
            watcher.responseConsumed();
        }
    }
}
}

```

## 1.16 sqlite 3.7.8

## 1.16.1 Available under license :

```
/*
** 2001 September 15
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**
** May you do good and not evil.
** May you find forgiveness for yourself and forgive others.
** May you share freely, never taking more than you give.
**
*****
** This header file defines the interface that the SQLite library
** presents to client programs. If a C-function, structure, datatype,
** or constant definition does not appear in this file, then it is
** not a published API of SQLite, is subject to change without
** notice, and should not be referenced by programs that use SQLite.
**
** Some of the definitions that are in this file are marked as
** "experimental". Experimental interfaces are normally new
** features recently added to SQLite. We do not anticipate changes
** to experimental interfaces but reserve the right to make minor changes
**
if experience from use "in the wild" suggest such changes are prudent.
**
** The official C-language API documentation for SQLite is derived
** from comments in this file. This file is the authoritative source
** on how SQLite interfaces are suppose to operate.
**
** The name of this file under configuration management is "sqlite.h.in".
** The makefile makes some minor changes to this file (such as inserting
** the version number) and changes its name to "sqlite3.h" as
** part of the build process.
*/
```

## 1.17 libiconv 1.14

### 1.17.1 Available under license :

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This option is useful when you wish to copy part of the code of the Library into a program that is not a library.

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END OF TERMS AND CONDITIONS

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A "Standard Interface" means an interface that either is

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```

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```
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```

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GNU LIBICONV - character set conversion library

This library provides an iconv() implementation, for use on systems which don't have one, or whose implementation cannot convert from/to Unicode.

It provides support for the encodings:

European languages

ASCII, ISO-8859-{1,2,3,4,5,7,9,10,13,14,15,16},  
KOI8-R, KOI8-U, KOI8-RU,  
CP{1250,1251,1252,1253,1254,1257}, CP{850,866,1131},  
Mac{Roman,CentralEurope,Iceland,Croatian,Romania},  
Mac{Cyrillic,Ukraine,Greek,Turkish},  
Macintosh

Semitic languages

ISO-8859-{6,8}, CP{1255,1256}, CP862, Mac{Hebrew,Arabic}

Japanese

EUC-JP, SHIFT\_JIS, CP932, ISO-2022-JP, ISO-2022-JP-2, ISO-2022-JP-1

Chinese

EUC-CN, HZ, GBK, CP936, GB18030, EUC-TW, BIG5, CP950, BIG5-HKSCS,  
BIG5-HKSCS:2004, BIG5-HKSCS:2001, BIG5-HKSCS:1999, ISO-2022-CN,  
ISO-2022-CN-EXT

Korean

EUC-KR, CP949, ISO-2022-KR, JOHAB

Armenian

ARMSCII-8

Georgian

Georgian-Academy, Georgian-PS

Tajik

KOI8-T

Kazakh

PT154, RK1048

Thai

ISO-8859-11, TIS-620, CP874, MacThai

Laotian

MuleLao-1, CP1133

Vietnamese

VISCII, TCVN, CP1258

Platform specifics

HP-ROMAN8, NEXTSTEP

Full Unicode

UTF-8

UCS-2, UCS-2BE, UCS-2LE

UCS-4, UCS-4BE, UCS-4LE

UTF-16, UTF-16BE, UTF-16LE

UTF-32, UTF-32BE, UTF-32LE

UTF-7

C99, JAVA

Full Unicode, in terms of 'uint16\_t' or 'uint32\_t'

(with machine dependent endianness and alignment)

UCS-2-INTERNAL, UCS-4-INTERNAL

Locale dependent, in terms of 'char' or 'wchar\_t'

(with machine dependent endianness and alignment, and with OS and locale dependent semantics)

char, wchar\_t

The empty encoding name "" is equivalent to "char": it denotes the

locale

dependent character encoding.

When configured with the option --enable-extra-encodings, it also provides support for a few extra encodings:

European languages

CP{437,737,775,852,853,855,857,858,860,861,863,865,869,1125}

Semitic languages

CP864

Japanese

EUC-JISX0213, Shift\_JISX0213, ISO-2022-JP-3

Chinese

BIG5-2003 (experimental)

Turkmen

TDS565

Platform specifics

ATARIST, RISCOS-LATIN1

It can convert from any of these encodings to any other, through Unicode conversion.

It has also some limited support for transliteration, i.e. when a character cannot be represented in the target character set, it can be approximated through one or several similarly looking characters. Transliteration is activated when "//TRANSLIT" is appended to the target encoding name.

libiconv is for you if your application needs to support multiple character encodings, but that support

lacks from your system.

## Installation

-----

As usual for GNU packages:

```
$ ./configure --prefix=/usr/local
```

```
$ make
```

```
$ make install
```

After installing GNU libiconv for the first time, it is recommended to recompile and reinstall GNU gettext, so that it can take advantage of libiconv.

On systems other than GNU/Linux, the iconv program will be internationalized only if GNU gettext has been built and installed before GNU libiconv. This means that the first time GNU libiconv is installed, we have a circular dependency between the GNU libiconv and GNU gettext packages, which can be resolved by building and installing either

- first libiconv, then gettext, then libiconv again,

or (on systems supporting shared libraries, excluding AIX)

- first gettext, then libiconv, then gettext again.

Recall that before building a package for the second time, you need to erase the traces of the first build by running "make distclean".

This library can be built and installed in two variants:

- The library mode. This works on all systems, and uses a library 'libiconv.so' and a header file '<iconv.h>'. (Both are installed through "make install".)

To use it, simply `#include <iconv.h>` and use the functions.

To use it in an autoconfiguring package:

- If you don't use automake, append `m4/iconv.m4` to your `aclocal.m4` file.
- If you do use automake, add `m4/iconv.m4` to your m4 macro repository.
- Add to the link command line of libraries and executables that use the functions the placeholder `@LIBICONV@` (or, if using libtool for the link, `@LTLIBICONV@`). If you use automake, the right place for these additions are the `*_LDADD` variables.

Note that 'iconv.m4' is also part of the GNU gettext package, which installs it in `/usr/local/share/aclocal/iconv.m4`.

- The libc plug/override mode. This works on GNU/Linux, Solaris and

OSF/1

systems only. It is a way to get good iconv support without having glibc-2.1.

It installs a library 'preloadable\_libiconv.so'. This library can be used with LD\_PRELOAD, to override the iconv\* functions present in the C library.

On GNU/Linux and Solaris:

```
$ export LD_PRELOAD=/usr/local/lib/preloadable_libiconv.so
```

On OSF/1:

```
$ export _RLD_LIST=/usr/local/lib/preloadable_libiconv.so:DEFAULT
```

A program's source need not be modified, the program need not even be recompiled. Just set the LD\_PRELOAD environment variable, that's it!

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-----

The libiconv and libcharset \_libraries\_ and their header files are under LGPL, see file COPYING.LIB.

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Download

-----

<http://ftp.gnu.org/gnu/libiconv/libiconv-1.14.tar.gz>

Homepage

-----

<http://www.gnu.org/software/libiconv/>

Bug

reports to

-----

<bug-gnu-libiconv@gnu.org>

Bruno Haible <bruno@clisp.org>

## 1.18 bouncy-castle 1.34

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Python was created in the early 1990s by Guido van Rossum at Stichting Mathematisch Centrum (CWI, see <http://www.cwi.nl>) in the Netherlands as a successor of a language called ABC. Guido remains Python's principal author, although it includes many contributions from others.

In 1995, Guido continued his work on Python at the Corporation for National Research Initiatives (CNRI, see <http://www.cnri.reston.va.us>) in Reston, Virginia where he released several versions of the software.

In May 2000, Guido and the Python core development team moved to BeOpen.com to form the BeOpen PythonLabs team. In October of the same year, the PythonLabs team moved to Digital Creations (now Zope Corporation, see <http://www.zope.com>). In 2001, the Python Software Foundation (PSF, see <http://www.python.org/psf/>) was formed, a non-profit organization created specifically to own Python-related Intellectual Property. Zope Corporation is a sponsoring member of the PSF.

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Release	Derived from	Year	Owner	GPL-compatible? (1)
0.9.0 thru 1.2		1991-1995	CWI	yes
1.3 thru 1.5.2	1.2	1995-1999	CNRI	yes
1.6	1.5.2	2000	CNRI	no
2.0	1.6	2000	BeOpen.com	no
1.6.1	1.6	2001	CNRI	yes (2)
2.1	2.0+1.6.1	2001	PSF	no
2.0.1	2.0+1.6.1	2001	PSF	yes
2.1.1	2.1+2.0.1	2001	PSF	yes
2.2	2.1.1	2001	PSF	yes
2.1.2	2.1.1	2002	PSF	yes

2.1.3				
2.1.2	2002	PSF	yes	
2.2.1	2.2	2002	PSF	yes
2.2.2	2.2.1	2002	PSF	yes
2.2.3	2.2.2	2003	PSF	yes
2.3	2.2.2	2002-2003	PSF	yes
2.3.1	2.3	2002-2003	PSF	yes
2.3.2	2.3.1	2002-2003	PSF	yes
2.3.3	2.3.2	2002-2003	PSF	yes
2.3.4	2.3.3	2004	PSF	yes
2.3.5	2.3.4	2005	PSF	yes
2.4	2.3	2004	PSF	yes
2.4.1	2.4	2005	PSF	yes
2.4.2	2.4.1	2005	PSF	yes
2.4.3	2.4.2	2006	PSF	yes
2.4.4	2.4.3	2006	PSF	yes
2.5	2.4	2006	PSF	yes
2.5.1	2.5	2007	PSF	yes
2.5.2	2.5.1	2008	PSF	yes
2.5.3	2.5.2	2008	PSF	yes
2.6	2.5	2008	PSF	yes
2.6.1	2.6	2008	PSF	yes
2.6.2	2.6.1	2009	PSF	yes
2.6.3	2.6.2	2009	PSF	yes
2.6.4	2.6.3	2009	PSF	yes
2.6.5	2.6.4	2010	PSF	yes
2.7	2.6	2010	PSF	yes

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```
minibz2
```

```
libbz2.dll test program.
```

```
by Yoshioka Tsuneo (tsuneo@rr.iij4u.or.jp)
```

```
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```

```
usage: minibz2 [-d] [-{1,2,..9}] [[srcfilename] destfilename]
*/
```

## 1.26 libyami 0.1.4

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## 1.28 open-ldap 2.4.40

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JUnit

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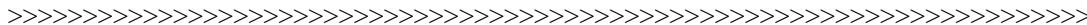
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 jar/net/miginfocom/layout/LayoutUtil.java  
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 jar/net/miginfocom/swt/MigLayout.java  
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jar/net/miginfocom/layout/ComponentWrapper.java
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jar/net/miginfocom/swing/SwingContainerWrapper.java
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\*

\* @version 1.0

\* @author Mikael Grev, MiG InfoCom AB

\* Date: 2006-sep-08

\*/

/\*\* Returns the absolute positioning of one or more of the edges. This will be applied last in the layout cycle and  
will not  
\* affect the flow or grid positions. The positioning is relative to the parent  
and can not (as padding) be used  
\* to adjust the edges relative to the old value. May be `null` and elements may be `null`.  
\* `null` value(s) for the x2 and y2 will be interpreted as to keep the preferred size and thus the x1  
\* and x2 will just absolutely position the component.

\* `<p>`

\* Note that { `@link #setBoundsInGrid(boolean)` } changes the interpretation of thisproperty slightly.

\* `<p>`

\* For a more thorough explanation of what this constraint does see the white paper or cheat Sheet at  
[www.migcomponents.com](http://www.migcomponents.com).

\* @return The current value as a new array, free to modify.

\*/

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/** Returns the gaps as pixel values.
* @param parent The parent. Used to get the pixel values.
* @param defGap The default gap to use if there is no gap set on this object (i.e. it is null).
* @param
refSize The reference size used to get the pixel sizes.
* @param before IF it is the gap before rather than the gap after to return.
* @return The [min,preferred,max] sizes for the specified gap. Uses { @link
net.miginfocom.layout.LayoutUtil#NOT_SET }
```

\* for gap sizes that are `null`. Returns `null` if there was no gap specified. A new and free to use array.

\*/

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```
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*
* @author Vincent Rijmen <vincent.rijmen@esat.kuleuven.ac.be>
* @author Antoon Bosselaers <antoon.bosselaers@esat.kuleuven.ac.be>
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#  
# Creation Date: 11/3/97 3:39:04PM  
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Data was extracted from the Unicode 5.1 UnicodeData.txt file.

Written by Marc-Andre Lemburg (mal@lemburg.com).

Modified for Python 2.0 by Fredrik Lundh (fredrik@pythonware.com)

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/\* Random objects \*/

/\* -----

The code in this module was based on a download from:

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It was modified in 2002 by Raymond Hettinger as follows:

\* the principal computational lines untouched except for tabbing.

\* renamed `genrand_res53()` to `random_random()` and wrapped in python calling/return code.

\* `genrand_int32()` and the helper functions, `init_genrand()` and `init_by_array()`, were declared static, wrapped in Python calling/return code. also, their global data references were replaced with structure references.

\* unused functions from the original were deleted.  
new, original C python code was added to implement the `Random()` interface.

The following are the verbatim comments from the original code:



A C-program for MT19937, with initialization improved 2002/1/26.  
Coded by Takuji Nishimura and Makoto Matsumoto.

Before using, initialize the state by using `init_genrand(seed)`  
or `init_by_array(init_key, key_length)`.

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=====

Python was created in the early 1990s by Guido van Rossum at Stichting

Mathematisch Centrum (CWI, see <http://www.cwi.nl>) in the Netherlands as a successor of a language called ABC. Guido remains Python's principal author, although it includes many contributions from others.

In 1995, Guido continued his work on Python at the Corporation for National Research Initiatives (CNRI, see <http://www.cnri.reston.va.us>) in Reston, Virginia where he released several versions of the software.

In May 2000, Guido and the Python core development team moved to BeOpen.com to form the BeOpen PythonLabs team. In October of the same year, the PythonLabs team moved to Digital Creations (now Zope Corporation, see <http://www.zope.com>). In 2001, the Python Software Foundation (PSF, see <http://www.python.org/psf/>) was formed, a non-profit organization created specifically to own Python-related Intellectual Property. Zope Corporation is a sponsoring member of the PSF.

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0.9.0 thru 1.2		1991-1995	CWI	yes
1.3 thru 1.5.2	1.2	1995-1999	CNRI	yes
1.6	1.5.2	2000	CNRI	no
2.0	1.6	2000	BeOpen.com	no
1.6.1	1.6	2001	CNRI	yes (2)
2.1	2.0+1.6.1	2001	PSF	no
2.0.1	2.0+1.6.1	2001	PSF	yes
2.1.1	2.1+2.0.1	2001	PSF	yes
2.1.2	2.1.1	2002	PSF	yes
2.1.3	2.1.2	2002	PSF	yes
2.2 and above				
2.1.1	2001-now	PSF		yes

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# subprocess - Subprocesses with accessible I/O streams
#
# For more information about this module, see PEP 324.
#
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```
----- */
# ElementTree
# $Id: ElementInclude.py 1862 2004-06-18 07:31:02Z Fredrik $
#
```

```

# limited xinclude support for element trees
#
# history:
# 2003-08-15 fl created
# 2003-11-14 fl fixed default loader
#
# Copyright (c) 2003-2004 by Fredrik Lundh. All rights reserved.
#
# fredrik@pythonware.com
# http://www.pythonware.com
#
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# install - install a program, script, or datafile

#

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/\* microprotocols.c - minimalist and non-validating protocols implementation

\*

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#
# -- Gregory P. Smith <greg@krypto.org>
#
# $Id: test_dbtables.py 66088 2008-08-31 14:00:51Z jesus.cea $
# Original version written by Greg Stein (gstein@lyra.org)
# and Bill Tutt (rassilon@lima.mudlib.org)
# February 1997.
#
# Modifications and improvements for Python 2.0 by Jeremy Hylton and
# Mark Hammond
#
# Some fixes to try to have correct line number on almost all nodes
# (except Module, Discard and Stmt) added by Sylvain Thenault
#
```

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IA64/unix Foreign Function Interface

Original author: Hans Boehm, HP Labs

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#

# re-compatible interface for the sre matching engine

#

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Mersenne Twister

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A C-program for MT19937, with initialization improved 2002/1/26.  
Coded by Takuji Nishimura and Makoto Matsumoto.

Before using, initialize the state by using `init_genrand(seed)`  
or `init_by_array(init_key, key_length)`.

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<http://www.math.keio.ac.jp/matumoto/emt.html>

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Sockets

-----

The `:mod:'socket'` module uses the functions, `:func:'getaddrinfo'`, and `:func:'getnameinfo'`, which are coded in separate source files from the WIDE Project, <http://www.wide.ad.jp/>. ::

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Floating point exception control

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MD5 message digest algorithm  
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L. Peter Deutsch  
ghost@aladdin.com

Independent implementation of MD5 (RFC 1321).

This code implements the MD5 Algorithm defined in RFC 1321, whose text is available at

<http://www.ietf.org/rfc/rfc1321.txt>

The code is derived from the text of the RFC, including the test suite (section A.5) but excluding the rest of Appendix A. It does not include

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The original and principal author of md5.h is L. Peter Deutsch <ghost@aladdin.com>. Other authors are noted in the change history that follows (in reverse chronological order):

2002-04-13 lpd Removed support for non-ANSI compilers; removed references to Ghostscript; clarified derivation from RFC 1321; now handles byte order either statically or dynamically.  
1999-11-04 lpd Edited comments slightly for automatic TOC extraction.  
1999-10-18 lpd Fixed typo in header comment (ansi2knr rather than md5); added conditionalization for C++ compilation from Martin Purschke <purschke@bnl.gov>.  
1999-05-03 lpd Original version.

Asynchronous socket services

-----

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Execution tracing

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UUencode and UUdecode functions  
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Modified by Jack Jansen, CWI, July 1995:

- Use binascii module to do the actual line-by-line conversion  
between ascii and binary. This results in a 1000-fold speedup. The C  
version is still 5 times faster, though.
- Arguments more compliant with python standard

XML Remote Procedure Calls  
-----

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test\_epoll

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Select kqueue

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/\* zlib.h -- interface of the 'zlib' general purpose compression library  
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# 1.44 ecj 4.6.1

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## 1.45 slf4j 1.7.16

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## 1.46 tcsh 6.20.00

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```
/*
 * config.h -- configure various defines for tcsh
 *
 * All source files should #include this FIRST.
 *
 * Edit this to match your system type.
 */

#ifndef _h_config
#define _h_config
/***** System dependant compilation flags *****/
/*
 * POSIX This system supports IEEE Std 1003.1-1988 (POSIX).
 */
#undef POSIX

/*
 * POSIXJOBS This system supports the optional IEEE Std 1003.1-1988 (POSIX)
 * job control facilities.
 */
#undef POSIXJOBS

/*
 * VFORK This machine has a vfork().
 * It used to be that for job control to work, this define
 * was mandatory. This is not the case any more.
 * If you think you still need it, but you don't have vfork,
 * define this anyway and then do #define vfork fork.
 * I do this anyway on a Sun because of yellow pages brain damage,
 * [should not be needed under 4.1]
 * and on the iris4d cause SGI's fork is sufficiently "virtual"
 * that vfork isn't necessary. (Besides, SGI's vfork is weird).
 * Note that some machines
 * eg. rs6000 have a vfork, but not
 * with the berkeley semantics, so we cannot use it there either.
 */
#define VFORK

/*
 * BSDJOBS You have BSD-style job control (both process groups and
 * a tty that deals correctly
```

```

*/
#define BSDJOBS

/*
* BSDTIMES You have BSD-style process time stuff (like rusage)
* This may or may not be true. For example, Apple Unix
* (OREO) has BSDJOBS but not BSDTIMES.
*/
#define BSDTIMES

/*
* BSDLIMIT You have BSD-style resource limit stuff (getrlimit/setrlimit)
*/
#define BSDLIMIT

/*
* TERMIO You have struct termio instead of struct sgttyb.
* This is usually the case for SYSV systems, where
* BSD uses sgttyb. POSIX systems should define this
* anyway, even though they use struct termios.
*/
#undef TERMIO

/*
* SYSVREL Your machine is SYSV based (HPUX, A/UX)
* NOTE: don't do this if you are on a Pyramid -- tcsh is
* built in a BSD universe.
* Set SYSVREL to 1, 2, 3, or 4, depending the version of System V
* you are running.
Or set it to 0 if you are not SYSV based
*/
#define SYSVREL 0

/*
* YPBUGS Work around Sun YP bugs that cause expansion of ~username
* to send command output to /dev/null
*/
#undef YPBUGS

/***** local defines *****/

#endif /* _h_config */
/*-
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## 1.48 libtool 2.4.6

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This script is compatible with the BSD `install` script, but was written from scratch. It can only install one file at a time, a restriction shared with many OS's `install` programs.

On Debian systems, the complete text of the GNU General Public License can be found in `'/usr/share/common-licenses/GPL-2'`

-- vile: txtmode file-encoding=utf-8

Upstream source <http://invisible-island.net/ncurses/ncurses.html>

This package is used for testing builds of `ncurses`.

Current `ncurses` maintainer: Thomas Dickey <[dickey@invisible-island.net](mailto:dickey@invisible-island.net)>

-----  
Files: \*

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Files: `aclocal.m4` package

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Files: `doc/html/NCURSES-Programming-HOWTO.html`

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-- vile: txtmode file-encoding=utf-8

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## 1.50 libtasn 4.13

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2.1	2.0+1.6.1	2001	PSF	no
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```
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   version 1.2.11, January 15th, 2017
```

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## 1.72 websocket 1.1.FR

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jar/javax/websocket/PongMessage.java

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\* /opt/cola/permits/1000018032\_1654022968.5253847/0/javax-websocket-api-1-1-sources-2-jar/javax/websocket/server/ServerEndpointConfig.java  
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 \* /opt/cola/permits/1000018032\_1654022968.5253847/0/javax-websocket-api-1-1-sources-2-jar/javax/websocket/HandshakeResponse.java  
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```
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it

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Version 3, 29 June 2007

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with the Invariant Sections being @var{list their titles}, with the Front-Cover Texts being @var{list}, and with the Back-Cover Texts being @var{list}.

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```
@c Local Variables:
@c ispell-local-pdict: "ispell-dict"
@c
End:
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@center Version 2.1, February 1999
```

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@c This file is intended to be included within another document,
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```

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```
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```
@subheading Preamble
```

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```
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```

```
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```

```
@var{signature of Ty Coon}, 1 April 1990
```

```
Ty Coon, President of Vice
```

```
@end smallexample
```

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```

```
@center Version 2, June 1991
```

```
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@display
```

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```
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Thus, it is not the intent of this section to claim rights or contest your rights to work written entirely by you; rather, the intent is to exercise the right to control the distribution of derivative or collective works based on the Program.

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@page

@heading Appendix: How to Apply These Terms to Your New Programs

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To do so, attach the following notices to the program. It is safest to attach them to the start of each source file to most effectively convey the exclusion of warranty; and each file should have at least the ``copyright" line and a pointer to where the full notice is found.

@smallexample

@var{one line to give the program's name  
and a brief idea of what it does.}

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@end smallexample

Also add information on how to contact you by electronic and paper mail.

If the program is interactive, make it output a short notice like this when it starts in an interactive mode:

```
@smallexample
Gnomovision version
69, Copyright (C) @var{year} @var{name of author}
Gnomovision comes with ABSOLUTELY NO WARRANTY; for details type `show w'.
This is free software, and you are welcome to redistribute it
under certain conditions; type `show c' for details.
@end smallexample
```

The hypothetical commands `@samp{show w}` and `@samp{show c}` should show the appropriate parts of the General Public License. Of course, the commands you use may be called something other than `@samp{show w}` and `@samp{show c}`; they could even be mouse-clicks or menu items---whatever suits your program.

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```
@example
Yoyodyne, Inc., hereby disclaims all copyright interest in the program
`Gnomovision' (which makes passes at compilers) written by James Hacker.
```

```
@var{signature of Ty Coon}, 1 April 1989
Ty Coon, President of Vice
@end example
```

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## 1.77 handlebars-java 4.0.6

## 1.78 json-c 0.12.1

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The original code is FirewallControl.pas, released April 16, 2007.

The initial developer of the original code is Rainer Budde (<http://www.speed-soft.de>).

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## 1.80 json-smart 2.2.1

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```
* /opt/cola/permits/1000738114_1651084661.34/0/json-smart-2-2-1-sources-
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- \* /opt/cola/permits/1000738114\_1651084661.34/0/json-smart-2-2-1-sources-jar/net/minidev/json/writer/JsonReader.java
- \* /opt/cola/permits/1000738114\_1651084661.34/0/json-smart-2-2-1-sources-jar/net/minidev/json/parser/JSONParserByteArray.java
- \* /opt/cola/permits/1000738114\_1651084661.34/0/json-smart-2-2-1-sources-jar/net/minidev/json/JSONAwareEx.java
- \*
- /opt/cola/permits/1000738114\_1651084661.34/0/json-smart-2-2-1-sources-jar/net/minidev/json/parser/JSONParser.java
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- \* /opt/cola/permits/1000738114\_1651084661.34/0/json-smart-2-2-1-sources-jar/net/minidev/json/JSONValue.java
- \* /opt/cola/permits/1000738114\_1651084661.34/0/json-smart-2-2-1-sources-jar/net/minidev/json/JSONObject.java
- \* /opt/cola/permits/1000738114\_1651084661.34/0/json-smart-2-2-1-sources-jar/net/minidev/json/writer/JsonReaderI.java
- \* /opt/cola/permits/1000738114\_1651084661.34/0/json-smart-2-2-1-sources-jar/net/minidev/json/JSONNavi.java
- \* /opt/cola/permits/1000738114\_1651084661.34/0/json-smart-2-2-1-sources-jar/net/minidev/json/writer/DefaultMapperOrdered.java
- \*
- /opt/cola/permits/1000738114\_1651084661.34/0/json-smart-2-2-1-sources-jar/net/minidev/json/parser/JSONParserInputStream.java
- \* /opt/cola/permits/1000738114\_1651084661.34/0/json-smart-2-2-1-sources-jar/net/minidev/json/writer/CompressorMapper.java
- \* /opt/cola/permits/1000738114\_1651084661.34/0/json-smart-2-2-1-sources-jar/net/minidev/json/JSONStreamAware.java
- \* /opt/cola/permits/1000738114\_1651084661.34/0/json-smart-2-2-1-sources-jar/net/minidev/json/writer/ArraysMapper.java
- \* /opt/cola/permits/1000738114\_1651084661.34/0/json-smart-2-2-1-sources-jar/net/minidev/json/parser/JSONParserMemory.java
- \* /opt/cola/permits/1000738114\_1651084661.34/0/json-smart-2-2-1-sources-jar/net/minidev/json/JSONUtil.java
- \* /opt/cola/permits/1000738114\_1651084661.34/0/json-smart-2-2-1-sources-jar/net/minidev/json/parser/JSONParserReader.java
- \* /opt/cola/permits/1000738114\_1651084661.34/0/json-smart-2-2-1-sources-jar/net/minidev/json/writer/DefaultMapperCollection.java
- \*
- /opt/cola/permits/1000738114\_1651084661.34/0/json-smart-2-2-1-sources-jar/net/minidev/json/JSONAware.java
- \* /opt/cola/permits/1000738114\_1651084661.34/0/json-smart-2-2-1-sources-jar/net/minidev/json/JStylerObj.java
- \* /opt/cola/permits/1000738114\_1651084661.34/0/json-smart-2-2-1-sources-jar/net/minidev/json/JSONArray.java
- \* /opt/cola/permits/1000738114\_1651084661.34/0/json-smart-2-2-1-sources-jar/net/minidev/json/parser/JSONParserBase.java
- \* /opt/cola/permits/1000738114\_1651084661.34/0/json-smart-2-2-1-sources-jar/net/minidev/json/writer/FakeMapper.java
- \* /opt/cola/permits/1000738114\_1651084661.34/0/json-smart-2-2-1-sources-jar/net/minidev/json/JSONStyle.java

```
* /opt/cola/permits/1000738114_1651084661.34/0/json-smart-2-2-1-sources-
jar/net/minidev/json/parser/JSONParserStream.java
* /opt/cola/permits/1000738114_1651084661.34/0/json-smart-2-2-1-sources-
jar/net/minidev/json/writer/BeansMapper.java
* /opt/cola/permits/1000738114_1651084661.34/0/json-smart-2-2-1-sources-
jar/net/minidev/json/JSONStreamAwareEx.java
```

## 1.81 accessors-smart 1.1

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```
* /opt/cola/permits/1000738334_1651084663.26/0/accessors-smart-1-1-sources-
jar/net/minidev/asm/BeansAccess.java
* /opt/cola/permits/1000738334_1651084663.26/0/accessors-smart-1-1-sources-jar/net/minidev/asm/Accessor.java
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jar/net/minidev/asm/DynamicClassLoader.java
*
/opt/cola/permits/1000738334_1651084663.26/0/accessors-smart-1-1-sources-jar/net/minidev/asm/ASMUtil.java
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\* /opt/cola/permits/1000738750\_1654022966.462261/0/tiger-types-1-4-sources-jar/org/jvnet/tiger\_types/WildcardTypeImpl.java  
\* /opt/cola/permits/1000738750\_1654022966.462261/0/tiger-types-1-4-sources-jar/org/jvnet/tiger\_types/TypeVisitor.java  
\* /opt/cola/permits/1000738750\_1654022966.462261/0/tiger-types-1-4-sources-jar/org/jvnet/tiger\_types/Lister.java  
\* /opt/cola/permits/1000738750\_1654022966.462261/0/tiger-types-1-4-sources-jar/org/jvnet/tiger\_types/Types.java  
\* /opt/cola/permits/1000738750\_1654022966.462261/0/tiger-types-1-4-sources-jar/org/jvnet/tiger\_types/ParameterizedTypeImpl.java

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```
* /opt/cola/permits/1000738750_1654022966.462261/0/tiger-types-1-4-sources-
jar/org/jvnet/tiger_types/GenericArrayTypeImpl.java
```

# 1.83 javax-ws-rs-api 2.0.1

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- \* /opt/cola/permits/1000741842\_1654022862.0826519/0/javax-ws-rs-api-2-0-1-sources-jar/javax/ws/rs/ext/FactoryFinder.java
- \* /opt/cola/permits/1000741842\_1654022862.0826519/0/javax-ws-rs-api-2-0-1-sources-jar/javax/ws/rs/core/Request.java
- \* /opt/cola/permits/1000741842\_1654022862.0826519/0/javax-ws-rs-api-2-0-1-sources-jar/javax/ws/rs/GET.java
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- \* /opt/cola/permits/1000741842\_1654022862.0826519/0/javax-ws-rs-api-2-0-1-sources-jar/javax/ws/rs/core/UriInfo.java
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- \* /opt/cola/permits/1000741842\_1654022862.0826519/0/javax-ws-rs-api-2-0-1-sources-jar/javax/ws/rs/CookieParam.java
- \* /opt/cola/permits/1000741842\_1654022862.0826519/0/javax-ws-rs-api-2-0-1-sources-jar/javax/ws/rs/ext/MessageBodyReader.java

```

*
/opt/cola/permits/1000741842_1654022862.0826519/0/javax-ws-rs-api-2-0-1-sources-jar/javax/ws/rs/HEAD.java
* /opt/cola/permits/1000741842_1654022862.0826519/0/javax-ws-rs-api-2-0-1-sources-
jar/javax/ws/rs/core/NewCookie.java
* /opt/cola/permits/1000741842_1654022862.0826519/0/javax-ws-rs-api-2-0-1-sources-
jar/javax/ws/rs/core/UriBuilder.java
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jar/javax/ws/rs/ApplicationPath.java
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jar/javax/ws/rs/DELETE.java
* /opt/cola/permits/1000741842_1654022862.0826519/0/javax-ws-rs-api-2-0-1-sources-jar/javax/ws/rs/package-
info.java
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jar/javax/ws/rs/core/Variant.java
* /opt/cola/permits/1000741842_1654022862.0826519/0/javax-ws-rs-api-2-0-1-sources-
jar/javax/ws/rs/Consumes.java
* /opt/cola/permits/1000741842_1654022862.0826519/0/javax-ws-rs-api-2-0-1-sources-
jar/javax/ws/rs/client/FactoryFinder.java
* /opt/cola/permits/1000741842_1654022862.0826519/0/javax-ws-rs-api-2-0-1-sources-
jar/javax/ws/rs/core/HttpHeaders.java
*
/opt/cola/permits/1000741842_1654022862.0826519/0/javax-ws-rs-api-2-0-1-sources-
jar/javax/ws/rs/FormParam.java
* /opt/cola/permits/1000741842_1654022862.0826519/0/javax-ws-rs-api-2-0-1-sources-
jar/javax/ws/rs/core/EntityTag.java
* /opt/cola/permits/1000741842_1654022862.0826519/0/javax-ws-rs-api-2-0-1-sources-
jar/javax/ws/rs/Produces.java

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## 1.87 commons-lang3 3.4

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 \*/  
 /\*\*  
 \* A registry for service provider objects.  
 \* <p/>  
 \* Service providers are looked up from the classpath, under the path  
 \* { @code META-INF/services/}&lt;full-class-name&gt;.  
 \* <p/>  
 \* For example:<br/>  
 \* { @code META-INF/services/com.company.package.spi.MyService }.  
 \* <p/>  
 \* The file should contain a list of fully-qualified concrete class names,  
 \*  
 \* one per line.  
 \* <p/>  
 \* The <em>full-class-name</em> represents an interface or (typically) an  
 \* abstract class, and is the same class used as the category for this registry.  
 \* Note that only one instance of a concrete subclass may be registered with a  
 \* specific category at a time.  
 \* <p/>  
 \* <small>Implementation detail: This class is a clean room implementation of  
 \* a service registry and does not use the proprietary { @code sun.misc.Service }  
 \* class that is referred to in the <em>JAR File specification</em>.  
 \* This class should work on any Java platform.  
 \* </small>  
 \*  
 \* @author <a href="mailto:harald.kuhr@gmail.com">Harald Kuhr</a>  
 \* @version \$Id: com/twelvemonkeys/util/service/ServiceRegistry.java#2 \$  
 \* @see RegisterableService  
 \* @see <a href="http://java.sun.com/j2se/1.3/docs/guide/jar/jar.html#Service%20Provider">JAR File

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\* /opt/cola/permits/1000760692\_1646171562.79/0/common-lang-3-4-sources-jar/com/twelvemonkeys/util/TokenIterator.java  
\* /opt/cola/permits/1000760692\_1646171562.79/0/common-lang-3-4-sources-jar/com/twelvemonkeys/lang/StringUtil.java  
\* /opt/cola/permits/1000760692\_1646171562.79/0/common-lang-3-4-sources-jar/com/twelvemonkeys/util/IgnoreCaseMap.java  
\* /opt/cola/permits/1000760692\_1646171562.79/0/common-lang-3-4-sources-jar/com/twelvemonkeys/util/regex/WildcardStringParser.java

\* /opt/cola/permits/1000760692\_1646171562.79/0/common-lang-3-4-sources-jar/com/twelvemonkeys/util/LRUHashMap.java  
\* /opt/cola/permits/1000760692\_1646171562.79/0/common-lang-3-4-sources-jar/com/twelvemonkeys/util/AbstractTokenIterator.java  
\*  
/opt/cola/permits/1000760692\_1646171562.79/0/common-lang-3-4-sources-jar/com/twelvemonkeys/lang/BeanUtil.java  
\* /opt/cola/permits/1000760692\_1646171562.79/0/common-lang-3-4-sources-jar/com/twelvemonkeys/util/DuplicateHandler.java  
\* /opt/cola/permits/1000760692\_1646171562.79/0/common-lang-3-4-sources-jar/com/twelvemonkeys/util/convert/NoAvailableConverterException.java  
\* /opt/cola/permits/1000760692\_1646171562.79/0/common-lang-3-4-sources-jar/com/twelvemonkeys/util/TimeFormat.java  
\* /opt/cola/permits/1000760692\_1646171562.79/0/common-lang-3-4-sources-jar/com/twelvemonkeys/util/convert/DateConverter.java  
\* /opt/cola/permits/1000760692\_1646171562.79/0/common-lang-3-4-sources-jar/com/twelvemonkeys/util/AbstractDecoratedMap.java  
\* /opt/cola/permits/1000760692\_1646171562.79/0/common-lang-3-4-sources-jar/com/twelvemonkeys/lang/SystemUtil.java  
\* /opt/cola/permits/1000760692\_1646171562.79/0/common-lang-3-4-sources-jar/com/twelvemonkeys/util/ExpiringMap.java  
\* /opt/cola/permits/1000760692\_1646171562.79/0/common-lang-3-4-sources-jar/com/twelvemonkeys/util/service/package\_info.java  
\*  
/opt/cola/permits/1000760692\_1646171562.79/0/common-lang-3-4-sources-jar/com/twelvemonkeys/util/LinkedMap.java  
\* /opt/cola/permits/1000760692\_1646171562.79/0/common-lang-3-4-sources-jar/com/twelvemonkeys/util/BeanMap.java  
\* /opt/cola/permits/1000760692\_1646171562.79/0/common-lang-3-4-sources-jar/com/twelvemonkeys/util/Time.java  
\* /opt/cola/permits/1000760692\_1646171562.79/0/common-lang-3-4-sources-jar/com/twelvemonkeys/util/convert/TimeConverter.java  
\* /opt/cola/permits/1000760692\_1646171562.79/0/common-lang-3-4-sources-jar/com/twelvemonkeys/util/convert/TypeMismatchException.java  
\* /opt/cola/permits/1000760692\_1646171562.79/0/common-lang-3-4-sources-jar/com/twelvemonkeys/util/convert/ConverterImpl.java  
\* /opt/cola/permits/1000760692\_1646171562.79/0/common-lang-3-4-sources-jar/com/twelvemonkeys/util/TimeoutMap.java  
\* /opt/cola/permits/1000760692\_1646171562.79/0/common-lang-3-4-sources-jar/com/twelvemonkeys/util/CollectionUtil.java  
\*  
/opt/cola/permits/1000760692\_1646171562.79/0/common-lang-3-4-sources-jar/com/twelvemonkeys/util/convert/DefaultConverter.java  
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Found in path(s):

\* /opt/cola/permits/1000760692\_1646171562.79/0/common-lang-3-4-sources-  
jar/com/twelvemonkeys/lang/Validate.java

## 1.88 tomcat 8.0.43

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- javaee\_web\_services\_client\_1\_3.xsd
- jsp\_2\_2.xsd
- web-app\_3\_0.xsd
- web-common\_3\_0.xsd
- web-fragment\_3\_0.xsd
- javaee\_7.xsd
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Schemas for Java EE Deployment Descriptors:

- javaee\_5.xsd
- javaee\_web\_services\_1\_2.xsd
- javaee\_web\_services\_client\_1\_2.xsd
- javaee\_6.xsd
- javaee\_web\_services\_1\_3.xsd
- javaee\_web\_services\_client\_1\_3.xsd
- jsp\_2\_2.xsd
- web-app\_3\_0.xsd
- web-common\_3\_0.xsd
- web-fragment\_3\_0.xsd
- javaee\_7.xsd
- javaee\_web\_services\_1\_4.xsd
- javaee\_web\_services\_client\_1\_4.xsd
- jsp\_2\_3.xsd
- web-app\_3\_1.xsd
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Written by: Philip Hazel  
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`/opt/cola/permits/1000966816_1607498231.08/0/aopalliance-repackaged-2-4-0-b31-sources-jar/pom.xml`

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```
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## 1.103 bean-validation-api 1.1.0

## 1.104 jetty-xml 9.2.13.v20150730

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Found in path(s):

```
* /opt/cola/permits/1001100689_1651084720.69/0/jetty-xml-9-2-13-v20150730-sources-
jar/org/eclipse/jetty/xml/XmlConfiguration.java
* /opt/cola/permits/1001100689_1651084720.69/0/jetty-xml-9-2-13-v20150730-sources-
jar/org/eclipse/jetty/xml/XmlAppendable.java
* /opt/cola/permits/1001100689_1651084720.69/0/jetty-xml-9-2-13-v20150730-sources-
jar/org/eclipse/jetty/xml/ConfigurationProcessor.java
* /opt/cola/permits/1001100689_1651084720.69/0/jetty-xml-9-2-13-v20150730-sources-
jar/org/eclipse/jetty/xml/ConfigurationProcessorFactory.java
```



\*

/opt/cola/permits/1001100689\_1651084720.69/0/jetty-xml-9-2-13-v20150730-sources-jar/org/eclipse/jetty/xml/XmlParser.java

\* /opt/cola/permits/1001100689\_1651084720.69/0/jetty-xml-9-2-13-v20150730-sources-jar/org/eclipse/jetty/xml/package-info.java

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Found in path(s):

\* /opt/cola/permits/1001100689\_1651084720.69/0/jetty-xml-9-2-13-v20150730-sources-jar/about.html

## 1.105 jetty-webapp 9.2.13.v20150730

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```

Found in path(s):

\* /opt/cola/permits/1001100681\_1651084510.26/0/jetty-webapp-9-2-13-v20150730-sources-jar/org/eclipse/jetty/webapp/DescriptorProcessor.java

\* /opt/cola/permits/1001100681\_1651084510.26/0/jetty-webapp-9-2-13-v20150730-sources-jar/org/eclipse/jetty/webapp/IterativeDescriptorProcessor.java

\* /opt/cola/permits/1001100681\_1651084510.26/0/jetty-webapp-9-2-13-v20150730-sources-jar/org/eclipse/jetty/webapp/Origin.java

\* /opt/cola/permits/1001100681\_1651084510.26/0/jetty-webapp-9-2-13-v20150730-sources-jar/org/eclipse/jetty/webapp/WebDescriptor.java

\*

/opt/cola/permits/1001100681\_1651084510.26/0/jetty-webapp-9-2-13-v20150730-sources-jar/org/eclipse/jetty/webapp/WebAppClassLoader.java

\* /opt/cola/permits/1001100681\_1651084510.26/0/jetty-webapp-9-2-13-v20150730-sources-jar/org/eclipse/jetty/webapp/WebXmlConfiguration.java

\* /opt/cola/permits/1001100681\_1651084510.26/0/jetty-webapp-9-2-13-v20150730-sources-

```

jar/org/eclipse/jetty/webapp/DiscoveredAnnotation.java
* /opt/cola/permits/1001100681_1651084510.26/0/jetty-webapp-9-2-13-v20150730-sources-
jar/org/eclipse/jetty/webapp/WebAppContext.java
* /opt/cola/permits/1001100681_1651084510.26/0/jetty-webapp-9-2-13-v20150730-sources-
jar/org/eclipse/jetty/webapp/DefaultsDescriptor.java
* /opt/cola/permits/1001100681_1651084510.26/0/jetty-webapp-9-2-13-v20150730-sources-
jar/org/eclipse/jetty/webapp/JarScanner.java
* /opt/cola/permits/1001100681_1651084510.26/0/jetty-webapp-9-2-13-v20150730-sources-
jar/org/eclipse/jetty/webapp/FragmentDescriptor.java
* /opt/cola/permits/1001100681_1651084510.26/0/jetty-webapp-9-2-13-v20150730-sources-
jar/org/eclipse/jetty/webapp/MetaData.java
*
/opt/cola/permits/1001100681_1651084510.26/0/jetty-webapp-9-2-13-v20150730-sources-
jar/org/eclipse/jetty/webapp/MetaDataComplete.java
* /opt/cola/permits/1001100681_1651084510.26/0/jetty-webapp-9-2-13-v20150730-sources-
jar/org/eclipse/jetty/webapp/Configuration.java
* /opt/cola/permits/1001100681_1651084510.26/0/jetty-webapp-9-2-13-v20150730-sources-
jar/org/eclipse/jetty/webapp/AbstractConfiguration.java
* /opt/cola/permits/1001100681_1651084510.26/0/jetty-webapp-9-2-13-v20150730-sources-
jar/org/eclipse/jetty/webapp/FragmentConfiguration.java
* /opt/cola/permits/1001100681_1651084510.26/0/jetty-webapp-9-2-13-v20150730-sources-
jar/org/eclipse/jetty/webapp/CloneConfiguration.java
* /opt/cola/permits/1001100681_1651084510.26/0/jetty-webapp-9-2-13-v20150730-sources-
jar/org/eclipse/jetty/webapp/MetaInfConfiguration.java
* /opt/cola/permits/1001100681_1651084510.26/0/jetty-webapp-9-2-13-v20150730-sources-
jar/org/eclipse/jetty/webapp/package-info.java
*
/opt/cola/permits/1001100681_1651084510.26/0/jetty-webapp-9-2-13-v20150730-sources-
jar/org/eclipse/jetty/webapp/OverrideDescriptor.java
* /opt/cola/permits/1001100681_1651084510.26/0/jetty-webapp-9-2-13-v20150730-sources-
jar/org/eclipse/jetty/webapp/StandardDescriptorProcessor.java
* /opt/cola/permits/1001100681_1651084510.26/0/jetty-webapp-9-2-13-v20150730-sources-
jar/org/eclipse/jetty/webapp/Descriptor.java
* /opt/cola/permits/1001100681_1651084510.26/0/jetty-webapp-9-2-13-v20150730-sources-
jar/org/eclipse/jetty/webapp/WebInfConfiguration.java
* /opt/cola/permits/1001100681_1651084510.26/0/jetty-webapp-9-2-13-v20150730-sources-
jar/org/eclipse/jetty/webapp/JettyWebXmlConfiguration.java
* /opt/cola/permits/1001100681_1651084510.26/0/jetty-webapp-9-2-13-v20150730-sources-
jar/org/eclipse/jetty/webapp/Ordering.java
* /opt/cola/permits/1001100681_1651084510.26/0/jetty-webapp-9-2-13-v20150730-sources-
jar/org/eclipse/jetty/webapp/ClasspathPattern.java
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Found in path(s):

\* /opt/cola/permits/1001100681\_1651084510.26/0/jetty-webapp-9-2-13-v20150730-sources-jar/about.html

## 1.106 jopt-simple 4.9

## 1.107 jetty 9.2.13.v20150730

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Found in path(s):

\* /opt/cola/permits/1001100693\_1651084722.9/0/jetty-servlet-9-2-13-v20150730-sources-jar/org/eclipse/jetty/servlet/FilterMapping.java  
\* /opt/cola/permits/1001100693\_1651084722.9/0/jetty-servlet-9-2-13-v20150730-sources-jar/org/eclipse/jetty/servlet/JspPropertyGroupServlet.java  
\* /opt/cola/permits/1001100693\_1651084722.9/0/jetty-servlet-9-2-13-v20150730-sources-jar/org/eclipse/jetty/servlet/ServletContextHandler.java  
\* /opt/cola/permits/1001100693\_1651084722.9/0/jetty-servlet-9-2-13-v20150730-sources-jar/org/eclipse/jetty/servlet/DefaultServlet.java

```

*
/opt/cola/permits/1001100693_1651084722.9/0/jetty-servlet-9-2-13-v20150730-sources-
jar/org/eclipse/jetty/servlet/FilterHolder.java
* /opt/cola/permits/1001100693_1651084722.9/0/jetty-servlet-9-2-13-v20150730-sources-
jar/org/eclipse/jetty/servlet/Invoker.java
* /opt/cola/permits/1001100693_1651084722.9/0/jetty-servlet-9-2-13-v20150730-sources-
jar/org/eclipse/jetty/servlet/listener/ELContextCleaner.java
* /opt/cola/permits/1001100693_1651084722.9/0/jetty-servlet-9-2-13-v20150730-sources-
jar/org/eclipse/jetty/servlet/ListenerHolder.java
* /opt/cola/permits/1001100693_1651084722.9/0/jetty-servlet-9-2-13-v20150730-sources-
jar/org/eclipse/jetty/servlet/listener/package-info.java
* /opt/cola/permits/1001100693_1651084722.9/0/jetty-servlet-9-2-13-v20150730-sources-
jar/org/eclipse/jetty/servlet/NoJspServlet.java
* /opt/cola/permits/1001100693_1651084722.9/0/jetty-servlet-9-2-13-v20150730-sources-
jar/org/eclipse/jetty/servlet/ServletMapping.java
* /opt/cola/permits/1001100693_1651084722.9/0/jetty-servlet-9-2-13-v20150730-sources-
jar/org/eclipse/jetty/servlet/package-info.java
*
/opt/cola/permits/1001100693_1651084722.9/0/jetty-servlet-9-2-13-v20150730-sources-
jar/org/eclipse/jetty/servlet/ServletHolder.java
* /opt/cola/permits/1001100693_1651084722.9/0/jetty-servlet-9-2-13-v20150730-sources-
jar/org/eclipse/jetty/servlet/jmx/package-info.java
* /opt/cola/permits/1001100693_1651084722.9/0/jetty-servlet-9-2-13-v20150730-sources-
jar/org/eclipse/jetty/servlet/ServletHandler.java
* /opt/cola/permits/1001100693_1651084722.9/0/jetty-servlet-9-2-13-v20150730-sources-
jar/org/eclipse/jetty/servlet/BaseHolder.java
* /opt/cola/permits/1001100693_1651084722.9/0/jetty-servlet-9-2-13-v20150730-sources-
jar/org/eclipse/jetty/servlet/jmx/HolderMBean.java
* /opt/cola/permits/1001100693_1651084722.9/0/jetty-servlet-9-2-13-v20150730-sources-
jar/org/eclipse/jetty/servlet/StatisticsServlet.java
* /opt/cola/permits/1001100693_1651084722.9/0/jetty-servlet-9-2-13-v20150730-sources-
jar/org/eclipse/jetty/servlet/jmx/FilterMappingMBean.java
*
/opt/cola/permits/1001100693_1651084722.9/0/jetty-servlet-9-2-13-v20150730-sources-
jar/org/eclipse/jetty/servlet/ServletTester.java
* /opt/cola/permits/1001100693_1651084722.9/0/jetty-servlet-9-2-13-v20150730-sources-
jar/org/eclipse/jetty/servlet/listener/IntrospectorCleaner.java
* /opt/cola/permits/1001100693_1651084722.9/0/jetty-servlet-9-2-13-v20150730-sources-
jar/org/eclipse/jetty/servlet/jmx/ServletMappingMBean.java
* /opt/cola/permits/1001100693_1651084722.9/0/jetty-servlet-9-2-13-v20150730-sources-
jar/org/eclipse/jetty/servlet/ErrorHandlerHandler.java
* /opt/cola/permits/1001100693_1651084722.9/0/jetty-servlet-9-2-13-v20150730-sources-
jar/org/eclipse/jetty/servlet/Holder.java

```

## 1.108 xmlunit-legacy 2.3.0

# 1.109 wiremock-standalone 2.5.1

## 1.110 jetty-security 9.2.13.v20150730

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Found in path(s):

\* /opt/cola/permits/1001100702\_1651084727.58/0/jetty-security-9-2-13-v20150730-sources-jar/org/eclipse/jetty/security/SpnegoUserIdentity.java

\* /opt/cola/permits/1001100702\_1651084727.58/0/jetty-security-9-2-13-v20150730-sources-jar/org/eclipse/jetty/security/UserDataConstraint.java

\* /opt/cola/permits/1001100702\_1651084727.58/0/jetty-security-9-2-13-v20150730-sources-jar/org/eclipse/jetty/security/IdentityService.java

\* /opt/cola/permits/1001100702\_1651084727.58/0/jetty-security-9-2-13-v20150730-sources-jar/org/eclipse/jetty/security/ConstraintAware.java

\*

/opt/cola/permits/1001100702\_1651084727.58/0/jetty-security-9-2-13-v20150730-sources-jar/org/eclipse/jetty/security/JDBCLoginService.java

\* /opt/cola/permits/1001100702\_1651084727.58/0/jetty-security-9-2-13-v20150730-sources-jar/org/eclipse/jetty/security/authentication/SpnegoAuthenticator.java

```

* /opt/cola/permits/1001100702_1651084727.58/0/jetty-security-9-2-13-v20150730-sources-
jar/org/eclipse/jetty/security/DefaultUserIdentity.java
* /opt/cola/permits/1001100702_1651084727.58/0/jetty-security-9-2-13-v20150730-sources-
jar/org/eclipse/jetty/security/authentication/BasicAuthenticator.java
* /opt/cola/permits/1001100702_1651084727.58/0/jetty-security-9-2-13-v20150730-sources-
jar/org/eclipse/jetty/security/SpnegoUserPrincipal.java
* /opt/cola/permits/1001100702_1651084727.58/0/jetty-security-9-2-13-v20150730-sources-
jar/org/eclipse/jetty/security/PropertyUserStore.java
* /opt/cola/permits/1001100702_1651084727.58/0/jetty-security-9-2-13-v20150730-sources-
jar/org/eclipse/jetty/security/RoleInfo.java
*
/opt/cola/permits/1001100702_1651084727.58/0/jetty-security-9-2-13-v20150730-sources-
jar/org/eclipse/jetty/security/DefaultIdentityService.java
* /opt/cola/permits/1001100702_1651084727.58/0/jetty-security-9-2-13-v20150730-sources-
jar/org/eclipse/jetty/security/authentication/SessionAuthentication.java
* /opt/cola/permits/1001100702_1651084727.58/0/jetty-security-9-2-13-v20150730-sources-
jar/org/eclipse/jetty/security/authentication/LoginAuthenticator.java
* /opt/cola/permits/1001100702_1651084727.58/0/jetty-security-9-2-13-v20150730-sources-
jar/org/eclipse/jetty/security/RoleRunAsToken.java
* /opt/cola/permits/1001100702_1651084727.58/0/jetty-security-9-2-13-v20150730-sources-
jar/org/eclipse/jetty/security/authentication/DeferredAuthentication.java
* /opt/cola/permits/1001100702_1651084727.58/0/jetty-security-9-2-13-v20150730-sources-
jar/org/eclipse/jetty/security/DefaultAuthenticatorFactory.java
* /opt/cola/permits/1001100702_1651084727.58/0/jetty-security-9-2-13-v20150730-sources-
jar/org/eclipse/jetty/security/Authenticator.java
*
/opt/cola/permits/1001100702_1651084727.58/0/jetty-security-9-2-13-v20150730-sources-
jar/org/eclipse/jetty/security/HashLoginService.java
* /opt/cola/permits/1001100702_1651084727.58/0/jetty-security-9-2-13-v20150730-sources-
jar/org/eclipse/jetty/security/authentication/FormAuthenticator.java
* /opt/cola/permits/1001100702_1651084727.58/0/jetty-security-9-2-13-v20150730-sources-
jar/org/eclipse/jetty/security/authentication/ClientCertAuthenticator.java
* /opt/cola/permits/1001100702_1651084727.58/0/jetty-security-9-2-13-v20150730-sources-
jar/org/eclipse/jetty/security/authentication/package-info.java
* /opt/cola/permits/1001100702_1651084727.58/0/jetty-security-9-2-13-v20150730-sources-
jar/org/eclipse/jetty/security/RunAsToken.java
* /opt/cola/permits/1001100702_1651084727.58/0/jetty-security-9-2-13-v20150730-sources-
jar/org/eclipse/jetty/security/ConstraintMapping.java
* /opt/cola/permits/1001100702_1651084727.58/0/jetty-security-9-2-13-v20150730-sources-
jar/org/eclipse/jetty/security/authentication/DigestAuthenticator.java
*
/opt/cola/permits/1001100702_1651084727.58/0/jetty-security-9-2-13-v20150730-sources-
jar/org/eclipse/jetty/security/LoginService.java
* /opt/cola/permits/1001100702_1651084727.58/0/jetty-security-9-2-13-v20150730-sources-
jar/org/eclipse/jetty/security/MappedLoginService.java
* /opt/cola/permits/1001100702_1651084727.58/0/jetty-security-9-2-13-v20150730-sources-
jar/org/eclipse/jetty/security/UserAuthentication.java
* /opt/cola/permits/1001100702_1651084727.58/0/jetty-security-9-2-13-v20150730-sources-

```

```

jar/org/eclipse/jetty/security/package-info.java
* /opt/cola/permits/1001100702_1651084727.58/0/jetty-security-9-2-13-v20150730-sources-
jar/org/eclipse/jetty/security/SecurityHandler.java
* /opt/cola/permits/1001100702_1651084727.58/0/jetty-security-9-2-13-v20150730-sources-
jar/org/eclipse/jetty/security/AbstractUserAuthentication.java
* /opt/cola/permits/1001100702_1651084727.58/0/jetty-security-9-2-13-v20150730-sources-
jar/org/eclipse/jetty/security/HashCrossContextPseudoSession.java
*
/opt/cola/permits/1001100702_1651084727.58/0/jetty-security-9-2-13-v20150730-sources-
jar/org/eclipse/jetty/security/CrossContextPseudoSession.java
* /opt/cola/permits/1001100702_1651084727.58/0/jetty-security-9-2-13-v20150730-sources-
jar/org/eclipse/jetty/security/authentication/LoginCallback.java
* /opt/cola/permits/1001100702_1651084727.58/0/jetty-security-9-2-13-v20150730-sources-
jar/org/eclipse/jetty/security/authentication/LoginCallbackImpl.java
* /opt/cola/permits/1001100702_1651084727.58/0/jetty-security-9-2-13-v20150730-sources-
jar/org/eclipse/jetty/security/SpnegoLoginService.java
* /opt/cola/permits/1001100702_1651084727.58/0/jetty-security-9-2-13-v20150730-sources-
jar/org/eclipse/jetty/security/ServerAuthException.java
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//Equivalent to //<user-data-constraint><transport-guarantee>CONFIDENTIAL</transport-guarantee></user-data-
constraint>

```

Found in path(s):

```

* /opt/cola/permits/1001100702_1651084727.58/0/jetty-security-9-2-13-v20150730-sources-
jar/org/eclipse/jetty/security/ConstraintSecurityHandler.java

```

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Any executables

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<one line to give the program's name and a brief idea of what it does.>  
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```
Gnomovision version 69, Copyright (C) year name of author
Gnomovision comes with ABSOLUTELY NO WARRANTY; for details type `show w'.
This is free software, and you are welcome to redistribute it
under certain conditions; type `show c' for details.
```

The hypothetical commands

```
`show w' and `show c' should show the appropriate
parts of the General Public License. Of course, the commands you use may
be called something other than `show w' and `show c'; they could even be
mouse-clicks or menu items--whatever suits your program.
```

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```
Yoyodyne, Inc., hereby disclaims all copyright interest in the program
`Gnomovision' (which makes passes at compilers) written by James Hacker.
```

```
<signature of Ty Coon>, 1 April 1989
Ty Coon, President of Vice
```

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## 1.113 c-ares 1.14.0

### 1.113.1 Available under license :

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## 1.114 sqlite 3.4.2

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## 1.115 javax-inject 2.4.0

## 1.116 mchange-commons-java 0.2.15

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"Source code"

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That's all there is to it!

# 1.117 java-getopt 1.0.9

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Version 2, June 1991

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The reason we have a separate public license for some libraries is that they blur the distinction we usually make between modifying or adding to a program and simply using it. Linking a program with a library, without changing the library, is in some sense simply using the library, and is analogous to running a utility program or application program. However, in a textual and legal sense, the linked executable is a combined work, a derivative of the original library, and the ordinary General Public License treats it as such.

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## 1.118 protobuf-java 2.2.0

## 1.119 eclipse-compiler 3.12.1.v20160829-0950

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## 1.120 xerces-j 2.7.1

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```
set yrange [0:]  
set terminal pngcairo font 'Sans, 8' lw 1 size 1400,1024  
set xtics rotate by -45  
set style histogram errorbars gap 2 lw 1  
set style fill solid border -1  
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```

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```
* /opt/cola/permits/1006740031_1651084572.34/0/hikaricp-java7-2-4-13-sources-  
jar/com/zaxxer/hikari/pool/PoolEntry.java  
* /opt/cola/permits/1006740031_1651084572.34/0/hikaricp-java7-2-4-13-sources-  
jar/com/zaxxer/hikari/metrics/dropwizard/CodahaleHealthChecker.java
```

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- \* /opt/cola/permits/1006740031\_1651084572.34/0/hikaricp-java7-2-4-13-sources-jar/com/zaxxer/hikari/metrics/PoolStats.java

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- \* /opt/cola/permits/1006740031\_1651084572.34/0/hikaricp-java7-2-4-13-sources-jar/com/zaxxer/hikari/util/PropertyElf.java
- \* /opt/cola/permits/1006740031\_1651084572.34/0/hikaricp-java7-2-4-13-sources-jar/com/zaxxer/hikari/pool/ProxyPreparedStatement.java
- \*

/opt/cola/permits/1006740031\_1651084572.34/0/hikaricp-java7-2-4-13-sources-jar/com/zaxxer/hikari/util/UtilityElf.java

- \* /opt/cola/permits/1006740031\_1651084572.34/0/hikaricp-java7-2-4-13-sources-jar/com/zaxxer/hikari/hibernate/HikariConnectionProvider.java
- \* /opt/cola/permits/1006740031\_1651084572.34/0/hikaricp-java7-2-4-13-sources-jar/com/zaxxer/hikari/pool/ProxyCallableStatement.java
- \* /opt/cola/permits/1006740031\_1651084572.34/0/hikaricp-java7-2-4-13-sources-jar/com/zaxxer/hikari/HikariDataSource.java
- \* /opt/cola/permits/1006740031\_1651084572.34/0/hikaricp-java7-2-4-13-sources-jar/com/zaxxer/hikari/HikariConfigMXBean.java
- \* /opt/cola/permits/1006740031\_1651084572.34/0/hikaricp-java7-2-4-13-sources-jar/com/zaxxer/hikari/HikariPoolMXBean.java

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\* /opt/cola/permits/1006740031\_1651084572.34/0/hikaricp-java7-2-4-13-sources-jar/com/zaxxer/hikari/pool/HikariPool.java

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/opt/cola/permits/1006740031\_1651084572.34/0/hikaricp-java7-2-4-13-sources-jar/com/zaxxer/hikari/metrics/MetricsTrackerFactory.java

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- \* /opt/cola/permits/1006740031\_1651084572.34/0/hikaricp-java7-2-4-13-sources-jar/com/zaxxer/hikari/metrics/prometheus/HikariCPCollector.java
- \* /opt/cola/permits/1006740031\_1651084572.34/0/hikaricp-java7-2-4-13-sources-jar/com/zaxxer/hikari/pool/PoolBase.java
- \*

/opt/cola/permits/1006740031\_1651084572.34/0/hikaricp-java7-2-4-13-sources-jar/com/zaxxer/hikari/metrics/prometheus/PrometheusMetricsTrackerFactory.java

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- \* /opt/cola/permits/1006740031\_1651084572.34/0/hikaricp-java7-2-4-13-sources-jar/com/zaxxer/hikari/util/ConcurrentBag.java
- \* /opt/cola/permits/1006740031\_1651084572.34/0/hikaricp-java7-2-4-13-sources-jar/com/zaxxer/hikari/util/DriverDataSource.java
- \*

/opt/cola/permits/1006740031\_1651084572.34/0/hikaricp-java7-2-4-13-sources-jar/com/zaxxer/hikari/pool/ProxyFactory.java

- \* /opt/cola/permits/1006740031\_1651084572.34/0/hikaricp-java7-2-4-13-sources-jar/com/zaxxer/hikari/util/SuspendResumeLock.java

- \* /opt/cola/permits/1006740031\_1651084572.34/0/hikaricp-java7-2-4-13-sources-jar/com/zaxxer/hikari/HikariConfig.java

- \* /opt/cola/permits/1006740031\_1651084572.34/0/hikaricp-java7-2-4-13-sources-jar/com/zaxxer/hikari/pool/ProxyResultSet.java

\* /opt/cola/permits/1006740031\_1651084572.34/0/hikaricp-java7-2-4-13-sources-jar/com/zaxxer/hikari/util/FastList.java  
\* /opt/cola/permits/1006740031\_1651084572.34/0/hikaricp-java7-2-4-13-sources-jar/com/zaxxer/hikari/pool/ProxyLeakTask.java  
\* /opt/cola/permits/1006740031\_1651084572.34/0/hikaricp-java7-2-4-13-sources-jar/com/zaxxer/hikari/util/JavassistProxyFactory.java

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jar/org/apache/log4j/spi/LoggerFactory.java
* /opt/ws_local/PERMITS_SQL/1014254129_1594628093.81/0/log4j-over-slf4j-2-0-0-alpha1-sources-
jar/org/apache/log4j/NDC.java
*
/opt/ws_local/PERMITS_SQL/1014254129_1594628093.81/0/log4j-over-slf4j-2-0-0-alpha1-sources-
jar/org/apache/log4j/helpers/LogLog.java
* /opt/ws_local/PERMITS_SQL/1014254129_1594628093.81/0/log4j-over-slf4j-2-0-0-alpha1-sources-
jar/org/apache/log4j/spi/ErrorHandler.java
* /opt/ws_local/PERMITS_SQL/1014254129_1594628093.81/0/log4j-over-slf4j-2-0-0-alpha1-sources-
jar/org/apache/log4j/spi/LoggingEvent.java
* /opt/ws_local/PERMITS_SQL/1014254129_1594628093.81/0/log4j-over-slf4j-2-0-0-alpha1-sources-
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```

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cmd/krb5/slave/kpropd_rpc.c
lib/gss_mechs/mech_krb5/et/kdb5_err.c
lib/gss_mechs/mech_spnego/mech_gssapiP_spnego.h
lib/gss_mechs/mech_spnego/mech_spnego_mech.c
lib/krb5/kadm5/kadm_host_srv_names.c
lib/krb5/kdb/kdb_convert.c
lib/krb5/kdb/kdb_hdr.h
lib/krb5/kdb/kdb_log.c
lib/krb5/kdb/kdb_log.h
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lib/libgss/g\_seal.c  
lib/libgss/g\_sign.c  
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The implementations of GSSAPI mechglue in GSSAPI-SPNEGO in "src/lib/gssapi", including the following files:

lib/gssapi/generic/gssapi\_err\_generic.et  
lib/gssapi/mechglue/g\_accept\_sec\_context.c  
lib/gssapi/mechglue/g\_acquire\_cred.c  
lib/gssapi/mechglue/g\_canon\_name.c  
lib/gssapi/mechglue/g\_compare\_name.c  
lib/gssapi/mechglue/g\_context\_time.c  
lib/gssapi/mechglue/g\_delete\_sec\_context.c  
lib/gssapi/mechglue/g\_dsp\_name.c  
lib/gssapi/mechglue/g\_dsp\_status.c  
lib/gssapi/mechglue/g\_dup\_name.c  
lib/gssapi/mechglue/g\_exp\_sec\_context.c  
lib/gssapi/mechglue/g\_export\_name.c  
lib/gssapi/mechglue/g\_glue.c  
lib/gssapi/mechglue/g\_imp\_name.c  
lib/gssapi/mechglue/g\_imp\_sec\_context.c  
lib/gssapi/mechglue/g\_init\_sec\_context.c  
lib/gssapi/mechglue/g\_initialize.c  
lib/gssapi/mechglue/g\_inquire\_context.c  
lib/gssapi/mechglue/g\_inquire\_cred.c

lib/gssapi/mechglue/g\_inquire\_names.c  
lib/gssapi/mechglue/g\_process\_context.c  
lib/gssapi/mechglue/g\_rel\_buffer.c  
lib/gssapi/mechglue/g\_rel\_cred.c  
lib/gssapi/mechglue/g\_rel\_name.c  
lib/gssapi/mechglue/g\_rel\_oid\_set.c  
lib/gssapi/mechglue/g\_seal.c  
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lib/gssapi/mechglue/g\_unseal.c  
lib/gssapi/mechglue/g\_userok.c  
lib/gssapi/mechglue/g\_utils.c  
lib/gssapi/mechglue/g\_verify.c  
lib/gssapi/mechglue/gssd\_pname\_to\_uid.c  
lib/gssapi/mechglue/mglueP.h  
lib/gssapi/mechglue/oid\_ops.c  
lib/gssapi/spnego/gssapiP\_spnego.h  
lib/gssapi/spnego/spnego\_mech.c

and the initial implementation of incremental propagation,  
including  
the following new or changed files:

include/ipropr\_hdr.h  
kadmin/server/ipropr\_svc.c  
lib/kdb/ipropr.x  
lib/kdb/kdb\_convert.c  
lib/kdb/kdb\_log.c  
lib/kdb/kdb\_log.h  
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kprop/kpropd\_rpc.c  
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.. toctree::

:hidden:

copyright.rst

.. include:: notice.rst

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## 1.144 perl 5.24.1

### 1.144.1 Available under license :

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abstract: 'Build and install Perl modules'

author:

- 'Ken Williams <kwilliams@cpan.org>'

- "Development questions, bug reports, and patches should be sent to the\nModule-Build mailing list at <module-build@perl.org>."

build\_requires:

File::Temp: 0.15

Test::Harness: 3.16

Test::More: 0.49

generated\_by: 'Module::Build version 0.3608'

license: gpl

meta-spec:  
url: <http://module-build.sourceforge.net/META-spec-v1.4.html>  
version: 1.4  
name: Module-Build  
resources:  
MailingList: <mailto:module-build@perl.org>  
license: <http://dev.perl.org/licenses/>  
repository: <http://github.com/dagolden/module-build/>  
version: 3

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```
<one line to give the program's name and a brief idea of what it does.>  
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```

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Also add information on how to contact you by electronic and paper mail.

If the program is interactive, make it output a short notice like this

when it starts in an interactive mode:

```
Gnomovision version 69, Copyright (C) 19xx name of author
Gnomovision comes with ABSOLUTELY NO WARRANTY; for details type `show w'.
This is free software, and you are welcome to redistribute it
under certain conditions; type `show c' for details.
```

The hypothetical commands `show w' and `show c' should show the appropriate parts of the General Public License.

Of course, the commands you use may be called something other than `show w' and `show c'; they could even be mouse-clicks or menu items--whatever suits your program.

You should also get your employer (if you work as a programmer) or your school, if any, to sign a "copyright disclaimer" for the program, if necessary. Here a sample; alter the names:

```
Yoyodyne, Inc., hereby disclaims all copyright interest in the
program `Gnomovision' (a program to direct compilers to make passes
at assemblers) written by James Hacker.
```

```
<signature of Ty Coon>, 1 April 1989
Ty Coon, President of Vice
```

```
That's all there is to it!
#!perl
```

```
=head1 NAME
```

```
copyright.t
```

```
=head1 DESCRIPTION
```

Tests that the latest copyright years in the top-level README file and the C<perl -v> output match each other.

If the test fails, update at least one of README and perl.c so that they match reality.

Optionally you can pass the C<--now> option to check they are at the current year. This isn't checked by default, so that it doesn't fail for people working on older releases. It should be run before making a new release.

```
=cut
```

```
use strict;
use Config;
```

```

BEGIN { require './test.pl' }

if ( $Config{usecrosscompile} ) {
    skip_all( "Not all files are available during cross-compilation" );
}

my ($opt) = @ARGV;

my $readme_year = readme_year();
my $v_year = v_year();

# Check that both copyright dates are up-to-date, but only if requested, so
# that tests still pass for people intentionally working on older versions:
if ($opt eq '--now')
{
    my $current_year = (gmtime)[5] + 1900;
    is $v_year, $current_year, 'perl -v copyright includes current
year';
    is $readme_year, $current_year, 'README copyright includes current year';
}

# Otherwise simply check that the two copyright dates match each other:
else
{
    is $readme_year, $v_year, 'README and perl -v copyright dates match';
}

done_testing;

sub readme_year
# returns the latest copyright year from the top-level README file
{

    open my $readme, '<', './README' or die "Opening README failed: $!";

    # The copyright message is the first paragraph:
    local $/ = "";
    my $copyright_msg = <$readme>;

    my ($year) = $copyright_msg =~ /\b(\d{4,})/s
        or die "Year not found in README copyright message '$copyright_msg'";

    $year;
}

sub v_year

```

```
# returns the latest copyright year shown in perl -v
{

my $output = runperl switches => ['-v'];
my ($year) = $output =~ /copyright 1987.*\b(\d{4,})/i
    or die "Copyright statement not found in perl -v output '$output'";

$year;
}
```

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abstract: 'Build and install Perl modules'

author:

- 'Ken Williams <kwilliams@cpan.org>'

- "Development questions, bug reports, and patches should be sent to the\nModule-Build mailing list at <module-build@perl.org>."

build\_requires:

File::Temp: 0.15

Test::Harness: 3.16

Test::More: 0.49

generated\_by: 'Module::Build version 0.3608'

license: gpl

meta-spec:

url: <http://module-build.sourceforge.net/META-spec-v1.4.html>

version: 1.4

name: Module-Build

resources:

MailingList: <mailto:module-build@perl.org>

license: <http://dev.perl.org/licenses/>

repository: <http://github.com/dagolden/module-build/>

version: 3

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Julian Seward, [jseward@bzip.org](mailto:jseward@bzip.org)  
bzip2/libbzip2 version 1.0.6 of 6 September 2010

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```

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```
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program `Gnomovision' (a program to direct compilers to make passes
```

at assemblers) written by James Hacker.

<signature of Ty Coon>, 1 April 1989  
Ty Coon, President of Vice

That's all there is to it!  
#!perl

=head1 NAME

copyright.t

=head1 DESCRIPTION

Tests that the latest copyright years in the top-level README file and the  
C<perl -v> output match each other.

If the test fails, update at least one of README and perl.c so that they match  
reality.

Optionally you can pass the C<--now> option to check they are at the current  
year. This isn't checked by default, so that it doesn't fail for people  
working on older releases. It should be run before making a new release.

=cut

```
use strict;
use Config;
BEGIN { require './test.pl' }
```

```
if ( $Config{usecrosscompile} ) {
    skip_all( "Not all files are available during cross-compilation" );
}
```

```
my ($opt) = @ARGV;
```

```
my $readme_year = readme_year();
my $v_year = v_year();
```

```
# Check that both copyright dates are up-to-date, but only if requested, so
# that tests still pass for people intentionally working on older versions:
if ($opt eq '--now')
{
    my $current_year = (gmtime)[5] + 1900;
    is $v_year, $current_year, 'perl -v copyright includes current
year';
    is $readme_year, $current_year, 'README copyright includes current year';
}
```

```

# Otherwise simply check that the two copyright dates match each other:
else
{
is $readme_year, $v_year, 'README and perl -v copyright dates match';
}

done_testing;

sub readme_year
# returns the latest copyright year from the top-level README file
{

open my $readme, '<', './README' or die "Opening README failed: $!";

# The copyright message is the first paragraph:
local $/ = "";
my $copyright_msg = <$readme>;

my ($year) = $copyright_msg =~ /\b(\d{4,})/s
    or die "Year not found in README copyright message '$copyright_msg'";

$year;
}

sub v_year
# returns the latest copyright year shown in perl -v
{

my $output = runperl switches => ['-v'];
my ($year) = $output =~ /copyright 1987.*\b(\d{4,})/i
    or die "Copyright statement not found in perl -v output '$output'";

$year;
}

```

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```

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at assemblers) written by James Hacker.
```

```
<signature of Ty Coon>, 1 April 1989
Ty Coon, President of Vice
```

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The End



# 1.146 libpng 1.5.4

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# 1.147 icu 58

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## Commands to generate dependency files
GEN_DEPS.c= $(CC) -E -MM $(DEFS) $(CPPFLAGS)
GEN_DEPS.cc= $(CXX) -E -MM $(DEFS) $(CPPFLAGS)

## Flags for position independent code
SHAREDLIBCFLAGS = -fPIC
SHAREDLIBCXXFLAGS = -fPIC
SHAREDLIBCPPFLAGS = -DPIC

## Additional flags when building libraries and with threads
THREADSCPPFLAGS = -D_REENTRANT
LIBCPPFLAGS =

## Compiler switch to embed a runtime search path
LD_RPATH=
LD_RPATH_PRE= -Wl,-rpath,

## Compiler switch to embed a library name
LD_SONAME = -Wl,-soname -Wl,$(notdir $(MIDDLE_SO_TARGET))

## Shared library options
LD_SOOPTIONS= -Wl,-Bsymbolic

## Shared object suffix
SO = so

## Non-shared intermediate object suffix
STATIC_O = ao

## Compilation
rules
%. $(STATIC_O): $(srcdir)/%.c
$(COMPILE.c) $(STATICCPPFLAGS) $(STATICCFLAGS) -o $@ $<
%.o: $(srcdir)/%.c
$(COMPILE.c) $(DYNAMICCPPFLAGS) $(DYNAMICCFLAGS) -o $@ $<

%. $(STATIC_O): $(srcdir)/%.cpp
$(COMPILE.cc) $(STATICCPPFLAGS) $(STATICCXXFLAGS) -o $@ $<
```

```
%.o: $(srcdir)/%.cpp
$(COMPILE.cc) $(DYNAMICCPPFLAGS) $(DYNAMICCXXFLAGS) -o $@ $<
```

```
## Dependency rules
```

```
%.d: $(srcdir)/%.c
@echo "generating dependency information for $<"
@$(SHELL) -ec '$(GEN_DEPS.c) $< \
| sed "s/^(.*)\.o[ :]*/\1.o $@ : /g"' > $@; \
[ -s $@ ] || rm -f $@'
```

```
%.d: $(srcdir)/%.cpp
@echo "generating dependency information for $<"
@$(SHELL) -ec '$(GEN_DEPS.cc) $< \
| sed "s/^(.*)\.o[ :]*/\1.o $@ : /g"' > $@; \
[ -s $@ ] || rm -f $@'
```

```
## Versioned libraries rules
```

```
%.${SO}.${SO_TARGET_VERSION_MAJOR}: %.${SO}.${SO_TARGET_VERSION}
$(RM) $@ && ln -s ${<F} $@
%.${SO}: %.${SO}.${SO_TARGET_VERSION_MAJOR}
$(RM) $@ && ln -s ${*F}.${SO}.${SO_TARGET_VERSION} $@
```

```
## Bind internal references
```

```
# LDflags that pkgdata will use
BIR_LDFLAGS= -Wl,-Bsymbolic
```

```
# Dependencies [i.e. map files] for the final library
BIR_DEPS=
```

```
## Remove shared library 's'
STATIC_PREFIX_WHEN_USED =
STATIC_PREFIX =
```

```
## End BSD-specific setup
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jseward@bzip.org  
bzip2/libbzip2 version 1.0.4 of 20 December 2006

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Written by: Philip Hazel  
Email local part: ph10  
Email domain: cam.ac.uk

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```
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## 1.154 postgresql 9.2

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# 1.155 unbound 1.8.1rc1

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## 1.156 antlr 1.7.16

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 */

/** templates used to generate make-compatible dependencies */
```

```

/** Generate "f : x, y, z" dependencies for input
 * dependencies and generated files. in and out
 * are File objects. For example, you can say
 * <f.canonicalPath>
 */
dependencies(grammarFileName,in,out) ::= <<
<if(in)><grammarFileName>: <in; separator=", "><endif>
<out:{f | <f> : <grammarFileName>} ;
 separator="\n">
>>

```

Found in path(s):

```

* /opt/cola/permits/1020749546_1607585150.55/0/antlr-4-9-complete-jar/org/antlr/v4/tool/templates/depend.stg
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```

```

atn(startState, states, edges, rankdir, decisionRanks, useBox) ::= <<
digraph ATN {

```

```

rankdir=LR;
<decisionRanks; separator="\n">
<states; separator="\n">
<edges; separator="\n">
}
>>

dfa(name, startState, states, edges, rankdir, decisionRanks, useBox) ::= <<
digraph <name> {
<if(rankdir)>rankdir=<rankdir>;<endif>
<decisionRanks; separator="\n">
<states; separator="\n">
<edges;
separator="\n">
}
>>

decision-rank(states) ::= <<
{rank=same; rankdir=TB; <states:{s | s<s>}; separator=" "; >}
>>

edge(src,target,label,arrowhead,transitionIndex) ::= <<
<src><if(transitionIndex)>:p<transitionIndex><endif> -> <target> [fontsize=11, fontname="Courier", arrowsize=.7,
label = "<label>"<if(arrowhead)>, arrowhead = <arrowhead><endif>];
>>

action-edge(src,target,label,arrowhead,transitionIndex) ::= <<
<src><if(transitionIndex)>:p<transitionIndex><endif> -> <target> [fontsize=11, fontname="Courier", arrowsize=.7,
label = "<label>"<if(arrowhead)>, arrowhead = <arrowhead><endif>];
>>

epsilon-edge(src,label,target,arrowhead,transitionIndex,loopback=false) ::= <<
<src><if(transitionIndex)>:p<transitionIndex><endif> -> <target> [fontname="Times-Italic",
label="&epsilon;"<if(loopback)>, style="dashed"<endif>];
>>

state(state, label, name, transitions) ::= <%
<name>[fontsize=11,
label="
<! rest(transition) tests for decision states: these nodes have a non-empty
set of transitions after the first one. !>
<if(rest(transitions))>
{
<! Label on the left side of the record node. !>
<label>
|
<! Named ports in order on right side of record node, no display text. !>
{<transitions:{t|\<p<i0>>}; separator="|">}}

```



```

    <else>
      <label>
    <endif>
    "
<if(rest(transitions))>
  , shape=record, fixedsize=false
<else>
  , shape=circle, fixedsize=true, width=.55
<endif>
  , peripheries=1];
%>

stopstate(name,label,actionIndex,useBox) ::= <<
<name>[fontsize=11, label="<label><if(actionIndex)>,\naction:<actionIndex><endif>",
<if(useBox)>shape=polygon,sides=4,peripheries=2,fixedsize=false<else>shape=doublecircle, fixedsize=true,
width=.6<endif>];
>>

```

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*/

```

```

phpTypeInitMap ::= [
  "int":"0",
  "long":"0",
  "float":"0.0",
  "double":"0.0",
  "boolean":"false",
  default:"null"
]

```

```

// args must be <object-model-object>, <fields-resulting-in-STs>

```

```

ParserFile(file, parser, namedActions, contextSuperClass) ::= <<
<fileHeader(file.grammarFileName, file.ANTLRVersion)>
<parser>
>>

```

```

ListenerFile(file, header, namedActions) ::= <<
<fileHeader(file.grammarFileName,
file.ANTLRVersion)>
<if(file.genPackage)>
namespace <file.genPackage>;
<endif>
<header>
use Antlr\Antlr4\Runtime\Tree\ParseTreeListener;

```

```

/**
 * This interface defines a complete listener for a parse tree produced by
 * { @see <file.parserName> }.
 */
interface <file.grammarName>Listener extends ParseTreeListener {
  <file.listenerNames: {lname |
/**
  <if(file.listenerLabelRuleNames.(lname))>
  * Enter a parse tree produced by the `<lname>`
  * labeled alternative in { @see <file.parserName>::<file.listenerLabelRuleNames.(lname)>() }.
  <else>
  * Enter a parse tree produced by { @see <file.parserName>::<lname>() }.
  <endif>
  * @param $context The parse tree.
  */
  public function enter<lname; format="cap">(Context\<lname; format="cap">Context $context) : void;
/**
  <if(file.listenerLabelRuleNames.(lname))>

```

```

* Exit a parse tree produced by the `<lname>` labeled alternative
* in { @see <file.parserName>::<file.listenerLabelRuleNames.<i>(lname)</i>>()}.
<else>
* Exit a parse
tree produced by { @see <file.parserName>::<i>(lname)</i>()}.
<endif>
* @param $context The parse tree.
*/
public function exit<i>(lname; format="cap"</i>>(Context<i>\\<i>(lname; format="cap"</i>>Context $context) : void;};
separator="\n">
}
>>

BaseListenerFile(file, header, namedActions) ::= <<
<fileHeader(file.grammarFileName, file.ANTLRVersion)>
<if(file.genPackage)>
namespace <file.genPackage>;
<endif>
<header>

use Antlr<i>\\Antlr4</i>\\Runtime\\ParserRuleContext;
use Antlr<i>\\Antlr4</i>\\Runtime\\Tree\\ErrorNode;
use Antlr<i>\\Antlr4</i>\\Runtime\\Tree\\TerminalNode;

/**
* This class provides an empty implementation of { @see <file.grammarName>Listener},
* which can be extended to create a listener which only needs to handle a subset
* of the available methods.
*/
class <file.grammarName>BaseListener implements <file.grammarName>Listener
{
<file.listenerNames:>{lname |
/**
* { @inheritdoc}
*
* The default implementation does nothing.
*/
public function enter<i>(lname; format="cap"</i>>(Context<i>\\<i>(lname; format="cap"</i>>Context
$context) : void {}

/**
* { @inheritdoc}
*
* The default implementation does nothing.
*/
public function exit<i>(lname; format="cap"</i>>(Context<i>\\<i>(lname; format="cap"</i>>Context $context) : void {});
separator="\n">

```

```

/**
 * {@inheritDoc}
 *
 * The default implementation does nothing.
 */
public function enterEveryRule(ParserRuleContext $context) : void {}

```

```

/**
 * {@inheritDoc}
 *
 * The default implementation does nothing.
 */
public function exitEveryRule(ParserRuleContext $context) : void {}

```

```

/**
 * {@inheritDoc}
 *
 * The default implementation does nothing.
 */
public function visitTerminal(TerminalNode $node) : void {}

```

```

/**
 * {@inheritDoc}
 *
 * The default implementation does nothing.
 */
public function visitErrorNode(ErrorNode $node) : void {}
}
>>

```

```

VisitorFile(file, header, namedActions) ::= <<
<fileHeader(file.grammarFileName, file.ANTLRVersion)>
<if(file.genPackage)>
namespace <file.genPackage>;
<endif>

```

```

<header>
use Antlr\Antlr4\Runtime\Tree\ParseTreeVisitor;

```

```

/**
 * This interface defines a complete generic visitor for a parse tree produced by {@see <file.parserName>}.
 */
interface <file.grammarName>Visitor extends ParseTreeVisitor
{
    <file.visitorNames:{Iname |
/**
<if(file.visitorLabelRuleNames.(Iname))>
 * Visit a parse tree produced by the `<Iname>` labeled alternative

```

```

* in { @see <file.parserName>::<file.visitorLabelRuleNames.(lname)>() }.
<else>
* Visit a parse tree produced by { @see <file.parserName>::<lname>() }.
<endif>
*
* @param Context\<lname; format="cap">Context $context The parse tree.
*
* @return mixed The visitor result.
*/
public function visit<lname; format="cap">(Context\<lname; format="cap">Context $context);
separator="\n\n"
}
>>

```

```

BaseVisitorFile(file, header, namedActions) ::= <<
<fileHeader(file.grammarFileName, file.ANTLRVersion)>
<if(file.genPackage)>
namespace <file.genPackage>;
<endif>
<header>
use Antlr\Antlr4\Runtime\Tree\AbstractParseTreeVisitor;

/**
 * This class provides
 * an empty implementation of { @see <file.grammarName>Visitor },
 * which can be extended to create a visitor which only needs to handle a subset
 * of the available methods.
 */
class <file.grammarName>BaseVisitor extends AbstractParseTreeVisitor implements <file.grammarName>Visitor
{
    <file.visitorNames:{lname |
/**
 * { @inheritdoc }
 *
 * The default implementation returns the result of calling
 * { @see self::visitChildren() } on `context`.
 */
public function visit<lname; format="cap">(Context\<lname; format="cap">Context $context)
{
    return $this->visitChildren($context);
}}; separator="\n\n"
}
>>

fileHeader(grammarFileName, ANTLRVersion) ::= <<
\<?php

/*

```

```

* Generated from <grammarFileName> by ANTLR <ANTLRVersion>
*/

>>
Parser(parser, funcs, atn, sempredFuncs, superClass) ::= <<
<Parser_(ctor="parser_ctor", ...)>
>>

Parser_(parser, funcs, atn, sempredFuncs, ctor, superClass) ::= <<
namespace<if(file.genPackage)> <file.genPackage><endif> {
<if(namedActions.header)><namedActions.header><endif>
use
Antlr\Antlr4\Runtime\Atn\ATN;
use Antlr\Antlr4\Runtime\Atn\ATNDeserializer;
use Antlr\Antlr4\Runtime\Atn\ParserATNSimulator;
use Antlr\Antlr4\Runtime\Dfa\DFA;
use Antlr\Antlr4\Runtime\Error\Exceptions\FailedPredicateException;
use Antlr\Antlr4\Runtime\Error\Exceptions\NoViableAltException;
use Antlr\Antlr4\Runtime\PredictionContexts\PredictionContextCache;
use Antlr\Antlr4\Runtime\Error\Exceptions\RecognitionException;
use Antlr\Antlr4\Runtime\RuleContext;
use Antlr\Antlr4\Runtime\Token;
use Antlr\Antlr4\Runtime\TokenStream;
use Antlr\Antlr4\Runtime\Vocabulary;
use Antlr\Antlr4\Runtime\VocabularyImpl;
use Antlr\Antlr4\Runtime\RuntimeMetaData;
use Antlr\Antlr4\Runtime\Parser;
<if(namedActions.definitions)><namedActions.definitions><endif>

final class <parser.name> extends <superClass; null="Parser">
{
<if(parser.tokens)>
public const <parser.tokens>:{k | <k> = <parser.tokens.(k)>}; separator=",
", wrap, anchor>;
<endif>

public const <parser.rules>:{r | RULE_<r.name> = <r.index>}; separator=", ", wrap, anchor>;

/**
 * @var array<string>
 */
public const RULE_NAMES = [
<parser.ruleNames>:{r | '<r>'}; separator=", ", wrap, anchor>
];

<vocabulary(parser.literalNames, parser.symbolicNames)>

<atn>

```

```

protected static $atn;
protected static $decisionToDFA;
protected static $sharedContextCache;
<if(namedActions.members)>

<namedActions.members>
<endif>

<parser:(ctor())>

private static function initialize() : void
{
    if (self::$atn !== null) {
        return;
    }

    RuntimeMetaData::checkVersion('<file.ANTLRVersion>', RuntimeMetaData::VERSION);

    $atn = (new ATNDeserializer()->deserialize(self::SERIALIZED_ATN);

    $decisionToDFA = [];
    for ($i = 0, $count = $atn->getNumberOfDecisions(); $i < $count; $i++) {
        $decisionToDFA[] = new DFA($atn->getDecisionState($i), $i);
    }

    self::$atn = $atn;
    self::$decisionToDFA = $decisionToDFA;
    self::$sharedContextCache
= new PredictionContextCache();
}

public function getGrammarFileName() : string
{
    return "<parser.grammarFileName>";
}

public function getRuleNames() : array
{
    return self::RULE_NAMES;
}

public function getSerializedATN() : string
{
    return self::SERIALIZED_ATN;
}

public function getATN() : ATN

```

```

    {
    return self::$satn;
    }

    public function getVocabulary() : Vocabulary
    {
        static $vocabulary;

        return $vocabulary = $vocabulary ?? new VocabularyImpl(self::LITERAL_NAMES, self::SYMBOLIC_NAMES);
    }
<if(funcs)>

    <funcs; separator="\n\n">
<endif>
<if(sempredFuncs)>

    public function sempred(?RuleContext $localContext, int $ruleIndex, int $predicateIndex) : bool
    {
        switch ($ruleIndex) {
            <parser.sempredFuncs.values:{f}
            case <f.ruleIndex>:
                return $this->sempred<f.name; format="cap">($localContext, $predicateIndex);}; separator="\n\n">

            default:
                return true;
        }
    }

    <sempredFuncs.values;
    separator="\n\n">
<endif>
}
}

namespace <if(file.genPackage)><file.genPackage>\\<endif>Context {
    use Antlr\\Antlr4\\Runtime\\ParserRuleContext;
    use Antlr\\Antlr4\\Runtime\\Token;
    use Antlr\\Antlr4\\Runtime\\Tree\\ParseTreeVisitor;
    use Antlr\\Antlr4\\Runtime\\Tree\\TerminalNode;
    use Antlr\\Antlr4\\Runtime\\Tree\\ParseTreeListener;
    use <if(file.genPackage)><file.genPackage>\\<endif><parser.name>;
    <if (file.genVisitor)>use <if(file.genPackage)><file.genPackage>\\<endif><file.grammarName>Visitor;<endif>
    <if (file.genListener)>use <if(file.genPackage)><file.genPackage>\\<endif><file.grammarName>Listener;<endif>
    <namedActions.contexts>

    <funcs :{ func | <func.ruleCtx><if(func.altLabelCtxs)>

    <func.altLabelCtxs:{1 | <func.altLabelCtxs.(1)>}; separator="\n\n"><endif> }; separator="\n\n">

```



```

}
>>

vocabulary(literalNames, symbolicNames) ::= <<
/**
 * @var array<string|null>
 */
private const LITERAL_NAMES = [
  <literalNames:{t | <t>}; null="null", separator=",",
  ", wrap, anchor>
];

/**
 * @var array<string>
 */
private const SYMBOLIC_NAMES = [
  <symbolicNames:{t | <t>}; null="null", separator=" ", wrap, anchor>
];
>>

dumpActions(recog, argFuncs, actionFuncs, sempredFuncs) ::= <<
<if(actionFuncs)>

public function action(?RuleContext $localContext, int $ruleIndex, int $actionIndex) : void
{
  switch ($ruleIndex) {
  <recog.actionFuncs.values:{f}
  case <f.ruleIndex>:
    $this->action<f.name; format="cap">($localContext, $actionIndex);
    break; }; separator="\n\n">
  }
}

<actionFuncs.values; separator="\n">
<endif>
<if(sempredFuncs)>

public function sempred(?RuleContext $localContext, int $ruleIndex, int $predicateIndex) : bool
{
  switch ($ruleIndex) {
  <recog.sempredFuncs.values:{f}
  case <f.ruleIndex>:
    return $this->sempred<f.name; format="cap">($localContext, $predicateIndex); }; separator="\n\n">
  }

  return true;
}
<sempredFuncs.values; separator="\n\n">

```

```

<endif>
>>

parser_ctor(p) ::= <<
public function __construct(TokenStream
    $input)
{
    parent::__construct($input);

    self::initialize();

    $this->interp = new ParserATNSimulator($this, self::$atn, self::$decisionToDFA, self::$sharedContextCache);
}
>>

/**
 * This generates a private method since the actionIndex is generated, making
 * an overriding implementation impossible to maintain.
 */
RuleActionFunction(r, actions) ::= <<
private function action<r.name; format="cap">(?

```

>>

```
RuleFunction(currentRule,args,code,locals,ruleCtx,altLabelCtxs,namedActions,finallyAction,exceptions,postamble)
 ::= <<
 /**
 * @throws RecognitionException
 */
 <if(currentRule.modifiers)><currentRule.modifiers:{f | <f> }><endif>public function <currentRule.name>(<args;
 separator=", ">) : Context\<currentRule.ctxType>
 {
   $localContext = new Context\<currentRule.ctxType>($this->ctx, $this->getState()<currentRule.args:{a | ,
 <a.name>}>);

   $this->enterRule($localContext, <currentRule.startState>, self::RULE_<currentRule.name>);
   <namedActions.init>
   <locals; separator="\n">

   try {
     <code>
     <postamble; separator="\n">
     <namedActions.after>
   }<if(exceptions)><exceptions; separator="\n"><else> catch (RecognitionException $exception) {
     $localContext->exception = $exception;
     $this->errorHandler->reportError($this, $exception);
     $this->errorHandler->recover($this, $exception);
   }<endif> finally {
     <finallyAction>
     $this->exitRule();
   }

   return $localContext;
 }
 >>
```

```
LeftRecursiveRuleFunction(currentRule,args,code,locals,ruleCtx,altLabelCtxs,namedActions,finallyAction,postamb
le) ::= <<
 /**
 * @throws RecognitionException
 */
 <if(currentRule.modifiers)><currentRule.modifiers:{f | <f> }><endif>public function <currentRule.name>(<args;
 separator=", ">) : Context\<currentRule.ctxType>
 {
   return $this->recursive<currentRule.name; format="cap">(0<currentRule.args:{a | , <a.name>}>);
 }

 /**
 * @throws RecognitionException
 */
```

```

private function recursive<currentRule.name; format="cap">(int $precedence<args:{ a | , <a> }>) :
Context\|<currentRule.ctxType>
{
  $parentContext = $this->ctx;
  $parentState = $this->getState();
  $localContext = new Context\|<currentRule.ctxType>($this->ctx, $parentState<currentRule.args:{ a | ,
<a.name> }>);
  $previousContext = $localContext;
  $startState = <currentRule.startState>;
  $this->enterRecursionRule($localContext, <currentRule.startState>, self::RULE_<currentRule.name>,
  $precedence);
  <namedActions.init>
  <locals; separator="\n">

  try {
    <code>
    <postamble; separator="\n">
    <namedActions.after>
  } catch (RecognitionException $exception) {
    $localContext->exception = $exception;
    $this->errorHandler->reportError($this, $exception);
    $this->errorHandler->recover($this, $exception);
  } finally {
    <finallyAction>
    $this->unrollRecursionContexts($parentContext);
  }

  return $localContext;
}
>>

```

```

CodeBlockForOuterMostAlt(currentOuterMostAltCodeBlock, locals, preamble, ops) ::= <<
<if(currentOuterMostAltCodeBlock.altLabel)>$localContext = new
Context\|<currentOuterMostAltCodeBlock.altLabel; format="cap">Context($localContext);<endif>
$this->enterOuterAlt($localContext, <currentOuterMostAltCodeBlock.alt.altNum>);
<CodeBlockForAlt(currentAltCodeBlock=currentOuterMostAltCodeBlock, ...)>
>>

```

```

CodeBlockForAlt(currentAltCodeBlock, locals, preamble, ops) ::= <<
<locals; separator="\n">
<preamble; separator="\n">
<ops; separator="\n">
>>

```

```

LL1AltBlock(choice,
  preamble, alts, error) ::= <<
$this->setState(<choice.stateNumber>);
$this->errorHandler->sync($this);

```

```
<if(choice.label)><labelref(choice.label)> = $this->input->LT(1);<endif>
```

```
<preamble; separator="\n">
```

```
switch ($this->input->LA(1)) {  
  <choice.altLook,alts:{look,alt| <cases(ttypes=look)>  
  <alt>  
  break;}; separator="\n\n">
```

```
default:
```

```
<error>
```

```
}
```

```
>>
```

```
LL1OptionalBlock(choice, alts, error) ::= <<
```

```
$this->setState(<choice.stateNumber>);
```

```
$this->errorHandler->sync($this);
```

```
switch ($this->input->LA(1)) {  
  <choice.altLook,alts:{look,alt| <cases(ttypes=look)>  
  <alt>  
  break;}; separator="\n\n">
```

```
default:
```

```
break;
```

```
}
```

```
>>
```

```
LL1OptionalBlockSingleAlt(choice, expr, alts, preamble, error, followExpr) ::= <<
```

```
$this->setState(<choice.stateNumber>);
```

```
$this->errorHandler->sync($this);
```

```
<preamble; separator="\n">
```

```
if (<expr>) {  
  <alts; separator="\n">
```

```
}
```

```
>>
```

```
LL1StarBlockSingleAlt(choice, loopExpr, alts, preamble, iteration) ::= <<
```

```
$this->setState(<choice.stateNumber>);
```

```
$this->errorHandler->sync($this);
```

```
<preamble;
```

```
separator="\n">
```

```
while (<loopExpr>) {
```

```
<alts; separator="\n">
```

```
$this->setState(<choice.loopBackStateNumber>);
```

```
$this->errorHandler->sync($this);
```

```
<iteration>
```

```
}  
>>
```

```
LL1PlusBlockSingleAlt(choice, loopExpr, alts, preamble, iteration) ::= <<  
$this->setState(<choice.blockStartStateNumber>); <! alt block decision !>  
$this->errorHandler->sync($this);
```

```
<preamble; separator="\n">  
do {  
  <alts; separator="\n">  
  $this->setState(<choice.stateNumber>); <! loopback/exit decision !>  
  $this->errorHandler->sync($this);  
  <iteration>  
} while (<loopExpr>);  
>>
```

```
// LL(*) stuff
```

```
AltBlock(choice, preamble, alts, error) ::= <<  
$this->setState(<choice.stateNumber>);  
$this->errorHandler->sync($this);  
<if(choice.label)><labelref(choice.label)> = $this->input->LT(1);<endif>  
<preamble; separator="\n">
```

```
switch ($this->getInterpreter()->adaptivePredict($this->input, <choice.decision>, $this->ctx)) {  
  <alts:{ alt |  
case <i>:  
  <alt>  
break; }; separator="\n\n">  
}  
>>
```

```
OptionalBlock(choice, alts,  
error) ::= <<  
$this->setState(<choice.stateNumber>);  
$this->errorHandler->sync($this);
```

```
switch ($this->getInterpreter()->adaptivePredict($this->input, <choice.decision>, $this->ctx)) {  
<alts:{ alt |  
  case <i><if(!choice.ast.greedy)>+1<endif>:  
    <alt>  
  break; }; separator="\n\n">  
}  
>>
```

```
StarBlock(choice, alts, sync, iteration) ::= <<  
$this->setState(<choice.stateNumber>);  
$this->errorHandler->sync($this);
```

```

$alt = $this->getInterpreter()->adaptivePredict($this->input, <choice.decision>, $this->ctx);

while ($alt !== <choice.exitAlt> && $alt !== ATN::INVALID_ALT_NUMBER) {
    if ($alt === 1<if(!choice.ast.greedy)>+1<endif>) {
        <iteration>
        <alts> <! should only be one !>
    }

    $this->setState(<choice.loopBackStateNumber>);
    $this->errorHandler->sync($this);

    $alt = $this->getInterpreter()->adaptivePredict($this->input, <choice.decision>, $this->ctx);
}
>>

PlusBlock(choice, alts, error) ::= <<
$this->setState(<choice.blockStartStateNumber>); <! alt block decision !>
$this->errorHandler->sync($this);

$alt
= 1<if(!choice.ast.greedy)>+1<endif>;

do {
    switch ($alt) {
        <alts>: {alt|
        case <i><if(!choice.ast.greedy)>+1<endif>:
            <alt>
            break;}; separator="\n\n">
        default:
            <error>
    }

    $this->setState(<choice.loopBackStateNumber>); <! loopback/exit decision !>
    $this->errorHandler->sync($this);

    $alt = $this->getInterpreter()->adaptivePredict($this->input, <choice.decision>, $this->ctx);
} while ($alt !== <choice.exitAlt> && $alt !== ATN::INVALID_ALT_NUMBER);
>>

Sync(s) ::= "sync(<s.expecting.name>);"

ThrowNoViableAlt(t) ::= "throw new NoViableAltException($this);"

TestSetInline(s) ::= <<
<s.bitsets: {bits | <if(rest(rest(bits.ttypes)))><bitsetBitfieldComparison(s, bits)><else><bitsetInlineComparison(s,
bits)><endif>} ; separator=" || ">
>>

```

```

// Java language spec 15.19 - shift operators mask operands rather than overflow to 0... need range test
testShiftInRange(shiftAmount) ::= <<
((<shiftAmount>) & ~0x3f) === 0
>>

// produces smaller bytecode only when bits.ttypes contains
more than two items
bitsetBitfieldComparison(s, bits) ::= <%
(<testShiftInRange(<offsetShiftVar(s.varName, bits.shift)>)> && ((1 \<< <offsetShiftVar(s.varName,
bits.shift)>) & (<bits.ttypes:{ttype | (1 \<< <offsetShiftConst(ttype, bits.shift)>)}; separator=" | ">)) !== 0)
%>

isZero ::= [
"0":true,
default:false
]

offsetShiftVar(shiftAmount, offset) ::= <%
<if(!isZero.(offset))>(<shiftAmount> - <offset>)<else><shiftAmount><endif>
%>
offsetShiftConst(shiftAmount, offset) ::= <%
<if(!isZero.(offset))>(self::<shiftAmount> - <offset>)<else>self::<shiftAmount><endif>
%>

// produces more efficient bytecode when bits.ttypes contains at most two items
bitsetInlineComparison(s, bits) ::= <%
<bits.ttypes:{ttype | $<s.varName> === self::<ttype>}; separator=" || ">
%>

cases(ttypes) ::= <<
<ttypes:{t | case self::<t>}; separator="\n">
>>

InvokeRule(r, argExprsChunks) ::= <<
$this->setState(<r.stateNumber>);
<if(r.labels)><r.labels:{1 | <labelref(1)> = }><endif>$this-><if(r.ast.options.p)>recursive<r.name>;
format="cap"><else><r.name><endif>(<if(r.ast.options.p)><r.ast.options.p><if(argExprsChunks)>,<endif><endif>
<argExprsChunks>);
>>

MatchToken(m) ::= <<
$this->setState(<m.stateNumber>);
<if(m.labels)><m.labels:{1 | <labelref(1)> = }><endif>$this->match(self::<m.name>);
>>

MatchSet(m, expr, capture) ::= "<CommonSetStuff(m, expr, capture, false)>"

```



```
MatchNotSet(m, expr, capture) ::= "<CommonSetStuff(m, expr, capture, true)>"
```

```
CommonSetStuff(m, expr, capture, invert) ::= <<  
$this->setState(<m.stateNumber>);
```

```
<if(m.labels)><m.labels:{1 | <labelref(l)> = }>$this->input->LT(1);<endif>  
<capture>
```

```
if (<if(invert)>$<m.varName> \<= 0 || <else>!<endif>(<expr>)) {  
    <if(m.labels)><m.labels:{1 | <labelref(l)> = }><endif>$this->errorHandler->recoverInline($this);  
} else {  
    if ($this->input->LA(1) === Token::EOF) {  
        $this->matchedEOF = true;  
    }  
}
```

```
$this->errorHandler->reportMatch($this);  
$this->consume();  
}  
>>
```

```
Wildcard(w) ::= <<  
$this->setState(<w.stateNumber>);  
<if(w.labels)><w.labels:{1  
| <labelref(l)> = }><endif>$this->matchWildcard();  
>>
```

```
// ACTION STUFF
```

```
Action(a, foo, chunks) ::= "<chunks>"
```

```
ArgAction(a, chunks) ::= "<chunks>"
```

```
SemPred(p, chunks, failChunks) ::= <<  
$this->setState(<p.stateNumber>);
```

```
if (!(<chunks>)) {  
    throw new FailedPredicateException($this, <p.predicate><if(failChunks)>, <failChunks><elseif(p.msg)>,  
<p.msg><endif>);  
}  
>>
```

```
ExceptionClause(e, catchArg, catchAction) ::= <<  
catch (<catchArg>) {  
    <catchAction>  
}  
>>
```

```
// lexer actions are not associated with model objects
```

```

LexerSkipCommand() ::= "$this->skip();"
LexerMoreCommand() ::= "$this->more();"
LexerPopModeCommand() ::= "$this->popMode();"

LexerTypeCommand(arg, grammar) ::= "$this->type = <arg>);"
LexerChannelCommand(arg, grammar) ::= "$this->channel = <arg>);"
LexerModeCommand(arg, grammar) ::= "$this->mode = <arg>);"
LexerPushModeCommand(arg, grammar) ::= "$this->pushMode(<arg>);"

ActionText(t) ::= "<t.text>"
ActionTemplate(t) ::= "<t.st>"
ArgRef(a) ::=
"$localContext-><a.name>"
LocalRef(a) ::= "$localContext-><a.name>"
RetValRef(a) ::= "$localContext-><a.name>"
QRetValRef(a) ::= "<ctx(a)-><a.dict-><a.name>"
/** How to translate $tokenLabel */
TokenRef(t) ::= "<ctx(t)-><t.name>"
LabelRef(t) ::= "<ctx(t)-><t.name>"
ListLabelRef(t) ::= "<ctx(t)-><ListLabelName(t.name)>"
SetAttr(s,rhsChunks) ::= "<ctx(s)-><s.name> = <rhsChunks>);"

TokenLabelType() ::= "<file.TokenLabelType; null={Token}>"
InputSymbolType() ::= "<file.InputSymbolType; null={Token}>"

TokenPropertyRef_text(t) ::= "<ctx(t)-><t.label> != null ? <ctx(t)-><t.label->getText() : null)"
TokenPropertyRef_type(t) ::= "<ctx(t)-><t.label> != null ? <ctx(t)-><t.label->getType() : 0)"
TokenPropertyRef_line(t) ::= "<ctx(t)-><t.label> != null ? <ctx(t)-><t.label->getLine() : 0)"
TokenPropertyRef_pos(t) ::= "<ctx(t)-><t.label> != null ? <ctx(t)-><t.label->getCharPositionInLine() : 0)"
TokenPropertyRef_channel(t) ::= "<ctx(t)-><t.label> != null ? <ctx(t)-><t.label->getChannel() : 0)"
TokenPropertyRef_index(t) ::= "<ctx(t)-><t.label> != null ? <ctx(t)-><t.label->getTokenIndex() : 0)"
TokenPropertyRef_int(t) ::= "<ctx(t)-><t.label> != null ? (int) <ctx(t)-><t.label->getText() : 0)"

RulePropertyRef_start(r) ::= "<ctx(r)-><r.label> != null ? (<ctx(r)-><r.label->start) : null)"
RulePropertyRef_stop(r) ::= "<ctx(r)-><r.label> != null ? (<ctx(r)-><r.label->stop) : null)"
RulePropertyRef_text(r) ::= "<ctx(r)-><r.label> != null ? $this->input->getTextByTokens(<ctx(r)-><r.label->start, <ctx(r)-><r.label->stop) : null)"
RulePropertyRef_ctx(r) ::= "<ctx(r)-><r.label>"
RulePropertyRef_parser(r) ::= "\$this"

ThisRulePropertyRef_start(r) ::= "$localContext->start"
ThisRulePropertyRef_stop(r) ::= "$localContext->stop"
ThisRulePropertyRef_text(r) ::= "$this->input->getTextByTokens($localContext->start, $this->input->LT(-1))"
ThisRulePropertyRef_ctx(r) ::= "$localContext"
ThisRulePropertyRef_parser(r) ::= "$this"

```

```

NonLocalAttrRef(s)
    ::= "\$this->getInvokingContext(<s.ruleIndex>)-><s.name>"
SetNonLocalAttr(s, rhsChunks) ::= "\$this->getInvokingContext(<s.ruleIndex>)-><s.name> = <rhsChunks>";

AddToLabelList(a) ::= "<ctx(a.label)>-><a.listName>[] = <labelref(a.label)>";

TokenDecl(t) ::= "<TokenLabelType()> $<t.name>"
TokenTypeDecl(t) ::= ""
TokenListDecl(t) ::= "array $<t.name> = []"
RuleContextDecl(r) ::= "<r.ctxName> $<r.name>"
RuleContextListDecl(rdecl) ::= "array $<rdecl.name> = []"
AttributeDecl(d) ::= "<d.type> $<d.name><if(d.initValue)> = <d.initValue><endif>"

PropertiesDecl(struct) ::= <<
<if(struct.tokenListDecls)>
    <struct.tokenListDecls : {d | /**
    * @var array<Token>|null $<d.name>
    */
    public $<d.name>;}; separator="\n\n">
<endif>
<if(struct.tokenDecls)>
<if(struct.tokenListDecls)>

<endif>
<struct.tokenDecls : {d | /**
    * @var <TokenLabelType()>|null $<d.name>
    */
    public $<d.name>;}; separator="\n\n">
<endif>
<if(struct.ruleContextDecls)>
<if(struct.tokenListDecls || struct.tokenDecls)>

<endif>
<struct.ruleContextDecls
: {d | /**
    * @var <d.ctxName>|null $<d.name>
    */
    public $<d.name>;}; separator="\n\n">
<endif>
<if(struct.ruleContextListDecls)>
<if(struct.tokenListDecls || struct.tokenDecls || struct.ruleContextDecls)>

<endif>
<struct.ruleContextListDecls : {d | /**
    * @var array<<d.ctxName>>|null $<d.name>
    */
    public $<d.name>;}; separator="\n\n">
<endif>

```

```

<if(struct.attributeDecls)>
<if(struct.tokenListDecls || struct.tokenDecls || struct.ruleContextDecls || struct.ruleContextListDecls)>

<endif>
<struct.attributeDecls : {d | /**
* @var <d.type><if(!d.initValue)>|null<endif> <d.name>
*/
public <d.name><if(d.initValue)> = <d.initValue><endif>;}; separator="\n\n">
<endif>

>>

ContextTokenGetterDecl(t) ::= <<
public function <t.name>() : ?TerminalNode
{
    return $this->getToken(<parser.name>::<t.name>, 0);
}
>>

ContextTokenListGetterDecl(t) ::= <<
>>

ContextTokenListIndexedGetterDecl(t) ::= <<
/**
* @return array<TerminalNode>|TerminalNode|null
*/
public function <t.name>(int $index = null)
{
    if ($index === null) {
        return $this->getTokens(<parser.name>::<t.name>);
    }

    return $this->getToken(<parser.name>::<t.name>, $index);
}
>>

ContextRuleGetterDecl(r) ::= <<
public function <r.name>() : ?<r.ctxName>
{
    return $this->getTypedRuleContext(<r.ctxName>::class, 0);
}
>>

ContextRuleListGetterDecl(r) ::= <<
>>

ContextRuleListIndexedGetterDecl(r) ::= <<
/**

```

```

* @return array\<<r.ctxName>\>\<r.ctxName>|null
*/
public function <r.name>(?int $index = null)
{
    if ($index === null) {
        return $this->getTypedRuleContexts(<r.ctxName>::class);
    }

    return $this->getTypedRuleContext(<r.ctxName>::class, $index);
}
>>

LexerRuleContext() ::= "RuleContext"

/**
 * The rule context name is the rule followed by a suffix; e.g., r becomes rContext.
 */
RuleContextNameSuffix() ::= "Context"

ImplicitTokenLabel(tokenName) ::= "<tokenName>"
ImplicitRuleLabel(ruleName) ::= "<ruleName>"
ImplicitSetLabel(id) ::= "_tset<id>"
ListLabelName(label)
    ::= "<label>"

CaptureNextToken(d) ::= "$<d.varName> = \$this->input->LT(1);"
CaptureNextTokenType(d) ::= "$<d.varName> = $this->input->LA(1);"

StructDecl(struct,ctorAttrs,attrs,getters,dispatchMethods,interfaces,extensionMembers) ::= <<
class <struct.name> extends
<if(contextSuperClass)><contextSuperClass><else>ParserRuleContext<endif><if(interfaces)> implements
<interfaces; separator=", "><endif>
{
<PropertiesDecl(struct)>
public function __construct(?ParserRuleContext $parent, ?int $invokingState = null<ctorAttrs:{a | , ?<a> = null}>)
{
    parent::__construct($parent, $invokingState);
<if(struct.ctorAttrs)>

    <struct.ctorAttrs:{a | $this-><a.name> = $<a.name> ?? $this-><a.name>;}; separator="\n">
<endif>
}

public function getRuleIndex() : int
{
    return <parser.name>::RULE_<struct.derivedFromName>;
}
<if(getters)>

```

```

    <getters:{g | <g>}; separator="\n\n">
<endif>
<if(struct.provideCopyFrom)> <! don't need copy unless we have subclasses
!>
public function copyFrom(ParserRuleContext $context) : void
{
    parent::copyFrom($context);

    <struct.attrs:{ a | $this-><a.name> = $context-><a.name>;}; separator="\n">
    }
<endif>
<if(dispatchMethods)>

    <dispatchMethods; separator="\n\n">
<endif>
<if(extensionMembers)>

    <extensionMembers; separator="\n\n">
<endif>
}
>>

```

```

AltLabelStructDecl(struct,attrs,getters,dispatchMethods) ::= <<
class <struct.name> extends <struct.parentRule; format="cap">Context
{
<PropertiesDecl(struct)>
    public function __construct(<struct.parentRule; format="cap">Context $context)
    {
        parent::__construct($context);

        $this->copyFrom($context);
    }
<if(getters)>

```

```

    <getters:{g | <g>}; separator="\n\n">
<endif>
<if(dispatchMethods)>

    <dispatchMethods; separator="\n\n">
<endif>
}
>>

```

```

ListenerDispatchMethod(method) ::= <<
public function <if(method.isEnter)>enter<else>exit<endif>Rule(ParseTreeListener $listener) : void
{
    if ($listener instanceof <parser.grammarName>Listener) {

```

```

    $listener-><if(method.isEnter)>enter<else>exit<endif><struct.derivedFromName;
format="cap">($this);
    }
}
>>

```

```

VisitorDispatchMethod(method) ::= <<
public function accept(ParseTreeVisitor $visitor)
{
    if ($visitor instanceof <parser.grammarName>Visitor) {
        return $visitor->visit<struct.derivedFromName; format="cap">($this);
    }

    return $visitor->visitChildren($this);
}
>>

```

```

/** If we don't know location of label def x, use this template */
labelref(x) ::= "<if(!x.isLocal)>$localContext-><endif><x.name>"

```

```

/** For any action chunk, what is correctly-typed context struct ptr? */
ctx(actionChunk) ::= "$localContext"

```

```

// used for left-recursive rules
recRuleAltPredicate(ruleName,opPrec) ::= "\$this->precpred(\$this->ctx, <opPrec>)"

```

```

recRuleSetReturnAction(src,name) ::= "\$<name> = \$<src>-><name>;"

```

```

recRuleSetStopToken()          ::= "$this->ctx->stop = $this->input->LT(-1);"

```

```

recRuleAltStartAction(ruleName, ctxName, label, isListLabel) ::= <<
$localContext = new Context\\<ctxName>Context($parentContext,
    $parentState);
<if(label)>
<if(isListLabel)>
$localContext-><label>[] = $previousContext;
<else>
$localContext-><label> = $previousContext;
<endif>
<endif>

$this->pushNewRecursionContext($localContext, $startState, self::RULE_<ruleName>);
>>

```

```

recRuleLabeledAltStartAction(ruleName, currentAltLabel, label, isListLabel) ::= <<
$localContext = new Context\\<currentAltLabel; format="cap">Context(new Context\\<ruleName;
format="cap">Context($parentContext, $parentState));
<if(label)>

```

```

<if(isListLabel)>
$localContext-><label>[] = $previousContext;
<else>
$localContext-><label> = $previousContext;
<endif>
<endif>

$this->pushNewRecursionContext($localContext, $startState, self::RULE_<ruleName>);
>>

recRuleReplaceContext(ctxName) ::= <<
$localContext = new Context\\<ctxName>Context($localContext);
$this->ctx = $localContext;
$previousContext = $localContext;
>>

recRuleSetPrevCtx() ::= <<
if ($this->getParseListeners() !== null) {
    $this->triggerExitRuleEvent();
}

$previousContext
    = $localContext;
>>

LexerFile(lexerFile, lexer, namedActions) ::= <<
<fileHeader(lexerFile.grammarFileName, lexerFile.ANTLRVersion)>
<lexer>
>>

Lexer(lexer, atn, actionFuncs, sempredFuncs, superClass) ::= <<
namespace<if(lexerFile.genPackage)> <lexerFile.genPackage><endif> {
<if(namedActions.header)><namedActions.header><endif>
    use Antlr\\Antlr4\\Runtime\\Atn\\ATNDeserializer;
    use Antlr\\Antlr4\\Runtime\\Atn\\LexerATNSimulator;
    use Antlr\\Antlr4\\Runtime\\Lexer;
    use Antlr\\Antlr4\\Runtime\\CharStream;
    use Antlr\\Antlr4\\Runtime\\PredictionContexts\\PredictionContextCache;
    use Antlr\\Antlr4\\Runtime\\RuleContext;
    use Antlr\\Antlr4\\Runtime\\Atn\\ATN;
    use Antlr\\Antlr4\\Runtime\\Dfa\\DFA;
    use Antlr\\Antlr4\\Runtime\\Vocabulary;
    use Antlr\\Antlr4\\Runtime\\RuntimeMetaData;
    use Antlr\\Antlr4\\Runtime\\VocabularyImpl;
<if(namedActions.definitions)><namedActions.definitions><endif>

    final class <lexer.name> extends <superClass; null="Lexer">

```



```

{
<if(lexer.tokens)>
public
const <lexer.tokens:{k | <k> = <lexer.tokens.(k)>}; separator=", ", wrap, anchor>;
<endif>

<if(lexer.channels)>
public const <lexer.channels:{c | <c> = <lexer.channels.(c)>}; separator=", ", wrap, anchor>;
<endif>

<if(rest(lexer.modes))>
public const <rest(lexer.modes){m | <m>=<i>}; separator=", ", wrap, anchor>;
<endif>

/**
 * @var array<string>
 */
public const CHANNEL_NAMES = [
'DEFAULT_TOKEN_CHANNEL', 'HIDDEN'<if (lexer.channels)>, <lexer.channels:{c | '<c>'}; separator=", ",
wrap, anchor><endif>
];

/**
 * @var array<string>
 */
public const MODE_NAMES = [
<lexer.modes:{m | '<m>'}; separator=", ", wrap, anchor>
];

/**
 * @var array<string>
 */
public const RULE_NAMES = [
<lexer.ruleNames:{r | '<r>'}; separator=", ", wrap, anchor>
];

<vocabulary(lexer.literalNames, lexer.symbolicNames)>

<atn>
protected static $atn;
protected static $decisionToDFA;
protected static $sharedContextCache;
<if(namedActions.members)>

<namedActions.members>
<endif>

public

```

```

function __construct(CharStream $input)
{
    parent::__construct($input);

    self::initialize();

    $this->interp = new LexerATNSimulator($this, self::$atn, self::$decisionToDFA, self::$sharedContextCache);
}

private static function initialize() : void
{
    if (self::$atn !== null) {
        return;
    }

    RuntimeMetaData::checkVersion('<lexerFile.ANTLRVersion>', RuntimeMetaData::VERSION);

    $atn = (new ATNDeserializer()->deserialize(self::SERIALIZED_ATN);

    $decisionToDFA = [];
    for ($i = 0, $count = $atn->getNumberOfDecisions(); $i < $count; $i++) {
        $decisionToDFA[] = new DFA($atn->getDecisionState($i), $i);
    }

    self::$atn = $atn;
    self::$decisionToDFA = $decisionToDFA;
    self::$sharedContextCache = new PredictionContextCache();
}

public static function vocabulary() : Vocabulary
{
    static $vocabulary;

    return $vocabulary = $vocabulary ?? new VocabularyImpl(self::LITERAL_NAMES, self::SYMBOLIC_NAMES);
}

public
function getGrammarFileName() : string
{
    return '<lexer.grammarFileName>';
}

public function getRuleNames() : array
{
    return self::RULE_NAMES;
}

public function getSerializedATN() : string

```

```

{
  return self::SERIALIZED_ATN;
}

/**
 * @return array<string>
 */
public function getChannelNames() : array
{
  return self::CHANNEL_NAMES;
}

/**
 * @return array<string>
 */
public function getModeNames() : array
{
  return self::MODE_NAMES;
}

public function getATN() : ATN
{
  return self::$atn;
}

public function getVocabulary() : Vocabulary
{
  return self::vocabulary();
}
<dumpActions(lexer, "", actionFuncs, sempredFuncs)>
}
}
>>

SerializedATN(model) ::= <<
<if(rest(model.segments))>
/**
 * @var string
 */
private const SERIALIZED_ATN =
  <model.segments:{segment| "<segment; wrap={ " .<n>" }>"}; separator=" .\n">;
<else>
/**
 * @var string
 */
private const SERIALIZED_ATN =
  "<model.serialized; wrap={ "

```

```

.<\n>  ">";
<endif>
>>

/**
 * Using a type to init value map, try to init a type; if not in table
 * must be an object, default value is `null`.
 */
initValue(typeName) ::= <<
<phpTypeInitMap.(typeName)>
>>

codeFileExtension() ::= ".php"

```

Found in path(s):

```

* /opt/cola/permits/1020749546_1607585150.55/0/antlr-4-9-complete-
jar/org/antlr/v4/tool/templates/codegen/PHP/PHP.stg
No license file was found, but licenses were detected in source scan.

```

```

/*
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```

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```

*/
/*

```

This file contains the actual layout of the messages emitted by ANTLR.

The text itself is coming out of the languages/\*stg files, according to the chosen locale.

This file contains the default format ANTLR uses.

\*/

location(file, line, column) ::= "<file>(<line>,<column>)"

message(id, text) ::= "error <id> : <text>"

report(location, message, type) ::= "<location> : <type> <message.id> : <message.text>"

wantsSingleLineMessage() ::= "true"

Found in path(s):

\* /opt/cola/permits/1020749546\_1607585150.55/0/antlr-4-9-complete-jar/org/antlr/v4/tool/templates/messages/formats/vs2005.stg

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\*/

```

javaTypeInitMap ::= [
  "int":"0",
  "long":"0",
  "float":"0.0f",
  "double":"0.0",
  "boolean":"false",
  "byte":"0",
  "short":"0",
  "char":"0",
  default:"null" // anything other than a primitive type is an object
]

```

// args must be <object-model-object>, <fields-resulting-in-STs>

```

ParserFile(file, parser, namedActions, contextSuperClass) ::= <<
<fileHeader(file.grammarFileName,
file.ANTLRVersion)>
<if(file.genPackage)>
package <file.genPackage>;
<endif>
<namedActions.header>
import org.antlr.v4.runtime.atn.*;
import org.antlr.v4.runtime.dfa.DFA;
import org.antlr.v4.runtime.*;
import org.antlr.v4.runtime.misc.*;
import org.antlr.v4.runtime.tree.*;
import java.util.List;
import java.util.Iterator;
import java.util.ArrayList;

<parser>
>>

```

```

ListenerFile(file, header, namedActions) ::= <<
<fileHeader(file.grammarFileName, file.ANTLRVersion)>
<if(file.genPackage)>
package <file.genPackage>;
<endif>
<header>
import org.antlr.v4.runtime.tree.ParseTreeListener;

/**
 * This interface defines a complete listener for a parse tree produced by
 * { @link <file.parserName> }.
 */
public interface <file.grammarName>Listener extends ParseTreeListener {
  <file.listenerNames: {lname |
/**

```

```

<if(file.listenerLabelRuleNames.(lname))>
* Enter a parse tree produced by the { @code <lname>\}
* labeled alternative in { @link <file.parserName>#<file.listenerLabelRuleNames.(lname)>\}.
<else>
* Enter a parse tree produced by { @link <file.parserName>#<lname>\}.
<endif>
* @param ctx the parse tree
*/
void enter<lname; format="cap">(<file.parserName>.<lname; format="cap">Context ctx);
/**
<if(file.listenerLabelRuleNames.(lname))>
* Exit a parse tree produced by the { @code <lname>\}
* labeled alternative in { @link <file.parserName>#<file.listenerLabelRuleNames.(lname)>\}.
<else>
* Exit a parse tree produced by { @link <file.parserName>#<lname>\}.
<endif>
* @param ctx the parse tree
*/
void exit<lname; format="cap">(<file.parserName>.<lname; format="cap">Context ctx);; separator="\n">
}
>>

```

```

BaseListenerFile(file, header, namedActions) ::= <<
<fileHeader(file.grammarFileName, file.ANTLRVersion)>
<if(file.genPackage)>
package <file.genPackage>;
<endif>
<header>

```

```

import org.antlr.v4.runtime.ParserRuleContext;
import org.antlr.v4.runtime.tree.ErrorNode;
import org.antlr.v4.runtime.tree.TerminalNode;

```

```

/**
* This class provides an empty implementation of { @link <file.grammarName>Listener},
* which can be extended to create a listener which only needs to handle a subset
* of the available methods.
*/
public class <file.grammarName>BaseListener implements <file.grammarName>Listener {
<file.listenerNames: {lname |
/**
* { @inheritDoc\}
*
* \<p>The default implementation does nothing.\</p>
*/
@Override public void enter<lname; format="cap">(<file.parserName>.<lname; format="cap">Context ctx) { \}
/**
* { @inheritDoc\}

```

```

*
* \<p>The default implementation does nothing.\</p>
*/
@Override public void exit<lname; format="cap">(<file.parserName>.<lname; format="cap">Context ctx) { \} };
separator="\n">

/**
 * { @inheritDoc\}
 *
 * \<p>The default implementation does nothing.\</p>
 */
@Override public void enterEveryRule(ParserRuleContext ctx) { }
/**
 * { @inheritDoc\}
 *
 * \<p>The default implementation does nothing.\</p>
 */
@Override public void exitEveryRule(ParserRuleContext ctx) { }
/**
 * { @inheritDoc\}
 *
 * \<p>The default
 implementation does nothing.\</p>
 */
@Override public void visitTerminal(TerminalNode node) { }
/**
 * { @inheritDoc\}
 *
 * \<p>The default implementation does nothing.\</p>
 */
@Override public void visitErrorNode(ErrorNode node) { }
}
>>

```

```

VisitorFile(file, header, namedActions) ::= <<
<fileHeader(file.grammarFileName, file.ANTLRVersion)>
<if(file.genPackage)>
package <file.genPackage>;
<endif>
<header>
import org.antlr.v4.runtime.tree.ParseTreeVisitor;

```

```

/**
 * This interface defines a complete generic visitor for a parse tree produced
 * by { @link <file.parserName> }.
 *
 * @param \<T> The return type of the visit operation. Use { @link Void } for
 * operations with no return type.

```



```

*/
public interface <file.grammarName>Visitor<T> extends ParseTreeVisitor<T> {
    <file.visitorNames:{ lname |
/**
<if(file.visitorLabelRuleNames.(lname))>
* Visit a parse tree produced by the { @code <lname>}
* labeled alternative in { @link <file.parserName>#<file.visitorLabelRuleNames.(lname)>}
<else>
* Visit a parse tree produced by { @link <file.parserName>#<lname>}
<endif>
* @param ctx the parse tree
* @return the visitor result
*/
T visit<lname; format="cap">(<file.parserName>.<lname; format="cap">Context ctx);}; separator="\n"
}
>>

BaseVisitorFile(file, header, namedActions) ::= <<
<fileHeader(file.grammarFileName, file.ANTLRVersion)>
<if(file.genPackage)>
package <file.genPackage>;
<endif>
<header>
import org.antlr.v4.runtime.tree.AbstractParseTreeVisitor;

/**
* This class provides an empty implementation of { @link <file.grammarName>Visitor},
* which can be extended to create a visitor which only needs to handle a subset
* of the available methods.
*
* @param <T> The return type of the visit operation. Use { @link Void} for
* operations with no return type.
*/
public class <file.grammarName>BaseVisitor<T> extends AbstractParseTreeVisitor<T> implements
<file.grammarName>Visitor<T> {
    <file.visitorNames:{ lname |
/**
* { @inheritDoc\}
*
* \<p>The default
implementation returns the result of calling
* { @link #visitChildren\} on { @code ctx\}.\</p>
*/
@Override public T visit<lname; format="cap">(<file.parserName>.<lname; format="cap">Context ctx) { return
visitChildren(ctx); \} }; separator="\n"
}
>>

```

```

fileHeader(grammarFileName, ANTLRVersion) ::= <<
// Generated from <grammarFileName; format="java-escape"> by ANTLR <ANTLRVersion>
>>

Parser(parser, funcs, atn, sempredFuncs, superClass) ::= <<
<Parser_(ctor="parser_ctor", ...)>
>>

Parser_(parser, funcs, atn, sempredFuncs, ctor, superClass) ::= <<
@SuppressWarnings({"all", "warnings", "unchecked", "unused", "cast"})
public class <parser.name> extends <superClass; null="Parser"> {
    static { RuntimeMetaData.checkVersion("<file.ANTLRVersion>", RuntimeMetaData.VERSION); }

    protected static final DFA[] _decisionToDFA;
    protected static final PredictionContextCache _sharedContextCache =
        new PredictionContextCache();
    <if(parser.tokens)>
    public static final int
        <parser.tokens:{k | <k>=<parser.tokens.(k)>}>;
    separator=" ", wrap, anchor>;
    <endif>
    public static final int
        <parser.rules:{r | RULE_<r.name> = <r.index>}>; separator=" ", wrap, anchor>;
    private static String[] makeRuleNames() {
        return new String[] {
            <parser.ruleNames:{r | "<r>"}>; separator=" ", wrap, anchor>
        };
    }
    public static final String[] ruleNames = makeRuleNames();

    <vocabulary(parser.literalNames, parser.symbolicNames)>

    @Override
    public String getGrammarFileName() { return "<parser.grammarFileName; format="java-escape">"; }

    @Override
    public String[] getRuleNames() { return ruleNames; }

    @Override
    public String getSerializedATN() { return _serializedATN; }

    @Override
    public ATN getATN() { return _ATN; }

    <namedActions.members>
    <parser:(ctor)()>
    <funcs; separator="\n">

```

```

<if(sempredFuncs)>
public boolean sempred(RuleContext _localctx, int ruleIndex, int predIndex) {
    switch (ruleIndex) {
        <parser.sempredFuncs.values:{f}
case <f.ruleIndex>:
return <f.name>_sempred((<f.ctxType>)_localctx,
predIndex);}; separator="\n">
    }
    return true;
    }
<sempredFuncs.values; separator="\n">
<endif>

<atn>
}
>>

vocabulary(literalNames, symbolicNames) ::= <<
private static String[] makeLiteralNames() {
return new String[] {
    <literalNames:{t | <t>}; null="null", separator=", ", wrap, anchor>
};
}
private static final String[] _LITERAL_NAMES = makeLiteralNames();
private static String[] makeSymbolicNames() {
return new String[] {
    <symbolicNames:{t | <t>}; null="null", separator=", ", wrap, anchor>
};
}
private static final String[] _SYMBOLIC_NAMES = makeSymbolicNames();
public static final Vocabulary VOCABULARY = new VocabularyImpl(_LITERAL_NAMES,
_SYMBOLIC_NAMES);

/**
 * @deprecated Use {@link #VOCABULARY} instead.
 */
@Deprecated
public static final String[] tokenNames;
static {
    tokenNames = new String[_SYMBOLIC_NAMES.length];
    for (int i = 0; i < tokenNames.length; i++) {
        tokenNames[i] = VOCABULARY.getLiteralName(i);
        if (tokenNames[i] == null) {
            tokenNames[i]
            = VOCABULARY.getSymbolicName(i);
        }

        if (tokenNames[i] == null) {

```

```

    tokenNames[i] = "\<INVALID>";
}
}
}

```

```

@Override
@Deprecated
public String[] getTokenNames() {
    return tokenNames;
}

```

```

@Override

public Vocabulary getVocabulary() {
    return VOCABULARY;
}
>>

```

```

dumpActions(recog, argFuncs, actionFuncs, sempredFuncs) ::= <<
<if(actionFuncs)>
@Override
public void action(RuleContext _localctx, int ruleIndex, int actionIndex) {
    switch (ruleIndex) {
        <recog.actionFuncs.values:{f}
    case <f.ruleIndex>:
        <f.name>_action((<f.ctxType>)_localctx, actionIndex);
        break;}; separator="\n">
    }
}
<actionFuncs.values; separator="\n">
<endif>
<if(sempredFuncs)>
@Override
public boolean sempred(RuleContext _localctx, int ruleIndex, int predIndex) {
    switch (ruleIndex) {
        <recog.sempredFuncs.values:{f}
    case <f.ruleIndex>:
        return <f.name>_sempred((<f.ctxType>)_localctx, predIndex);}; separator="\n">
    }
    return true;
}
<sempredFuncs.values; separator="\n">
<endif>
>>

```

```

parser_ctor(p) ::= <<
public

```

```

<p.name>(TokenStream input) {
  super(input);
  _interp = new ParserATNSimulator(this,_ATN,_decisionToDFA,_sharedContextCache);
}
>>

```

/\* This generates a private method since the actionIndex is generated, making an  
 \* overriding implementation impossible to maintain.

```

*/
RuleActionFunction(r, actions) ::= <<
private void <r.name>_action(<r.ctxType> _localctx, int actionIndex) {
  switch (actionIndex) {
    <actions:{index|
  case <index>:
    <actions.(index)>
    break;}; separator="\n">
  }
}
>>

```

/\* This generates a private method since the predIndex is generated, making an  
 \* overriding implementation impossible to maintain.

```

*/
RuleSempredFunction(r, actions) ::= <<
private boolean <r.name>_sempred(<r.ctxType> _localctx, int predIndex) {
  switch (predIndex) {
    <actions:{index|
  case <index>:
    return <actions.(index)>;}; separator="\n">
  }
  return true;
}
>>

```

```

RuleFunction(currentRule,args,code,locals,ruleCtx,altLabelCtxs,namedActions,finallyAction,postamble,exceptions)
::= <<

```

```

<ruleCtx>
<altLabelCtxs:{l
| <altLabelCtxs.(l)>; separator="\n">

```

```

<if(currentRule.modifiers)><currentRule.modifiers:{f | <f> }><else>public final <endif><currentRule.ctxType>
<currentRule.name><(<args; separator=",">) throws RecognitionException {
  <currentRule.ctxType> _localctx = new <currentRule.ctxType>(<_ctx, getState()<currentRule.args:{a | ,
<a.name>}>>);
  enterRule(_localctx, <currentRule.startState>, RULE_<currentRule.name>);
  <namedActions.init>
  <locals; separator="\n">

```

```

try {
<if(currentRule.hasLookaheadBlock)>
  int _alt;
<endif>
  <code>
  <postamble; separator="\n">
  <namedActions.after>
  }
  <if(exceptions)>
  <exceptions; separator="\n">
  <else>
  catch (RecognitionException re) {
    _localctx.exception = re;
    _errHandler.reportError(this, re);
    _errHandler.recover(this, re);
  }
  <endif>
  finally {
    <finallyAction>
    exitRule();
  }
  return _localctx;
}
>>

```

```

LeftRecursiveRuleFunction(currentRule,args,code,locals,ruleCtx,altLabelCtxs,
  namedActions,finallyAction,postamble) ::=
<<

```

```

<ruleCtx>
<altLabelCtxs:{l
| <altLabelCtxs.(l)>}; separator="\n">

```

```

<if(currentRule.modifiers)><currentRule.modifiers:{f | <f> }><else>public final <endif><currentRule.ctxType>
<currentRule.name><(<args; separator=", ">) throws RecognitionException {
  return <currentRule.name>(0<currentRule.args:{a | , <a.name>}>);
}

```

```

private <currentRule.ctxType> <currentRule.name>(int _p<args:{a | , <a>}>) throws RecognitionException {
  ParserRuleContext _parentctx = _ctx;
  int _parentState = getState();
  <currentRule.ctxType> _localctx = new <currentRule.ctxType>(_ctx, _parentState<currentRule.args:{a | ,
  <a.name>}>);
  <currentRule.ctxType> _prevctx = _localctx;
  int _startState = <currentRule.startState>;
  enterRecursionRule(_localctx, <currentRule.startState>, RULE_<currentRule.name>, _p);
  <namedActions.init>
  <locals; separator="\n">

```

```

try {
<if(currentRule.hasLookaheadBlock)>
  int _alt;
<endif>
  <code>
  <postamble; separator="\n">
  <namedActions.after>
  }
catch (RecognitionException re) {
  _localctx.exception
= re;
  _errHandler.reportError(this, re);
  _errHandler.recover(this, re);
}
finally {
  <finallyAction>
  unrollRecursionContexts(_parentctx);
}
return _localctx;
}
>>

```

```

CodeBlockForOuterMostAlt(currentOuterMostAltCodeBlock, locals, preamble, ops) ::= <<
<if(currentOuterMostAltCodeBlock.altLabel)>_localctx = new <currentOuterMostAltCodeBlock.altLabel;
format="cap">Context(_localctx);<endif>
enterOuterAlt(_localctx, <currentOuterMostAltCodeBlock.alt.altNum>);
<CodeBlockForAlt(currentAltCodeBlock=currentOuterMostAltCodeBlock, ...)>
>>

```

```

CodeBlockForAlt(currentAltCodeBlock, locals, preamble, ops) ::= <<
{
<locals; separator="\n">
<preamble; separator="\n">
<ops; separator="\n">
}
>>

```

```

LL1AltBlock(choice, preamble, alts, error) ::= <<
setState(<choice.stateNumber>);
_errHandler.sync(this);
<if(choice.label)><labelref(choice.label)> = _input.LT(1);<endif>
<preamble; separator="\n">
switch (_input.LA(1)) {
<choice.altLook,alts:{look,alt| <cases(ttypes=look)>
<alt>
break;}; separator="\n">
default:
<error>

```

```
}  
>>
```

```
LL1OptionalBlock(choice,  
alts, error) ::= <<  
setState(<choice.stateNumber>);  
_errHandler.sync(this);  
switch (_input.LA(1)) {  
<choice.altLook,alts:{look,alt| <cases(ttypes=look)>  
<alt>  
break;}; separator="\n">  
default:  
break;  
}  
>>
```

```
LL1OptionalBlockSingleAlt(choice, expr, alts, preamble, error, followExpr) ::= <<  
setState(<choice.stateNumber>);  
_errHandler.sync(this);  
<preamble; separator="\n">  
if (<expr>) {  
<alts; separator="\n">  
}  
<!else if ( !(<followExpr> ) <error>!>  
>>
```

```
LL1StarBlockSingleAlt(choice, loopExpr, alts, preamble, iteration) ::= <<  
setState(<choice.stateNumber>);  
_errHandler.sync(this);  
<preamble; separator="\n">  
while (<loopExpr>) {  
<alts; separator="\n">  
setState(<choice.loopBackStateNumber>);  
_errHandler.sync(this);  
<iteration>  
}  
>>
```

```
LL1PlusBlockSingleAlt(choice, loopExpr, alts, preamble, iteration) ::= <<  
setState(<choice.blockStartStateNumber>); <! alt block decision !>  
_errHandler.sync(this);  
<preamble; separator="\n">  
do  
{  
<alts; separator="\n">  
setState(<choice.stateNumber>); <! loopback/exit decision !>  
_errHandler.sync(this);  
<iteration>
```



```

} while ( <loopExpr> );
>>

// LL(*) stuff

AltBlock(choice, preamble, alts, error) ::= <<
setState(<choice.stateNumber>);
_errHandler.sync(this);
<if(choice.label)><labelref(choice.label)> = _input.LT(1);<endif>
<preamble; separator="\n">
switch ( getInterpreter().adaptivePredict(_input,<choice.decision>,_ctx) ) {
<alts:{alt |
case <i>:
<alt>
break;}; separator="\n">
}
>>

OptionalBlock(choice, alts, error) ::= <<
setState(<choice.stateNumber>);
_errHandler.sync(this);
switch ( getInterpreter().adaptivePredict(_input,<choice.decision>,_ctx) ) {
<alts:{alt |
case <i><if(!choice.ast.greedy)>+1<endif>:
<alt>
break;}; separator="\n">
}
>>

StarBlock(choice, alts, sync, iteration) ::= <<
setState(<choice.stateNumber>);
_errHandler.sync(this);
_alt = getInterpreter().adaptivePredict(_input,<choice.decision>,_ctx);
while ( _alt!=<choice.exitAlt> && _alt!=org.antlr.v4.runtime.atn.ATN.INVALID_ALT_NUMBER
) {
if ( _alt==1<if(!choice.ast.greedy)>+1<endif> ) {
<iteration>
<alts> <! should only be one !>
}
setState(<choice.loopBackStateNumber>);
_errHandler.sync(this);
_alt = getInterpreter().adaptivePredict(_input,<choice.decision>,_ctx);
}
>>

PlusBlock(choice, alts, error) ::= <<
setState(<choice.blockStartStateNumber>); <! alt block decision !>
_errHandler.sync(this);

```

```

_alt = 1<if(!choice.ast.greedy)>+1<endif>;
do {
  switch (_alt) {
    <alts:{ alt|
case <i><if(!choice.ast.greedy)>+1<endif>:
  <alt>
  break;}; separator="\n">
  default:
    <error>
  }
  setState(<choice.loopBackStateNumber>); <! loopback/exit decision !>
  _errHandler.sync(this);
  _alt = getInterpreter().adaptivePredict(_input,<choice.decision>,_ctx);
} while ( _alt!=<choice.exitAlt> && _alt!=org.antlr.v4.runtime.atn.ATN.INVALID_ALT_NUMBER );
>>

```

```

Sync(s) ::= "sync(<s.expecting.name>);"

```

```

ThrowNoViableAlt(t) ::= "throw new NoViableAltException(this);"

```

```

TestSetInline(s) ::= <<
<s.bitsets:{ bits
| <if(rest(rest(bits.ttypes)))><bitsetBitfieldComparison(s, bits)><else><bitsetInlineComparison(s, bits)><endif>};
separator=" || ">
>>

```

```

// Java language spec 15.19 - shift operators mask operands rather than overflow to 0... need range test
testShiftInRange(shiftAmount) ::= <<
((<shiftAmount>) & ~0x3f) == 0
>>

```

```

// produces smaller bytecode only when bits.ttypes contains more than two items
bitsetBitfieldComparison(s, bits) ::= <%
(<testShiftInRange({<offsetShift(s.varName, bits.shift)>})> && ((1L \<< <offsetShift(s.varName, bits.shift)>) &
(<bits.ttypes:{ ttype | (1L \<< <offsetShift(ttype, bits.shift)>)}; separator=" | ">)) != 0)
%>

```

```

isZero ::= [
"0":true,
default:false
]

```

```

offsetShift(shiftAmount, offset) ::= <%
<if(!isZero.(offset))><shiftAmount> - <offset><else><shiftAmount><endif>
%>

```

```

// produces more efficient bytecode when bits.ttypes contains at most two items
bitsetInlineComparison(s, bits) ::= <%

```

```

<bits.ttypes:{ ttype | <s.varName>===<ttype>}; separator=" || ">
%>

cases(ttypes)
 ::= <<
<ttypes:{ t | case <t>:}; separator="\n">
>>

InvokeRule(r, argExprsChunks) ::= <<
setState(<r.stateNumber>);
<if(r.labels)><r.labels:{1 | <labelref(l)> =
}><endif><r.name>(<if(r.ast.options.p)><r.ast.options.p><if(argExprsChunks)>,<endif><endif><argExprsChunks>
);
>>

MatchToken(m) ::= <<
setState(<m.stateNumber>);
<if(m.labels)><m.labels:{1 | <labelref(l)> = }><endif>match(<m.name>);
>>

MatchSet(m, expr, capture) ::= "<CommonSetStuff(m, expr, capture, false)>"

MatchNotSet(m, expr, capture) ::= "<CommonSetStuff(m, expr, capture, true)>"

CommonSetStuff(m, expr, capture, invert) ::= <<
setState(<m.stateNumber>);
<if(m.labels)><m.labels:{1 | <labelref(l)> = }>_input.LT(1);<endif>
<capture>
if ( <if(invert)><m.varName> \<= 0 || <else>!<endif>(<expr> ) ) {
  <if(m.labels)><m.labels:{1 | <labelref(l)> = (Token)}><endif>_errHandler.recoverInline(this);
}
else {
  if ( _input.LA(1)==Token.EOF ) matchedEOF = true;
  _errHandler.reportMatch(this);
  consume();
}
>>

Wildcard(w)
 ::= <<
setState(<w.stateNumber>);
<if(w.labels)><w.labels:{1 | <labelref(l)> = }><endif>matchWildcard();
>>

// ACTION STUFF

Action(a, foo, chunks) ::= "<chunks>"

```

```

ArgAction(a, chunks) ::= "<chunks>"

SemPred(p, chunks, failChunks) ::= <<
setState(<p.stateNumber>);
if (!(<chunks>)) throw new FailedPredicateException(this, <p.predicate><if(failChunks)>,
<failChunks><elseif(p.msg)>, <p.msg><endif>);
>>

ExceptionClause(e, catchArg, catchAction) ::= <<
catch (<catchArg>) {
    <catchAction>
}
>>

// lexer actions are not associated with model objects

LexerSkipCommand() ::= "skip();"
LexerMoreCommand() ::= "more();"
LexerPopModeCommand() ::= "popMode();"

LexerTypeCommand(arg, grammar) ::= "_type = <arg>";
LexerChannelCommand(arg, grammar) ::= "_channel = <arg>";
LexerModeCommand(arg, grammar) ::= "_mode = <arg>";
LexerPushModeCommand(arg, grammar) ::= "pushMode(<arg>);"

ActionText(t) ::= "<t.text>"
ActionTemplate(t) ::= "<t.st>"
ArgRef(a) ::= "_localctx.<a.name>"
LocalRef(a)
    ::= "_localctx.<a.name>"
RetValRef(a) ::= "_localctx.<a.name>"
QRetValRef(a) ::= "<ctx(a)>.<a.dict>.<a.name>"
/** How to translate $tokenLabel */
TokenRef(t) ::= "<ctx(t)>.<t.name>"
LabelRef(t) ::= "<ctx(t)>.<t.name>"
ListLabelRef(t) ::= "<ctx(t)>.<ListLabelName(t.name)>"
SetAttr(s,rhsChunks) ::= "<ctx(s)>.<s.name> = <rhsChunks>";

TokenLabelType() ::= "<file.TokenLabelType; null={Token}>"
InputSymbolType() ::= "<file.InputSymbolType; null={Token}>"

TokenPropertyRef_text(t) ::= "<ctx(t)>.<t.label>!=null?<ctx(t)>.<t.label>.getText():null)"
TokenPropertyRef_type(t) ::= "<ctx(t)>.<t.label>!=null?<ctx(t)>.<t.label>.getType():0)"
TokenPropertyRef_line(t) ::= "<ctx(t)>.<t.label>!=null?<ctx(t)>.<t.label>.getLine():0)"
TokenPropertyRef_pos(t) ::= "<ctx(t)>.<t.label>!=null?<ctx(t)>.<t.label>.getCharPositionInLine():0)"
TokenPropertyRef_channel(t) ::= "<ctx(t)>.<t.label>!=null?<ctx(t)>.<t.label>.getChannel():0)"
TokenPropertyRef_index(t) ::= "<ctx(t)>.<t.label>!=null?<ctx(t)>.<t.label>.getTokenIndex():0)"
TokenPropertyRef_int(t)

```

```

::= "<ctx(t)>.<t.label>!=null?Integer.valueOf(<ctx(t)>.<t.label>.getText():0)"

RulePropertyRef_start(r) ::= "<ctx(r)>.<r.label>!=null?(<ctx(r)>.<r.label>.start):null)"
RulePropertyRef_stop(r) ::= "<ctx(r)>.<r.label>!=null?(<ctx(r)>.<r.label>.stop):null)"
RulePropertyRef_text(r) ::=
"<ctx(r)>.<r.label>!=null?_input.getText(<ctx(r)>.<r.label>.start,<ctx(r)>.<r.label>.stop):null)"
RulePropertyRef_ctx(r) ::= "<ctx(r)>.<r.label>"
RulePropertyRef_parser(r) ::= "this"

ThisRulePropertyRef_start(r) ::= "_localctx.start"
ThisRulePropertyRef_stop(r) ::= "_localctx.stop"
ThisRulePropertyRef_text(r) ::= "_input.getText(_localctx.start, _input.LT(-1))"
ThisRulePropertyRef_ctx(r) ::= "_localctx"
ThisRulePropertyRef_parser(r) ::= "this"

NonLocalAttrRef(s) ::= "(<s.ruleName; format=\"cap\">Context)getInvokingContext(<s.ruleIndex>).<s.name>"
SetNonLocalAttr(s, rhsChunks) ::=
"(<s.ruleName; format=\"cap\">Context)getInvokingContext(<s.ruleIndex>).<s.name>
= <rhsChunks>;"

AddToLabelList(a) ::= "<ctx(a.label)>.<a.listName>.add(<labelref(a.label)>);"

TokenDecl(t) ::= "<TokenLabelType() <t.name>"
TokenTypeDecl(t) ::= "int <t.name>;"
TokenListDecl(t) ::= "List<Token> <t.name> = new ArrayList<Token>()"
RuleContextDecl(r) ::= "<r.ctxName> <r.name>"
RuleContextListDecl(rdecl) ::= "List<<rdecl.ctxName>> <rdecl.name> = new ArrayList<<rdecl.ctxName>>()"

ContextTokenGetterDecl(t) ::=
"public TerminalNode <t.name>() { return getToken(<parser.name>.<t.name>, 0); }"
ContextTokenListGetterDecl(t) ::=
"public List<TerminalNode> <t.name>() { return getTokens(<parser.name>.<t.name>); }"
ContextTokenListIndexedGetterDecl(t) ::= <<
public TerminalNode <t.name>(int i) {
return getToken(<parser.name>.<t.name>, i);
}
>>
ContextRuleGetterDecl(r) ::= <<
public <r.ctxName> <r.name>() {
return getRuleContext(<r.ctxName>.class,0);
}
>>
ContextRuleListGetterDecl(r) ::= <<
public List<<r.ctxName>> <r.name>()
{
return getRuleContexts(<r.ctxName>.class);
}
>>

```

```

ContextRuleListIndexedGetterDecl(r) ::= <<
public <r.ctxName> <r.name>(int i) {
    return getRuleContext(<r.ctxName>.class,i);
}
>>

```

```

LexerRuleContext() ::= "RuleContext"

```

```

/** The rule context name is the rule followed by a suffix; e.g.,
 * r becomes rContext.
 */

```

```

RuleContextNameSuffix() ::= "Context"

```

```

ImplicitTokenLabel(tokenName) ::= "<tokenName>"

```

```

ImplicitRuleLabel(ruleName) ::= "<ruleName>"

```

```

ImplicitSetLabel(id) ::= "_tset<id>"

```

```

ListLabelName(label) ::= "<label>"

```

```

CaptureNextToken(d) ::= "<d.varName> = _input.LT(1);"

```

```

CaptureNextTokenType(d) ::= "<d.varName> = _input.LA(1);"

```

```

StructDecl(struct,ctorAttrs,attrs, getters,dispatchMethods,interfaces,extensionMembers)

```

```

::= <<

```

```

public static class <struct.name> extends

```

```

<if(contextSuperClass)><contextSuperClass><else>ParserRuleContext<endif><if(interfaces)> implements

```

```

<interfaces; separator=", "><endif> {

```

```

<attrs:{ a | public <a>;}; separator="\n">

```

```

<getters:{ g | <g>;}; separator="\n">

```

```

<if(ctorAttrs)>public

```

```

<struct.name>(ParserRuleContext parent, int invokingState) { super(parent, invokingState); }<endif>

```

```

public <struct.name>(ParserRuleContext parent, int invokingState<ctorAttrs:{ a | , <a>>}) {

```

```

    super(parent, invokingState);

```

```

    <struct.ctorAttrs:{ a | this.<a.name> = <a.name>;}; separator="\n">

```

```

}

```

```

@Override public int getRuleIndex() { return RULE_<struct.derivedFromName>; }

```

```

<if(struct.provideCopyFrom)> <! don't need copy unless we have subclasses !>

```

```

public <struct.name>() { }

```

```

public void copyFrom(<struct.name> ctx) {

```

```

    super.copyFrom(ctx);

```

```

    <struct.attrs:{ a | this.<a.name> = ctx.<a.name>;}; separator="\n">

```

```

}

```

```

<endif>

```

```

<dispatchMethods; separator="\n">

```

```

<extensionMembers; separator="\n">

```

```

}

```

```

>>

```

```

AltLabelStructDecl(struct,attrs, getters,dispatchMethods) ::= <<

```

```

public static class <struct.name> extends <currentRule.name; format="cap">Context {
  <attrs:{a | public <a>;}; separator="\n">
  <getters:{g | <g>;}; separator="\n">
  public <struct.name>(<currentRule.name; format="cap">Context
  ctx) { copyFrom(ctx); }
  <dispatchMethods; separator="\n">
}
>>

```

```

ListenerDispatchMethod(method) ::= <<
@Override
public void <if(method.isEnter)>enter<else>exit<endif>Rule(ParseTreeListener listener) {
  if ( listener instanceof <parser.grammarName>Listener )
  ((<parser.grammarName>Listener)listener).<if(method.isEnter)>enter<else>exit<endif><struct.derivedFromName;
  format="cap">(this);
}
>>

```

```

VisitorDispatchMethod(method) ::= <<
@Override
public <T> T accept(ParseTreeVisitor<? extends T> visitor) {
  if ( visitor instanceof <parser.grammarName>Visitor ) return ((<parser.grammarName>Visitor<? extends
  T>)visitor).visit<struct.derivedFromName; format="cap">(this);
  else return visitor.visitChildren(this);
}
>>

```

```

AttributeDecl(d) ::= "<d.type> <d.name><if(d.initValue)> = <d.initValue><endif>"

```

```

/** If we don't know location of label def x, use this template */
labelref(x) ::= "<if(!x.isLocal)>(<x.ctx.name>)_localctx.<endif><x.name>"

```

```

/** For any action chunk, what is correctly-typed
context struct ptr? */
ctx(actionChunk) ::= "(<actionChunk.ctx.name>)_localctx"

```

```

// used for left-recursive rules
recRuleAltPredicate(ruleName,opPrec) ::= "precpred(_ctx, <opPrec>)"
recRuleSetReturnAction(src,name) ::= "$<name>=<src>.<name>;"
recRuleSetStopToken() ::= "_ctx.stop = _input.LT(-1);"

```

```

recRuleAltStartAction(ruleName, ctxName, label, isListLabel) ::= <<
_localctx = new <ctxName>Context(_parentctx, _parentState);
<if(label)>
<if(isListLabel)>
_localctx.<label>.add(_prevctx);
<else>
_localctx.<label> = _prevctx;

```

```

<endif>
<endif>
<if(label)>_localctx.<label> = _prevctx;<endif>
pushNewRecursionContext(_localctx, _startState, RULE_<ruleName>);
>>

recRuleLabeledAltStartAction(ruleName, currentAltLabel, label, isListLabel) ::= <<
_localctx = new <currentAltLabel; format="cap">Context(new <ruleName; format="cap">Context(_parentctx,
_parentState));
<if(label)>
<if(isListLabel)>
((<currentAltLabel; format="cap">Context)_localctx).<label>.add(_prevctx);
<else>
((<currentAltLabel;
format="cap">Context)_localctx).<label> = _prevctx;
<endif>
<endif>
pushNewRecursionContext(_localctx, _startState, RULE_<ruleName>);
>>

recRuleReplaceContext(ctxName) ::= <<
_localctx = new <ctxName>Context(_localctx);
_ctx = _localctx;
_prevctx = _localctx;
>>

recRuleSetPrevCtx() ::= <<
if ( _parseListeners!=null ) triggerExitRuleEvent();
_prevctx = _localctx;
>>

LexerFile(lexerFile, lexer, namedActions) ::= <<
<fileHeader(lexerFile.grammarFileName, lexerFile.ANTLRVersion)>
<if(lexerFile.genPackage)>
package <lexerFile.genPackage>;
<endif>
<namedActions.header>
import org.antlr.v4.runtime.Lexer;
import org.antlr.v4.runtime.CharStream;
import org.antlr.v4.runtime.Token;
import org.antlr.v4.runtime.TokenStream;
import org.antlr.v4.runtime.*;
import org.antlr.v4.runtime.atn.*;
import org.antlr.v4.runtime.dfa.DFA;
import org.antlr.v4.runtime.misc.*;

<lexer>

```



>>

```
Lexer(lexer, atn, actionFuncs, sempredFuncs, superClass) ::= <<
@SuppressWarnings({"all", "warnings",
"unchecked", "unused", "cast"})
public class <lexer.name> extends <superClass; null="Lexer"> {
static { RuntimeMetaData.checkVersion("<lexerFile.ANTLRVersion>", RuntimeMetaData.VERSION); }

protected static final DFA[] _decisionToDFA;
protected static final PredictionContextCache _sharedContextCache =
new PredictionContextCache();
<if(lexer.tokens)>
public static final int
<lexer.tokens:{k | <k>=<lexer.tokens.(k)>}; separator=", ", wrap, anchor>;
<endif>
<if(lexer.channels)>
public static final int
<lexer.channels:{c | <c>=<lexer.channels.(c)>}; separator=", ", wrap, anchor>;
<endif>
<if(rest(lexer.modes)>
public static final int
<rest(lexer.modes):{m | <m>=<i>}; separator=", ", wrap, anchor>;
<endif>
public static String[] channelNames = {
"DEFAULT_TOKEN_CHANNEL", "HIDDEN"<if (lexer.channels)>, <lexer.channels:{c| "<c>"}; separator=", ",
wrap, anchor><endif>
};

public static String[] modeNames = {
<lexer.modes:{m| "<m>"}; separator=", ", wrap, anchor>
};

private
static String[] makeRuleNames() {
return new String[] {
<lexer.ruleNames:{r | "<r>"}; separator=", ", wrap, anchor>
};
}
public static final String[] ruleNames = makeRuleNames();

<vocabulary(lexer.literalNames, lexer.symbolicNames)>

<namedActions.members>

public <lexer.name>(CharStream input) {
super(input);
_interp = new LexerATNSimulator(this, _ATN, _decisionToDFA, _sharedContextCache);
}
}
```

```

@Override
public String getGrammarFileName() { return "<lexer.grammarFileName>"; }

@Override
public String[] getRuleNames() { return ruleNames; }

@Override
public String getSerializedATN() { return _serializedATN; }

@Override
public String[] getChannelNames() { return channelNames; }

@Override
public String[] getModeNames() { return modeNames; }

@Override
public ATN getATN() { return _ATN; }

<dumpActions(lexer, "", actionFuncs, sempredFuncs)>
<atn>
}
>>

SerializedATN(model) ::= <<
<if(rest(model.segments))>
<! requires segmented representation !>
private
static final int _serializedATNSegments = <length(model.segments)>;
<model.segments:{segment|private static final String _serializedATNSegment<i0> =
"<segment; wrap={ "+<\n><\t>" }>";}; separator="\n">
public static final String _serializedATN = Utils.join(
new String[] {
<model.segments:{segment | _serializedATNSegment<i0>}; separator=",\n">
},
""
);
<else>
<! only one segment, can be inlined !>
public static final String _serializedATN =
"<model.serialized; wrap={ "+<\n><\t>" }>";
<endif>
public static final ATN _ATN =
new ATNDeserializer().deserialize(_serializedATN.toCharArray());
static {
_decisionToDFA = new DFA[_ATN.getNumberOfDecisions()];
for (int i = 0; i < _ATN.getNumberOfDecisions(); i++) {
_decisionToDFA[i] = new DFA(_ATN.getDecisionState(i), i);
}
}

```

```
}
<! org.antlr.v4.tool.DOTGenerator dot = new org.antlr.v4.tool.DOTGenerator(null);!>
<! System.out.println(dot.getDOT(_ATN.decisionToState.get(0), ruleNames, false));!>
<! System.out.println(dot.getDOT(_ATN.ruleToStartState[2],
ruleNames, false));!>
}
```

```
>>

/** Using a type to init value map, try to init a type; if not in table
* must be an object, default value is "null".
*/
```

```
initValue(typeName) ::= <<
<javaTypeInitMap.(typeName)>
>>
```

```
codeFileExtension() ::= ".java"
```

Found in path(s):

```
* /opt/cola/permits/1020749546_1607585150.55/0/antlr-4-9-complete-
jar/org/antlr/v4/tool/templates/codegen/Java/Java.stg
```

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```
/*
```

```
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```

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```

```
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```

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\*/

/\*

This file contains the actual layout of the messages emitted by ANTLR.

This file contains the default format ANTLR uses.

\*/

location(file, line, column) ::= "<file>:<line>:<column>:"

message(id, text) ::= "<id> <text>"

report(location, message, type) ::= "<type>(<message.id>): <location> <message.text>"

wantsSingleLineMessage() ::= "false"

Found in path(s):

\* /opt/cola/permits/1020749546\_1607585150.55/0/antlr-4-9-complete-jar/org/antlr/v4/tool/templates/messages/formats/antlr.stg

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```

*/

/** How to generate rules derived from left-recursive rules.
 * These rely on recRuleAltPredicate(),
 * recRuleArg(), recRuleSetResultAction(), recRuleSetReturnAction()
 * templates in main language.stg
 */
group LeftRecursiveRules;

recRule(ruleName, argName, primaryAlts, opAlts, setResultAction,
        userRetvals, leftRecursiveRuleRefLabels) ::=
<<
<ruleName><if(userRetvals)>
returns [<userRetvals>]<endif>
: ( { } <primaryAlts:{ alt | <alt.altText> }; separator="\n    | ">
    )
    (
        <opAlts; separator="\n    | ">
    )*
;
>>

recRuleAlt(alt, precOption, opPrec, pred) ::= <<
{<pred>}?<<precOption>=<opPrec>> <alt.altText>
>>

```

Found in path(s):

```

* /opt/cola/permits/1020749546_1607585150.55/0/antlr-4-9-complete-
jar/org/antlr/v4/tool/templates/LeftRecursiveRules.stg

```

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*/

```

```

/** ANTLR tool checks output templates are compatible with tool code generation.
*   For now, a simple string match used on x.y of x.y.z scheme.
*   Must match Tool.VERSION during load to templates.
*
*   REQUIRED.
*/

```

```

pythonTypeInitMap ::= [
  "bool":"False",
  "int":"0",
  "float":"0.0",
  "str": "",
  default:"None" // anything other
  than a primitive type is an object
]

```

```

// args must be <object-model-object>, <fields-resulting-in-STs>

```

```

ParserFile(file, parser, namedActions, contextSuperClass) ::= <<
<fileHeader(file.grammarFileName, file.ANTLRVersion)>
# encoding: utf-8
from antlr4 import *
from io import StringIO
import sys
if sys.version_info[1] > 5:
  from typing import TextIO
else:
  from typing.io import TextIO

<namedActions.header>
<parser>

>>

```

```

ListenerFile(file, header, namedActions) ::= <<
<fileHeader(file.grammarFileName, file.ANTLRVersion)>
from antlr4 import *
if __name__ is not None and "." in __name__:
    from <file.parserName> import <file.parserName>
else:
    from <file.parserName> import <file.parserName>
<header>

# This class defines a complete listener for a parse tree produced by <file.parserName>.
class <file.grammarName>Listener(ParseTreeListener):

    <file.listenerNames: {lname |
# Enter a parse tree produced by <file.parserName>#<lname>.
def enter<lname; format="cap">(self, ctx:<file.parserName>.<lname;
format="cap">Context):
    pass

# Exit a parse tree produced by <file.parserName>#<lname>.
def exit<lname; format="cap">(self, ctx:<file.parserName>.<lname; format="cap">Context):
    pass

}; separator="\n">

del <file.parserName>
>>

```

```

VisitorFile(file, header, namedActions) ::= <<
<fileHeader(file.grammarFileName, file.ANTLRVersion)>
from antlr4 import *
if __name__ is not None and "." in __name__:
    from <file.parserName> import <file.parserName>
else:
    from <file.parserName> import <file.parserName>
<header>

# This class defines a complete generic visitor for a parse tree produced by <file.parserName>.

class <file.grammarName>Visitor(ParseTreeVisitor):

    <file.visitorNames: {lname |
# Visit a parse tree produced by <file.parserName>#<lname>.
def visit<lname; format="cap">(self, ctx:<file.parserName>.<lname; format="cap">Context):
    return self.visitChildren(ctx)

}; separator="\n">

```

```

del <file.parserName>
>>

fileHeader(grammarFileName, ANTLRVersion)
::= <<
# Generated from <grammarFileName> by ANTLR <ANTLRVersion>
>>

Parser(parser, funcs, atn, sempredFuncs, superClass) ::= <<
<Parser_(ctor="parser_ctor", ...)>
>>

Parser_(parser, funcs, atn, sempredFuncs, ctor, superClass) ::= <<
<if(superClass)>
if __name__ is not None and "." in __name__:
    from .<superClass> import <superClass>
else:
    from <superClass> import <superClass>

<endif>
<atn>

class <parser.name> ( <if(superClass)><superClass><else>Parser<endif> ):

    grammarFileName = "<parser.grammarFileName>"

    atn = ATNDeserializer().deserialize(serializedATN())

    decisionsToDFA = [ DFA(ds, i) for i, ds in enumerate(atn.decisionToState) ]

    sharedContextCache = PredictionContextCache()

    literalNames = [ <parser.literalNames:{t | <t>}; null="\\"<INVALID>\\"", separator=", ", wrap, anchor> ]

    symbolicNames = [ <parser.symbolicNames:{t | <t>}; null="\\"<INVALID>\\"", separator=", ", wrap, anchor> ]

    <parser.rules:{r | RULE_<r.name> = <r.index>}; separator="\n",
wrap, anchor>

    ruleNames = [ <parser.ruleNames:{r | "<r>"}; separator=", ", wrap, anchor> ]

    EOF = <TokenLabelType().EOF
    <if(parser.tokens)>
    <parser.tokens:{k | <k>=<parser.tokens.(k)>}; separator="\n", wrap, anchor>
    <endif>

```



```

<parser:(ctor())>

<namedActions.members>

<funcs; separator="\n">

<if(sempredFuncs)>
  def sempred(self, localctx:RuleContext, ruleIndex:int, predIndex:int):
    if self._predicates == None:
      self._predicates = dict()
<parser.sempredFuncs.values: { f |
  self._predicates[<f.ruleIndex>] = self.<f.name>_sempred }; separator="\n    ">
  pred = self._predicates.get(ruleIndex, None)
  if pred is None:
    raise Exception("No predicate with index:" + str(ruleIndex))
  else:
    return pred(localctx, predIndex)

  <sempredFuncs.values; separator="\n">
<endif>

>>

dumpActions(recog, argFuncs, actionFuncs, sempredFuncs) ::= <<
<if(actionFuncs)>
def action(self, localctx:RuleContext,
  ruleIndex:int, actionIndex:int):
  if self._actions is None:
    actions = dict()
<recog.actionFuncs.values: { f |
  actions[<f.ruleIndex>] = self.<f.name>_action }; separator="\n">
  self._actions = actions
  action = self._actions.get(ruleIndex, None)
  if action is not None:
    action(localctx, actionIndex)
  else:
    raise Exception("No registered action for:" + str(ruleIndex))

<actionFuncs.values; separator="\n">

<endif>
<if(sempredFuncs)>
def sempred(self, localctx:RuleContext, ruleIndex:int, predIndex:int):
  if self._predicates is None:
    preds = dict()

```

```

<recog.sempredFuncs.values:{f]
  preds[<f.ruleIndex>] = self.<f.name>_sempred}; separator="\n">
  self._predicates = preds
  pred = self._predicates.get(ruleIndex, None)
  if pred is not None:
    return pred(localctx, predIndex)
  else:
    raise Exception("No registered predicate for:" + str(ruleIndex))

<sempredFuncs.values; separator="\n">
<endif>
>>

parser_ctor(p)
::= <<
def __init__(self, input:TokenStream, output:TextIO = sys.stdout):
  super().__init__(input, output)
  self.checkVersion("<file.ANTLRVersion>")
  self._interp = ParserATNSimulator(self, self.atn, self.decisionsToDFA, self.sharedContextCache)
  self._predicates = None

>>

/* This generates a private method since the actionIndex is generated, making an
* overriding implementation impossible to maintain.
*/
RuleActionFunction(r, actions) ::= <<

def <r.name>_action(self, localctx:<r.ctxType> , actionIndex:int):
<actions:{index|
<if(first(actions))>
  if actionIndex == <index>:
    <actions.(index)>
<elseif(rest(actions))>
  elif actionIndex == <index>:
    <actions.(index)>
<endif> }; separator="\n">
>>

/* This generates a private method since the predIndex is generated, making an
* overriding implementation impossible to maintain.
*/
RuleSempredFunction(r, actions) ::= <<
def <r.name>_sempred(self, localctx:<r.ctxType>, predIndex:int):
  <actions:{index|
<if(first(actions))>
  if predIndex == <index>:
    return <actions.(index)>

```

```

<elseif(rest(actions))>
  elif predIndex == <index>:
    return <actions.(index)>
<endif> }; separator="\n">

>>

RuleFunction(currentRule,args,code,locals,ruleCtx,altLabelCtxs,namedActions,finallyAction,postamble,exceptions)
::= <<

<ruleCtx>

<altLabelCtxs:{l | <altLabelCtxs.(l)>}; separator="\n">

def <currentRule.name>(self<currentRule.args:{a | , <a.name><if(a.type)><a.type><endif>}>):

  localctx = <parser.name>.<currentRule.ctxType>(self, self._ctx, self.state<currentRule.args:{a | , <a.name>}>)>
  self.enterRule(localctx, <currentRule.startState>, self.RULE_<currentRule.name>)
  <namedActions.init>
  <locals; separator="\n">
  try:
    <code>
    <postamble; separator="\n">
    <namedActions.after>
  <if(exceptions)>
    <exceptions; separator="\n">
  <else>
  except RecognitionException as re:
    localctx.exception = re
    self._errHandler.reportError(self,
re)
    self._errHandler.recover(self, re)
  <endif>
  finally:
    <finallyAction>
    self.exitRule()
  return localctx

>>

LeftRecursiveRuleFunction(currentRule,args,code,locals,ruleCtx,altLabelCtxs,
namedActions,finallyAction,postamble) ::=

<<

<ruleCtx>
<altLabelCtxs:{l | <altLabelCtxs.(l)>}; separator="\n">

def <currentRule.name>(self, _p:int=0<if(currentRule.args)>, <args:{a | , <a>}><endif>):

```

```

_parentctx = self._ctx
_parentState = self.state
localctx = <parser.name>.<currentRule.ctxType>(self, self._ctx, _parentState<args:{a | , <a.name>}>)
_prevctx = localctx
_startState = <currentRule.startState>
self.enterRecursionRule(localctx, <currentRule.startState>, self.RULE_<currentRule.name>, _p)
<namedActions.init>
<locals; separator="\n">
try:
    <code>
    <postamble; separator="\n">
    <namedActions.after>
except RecognitionException as re:
    localctx.exception = re
    self._errHandler.reportError(self, re)
    self._errHandler.recover(self, re)
finally:
    <finallyAction>
    self.unrollRecursionContexts(_parentctx)
return localctx

>>

```

```

CodeBlockForOuterMostAlt(currentOuterMostAltCodeBlock, locals, preamble, ops) ::= <<
<if(currentOuterMostAltCodeBlock.altLabel)>localctx = <parser.name>.<currentOuterMostAltCodeBlock.altLabel;
format="cap">Context(self, localctx)<endif>
self.enterOuterAlt(localctx, <currentOuterMostAltCodeBlock.alt.altNum>)
<CodeBlockForAlt(currentAltCodeBlock=currentOuterMostAltCodeBlock, ...)>
>>

```

```

CodeBlockForAlt(currentAltCodeBlock, locals, preamble, ops) ::= <<
<locals; separator="\n">
<preamble; separator="\n">
<ops; separator="\n">
>>

```

```

LL1AltBlock(choice, preamble, alts, error) ::= <<
self.state = <choice.stateNumber>
self._errHandler.sync(self)
<if(choice.label)><labelref(choice.label)> = _input.LT(1)<endif>
<preamble; separator="\n">
token = self._input.LA(1)
<choice.altLook,alts:{look,alt| <cases(ttypes=look)>
    <alt>
    pass}; separator="\n1">
else:
    <error>

```

>>

```
LL1OptionalBlock(choice, alts, error) ::= <<
self.state = <choice.stateNumber>
self._errHandler.sync(self)
token = self._input.LA(1)
<choice.altLook,alts:{look,alt| <cases(ttypes=look)>
  <alt>
  pass }; separator="\n">
else:
  pass
>>
```

```
LL1OptionalBlockSingleAlt(choice, expr, alts, preamble, error, followExpr) ::= <<
self.state = <choice.stateNumber>
self._errHandler.sync(self)
<preamble; separator="\n">
if <expr>:
  <alts; separator="\n">

<!else if ( !(<followExpr> ) <error!>
>>
```

```
LL1StarBlockSingleAlt(choice, loopExpr, alts, preamble, iteration) ::= <<
self.state = <choice.stateNumber>
self._errHandler.sync(self)
<preamble; separator="\n">
while <loopExpr>:
  <alts; separator="\n">
  self.state = <choice.loopBackStateNumber>
  self._errHandler.sync(self)
  <iteration>

>>
```

```
LL1PlusBlockSingleAlt(choice, loopExpr, alts, preamble, iteration) ::= <<
self.state = <choice.blockStartStateNumber>
<! alt block decision !>
self._errHandler.sync(self)
<preamble; separator="\n">
while True:
  <alts; separator="\n">
  self.state = <choice.stateNumber> <! loopback/exit decision !>
  self._errHandler.sync(self)
  <iteration>
if not (<loopExpr>):
  break
```

>>

// LL(\*) stuff

```
AltBlock(choice, preamble, alts, error) ::= <<
self.state = <choice.stateNumber>
self._errHandler.sync(self)
<if(choice.label)><labelref(choice.label)> = _input.LT(1)<endif>
<preamble; separator="\n">
la_ = self._interp.adaptivePredict(self._input,<choice.decision>,self._ctx)
<alts:{alt |
if la_ == <i>:
    <alt>
    pass
}; separator="\nel">
```

>>

```
OptionalBlock(choice, alts, error) ::= <<
self.state = <choice.stateNumber>
self._errHandler.sync(self)
la_ = self._interp.adaptivePredict(self._input,<choice.decision>,self._ctx)
<alts:{alt |
if la_ == <i><if(!choice.ast.greedy)>+1<endif>:
    <alt>
}; separator="\nel">
```

>>

```
StarBlock(choice, alts, sync, iteration) ::= <<
self.state = <choice.stateNumber>
self._errHandler.sync(self)
_alt
= self._interp.adaptivePredict(self._input,<choice.decision>,self._ctx)
while _alt!=<choice.exitAlt> and _alt!=ATN.INVALID_ALT_NUMBER:
    if _alt==1<if(!choice.ast.greedy)>+1<endif>:
        <iteration>
        <alts> <! should only be one !>
    self.state = <choice.loopBackStateNumber>
    self._errHandler.sync(self)
    _alt = self._interp.adaptivePredict(self._input,<choice.decision>,self._ctx)
```

>>

```
PlusBlock(choice, alts, error) ::= <<
self.state = <choice.blockStartStateNumber> <! alt block decision !>
self._errHandler.sync(self)
```

```

_alt = 1<if(!choice.ast.greedy)>+1<endif>
while _alt!=<choice.exitAlt> and _alt!=ATN.INVALID_ALT_NUMBER:
  <alts:{alt|
if _alt == <i><if(!choice.ast.greedy)>+1<endif>:
  <alt>
}; separator="\nел">
  else:
    <error>
  self.state = <choice.loopBackStateNumber> <! loopback/exit decision !>
  self._errHandler.sync(self)
  _alt = self._interp.adaptivePredict(self._input,<choice.decision>,self._ctx)

>>

Sync(s)
::= "sync(<s.expecting.name>)"

ThrowNoViableAlt(t) ::= "raise NoViableAltException(self)"

TestSetInline(s) ::= <<
<s.bitsets:{bits | <if(rest(rest(bits.ttypes)))><bitsetBitfieldComparison(s, bits)><else><bitsetInlineComparison(s,
bits)><endif>}; separator=" or ">
>>

// Java language spec 15.19 - shift operators mask operands rather than overflow to 0... need range test
testShiftInRange(shiftAmount) ::= <<
((<shiftAmount>) & ~0x3f) == 0
>>

// produces smaller bytecode only when bits.ttypes contains more than two items
bitsetBitfieldComparison(s, bits) ::= <%
(<testShiftInRange({<offsetShiftVar(s.varName, bits.shift)>})> and ((1 \<< <offsetShiftVar(s.varName,
bits.shift)>) & (<bits.ttypes:{ttype | (1 \<< <offsetShiftType(ttype, bits.shift)>)}); separator=" | ">) != 0)
%>

isZero ::= [
"0":true,
default:false
]

offsetShiftVar(shiftAmount, offset) ::= <%
<if(!isZero.(offset))>(<shiftAmount> - <offset>)<else><shiftAmount><endif>
%>

offsetShiftType(shiftAmount, offset) ::= <%
<if(!isZero.(offset))>(<parser.name>.<shiftAmount>
- <offset>)<else><parser.name>.<shiftAmount><endif>
%>

```

```

// produces more efficient bytecode when bits.ttypes contains at most two items
bitsetInlineComparison(s, bits) ::= <%
<bits.ttypes:{ ttype | <s.varName>==<parser.name>.<ttype>} ; separator=" or ">
%>

cases(ttypes) ::= <<
if token in [<ttypes:{ t | <parser.name>.<t>} ; separator=", ">]:
>>

InvokeRule(r, argExprsChunks) ::= <<
self.state = <r.stateNumber>
<if(r.labels)><r.labels:{1 | <labelref(l)> =
}><endif>self.<r.name>(<if(r.ast.options.p)><r.ast.options.p><if(argExprsChunks)>,<endif><endif><argExprsChu
nks>)
>>

MatchToken(m) ::= <<
self.state = <m.stateNumber>
<if(m.labels)><m.labels:{1 | <labelref(l)> = }><endif>self.match(<parser.name>.<m.name>)
>>

MatchSet(m, expr, capture) ::= "<CommonSetStuff(m, expr, capture, false)>"

MatchNotSet(m, expr, capture) ::= "<CommonSetStuff(m, expr, capture, true)>"

CommonSetStuff(m, expr, capture, invert) ::= <<
self.state = <m.stateNumber>
<if(m.labels)><m.labels:{1
| <labelref(l)> = }>self._input.LT(1)<endif>
<capture>
<if(invert)>if <m.varName> \<= 0 or <expr><else>if not(<expr>)<endif>:
<if(m.labels)><m.labels:{1 | <labelref(l)> = }><else> <endif>self._errHandler.recoverInline(self)
else:
    self._errHandler.reportMatch(self)
    self.consume()
>>

Wildcard(w) ::= <<
self.state = <w.stateNumber>
<if(w.labels)><w.labels:{1 | <labelref(l)> = }><endif>self.matchWildcard()
>>

// ACTION STUFF

Action(a, foo, chunks) ::= "<chunks>"

ArgAction(a, chunks) ::= "<chunks>"

```



```

SemPred(p, chunks, failChunks) ::= <<
self.state = <p.stateNumber>
if not <chunks>:
    from antlr4.error.Errors import FailedPredicateException
    raise FailedPredicateException(self, <p.predicate><if(failChunks)>, <failChunks><elseif(p.msg)>,
<p.msg><endif>)
>>

```

```

ExceptionClause(e, catchArg, catchAction) ::= <<
except <catchArg>:
    <catchAction>
>>

```

```
// lexer actions are not associated with model objects
```

```

LexerSkipCommand() ::= "skip()"
LexerMoreCommand()
    ::= "more()"
LexerPopModeCommand() ::= "popMode()"

```

```

LexerTypeCommand(arg, grammar)    ::= "_type = <arg>"
LexerChannelCommand(arg, grammar) ::= "_channel = <arg>"
LexerModeCommand(arg, grammar)    ::= "_mode = <arg>"
LexerPushModeCommand(arg, grammar) ::= "pushMode(<arg>)"

```

```

ActionText(t) ::= "<t.text>"
ActionTemplate(t) ::= "<t.st>"
ArgRef(a) ::= "localctx.<a.name>"
LocalRef(a) ::= "localctx.<a.name>"
RetValRef(a) ::= "localctx.<a.name>"
QRetValRef(a) ::= "<ctx(a)>.<a.dict>.<a.name>"
/** How to translate $tokenLabel */
TokenRef(t) ::= "<ctx(t)>.<t.name>"
LabelRef(t) ::= "<ctx(t)>.<t.name>"
ListLabelRef(t) ::= "<ctx(t)>.<ListLabelName(t.name)>"
SetAttr(s,rhsChunks) ::= "<ctx(s)>.<s.name> = <rhsChunks>"

```

```

TokenLabelType() ::= "<file.TokenLabelType; null={Token}>"
InputSymbolType() ::= "<file.InputSymbolType; null={Token}>"

```

```

TokenPropertyRef_text(t) ::= "(None if <ctx(t)>.<t.label> is None else <ctx(t)>.<t.label>.text)"
TokenPropertyRef_type(t) ::= "(0 if <ctx(t)>.<t.label>
is None else <ctx(t)>.<t.label>.type()"
TokenPropertyRef_line(t) ::= "(0 if <ctx(t)>.<t.label> is None else <ctx(t)>.<t.label>.line)"
TokenPropertyRef_pos(t) ::= "(0 if <ctx(t)>.<t.label> is None else <ctx(t)>.<t.label>.column)"
TokenPropertyRef_channel(t) ::= "(0 if (<ctx(t)>.<t.label> is None else <ctx(t)>.<t.label>.channel)"
TokenPropertyRef_index(t) ::= "(0 if <ctx(t)>.<t.label> is None else <ctx(t)>.<t.label>.tokenIndex)"

```

```

TokenPropertyRef_int(t) ::= "(0 if <ctx(t)>.<t.label> is None else int(<ctx(t)>.<t.label>.text))"

RulePropertyRef_start(r) ::= "(None if <ctx(r)>.<r.label> is None else <ctx(r)>.<r.label>.start)"
RulePropertyRef_stop(r) ::= "(None if <ctx(r)>.<r.label> is None else <ctx(r)>.<r.label>.stop)"
RulePropertyRef_text(r) ::= "(None if <ctx(r)>.<r.label> is None else
self._input.getText(<ctx(r)>.<r.label>.start,<ctx(r)>.<r.label>.stop))"
RulePropertyRef_ctx(r) ::= "<ctx(r)>.<r.label>"
RulePropertyRef_parser(r) ::= "self"

ThisRulePropertyRef_start(r) ::= "localctx.start"
ThisRulePropertyRef_stop(r)
::= "localctx.stop"
ThisRulePropertyRef_text(r) ::= "self._input.getText(localctx.start, self._input.LT(-1))"
ThisRulePropertyRef_ctx(r) ::= "localctx"
ThisRulePropertyRef_parser(r) ::= "self"

NonLocalAttrRef(s) ::= "self.getInvokingContext(<s.ruleIndex>).<s.name>"
SetNonLocalAttr(s, rhsChunks) ::= "self.getInvokingContext(<s.ruleIndex>).<s.name> = <rhsChunks>"

AddToLabelList(a) ::= "<ctx(a.label)>.<a.listName>.append(<labelref(a.label)>)"

TokenDecl(t) ::= "self.<t.name> = None # <TokenLabelType()>"
TokenTypeDecl(t) ::= "self.<t.name> = 0 # <TokenLabelType()> type"
TokenListDecl(t) ::= "self.<t.name> = list() # of <TokenLabelType()>s"
RuleContextDecl(r) ::= "self.<r.name> = None # <r.ctxName>"
RuleContextListDecl(rdecl) ::= "self.<rdecl.name> = list() # of <rdecl.ctxName>s"

ContextTokenGetterDecl(t) ::= <<
def <t.name>(self):
    return self.getToken(<parser.name>.<t.name>, 0)
>>

// should never be called
ContextTokenListGetterDecl(t)
::= <<
def <t.name>_list(self):
    return self.getTokens(<parser.name>.<t.name>)
>>

ContextTokenListIndexedGetterDecl(t) ::= <<
def <t.name>(self, i:int=None):
    if i is None:
        return self.getTokens(<parser.name>.<t.name>)
    else:
        return self.getToken(<parser.name>.<t.name>, i)
>>

ContextRuleGetterDecl(r) ::= <<

```

```

def <r.name>(self):
    return self.getTypedRuleContext(<parser.name>.<r.ctxName>,0)

>>

// should never be called
ContextRuleListGetterDecl(r) ::= <<
def <r.name>_list(self):
    return self.getTypedRuleContexts(<parser.name>.<r.ctxName>)

>>

ContextRuleListIndexedGetterDecl(r) ::= <<
def <r.name>(self, i:int=None):
    if i is None:
        return self.getTypedRuleContexts(<parser.name>.<r.ctxName>)
    else:
        return self.getTypedRuleContext(<parser.name>.<r.ctxName>,i)

>>

LexerRuleContext() ::= "RuleContext"

/** The rule context name is the rule followed by a suffix; e.g.,
 * r becomes rContext.
 */
RuleContextNameSuffix()
    ::= "Context"

ImplicitTokenLabel(tokenName) ::= "_<tokenName>"
ImplicitRuleLabel(ruleName) ::= "_<ruleName>"
ImplicitSetLabel(id) ::= "_tset<id>"
ListLabelName(label) ::= "<label>"

CaptureNextToken(d) ::= "<d.varName> = self._input.LT(1)"
CaptureNextTokenType(d) ::= "<d.varName> = self._input.LA(1)"

StructDecl(struct,ctorAttrs,attrs,getters,dispatchMethods,interfaces,extensionMembers) ::= <<
class <struct.name>(<if(contextSuperClass)><contextSuperClass><else>ParserRuleContext<endif>):

    def __init__(self, parser, parent:ParserRuleContext=None, invokingState:int=-1<struct.ctorAttrs:{ a | ,
<a.name><if(a.type)>:<a.type><endif>=None }>):
        super().__init__(parent, invokingState)
        self.parser = parser
        <attrs:{ a | <a> }; separator="\n">
        <struct.ctorAttrs:{ a | self.<a.name> = <a.name> }; separator="\n">

        <getters:{ g | <g> }; separator="\n\n">

```

```

def getRuleIndex(self):
    return <parser.name>.RULE_<struct.derivedFromName>

<if(struct.provideCopyFrom)>
<! don't need copy unless we have subclasses !>
def copyFrom(self, ctx:ParserRuleContext):
    super().copyFrom(ctx)
    <struct.attrs:{a | self.<a.name> = ctx.<a.name>}; separator="\n">

<endif>
<dispatchMethods; separator="\n">
<extensionMembers; separator="\n">

>>

AltLabelStructDecl(struct,attrs, getters,dispatchMethods) ::= <<
class <struct.name>( <currentRule.name; format="cap">Context):

    def __init__(self, parser, ctx:ParserRuleContext): # actually a <parser.name>.<currentRule.name;
format="cap">Context
        super().__init__(parser)
        <attrs:{a | <a>}; separator="\n">
        self.copyFrom(ctx)

    <getters:{g | <g>}; separator="\n">

    <dispatchMethods; separator="\n">

>>

ListenerDispatchMethod(method) ::= <<
def <if(method.isEnter)>enter<else>exit<endif>Rule(self, listener:ParseTreeListener):
    if hasattr( listener, "<if(method.isEnter)>enter<else>exit<endif><struct.derivedFromName; format="cap">" ):
        listener.<if(method.isEnter)>enter<else>exit<endif><struct.derivedFromName;
format="cap">(self)

>>

VisitorDispatchMethod(method) ::= <<
def accept(self, visitor:ParseTreeVisitor):
    if hasattr( visitor, "visit<struct.derivedFromName; format="cap">" ):
        return visitor.visit<struct.derivedFromName; format="cap">(self)
    else:
        return visitor.visitChildren(self)

>>

```

```

AttributeDecl(d) ::= "self.<d.name> = <if(d.initValue)><d.initValue><else>None<endif>"

/** If we don't know location of label def x, use this template */
labelref(x) ::= "<if(!x.isLocal)>localctx.<endif><x.name>"

/** For any action chunk, what is correctly-typed context struct ptr? */
ctx(actionChunk) ::= "localctx"

// used for left-recursive rules
recRuleAltPredicate(ruleName,opPrec) ::= "self.precpred(self._ctx, <opPrec>)"
recRuleSetReturnAction(src,name) ::= "$<name>=<src>.<name>"
recRuleSetStopToken() ::= "self._ctx.stop = self._input.LT(-1)"

recRuleAltStartAction(ruleName, ctxName, label) ::= <<
localctx
= <parser.name>.<ctxName>Context(self, _parentctx, _parentState)
<if(label)>localctx.<label> = _prevctx<endif>
self.pushNewRecursionContext(localctx, _startState, self.RULE_<ruleName>)
>>

recRuleLabeledAltStartAction(ruleName, currentAltLabel, label, isListLabel) ::= <<
localctx = <parser.name>.<currentAltLabel; format="cap">Context(self, <parser.name>.<ruleName;
format="cap">Context(self, _parentctx, _parentState))
<if(label)>
<if(isListLabel)>
localctx.<label>.append(_prevctx)
<else>
localctx.<label> = _prevctx
<endif>
<endif>
self.pushNewRecursionContext(localctx, _startState, self.RULE_<ruleName>)
>>

recRuleReplaceContext(ctxName) ::= <<
localctx = <parser.name>.<ctxName>Context(self, localctx)
self._ctx = localctx
_prevctx = localctx
>>

recRuleSetPrevCtx() ::= <<
if self._parseListeners is not None:
self.triggerExitRuleEvent()
_prevctx = localctx
>>

LexerFile(lexerFile, lexer, namedActions) ::= <<
<fileHeader(lexerFile.grammarFileName, lexerFile.ANTLRVersion)>

```

```

from
  antlr4 import *
from io import StringIO
from typing.io import TextIO
import sys

<namedActions.header>

<lexer>
>>

Lexer(lexer, atn, actionFuncs, sempredFuncs, superClass) ::= <<
<if(superClass)>
if __name__ is not None and "." in __name__:
    from .<superClass> import <superClass>
else:
    from <superClass> import <superClass>

<endif>
<atn>

class <lexer.name>(<if(superClass)><superClass><else>Lexer<endif>):

    atn = ATNDeserializer().deserialize(serializedATN())

    decisionsToDFA = [ DFA(ds, i) for i, ds in enumerate(atn.decisionToState) ]

    <if(lexer.channels)>
        <lexer.channels:{c| <c> = <lexer.channels.(c)>}; separator="\n">

    <endif>
    <if(rest(lexer.modes)>
        <rest(lexer.modes):{m| <m> = <i>}; separator="\n">

    <endif>
    <lexer.tokens:{k | <k> = <lexer.tokens.(k)>}; separator="\n", wrap, anchor>

    channelNames = [ u"DEFAULT_TOKEN_CHANNEL", u"HIDDEN"<if (lexer.channels)>, <lexer.channels:{c|
u"<c>"}; separator=", ", wrap, anchor><endif> ]

    modeNames = [ <lexer.modes:{m|
"<m>"}; separator=", ", wrap, anchor> ]

    literalNames = [ "\<INVALID>",
        <lexer.literalNames:{t | <t>}; separator=", ", wrap, anchor> ]

    symbolicNames = [ "\<INVALID>",
        <lexer.symbolicNames:{t | <t>}; separator=", ", wrap, anchor> ]

```

```

ruleNames = [ <lexer.ruleNames:{r | "<r>"}; separator=", ", wrap, anchor> ]

grammarFileName = "<lexer.grammarFileName>"

def __init__(self, input=None, output:TextIO = sys.stdout):
    super().__init__(input, output)
    self.checkVersion("<lexerFile.ANTLRVersion>")
    self._interp = LexerATNSimulator(self, self.atn, self.decisionsToDFA, PredictionContextCache())
    self._actions = None
    self._predicates = None

<namedActions.members>

<dumpActions(lexer, "", actionFuncs, sempredFuncs)>

>>

SerializedATN(model) ::= <<
<! only one segment, can be inlined !>

def serializedATN():
    with StringIO() as buf:
        buf.write("<model.serialized; wrap={ }<\n>    buf.write({ }>")
        return buf.getvalue()

>>

/** Using a type to init value map, try to init a type; if not in table
 * must be an object, default value is "null".
 */
initValue(typeName) ::= <<
<pythonTypeInitMap.(typeName)>
>>

codeFileExtension() ::= ".py"

Found in path(s):
* /opt/cola/permits/1020749546_1607585150.55/0/antlr-4-9-complete-
jar/org/antlr/v4/tool/templates/codegen/Python3/Python3.stg
No license file was found, but licenses were detected in source scan.

/*
 * [The "BSD license"]
 * Copyright (c) 2013 Terence Parr
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 * All rights reserved.
 */

```

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- \*/

// args must be <object-model-object>, <fields-resulting-in-STs>

ParserFile(file, parser, namedActions, contextSuperClass) ::= <<

<fileHeader(file.grammarFileName, file.ANTLRVersion)>

<if(file.genPackage)>

namespace <file.genPackage> {

<endif>

<namedActions.header>

using System;

using System.IO;

using System.Text;

using System.Diagnostics;

using System.Collections.Generic;

using

Antlr4.Runtime;

using Antlr4.Runtime.Atn;

using Antlr4.Runtime.Misc;

using Antlr4.Runtime.Tree;

using DFA = Antlr4.Runtime.Dfa.DFA;

<parser>

<if(file.genPackage)>

} // namespace <file.genPackage>



```

<endif>
>>

ListenerFile(file, header, namedActions) ::= <<
<fileHeader(file.grammarFileName, file.ANTLRVersion)>
<if(file.genPackage)>
namespace <file.genPackage> {
<endif>
<header>
using Antlr4.Runtime.Misc;
using IParseTreeListener = Antlr4.Runtime.Tree.IParseTreeListener;
using IToken = Antlr4.Runtime.IToken;

/// \<summary>
/// This interface defines a complete listener for a parse tree produced by
/// \<see cref="<csIdentifier.(file.parserName)>">/.
/// \</summary>
[System.CodeDom.Compiler.GeneratedCode("ANTLR", "<file.ANTLRVersion>")]
[System.CLSCompliant(false)]
public interface I<file.grammarName>Listener : IParseTreeListener {
  <file.listenerNames>: {Iname |
/// \<summary>
<if(file.listenerLabelRuleNames.(Iname))>
/// Enter a parse tree produced by the \<c><Iname>\</c>
/// labeled
  alternative in \<see cref="<file.parserName>.<file.listenerLabelRuleNames.(Iname)>">/.
<else>
/// Enter a parse tree produced by \<see cref="<file.parserName>.<Iname>">/.
<endif>
/// \</summary>
/// \<param name="context">The parse tree.\</param>
  void Enter<Iname; format="cap">([NotNull] <csIdentifier.(file.parserName)>.<Iname; format="cap">Context
  context);
/// \<summary>
<if(file.listenerLabelRuleNames.(Iname))>
/// Exit a parse tree produced by the \<c><Iname>\</c>
/// labeled alternative in \<see cref="<file.parserName>.<file.listenerLabelRuleNames.(Iname)>">/.
<else>
/// Exit a parse tree produced by \<see cref="<file.parserName>.<Iname>">/.
<endif>
/// \</summary>
/// \<param name="context">The parse tree.\</param>
  void Exit<Iname; format="cap">([NotNull] <csIdentifier.(file.parserName)>.<Iname; format="cap">Context
  context);}; separator="\n"
}
<if(file.genPackage)>
} // namespace <file.genPackage>
<endif>

```

>>

```
BaseListenerFile(file, header, namedActions) ::= <<
<fileHeader(file.grammarFileName,
file.ANTLRVersion)>
<if(file.genPackage)>
namespace <file.genPackage> {
<endif>
<header>

using Antlr4.Runtime.Misc;
using IErrorNode = Antlr4.Runtime.Tree.IErrorNode;
using ITerminalNode = Antlr4.Runtime.Tree.ITerminalNode;
using IToken = Antlr4.Runtime.IToken;
using ParserRuleContext = Antlr4.Runtime.ParserRuleContext;

/// \<summary>
/// This class provides an empty implementation of \<see cref="I<file.grammarName>Listener"/>,
/// which can be extended to create a listener which only needs to handle a subset
/// of the available methods.
/// \</summary>
[System.CodeDom.Compiler.GeneratedCode("ANTLR", "<file.ANTLRVersion>")]
[System.Diagnostics.DebuggerNonUserCode]
[System.CLSCompliant(false)]
public partial class <file.grammarName>BaseListener : I<file.grammarName>Listener {
    <file.listenerNames: {Iname |
/// \<summary>
<if(file.listenerLabelRuleNames.(Iname))>
/// Enter a parse tree produced by the \<c><Iname>\</c>
/// labeled alternative in \<see cref="<file.parserName>.<file.listenerLabelRuleNames.(Iname)>"/>.
<else>
///
    Enter a parse tree produced by \<see cref="<file.parserName>.<Iname>"/>.
<endif>
/// \<para>The default implementation does nothing.\</para>
/// \</summary>
/// \<param name="context">The parse tree.\</param>
public virtual void Enter<Iname; format="cap">([NotNull] <csIdentifier.(file.parserName)>.<Iname;
format="cap">Context context) { \}
/// \<summary>
<if(file.listenerLabelRuleNames.(Iname))>
/// Exit a parse tree produced by the \<c><Iname>\</c>
/// labeled alternative in \<see cref="<file.parserName>.<file.listenerLabelRuleNames.(Iname)>"/>.
<else>
/// Exit a parse tree produced by \<see cref="<file.parserName>.<Iname>"/>.
<endif>
/// \<para>The default implementation does nothing.\</para>
/// \</summary>
```

```

/// \<param name="context">The parse tree.\</param>
public virtual void Exit<Iname; format="cap">([NotNull] <csIdentifier.(file.parserName)>.<Iname;
format="cap">Context context) { \} }; separator="\n">

/// \<inheritdoc/>
///
\<remarks>The default implementation does nothing.\</remarks>
public virtual void EnterEveryRule([NotNull] ParserRuleContext context) { }
/// \<inheritdoc/>
/// \<remarks>The default implementation does nothing.\</remarks>
public virtual void ExitEveryRule([NotNull] ParserRuleContext context) { }
/// \<inheritdoc/>
/// \<remarks>The default implementation does nothing.\</remarks>
public virtual void VisitTerminal([NotNull] ITerminalNode node) { }
/// \<inheritdoc/>
/// \<remarks>The default implementation does nothing.\</remarks>
public virtual void VisitErrorNode([NotNull] IErrorNode node) { }
}
<if(file.genPackage)>
} // namespace <file.genPackage>
<endif>
>>

```

```

VisitorFile(file, header, namedActions) ::= <<
<fileHeader(file.grammarFileName, file.ANTLRVersion)>
<if(file.genPackage)>
namespace <file.genPackage> {
<endif>
<header>
using Antlr4.Runtime.Misc;
using Antlr4.Runtime.Tree;
using IToken = Antlr4.Runtime.IToken;

/// \<summary>
/// This interface defines a complete
generic visitor for a parse tree produced
/// by \<see cref="<csIdentifier.(file.parserName)>">/>.
/// \</summary>
/// \<typeparam name="Result">The return type of the visit operation.\</typeparam>
[System.CodeDom.Compiler.GeneratedCode("ANTLR", "<file.ANTLRVersion>")]
[System.CLSCompliant(false)]
public interface I<file.grammarName>Visitor<Result> : IParseTreeVisitor<Result> {
<file.visitorNames:{Iname |
/// \<summary>
<if(file.visitorLabelRuleNames.(Iname))>
/// Visit a parse tree produced by the \<c><Iname>\</c>
/// labeled alternative in \<see cref="<file.parserName>.<file.visitorLabelRuleNames.(Iname)>">/>.
<else>

```

```

/// Visit a parse tree produced by \<see cref="<file.parserName>.<lname>"/>.
<endif>
/// \</summary>
/// \<param name="context">The parse tree.\</param>
/// \<return>The visitor result.\</return>
Result Visit<lname; format="cap">([NotNull] <csIdentifier.(file.parserName)>.<lname; format="cap">Context
context);}; separator="\n">
}
<if(file.genPackage)>
} // namespace
<file.genPackage>
<endif>
>>

```

```

BaseVisitorFile(file, header, namedActions) ::= <<
<fileHeader(file.grammarFileName, file.ANTLRVersion)>
<if(file.genPackage)>
namespace <file.genPackage> {
<endif>
<header>
using Antlr4.Runtime.Misc;
using Antlr4.Runtime.Tree;
using IToken = Antlr4.Runtime.IToken;
using ParserRuleContext = Antlr4.Runtime.ParserRuleContext;

/// \<summary>
/// This class provides an empty implementation of \<see cref="I<file.grammarName>Visitor{Result}"/>,
/// which can be extended to create a visitor which only needs to handle a subset
/// of the available methods.
/// \</summary>
/// \<typeparam name="Result">The return type of the visit operation.\</typeparam>
[System.CodeDom.Compiler.GeneratedCode("ANTLR", "<file.ANTLRVersion>")]
[System.Diagnostics.DebuggerNonUserCode]
[System.CLSCompliant(false)]
public partial class <file.grammarName>BaseVisitor<Result> : AbstractParseTreeVisitor<Result>,
I<file.grammarName>Visitor<Result> {
<file.visitorNames:{lname |
/// \<summary>
<if(file.visitorLabelRuleNames.(lname))>
///
Visit a parse tree produced by the \<c><lname>\</c>
/// labeled alternative in \<see cref="<file.parserName>.<file.visitorLabelRuleNames.(lname)>"/>.
<else>
/// Visit a parse tree produced by \<see cref="<file.parserName>.<lname>"/>.
<endif>
/// \<para>
/// The default implementation returns the result of calling \<see
cref="AbstractParseTreeVisitor{Result}.VisitChildren(IRuleNode)"/>

```

```

/// on \<paramref name="context"/>.
/// \</para>
/// \</summary>
/// \<param name="context">The parse tree.\</param>
/// \<return>The visitor result.\</return>
public virtual Result Visit<Iname; format="cap">([NotNull] <csIdentifier.(file.parserName)>.<Iname;
format="cap">Context context) { return VisitChildren(context); \}}; separator="\n">
}
<if(file.genPackage)>
} // namespace <file.genPackage>
<endif>
>>

```

```

fileHeader(grammarFileName, ANTLRVersion) ::= <<
//-----
// \<auto-generated>
//
// This code was generated by a tool.
// ANTLR Version: <ANTLRVersion>
//
// Changes to this file may cause incorrect behavior and will be lost if
// the code is regenerated.
// \</auto-generated>
//-----

```

```

// Generated from <grammarFileName> by ANTLR <ANTLRVersion>

```

```

// Unreachable code detected
#pragma warning disable 0162
// The variable '...' is assigned but its value is never used
#pragma warning disable 0219
// Missing XML comment for publicly visible type or member '...'
#pragma warning disable 1591
// Ambiguous reference in cref attribute
#pragma warning disable 419

```

```

>>

```

```

Parser(parser, funcs, atn, sempredFuncs, superClass) ::= <<
<Parser_(ctor="parser_ctor", ...)>
>>

```

```

Parser_(parser, funcs, atn, sempredFuncs, ctor, superClass) ::= <<
[System.CodeDom.Compiler.GeneratedCode("ANTLR", "<file.ANTLRVersion>")]
[System.CLSCompliant(false)]
public partial class <csIdentifier.(parser.name)> : <superClass;
null="Parser"> {
protected static DFA[] decisionToDFA;

```

```

protected static PredictionContextCache sharedContextCache = new PredictionContextCache();
<if(parser.tokens)>
public const int
  <parser.tokens:{k | <k>=<parser.tokens.(k)>}; separator=", ", wrap, anchor>;
<endif>
public const int
  <parser.rules:{r | RULE_<r.name> = <r.index>}; separator=", ", wrap, anchor>;
public static readonly string[] ruleNames = {
  <parser.ruleNames:{r | "<r>"}; separator=", ", wrap, anchor>
};

<vocabulary(parser.literalNames, parser.symbolicNames)>

public override string GrammarFileName { get { return "<parser.grammarFileName>"; } }

public override string[] RuleNames { get { return ruleNames; } }

public override string SerializedAtn { get { return new string(_serializedATN); } }

static <csIdentifier.(parser.name)>() {
  decisionToDFA = new DFA[_ATN.NumberOfDecisions];
  for (int i = 0; i < _ATN.NumberOfDecisions; i++) {
    decisionToDFA[i] = new DFA(_ATN.GetDecisionState(i),
  i);
  }
}

<namedActions.members>
<parser:(ctor)()>
<funcs; separator="\n">

<if(sempredFuncs)>
public override bool Sempred(RuleContext _localctx, int ruleIndex, int predIndex) {
  switch (ruleIndex) {
    <parser.sempredFuncs.values:{f}
  case <f.ruleIndex>: return <f.name>_sempred((<f.ctxType>)_localctx, predIndex);}; separator="\n">
  }
  return true;
}
<sempredFuncs.values; separator="\n">
<endif>

<atn>
}
>>

vocabulary(literalNames, symbolicNames) ::= <<
private static readonly string[] _LiteralNames = {

```

```

<literalNames:{t | <t>}; null="null", separator=", ", wrap, anchor>
};
private static readonly string[] _SymbolicNames = {
<symbolicNames:{t | <t>}; null="null", separator=", ", wrap, anchor>
};
public static readonly IVocabulary DefaultVocabulary = new Vocabulary(_LiteralNames, _SymbolicNames);

[NotNull]
public override IVocabulary Vocabulary
{
    get
    {
        return DefaultVocabulary;
    }
}
>>

dumpActions(recog, argFuncs, actionFuncs, sempredFuncs) ::= <<
<if(actionFuncs)>
public
override void Action(RuleContext _localctx, int ruleIndex, int actionIndex) {
switch (ruleIndex) {
<recog.actionFuncs.values:{f}
case <f.ruleIndex> : <f.name>_action(<if(!recog.modes)><f.ctxType><endif>_localctx, actionIndex); break;};
separator="\n">
}
}
<actionFuncs.values; separator="\n">
<endif>
<if(sempredFuncs)>
public override bool Sempred(RuleContext _localctx, int ruleIndex, int predIndex) {
switch (ruleIndex) {
<recog.sempredFuncs.values:{f}
case <f.ruleIndex> : return <f.name>_sempred(<if(!recog.modes)><f.ctxType><endif>_localctx, predIndex);};
separator="\n">
}
return true;
}
<sempredFuncs.values; separator="\n">
<endif>
>>

parser_ctor(parser) ::= <<
public <csIdentifier.(parser.name)>(ITokenStream input) : this(input, Console.Out, Console.Error) { }

public <csIdentifier.(parser.name)>(ITokenStream input, TextWriter output, TextWriter errorOutput)
: base(input, output, errorOutput)
{

```

```

Interpreter = new ParserATNSimulator(this, _ATN, decisionToDFA, sharedContextCache);
}
>>

/*
This generates a private method since the actionIndex is generated, making an
* overriding implementation impossible to maintain.
*/
RuleActionFunction(r, actions) ::= <<
private void <r.name>_action(<r.ctxType> _localctx, int actionIndex) {
switch (actionIndex) {
<actions:{index|
case <index>: <actions.(index)> break;}; separator="\n">
}
}
>>

/* This generates a private method since the predIndex is generated, making an
* overriding implementation impossible to maintain.
*/
RuleSempredFunction(r, actions) ::= <<
private bool <r.name>_sempred(<r.ctxType> _localctx, int predIndex) {
switch (predIndex) {
<actions:{index|
case <index>: return <actions.(index)>;}; separator="\n">
}
return true;
}
>>

RuleFunction(currentRule,args,code,locals,ruleCtx,altLabelCtxs,namedActions,finallyAction,postamble,exceptions)
::= <<

<if(ruleCtx)>
<ruleCtx>
<endif>
<altLabelCtxs:{l | <altLabelCtxs.(l)>}; separator="\n">

[RuleVersion(<namedActions.version; null="0">)]
<if(currentRule.modifiers)><currentRule.modifiers:{f
| <f> }><else>public <endif><currentRule.ctxType> <csIdentifier.(currentRule.name)><(args; separator=", "> {
<currentRule.ctxType> _localctx = new <currentRule.ctxType>(Context, State<currentRule.args:{a | ,
<csIdentifier.(a.name)>}>>);
EnterRule(_localctx, <currentRule.startState>, RULE_<currentRule.name>);
<namedActions.init>
<locals; separator="\n">
try {
<if(currentRule.hasLookaheadBlock)>

```



```

    int _alt;
<endif>
    <code>
    <postamble; separator="\n">
    <namedActions.after>
    }
<if(exceptions)>
<exceptions; separator="\n">
<else>
catch (RecognitionException re) {
    _localctx.exception = re;
    ErrorHandler.ReportError(this, re);
    ErrorHandler.Recover(this, re);
}
<endif>
finally {
    <finallyAction>
    ExitRule();
}
return _localctx;
}
>>

```

```

LeftFactoredRuleFunction(currentRule,args,code,locals,namedActions,finallyAction,postamble) ::=
<<

```

```

<if(currentRule.modifiers)><currentRule.modifiers:{f | <f> }><else>private <endif><currentRule.ctxType>
<csIdentifier.(currentRule.name)><(<args; separator=", ">) {
<currentRule.ctxType> _localctx = new <currentRule.ctxType>(Context, State<currentRule.args:{a | ,
<csIdentifier.(a.name)>>>);
EnterLeftFactoredRule(_localctx, <currentRule.startState>, RULE_<currentRule.variantOf>);
<namedActions.init>
<locals; separator="\n">
try {
<if(currentRule.hasLookaheadBlock)>
    int _alt;
<endif>
    <code>
    <postamble; separator="\n">
    <namedActions.after>
    }
catch (RecognitionException re) {
    _localctx.exception = re;
    ErrorHandler.ReportError(this, re);
    ErrorHandler.Recover(this, re);
}
finally {
    <finallyAction>

```

```

    ExitRule();
}
return _localctx;
}
>>

// This behaves similar to RuleFunction (enterRule is called, and no adjustments
// are made to the parse tree), but since it's still a variant no context class
// needs to be generated.
LeftUnfactoredRuleFunction(currentRule,args,code,locals,namedActions,finallyAction,postamble) ::=
<<

<if(currentRule.modifiers)><currentRule.modifiers: { f
| <f >><else>private <endif><currentRule.ctxType> <csIdentifier.(currentRule.name)><(<args; separator=", ">) {
<currentRule.ctxType> _localctx = new <currentRule.ctxType>(Context, State<currentRule.args:{ a | ,
<csIdentifier.(a.name)>>>);
EnterRule(_localctx, <currentRule.startState>, RULE_<currentRule.variantOf>);
<namedActions.init>
<locals; separator="\n">
try {
<if(currentRule.hasLookaheadBlock)>
int _alt;
<endif>
<code>
<postamble; separator="\n">
<namedActions.after>
}
catch (RecognitionException re) {
_localctx.exception = re;
ErrorHandler.ReportError(this, re);
ErrorHandler.Recover(this, re);
}
finally {
<finallyAction>
ExitRule();
}
return _localctx;
}
>>

LeftRecursiveRuleFunction(currentRule,args,code,locals,ruleCtx,altLabelCtxs,
namedActions,finallyAction,postamble) ::=
<<

<ruleCtx>
<altLabelCtxs:{ l | <altLabelCtxs.(l)>}; separator="\n">

[RuleVersion(<namedActions.version; null="0">)]

```

```

<if(currentRule.modifiers)><currentRule.modifiers: { f
| <f >><else>public <endif><currentRule.ctxType> <csIdentifier.(currentRule.name)><(<args; separator=", ">) {
return <csIdentifier.(currentRule.name)>(0<currentRule.args:{ a | , <csIdentifier.(a.name)>}>}>;
}

```

```

private <currentRule.ctxType> <csIdentifier.(currentRule.name)>(int _p<args:{ a | , <a>}>) {
  ParserRuleContext _parentctx = Context;
  int _parentState = State;
  <currentRule.ctxType> _localctx = new <currentRule.ctxType>(Context, _parentState<currentRule.args:{ a | ,
  <csIdentifier.(a.name)>}>});
  <currentRule.ctxType> _prevctx = _localctx;
  int _startState = <currentRule.startState>;
  EnterRecursionRule(_localctx, <currentRule.startState>, RULE_<currentRule.name>, _p);
  <namedActions.init>
  <locals; separator="\n">
  try {
  <if(currentRule.hasLookaheadBlock)>
  int _alt;
  <endif>
  <code>
  <postamble; separator="\n">
  <namedActions.after>
  }
  catch (RecognitionException re) {
  _localctx.exception = re;
  ErrorHandler.ReportError(this, re);
  ErrorHandler.Recover(this,
  re);
  }
  finally {
  <finallyAction>
  UnrollRecursionContexts(_parentctx);
  }
  return _localctx;
  }
  >>

```

```

CodeBlockForOuterMostAlt(currentOuterMostAltCodeBlock, locals, preamble, ops) ::= <<
<if(currentOuterMostAltCodeBlock.altLabel)>_localctx = new <currentOuterMostAltCodeBlock.altLabel>
format="cap">Context(_localctx);<endif>
EnterOuterAlt(_localctx, <currentOuterMostAltCodeBlock.alt.altNum>);
<CodeBlockForAlt(currentAltCodeBlock=currentOuterMostAltCodeBlock, ...)>
>>

```

```

CodeBlockForAlt(currentAltCodeBlock, locals, preamble, ops) ::= <<
{
  <locals; separator="\n">
  <preamble; separator="\n">

```

```
<ops; separator="\n">
}
>>
```

```
LL1AltBlock(choice, preamble, alts, error) ::= <<
State = <choice.stateNumber>;
ErrorHandler.Sync(this);
<if(choice.label)><labelref(choice.label)> = TokenStream.LT(1);<endif>
<preamble; separator="\n">
switch (TokenStream.LA(1)) {
<choice.altLook,alts:{look,alt| <cases(ttypes=look)>
<alt>
break;}; separator="\n">
default:
<error>
}
>>
```

```
LL1OptionalBlock(choice, alts,
error) ::= <<
State = <choice.stateNumber>;
ErrorHandler.Sync(this);
switch (TokenStream.LA(1)) {
<choice.altLook,alts:{look,alt| <cases(ttypes=look)>
<alt>
break;}; separator="\n">
default:
break;
}
>>
```

```
LL1OptionalBlockSingleAlt(choice, expr, alts, preamble, error, followExpr) ::= <<
State = <choice.stateNumber>;
ErrorHandler.Sync(this);
<preamble; separator="\n">
if (<expr>) {
<alts; separator="\n">
}
<!else if ( !(<followExpr> ) <error>!>
>>
```

```
LL1StarBlockSingleAlt(choice, loopExpr, alts, preamble, iteration) ::= <<
State = <choice.stateNumber>;
ErrorHandler.Sync(this);
<preamble; separator="\n">
while (<loopExpr>) {
<alts; separator="\n">
State = <choice.loopBackStateNumber>;
}
```

```

ErrorHandler.Sync(this);
<iteration>
}
>>

```

```

LL1PlusBlockSingleAlt(choice, loopExpr, alts, preamble, iteration) ::= <<
State = <choice.blockStartStateNumber>;<! alt block decision !>
ErrorHandler.Sync(this);
<preamble; separator="\n">
do {
<alts; separator="\n">
State = <choice.stateNumber>;<! loopback/exit
decision !>
ErrorHandler.Sync(this);
<iteration>
} while ( <loopExpr> );
>>

```

```
// LL(*) stuff
```

```

AltBlock(choice, preamble, alts, error) ::= <<
State = <choice.stateNumber>;
ErrorHandler.Sync(this);
<if(choice.label)><labelref(choice.label)> = TokenStream.LT(1);<endif>
<preamble; separator="\n">
switch ( Interpreter.AdaptivePredict(TokenStream,<choice.decision>,Context) ) {
<alts:{ alt |
case <i>:
<alt>
break;}; separator="\n">
}
>>

```

```

OptionalBlock(choice, alts, error) ::= <<
State = <choice.stateNumber>;
ErrorHandler.Sync(this);
switch ( Interpreter.AdaptivePredict(TokenStream,<choice.decision>,Context) ) {
<alts:{ alt |
case <i><if(!choice.ast.greedy)>+1<endif>:
<alt>
break;}; separator="\n">
}
>>

```

```

StarBlock(choice, alts, sync, iteration) ::= <<
State = <choice.stateNumber>;
ErrorHandler.Sync(this);
_alt = Interpreter.AdaptivePredict(TokenStream,<choice.decision>,Context);

```

```

while ( _alt!=<choice.exitAlt> && _alt!=global::Antlr4.Runtime.Atn.ATN.INVALID_ALT_NUMBER ) {
if ( _alt==1<if(!choice.ast.greedy)>+1<endif>
) {
<iteration>
<alts> <! should only be one !>
}
State = <choice.loopBackStateNumber>;
ErrorHandler.Sync(this);
_alt = Interpreter.AdaptivePredict(TokenStream,<choice.decision>,Context);
}
>>

```

```

PlusBlock(choice, alts, error) ::= <<
State = <choice.blockStartStateNumber>;<! alt block decision !>
ErrorHandler.Sync(this);
_alt = 1<if(!choice.ast.greedy)>+1<endif>;
do {
switch ( _alt ) {
<alts:{alt|
case <i><if(!choice.ast.greedy)>+1<endif>:
<alt>
break;}; separator="\n">
default:
<error>
}
State = <choice.loopBackStateNumber>;<! loopback/exit decision !>
ErrorHandler.Sync(this);
_alt = Interpreter.AdaptivePredict(TokenStream,<choice.decision>,Context);
} while ( _alt!=<choice.exitAlt> && _alt!=global::Antlr4.Runtime.Atn.ATN.INVALID_ALT_NUMBER );
>>

```

```

Sync(s) ::= "Sync(<s.expecting.name>);"

```

```

ThrowNoViableAlt(t) ::= "throw new NoViableAltException(this);"

```

```

TestSetInline(s) ::= <<
<s.bitsets:{bits | <if(rest(rest(bits.ttypes)))><bitsetBitfieldComparison(s,
bits)><else><bitsetInlineComparison(s, bits)><endif>}; separator=" || ">
>>

```

```

// Java language spec 15.19 - shift operators mask operands rather than overflow to 0... need range test
testShiftInRange(shiftAmount) ::= <<
((<shiftAmount>) & ~0x3f) == 0
>>

```

```

// produces smaller bytecode only when bits.ttypes contains more than two items
bitsetBitfieldComparison(s, bits) ::= <%
(<testShiftInRange({<offsetShift(s.varName, bits.shift)>})> && ((1L \<< <offsetShift(s.varName, bits.shift)>) &

```

```

(<bits.ttypes:{ttype | (1L \<< <offsetShift(tokenType.(ttype), bits.shift)>)}; separator=" | ">) != 0)
%>

isZero ::= [
"0":true,
default:false
]

offsetShift(shiftAmount, offset) ::= <%
<if(!isZero.(offset))><shiftAmount> - <offset><else><shiftAmount><endif>
%>

// produces more efficient bytecode when bits.ttypes contains at most two items
bitsetInlineComparison(s, bits) ::= <%
<bits.ttypes:{ttype | <s.varName>===<tokenType.(ttype)>}; separator=" || ">
%>

cases(ttypes) ::= <<
<ttypes:{ t
| case <tokenType.(t)>; separator="\n">
>>

InvokeRule(r, argExprsChunks) ::= <<
State = <r.stateNumber>; <if(r.labels)><r.labels:{1 | <labelref(l)> =
}><endif><csIdentifier.(r.name)><(<if(r.ast.options.p)><r.ast.options.p><if(argExprsChunks)><endif><endif><arg
ExprsChunks>);
>>

MatchToken(m) ::= <<
State = <m.stateNumber>; <if(m.labels)><m.labels:{1 | <labelref(l)> = }><endif>Match(<tokenType.(m.name)>);
>>

MatchSet(m, expr, capture) ::= "<CommonSetStuff(m, expr, capture, false)>"

MatchNotSet(m, expr, capture) ::= "<CommonSetStuff(m, expr, capture, true)>"

CommonSetStuff(m, expr, capture, invert) ::= <<
State = <m.stateNumber>;
<if(m.labels)><m.labels:{1 | <labelref(l)> = }>TokenStream.LT(1);<endif>
<capture>
if ( <if(invert)><m.varName> \<= 0 || <else>!<endif><(<expr>) ) {
<if(m.labels)><m.labels:{1 | <labelref(l)> = }><endif>ErrorHandler.RecoverInline(this);
}
else {
ErrorHandler.ReportMatch(this);
Consume();
}
>>

```

```

Wildcard(w) ::= <<
State = <w.stateNumber>;
<if(w.labels)><w.labels:{1
| <labelref(l)> = }><endif>MatchWildcard();
>>

// ACTION STUFF

Action(a, foo, chunks) ::= "<chunks>"

ArgAction(a, chunks) ::= "<chunks>"

SemPred(p, chunks, failChunks) ::= <<
State = <p.stateNumber>;
if (!(<chunks>)) throw new FailedPredicateException(this, <p.predicate><if(failChunks)>,
<failChunks><elseif(p.msg)>, <p.msg><endif>);
>>

ExceptionClause(e, catchArg, catchAction) ::= <<
catch (<catchArg>) {
  <catchAction>
}
>>

// lexer actions are not associated with model objects

LexerSkipCommand() ::= "Skip()";
LexerMoreCommand() ::= "More()";
LexerPopModeCommand() ::= "PopMode()";

LexerTypeCommand(arg, grammar) ::= "_type = <tokenType.(arg)>";
LexerChannelCommand(arg, grammar) ::= "_channel = <channelName.(arg)>";
LexerModeCommand(arg, grammar) ::= "_mode = <modeName.(arg)>";
LexerPushModeCommand(arg, grammar) ::= "PushMode(<modeName.(arg)>";

ActionText(t) ::= "<t.text>"
ActionTemplate(t) ::= "<t.st>"
ArgRef(a) ::= "_localctx.<csIdentifier.(a.name)>"
LocalRef(a)
 ::= "_localctx.<csIdentifier.(a.name)>"
RetValRef(a) ::= "_localctx.<csIdentifier.(a.name)>"
QRetValRef(a) ::= "<ctx(a)>.<a.dict>.<csIdentifier.(a.name)>"
/** How to translate $tokenLabel */
TokenRef(t) ::= "<ctx(t)>.<csIdentifier.(tokenType.(t.name))>"
LabelRef(t) ::= "<ctx(t)>.<csIdentifier.(t.name)>"
ListLabelRef(t) ::= "<ctx(t)>.<ListLabelName(csIdentifier.(t.name))>"
SetAttr(s,rhsChunks) ::= "<ctx(s)>.<csIdentifier.(s.name)> = <rhsChunks>";

```



```

TokenLabelType() ::= "<file.TokenLabelType; null={IToken}>"
InputSymbolType() ::= "<file.InputSymbolType; null={IToken}>"

TokenPropertyRef_text(t) ::= "<ctx(t).<tokenType.(t.label)>!=null?ctx(t).<tokenType.(t.label)>.Text:null)"
TokenPropertyRef_type(t) ::= "<ctx(t).<tokenType.(t.label)>!=null?ctx(t).<tokenType.(t.label)>.Type:0)"
TokenPropertyRef_line(t) ::= "<ctx(t).<tokenType.(t.label)>!=null?ctx(t).<tokenType.(t.label)>.Line:0)"
TokenPropertyRef_pos(t) ::=
"<ctx(t).<tokenType.(t.label)>!=null?ctx(t).<tokenType.(t.label)>.CharPositionInLine:0)"
TokenPropertyRef_channel(t)
::= "<ctx(t).<tokenType.(t.label)>!=null?ctx(t).<tokenType.(t.label)>.Channel:0)"
TokenPropertyRef_index(t) ::=
"<ctx(t).<tokenType.(t.label)>!=null?ctx(t).<tokenType.(t.label)>.TokenIndex:0)"
TokenPropertyRef_int(t) ::=
"<ctx(t).<tokenType.(t.label)>!=null?int.Parse(<ctx(t).<tokenType.(t.label)>.Text):0)"

RulePropertyRef_start(r) ::= "<ctx(r).<r.label>!=null?(ctx(r).<r.label>.Start):null)"
RulePropertyRef_stop(r) ::= "<ctx(r).<r.label>!=null?(ctx(r).<r.label>.Stop):null)"
RulePropertyRef_text(r) ::=
"<ctx(r).<r.label>!=null?TokenStream.GetText(<ctx(r).<r.label>.Start,<ctx(r).<r.label>.Stop):null)"
RulePropertyRef_ctx(r) ::= "<ctx(r).<r.label>"
RulePropertyRef_parser(r) ::= "this"

ThisRulePropertyRef_start(r) ::= "_localctx.Start"
ThisRulePropertyRef_stop(r) ::= "_localctx.Stop"
ThisRulePropertyRef_text(r) ::= "TokenStream.GetText(_localctx.Start, TokenStream.LT(-1))"
ThisRulePropertyRef_ctx(r)
::= "_localctx"
ThisRulePropertyRef_parser(r) ::= "this"

NonLocalAttrRef(s) ::= <%((<s.ruleName;
format="cap">Context)GetInvokingContext(<s.ruleIndex>)).<csIdentifier.(s.name)>%>
SetNonLocalAttr(s, rhsChunks) ::=
<%((<s.ruleName; format="cap">Context)GetInvokingContext(<s.ruleIndex>)).<csIdentifier.(s.name)> =
<rhsChunks>;%>

AddToLabelList(a) ::= "<ctx(a.label).<a.listName>.Add(<labelref(a.label)>);"

TokenDecl(t) ::= "<TokenLabelType() <csIdentifier.(tokenType.(t.name))>"
TokenTypeDecl(t) ::= "int <csIdentifier.(tokenType.(t.name))>);"
TokenListDecl(t) ::= "IList<IToken> <csIdentifier.(tokenType.(t.name))> = new List<IToken>()"
RuleContextDecl(r) ::= "<r.ctxName> <csIdentifier.(r.name)>"
RuleContextListDecl(rdecl) ::= "IList<<rdecl.ctxName>> <csIdentifier.(rdecl.name)> = new
List<<rdecl.ctxName>>()"

contextGetterCollection(elementType) ::= <%
<elementType>[]
%>

```

```

ContextTokenGetterDecl(t) ::=
    "[System.Diagnostics.DebuggerNonUserCode] public ITerminalNode
    <csIdentifier.(tokenType.(t.name))>() { return
    GetToken(<csIdentifier.(parser.name)>.<csIdentifier.(tokenType.(t.name))>, 0); }"
ContextTokenListGetterDecl(t) ::= <<
[System.Diagnostics.DebuggerNonUserCode] public <contextGetterCollection("ITerminalNode")>
<csIdentifier.(tokenType.(t.name))>() { return
GetTokens(<csIdentifier.(parser.name)>.<csIdentifier.(tokenType.(t.name))>); }
>>
ContextTokenListIndexedGetterDecl(t) ::= <<
[System.Diagnostics.DebuggerNonUserCode] public ITerminalNode <csIdentifier.(tokenType.(t.name))>(int i) {
return GetToken(<csIdentifier.(parser.name)>.<csIdentifier.(tokenType.(t.name))>, i);
}
>>
ContextRuleGetterDecl(r) ::= <<
[System.Diagnostics.DebuggerNonUserCode] public <r.ctxName> <csIdentifier.(r.name)>() {
return GetRuleContext\<<r.ctxName>\>(0);
}
>>
ContextRuleListGetterDecl(r) ::= <<
[System.Diagnostics.DebuggerNonUserCode] public <contextGetterCollection({<r.ctxName>})>
<csIdentifier.(r.name)>() {
return GetRuleContexts\<<r.ctxName>\>();
}
>>
ContextRuleListIndexedGetterDecl(r)
    ::= <<
[System.Diagnostics.DebuggerNonUserCode] public <r.ctxName> <csIdentifier.(r.name)>(int i) {
return GetRuleContext\<<r.ctxName>\>(i);
}
>>

LexerRuleContext() ::= "RuleContext"

/** The rule context name is the rule followed by a suffix; e.g.,
* r becomes rContext.
*/
RuleContextNameSuffix() ::= "Context"

ImplicitTokenLabel(tokenName) ::= "_<tokenType.(tokenName)>"
ImplicitRuleLabel(ruleName) ::= "_<ruleName>"
ImplicitSetLabel(id) ::= "_tset<id>"
ListLabelName(label) ::= "_<label>"

CaptureNextToken(d) ::= "<d.varName> = TokenStream.LT(1);"
CaptureNextTokenType(d) ::= "<d.varName> = TokenStream.LA(1);"

```

```

StructDecl(struct,ctorAttrs,attrs, getters,dispatchMethods,interfaces,extensionMembers,
    superClass={ParserRuleContext}) ::= <<
public partial class <struct.name> :
<if(contextSuperClass)><contextSuperClass><else>ParserRuleContext<endif><if(interfaces)>, <interfaces;
separator=", "><endif> {
    <attrs:{ a | public <a>;};
    separator="\n">
    <getters:{ g | <g>;}; separator="\n">
    <if(ctorAttrs)>public <struct.name>(ParserRuleContext parent, int invokingState) : base(parent, invokingState) {
    }<endif>
    public <struct.name>(ParserRuleContext parent, int invokingState<ctorAttrs:{ a | , <a>}>)
    : base(parent, invokingState)
    {
        <struct.ctorAttrs:{ a | this.<csIdentifier.(a.name)> = <csIdentifier.(a.name)>;}; separator="\n">
    }
    public override int RuleIndex { get { return RULE_<struct.derivedFromName>; } }
<if(struct.provideCopyFrom)><! don't need copy unless we have subclasses !>
    public <struct.name>() { }
    public virtual void CopyFrom(<struct.name> context) {
        base.CopyFrom(context);
        <struct.attrs:{ a | this.<csIdentifier.(a.name)> = context.<csIdentifier.(a.name)>;}; separator="\n">
    }
<endif>
    <dispatchMethods; separator="\n">
    <extensionMembers; separator="\n">
}
>>

```

```

AltLabelStructDecl(struct,attrs, getters,dispatchMethods) ::= <<
public partial class <struct.name> : <currentRule.name; format="cap">Context
{
    <attrs:{ a | public <a>;}; separator="\n">
    <getters:{ g | <g>;}; separator="\n">
    public <struct.name>(<currentRule.name; format="cap">Context context) { CopyFrom(context); }
    <dispatchMethods; separator="\n">
}
>>

```

```

ListenerDispatchMethod(method) ::= <<
[System.Diagnostics.DebuggerNonUserCode]
public override void <if(method.isEnter)>Enter<else>Exit<endif>Rule(IParseTreeListener listener) {
    I<parser.grammarName>Listener typedListener = listener as I<parser.grammarName>Listener;
    if (typedListener != null) typedListener.<if(method.isEnter)>Enter<else>Exit<endif><struct.derivedFromName;
format="cap">(this);
}
>>

```

```

VisitorDispatchMethod(method) ::= <<

```

```
[System.Diagnostics.DebuggerNonUserCode]
public override TResult Accept<TResult>(IParseTreeVisitor<TResult> visitor) {
    I<parser.grammarName>Visitor<TResult> typedVisitor = visitor as I<parser.grammarName>Visitor<TResult>;
    if (typedVisitor != null) return typedVisitor.Visit<struct.derivedFromName; format="cap">(this);
    else return
        visitor.VisitChildren(this);
    }
}>>
```

```
AttributeDecl(d) ::= "<d.type> <csIdentifier.(d.name)><if(d.initValue)> = <d.initValue><endif>"
```

```
/** If we don't know location of label def x, use this template */
```

```
labelref(x) ::= "<if(!x.isLocal)><typedContext(x.ctx)>. <endif><csIdentifier.(x.name)>"
```

```
/** For any action chunk, what is correctly-typed context struct ptr? */
```

```
ctx(actionChunk) ::= "<typedContext(actionChunk.ctx)>"
```

```
// only casts _localctx to the type when the cast isn't redundant (i.e. to a sub-context for a labeled alt)
```

```
typedContext(ctx) ::= "<if(ctx.provideCopyFrom)>((<ctx.name>)_localctx)<else>_localctx<endif>"
```

```
// used for left-recursive rules
```

```
recRuleAltPredicate(ruleName,opPrec) ::= "Precpred(Context, <opPrec>)"
```

```
recRuleSetReturnAction(src,name) ::= "$<name>=<src>.<name>;"
```

```
recRuleSetStopToken() ::= "Context.Stop = TokenStream.LT(-1);"
```

```
recRuleAltStartAction(ruleName, ctxName, label, isListLabel) ::= <<
```

```
_localctx = new <ctxName>Context(_parentctx, _parentState);
```

```
<if(label)>
```

```
<if(isListLabel)>
```

```
_localctx.<label>.Add(_prevctx);
```

```
<else>
```

```
_localctx.<label>
```

```
= _prevctx;
```

```
<endif>
```

```
<endif>
```

```
PushNewRecursionContext(_localctx, _startState, RULE_<ruleName>);
```

```
>>
```

```
recRuleLabeledAltStartAction(ruleName, currentAltLabel, label, isListLabel) ::= <<
```

```
_localctx = new <currentAltLabel; format="cap">Context(new <ruleName; format="cap">Context(_parentctx,
    _parentState));
```

```
<if(label)>
```

```
<if(isListLabel)>
```

```
((<currentAltLabel; format="cap">Context)_localctx).<label>.Add(_prevctx);
```

```
<else>
```

```
((<currentAltLabel; format="cap">Context)_localctx).<label> = _prevctx;
```

```
<endif>
```

```
<endif>
```

```
PushNewRecursionContext(_localctx, _startState, RULE_<ruleName>);
```

```
>>
```

```
recRuleReplaceContext(ctxName) ::= <<  
_localctx = new <ctxName>Context(_localctx);  
Context = _localctx;  
_prevctx = _localctx;  
>>
```

```
recRuleSetPrevCtx() ::= <<  
if ( ParseListeners!=null )  
    TriggerExitRuleEvent();  
_prevctx = _localctx;  
>>
```

```
LexerFile(file, lexer, namedActions) ::= <<  
<fileHeader(file.grammarFileName, file.ANTLRVersion)>  
<if(file.genPackage)>  
namespace  
    <file.genPackage> {  
<endif>  
<namedActions.header>  
using System;  
using System.IO;  
using System.Text;  
using Antlr4.Runtime;  
using Antlr4.Runtime.Atn;  
using Antlr4.Runtime.Misc;  
using DFA = Antlr4.Runtime.Dfa.DFA;  
  
<lexer>  
<if(file.genPackage)>  
} // namespace <file.genPackage>  
<endif>  
>>
```

```
Lexer(lexer, atn, actionFuncs, sempredFuncs, superClass) ::= <<  
[System.CodeDom.Compiler.GeneratedCode("ANTLR", "<file.ANTLRVersion>")]  
[System.CLSCompliant(false)]  
public partial class <csIdentifier.(lexer.name)> : <superClass; null="Lexer"> {  
    protected static DFA[] decisionToDFA;  
    protected static PredictionContextCache sharedContextCache = new PredictionContextCache();  
    public const int  
        <lexer.tokens:{k | <tokenType.(k)>=<lexer.tokens.(k)>}; separator=", ", wrap, anchor>;  
    <if(lexer.channels)>  
    public const int  
        <lexer.channels:{k | <csIdentifier.(k)>=<lexer.channels.(k)>}; separator=", ", wrap, anchor>;
```

```

<endif>
<if(rest(lexer.modes))>
public const int
  <rest(lexer.modes):{m
| <m>=<i>}; separator=", ", wrap, anchor>
<endif>
public static string[] channelNames = {
  "DEFAULT_TOKEN_CHANNEL", "HIDDEN" <if (lexer.channels)>, <lexer.channels:{c| "<c>"}; separator=", ",
wrap, anchor><endif>
};

public static string[] modeNames = {
  <lexer.modes:{m| "<m>"}; separator=", ", wrap, anchor>
};

public static readonly string[] ruleNames = {
  <lexer.ruleNames:{r| "<r>"}; separator=", ", wrap, anchor>
};

<namedActions.members>

public <csIdentifier.(lexer.name)>(ICharStream input)
: this(input, Console.Out, Console.Error) { }

public <csIdentifier.(lexer.name)>(ICharStream input, TextWriter output, TextWriter errorOutput)
: base(input, output, errorOutput)
{
  Interpreter = new LexerATNSimulator(this, _ATN, decisionToDFA, sharedContextCache);
}

<vocabulary(lexer.literalNames, lexer.symbolicNames)>

public override string GrammarFileName { get { return "<lexer.grammarFileName>"; } }

public override string[] RuleNames { get { return ruleNames;
} }

public override string[] ChannelNames { get { return channelNames; } }

public override string[] ModeNames { get { return modeNames; } }

public override string SerializedAtn { get { return new string(_serializedATN); } }

static <csIdentifier.(lexer.name)>() {
  decisionToDFA = new DFA[_ATN.NumberOfDecisions];
  for (int i = 0; i < _ATN.NumberOfDecisions; i++) {
    decisionToDFA[i] = new DFA(_ATN.GetDecisionState(i), i);
  }
}

```

```
}  
<dumpActions(lexer, "", actionFuncs, sempredFuncs)>  
<atn>  
}  
>>
```

```
SerializedATN(model) ::= <<  
private static char[] _serializedATN = {  
    <model.serialized; separator=", ", wrap>,  
};  
  
public static readonly ATN _ATN =  
    new ATNDeserializer().Deserialize(_serializedATN);
```

```
>>
```

```
initValue(typeName) ::= <<  
default(<typeName>)  
>>
```

```
codeFileExtension() ::= ".cs"
```

```
modeName ::= [  
    "DEFAULT_MODE" : "DefaultMode",  
    default : key  
]
```

```
channelName ::= [  
    "HIDDEN" : "Hidden",  
    "DEFAULT_TOKEN_CHANNEL" : "DefaultTokenChannel",  
    default : key  
]
```

```
tokenType ::= [  
    "EOF"  
    : "Eof",  
    default : key  
]
```

```
csIdentifier ::= [  
    "abstract" : "@abstract",  
    "as" : "@as",  
    "base" : "@base",  
    "bool" : "@bool",  
    "break" : "@break",  
    "byte" : "@byte",
```

"case" : "@case",  
"catch" : "@catch",  
"char" : "@char",  
"checked" : "@checked",  
"class" : "@class",  
"const" : "@const",  
"continue" : "@continue",  
"decimal" : "@decimal",  
"default" : "@default",  
"delegate" : "@delegate",  
"do" : "@do",  
"double" : "@double",  
"else" : "@else",  
"enum" : "@enum",  
"event" : "@event",  
"explicit" : "@explicit",  
"extern" : "@extern",  
"false" : "@false",  
"finally" : "@finally",  
"fixed" : "@fixed",  
"float" : "@float",  
"for" : "@for",  
"foreach" : "@foreach",  
"goto" : "@goto",  
"if" : "@if",  
"implicit" : "@implicit",  
"in" : "@in",  
"int" : "@int",  
"interface" : "@interface",  
"internal" : "@internal",  
"is" : "@is",  
"lock" : "@lock",  
"long" : "@long",  
"namespace" : "@namespace",  
"new" : "@new",  
"null" : "@null",  
"object" : "@object",  
"operator" : "@operator",  
"out" : "@out",  
"override"  
: "@override",  
"params" : "@params",  
"private" : "@private",  
"protected" : "@protected",  
"public" : "@public",  
"readonly" : "@readonly",  
"ref" : "@ref",  
"return" : "@return",



```
"sbyte" : "@sbyte",
"sealed" : "@sealed",
"short" : "@short",
"sizeof" : "@sizeof",
"stackalloc" : "@stackalloc",
"static" : "@static",
"string" : "@string",
"struct" : "@struct",
"switch" : "@switch",
"this" : "@this",
"throw" : "@throw",
>true" : "@true",
"try" : "@try",
"typeof" : "@typeof",
"uint" : "@uint",
"ulong" : "@ulong",
"unchecked" : "@unchecked",
"unsafe" : "@unsafe",
"ushort" : "@ushort",
"using" : "@using",
"virtual" : "@virtual",
"values" : "@values",
"void" : "@void",
"volatile" : "@volatile",
"while" : "@while",
default : key
]
```

Found in path(s):

```
* /opt/cola/permits/1020749546_1607585150.55/0/antlr-4-9-complete-
jar/org/antlr/v4/tool/templates/codegen/CSharp/CSharp.stg
```

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 \*/

```
dartTypeInitMap ::= [
  "int": "0",
  "double": "0.0",
  "bool": "false",
  default: "null" // anything other than a primitive type is an object
]
```

// args must be <object-model-object>, <fields-resulting-in-STs>

```
ParserFile(file, parser, namedActions, contextSuperClass) ::= <<
  <fileHeader(file.grammarFileName,
  file.ANTLRVersion)>
  <if(file.genPackage)>
  library <file.genPackage>;
```

```
import 'package:antlr4/antlr4.dart';
import 'dart:io';
```

```
<if(file.genListener)>
part '<file.grammarName>Listener.dart';
part '<file.grammarName>BaseListener.dart';
<endif>
<if(file.genVisitor)>
part '<file.grammarName>Visitor.dart';
part '<file.grammarName>BaseVisitor.dart';
<endif>
part '<file.grammarName>Lexer.dart';
<else>
import 'package:antlr4/antlr4.dart';
```

```

import 'dart:io';

<if(file.genListener)>
import '<file.grammarName>Listener.dart';
import '<file.grammarName>BaseListener.dart';
<endif>
<if(file.genVisitor)>
import '<file.grammarName>Visitor.dart';
import '<file.grammarName>BaseVisitor.dart';
<endif>
<endif>

<namedActions.header>
<parser>
>>

ListenerFile(file, header, namedActions) ::= <<
<fileHeader(file.grammarFileName, file.ANTLRVersion)>
<if(file.genPackage)>
part of <file.genPackage>;
<else>
import 'package:antlr4/antlr4.dart';

import '<file.parserName>.dart';
<endif>
<header>

///
This abstract class defines a complete listener for a parse tree produced by
/// [<file.parserName>].
abstract class <file.grammarName>Listener extends ParseTreeListener {
<file.listenerNames>:{ Iname |
<if(file.listenerLabelRuleNames.(Iname))>
/// Enter a parse tree produced by the [<Iname>]
/// labeled alternative in [<file.parserName>.<file.listenerLabelRuleNames.(Iname)>].
<else>
/// Enter a parse tree produced by [<file.parserName>.<Iname>].
<endif>
/// [ctx] the parse tree
void enter<Iname; format="cap">(<Iname; format="cap">Context ctx);
<if(file.listenerLabelRuleNames.(Iname))>
/// Exit a parse tree produced by the [<Iname>]
/// labeled alternative in [<file.parserName>.<file.listenerLabelRuleNames.(Iname)>].
<else>
/// Exit a parse tree produced by [<file.parserName>.<Iname>].
<endif>
/// [ctx] the parse tree
void exit<Iname; format="cap">(<Iname; format="cap">Context ctx);}; separator="\n">

```

```

}
>>

BaseListenerFile(file, header, namedActions)
::= <<
<fileHeader(file.grammarFileName, file.ANTLRVersion)>
<if(file.genPackage)>
part of <file.genPackage>;
<else>
import 'package:antlr4/antlr4.dart';

import '<file.parserName>.dart';
import '<file.grammarName>Listener.dart';
<endif>

<header>

/// This class provides an empty implementation of [<file.grammarName>Listener],
/// which can be extended to create a listener which only needs to handle
/// a subset of the available methods.
class <file.grammarName>BaseListener implements <file.grammarName>Listener {
  <file.listenerNames>:{Iname |

  /// The default implementation does nothing.
  @override
  void enter<Iname; format="cap">(<Iname; format="cap">Context ctx) {}

  /// The default implementation does nothing.
  @override
  void exit<Iname; format="cap">(<Iname; format="cap">Context ctx) {}}; separator="\n">

  /// The default implementation does nothing.
  @override
  void enterEveryRule(ParserRuleContext ctx) {}

  /// The default implementation does nothing.
  @override
  void exitEveryRule(ParserRuleContext ctx) {}

  /// The default implementation does nothing.
  @override
  void visitTerminal(TerminalNode node) {}

  /// The default implementation does nothing.
  @override
  void visitErrorNode(ErrorNode node) {}
}

```

>>

```
VisitorFile(file, header, namedActions) ::= <<
<fileHeader(file.grammarFileName, file.ANTLRVersion)>
<if(file.genPackage)>
part of <file.genPackage>;
<else>
import 'package:antlr4/antlr4.dart';

import '<file.parserName>.dart';
<endif>
<header>

/// This abstract class defines a complete generic visitor for a parse tree
/// produced by [<file.parserName>].
///
/// [T] is the return type of the visit operation. Use `void` for
/// operations with no return type.
abstract class <file.grammarName>Visitor<T> extends ParseTreeVisitor<T> {
  <file.visitorNames>: { Iname |
<if(file.visitorLabelRuleNames.(Iname))>
  /// Visit a parse tree produced by the { @code <Iname>}
  /// labeled alternative in { @link <file.parserName>#<file.visitorLabelRuleNames.(Iname)>}.
  <else>
  ///
  Visit a parse tree produced by [<file.parserName>.<Iname>].
  <endif>
  /// [ctx] the parse tree.
  /// Return the visitor result.
  T visit<Iname; format="cap">(<Iname; format="cap">Context ctx);}; separator="\n"
}
>>
```

```
BaseVisitorFile(file, header, namedActions) ::= <<
<fileHeader(file.grammarFileName, file.ANTLRVersion)>
<if(file.genPackage)>
part of <file.genPackage>;
<else>
import 'package:antlr4/antlr4.dart';

import '<file.parserName>.dart';
import '<file.grammarName>Visitor.dart';
<endif>
<header>

/// This class provides an empty implementation of [<file.grammarName>Visitor],
/// which can be extended to create a visitor which only needs to handle
/// a subset of the available methods.
```

```

///
/// [T] is the return type of the visit operation. Use `void` for
/// operations with no return type.
class <file.grammarName>BaseVisitor<T> extends ParseTreeVisitor<T> implements
<file.grammarName>Visitor<T> {
    <file.visitorNames:{lname |
/// The default implementation
    returns the result of calling
/// [visitChildren] on [ctx].
    @override
    T visit<lname; format="cap">(<lname; format="cap">Context ctx) => visitChildren(ctx);}; separator="\n">
}
>>

fileHeader(grammarFileName, ANTLRVersion) ::= <<
// Generated from <grammarFileName> by ANTLR <ANTLRVersion>
// ignore_for_file: unused_import, unused_local_variable, prefer_single_quotes
>>

Parser(parser, funcs, atn, sempredFuncs, superClass) ::= <<
<Parser_(ctor="parser_ctor", ...)>
>>

Parser_(parser, funcs, atn, sempredFuncs, ctor, superClass) ::= <<
<if(namedActions.definitions)><namedActions.definitions><endif>
const int <parser.rules:{r | RULE_<r.name> = <r.index>}; separator=", ", wrap, anchor>;
class <parser.name> extends <superClass; null="Parser"> {
    static final checkVersion = () => RuntimeMetaData.checkVersion('<file.ANTLRVersion>',
RuntimeMetaData.VERSION);
    static const int TOKEN_EOF = IntStream.EOF;

    static final List<DFA> _decisionToDFA = List.generate(
        _ATN.numberOfDecisions, (i)
=> DFA(_ATN.getDecisionState(i), i));
    static final PredictionContextCache _sharedContextCache = PredictionContextCache();
    <if(parser.tokens)>
    static const int <parser.tokens:{k | TOKEN_<k> = <parser.tokens.(k)>}; separator=", ", wrap, anchor>;
    <endif>

    @override
    final List<String> ruleNames = [
        <parser.ruleNames:{r | '<r>'}; separator=", ", wrap, anchor>
    ];

    <vocabulary(parser.literalNames, parser.symbolicNames)>

    @override
    String get grammarFileName => '<parser.grammarFileName>';

```

```

@Override
String get serializedATN => _serializedATN;

@Override
ATN getATN() {
    return _ATN;
}

<namedActions.members>
<parser:(ctor)()>
<funcs; separator="\n">

<if(semanticPredFuncs)>
@Override
bool semanticPred(RuleContext _localctx, int ruleIndex, int predIndex) {
    switch (ruleIndex) {
        <parser.semanticPredFuncs.values:{f}
    case <f.ruleIndex>:
        return _<f.name>_semanticPred(_localctx, predIndex);}; separator="\n">
    }
    return true;
}
<semanticPredFuncs.values; separator="\n">
<endif>

<atn>
}
<funcs:{ func | <if(func.ruleCtx)><func.ruleCtx><endif>}; separator="\n\n">

<funcs:{ func | <if(func.altLabelCtxs)><func.altLabelCtxs:{l | <func.altLabelCtxs.(l)>};
separator="\n\n"><endif>}>
>>

vocabulary(literalNames, symbolicNames) ::= <<
static final List<String> _LITERAL_NAMES = [
    <literalNames:{t | <t>}; null="null", separator=", ", wrap, anchor>
];
static final List<String> _SYMBOLIC_NAMES = [
    <symbolicNames:{t | <t>}; null="null", separator=", ", wrap, anchor>
];
static final Vocabulary VOCABULARY = VocabularyImpl(_LITERAL_NAMES, _SYMBOLIC_NAMES);

@Override
Vocabulary get vocabulary {
    return VOCABULARY;
}
>>

```

```

dumpActions(recog, argFuncs, actionFuncs, sempredFuncs) ::= <<
<if(actionFuncs)>
void action(RuleContext _localctx, int ruleIndex, int actionIndex) {
  switch (ruleIndex) {
    <recog.actionFuncs.values:{f}
  case <f.ruleIndex>:
    _<f.name>_action(_localctx, actionIndex);
    break;}; separator="\n">
  }
}
<actionFuncs.values; separator="\n">
<endif>
<if(sempredFuncs)>
bool
sempred(RuleContext _localctx, int ruleIndex, int predIndex) {
  switch (ruleIndex) {
    <recog.sempredFuncs.values:{f}
  case <f.ruleIndex>:
    return _<f.name>_sempred(_localctx, predIndex);}; separator="\n">
  }
  return true;
}
<sempredFuncs.values; separator="\n">
<endif>
>>

parser_ctor(p) ::= <<
<p.name>(TokenStream input) : super(input) {
  interpreter = ParserATNSimulator(this, _ATN, _decisionToDFA, _sharedContextCache);
}
>>

/// This generates a private method since the actionIndex is generated, making an
/// overriding implementation impossible to maintain.
RuleActionFunction(r, actions) ::= <<
void _<r.name>_action(<r.ctxType> _localctx, int actionIndex) {
  switch (actionIndex) {
    <actions:{index|case <index>: <actions.(index)> break;}; separator="\n">
  }
}
>>

/// This generates a private method since the predIndex is generated, making an
/// overriding implementation impossible to maintain.
RuleSempredFunction(r, actions) ::= <<
bool

```



```

_<r.name>_sempred(<r.ctxType> _localctx, int predIndex) {
switch (predIndex) {
  <actions:{index|case <index>: return <actions.(index)>;}; separator="\n">
}
return true;
}
>>

```

```

RuleFunction(currentRule,args,code,locals,ruleCtx,altLabelCtxs,namedActions,finallyAction,postamble,exceptions)
::= <<

```

```

<if(currentRule.modifiers)><currentRule.modifiers:{f | <f> }><else><endif><currentRule.ctxType>
<currentRule.name><(args; separator=", "> {
dynamic _localctx = <currentRule.ctxType>(context, state<currentRule.args:{a | , <a.name>}>);
enterRule(_localctx, <currentRule.startState>, RULE_<currentRule.name>);
<namedActions.init>
<locals; separator="\n">
try {
<if(currentRule.hasLookaheadBlock)>
  int _alt;
<endif>
  <code>
  <postamble; separator="\n">
  <namedActions.after>
} <if(exceptions)> <exceptions; separator="\n"><else>on RecognitionException catch (re) {
  _localctx.exception = re;
  errorHandler.reportError(this, re);
  errorHandler.recover(this, re);
}<endif> finally {
  <finallyAction>
  exitRule();
}
return _localctx;
}
>>

```

```

LeftRecursiveRuleFunction(currentRule,args,code,locals,ruleCtx,altLabelCtxs,
namedActions,finallyAction,postamble) ::=
<<

```

```

<currentRule.ctxType> <currentRule.name>([int _p = 0]<args:{a | , <a>}>) {
final _parentctx = context;
final _parentState = state;
dynamic _localctx = <currentRule.ctxType>(context, _parentState<currentRule.args:{a | , <a.name>}>);
var _prevctx = _localctx;
var _startState = <currentRule.startState>;
enterRecursionRule(_localctx, <currentRule.startState>, RULE_<currentRule.name>, _p);
<namedActions.init>

```

```

<locals; separator="\n">
try {
<if(currentRule.hasLookaheadBlock)>
  int _alt;
<endif>
  <code>
  <postamble; separator="\n">
  <namedActions.after>
} on RecognitionException catch (re) {
  _localctx.exception = re;
  errorHandler.reportError(this, re);
  errorHandler.recover(this, re);
} finally {
  <finallyAction>
  unrollRecursionContexts(_parentctx);
}
return _localctx;
}
>>

```

```

CodeBlockForOuterMostAlt(currentOuterMostAltCodeBlock, locals, preamble, ops) ::= <<
<if(currentOuterMostAltCodeBlock.altLabel)>_localctx = <currentOuterMostAltCodeBlock.altLabel;
format="cap">Context(_localctx);<endif>
enterOuterAlt(_localctx, <currentOuterMostAltCodeBlock.alt.altNum>);
<CodeBlockForAlt(currentAltCodeBlock=currentOuterMostAltCodeBlock, ...)>
>>

```

```

CodeBlockForAlt(currentAltCodeBlock, locals, preamble, ops) ::= <<
<locals; separator="\n">
<preamble; separator="\n">
<ops; separator="\n">
>>

```

```

LL1AltBlock(choice, preamble, alts, error) ::= <<
state = <choice.stateNumber>;
errorHandler.sync(this);
<if(choice.label)><labelref(choice.label)> = tokenStream.LT(1);<endif>
<preamble; separator="\n">
switch (tokenStream.LA(1)) {
<choice.altLook,alts:{look,alt| <cases(ttypes=look)>
  <alt>
  break;}; separator="\n">
default:
  <error>
}
>>

```

```

LL1OptionalBlock(choice, alts, error) ::= <<

```

```

state = <choice.stateNumber>;
errorHandler.sync(this);
switch
(tokenStream.LA(1)) {
<choice.altLook,alts:{look,alt| <cases(ttypes=look)>
<alt>
break;}; separator="\n">
default:
break;
}
>>

```

```

LL1OptionalBlockSingleAlt(choice, expr, alts, preamble, error, followExpr) ::= <<
state = <choice.stateNumber>;
errorHandler.sync(this);
<preamble; separator="\n">
if (<expr>) {
<alts; separator="\n">
}
<!else if ( !(<followExpr>) ) <error!>
>>

```

```

LL1StarBlockSingleAlt(choice, loopExpr, alts, preamble, iteration) ::= <<
state = <choice.stateNumber>;
errorHandler.sync(this);
<preamble; separator="\n">
while (<loopExpr>) {
<alts; separator="\n">
state = <choice.loopBackStateNumber>;
errorHandler.sync(this);
<iteration>
}
>>

```

```

LL1PlusBlockSingleAlt(choice, loopExpr, alts, preamble, iteration) ::= <<
state = <choice.blockStartStateNumber>; <! alt block decision !>
errorHandler.sync(this);
<preamble; separator="\n">
do {
<alts; separator="\n">
state = <choice.stateNumber>; <! loopback/exit decision !>
errorHandler.sync(this);
<iteration>
}
while (<loopExpr>);
>>

```

```

// LL(*) stuff

```

```

AltBlock(choice, preamble, alts, error) ::= <<
state = <choice.stateNumber>;
errorHandler.sync(this);
<if(choice.label)><labelref(choice.label)> = tokenStream.LT(1);<endif>
<preamble; separator="\n">
switch (interpreter.adaptivePredict(tokenStream, <choice.decision>, context)) {
<alts:{alt |
case <i>:
<alt>
break;}; separator="\n">
}
>>

```

```

OptionalBlock(choice, alts, error) ::= <<
state = <choice.stateNumber>;
errorHandler.sync(this);
switch (interpreter.adaptivePredict(tokenStream, <choice.decision>, context)) {
<alts:{alt |
case <i><if(!choice.ast.greedy)>+1<endif>:
<alt>
break;}; separator="\n">
}
>>

```

```

StarBlock(choice, alts, sync, iteration) ::= <<
state = <choice.stateNumber>;
errorHandler.sync(this);
_alt = interpreter.adaptivePredict(tokenStream, <choice.decision>, context);
while (_alt != <choice.exitAlt> && _alt != ATN.INVALID_ALT_NUMBER) {
if (_alt == 1<if(!choice.ast.greedy)> + 1<endif>) {
<iteration>
<alts> <!
should only be one !>
}
state = <choice.loopBackStateNumber>;
errorHandler.sync(this);
_alt = interpreter.adaptivePredict(tokenStream, <choice.decision>, context);
}
>>

```

```

PlusBlock(choice, alts, error) ::= <<
state = <choice.blockStartStateNumber>; <! alt block decision !>
errorHandler.sync(this);
_alt = 1<if(!choice.ast.greedy)>+1<endif>;
do {
switch (_alt) {
<alts:{alt|

```

```

case <i><if(!choice.ast.greedy)> + 1<endif>:
  <alt>
  break;}; separator="\n">
  default:
    <error>
    }
  state = <choice.loopBackStateNumber>; <! loopback/exit decision !>
  errorHandler.sync(this);
  _alt = interpreter.adaptivePredict(tokenStream, <choice.decision>, context);
} while (_alt != <choice.exitAlt> && _alt != ATN.INVALID_ALT_NUMBER);
>>

Sync(s) ::= "sync(<s.expecting.name>);"

ThrowNoViableAlt(t) ::= "throw NoViableAltException(this);"

TestSetInline(s) ::= <<
<s.bitsets:{bits | <if(rest(rest(bits.ttypes))>><bitsetBitfieldComparison(s, bits)><else><bitsetInlineComparison(s,
bits)><endif>};
separator=" || ">
>>

// Java language spec 15.19 - shift operators mask operands rather than overflow to 0... need range test
testShiftInRange(shiftAmount) ::= <<
((<shiftAmount>) & ~0x3f) == 0
>>

// produces smaller bytecode only when bits.ttypes contains more than two items
bitsetBitfieldComparison(s, bits) ::= <%
(<testShiftInRange({<offsetShift(s.varName, bits.shift)>})> && ((BigInt.one \<< <offsetShift(s.varName,
bits.shift)>) & (<bits.ttypes:{ttype | (BigInt.one \<< <offsetShift({TOKEN_<ttype>}, bits.shift)>)}); separator=" |
">)) != BigInt.zero)
%>

isZero ::= [
"0":true,
default:false
]

offsetShift(shiftAmount, offset) ::= <%
<if(!isZero.(offset))><shiftAmount> - <offset><else><shiftAmount><endif>
%>

// produces more efficient bytecode when bits.ttypes contains at most two items
bitsetInlineComparison(s, bits) ::= <%
<bits.ttypes:{ttype | <s.varName> == TOKEN_<ttype>}; separator=" || ">
%>

```

```

cases(ttypes) ::= <<
<types:{ t | case TOKEN_<t>:}; separator="\n">
>>

InvokeRule(r,
  argExprsChunks) ::=<<
state = <r.stateNumber>;
<if(r.labels)><r.labels:{1 | <labelref(l)> =
}><endif><r.name><(if(r.ast.options.p)><r.ast.options.p><if(argExprsChunks)>,<endif><endif><argExprsChunks>
);
>>

MatchToken(m) ::= <<
state = <m.stateNumber>;
<if(m.labels)><m.labels:{1 | <labelref(l)> = }><endif>match(TOKEN_<m.name>);
>>

MatchSet(m, expr, capture) ::= "<CommonSetStuff(m, expr, capture, false)>"

MatchNotSet(m, expr, capture) ::= "<CommonSetStuff(m, expr, capture, true)>"

CommonSetStuff(m, expr, capture, invert) ::= <<
state = <m.stateNumber>;
<if(m.labels)><m.labels:{1 | <labelref(l)> = }>tokenStream.LT(1);<endif>
<capture>
if (<if(invert)><m.varName> \<= 0 || <else>!<endif><(expr)>) {
  <if(m.labels)><m.labels:{1 | <labelref(l)> = }><endif>errorHandler.recoverInline(this);
} else {
  if ( tokenStream.LA(1)==IntStream.EOF ) matchedEOF = true;
  errorHandler.reportMatch(this);
  consume();
}
>>

Wildcard(w) ::= <<
state = <w.stateNumber>;
<if(w.labels)><w.labels:{1 | <labelref(l)>
= }><endif>matchWildcard();
>>

// ACTION STUFF

Action(a, foo, chunks) ::= "<chunks>"

ArgAction(a, chunks) ::= "<chunks>"

SemPred(p, chunks, failChunks) ::= <<
state = <p.stateNumber>;

```

```

if (!(<chunks>)) {
    throw FailedPredicateException(this, <p.predicate><if(failChunks)>, <failChunks><elseif(p.msg)>,
    <p.msg><endif>);
}
>>

```

```

ExceptionClause(e, catchArg, catchAction) ::= <<
catch (<catchArg>) {
    <catchAction>
}
>>

```

// lexer actions are not associated with model objects

```

LexerSkipCommand() ::= "skip();"
LexerMoreCommand() ::= "more();"
LexerPopModeCommand() ::= "popMode();"

```

```

LexerTypeCommand(arg, grammar) ::= "type = <arg>";
LexerChannelCommand(arg, grammar) ::= "channel = <arg>";
LexerModeCommand(arg, grammar) ::= "mode_ = <arg>";
LexerPushModeCommand(arg, grammar) ::= "pushMode(<arg>);";

```

```

ActionText(t) ::= "<t.text>"
ActionTemplate(t) ::= "<t.st>"
ArgRef(a) ::= "_localctx.<a.name>"
LocalRef(a) ::= "_localctx.<a.name>"
RetValRef(a) ::= "_localctx.<a.name>"
QRetValRef(a)
    ::= "<ctx(a)>.<a.dict>.<a.name>"
/** How to translate $tokenLabel */
TokenRef(t) ::= "<ctx(t)>.<t.name>"
LabelRef(t) ::= "<ctx(t)>.<t.name>"
ListLabelRef(t) ::= "<ctx(t)>.<ListLabelName(t.name)>"
SetAttr(s,rhsChunks) ::= "<ctx(s)>.<s.name> = <rhsChunks>";

```

```

TokenLabelType() ::= "<file.TokenLabelType; null={Token}>"
InputSymbolType() ::= "<file.InputSymbolType; null={Token}>"

```

```

TokenPropertyRef_text(t) ::= "<ctx(t)>.<t.label>?.text"
TokenPropertyRef_type(t) ::= "<ctx(t)>.<t.label> != null ? <ctx(t)>.<t.label>.type : 0"
TokenPropertyRef_line(t) ::= "<ctx(t)>.<t.label> != null ? <ctx(t)>.<t.label>.line : 0"
TokenPropertyRef_pos(t) ::= "<ctx(t)>.<t.label> != null ? <ctx(t)>.<t.label>.charPositionInLine : 0"
TokenPropertyRef_channel(t) ::= "<ctx(t)>.<t.label> != null ? <ctx(t)>.<t.label>.channel : 0"
TokenPropertyRef_index(t) ::= "<ctx(t)>.<t.label> != null ? <ctx(t)>.<t.label>.tokenIndex : 0"
TokenPropertyRef_int(t) ::= "<ctx(t)>.<t.label> != null ? int.parse(<ctx(t)>.<t.label>.text)
: 0"

```

```

RulePropertyRef_start(r) ::= "<ctx(r)>.<r.label>?.start"
RulePropertyRef_stop(r) ::= "<ctx(r)>.<r.label>?.stop"
RulePropertyRef_text(r) ::= "(<ctx(r)>.<r.label> != null ? tokenStream.getTextRange(<ctx(r)>.<r.label>.start,
<ctx(r)>.<r.label>.stop) : null)"
RulePropertyRef_ctx(r) ::= "<ctx(r)>.<r.label>"
RulePropertyRef_parser(r) ::= "this"

ThisRulePropertyRef_start(r) ::= "_localctx.start"
ThisRulePropertyRef_stop(r) ::= "_localctx.stop"
ThisRulePropertyRef_text(r) ::= "tokenStream.getTextRange(_localctx.start, tokenStream.LT(-1))"
ThisRulePropertyRef_ctx(r) ::= "_localctx"
ThisRulePropertyRef_parser(r) ::= "this"

NonLocalAttrRef(s) ::= "(getInvokingContext(<s.ruleIndex>) as <s.ruleName; format=\"cap\">Context).<s.name>"
SetNonLocalAttr(s, rhsChunks) ::=
"(getInvokingContext(<s.ruleIndex>) as <s.ruleName; format=\"cap\">Context).<s.name> = <rhsChunks>;"

AddToLabelList(a) ::= "<ctx(a.label)>.<a.listName>.add(<labelref(a.label)>);"

TokenDecl(t) ::= "<TokenLabelType()>
<t.name>"
TokenTypeDecl(t) ::= "int <t.name>;"
TokenListDecl(t) ::= "List<Token> <t.name> = List<Token>()"
RuleContextDecl(r) ::= "<r.ctxName> <r.name>"
RuleContextListDecl(rdecl) ::= "List<<rdecl.ctxName>> <rdecl.name> = List<<rdecl.ctxName>>()"

ContextTokenGetterDecl(t) ::= <<
TerminalNode <t.name>() => getToken(<parser.name>.TOKEN_<t.name>, 0);
>>
ContextTokenListGetterDecl(t) ::= <<
List<TerminalNode> <t.name>s() => getTokens(<parser.name>.TOKEN_<t.name>);
>>
ContextTokenListIndexedGetterDecl(t) ::= <<
TerminalNode <t.name>(int i) => getToken(<parser.name>.TOKEN_<t.name>, i);
>>
ContextRuleGetterDecl(r) ::= <<
<r.ctxName> <r.name>() => getRuleContext<<r.ctxName>>();
>>
ContextRuleListGetterDecl(r) ::= <<
List<<r.ctxName>> <r.name>s() => getRuleContexts<<r.ctxName>>();
>>
ContextRuleListIndexedGetterDecl(r) ::= <<
<r.ctxName> <r.name>(int i) => getRuleContext<<r.ctxName>>(i);
>>

LexerRuleContext() ::= "RuleContext"

/// The rule context name is the rule

```



followed by a suffix; e.g.,

```
/// r becomes rContext.
```

```
RuleContextNameSuffix() ::= "Context"
```

```
ImplicitTokenLabel(tokenName) ::= "_<tokenName>"
```

```
ImplicitRuleLabel(ruleName) ::= "_<ruleName>"
```

```
ImplicitSetLabel(id) ::= "_tset<id>"
```

```
ListLabelName(label) ::= "<label>"
```

```
CaptureNextToken(d) ::= "<d.varName> = tokenStream.LT(1);"
```

```
CaptureNextTokenType(d) ::= "<d.varName> = tokenStream.LA(1);"
```

```
StructDecl(struct,ctorAttrs,attrs, getters,dispatchMethods,interfaces,extensionMembers)
```

```
 ::= <<
```

```
class <struct.name> extends
```

```
<if(contextSuperClass)><contextSuperClass><else>ParserRuleContext<endif><if(interfaces)> implements
```

```
<interfaces; separator=", "><endif> {
```

```
<attrs:{ a | <a>; }; separator="\n">
```

```
<getters:{ g | <g>; }; separator="\n">
```

```
<struct.name>([ParserRuleContext parent, int invokingState<ctorAttrs:{ a | , <a>>]) : super(parent, invokingState)<if(struct.ctorAttrs)> {
```

```
<struct.ctorAttrs:{ a | this.<a.name> = <a.name>; }; separator="\n">
```

```
><else>;<endif>
```

```
@override
```

```
int get ruleIndex => RULE_<struct.derivedFromName>;
```

```
<if(struct.provideCopyFrom)>
```

```
<! don't need copy unless we have subclasses !>
```

```
@override
```

```
void copyFrom(<if(contextSuperClass)><contextSuperClass><else>ParserRuleContext<endif> ctx) {  
    super.copyFrom(ctx);
```

```
<struct.attrs:{ a | this.<a.name> = (ctx as <struct.name>).<a.name>; }; separator="\n">
```

```
}
```

```
<endif>
```

```
<dispatchMethods; separator="\n">
```

```
<extensionMembers; separator="\n">
```

```
}
```

```
>>
```

```
AltLabelStructDecl(struct,attrs, getters,dispatchMethods) ::= <<
```

```
class <struct.name> extends <struct.parentRule; format="cap">Context {
```

```
<attrs:{ a | <a>; }; separator="\n">
```

```
<getters:{ g | <g>; }; separator="\n">
```

```
<struct.name>(<struct.parentRule; format="cap">Context ctx) { copyFrom(ctx); }
```

```
<dispatchMethods; separator="\n">
```

```
}
```

```
>>
```

```

ListenerDispatchMethod(method) ::= <<
@override
void <if(method.isEnter)>enter<else>exit<endif>Rule(ParseTreeListener listener) {
  if (listener is <parser.grammarName>Listener)
  listener.<if(method.isEnter)>enter<else>exit<endif><struct.derivedFromName>;
  format="cap">(this);
}
>>

```

```

VisitorDispatchMethod(method) ::= <<
@override
T accept<T>(ParseTreeVisitor<T> visitor) {
  if (visitor is <parser.grammarName>Visitor<T>) {
    return visitor.visit<struct.derivedFromName>; format="cap">(this);
  } else {
    return visitor.visitChildren(this);
  }
}
>>

```

```

AttributeDecl(d) ::= "<d.type> <d.name><if(d.initValue)> = <d.initValue><endif>"

```

```

// If we don't know location of label def x, use this template
labelref(x) ::= "<if(!x.isLocal)>_localctx.<endif><x.name>"

```

```

// For any action chunk, what is correctly-typed context struct ptr?
ctx(actionChunk) ::= "_localctx"

```

```

// used for left-recursive rules
recRuleAltPredicate(ruleName,opPrec) ::= "precpred(context, <opPrec>)"
recRuleSetReturnAction(src,name) ::= "$<name> = $<src>.<name>;"
recRuleSetStopToken() ::= "context.stop = tokenStream.LT(-1);"

```

```

recRuleAltStartAction(ruleName, ctxName, label, isListLabel) ::= <<
  _localctx = <ctxName>Context(_parentctx, _parentState);
  <if(label)>
  <if(isListLabel)>
    _localctx.<label>.add(_prevctx);
  <else>
    _localctx.<label>
    = _prevctx;
  <endif>
  <endif>
  pushNewRecursionContext(_localctx, _startState, RULE_<ruleName>);
>>

```

```

recRuleLabeledAltStartAction(ruleName, currentAltLabel, label, isListLabel) ::= <<
  _localctx = <currentAltLabel; format="cap">Context(new <ruleName; format="cap">Context(_parentctx,

```

```

_parentState));
<if(label)>
<if(isListLabel)>
_localctx.<label>.add(_prevctx);
<else>
_localctx.<label> = _prevctx;
<endif>
<endif>
pushNewRecursionContext(_localctx, _startState, RULE_<ruleName>);
>>

```

```

recRuleReplaceContext(ctxName) ::= <<
_localctx = <ctxName>Context(_localctx);
context = _localctx;
_prevctx = _localctx;
>>

```

```

recRuleSetPrevCtx() ::= <<
if (parseListeners != null) triggerExitRuleEvent();
_prevctx = _localctx;
>>

```

```

LexerFile(lexerFile, lexer, namedActions) ::= <<
<fileHeader(lexerFile.grammarFileName, lexerFile.ANTLRVersion)>
<if(lexerFile.genPackage)>
part of <lexerFile.genPackage>;
<else>
import 'package:antlr4/antlr4.dart';
<endif>
<namedActions.header>

<lexer>
>>

```

```

Lexer(lexer,
atn, actionFuncs, sempredFuncs, superClass) ::= <<
<if(namedActions.definitions)><namedActions.definitions><endif>

```

```

class <lexer.name> extends <superClass; null="Lexer"> {
static final checkVersion = () => RuntimeMetaData.checkVersion('<lexerFile.ANTLRVersion>',
RuntimeMetaData.VERSION);

```

```

static final List<DFA> _decisionToDFA = List.generate(
_ATN.numberOfDecisions, (i) => DFA(_ATN.getDecisionState(i), i));
static final PredictionContextCache _sharedContextCache = PredictionContextCache();
<if(lexer.tokens)>
static const int

```

```

    <lexer.tokens:{k | TOKEN_<k> = <lexer.tokens.(k)>; separator=", ", wrap, anchor>;
<endif>
<if(lexer.channels)>
static const int
    <lexer.channels:{c | <c> = <lexer.channels.(c)>; separator=", ", wrap, anchor>;
<endif>
<if(rest(lexer.modes))>
static const int
    <rest(lexer.modes){m | <m> = <i>; separator=", ", wrap, anchor>;
<endif>

@override
final List<String>
channelNames = [
    'DEFAULT_TOKEN_CHANNEL', 'HIDDEN'<if (lexer.channels)>, <lexer.channels:{c| '<c>'}; separator=", ",
wrap, anchor><endif>
];

@override
final List<String> modeNames = [
    <lexer.modes:{m| '<m>'}; separator=", ", wrap, anchor>
];

@override
final List<String> ruleNames = [
    <lexer.ruleNames:{r | '<r>'}; separator=", ", wrap, anchor>
];

<vocabulary(lexer.literalNames, lexer.symbolicNames)>

<namedActions.members>

<lexer.name>(CharStream input) : super(input) {
    interpreter = LexerATNSimulator(_ATN, _decisionToDFA, _sharedContextCache, recog: this);
}

@override
String get serializedATN => _serializedATN;

@override
String get grammarFileName => '<lexer.grammarFileName>';

@override
ATN getATN() { return _ATN; }

<dumpActions(lexer, "", actionFuncs, sempredFuncs)>
<atn>
}

```

>>

```
SerializedATN(model) ::= <<
<if(rest(model.segments))>
<! requires segmented representation !>
static const int _serializedATNSegments = <length(model.segments)>;
<model.segments:{segment|static
final String _serializedATNSegment<i0> =
'<segment; wrap={'\n<t>'}>'; separator="\n">
static final String _serializedATN = [
  <model.segments:{segment | _serializedATNSegment<i0>}; separator=",\n">
].join();
<else>
<! only one segment, can be inlined !>
static const String _serializedATN = '<model.serialized; wrap={'\n<t>'}>';
<endif>
static final ATN _ATN =
  ATNDeserializer().deserialize(_serializedATN.codeUnits);
>>
```

```
/// Using a type to init value map, try to init a type; if not in table
/// must be an object, default value is "null".
```

```
initValue(typeName) ::= <<
<dartTypeInitMap.(typeName)>
>>
```

```
codeFileExtension() ::= ".dart"
```

Found in path(s):

```
* /opt/cola/permits/1020749546_1607585150.55/0/antlr-4-9-complete-
jar/org/antlr/v4/tool/templates/codegen/Dart/Dart.stg
```

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 \*/

```
SwiftTypeInitMap ::= [
  "Int": "0",
  "Int64": "0",
  "Float": "0.0",
  "Double": "0.0",
  "Bool": "false",
  default: "nil" // anything other than a primitive type is an object
]
```

```
SwiftTypeMap ::= [
  "int": "Int",
  "float": "Float",
  "long": "Int64",
  "double": "Double",
  "bool": "Bool",
  "boolean": "Bool",
  default : key
]
// args must be <object-model-object>,
<fields-resulting-in-STs>
```

```
accessLevelOpenOK(obj) ::= "<obj.accessLevel; null=\\"open\\">"
accessLevelNotOpen(obj) ::= "<obj.accessLevel; null=\\"public\\">"
```

```
ParserFile(file, parser, namedActions, contextSuperClass) ::= <<
<fileHeader(file.grammarFileName, file.ANTLRVersion)>
<if(file.genPackage)>
<!package <file.genPackage>;!>
<endif>
<namedActions.header>
import Antlr4

<parser>
>>
```

```
ListenerFile(file, header, namedActions) ::= <<
```

```

<fileHeader(file.grammarFileName, file.ANTLRVersion)>
<if(file.genPackage)>
<!package <file.genPackage>;!>
<endif>
<header>
import Antlr4

/**
 * This interface defines a complete listener for a parse tree produced by
 * { @link <file.parserName> }.
 */
<accessLevelNotOpen(file)> protocol <file.grammarName>Listener: ParseTreeListener {
  <file.listenerNames>: {Iname |
/**
<if(file.listenerLabelRuleNames.(Iname))>
 * Enter a parse tree produced by the { @code <Iname>\}
 * labeled alternative in { @link <file.parserName>#<file.listenerLabelRuleNames.(Iname)>\}.
<else>
 * Enter a parse tree produced by { @link <file.parserName>#<Iname>\}.
<endif>
- Parameters:
  - ctx: the parse tree
*/
func enter<Iname; format="cap">(_ ctx: <file.parserName>.<Iname; format="cap">Context)
/**
<if(file.listenerLabelRuleNames.(Iname))>
 * Exit a parse tree produced by the { @code <Iname>\}
 * labeled alternative in { @link <file.parserName>#<file.listenerLabelRuleNames.(Iname)>\}.
<else>
 * Exit a parse tree produced by { @link <file.parserName>#<Iname>\}.
<endif>
- Parameters:
  - ctx: the parse tree
*/
func exit<Iname; format="cap">(_ ctx: <file.parserName>.<Iname; format="cap">Context); separator="\n">
}
>>

BaseListenerFile(file, header, namedActions) ::= <<
<fileHeader(file.grammarFileName, file.ANTLRVersion)>
<if(file.genPackage)>
<!package <file.genPackage>;!>
<endif>
<header>

import Antlr4

```



```

/**
 * This class provides an empty implementation of { @link <file.grammarName>Listener },
 * which can be extended to create a listener which only needs to handle
 a subset
 * of the available methods.
 */
<accessLevelOpenOK(file)> class <file.grammarName>BaseListener: <file.grammarName>Listener {
    <accessLevelNotOpen(file)> init() { \}
    <file.listenerNames: {Iname |

/**
 * { @inheritDoc\}
 *
 * \<p>The default implementation does nothing.\</p>
 */
<accessLevelOpenOK(file)> func enter<Iname; format="cap">(_ ctx: <file.parserName>.<Iname;
format="cap">Context) { \}

/**
 * { @inheritDoc\}
 *
 * \<p>The default implementation does nothing.\</p>
 */
<accessLevelOpenOK(file)> func exit<Iname; format="cap">(_ ctx: <file.parserName>.<Iname;
format="cap">Context) { \} }; separator="\n"

/**
 * { @inheritDoc\}
 *
 * \<p>The default implementation does nothing.\</p>
 */
<accessLevelOpenOK(file)> func enterEveryRule(_ ctx: ParserRuleContext) throws { }

/**
 * { @inheritDoc\}
 *
 * \<p>The default implementation does nothing.\</p>
 */
<accessLevelOpenOK(file)> func exitEveryRule(_ ctx: ParserRuleContext) throws { }

/**
 * { @inheritDoc\}
 *
 * \<p>The default implementation does nothing.\</p>
 */
<accessLevelOpenOK(file)> func visitTerminal(_ node: TerminalNode) { }

/**
 * { @inheritDoc\}
 *
 * \<p>The default implementation does nothing.\</p>

```

```

*/
<accessLevelOpenOK(file)> func visitErrorNode(_ node: ErrorNode) { }
}
>>

VisitorFile(file, header, namedActions) ::= <<
<fileHeader(file.grammarFileName, file.ANTLRVersion)>
<if(file.genPackage)>
<!package <file.genPackage>;!>
<endif>
<header>
import Antlr4

/**
 * This interface defines a complete generic visitor for a parse tree produced
 * by { @link <file.parserName> }.
 *
 * @param \<T> The return type of the visit operation. Use { @link Void } for
 * operations with no return type.
 */
<accessLevelOpenOK(file)> class <file.grammarName>Visitor\<T>: ParseTreeVisitor\<T> {
  <file.visitorNames:{ lname |
/**
<if(file.visitorLabelRuleNames.(lname))>
 * Visit a parse tree produced by the { @code <lname>}
 * labeled alternative in { @link <file.parserName>#<file.visitorLabelRuleNames.(lname)>} .
<else>
 * Visit a parse tree produced by { @link <file.parserName>#<lname>} .
<endif>
- Parameters:
- ctx: the parse tree
- returns: the visitor result
*/
<accessLevelOpenOK(file)> func visit<lname; format="cap">(_ ctx: <file.parserName>.<lname;
format="cap">Context) -> T {
  fatalError(#function + " must be overridden")
}
}; separator="\n">
}
>>

```

```

BaseVisitorFile(file, header, namedActions) ::= <<
<fileHeader(file.grammarFileName, file.ANTLRVersion)>
<if(file.genPackage)>
<!package <file.genPackage>;!>
<endif>
<header>
import Antlr4

```

```

/**
 * This class provides an empty implementation of { @link <file.grammarName>Visitor},
 * which can be extended to create a visitor which only needs to handle a subset
 * of the available methods.
 *
 * @param \<T> The return type of the visit operation. Use { @link Void} for
 * operations with no return type.
 */
<accessLevelOpenOK(file)> class <file.grammarName>BaseVisitor\<T>: AbstractParseTreeVisitor\<T> {
  <file.visitorNames:{ lname
  |
  /**
  * { @inheritDoc\}
  *
  * \<p>The default implementation returns the result of calling
  * { @link #visitChildren\} on { @code ctx\}.\</p>
  */
  <accessLevelOpenOK(file)> func visit<lname; format="cap">(_ ctx: <file.parserName>.<lname;
  format="cap">Context) -> T? { return visitChildren(ctx) \}}; separator="\n">
  }
  >>

fileHeader(grammarFileName, ANTLRVersion) ::= <<
// Generated from <grammarFileName; format="java-escape"> by ANTLR <ANTLRVersion>
>>

Parser(parser, funcs, atn, sempredFuncs, superClass) ::= <<
<Parser_(<ctor="parser_ctor", ...)>
>>

Parser_(parser, funcs, atn, sempredFuncs, ctor, superClass) ::= <<
</*!@SuppressWarnings({"all", "warnings", "unchecked", "unused", "cast"})!>
<accessLevelOpenOK(parser)> class <parser.name>: <superClass; null="Parser"> {

internal static var _decisionToDFA: [DFA] = {
    var decisionToDFA = [DFA]()
    let length = <parser.name>._ATN.getNumberOfDecisions()
    for i in 0..\<length {
        </*! decisionToDFA[i] = DFA(<parser.name>._ATN.getDecisionState(i)!,
i);!>
        decisionToDFA.append(DFA(<parser.name>._ATN.getDecisionState(i)!, i)
    }
    return decisionToDFA
  }()

internal static let _sharedContextCache = PredictionContextCache()

```

```

<if(parser.tokens)>
<accessLevelNotOpen(parser)>
enum Tokens: Int {
  case EOF = -1, <parser.tokens:{k | <k> = <parser.tokens.(k)>}; separator=", ", wrap, anchor>
}
  <endif>

<accessLevelNotOpen(parser)>
static let <parser.rules:{r | RULE_<r.name> = <r.index>}; separator=", ", wrap, anchor>

<accessLevelNotOpen(parser)>
static let ruleNames: [String] = [
  <parser.ruleNames:{r | "<r>"}; separator=", ", wrap, anchor>
]

<vocabulary(parser.literalNames, parser.symbolicNames,
  accessLevelNotOpen(parser))>

override <accessLevelOpenOK(parser)>
func getGrammarFileName() -> String { return "<parser.grammarFileName; format="java-escape">" }

override <accessLevelOpenOK(parser)>
func getRuleNames() -> [String]
{ return <parser.name>.ruleNames }

override <accessLevelOpenOK(parser)>
func getSerializedATN() -> String { return <parser.name>._serializedATN }

override <accessLevelOpenOK(parser)>
func getATN() -> ATN { return <parser.name>._ATN }

<namedActions.members>
<parser:(ctor)()>
<funcs; separator="\n">

<if(sempredFuncs)>
override <accessLevelOpenOK(parser)>
func sempred(_ _localctx: RuleContext?, _ ruleIndex: Int, _ predIndex: Int)throws -> Bool {
  switch (ruleIndex) {
    <parser.sempredFuncs.values:{f}
  case <f.ruleIndex>:
    return try <f.name>_sempred(_localctx?.castdown(<f.ctxType>.self), predIndex)); separator="\n">
    default: return true
  }
  <!return true;!>
}
  <sempredFuncs.values; separator="\n">
<endif>

```

```

<atn>

<accessLevelNotOpen(parser)>
static let _serializedATN = <parser.name>ATN().jsonString

<accessLevelNotOpen(parser)>
static let _ATN = ATNDeserializer().deserializeFromJson(_serializedATN)
}
>>

vocabulary(literalNames, symbolicNames, accessLevel)
::= <<
private static let _LITERAL_NAMES: [String?] = [
<literalNames:{t | <t>}; null="nil", separator=", ", wrap, anchor>
]
private static let _SYMBOLIC_NAMES: [String?] = [
<symbolicNames:{t | <t>}; null="nil", separator=", ", wrap, anchor>
]
<accessLevel>
static let VOCABULARY = Vocabulary(_LITERAL_NAMES, _SYMBOLIC_NAMES)
>>

dumpActions(recog, argFuncs, actionFuncs, sempredFuncs) ::= <<
<if(actionFuncs)>
override <accessLevelOpenOK(parser)>
func action(_ _localctx: RuleContext?, _ ruleIndex: Int, _ actionIndex: Int) throws {
switch (ruleIndex) {
<recog.actionFuncs.values:{f}
case <f.ruleIndex>:
<f.name>_action((_localctx as <f.ctxType>?), actionIndex)
}; separator="\n">
default: break
}
}
<actionFuncs.values; separator="\n">
<endif>
<if(sempredFuncs)>
override <accessLevelOpenOK(parser)>
func sempred(_ _localctx: RuleContext?, _ ruleIndex: Int, _ predIndex: Int) throws -> Bool {
switch (ruleIndex) {
<recog.sempredFuncs.values:{f}
case <f.ruleIndex>:
return try <f.name>_sempred(_localctx?.castdown(<f.ctxType>.self),
predIndex); separator="\n">
default: return true
}
}
<!return true;!>

```

```

}
<sempredFuncs.values; separator="\n">
<endif>
>>

parser_ctor(p) ::= <<

override <accessLevelOpenOK(parser)>
func getVocabulary() -> Vocabulary {
    return <p.name>.VOCABULARY
}

override <accessLevelNotOpen(parser)>
init(_ input:TokenStream) throws {
    RuntimeMetaData.checkVersion("4.9", RuntimeMetaData.VERSION)
    try super.init(input)
    _interp = ParserATNSimulator(self,<p.name>._ATN,<p.name>._decisionToDFA,
<parser.name>._sharedContextCache)
}

>>

/* This generates a private method since the actionIndex is generated, making an
* overriding implementation impossible to maintain.
*/
RuleActionFunction(r, actions) ::= <<
private func <r.name>_action(_ _localctx: <r.ctxType>?, _ actionIndex: Int) {
    switch (actionIndex) {
    <actions:{index|
case <index>:
    <actions.(index)>
    }; separator="\n">
    default: break
    }
}
}
>>

/* This generates a private method since
the predIndex is generated, making an
* overriding implementation impossible to maintain.
*/
RuleSempredFunction(r, actions) ::= <<
private func <r.name>_sempred(_ _localctx: <r.ctxType>!, _ predIndex: Int) throws -> Bool {
    switch (predIndex) {
    <actions:{index|
    case <index>:return <actions.(index)>; separator="\n">
    default: return true
    }
}
}

```

```

<!return true;!>
}
>>

```

RuleFunction(currentRule,args,code,locals,ruleCtx,altLabelCtxs,namedActions,finallyAction,postamble,exceptions)

```

::= <<
<ruleCtx>
<altLabelCtxs:{l | <altLabelCtxs.l>}; separator="\n">
@discardableResult
<if(currentRule.modifiers)><currentRule.modifiers:{f | <f> }><else> <accessLevelOpenOK(parser)> func
<endif><currentRule.name><(if(first(args))>_ <endif><args; separator=", _">) throws -> <currentRule.ctxType> {
var _localctx: <currentRule.ctxType> = <currentRule.ctxType>(_ctx, getState()<currentRule.args:{a | ,
<a.name>}>)
try enterRule(_localctx, <currentRule.startState>, <parser.name>.RULE_<currentRule.name>)
<namedActions.init>
<locals;
separator="\n">
defer {
    <finallyAction>
    try! exitRule()
}
do {
<if(currentRule.hasLookaheadBlock)>
var _alt:Int
<endif>
<code>
<postamble; separator="\n">
<namedActions.after>
}
<if(exceptions)>
<exceptions; separator="\n">
<else>
catch ANTLRException.recognition(let re) {
    _localctx.exception = re
    _errHandler.reportError(self, re)
    try _errHandler.recover(self, re)
}
<endif>

return _localctx
}
>>

```

LeftRecursiveRuleFunction(currentRule,args,code,locals,ruleCtx,altLabelCtxs,  
namedActions,finallyAction,postamble) ::=

```

<<
<ruleCtx>

```

```
<altLabelCtxs:{l | <altLabelCtxs.(l)>}; separator="\n">
```

```
<if(currentRule.modifiers)><currentRule.modifiers:{f | <f> }><else> <accessLevelNotOpen(parser)> final <endif>  
func <currentRule.name>( <if(first(args))>_ <endif><args; separator=", _">) throws -> <currentRule.ctxType> {  
  return try <currentRule.name>(0<currentRule.args:{a | , <a.name>}>)  
}
```

```
@discardableResult
```

```
private func <currentRule.name>(_
```

```
  _p<args:{a | , <a>}>: Int) throws -> <currentRule.ctxType> {
```

```
  let _parentctx: ParserRuleContext? = _ctx
```

```
  let _parentState: Int = getState()
```

```
  var _localctx: <currentRule.ctxType> = <currentRule.ctxType>(_ctx, _parentState<currentRule.args:{a | ,  
<a.name>}>)
```

```
  var _prevctx: <currentRule.ctxType> = _localctx
```

```
  let _startState: Int = <currentRule.startState>
```

```
  try enterRecursionRule(_localctx, <currentRule.startState>, <parser.name>.RULE_<currentRule.name>, _p)
```

```
  <namedActions.init>
```

```
  <locals; separator="\n">
```

```
  defer {
```

```
    <finallyAction>
```

```
    try! unrollRecursionContexts(_parentctx)
```

```
  }
```

```
  do {
```

```
  <if(currentRule.hasLookaheadBlock)>
```

```
    var _alt: Int
```

```
  <endif>
```

```
  <code>
```

```
  <postamble; separator="\n">
```

```
  <namedActions.after>
```

```
}
```

```
catch ANTLRException.recognition(let re) {
```

```
  _localctx.exception = re
```

```
  _errHandler.reportError(self, re)
```

```
  try _errHandler.recover(self, re)
```

```
}
```

```
return _localctx;
```

```
}
```

```
>>
```

```
CodeBlockForOuterMostAlt(currentOuterMostAltCodeBlock, locals, preamble, ops) ::= <<
```

```
<if(currentOuterMostAltCodeBlock.altLabel)>_localctx
```

```
= <currentOuterMostAltCodeBlock.altLabel; format="cap">Context(_localctx);<endif>
```

```
try enterOuterAlt(_localctx, <currentOuterMostAltCodeBlock.alt.altNum>)
```

```
<CodeBlockForAlt(currentAltCodeBlock=currentOuterMostAltCodeBlock, ...)>
```

```
>>
```

```
CodeBlockForAlt(currentAltCodeBlock, locals, preamble, ops) ::= <<
```



```

<!/{!>
<locals; separator="\n">
<preamble; separator="\n">
<ops; separator="\n">
<!/{}!>
>>

```

```

LL1AltBlock(choice, preamble, alts, error) ::= <<
setState(<choice.stateNumber>)
try _errHandler.sync(self)
<if(choice.label)><labelref(choice.label)> = try _input.LT(1)<endif>
<preamble; separator="\n">
switch (<parser.name>.Tokens(rawValue: try _input.LA(1))!) {
<choice.altLook,alts:{look,alt | <cases(ttypes=look)>
<alt>
break }; separator="\n">
default:
<error>
}
>>

```

```

LL1OptionalBlock(choice, alts, error) ::= <<
setState(<choice.stateNumber>)
try _errHandler.sync(self)
switch (<parser.name>.Tokens(rawValue: try _input.LA(1))!) {
<choice.altLook,alts:{look,alt|
<cases(ttypes=look)>
<alt>
break }; separator="\n">
default:
break
}
>>

```

```

LL1OptionalBlockSingleAlt(choice, expr, alts, preamble, error, followExpr) ::= <<
setState(<choice.stateNumber>)
try _errHandler.sync(self)
<preamble; separator="\n">
if (<expr>) {
<alts; separator="\n">
}
<!else if ( !(<followExpr> ) <error>!>
>>

```

```

LL1StarBlockSingleAlt(choice, loopExpr, alts, preamble, iteration) ::= <<
setState(<choice.stateNumber>)
try _errHandler.sync(self)
<preamble; separator="\n">

```

```

while (<loopExpr>) {
  <alts; separator="\n">
  setState(<choice.loopBackStateNumber>)
  try _errHandler.sync(self)
  <iteration>
}
>>

LL1PlusBlockSingleAlt(choice, loopExpr, alts, preamble, iteration) ::= <<
setState(<choice.blockStartStateNumber>) <! alt block decision !>
try _errHandler.sync(self)
<preamble; separator="\n">
repeat {
  <alts; separator="\n">
  setState(<choice.stateNumber>); <! loopback/exit decision !>
  try _errHandler.sync(self)
  <iteration>
} while (<loopExpr>)
>>

// LL(*) stuff

AltBlock(choice,
  preamble, alts, error) ::= <<
setState(<choice.stateNumber>)
try _errHandler.sync(self)
<if(choice.label)><labelref(choice.label)> = try _input.LT(1)<endif>
<preamble; separator="\n">
switch(try getInterpreter().adaptivePredict(_input,<choice.decision>,_ctx)) {
  <alts:{alt |
  case <i>:
    <alt>
    break }; separator="\n">
  default: break
}
>>

OptionalBlock(choice, alts, error) ::= <<
setState(<choice.stateNumber>)
try _errHandler.sync(self)
switch (try getInterpreter().adaptivePredict(_input,<choice.decision>,_ctx)) {
  <alts:{alt |
  case <i><if(!choice.ast.greedy)>+1<endif>:
    <alt>
    break }; separator="\n">
  default: break
}
>>

```

```

StarBlock(choice, alts, sync, iteration) ::= <<
setState(<choice.stateNumber>)
try _errHandler.sync(self)
_alt = try getInterpreter().adaptivePredict(_input,<choice.decision>,_ctx)
while (_alt != <choice.exitAlt> && _alt != ATN.INVALID_ALT_NUMBER) {
if ( _alt==1<if(!choice.ast.greedy)>+1<endif> ) {
<iteration>
<alts> <! should only be one !>
}
setState(<choice.loopBackStateNumber>)
try
_errHandler.sync(self)
_alt = try getInterpreter().adaptivePredict(_input,<choice.decision>,_ctx)
}
>>

```

```

PlusBlock(choice, alts, error) ::= <<
setState(<choice.blockStartStateNumber>); <! alt block decision !>
try _errHandler.sync(self)
_alt = 1<if(!choice.ast.greedy)>+1<endif>;
repeat {
switch (_alt) {
<alts:{alt|
case <i><if(!choice.ast.greedy)>+1<endif>:
<alt>
break}; separator="\n">
default:
<error>
}
setState(<choice.loopBackStateNumber>); <! loopback/exit decision !>
try _errHandler.sync(self)
_alt = try getInterpreter().adaptivePredict(_input,<choice.decision>,_ctx)
} while (_alt != <choice.exitAlt> && _alt != ATN.INVALID_ALT_NUMBER)
>>

```

```

Sync(s) ::= "sync(<s.expecting.name>);"

```

```

ThrowNoViableAlt(t) ::= "throw ANTLRException.recognition(e: NoViableAltException(self))"

```

```

TestSetInline(s) ::= <<
<!<s.bitsets:{bits | <if(rest(rest(bits.ttypes))><bitsetBitfieldComparison(s, bits)><else><bitsetInlineComparison(s,
bits)><endif>}; separator="
|| ">!>
//closure
{ () -> Bool in
<if(rest(s.bitsets)>>var<else>let<endif> testSet: Bool = <first(s.bitsets):{bits |
<if(rest(rest(bits.ttypes))><bitsetBitfieldComparison(s, bits)><else><bitsetInlineComparison(s, bits)><endif>}>

```

```

    <rest(s.bitsets):{bits | testSet = testSet || <if(rest(rest(bits.ttypes))><bitsetBitfieldComparison(s,
bits)><else><bitsetInlineComparison(s, bits)><endif>}; separator="\n">
    return testSet
}()
>>

// Java language spec 15.19 - shift operators mask operands rather than overflow to 0... need range test
testShiftInRange(shiftAmount) ::= <<
((<shiftAmount>) & ~0x3f) == 0
>>

// produces smaller bytecode only when bits.ttypes contains more than two items
bitsetBitfieldComparison(s, bits) ::= <<
<!(<testShiftInRange({<offsetShift(s.varName, bits.shift)>})>> && ((1 \<< <offsetShift(s.varName, bits.shift)>) &
(<bits.ttypes:{ ttype | (1 \<< <offsetShift(ttype, bits.shift)>); separator=" | ">) != 0)!>
{ () -> Bool in
    <! let test:
Bool = (<testShiftInRange({<offsetShift(s.varName, bits.shift)>})>)!>
<!var temp: Int64 = Int64(<offsetShift(s.varName, bits.shift)>)!>
<!temp = (temp \< 0) ? (64 + (temp % 64)) : (temp % 64)!>
<!let test1: Int64 = (Int64(1) \<< temp)!>
<!var test2: Int64 = (<first(bits.ttypes):{ ttype | Utils.bitLeftShift(<offsetShift(parserName(ttype), bits.shift)>)}>)!>
<!<rest(bits.ttypes):{ ttype | test2 = test2 | Utils.bitLeftShift(<offsetShift(parserName(ttype), bits.shift)>)});
separator="\n">!>
    let testArray: [Int] = [<s.varName>, <bits.ttypes:{ ttype |<parserName(ttype)>}; separator=", ">]
    <!var test2: Int64 = Utils.testBitLeftShiftArray(testArray)!>
    return Utils.testBitLeftShiftArray(testArray, <bits.shift>)
}()
>>

isZero ::= [
"0": true,
default: false
]
parserName(ttype) ::= <%
<parser.name>.Tokens.<ttype>.rawValue
%>
offsetShift(shiftAmount, offset) ::= <%
<if(!isZero.(offset))><<shiftAmount> - <offset><else><<shiftAmount><endif>
%>

// produces more efficient
bytecode when bits.ttypes contains at most two items
bitsetInlineComparison(s, bits) ::= <%
<bits.ttypes:{ ttype | <s.varName> == <parser.name>.Tokens.<ttype>.rawValue }; separator=" || ">
%>

cases(ttypes) ::= <<

```

```

<trunc(ttypes): {t | case .<t>:fallthrough} ; separator="\n">
<last(ttypes): {t | case .<t>:} ; separator="\n">
>>

```

```

InvokeRule(r, argExprsChunks) ::= <<
  setState(<r.stateNumber>)
  <if(r.labels)>
  try {
    let assignmentValue = try
  <r.name>(<if(r.ast.options.p)><r.ast.options.p><if(argExprsChunks)>,<endif><endif><argExprsChunks>)
  <r.labels:{1 | <labelref(l)> = assignmentValue} ; separator="\n">
    }()
  <else>try
  <r.name>(<if(r.ast.options.p)><r.ast.options.p><if(argExprsChunks)>,<endif><endif><argExprsChunks>)<endif>
  >>

```

```

MatchToken(m) ::= <<
  setState(<m.stateNumber>)
  <if(m.labels)>
  try {
    let assignmentValue = try match(<parser.name>.Tokens.<m.name>.rawValue)
  <m.labels:{1 | <labelref(l)> = assignmentValue} ; separator="\n">
    }()
  <else>try match(<parser.name>.Tokens.<m.name>.rawValue)<endif>
  >>

```

```

MatchSet(m,
  expr, capture) ::= "<CommonSetStuff(m, expr, capture, false)>"

```

```

MatchNotSet(m, expr, capture) ::= "<CommonSetStuff(m, expr, capture, true)>"

```

```

CommonSetStuff(m, expr, capture, invert) ::= <<
  setState(<m.stateNumber>)
  <if(m.labels)><m.labels:{1 | <labelref(l)> = }>try _input.LT(1)<endif>
  <capture>
  if (<if(invert)><m.varName> \<= 0 || <else>!<endif><expr>) {
  <if(m.labels)><m.labels:{1 | <labelref(l)> = }><endif>try _errHandler.recoverInline(self)<if(m.labels)> as
  Token<endif>
  }
  else {
  _errHandler.reportMatch(self)
  try consume()
  }
  >>

```

```

Wildcard(w) ::= <<
  setState(<w.stateNumber>)
  <if(w.labels)><w.labels:{1 | <labelref(l)> = }><endif>try matchWildcard();

```

```

>>

// ACTION STUFF

Action(a, foo, chunks) ::= "<chunks>"

ArgAction(a, chunks) ::= "<chunks>"

SemPred(p, chunks, failChunks) ::= <<
setState(<p.stateNumber>)
if (!(<chunks>)) {
    throw ANTLRException.recognition(e:FailedPredicateException(self, <p.predicate><if(failChunks)>,
<failChunks><elseif(p.msg)>,
<p.msg><endif>))
}
>>

ExceptionClause(e, catchArg, catchAction) ::= <<
catch (<catchArg>) {
    <catchAction>
}
>>

// lexer actions are not associated with model objects

LexerSkipCommand() ::= "skip()"
LexerMoreCommand() ::= "more()"
LexerPopModeCommand() ::= "popMode()"

LexerTypeCommand(arg)    ::= "_type = <arg>"
LexerChannelCommand(arg) ::= "_channel = <arg>"
LexerModeCommand(arg)    ::= "_mode = <arg>"
LexerPushModeCommand(arg) ::= "pushMode(<arg>)"

ActionText(t) ::= "<t.text>"
ActionTemplate(t) ::= "<t.st>"
ArgRef(a) ::= "_localctx.<a.name>"
LocalRef(a) ::= "_localctx.<a.name>"
RetValRef(a) ::= "_localctx.<a.name>"
QRetValRef(a) ::= "<ctx(a)>.<a.dict>.<a.name>"
/** How to translate $tokenLabel */
TokenRef(t) ::= "<ctx(t)>.<t.name>"
LabelRef(t) ::= "<ctx(t)>.<t.name>"
ListLabelRef(t) ::= "<ctx(t)>.<ListLabelName(t.name)>"
SetAttr(s,rhsChunks) ::= "<ctx(s)>.<s.name> = <rhsChunks>"

TokenLabelType() ::= "<file.TokenLabelType; null={Token}>"
InputSymbolType()

```

```

::= "<file.InputSymbolType; null={Token}>"

TokenPropertyRef_text(t) ::= "<ctx(t)>.<t.label> != nil ? <ctx(t)>.<t.label>!.getText()! : \"\""
TokenPropertyRef_type(t) ::= "<ctx(t)>.<t.label> != nil ? <ctx(t)>.<t.label>!.getType() : 0)"
TokenPropertyRef_line(t) ::= "<ctx(t)>.<t.label> != nil ? <ctx(t)>.<t.label>!.getLine() : 0)"
TokenPropertyRef_pos(t) ::= "<ctx(t)>.<t.label> != nil ? <ctx(t)>.<t.label>!.getCharPositionInLine() : 0)"
TokenPropertyRef_channel(t) ::= "<ctx(t)>.<t.label> != nil ? <ctx(t)>.<t.label>!.getChannel() : 0)"
TokenPropertyRef_index(t) ::= "<ctx(t)>.<t.label> != nil ? <ctx(t)>.<t.label>!.getTokenIndex() : 0)"
TokenPropertyRef_int(t) ::= "<ctx(t)>.<t.label> != nil ? Int<ctx(t)>.<t.label>!.getText()! : 0)"

RulePropertyRef_start(r) ::= "<ctx(r)>.<r.label> != nil ? (<ctx(r)>.<r.label>!.start?.description ?? \"\") : \"\""
RulePropertyRef_stop(r) ::= "<ctx(r)>.<r.label> != nil ? (<ctx(r)>.<r.label>!.stop?.description ?? \"\") : \"\""
RulePropertyRef_text(r)
::= "<ctx(r)>.<r.label> != nil ? try _input.getText(<ctx(r)>.<r.label>!.start,<ctx(r)>.<r.label>!.stop) : \"\""
RulePropertyRef_ctx(r) ::= "<ctx(r)>.<r.label>"
RulePropertyRef_parser(r) ::= "self"

ThisRulePropertyRef_start(r) ::= "_localctx.start"
ThisRulePropertyRef_stop(r) ::= "_localctx.stop"
ThisRulePropertyRef_text(r) ::= "(try _input.getText(_localctx.start, try _input.LT(-1)))"
ThisRulePropertyRef_ctx(r) ::= "_localctx"
ThisRulePropertyRef_parser(r) ::= "self"

NonLocalAttrRef(s) ::= "(<s.ruleName; format=\"cap\">Context)getInvokingContext(<s.ruleIndex>).<s.name>"
SetNonLocalAttr(s, rhsChunks) ::=
"(<s.ruleName; format=\"cap\">Context)getInvokingContext(<s.ruleIndex>).<s.name> = <rhsChunks>"

AddToLabelList(a) ::= "<ctx(a.label)>.<a.listName>.append(<labelref(a.label)>)"

TokenDecl(t) ::= "<t.name>: <SwiftTypeMap.(TokenLabelType)>!"
TokenTypeDecl(t) ::= "var <t.name>: Int = 0"
TokenListDecl(t) ::= "<t.name>: [Token] = [Token]()"
RuleContextDecl(r) ::= "<r.name>:
<r.ctxName>!"
RuleContextListDecl(rdecl) ::= "<rdecl.name>: [<rdecl.ctxName>] = [<rdecl.ctxName>]()"

ContextTokenGetterDecl(t) ::= <<
<accessLevelOpenOK(parser)>
func <t.name>() -> TerminalNode? {
return getToken(<parser.name>.Tokens.<t.name>.rawValue, 0)
}
>>

ContextTokenListGetterDecl(t) ::= <<
<accessLevelOpenOK(parser)>
func <t.name>() -> [TerminalNode] {
return getTokens(<parser.name>.Tokens.<t.name>.rawValue)
}
>>

```

```

ContextTokenListIndexedGetterDecl(t) ::= <<
  <accessLevelOpenOK(parser)>
  func <t.name>(_ i: Int) -> TerminalNode? {
    return getToken(<parser.name>.Tokens.<t.name>.rawValue, i)
  }
>>

ContextRuleGetterDecl(r) ::= <<
  <accessLevelOpenOK(parser)>
  func <r.name>() -> <r.ctxName>? {
    return getRuleContext(<r.ctxName>.self, 0)
  }
>>

ContextRuleListGetterDecl(r) ::= <<
  <accessLevelOpenOK(parser)>
  func <r.name>() -> [<r.ctxName>] {
    return getRuleContexts(<r.ctxName>.self)
  }
>>

ContextRuleListIndexedGetterDecl(r) ::= <<
  <accessLevelOpenOK(parser)>
  func
  <r.name>(_ i: Int) -> <r.ctxName>? {
    return getRuleContext(<r.ctxName>.self, i)
  }
>>

LexerRuleContext() ::= "RuleContext"

/** The rule context name is the rule followed by a suffix; e.g.,
 * r becomes rContext.
 */
RuleContextNameSuffix() ::= "Context"

ImplicitTokenLabel(tokenName) ::= "_<tokenName>"
ImplicitRuleLabel(ruleName) ::= "_<ruleName>"
ImplicitSetLabel(id) ::= "_tset<id>"
ListLabelName(label) ::= "<label>"

CaptureNextToken(d) ::= "<d.varName> = try _input.LT(1)"
CaptureNextTokenType(d) ::= "<d.varName> = try _input.LA(1)"

StructDecl(struct, ctorAttrs, attrs, getters, dispatchMethods, interfaces, extensionMembers,
  superClass={ParserRuleContext}) ::= <<

  <accessLevelNotOpen(parser)> class <struct.name>:
  <if(contextSuperClass)><contextSuperClass><else>ParserRuleContext<endif><if(interfaces)>, <interfaces>;
  separator=", "><endif> {
  <attrs: {a | <accessLevelOpenOK(parser)> var <a>} ; separator="\n">

```



```

<getters:{g | <g>}; separator="\n">
<! <if(ctorAttrs)> <accessLevelNotOpen(parser)>
init(_ parent: ParserRuleContext, _ invokingState: Int) { super.init(parent, invokingState) }<endif> !>
<if(ctorAttrs)>
<accessLevelNotOpen(parser)> convenience init(_ parent: ParserRuleContext?, _ invokingState: Int<ctorAttrs:{a | ,
_ <a>}>) {
self.init(parent, invokingState)
<struct.ctorAttrs:{a | self.<a.name> = <a.name>;}; separator="\n">
}
<endif>

```

```

override <accessLevelOpenOK(parser)>
func getRuleIndex() -> Int {
return <parser.name>.RULE_<struct.derivedFromName>
}
<if(struct.provideCopyFrom && struct.attrs)> <! don't need copy unless we have subclasses !>
<accessLevelOpenOK(parser)>
override func copyFrom(_ ctx_: ParserRuleContext) {
super.copyFrom(ctx_)
let ctx = ctx_ as! <struct.name>
<struct.attrs:{a | self.<a.name> = ctx.<a.name>;}; separator="\n">
}
<endif>
<dispatchMethods; separator="\n">
<extensionMembers; separator="\n">
}
>>

```

```

AltLabelStructDecl(struct,attrs,getters,dispatchMethods) ::= <<
<accessLevelNotOpen(parser)> class
<struct.name>: <currentRule.name; format="cap">Context {
<attrs:{a | <accessLevelNotOpen(parser)> var <a>}; separator="\n">
<getters:{g | <g>}; separator="\n">

```

```

<accessLevelNotOpen(parser)>
init(_ ctx: <currentRule.name; format="cap">Context) {
super.init()
copyFrom(ctx)
}
<dispatchMethods; separator="\n">
}
>>

```

```

ListenerDispatchMethod(method) ::= <<
override <accessLevelOpenOK(parser)>
func <if(method.isEnter)>enter<else>exit<endif>Rule(_ listener: ParseTreeListener) {
if let listener = listener as? <parser.grammarName>Listener {
listener.<if(method.isEnter)>enter<else>exit<endif><struct.derivedFromName; format="cap">(self)

```

```
}  
}  
>>
```

```
VisitorDispatchMethod(method) ::= <<  
  override <accessLevelOpenOK(parser)>  
  func accept<T>(<_ visitor: ParseTreeVisitor<T> -> T? {  
    if let visitor = visitor as? <parser.grammarName>Visitor {  
      return visitor.visit<struct.derivedFromName; format="cap">(self)  
    }  
    else if let visitor = visitor as? <parser.grammarName>BaseVisitor {  
      return  
      visitor.visit<struct.derivedFromName; format="cap">(self)  
    }  
    else {  
      return visitor.visitChildren(self)  
    }  
  }  
>>
```

```
AttributeDecl(d) ::= "<d.name>: <SwiftTypeMap.(d.type)><if(d.initValue)> = <d.initValue><else>!<endif>"
```

```
/** If we don't know location of label def x, use this template (_localctx as! <x.ctx.name> */  
labelref(x) ::= "<if(!x.isLocal)>_localctx.castdown(<x.ctx.name>.self).<endif><x.name>"
```

```
/** For any action chunk, what is correctly-typed context struct ptr? */  
ctx(actionChunk) ::= "_localctx.castdown(<actionChunk.ctx.name>.self)"
```

```
// used for left-recursive rules  
recRuleAltPredicate(ruleName,opPrec) ::= "precpred(_ctx, <opPrec>)"  
recRuleSetReturnAction(src,name) ::= "$<name>=<src>.<name>"  
recRuleSetStopToken() ::= "_ctx!.stop = try _input.LT(-1)"
```

```
recRuleAltStartAction(ruleName, ctxName, label, isListLabel) ::= <<  
  _localctx = <ctxName>Context(_parentctx, _parentState);  
  <if(label)>  
  <if(isListLabel)>  
    _localctx.<label>.append(_prevctx)  
  <else>  
    _localctx.<label>  
    = _prevctx  
  <endif>  
  <endif>  
  <if(label)>_localctx.<label> = _prevctx;<endif>  
  try pushNewRecursionContext(_localctx, _startState, <parser.name>.RULE_<ruleName>)  
>>
```

```
recRuleLabeledAltStartAction(ruleName, currentAltLabel, label, isListLabel) ::= <<
```

```

_localctx = <currentAltLabel; format="cap">Context( <ruleName; format="cap">Context(_parentctx,
_parentState))
<if(label)>
<if(isListLabel)>
(_localctx as! <currentAltLabel; format="cap">Context).<label>.append(_prevctx)
<else>
(_localctx as! <currentAltLabel; format="cap">Context).<label> = _prevctx
<endif>
<endif>
try pushNewRecursionContext(_localctx, _startState, <parser.name>.RULE_<ruleName>)
>>

```

```

recRuleReplaceContext(ctxName) ::= <<
_localctx = <ctxName>Context(_localctx)
_ctx = _localctx
_prevctx = _localctx
>>

```

```

recRuleSetPrevCtx() ::= <<
if _parseListeners != nil {
try triggerExitRuleEvent()
}
_prevctx = _localctx
>>

```

```

LexerFile(lexerFile, lexer, namedActions) ::= <<
<fileHeader(lexerFile.grammarFileName, lexerFile.ANTLRVersion)>
<if(lexerFile.genPackage)>
<!package
<lexerFile.genPackage>;!>
<endif>
<namedActions.header>
import Antlr4

<lexer>
>>

```

```

Lexer(lexer, atn, actionFuncs, sempredFuncs, superClass) ::= <<
<accessLevelOpenOK(lexer)> class <lexer.name>: <superClass; null="Lexer"> {

```

```

internal static var _decisionToDFA: [DFA] = {
var decisionToDFA = [DFA]()
let length = <lexer.name>._ATN.getNumberOfDecisions()
for i in 0..<length {
<! decisionToDFA[i] = DFA(<lexer.name>._ATN.getDecisionState(i)!, i);!>
decisionToDFA.append(DFA(<lexer.name>._ATN.getDecisionState(i)!, i))
}
return decisionToDFA

```

}0

```
internal static let _sharedContextCache = PredictionContextCache()
```

```
<accessLevelNotOpen(lexer)>
```

```
static let <lexer.tokens:{k | <k>=<lexer.tokens.(k)>}; separator=", ", wrap, anchor>
```

```
<if(lexer.channels)>
```

```
<accessLevelNotOpen(lexer)>
```

```
static let <lexer.channels:{k | <k>=<lexer.channels.(k)>}; separator=", ", wrap, anchor>
```

```
<endif>
```

```
<if(rest(lexer.modes))>
```

```
<accessLevelNotOpen(lexer)>
```

```
static
```

```
let <rest(lexer.modes){m | <m>=<i>}; separator=", ", wrap, anchor>
```

```
<endif>
```

```
<accessLevelNotOpen(lexer)>
```

```
static let channelNames: [String] = [
```

```
  "DEFAULT_TOKEN_CHANNEL", "HIDDEN"<if (lexer.channels)>, <lexer.channels:{c | "<c>"}; separator=", ",
```

```
wrap, anchor><endif>
```

```
]
```

```
<accessLevelNotOpen(lexer)>
```

```
static let modeNames: [String] = [
```

```
  <lexer.modes:{m | "<m>"}; separator=", ", wrap, anchor>
```

```
]
```

```
<accessLevelNotOpen(lexer)>
```

```
static let ruleNames: [String] = [
```

```
  <lexer.ruleNames:{r | "<r>"}; separator=", ", wrap, anchor>
```

```
]
```

```
<vocabulary(lexer.literalNames, lexer.symbolicNames,
```

```
  accessLevelNotOpen(lexer))>
```

```
<namedActions.members>
```

```
override <accessLevelOpenOK(lexer)>
```

```
func getVocabulary() -> Vocabulary {
```

```
  return <lexer.name>.VOCABULARY
```

```
}
```

```
<accessLevelNotOpen(lexer)>
```

```
required init(_ input: CharStream) {
```

```
  RuntimeMetaData.checkVersion("<lexerFile.ANTLRVersion>", RuntimeMetaData.VERSION)
```

```
  super.init(input)
```

```
  _interp
```

```

= LexerATNSimulator(self, <lexer.name>._ATN, <lexer.name>._decisionToDFA,
<lexer.name>._sharedContextCache)
}

```

```

override <accessLevelOpenOK(lexer)>
func getGrammarFileName() -> String { return "<lexer.grammarFileName>" }

```

```

override <accessLevelOpenOK(lexer)>
func getRuleNames() -> [String] { return <lexer.name>.ruleNames }

```

```

override <accessLevelOpenOK(lexer)>
func getSerializedATN() -> String { return <lexer.name>._serializedATN }

```

```

override <accessLevelOpenOK(lexer)>
func getChannelNames() -> [String] { return <lexer.name>.channelNames }

```

```

override <accessLevelOpenOK(lexer)>
func getModeNames() -> [String] { return <lexer.name>.modeNames }

```

```

override <accessLevelOpenOK(lexer)>
func getATN() -> ATN { return <lexer.name>._ATN }

```

```

<dumpActions(lexer, "", actionFuncs, sempredFuncs)>
<atn>

```

```

<accessLevelNotOpen(lexer)>
static let _serializedATN: String = <lexer.name>ATN().jsonString

```

```

<accessLevelNotOpen(lexer)>
static let _ATN: ATN = ATNDeserializer().deserializeFromJson(_serializedATN)
}
>>

```

```

/**

```

```

Don't need to define anything. The tool generates a XParserATN.swift file (and same for lexer)
* which is referenced from static field _serializedATN. This json string is passed to
* deserializeFromJson(). Note this is not the "serialization as array of ints" that other targets
* do. It is more or less the output of ATNPrinter which gets read back in.
*/

```

```

*/

```

```

SerializedATN(model) ::= <<
>>

```

```

/** Using a type to init value map, try to init a type; if not in table
* must be an object, default value is "null".
*/

```

```

initValue(typeName) ::= <<
<SwiftTypeInitMap.(typeName)>
>>

```

```
codeFileExtension() ::= ".swift"
```

Found in path(s):

```
* /opt/cola/permits/1020749546_1607585150.55/0/antlr-4-9-complete-  
jar/org/antlr/v4/tool/templates/codegen/Swift/Swift.stg
```

No license file was found, but licenses were detected in source scan.

```
/*
```

```
* [The "BSD license"]
```

```
* Copyright (c) 2015 Dan McLaughlin, Mike Lischke
```

```
* All rights reserved.
```

```
*
```

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```

```
* modification, are permitted provided that the following conditions
```

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* are met:
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```

```
* THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.
```

```
*/
```

Found in path(s):

```
* /opt/cola/permits/1020749546_1607585150.55/0/antlr-4-9-complete-  
jar/org/antlr/v4/tool/templates/codegen/Cpp/Cpp.stg
```

No license file was found, but licenses were detected in source scan.

```
/*
```

```
* [The "BSD license"]
```

```
* Copyright (c) 2012-2016 Terence Parr
```

```
* Copyright (c) 2012-2016 Sam Harwell
```

```
* Copyright (c) 2014 Eric Vergnaud
```

```
* All rights reserved.
```

```

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* THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT
* (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF
* THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.
*/

```

```

/** ANTLR tool checks output templates are compatible with tool code generation.

```

```

* For now, a simple string match used on x.y of x.y.z scheme.

```

```

* Must match Tool.VERSION during load to templates.

```

```

*

```

```

* REQUIRED.

```

```

*/

```

```

pythonTypeInitMap ::= [
  "bool":"False",
  "int":"0",
  "float":"0.0",
  "str": "",
  default:"None" // anything other
  than a primitive type is an object
]

```

```

// args must be <object-model-object>, <fields-resulting-in-STs>

```

```

ParserFile(file, parser, namedActions, contextSuperClass) ::= <<

```

```

<fileHeader(file.grammarFileName, file.ANTLRVersion)>

```

```

# encoding: utf-8

```

```

from __future__ import print_function

```

```
from antlr4 import *
from io import StringIO
import sys
```

```
<namedActions.header>
<parser>
```

```
>>
```

```
ListenerFile(file, header, namedActions) ::= <<
<fileHeader(file.grammarFileName, file.ANTLRVersion)>
from antlr4 import *
<header>
```

```
# This class defines a complete listener for a parse tree produced by <file.parserName>.
class <file.grammarName>Listener(ParseTreeListener):
```

```
    <file.listenerNames: {lname |
# Enter a parse tree produced by <file.parserName>#<lname>.
def enter<lname; format="cap">(self, ctx):
    pass

# Exit a parse tree produced by <file.parserName>#<lname>.
def exit<lname; format="cap">(self, ctx):
    pass

}; separator="\n">
```

```
>>
```

```
VisitorFile(file, header, namedActions) ::= <<
<fileHeader(file.grammarFileName,
file.ANTLRVersion)>
from antlr4 import *
<header>
```

```
# This class defines a complete generic visitor for a parse tree produced by <file.parserName>.
```

```
class <file.grammarName>Visitor(ParseTreeVisitor):
```

```
    <file.visitorNames: {lname |
# Visit a parse tree produced by <file.parserName>#<lname>.
def visit<lname; format="cap">(self, ctx):
    return self.visitChildren(ctx)

}; separator="\n">
```



>>

```
fileHeader(grammarFileName, ANTLRVersion) ::= <<  
# Generated from <grammarFileName> by ANTLR <ANTLRVersion>  
>>
```

```
Parser(parser, funcs, atn, sempredFuncs, superClass) ::= <<  
<Parser_(ctor="parser_ctor", ...)>  
>>
```

```
Parser_(parser, funcs, atn, sempredFuncs, ctor, superClass) ::= <<  
<if(superClass)>  
if __name__ is not None and "." in __name__:  
    from .<superClass> import <superClass>  
else:  
    from <superClass> import <superClass>  
  
<endif>  
<atn>
```

```
class <parser.name> ( <if(superClass)><superClass><else>Parser<endif> ):
```

```
    grammarFileName = "<parser.grammarFileName>"
```

```
    atn = ATNDeserializer().deserialize(serializedATN())
```

```
    decisionsToDFA = [ DFA(ds, i) for i, ds in enumerate(atn.decisionToState) ]
```

```
    sharedContextCache = PredictionContextCache()
```

```
    literalNames = [ <parser.literalNames:{t | u<t>}; null="u\"<INVALID>\"", separator=", ", wrap, anchor ]
```

```
    symbolicNames = [ <parser.symbolicNames:{t | u<t>}; null="u\"<INVALID>\"", separator=", ", wrap, anchor ]
```

```
    <parser.rules:{r | RULE_<r.name> = <r.index>}; separator="\n", wrap, anchor>
```

```
    ruleNames = [ <parser.ruleNames:{r | u"<r>"}; separator=", ", wrap, anchor ]
```

```
    EOF = <TokenLabelType().EOF
```

```
    <if(parser.tokens)>
```

```
    <parser.tokens:{k | <k>=<parser.tokens.(k)>}; separator="\n", wrap, anchor>
```

```
    <endif>
```

```
    <parser:(ctor)()>
```

```
    <namedActions.members>
```

```

<funcs; separator="\n">

<if(sempredFuncs)>
  def sempred(self, localctx, ruleIndex, predIndex):
    if self._predicates == None:
      self._predicates = dict()
<parser.sempredFuncs.values: { f |
  self._predicates[<f.ruleIndex>]
= self.<f.name>_sempred}; separator="\n    ">
    pred = self._predicates.get(ruleIndex, None)
    if pred is None:
      raise Exception("No predicate with index:" + str(ruleIndex))
    else:
      return pred(localctx, predIndex)

  <sempredFuncs.values; separator="\n">
<endif>

>>

dumpActions(recog, argFuncs, actionFuncs, sempredFuncs) ::= <<
<if(actionFuncs)>
def action(self, localctx, ruleIndex, actionIndex):
  if self._actions is None:
    actions = dict()
<recog.actionFuncs.values: { f |
  actions[<f.ruleIndex>] = self.<f.name>_action }; separator="\n">
  self._actions = actions
  action = self._actions.get(ruleIndex, None)
  if action is not None:
    action(localctx, actionIndex)
  else:
    raise Exception("No registered action for:" + str(ruleIndex))

<actionFuncs.values; separator="\n">

<endif>
<if(sempredFuncs)>
def sempred(self, localctx, ruleIndex, predIndex):
  if self._predicates is None:
    preds = dict()
<recog.sempredFuncs.values: { f |
  preds[<f.ruleIndex>] = self.<f.name>_sempred}; separator="\n">
  self._predicates = preds
  pred = self._predicates.get(ruleIndex, None)

```

```

if pred is not None:
    return pred(localctx, predIndex)
else:
    raise Exception("No registered predicate for:" + str(ruleIndex))

<sempredFuncs.values; separator="\n">
<endif>
>>

parser_ctor(p) ::= <<
def __init__(self, input, output=sys.stdout):
    super(<parser.name>, self).__init__(input, output=output)
    self.checkVersion("<file.ANTLRVersion>")
    self._interp = ParserATNSimulator(self, self.atn, self.decisionsToDFA, self.sharedContextCache)
    self._predicates = None

>>

/* This generates a private method since the actionIndex is generated, making an
* overriding implementation impossible to maintain.
*/
RuleActionFunction(r, actions) ::= <<

def <r.name>_action(self, localctx , actionIndex):
<actions: {index|
<if(first(actions))>
    if actionIndex ==
<index>:
        <actions.(index)>
<elseif(rest(actions))>
    elif actionIndex == <index>:
        <actions.(index)>
<endif> }; separator="\n">
>>

/* This generates a private method since the predIndex is generated, making an
* overriding implementation impossible to maintain.
*/
RuleSempredFunction(r, actions) ::= <<
def <r.name>_sempred(self, localctx, predIndex):
    <actions: {index|
<if(first(actions))>
        if predIndex == <index>:
            return <actions.(index)>
<elseif(rest(actions))>
        elif predIndex == <index>:
            return <actions.(index)>
<endif> }; separator="\n">

```

>>

```
RuleFunction(currentRule,args,code,locals,ruleCtx,altLabelCtxs,namedActions,finallyAction,postamble,exceptions) ::= <<
```

```
<ruleCtx>
```

```
<altLabelCtxs:{l | <altLabelCtxs.(l)>}; separator="\n">
```

```
def <currentRule.name>(self<currentRule.args:{a | , <a.name>}>):
```

```
    localctx = <parser.name>.<currentRule.ctxType>(self, self._ctx, self.state<currentRule.args:{a | , <a.name>}>)  
    self.enterRule(localctx, <currentRule.startState>,  
self.RULE_<currentRule.name>)  
    <namedActions.init>  
    <locals; separator="\n">  
    try:  
        <code>  
        <postamble; separator="\n">  
        <namedActions.after>  
    <if(exceptions)>  
    <exceptions; separator="\n">  
    <else>  
    except RecognitionException as re:  
        localctx.exception = re  
        self._errHandler.reportError(self, re)  
        self._errHandler.recover(self, re)  
    <endif>  
    finally:  
        <finallyAction>  
        self.exitRule()  
    return localctx
```

>>

```
LeftRecursiveRuleFunction(currentRule,args,code,locals,ruleCtx,altLabelCtxs,  
namedActions,finallyAction,postamble) ::=
```

```
<<
```

```
<ruleCtx>
```

```
<altLabelCtxs:{l | <altLabelCtxs.(l)>}; separator="\n">
```

```
def <currentRule.name>(self, _p=0<if(currentRule.args)>, <args:{a | , <a>}><endif>):
```

```
    _parentctx = self._ctx  
    _parentState = self.state  
    localctx = <parser.name>.<currentRule.ctxType>(self, self._ctx, _parentState<args:{a | , <a.name>}>)  
    _prevctx = localctx
```

```

_startState = <currentRule.startState>
self.enterRecursionRule(localctx, <currentRule.startState>, self.RULE_<currentRule.name>, _p)
<namedActions.init>
<locals; separator="\n">
try:
    <code>
    <postamble; separator="\n">
    <namedActions.after>
except RecognitionException as re:
    localctx.exception = re
    self._errHandler.reportError(self, re)
    self._errHandler.recover(self, re)
finally:
    <finallyAction>
    self.unrollRecursionContexts(_parentctx)
return localctx

>>

CodeBlockForOuterMostAlt(currentOuterMostAltCodeBlock, locals, preamble, ops) ::= <<
<if(currentOuterMostAltCodeBlock.altLabel)>localctx = <parser.name>.<currentOuterMostAltCodeBlock.altLabel;
format="cap">Context(self, localctx)<endif>
self.enterOuterAlt(localctx, <currentOuterMostAltCodeBlock.alt.altNum>)
<CodeBlockForAlt(currentAltCodeBlock=currentOuterMostAltCodeBlock, ...)>
>>

CodeBlockForAlt(currentAltCodeBlock, locals, preamble, ops) ::= <<
<locals; separator="\n">
<preamble;
separator="\n">
<ops; separator="\n">
>>

LL1AltBlock(choice, preamble, alts, error) ::= <<
self.state = <choice.stateNumber>
self._errHandler.sync(self)
<if(choice.label)><labelref(choice.label)> = _input.LT(1)<endif>
<preamble; separator="\n">
token = self._input.LA(1)
<choice.altLook,alts:{look,alt| <cases(ttypes=look)>
    <alt>
    pass}; separator="\nel">
else:
    <error>

>>

LL1OptionalBlock(choice, alts, error) ::= <<

```

```

self.state = <choice.stateNumber>
self._errHandler.sync(self)
token = self._input.LA(1)
<choice.altLook,alts:{look,alt| <cases(ttypes=look)>
  <alt>
  pass}; separator="\n! ">
else:
  pass
>>

```

```

LL1OptionalBlockSingleAlt(choice, expr, alts, preamble, error, followExpr) ::= <<
self.state = <choice.stateNumber>
self._errHandler.sync(self)
<preamble; separator="\n ">
if <expr>:
  <alts; separator="\n ">

<!else if ( !(<followExpr> ) ) <error>!>
>>

```

```

LL1StarBlockSingleAlt(choice, loopExpr, alts, preamble, iteration) ::= <<
self.state = <choice.stateNumber>
self._errHandler.sync(self)
<preamble;
separator="\n ">
while <loopExpr>:
  <alts; separator="\n ">
  self.state = <choice.loopBackStateNumber>
  self._errHandler.sync(self)
  <iteration>

>>

```

```

LL1PlusBlockSingleAlt(choice, loopExpr, alts, preamble, iteration) ::= <<
self.state = <choice.blockStartStateNumber> <! alt block decision !>
self._errHandler.sync(self)
<preamble; separator="\n ">
while True:
  <alts; separator="\n ">
  self.state = <choice.stateNumber> <! loopback/exit decision !>
  self._errHandler.sync(self)
  <iteration>
  if not (<loopExpr>):
    break

>>

```

```
// LL(*) stuff
```

```
AltBlock(choice, preamble, alts, error) ::= <<  
self.state = <choice.stateNumber>  
self._errHandler.sync(self)  
<if(choice.label)><labelref(choice.label)> = _input.LT(1)<endif>  
<preamble; separator="\n">  
la_ = self._interp.adaptivePredict(self._input,<choice.decision>,self._ctx)  
<alts:{ alt |  
if la_ == <i>:  
    <alt>  
    pass  
}; separator="\nel">  
  
>>
```

```
OptionalBlock(choice,  
alts, error) ::= <<  
self.state = <choice.stateNumber>  
self._errHandler.sync(self)  
la_ = self._interp.adaptivePredict(self._input,<choice.decision>,self._ctx)  
<alts:{ alt |  
if la_ == <i><if(!choice.ast.greedy)>+1<endif>:  
    <alt>  
}; separator="\nel">  
  
>>
```

```
StarBlock(choice, alts, sync, iteration) ::= <<  
self.state = <choice.stateNumber>  
self._errHandler.sync(self)  
_alt = self._interp.adaptivePredict(self._input,<choice.decision>,self._ctx)  
while _alt!=<choice.exitAlt> and _alt!=ATN.INVALID_ALT_NUMBER:  
    if _alt==1<if(!choice.ast.greedy)>+1<endif>:  
        <iteration>  
        <alts> <! should only be one !>  
    self.state = <choice.loopBackStateNumber>  
    self._errHandler.sync(self)  
    _alt = self._interp.adaptivePredict(self._input,<choice.decision>,self._ctx)  
  
>>
```

```
PlusBlock(choice, alts, error) ::= <<  
self.state = <choice.blockStartStateNumber> <! alt block decision !>  
self._errHandler.sync(self)  
_alt = 1<if(!choice.ast.greedy)>+1<endif>  
while _alt!=<choice.exitAlt> and _alt!=ATN.INVALID_ALT_NUMBER:
```

```

    <alts:{ alt|
if _alt == <i><if(!choice.ast.greedy)>+1<endif>:
    <alt>
}; separator="\nел">
    else:
        <error>
        self.state = <choice.loopBackStateNumber> <! loopback/exit decision !>
        self._errHandler.sync(self)
        _alt = self._interp.adaptivePredict(self._input,<choice.decision>,self._ctx)

>>

Sync(s) ::= "sync(<s.expecting.name>)"

ThrowNoViableAlt(t) ::= "raise NoViableAltException(self)"

TestSetInline(s) ::= <<
<s.bitsets:{ bits | <if(rest(rest(bits.ttypes)))><bitsetBitfieldComparison(s, bits)><else><bitsetInlineComparison(s,
bits)><endif>}; separator=" or ">
>>

// Java language spec 15.19 - shift operators mask operands rather than overflow to 0... need range test
testShiftInRange(shiftAmount) ::= <<
((<shiftAmount>) & ~0x3f) == 0
>>

// produces smaller bytecode only when bits.ttypes contains more than two items
bitsetBitfieldComparison(s, bits) ::= <%
(<testShiftInRange({ <offsetShiftVar(s.varName, bits.shift)>})> and ((1 \<< <offsetShiftVar(s.varName,
bits.shift)>) & (<bits.ttypes: { ttype | (1 \<< <offsetShiftType(ttype, bits.shift)>)}; separator=" | ">)) != 0)
%>

isZero ::= [
"0":true,
default:false
]

offsetShiftVar(shiftAmount, offset) ::= <%
<if(!isZero.(offset))><shiftAmount> - <offset><else><shiftAmount><endif>
%>

offsetShiftType(shiftAmount, offset) ::= <%
<if(!isZero.(offset))><parser.name>.<shiftAmount> - <offset><else><parser.name>.<shiftAmount><endif>
%>

// produces more efficient bytecode when bits.ttypes contains at most two items
bitsetInlineComparison(s, bits) ::= <%
<bits.ttypes: { ttype | <s.varName>==<parser.name>.<ttype>}; separator=" or ">

```



```

%>

cases(ttypes) ::= <<
if token in [<ttypes:{t | <parser.name>.<t>}]; separator=", ">]:
>>

InvokeRule(r, argExprsChunks) ::= <<
self.state = <r.stateNumber>
<if(r.labels)><r.labels:{1 | <labelref(l)> =
}><endif>self.<r.name>( <if(r.ast.options.p)><r.ast.options.p><if(argExprsChunks)>,<endif><endif><argExprsChu
nks>)
>>

MatchToken(m) ::= <<
self.state = <m.stateNumber>
<if(m.labels)><m.labels:{1
| <labelref(l)> = }><endif>self.match(<parser.name>.<m.name>)
>>

MatchSet(m, expr, capture) ::= "<CommonSetStuff(m, expr, capture, false)>"

MatchNotSet(m, expr, capture) ::= "<CommonSetStuff(m, expr, capture, true)>"

CommonSetStuff(m, expr, capture, invert) ::= <<
self.state = <m.stateNumber>
<if(m.labels)><m.labels:{1 | <labelref(l)> = }>self._input.LT(1)<endif>
<capture>
<if(invert)>if <m.varName> \<= 0 or <expr><else>if not(<expr>)<endif>:
<if(m.labels)><m.labels:{1 | <labelref(l)> = }><else> <endif>self._errHandler.recoverInline(self)
else:
    self._errHandler.reportMatch(self)
    self.consume()
>>

Wildcard(w) ::= <<
self.state = <w.stateNumber>
<if(w.labels)><w.labels:{1 | <labelref(l)> = }><endif>self.matchWildcard()
>>

// ACTION STUFF

Action(a, foo, chunks) ::= "<chunks>"

ArgAction(a, chunks) ::= "<chunks>"

SemPred(p, chunks, failChunks) ::= <<
self.state = <p.stateNumber>
if not <chunks>:

```

```

    from antlr4.error.Errors import
    FailedPredicateException
    raise FailedPredicateException(self, <p.predicate><if(failChunks)>, <failChunks><elseif(p.msg)>,
    <p.msg><endif>)
>>

```

```

ExceptionClause(e, catchArg, catchAction) ::= <<
except <catchArg>:
    <catchAction>
>>

```

```
// lexer actions are not associated with model objects
```

```

LexerSkipCommand() ::= "skip()"
LexerMoreCommand() ::= "more()"
LexerPopModeCommand() ::= "popMode()"

```

```

LexerTypeCommand(arg, grammar) ::= "_type = <arg>"
LexerChannelCommand(arg, grammar) ::= "_channel = <arg>"
LexerModeCommand(arg, grammar) ::= "_mode = <arg>"
LexerPushModeCommand(arg, grammar) ::= "pushMode(<arg>)"

```

```

ActionText(t) ::= "<t.text>"
ActionTemplate(t) ::= "<t.st>"
ArgRef(a) ::= "localctx.<a.name>"
LocalRef(a) ::= "localctx.<a.name>"
RetValRef(a) ::= "localctx.<a.name>"
QRetValRef(a) ::= "<ctx(a)>.<a.dict>.<a.name>"
/** How to translate $tokenLabel */
TokenRef(t) ::= "<ctx(t)>.<t.name>"
LabelRef(t) ::= "<ctx(t)>.<t.name>"
ListLabelRef(t) ::= "<ctx(t)>.<ListLabelName(t.name)>"
SetAttr(s,rhsChunks)
::= "<ctx(s)>.<s.name> = <rhsChunks>"

```

```

TokenLabelType() ::= "<file.TokenLabelType; null={Token}>"
InputSymbolType() ::= "<file.InputSymbolType; null={Token}>"

```

```

TokenPropertyRef_text(t) ::= "(None if <ctx(t)>.<t.label> is None else <ctx(t)>.<t.label>.text)"
TokenPropertyRef_type(t) ::= "(0 if <ctx(t)>.<t.label> is None else <ctx(t)>.<t.label>.type()"
TokenPropertyRef_line(t) ::= "(0 if <ctx(t)>.<t.label> is None else <ctx(t)>.<t.label>.line)"
TokenPropertyRef_pos(t) ::= "(0 if <ctx(t)>.<t.label> is None else <ctx(t)>.<t.label>.column)"
TokenPropertyRef_channel(t) ::= "(0 if (<ctx(t)>.<t.label> is None else <ctx(t)>.<t.label>.channel)"
TokenPropertyRef_index(t) ::= "(0 if <ctx(t)>.<t.label> is None else <ctx(t)>.<t.label>.tokenIndex)"
TokenPropertyRef_int(t) ::= "(0 if <ctx(t)>.<t.label> is None else int(<ctx(t)>.<t.label>.text))"

```

```

RulePropertyRef_start(r) ::= "(None if <ctx(r)>.<r.label> is None else <ctx(r)>.<r.label>.start)"
RulePropertyRef_stop(r) ::= "(None

```

```

if <ctx(r)>.<r.label> is None else <ctx(r)>.<r.label>.stop)"
RulePropertyRef_text(r) ::= "(None if <ctx(r)>.<r.label> is None else
self._input.getText(<ctx(r)>.<r.label>.start,<ctx(r)>.<r.label>.stop))"
RulePropertyRef_ctx(r) ::= "<ctx(r)>.<r.label>"
RulePropertyRef_parser(r) ::= "self"

ThisRulePropertyRef_start(r) ::= "localctx.start"
ThisRulePropertyRef_stop(r) ::= "localctx.stop"
ThisRulePropertyRef_text(r) ::= "self._input.getText(localctx.start, self._input.LT(-1))"
ThisRulePropertyRef_ctx(r) ::= "localctx"
ThisRulePropertyRef_parser(r) ::= "self"

NonLocalAttrRef(s) ::= "self.getInvokingContext(<s.ruleIndex>).<s.name>"
SetNonLocalAttr(s, rhsChunks) ::= "self.getInvokingContext(<s.ruleIndex>).<s.name> = <rhsChunks>"

AddToLabelList(a) ::= "<ctx(a.label)>.<a.listName>.append(<labelref(a.label)>)"

TokenDecl(t) ::= "self.<t.name> = None # <TokenLabelType()>"
TokenTypeDecl(t) ::= "self.<t.name> = 0 # <TokenLabelType()> type"
TokenListDecl(t) ::= "self.<t.name> = list()
# of <TokenLabelType()>s"
RuleContextDecl(r) ::= "self.<r.name> = None # <r.ctxName>"
RuleContextListDecl(rdecl) ::= "self.<rdecl.name> = list() # of <rdecl.ctxName>s"

ContextTokenGetterDecl(t) ::= <<
def <t.name>(self):
    return self.getToken(<parser.name>.<t.name>, 0)
>>

// should never be called
ContextTokenListGetterDecl(t) ::= <<
def <t.name>_list(self):
    return self.getTokens(<parser.name>.<t.name>)
>>

ContextTokenListIndexedGetterDecl(t) ::= <<
def <t.name>(self, i=None):
    if i is None:
        return self.getTokens(<parser.name>.<t.name>)
    else:
        return self.getToken(<parser.name>.<t.name>, i)
>>

ContextRuleGetterDecl(r) ::= <<
def <r.name>(self):
    return self.getTypedRuleContext(<parser.name>.<r.ctxName>,0)
>>

```

```

// should never be called
ContextRuleListGetterDecl(r) ::= <<
def <r.name>_list(self):
    return self.getTypedRuleContexts(<parser.name>.<r.ctxName>)

>>

ContextRuleListIndexedGetterDecl(r) ::= <<
def <r.name>(self, i=None):
    if i is None:
        return self.getTypedRuleContexts(<parser.name>.<r.ctxName>)
    else:
        return self.getTypedRuleContext(<parser.name>.<r.ctxName>,i)

>>

LexerRuleContext() ::= "RuleContext"

/** The rule context name is the rule followed by a suffix; e.g.,
 * r becomes rContext.
 */
RuleContextNameSuffix() ::= "Context"

ImplicitTokenLabel(tokenName) ::= "_<tokenName>"
ImplicitRuleLabel(ruleName) ::= "_<ruleName>"
ImplicitSetLabel(id) ::= "_tset<id>"
ListLabelName(label) ::= "<label>"

CaptureNextToken(d) ::= "<d.varName> = self._input.LT(1)"
CaptureNextTokenType(d) ::= "<d.varName> = self._input.LA(1)"

StructDecl(struct,ctorAttrs,attrs,getters,dispatchMethods,interfaces,extensionMembers) ::= <<
class <struct.name>(<if(contextSuperClass)><contextSuperClass><else>ParserRuleContext<endif>):

    def __init__(self, parser, parent=None, invokingState=-1<struct.ctorAttrs:{a | , <a.name>=None}>):
        super(<parser.name>.<struct.name>, self).__init__(parent,
invokingState)
        self.parser = parser
        <attrs:{a | <a>}; separator="\n">
        <struct.ctorAttrs:{a | self.<a.name> = <a.name>}; separator="\n">

        <getters:{g | <g>}; separator="\n\n">

    def getRuleIndex(self):
        return <parser.name>.RULE_<struct.derivedFromName>

<if(struct.provideCopyFrom)><! don't need copy unless we have subclasses !>

```

```

def copyFrom(self, ctx):
    super(<parser.name>.<struct.name>, self).copyFrom(ctx)
    <struct.attrs: { a | self.<a.name> = ctx.<a.name> }; separator="\n">

<endif>
<dispatchMethods; separator="\n">
<extensionMembers; separator="\n">

>>

AltLabelStructDecl(struct,attrs, getters,dispatchMethods) ::= <<
class <struct.name>(<currentRule.name; format="cap">Context):

    def __init__(self, parser, ctx): # actually a <parser.name>.<currentRule.name; format="cap">Context
        super(<parser.name>.<struct.name>, self).__init__(parser)
        <attrs: { a | <a> }; separator="\n">
        self.copyFrom(ctx)

    <getters: { g | <g> }; separator="\n">

    <dispatchMethods; separator="\n">

>>

ListenerDispatchMethod(method) ::= <<
def <if(method.isEnter)>enter<else>exit<endif>Rule(self, listener):
    if hasattr(listener, "<if(method.isEnter)>enter<else>exit<endif><struct.derivedFromName; format="cap">"):
        listener.<if(method.isEnter)>enter<else>exit<endif><struct.derivedFromName; format="cap">(self)

>>

VisitorDispatchMethod(method) ::= <<
def accept(self, visitor):
    if hasattr(visitor, "visit<struct.derivedFromName; format="cap">"):
        return visitor.visit<struct.derivedFromName; format="cap">(self)
    else:
        return visitor.visitChildren(self)

>>

AttributeDecl(d) ::= "self.<d.name> = <if(d.initValue)><d.initValue><else>None<endif>"

/** If we don't know location of label def x, use this template */
labelref(x) ::= "<if(!x.isLocal)>localctx.<endif><x.name>"

/** For any action chunk, what is correctly-typed context struct ptr? */
ctx(actionChunk) ::= "localctx"

```

```

// used
for left-recursive rules
recRuleAltPredicate(ruleName,opPrec) ::= "self.precpred(self._ctx, <opPrec>)"
recRuleSetReturnAction(src,name) ::= "$<name>=$<src>.<name>"
recRuleSetStopToken() ::= "self._ctx.stop = self._input.LT(-1)"

recRuleAltStartAction(ruleName, ctxName, label) ::= <<
localctx = <parser.name>.<ctxName>Context(self, _parentctx, _parentState)
<if(label)>localctx.<label> = _prevctx<endif>
self.pushNewRecursionContext(localctx, _startState, self.RULE_<ruleName>)
>>

recRuleLabeledAltStartAction(ruleName, currentAltLabel, label, isListLabel) ::= <<
localctx = <parser.name>.<currentAltLabel; format="cap">Context(self, <parser.name>.<ruleName;
format="cap">Context(self, _parentctx, _parentState))
<if(label)>
<if(isListLabel)>
localctx.<label>.append(_prevctx)
<else>
localctx.<label> = _prevctx
<endif>
<endif>
self.pushNewRecursionContext(localctx, _startState, self.RULE_<ruleName>)
>>

recRuleReplaceContext(ctxName) ::= <<
localctx = <parser.name>.<ctxName>Context(self,
localctx)
self._ctx = localctx
_prevctx = localctx
>>

recRuleSetPrevCtx() ::= <<
if self._parseListeners is not None:
self.triggerExitRuleEvent()
_prevctx = localctx
>>

LexerFile(lexerFile, lexer, namedActions) ::= <<
<fileHeader(lexerFile.grammarFileName, lexerFile.ANTLRVersion)>
# encoding: utf-8
from __future__ import print_function
from antlr4 import *
from io import StringIO
import sys

```

```

<namedActions.header>

<lexer>
>>

Lexer(lexer, atn, actionFuncs, sempredFuncs, superClass) ::= <<
<if(superClass)>
if __name__ is not None and "." in __name__:
    from .<superClass> import <superClass>
else:
    from <superClass> import <superClass>

<endif>

<atn>

class <lexer.name>(<if(superClass)><superClass><else>Lexer<endif>):

    atn = ATNDeserializer().deserialize(serializedATN())

    decisionsToDFA = [ DFA(ds, i) for i, ds in enumerate(atn.decisionToState) ]

<if(lexer.channels)>
    <lexer.channels:{c| <c> = <lexer.channels.(c)>}; separator="\n">

<endif>
<if(rest(lexer.modes))>
    <rest(lexer.modes):{m| <m> = <i>}; separator="\n">

<endif>
<lexer.tokens:{k | <k> = <lexer.tokens.(k)>}; separator="\n", wrap, anchor>

channelNames = [ u"DEFAULT_TOKEN_CHANNEL", u"HIDDEN"<if (lexer.channels)>, <lexer.channels:{c|
u"<c>"}; separator=", ", wrap, anchor><endif> ]

modeNames = [ <lexer.modes:{m| u"<m>"}; separator=", ", wrap, anchor> ]

literalNames = [ u"\<INVALID>",
    <lexer.literalNames:{t | u<t>}; separator=", ", wrap, anchor> ]

symbolicNames = [ u"\<INVALID>",
    <lexer.symbolicNames:{t | u<t>}; separator=", ", wrap, anchor> ]

ruleNames = [ <lexer.ruleNames:{r | u"<r>"}; separator=", ", wrap, anchor> ]

grammarFileName = u"<lexer.grammarFileName>"

```

```

def __init__(self, input=None, output=sys.stdout):
    super(<lexer.name>, self).__init__(input, output=output)
    self.checkVersion("<lexerFile.ANTLRVersion>")
    self._interp = LexerATNSimulator(self, self.atn, self.decisionsToDFA, PredictionContextCache())
    self._actions = None
    self._predicates = None

<namedActions.members>

<dumpActions(lexer, "", actionFuncs, sempredFuncs)>

>>

SerializedATN(model) ::= <<
<! only one segment, can be inlined !>

def serializedATN():
    with StringIO() as buf:
        buf.write(u"<model.serialized; wrap={ }><n>    buf.write(u" }>")
        return buf.getvalue()

>>

/** Using a type to init value map, try to init a type; if not in table
 * must be an object, default value is "null".
 */
initValue(typeName) ::= <<
<pythonTypeInitMap.(typeName)>
>>

codeFileExtension() ::= ".py"

```

Found in path(s):

```

* /opt/cola/permits/1020749546_1607585150.55/0/antlr-4-9-complete-
jar/org/antlr/v4/tool/templates/codegen/Python2/Python2.stg
No license file was found, but licenses were detected in source scan.

```

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Found in path(s):

\*

/opt/cola/permits/1020749546\_1607585150.55/0/antlr-4-9-complete-jar/META-INF/maven/org.glassfish/javax.json/pom.xml

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\*/

/\*

This file contains the actual layout of the messages emitted by ANTLR.

The text itself is coming out of the languages/\*stg files, according to the chosen locale.

This file contains the format that mimicks GCC output.

\*/

location(file, line, column) ::= "<file>:<line>:<column>:"

message(id, text) ::= "<text> [error <id>]"

report(location, message, type) ::= "<location> <type>: <message>"

wantsSingleLineMessage() ::= "true"

Found in path(s):

\* /opt/cola/permits/1020749546\_1607585150.55/0/antlr-4-9-complete-jar/org/antlr/v4/tool/templates/messages/formats/gnu.stg

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*/

```

```

/** ANTLR tool checks output templates are compatible with tool code generation.

```

```

* For now, a simple string match used on x.y of x.y.z scheme.
* Must match Tool.VERSION during load to templates.

```

```

*
* REQUIRED.
*/

```

```

javascriptTypeInitMap ::= [
  "bool":"false",
  "int":"0",
  "float":"0.0",
  "str": "",
  default:"{}" // anything
  other than a primitive type is an object
]

```

```

// args must be <object-model-object>, <fields-resulting-in-STs>

```

```

ParserFile(file, parser, namedActions, contextSuperClass) ::= <<
<fileHeader(file.grammarFileName, file.ANTLRVersion)>
import antlr4 from 'antlr4';
<if(file.genListener)>
import <file.grammarName>Listener from './<file.grammarName>Listener.js';
<endif>
<if(file.genVisitor)>
import <file.grammarName>Visitor from './<file.grammarName>Visitor.js';
<endif>

```

```

<namedActions.header>
<parser>
>>

```

```

ListenerFile(file, header, namedActions) ::= <<
<fileHeader(file.grammarFileName, file.ANTLRVersion)>

```

```

import antlr4 from 'antlr4';

// This class defines a complete listener for a parse tree produced by <file.parserName>.
export default class <file.grammarName>Listener extends antlr4.tree.ParseTreeListener {

  <file.listenerNames>: { lname |
    // Enter a parse tree produced by <file.parserName>#<lname>.
    enter<lname; format="cap">(ctx) {
      \}

    // Exit a parse tree produced by <file.parserName>#<lname>.
    exit<lname;
    format="cap">(ctx) {
      \}

  }; separator="\n">

}
>>

```

```

VisitorFile(file, header, namedActions) ::= <<
<fileHeader(file.grammarFileName, file.ANTLRVersion)>
import antlr4 from 'antlr4';

// This class defines a complete generic visitor for a parse tree produced by <file.parserName>.

export default class <file.grammarName>Visitor extends antlr4.tree.ParseTreeVisitor {

  <file.visitorNames>: { lname |
    // Visit a parse tree produced by <file.parserName>#<lname>.
    visit<lname; format="cap">(ctx) {
      return this.visitChildren(ctx);
    }

  }; separator="\n">

}
>>

```

```

fileHeader(grammarFileName, ANTLRVersion) ::= <<
// Generated from <grammarFileName; format="java-escape"> by ANTLR <ANTLRVersion>
// jshint ignore: start
>>

```

```

Parser(parser, funcs, atn, sempredFuncs, superClass) ::= <<
<if(superClass)>

```

```

import <superClass> from './<superClass>.js';
<endif>

<atn>

const atn = new antlr4.atn.ATNDeserializer().deserialize(serializedATN);

const decisionsToDFA = atn.decisionToState.map( (ds,
index) => new antlr4.dfa.DFA(ds, index) );

const sharedContextCache = new antlr4.PredictionContextCache();

export default class <parser.name> extends <superClass; null="antlr4.Parser"> {

  static grammarFileName = "<parser.grammarFileName; format="java-escape">";
  static literalNames = [ <parser.literalNames:{t | <t>}; null="null", separator=", ", wrap, anchor> ];
  static symbolicNames = [ <parser.symbolicNames:{t | <t>}; null="null", separator=", ", wrap, anchor> ];
  static ruleNames = [ <parser.ruleNames:{r | "<r">}; separator=", ", wrap, anchor> ];

  constructor(input) {
    super(input);
    this._interp = new antlr4.atn.ParserATNSimulator(this, atn, decisionsToDFA, sharedContextCache);
    this.ruleNames = <parser.name>.ruleNames;
    this.literalNames = <parser.name>.literalNames;
    this.symbolicNames = <parser.name>.symbolicNames;
    <namedActions.members>
  }

  get atn() {
    return atn;
  }

  <if(semPredFuncs)>

  sempred(localctx, ruleIndex, predIndex) {
    switch(ruleIndex) {
      <parser.sempredFuncs.values:{f | case <f.ruleIndex>:
return this.<f.name>_sempred(localctx, predIndex);}; separator="\n">
      default:
        throw "No predicate with index:" + ruleIndex;
    }
  }

  <sempredFuncs.values; separator="\n">
<endif>

<funcs; separator="\n">

```

```

}

<parser.name>.EOF = antlr4.Token.EOF;
<if(parser.tokens)>
<parser.tokens:{k | <parser.name>.<k> = <parser.tokens.(k)>;}; separator="\n", wrap, anchor>
<endif>

<parser.rules:{r | <parser.name>.RULE_<r.name> = <r.index>;}; separator="\n", wrap, anchor>

<funcs:{f | <ruleContexts(f)>;}; separator="\n">

<! Define fields of this parser to export the context classes !>
<parser.funcs:{f | <parser.name>.<f.ctxType> = <f.ctxType>;}; separator="\n">

>>

ruleContexts(currentRule) ::= <<
<currentRule.ruleCtx>

<currentRule.altLabelCtxs:{l | <currentRule.altLabelCtxs.(l)>;}; separator="\n">
>>

dumpActions(recog, argFuncs, actionFuncs,
  sempredFuncs) ::= <<
<if(actionFuncs)>
<lexer.name>.prototype.action = function(localctx, ruleIndex, actionIndex) {
  switch (ruleIndex) {
    <recog.actionFuncs.values:{f|
case <f.ruleIndex>:
  this.<f.name>_action(localctx, actionIndex);
  break;}; separator="\n">
  default:
    throw "No registered action for:" + ruleIndex;
  }
};

<actionFuncs.values; separator="\n">
<endif>
<if(sempredFuncs)>
<lexer.name>.prototype.sempred = function(localctx, ruleIndex, predIndex) {
  switch (ruleIndex) {
    <recog.sempredFuncs.values:{f| case <f.ruleIndex>:
return this.<f.name>_sempred(localctx, predIndex);}; separator="\n">
  default:
    throw "No registered predicate for:" + ruleIndex;
  }
};

```

```

<sempredFuncs.values; separator="\n">
<endif>
>>

/* This generates a private method since the actionIndex is generated, making an
* overriding implementation impossible to maintain.
*/
RuleActionFunction(r, actions) ::= <<

<lexer.name>.prototype.<r.name>_action = function(localctx , actionIndex)
{
switch (actionIndex) {
<actions:{index|
case <index>:
<actions.(index)>
break;}; separator="\n">
default:
throw "No registered action for:" + actionIndex;
}
};
>>

/* This generates a private method since the predIndex is generated, making an
* overriding implementation impossible to maintain.
*/
RuleSempredFunction(r, actions) ::= <<
<if (r.factory.g.lexer)><lexer.name>.prototype.<r.name>_sempred =
function<else><r.name>_sempred<endif>(localctx, predIndex) {
switch(predIndex) {
<actions:{index| case <index>:
return <actions.(index)>;}; separator="\n">
default:
throw "No predicate with index:" + predIndex;
}
};
>>

RuleFunction(currentRule,args,code,locals,ruleCtx,altLabelCtxs,namedActions,finallyAction,postamble,exceptions)
::= <<

<currentRule.name><(currentRule.args:{a | <a.name>}; separator=", ">) {
let localctx = new <currentRule.ctxType>(this, this._ctx, this.state<currentRule.args:{a | , <a.name>}>>);
this.enterRule(localctx, <currentRule.startState>,
<parser.name>.RULE_<currentRule.name>);
<namedActions.init>

```

```

<locals; separator="\n">
try {
  <code>
  <postamble; separator="\n">
  <namedActions.after>
<if(exceptions)>
<exceptions; separator="\n">
<else>
} catch (re) {
  if(re instanceof antlr4.error.RecognitionException) {
    localctx.exception = re;
    this._errHandler.reportError(this, re);
    this._errHandler.recover(this, re);
  } else {
    throw re;
  }
}<endif> finally {
  <finallyAction>
  this.exitRule();
}
return localctx;
}

```

>>

LeftRecursiveRuleFunction(currentRule,args,code,locals,ruleCtx,altLabelCtxs,  
namedAction,finallyAction,postamble) ::=

<<

```

<currentRule.name>(_p<if(currentRule.args)>, <args:{ a | , <a> }><endif>) {
  if(_p===undefined) {
    _p = 0;
  }
  const _parentctx = this._ctx;
  const _parentState = this.state;
  let localctx = new <currentRule.ctxType>(this, this._ctx, _parentState<args:{ a | , <a.name> }>);
  let _prevctx = localctx;
  const _startState = <currentRule.startState>;
  this.enterRecursionRule(localctx, <currentRule.startState>, <parser.name>.RULE_<currentRule.name>, _p);
  <namedActions.init>
  <locals; separator="\n">
  try {
    <code>
    <postamble; separator="\n">
    <namedActions.after>
  } catch( error) {
    if(error instanceof antlr4.error.RecognitionException) {
      localctx.exception = error;

```



```

        this._errHandler.reportError(this, error);
        this._errHandler.recover(this, error);
    } else {
        throw error;
    }
} finally {
    <finallyAction>
    this.unrollRecursionContexts(_parentctx)
}
return localctx;
}
>>

```

```

CodeBlockForOuterMostAlt(currentOuterMostAltCodeBlock, locals, preamble, ops) ::= <<
<if(currentOuterMostAltCodeBlock.altLabel)>localctx = new <currentOuterMostAltCodeBlock.altLabel;
format="cap">Context(this, localctx);<endif>
this.enterOuterAlt(localctx, <currentOuterMostAltCodeBlock.alt.altNum>);
<CodeBlockForAlt(currentAltCodeBlock=currentOuterMostAltCodeBlock,
...)>
>>

```

```

CodeBlockForAlt(currentAltCodeBlock, locals, preamble, ops) ::= <<
<locals; separator="\n">
<preamble; separator="\n">
<ops; separator="\n">
>>

```

```

LL1AltBlock(choice, preamble, alts, error) ::= <<
this.state = <choice.stateNumber>;
this._errHandler.sync(this);
<if(choice.label)><labelref(choice.label)> = this._input.LT(1);<endif>
<preamble; separator="\n">
switch(this._input.LA(1)) {
<choice.altLook,alts:{look,alt| <cases(ttypes=look)>
    <alt>
    break;}; separator="\n">
default:
    <error>
}
>>

```

```

LL1OptionalBlock(choice, alts, error) ::= <<
this.state = <choice.stateNumber>;
this._errHandler.sync(this);
switch (this._input.LA(1)) {
<choice.altLook,alts:{look,alt| <cases(ttypes=look)>
    <alt>

```

```

break;}; separator="\n">
default:
break;
}
>>

```

```

LL1OptionalBlockSingleAlt(choice, expr, alts, preamble, error, followExpr) ::= <<
this.state = <choice.stateNumber>;
this._errHandler.sync(this);
<preamble;
separator="\n">
if(<expr>) {
<alts; separator="\n">
}
<!else if ( !(<followExpr>) ) <error!>
>>

```

```

LL1StarBlockSingleAlt(choice, loopExpr, alts, preamble, iteration) ::= <<
this.state = <choice.stateNumber>;
this._errHandler.sync(this);
<preamble; separator="\n">
while(<loopExpr>) {
<alts; separator="\n">
this.state = <choice.loopBackStateNumber>;
this._errHandler.sync(this);
<iteration>
}
>>

```

```

LL1PlusBlockSingleAlt(choice, loopExpr, alts, preamble, iteration) ::= <<
this.state = <choice.blockStartStateNumber>; <! alt block decision !>
this._errHandler.sync(this);
<preamble; separator="\n">
do {
<alts; separator="\n">
this.state = <choice.stateNumber>; <! loopback/exit decision !>
this._errHandler.sync(this);
<iteration>
} while(<loopExpr>);
>>

```

```
// LL(*) stuff
```

```

AltBlock(choice, preamble, alts, error) ::= <<
this.state = <choice.stateNumber>;
this._errHandler.sync(this);
<if(choice.label)><labelref(choice.label)> = _input.LT(1)<endif>
<preamble;

```

```

separator="\n">
var la_ = this._interp.adaptivePredict(this._input,<choice.decision>,this._ctx);
switch(la_) {
<alts:{alt |
case <i>:
    <alt>
    break;
}; separator="\n">
}
>>

```

```

OptionalBlock(choice, alts, error) ::= <<
this.state = <choice.stateNumber>;
this._errHandler.sync(this);
var la_ = this._interp.adaptivePredict(this._input,<choice.decision>,this._ctx);
<alts:{alt |
if(la_===<i><if(!choice.ast.greedy)>+1<endif>) {
    <alt>
}; separator="\n} else ">
}
>>

```

```

StarBlock(choice, alts, sync, iteration) ::= <<
this.state = <choice.stateNumber>;
this._errHandler.sync(this);
let _alt = this._interp.adaptivePredict(this._input,<choice.decision>,this._ctx)
while(_alt!=<choice.exitAlt> && _alt!=antlr4.atn.ATN.INVALID_ALT_NUMBER) {
    if(_alt===1<if(!choice.ast.greedy)>+1<endif>) {
        <iteration>
        <alts> <! should only be one !>
    }
    this.state = <choice.loopBackStateNumber>;
    this._errHandler.sync(this);
    _alt = this._interp.adaptivePredict(this._input,<choice.decision>,this._ctx);
}
>>

```

```

PlusBlock(choice,
alts, error) ::= <<
this.state = <choice.blockStartStateNumber>; <! alt block decision !>
this._errHandler.sync(this);
let _alt = 1<if(!choice.ast.greedy)>+1<endif>;
do {
    switch (_alt) {
    <alts:{alt|
case <i><if(!choice.ast.greedy)>+1<endif>:
    <alt>

```

```

break;}; separator="\n">
default:
  <error>
}
this.state = <choice.loopBackStateNumber>; <! loopback/exit decision !>
this._errHandler.sync(this);
_alt = this._interp.adaptivePredict(this._input,<choice.decision>, this._ctx);
} while ( _alt!=<choice.exitAlt> && _alt!=antlr4.atn.ATN.INVALID_ALT_NUMBER );
>>

Sync(s) ::= "sync(<s.expecting.name>)"

ThrowNoViableAlt(t) ::= "throw new antlr4.error.NoViableAltException(this);"

TestSetInline(s) ::= <<
<s.bitsets:{bits | <if(rest(rest(bits.ttypes)))><bitsetBitfieldComparison(s, bits)><else><bitsetInlineComparison(s,
bits)><endif>}>; separator=" || ">
>>

// Javascript language spec - shift operators are 32 bits long max
testShiftInRange(shiftAmount)
::= <<
((<shiftAmount>) & ~0x1f) == 0
>>

// produces smaller bytecode only when bits.ttypes contains more than two items
bitsetBitfieldComparison(s, bits) ::= <%
(<testShiftInRange({<offsetShiftVar(s.varName, bits.shift)>})> && ((1 \<< <offsetShiftVar(s.varName,
bits.shift)>) & (<bits.ttypes:{ttype | (1 \<< <offsetShiftType(ttype, bits.shift)>)}>); separator=" | ">)) !== 0
%>

isZero ::= [
"0":true,
default:false
]

offsetShiftVar(shiftAmount, offset) ::= <%
<if(!isZero.(offset))><shiftAmount> - <offset><else><shiftAmount><endif>
%>

offsetShiftType(shiftAmount, offset) ::= <%
<if(!isZero.(offset))><parser.name>.<shiftAmount> - <offset><else><parser.name>.<shiftAmount><endif>
%>

// produces more efficient bytecode when bits.ttypes contains at most two items
bitsetInlineComparison(s, bits) ::= <%
<bits.ttypes:{ttype | <s.varName>===<parser.name>.<ttype>}>; separator=" || ">
%>

```

```

cases(ttypes) ::= <<
<types: {t | case <parser.name>.<t>}; separator="\n">
>>

InvokeRule(r, argExprsChunks)
 ::= <<
this.state = <r.stateNumber>;
<if(r.labels)><r.labels: {1 | <labelref(l)> =
}><endif>this.<r.name>(<if(r.ast.options.p)><r.ast.options.p><if(argExprsChunks)>,<endif><endif><argExprsChu
nks>);
>>

MatchToken(m) ::= <<
this.state = <m.stateNumber>;
<if(m.labels)><m.labels: {1 | <labelref(l)> = }><endif>this.match(<parser.name>.<m.name>);
>>

MatchSet(m, expr, capture) ::= "<CommonSetStuff(m, expr, capture, false)>"

MatchNotSet(m, expr, capture) ::= "<CommonSetStuff(m, expr, capture, true)>"

CommonSetStuff(m, expr, capture, invert) ::= <<
this.state = <m.stateNumber>;
<if(m.labels)><m.labels: {1 | <labelref(l)> = }>this._input.LT(1);<endif>
<capture>
<if(invert)>if(<m.varName>\<=0 || <expr>)<else>if(!(<expr>))<endif> {
  <if(m.labels)><m.labels: {1 | <labelref(l)> = }><endif>this._errHandler.recoverInline(this);
}
else {
  this._errHandler.reportMatch(this);
  this.consume();
}
>>

Wildcard(w) ::= <<
this.state = <w.stateNumber>;
<if(w.labels)><w.labels: {1 | <labelref(l)>
= }><endif>this.matchWildcard();
>>

// ACTION STUFF

Action(a, foo, chunks) ::= "<chunks>"

ArgAction(a, chunks) ::= "<chunks>"

SemPred(p, chunks, failChunks) ::= <<

```

```

this.state = <p.stateNumber>;
if (!( <chunks>)) {
    throw new antlr4.error.FailedPredicateException(this, <p.predicate><if(failChunks)>,
<failChunks><elseif(p.msg)>, <p.msg><endif>);
}
>>

ExceptionClause(e, catchArg, catchAction) ::= <<
catch (<catchArg>) {
    <catchAction>
}
>>

// lexer actions are not associated with model objects

LexerSkipCommand() ::= "this.skip()"
LexerMoreCommand() ::= "this.more()"
LexerPopModeCommand() ::= "this.popMode()"
LexerTypeCommand(arg, grammar) ::= "this._type = <arg>"
LexerChannelCommand(arg, grammar) ::= "this._channel = <arg>"
LexerModeCommand(arg, grammar) ::= "this._mode = <arg>"
LexerPushModeCommand(arg, grammar) ::= "this.pushMode(<arg>)"

ActionText(t) ::= "<t.text>"
ActionTemplate(t) ::= "<t.st>"
ArgRef(a) ::= "localctx.<a.name>"
LocalRef(a) ::= "localctx.<a.name>"
RetValRef(a)
    ::= "localctx.<a.name>"
QRetValRef(a) ::= "<ctx(a)>.<a.dict>.<a.name>"
/** How to translate $tokenLabel */
TokenRef(t) ::= "<ctx(t)>.<t.name>"
LabelRef(t) ::= "<ctx(t)>.<t.name>"
ListLabelRef(t) ::= "<ctx(t)>.<ListLabelName(t.name)>"
SetAttr(s,rhsChunks) ::= "<ctx(s)>.<s.name> = <rhsChunks>"

TokenLabelType() ::= "<file.TokenLabelType; null={Token}>"
InputSymbolType() ::= "<file.InputSymbolType; null={Token}>"

TokenPropertyRef_text(t) ::= "<ctx(t)>.<t.label>===null ? null : <ctx(t)>.<t.label>.text)"
TokenPropertyRef_type(t) ::= "<ctx(t)>.<t.label> === null ? 0 : <ctx(t)>.<t.label>.type)"
TokenPropertyRef_line(t) ::= "<ctx(t)>.<t.label> === null ? 0 : <ctx(t)>.<t.label>.line)"
TokenPropertyRef_pos(t) ::= "<ctx(t)>.<t.label> === null ? 0 : <ctx(t)>.<t.label>.column)"
TokenPropertyRef_channel(t) ::= "<ctx(t)>.<t.label> === null ? 0 : <ctx(t)>.<t.label>.channel)"
TokenPropertyRef_index(t) ::= "<ctx(t)>.<t.label> === null ? 0 : <ctx(t)>.<t.label>.tokenIndex)"
TokenPropertyRef_int(t)
    ::= "<ctx(t)>.<t.label> === null ? 0 : parseInt(<ctx(t)>.<t.label>.text)"

```

```

RulePropertyRef_start(r) ::= "<ctx(r)>.<r.label>===null ? null : <ctx(r)>.<r.label>.start"
RulePropertyRef_stop(r) ::= "<ctx(r)>.<r.label>===null ? null : <ctx(r)>.<r.label>.stop"
RulePropertyRef_text(r) ::= "<ctx(r)>.<r.label>===null ? null : this._input.getText(new antlr4.Interval(<ctx(r)>.<r.label>.start,<ctx(r)>.<r.label>.stop)))"
RulePropertyRef_ctx(r) ::= "<ctx(r)>.<r.label>"
RulePropertyRef_parser(r) ::= "this"

ThisRulePropertyRef_start(r) ::= "localctx.start"
ThisRulePropertyRef_stop(r) ::= "localctx.stop"
ThisRulePropertyRef_text(r) ::= "this._input.getText(new antlr4.Interval(localctx.start, this._input.LT(-1)))"
ThisRulePropertyRef_ctx(r) ::= "localctx"
ThisRulePropertyRef_parser(r) ::= "this"

NonLocalAttrRef(s) ::= "this.getInvokingContext(<s.ruleIndex>).<s.name>"
SetNonLocalAttr(s, rhsChunks) ::= "this.getInvokingContext(<s.ruleIndex>).<s.name> = <rhsChunks>"

AddToLabelList(a)
 ::= "<ctx(a.label)>.<a.listName>.push(<labelref(a.label)>);"

TokenDecl(t) ::= "this.<t.name> = null; // <TokenLabelType()>"
TokenTypeDecl(t) ::= "var <t.name> = 0; // <TokenLabelType()> type"
TokenListDecl(t) ::= "this.<t.name> = []; // of <TokenLabelType()>s"
RuleContextDecl(r) ::= "this.<r.name> = null; // <r.ctxName>"
RuleContextListDecl(rdecl) ::= "this.<rdecl.name> = []; // of <rdecl.ctxName>s"

ContextTokenGetterDecl(t) ::= <<
<t.name>() {
    return this.getToken(<parser.name>.<t.name>, 0);
};
>>

// should never be called
ContextTokenListGetterDecl(t) ::= <<
<t.name>_list() {
    return this.getTokens(<parser.name>.<t.name>);
}
>>

ContextTokenListIndexedGetterDecl(t) ::= <<
<t.name> = function(i) {
    if(i===undefined) {
        i = null;
    }
    if(i===null) {
        return this.getTokens(<parser.name>.<t.name>);
    } else {
        return this.getToken(<parser.name>.<t.name>, i);
    }
}

```

```

};

>>

ContextRuleGetterDecl(r) ::= <<
<r.name>() {
    return this.getTypedRuleContext(<r.ctxName>,0);
};
>>

// should never be called
ContextRuleListGetterDecl(r) ::= <<
<r.name>_list() {
    return this.getTypedRuleContexts(<parser.name>.<r.ctxName>);
}
>>

ContextRuleListIndexedGetterDecl(r) ::= <<
<r.name> = function(i) {
    if(i===undefined) {
        i = null;
    }
    if(i===null) {
        return this.getTypedRuleContexts(<r.ctxName>);
    } else {
        return this.getTypedRuleContext(<r.ctxName>,i);
    }
};
>>

LexerRuleContext() ::= "RuleContext"

/** The rule context name is the rule followed by a suffix; e.g.,
 * r becomes rContext.
 */
RuleContextNameSuffix() ::= "Context"

ImplicitTokenLabel(tokenName) ::= "_<tokenName>"
ImplicitRuleLabel(ruleName) ::= "_<ruleName>"
ImplicitSetLabel(id) ::= "_tset<id>"
ListLabelName(label) ::= "<label>"

CaptureNextToken(d) ::= "<d.varName> = self._input.LT(1)"
CaptureNextTokenType(d) ::= "<d.varName> = this._input.LA(1);"

StructDecl(struct,ctorAttrs,attrs, getters,dispatchMethods,interfaces,extensionMembers)
::= <<
class <struct.name> extends <if(contextSuperClass)><contextSuperClass><else>antlr4.ParserRuleContext<endif> {

```



```

constructor(parser, parent, invokingState<struct.ctorAttrs:{ a | , <a.name>}>) {
  if(parent===undefined) {
    parent = null;
  }
  if(invokingState===undefined || invokingState===null) {
    invokingState = -1;
  }
  super(parent, invokingState);
  this.parser = parser;
  this.ruleIndex = <parser.name>.RULE_<struct.derivedFromName>;
  <attrs:{ a | <a>}; separator="\n">
  <struct.ctorAttrs:{ a | this.<a.name> = <a.name> || null;}; separator="\n">
}

<getters:{ g | <g>}; separator="\n\n">

<if(struct.provideCopyFrom)> <! don't need copy unless we have subclasses !>
copyFrom(ctx) {
  super.copyFrom(ctx);
  <struct.attrs:{ a | this.<a.name> = ctx.<a.name>;}; separator="\n">
}
<endif>
<dispatchMethods; separator="\n">
<extensionMembers; separator="\n">

}

>>

AltLabelStructDecl(struct,attrs,getters,dispatchMethods)
::= <<
class <struct.name> extends <struct.parentRule; format="cap">Context {

  constructor(parser, ctx) {
    super(parser);
    <attrs:{ a | <a>}; separator="\n">
    super.copyFrom(ctx);
  }

  <getters:{ g | <g>}; separator="\n\n">

  <dispatchMethods; separator="\n">

}

<! Define fields of this parser to export this struct/context class !>
<parser.name>.<struct.name> = <struct.name>;

```

>>

```
ListenerDispatchMethod(method) ::= <<
<if(method.isEnter)>enter<else>exit<endif>Rule(listener) {
  if(listener instanceof <parser.grammarName>Listener ) {
    listener.<if(method.isEnter)>enter<else>exit<endif><<struct.derivedFromName; format="cap">(this);
  }
}
```

>>

```
VisitorDispatchMethod(method) ::= <<
accept(visitor) {
  if ( visitor instanceof <parser.grammarName>Visitor ) {
    return visitor.visit<<struct.derivedFromName; format="cap">(this);
  } else {
    return visitor.visitChildren(this);
  }
}
```

>>

```
AttributeDecl(d)
::= "this.<d.name> = <if(d.initValue)><d.initValue><else>null<endif>"
```

```
/** If we don't know location of label def x, use this template */
```

```
labelref(x) ::= "<if(!x.isLocal)>localctx.<endif><x.name>"
```

```
/** For any action chunk, what is correctly-typed context struct ptr? */
```

```
ctx(actionChunk) ::= "localctx"
```

```
// used for left-recursive rules
```

```
recRuleAltPredicate(ruleName,opPrec) ::= "this.precpred(this._ctx, <opPrec>)"
```

```
recRuleSetReturnAction(src,name) ::= "$<name>=$<src>.<name>"
```

```
recRuleSetStopToken() ::= "this._ctx.stop = this._input.LT(-1);"
```

```
recRuleAltStartAction(ruleName, ctxName, label) ::= <<
```

```
localctx = new <ctxName>Context(this, _parentctx, _parentState);
```

```
<if(label)>localctx.<label> = _prevctx;<endif>
```

```
this.pushNewRecursionContext(localctx, _startState, <parser.name>.RULE_<ruleName>);
```

>>

```
recRuleLabeledAltStartAction(ruleName, currentAltLabel, label, isListLabel) ::= <<
```

```
localctx = new <currentAltLabel; format="cap">Context(this, new <ruleName; format="cap">Context(this,
  _parentctx, _parentState));
```

```
<if(label)>
```

```
<if(isListLabel)>
```

```

localctx.<label>.push(_prevctx);
<else>
localctx.<label> = _prevctx;
<endif>
<endif>
this.pushNewRecursionContext(localctx, _startState, <parser.name>.RULE_<ruleName>);
>>

recRuleReplaceContext(ctxName) ::= <<
localctx = new <ctxName>Context(this, localctx);
this._ctx = localctx;
_prevctx = localctx;
>>

recRuleSetPrevCtx() ::= <<
if(this._parseListeners!==null) {
    this.triggerExitRuleEvent();
}
_prevctx = localctx;
>>

LexerFile(lexerFile, lexer, namedActions) ::= <<
<fileHeader(lexerFile.grammarFileName, lexerFile.ANTLRVersion)>
import antlr4 from 'antlr4';

<namedActions.header>

<lexer>

>>

Lexer(lexer, atn, actionFuncs, sempredFuncs, superClass) ::= <<
<if(superClass)>
import <superClass> from './<superClass>.js';
<endif>

<atn>

const atn = new antlr4.atn.ATNDeserializer().deserialize(serializedATN);

const decisionsToDFA = atn.decisionToState.map( (ds, index) => new antlr4.dfa.DFA(ds, index)
);

export default class <lexer.name> extends <if(superClass)><superClass><else>antlr4.Lexer<endif> {

    static grammarFileName = "<lexer.grammarFileName>";
    static channelNames = [ "DEFAULT_TOKEN_CHANNEL", "HIDDEN"<if (lexer.channels)>,

```

```

<lexer.channels:{c | "<c>"}; separator=", ", wrap, anchor><endif> ];
static modeNames = [ <lexer.modes:{m | "<m>"}; separator=", ", wrap, anchor> ];
static literalNames = [ <lexer.literalNames:{t | <t>}; null="null", separator=", ", wrap, anchor> ];
static symbolicNames = [ <lexer.symbolicNames:{t | <t>}; null="null", separator=", ", wrap, anchor> ];
static ruleNames = [ <lexer.ruleNames:{r | "<r>"}; separator=", ", wrap, anchor> ];

constructor(input) {
    super(input)
    this._interp = new antlr4.atn.LexerATNSimulator(this, atn, decisionsToDFA, new
antlr4.PredictionContextCache());
    <namedActions.members>
}

get atn() {
    return atn;
}
}

<lexer.name>.EOF = antlr4.Token.EOF;
<lexer.tokens:{k | <lexer.name>.<k>
= <lexer.tokens.(k)>;}; separator="\n", wrap, anchor>

<if(lexer.channels)>
<lexer.channels:{c | <lexer.name>.<c> = <lexer.channels.(c)>;}; separator="\n">

<endif>
<if(rest(lexer.modes))>
<rest(lexer.modes):{m | <lexer.name>.<m> = <i>;}; separator="\n">

<endif>

<dumpActions(lexer, "", actionFuncs, sempredFuncs)>

>>

SerializedATN(model) ::= <<
<! only one segment, can be inlined !>

const serializedATN = ["<model.serialized; wrap={",<\n> " }>"].join("");

>>

/** Using a type to init value map, try to init a type; if not in table
* must be an object, default value is "null".
*/
initValue(typeName) ::= <<
<javascriptTypeInitMap.(typeName)>

```

>>

```
codeFileExtension() ::= ".js"
```

Found in path(s):

```
* /opt/cola/permits/1020749546_1607585150.55/0/antlr-4-9-complete-jar/org/antlr/v4/tool/templates/codegen/JavaScript/JavaScript.stg
```

## 1.157 go-jmespath 0.2.2

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# 1.160 afero 1.1.0

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## 1.161 less 481

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Version 3, 29 June 2007

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# 1.163 grpc 1.21.1

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## 1.164 nghttp 1.23.1

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Bud1ghttp2libnghttp2-1.23.1dsclbool @ @ @ @EDSDB ` @ @ @

## 1.165 bolt

# e9cf4fae01b5a8ff89d0ec6b32f0d9c9f79aefdd

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```

```
// Parts inspired by https://github.com/ryanuber/go-license
```

```
package cmd
```

```
func initApache2() {
    Licenses["apache"] = License{
        Name: "Apache 2.0",
        PossibleMatches: []string{"apache", "apache20", "apache 2.0", "apache2.0", "apache-2.0"},
        Header: `Licensed under the Apache License, Version 2.0 (the "License");
you may not use this file except in compliance with the License.
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obtain a copy of the License at
```

```
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```
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```

```
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```

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```
`  
}  
}
```

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```

```
package cmd
```

```
func initGpl3() {
```

```
    Licenses["gpl3"] = License{
```

```
        Name:      "GNU General Public License 3.0",
```

```
        PossibleMatches: []string{"gpl3", "gplv3", "gpl", "gnu gpl3", "gnu gpl"},
```

```
        Header: `{{.copyright}}`
```

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```
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```

```
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```

```
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```

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```
`  
`  
}  
}  
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```

```
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```

```
package cmd
```

```
func initBsdClause2() {
    Licenses["freebsd"] = License{
        Name: "Simplified BSD License",
        PossibleMatches: []string{"freebsd", "simpbsd", "simple bsd", "2-clause bsd",
            "2 clause bsd", "simplified bsd license"},
        Header: `
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```

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```
`  
`  
}  
}  
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```

```
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```

```
package cmd
```

```
func initMit() {  
    Licenses["mit"] = License{  
        Name:      "Mit",  
        PossibleMatches: []string{"mit"},  
        Header: `Permission is hereby granted, free of charge, to any person obtaining a copy
```

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```
`  
}  
}
```

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package cmd

import (
    "strings"
    "time"

    "github.com/spf13/viper"
)

// Licenses contains all possible licenses a user can choose from.
var Licenses = make(map[string]License)

// License represents a software license agreement, containing the Name of
// the license, its possible matches (on the command line as given to cobra),
// the
// header to be used with each file on the file's creating, and the text
// of the license
type License struct {
    Name      string // The type of license in use
    PossibleMatches []string // Similar names to guess
    Text      string // License text data
    Header    string // License header for source files
}

func init() {
    // Allows a user to not use a license.
    Licenses["none"] = License{"None", []string{"none", "false", "", ""}}

    initApache2()
    initMit()
    initBsdClause3()
    initBsdClause2()
    initGpl2()
    initGpl3()
    initLgpl()
    initAgpl()
}

// getLicense returns license specified by user in flag or in config.

```

```

// If user didn't specify the license, it returns Apache License 2.0.
//
// TODO: Inspect project for existing license
func getLicense() License {
// If explicitly flagged, use that.
if userLicense != "" {
return findLicense(userLicense)
}

// If user wants to have custom license, use that.
if viper.IsSet("license.header") || viper.IsSet("license.text")
{
return License{Header: viper.GetString("license.header"),
Text: "license.text"}
}

// If user wants to have built-in license, use that.
if viper.IsSet("license") {
return findLicense(viper.GetString("license"))
}

// If user didn't set any license, use Apache 2.0 by default.
return Licenses["apache"]
}

func copyrightLine() string {
author := viper.GetString("author")
year := time.Now().Format("2006")

return "Copyright " + year + " " + author
}

// findLicense looks for License object of built-in licenses.
// If it didn't find license, then the app will be terminated and
// error will be printed.
func findLicense(name string) License {
found := matchLicense(name)
if found == "" {
er("unknown license: " + name)
}
return Licenses[found]
}

// matchLicense compares the given a license name
// to PossibleMatches of all built-in licenses.
// It returns blank string, if name is blank string or it didn't find
// then appropriate match to name.
func matchLicense(name

```

```

string) string {
if name == "" {
return ""
}

for key, lic := range Licenses {
for _, match := range lic.PossibleMatches {
if strings.EqualFold(name, match) {
return key
}
}
}

return ""
}

```

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```

package cmd

```
func initGpl2() {
Licenses["gpl2"] = License{
    Name: "GNU General Public License 2.0",
    PossibleMatches: []string{"gpl2", "gnu gpl2", "gplv2"},
    Header: `{{.copyright}}`
}
```

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```

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```

```
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```
`  
}  
}  
package cmd
```

```
func initLgpl() {
```

```
Licenses["lgpl"] = License{
  Name:      "GNU Lesser General Public License",
  PossibleMatches: []string{"lgpl", "lesser gpl", "gnu lgpl"},
  Header: `{{.copyright}}`
```

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```
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```

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```
},  
}  
}
```

```
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```

package cmd

```
func initBsdClause3() {
    Licenses["bsd"] = License{
        Name:      "NewBSD",
        PossibleMatches: []string{"bsd", "newbsd", "3 clause bsd", "3-clause bsd"},
        Header: `
All rights reserved.
```

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```
`  
}  
}
```

```
package cmd
```

```
func initAgpl() {  
    Licenses["agpl"] = License{  
        Name: "GNU Affero General Public License",  
        PossibleMatches: []string{"agpl", "affero gpl", "gnu agpl"},  
        Header: `{{.copyright}}`  
    }  
}
```

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## 1.176 logrus

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# 1.178 jansson 2.5

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The source package was downloaded from  
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Upstream Author(s): Tobias Oetiker <oetiker@ee.ethz.ch>

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Simon Leinen

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Peter Stamfest <peter@stamfest.at> initial multi-thread support  
David L. Barker <dave@ncomtech.com> xport function bug fixes  
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Peter Speck <speck@vitality.dk> eps/svg/pdf file format code in rrdtool-1.x  
David Grimes <dgrimes@navisite.com> SQRT/SORT/REV/SHIFT/TREND  
Henrik Storner <henrik@hsw.n.dk> make rrd\_graph() provide the min/max values of data in graph  
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#### Internet Resources

LAN Services AG ([www.lan.ch](http://www.lan.ch))  
for the <http://rrdtool.eu.org> domain reflector

Alexander Lucke ([lucke@dns-net.de](mailto:lucke@dns-net.de))  
and DNS:NET Internet Services ([www.dns-net.de](http://www.dns-net.de))  
for <http://rrdtool.org>

Further I would like to note, that RRDtool would not exist without  
the following free software products:

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cgilib by Martin Schulze  
zlib by Jean-loup Gailly and Mark Adler  
SNMP Perl-Module by Simon Leinen

and last but not least

Linux by Linus Torvalds

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During Summer 1999 CAIDA ([www.caida.org](http://www.caida.org)) has supported me in working full  
time on RRDtool ... A big thank you to them as well.

Tobias Oetiker <[oetiker@ee.ethz.ch](mailto:oetiker@ee.ethz.ch)>

## 1.180 properties 1.7.6

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goproperties - properties file decoder for Go

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Python was created in the early 1990s by Guido van Rossum at Stichting Mathematisch Centrum (CWI, see <http://www.cwi.nl>) in the Netherlands as a successor of a language called ABC. Guido remains Python's principal author, although it includes many contributions from others.

In 1995, Guido continued his work on Python at the Corporation for National Research Initiatives (CNRI, see <http://www.cnri.reston.va.us>) in Reston, Virginia where he released several versions of the software.

In May 2000, Guido and the Python core development team moved to BeOpen.com to form the BeOpen PythonLabs team. In October of the same year, the PythonLabs team moved to Digital Creations, which became Zope Corporation. In 2001, the Python Software Foundation (PSF, see <https://www.python.org/psf/>) was formed, a non-profit organization created specifically to own Python-related Intellectual Property. Zope Corporation was a sponsoring member of the PSF.

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1.3 thru 1.5.2	1.2	1995-1999	CNRI	yes
1.6	1.5.2	2000	CNRI	no
2.0	1.6	2000	BeOpen.com	no
1.6.1	1.6	2001	CNRI	yes (2)
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2.0.1	2.0+1.6.1	2001	PSF	yes
2.1.1	2.1+2.0.1	2001	PSF	yes
2.1.2	2.1.1	2002	PSF	yes
2.1.3	2.1.2	2002	PSF	yes
2.2 and above	2.1.1	2001-now	PSF	yes

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## 1.187 ipmiutil 1.8.9

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Upstream-Contact: Andy Cress <arcress at users.sourceforge.net>

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The End

## 1.189 quartz 2.3.2

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## 1.193 openssl 1.0.1e

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```

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# 1.197 xz 5.0.4

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\* /opt/ws\_local/PERMITS\_SQL/1050086594\_1591660967.89/0/setuptools-20-10-1-1-tar-gz/setuptools-20.10.1/setuptools.egg-info/PKG-INFO

\* /opt/ws\_local/PERMITS\_SQL/1050086594\_1591660967.89/0/setuptools-20-10-1-1-tar-gz/setuptools-20.10.1/PKG-INFO

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\* /opt/ws\_local/PERMITS\_SQL/1050086594\_1591660967.89/0/setuptools-20-10-1-1-tar-gz/setuptools-20.10.1/pkg\_resources/\_vendor/packaging/\_about\_\_.py

\* /opt/ws\_local/PERMITS\_SQL/1050086594\_1591660967.89/0/setuptools-20-10-1-1-tar-gz/setuptools-20.10.1/pkg\_resources/\_vendor/packaging/specifiers.py

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\* /opt/ws\_local/PERMITS\_SQL/1050086594\_1591660967.89/0/setuptools-20-10-1-1-tar-gz/setuptools-20.10.1/pkg\_resources/\_vendor/packaging/utis.py

\*

/opt/ws\_local/PERMITS\_SQL/1050086594\_1591660967.89/0/setuptools-20-10-1-1-tar-gz/setuptools-20.10.1/pkg\_resources/\_vendor/packaging/\_structures.py

\* /opt/ws\_local/PERMITS\_SQL/1050086594\_1591660967.89/0/setuptools-20-10-1-1-tar-gz/setuptools-20.10.1/pkg\_resources/\_vendor/packaging/version.py

\* /opt/ws\_local/PERMITS\_SQL/1050086594\_1591660967.89/0/setuptools-20-10-1-1-tar-gz/setuptools-20.10.1/pkg\_resources/\_vendor/packaging/\_init\_\_.py

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## Building and Distributing Packages with Setuptools

---

---

``Setuptools`` is a collection of enhancements to the Python ``distutils`` (for Python 2.6 and up) that allow developers to more easily build and distribute Python packages, especially ones that have dependencies on other packages.

Packages built and distributed using ``setuptools`` look to the user like ordinary Python packages based on the ``distutils``. Your users don't need to install or even know about setuptools in order to use them, and you don't have to include the entire setuptools package in your distributions. By including just a single bootstrap module (a 12K .py file), your package will automatically download and install ``setuptools`` if the user is building your package from source and doesn't have a suitable version already installed.

.. \_bootstrap  
module: [https://bootstrap.pypa.io/ez\\_setup.py](https://bootstrap.pypa.io/ez_setup.py)

### Feature Highlights:

- \* Automatically find/download/install/upgrade dependencies at build time using the EasyInstall tool <[easy\\_install.html](#)>, which supports downloading via HTTP, FTP, Subversion, and SourceForge, and automatically scans web pages linked from PyPI to find download links. (It's the closest thing to CPAN currently available for Python.)
- \* Create Python Eggs <<http://peak.telecommunity.com/DevCenter/PythonEggs>> - a single-file importable distribution format
- \* Enhanced support for accessing data files hosted in zipped packages.
- \* Automatically include all packages in your source tree, without listing them individually in setup.py
- \* Automatically include all relevant files in your source distributions, without needing to create a ``MANIFEST.in`` file, and without having to force regeneration of the ``MANIFEST`` file when your source tree changes.
- \* Automatically generate wrapper scripts or Windows (console and GUI) .exe files for any number of "main" functions in your project. (Note: this is not a py2exe replacement; the .exe files rely on the local Python installation.)
- \* Transparent Pyrex support, so that your setup.py can list ``.pyx`` files and still work even when the end-user doesn't have Pyrex installed (as long as you include the Pyrex-generated C in your source distribution)

- \* Command aliases - create project-specific, per-user, or site-wide shortcut names for commonly used commands and options
- \* PyPI upload support - upload your source distributions and eggs to PyPI
- \* Deploy your project in "development mode", such that it's available on `sys.path`, yet can still be edited directly from its source checkout.
- \* Easily extend the distutils with new commands or `setup()` arguments, and distribute/reuse your extensions for multiple projects, without copying code.
- \* Create extensible applications and frameworks that automatically discover extensions, using simple "entry points" declared in a project's setup script.

In addition to the PyPI downloads, the development version of `setuptools` is available from the `Python SVN sandbox`, and in-development versions of the `0.6 branch` are available as well.

`.._0.6 branch`: <http://svn.python.org/projects/sandbox/branches/setuptools-0.6/#egg=setuptools-dev06>

`.._Python SVN sandbox`: <http://svn.python.org/projects/sandbox/trunk/setuptools/#egg=setuptools-dev>

`.. contents::` **Table of Contents**

`.._ez_setup.py`: `bootstrap module`

-----  
 Developer's Guide  
 -----

Installing `setuptools`

=====

Please follow the `EasyInstall Installation Instructions` to install the current stable version of `setuptools`. In particular, be sure to read the section on `Custom Installation Locations` if you are installing anywhere other than Python's `site-packages` directory.

`.._EasyInstall Installation Instructions`: [easy\\_install.html#installation-instructions](http://easy_install.html#installation-instructions)

`.._Custom Installation Locations`: [easy\\_install.html#custom-installation-locations](http://easy_install.html#custom-installation-locations)

If you want the current in-development version of `setuptools`, you should first

install a stable version, and then run::

```
ez_setup.py setuptools==dev
```

This will download and install the latest development (i.e. unstable) version of setuptools from the Python Subversion sandbox.

## Basic Use

=====

For basic use of setuptools, just import things from setuptools instead of the distutils. Here's a minimal setup script using setuptools::

```
from setuptools import setup, find_packages
setup(
    name = "HelloWorld",
    version = "0.1",
    packages = find_packages(),
)
```

As you can see, it doesn't take much to use setuptools in a project. Run that script in your project folder, alongside the Python packages you have developed.

Invoke that script to produce eggs, upload to PyPI, and automatically include all packages in the directory where the setup.py lives. See the ``Command Reference`_` section below to see what commands you can give to this setup script. For example, to produce a source distribution, simply invoke::

```
python setup.py sdist
```

Of course, before you release your project to PyPI, you'll want to add a bit more information to your setup script to help people find or learn about your project. And maybe your project will have grown by then to include a few dependencies, and perhaps some data files and scripts::

```
from setuptools import setup, find_packages
setup(
    name = "HelloWorld",
    version = "0.1",
    packages = find_packages(),
    scripts = ['say_hello.py'],

    # Project uses reStructuredText, so ensure that the docutils get
    # installed or upgraded on the target machine
```

```

install_requires = ['docutils>=0.3'],

package_data = {
    # If any package contains *.txt or *.rst files, include them:
    '*': ['*.txt', '*.rst'],
    # And include any *.msg
files found in the 'hello' package, too:
    'hello': ['*.msg'],
},

# metadata for upload to PyPI
author = "Me",
author_email = "me@example.com",
description = "This is an Example Package",
license = "PSF",
keywords = "hello world example examples",
url = "http://example.com/HelloWorld/", # project home page, if any

# could also include long_description, download_url, classifiers, etc.
)

```

In the sections that follow, we'll explain what most of these ``setup()`` arguments do (except for the metadata ones), and the various ways you might use them in your own project(s).

## Specifying Your Project's Version

-----

Setuptools can work well with most versioning schemes; there are, however, a few special things to watch out for, in order to ensure that setuptools and EasyInstall can always tell what version of your package is newer than another version. Knowing these things will also help you correctly specify what versions of other projects your project depends on.

A version consists of an alternating series of release numbers and pre-release or post-release tags. A release number is a series of digits punctuated by dots, such as ``2.4`` or ``0.5``. Each series of digits is treated numerically, so releases ``2.1`` and ``2.1.0`` are different ways to spell the same release number, denoting the first subrelease of release 2. But ``2.10`` is the *tenth* subrelease of release 2, and so is a different and newer release from ``2.1`` or ``2.1.0``. Leading zeros within a series of digits are also ignored, so ``2.01`` is the same as ``2.1``, and different from ``2.0.1``.

Following a release number, you can have either a pre-release or post-release tag. Pre-release tags make a version be considered *older* than the version they are appended to. So, revision ``2.4`` is *newer* than revision ``2.4c1``,

which in turn is newer than `2.4b1` or `2.4a1`. Postrelease

tags make

a version be considered *newer* than the version they are appended to. So, revisions like `2.4-1` and `2.4pl3` are newer than `2.4`, but are *older* than `2.4.1` (which has a higher release number).

A pre-release tag is a series of letters that are alphabetically before "final". Some examples of prerelease tags would include `alpha`, `beta`, `a`, `c`, `dev`, and so on. You do not have to place a dot or dash before the prerelease tag if it's immediately after a number, but it's okay to do so if you prefer. Thus, `2.4c1` and `2.4.c1` and `2.4-c1` all represent release candidate 1 of version `2.4`, and are treated as identical by `setuptools`.

In addition, there are three special prerelease tags that are treated as if they were the letter `c`: `pre`, `preview`, and `rc`. So, version `2.4rc1`, `2.4pre1` and `2.4preview1` are all the exact same version as `2.4c1`, and are treated as identical by `setuptools`.

A post-release

tag is either a series of letters that are alphabetically greater than or equal to "final", or a dash (`-`). Post-release tags are generally used to separate patch numbers, port numbers, build numbers, revision numbers, or date stamps from the release number. For example, the version `2.4-r1263` might denote Subversion revision 1263 of a post-release patch of version `2.4`. Or you might use `2.4-20051127` to denote a date-stamped post-release.

Notice that after each pre or post-release tag, you are free to place another release number, followed again by more pre- or post-release tags. For example, `0.6a9.dev-r41475` could denote Subversion revision 41475 of the in-development version of the ninth alpha of release 0.6. Notice that `dev` is a pre-release tag, so this version is a *lower* version number than `0.6a9`, which would be the actual ninth alpha of release 0.6. But the `-r41475` is a post-release tag, so this version is *newer* than `0.6a9.dev`.

For the

most part, `setuptools`' interpretation of version numbers is intuitive, but here are a few tips that will keep you out of trouble in the corner cases:

\* Don't stick adjoining pre-release tags together without a dot or number between them. Version `1.9adev` is the `adev` prerelease of `1.9`, *not* a development pre-release of `1.9a`. Use `.dev` instead, as in `1.9a.dev`, or separate the prerelease tags with a number, as in `1.9a0dev`. `1.9a.dev`, `1.9a0dev`, and even `1.9.a.dev` are identical versions from `setuptools`' point of view, so you can use whatever scheme you prefer.

\* If you want to be certain that your chosen numbering scheme works the way you think it will, you can use the `pkg_resources.parse_version()` function to compare different version numbers::

```
>>> from pkg_resources import parse_version
>>> parse_version('1.9.a.dev') == parse_version('1.9a0dev')
True
>>> parse_version('2.1-rc2') < parse_version('2.1')
True
>>> parse_version('0.6a9dev-r41475') < parse_version('0.6a9')
True
```

Once you've decided on a version numbering scheme for your project, you can have `setuptools` automatically tag your in-development releases with various pre- or post-release tags. See the following sections for more details:

- \* `Tagging and "Daily Build" or "Snapshot" Releases`
- \* `Managing "Continuous Releases" Using Subversion`
- \* The `egg_info` command

#### New and Changed `setup()` Keywords

=====

The following keyword arguments to `setup()` are added or changed by `setuptools`. All of them are optional; you do not have to supply them unless you need the associated `setuptools` feature.

##### `include_package_data`

If set to `True`, this tells `setuptools` to automatically include any data files it finds inside your package directories that are specified by your `MANIFEST.in` file. For more information, see the section below on `Including Data Files`.

##### `exclude_package_data`

A dictionary mapping package names to lists of glob patterns that should be *excluded* from your package directories. You can use this to trim back any excess files included by `include_package_data`. For a complete description and examples, see the section below on `Including Data Files`.

##### `package_data`

A dictionary mapping package names to lists of glob patterns. For a complete description and examples, see the section below on `Including Data Files`. You do not need to use this option if you are using `include_package_data`, unless you need to add e.g. files that are generated by your setup script and build process. (And are therefore not in source control or are files that you don't want to include in your source distribution.)



```zip_safe```

A boolean (True or False) flag specifying whether the project can be safely installed and run from a zip file. If this argument is not supplied,

the ```bdist_egg``` command will have to analyze all of your project's contents for possible problems each time it builds an egg.

```install_requires```

A string or list of strings specifying what other distributions need to be installed when this one is. See the section below on ```Declaring Dependencies``` for details and examples of the format of this argument.

```entry_points```

A dictionary mapping entry point group names to strings or lists of strings defining the entry points. Entry points are used to support dynamic discovery of services or plugins provided by a project. See ```Dynamic Discovery of Services and Plugins``` for details and examples of the format of this argument. In addition, this keyword is used to support ```Automatic Script Creation```.

```extras_require```

A dictionary mapping names of "extras" (optional features of your project) to strings or lists of strings specifying what other distributions must be installed to

support those features. See the section below on ```Declaring Dependencies``` for details and examples of the format of this argument.

```setup_requires```

A string or list of strings specifying what other distributions need to be present in order for the `*setup script*` to run. ```setuptools``` will attempt to obtain these (even going so far as to download them using ```EasyInstall```) before processing the rest of the setup script or commands. This argument is needed if you are using distutils extensions as part of your build process; for example, extensions that process `setup()` arguments and turn them into EGG-INFO metadata files.

(Note: projects listed in ```setup_requires``` will NOT be automatically installed on the system where the setup script is being run. They are simply downloaded to the `./eggs` directory if they're not locally available already. If you want them to be installed, as well as being available when the setup script

is run, you should add them to ```install_requires```

`**and** ``setup_requires```.)

```dependency_links```

A list of strings naming URLs to be searched when satisfying dependencies.

These links will be used if needed to install packages specified by

```setup_requires``` or ```tests_require```. They will also be written into the egg's metadata for use by tools like EasyInstall to use when installing an ```.egg``` file.

#### ```namespace_packages```

A list of strings naming the project's "namespace packages". A namespace package is a package that may be split across multiple project distributions. For example, Zope 3's ```zope``` package is a namespace package, because subpackages like ```zope.interface``` and ```zope.publisher``` may be distributed separately. The egg runtime system can automatically merge such subpackages into a single parent package at runtime, as long as you declare them in each project that contains any subpackages of the namespace

package, and as long as the namespace package's ```__init__.py``` does not contain any code other than a namespace declaration. See the section below on ```Namespace Packages``` for more information.

#### ```test_suite```

A string naming a ```unittest.TestCase``` subclass (or a package or module containing one or more of them, or a method of such a subclass), or naming a function that can be called with no arguments and returns a ```unittest.TestSuite```. If the named suite is a module, and the module has an ```additional_tests()``` function, it is called and the results are added to the tests to be run. If the named suite is a package, any submodules and subpackages are recursively added to the overall test suite.

Specifying this argument enables use of the ```test``_` command to run the specified test suite, e.g. via ``setup.py test``. See the section on the ``test``_` command below for more details.`

#### ```tests_require```

If your project's tests need one or more additional packages besides those needed to install it, you can use this option to specify them. It should be a string or list of strings specifying what other distributions need to be present for the package's tests to run. When you run the ```test``` command, ```setuptools``` will attempt to obtain these (even going so far as to download them using ```EasyInstall```). Note that these required projects will *\*not\** be installed on the system where the tests are run, but only downloaded to the project's setup directory if they're not already installed locally.

#### `.. _test_loader:`

#### ```test_loader```

If you would like to use a different way of finding tests to run than what ```setuptools``` normally uses, you can specify a module name and class name in this argument. The named class must be instantiable with no arguments, and

its instances must support the `loadTestsFromNames()` method as defined in the Python `unittest` module's `TestLoader` class. Setuptools will pass only one test "name" in the `names` argument: the value supplied for the `test_suite` argument. The loader you specify may interpret this string in any way it likes, as there are no restrictions on what may be contained in a `test_suite` string.

The module name and class name must be separated by a `:`. The default value of this argument is `"setuptools.command.test:ScanningLoader"`. If you want to use the default `unittest` behavior, you can specify `"unittest:TestLoader"` as your `test_loader` argument instead. This will prevent automatic scanning of submodules and subpackages.

The module and class you specify here may be contained in another package, as long as you use the `tests_require` option to ensure that the package containing the loader class is available when the `test` command is run.

#### `eager_resources`

A list of strings naming resources that should be extracted together, if any of them is needed, or if any C extensions included in the project are imported. This argument is only useful if the project will be installed as a zipfile, and there is a need to have all of the listed resources be extracted to the filesystem \*as a unit\*. Resources listed here should be `/`-separated paths, relative to the source root, so to list a resource `foo.png` in package `bar.baz`, you would include the string `bar/baz/foo.png` in this argument.

If you only need to obtain resources one at a time, or you don't have any C extensions that access other files in the project (such as data files or shared libraries), you probably do NOT need this argument and shouldn't mess with it. For more details on how this argument works, see the section below on `Automatic Resource Extraction`.

#### `use_2to3`

Convert the source code from Python 2 to Python 3 with 2to3 during the build process. See `:doc:python3` for more details.

#### `convert_2to3_doctests`

List of doctest source files that need to be converted with 2to3. See `:doc:python3` for more details.

#### `use_2to3_fixers`

A list of modules to search for additional fixers to be used during the 2to3 conversion. See `:doc:python3` for more details.

Using `find_packages()`

-----

For simple projects, it's usually easy enough to manually add packages to the `packages` argument of `setup()`. However, for very large projects (Twisted, PEAK, Zope, Chandler, etc.), it can be a big burden to keep the package list updated. That's what `setuptools.find_packages()` is for.

`find_packages()` takes a source directory and two lists of package name patterns to exclude and include. If omitted, the source directory defaults to the same directory as the setup script. Some projects use a `src` or `lib` directory as the root of their source tree, and those projects would of course use `src` or `lib` as the first argument to `find_packages()`. (And such projects also need something like `package_dir = {'src'}` in their `setup()` arguments, but that's just a normal distutils thing.)

Anyway, `find_packages()` walks the target directory, filtering by inclusion patterns, and finds Python packages (any directory). On Python 3.2 and earlier, packages are only recognized if they include an `__init__.py` file. Finally, exclusion patterns are applied to remove matching packages.

Inclusion and exclusion patterns are package names, optionally including wildcards. For example, `find_packages(exclude=["*.tests"])` will exclude all packages whose last name part is `tests`. Or, `find_packages(exclude=["*.tests", "*.tests.*"])` will also exclude any subpackages of packages named `tests`, but it still won't exclude a top-level `tests` package or the children thereof. In fact, if you really want no `tests` packages at all, you'll need something like this::

```
find_packages(exclude=["*.tests", "*.tests.*", "tests.*", "tests"])
```

in order to cover all the bases. Really, the exclusion patterns are intended to cover simpler use cases than this, like excluding a single, specified package and its subpackages.

Regardless of the parameters, the `find_packages()` function returns a list of package names suitable for use as the `packages` argument to `setup()`, and so is usually the easiest way to set that argument in your setup script. Especially since it frees you from having to remember to modify your setup script whenever your project grows additional top-level packages or subpackages.

Automatic Script Creation

=====  
Packaging and installing scripts can be a bit awkward with the distutils. For one thing, there's no easy way to have a script's filename match local conventions on both Windows and POSIX platforms. For another, you often have to create a separate file just for the "main" script, when your actual "main" is a function in a module somewhere. And even in Python 2.4, using the `--m` option only works for actual `.py` files that aren't installed in a package.

`setuptools` fixes all of these problems by automatically generating scripts for you with the correct extension, and on Windows it will even create an `.exe` file so that users don't have to change their `PATHEXT` settings. The way to use this feature is to define "entry points" in your setup script that indicate what function the generated script should import and run. For example, to create two console scripts called `foo` and `bar`, and a GUI script called `baz`, you might do something like this::

```
setup(  
    # other arguments here...  
    entry_points={  
        'console_scripts': [  
            'foo = my_package.some_module:main_func',  
            'bar = other_module:some_func',  
        ],  
        'gui_scripts': [  
            'baz = my_package_gui:start_func',  
        ]  
    }  
)
```

When this project is installed on non-Windows platforms (using "setup.py install", "setup.py develop", or by using EasyInstall), a set of `foo`, `bar`, and `baz` scripts will be installed that import `main_func` and `some_func` from the specified modules. The functions you specify are called with no arguments, and their return value is passed to `sys.exit()`, so you can return an errorlevel or message to print to stderr.

On Windows, a set of `foo.exe`, `bar.exe`, and `baz.exe` launchers are created, alongside a set of `foo.py`, `bar.py`, and `baz.pyw` files. The `.exe` wrappers find and execute the right version of Python to run the `.py` or `.pyw` file.

You may define as many "console script" and "gui script" entry points as you like, and each one can optionally specify "extras" that it depends on, that will be added to `sys.path` when the script is run. For more information on "extras", see the section below on `Declaring Extras`.

For more information on "entry points" in general, see the section below on `Dynamic Discovery of Services and Plugins`.

## "Eggsecutable" Scripts

-----

Occasionally, there are situations where it's desirable to make an ``.egg`` file directly executable. You can do this by including an entry point such as the following::

```
setup(  
    # other arguments here...  
    entry_points = {  
        'setuptools.installation': [  
            'eggsecutable = my_package.some_module:main_func',  
        ]  
    }  
)
```

Any eggs built from the above setup script will include a short executable prelude that imports and calls ``main\_func()`` from ``my\_package.some\_module``. The prelude can be run on Unix-like platforms (including Mac and Linux) by invoking the egg with ``/bin/sh``, or by enabling execute permissions on the ``.egg`` file. For the executable prelude to run, the appropriate version of Python must be available via the ``PATH`` environment variable, under its "long" name. That is, if the egg is built for Python 2.3, there must be a ``python2.3`` executable present in a directory on ``PATH``.

This feature is primarily intended to support ez\_setup the installation of setuptools itself on non-Windows platforms, but may also be useful for other projects as well.

**IMPORTANT NOTE:** Eggs with an "eggsecutable" header cannot be renamed, or invoked via symlinks. They *must* be invoked using their original filename, in order to ensure that, once running, ``pkg\_resources`` will know what project and version is in use. The header script will check this and exit with an error if the ``.egg`` file has been renamed or is invoked via a symlink that changes its base name.

## Declaring Dependencies

=====

``setuptools`` supports automatically installing dependencies when a package is installed, and including information about dependencies in Python Eggs (so that

package management tools like EasyInstall can use the information).

```setuptools```

and ```pkg_resources``` use a common syntax for specifying a project's required dependencies. This syntax consists of a project's PyPI name, optionally followed by a comma-separated list of "extras" in square brackets, optionally followed by a comma-separated list of version specifiers. A version specifier is one of the operators ```<```, ```>```, ```<=```, ```>=```, ```==``` or ```!=```, followed by a version identifier. Tokens may be separated by whitespace, but any whitespace or nonstandard characters within a project name or version identifier must be replaced with ```-```.

Version specifiers for a given project are internally sorted into ascending version order, and used to establish what ranges of versions are acceptable. Adjacent redundant conditions are also consolidated (e.g. ```>1, >2``` becomes ```>1```, and ```<2, <3``` becomes ```<3```). ```!=``` versions are excised from the ranges they fall within. A project's version is then checked for membership in the resulting ranges. (Note that providing conflicting conditions for the same version (e.g. `"<2, >=2"` or `"==2, !=2"`) is meaningless and may therefore produce bizarre results.)

Here are some example requirement specifiers::

```
docutils >= 0.3
```

```
# comment lines and \ continuations are allowed in requirement strings
BazSpam ==1.1, ==1.2, ==1.3, ==1.4, ==1.5, \
    ==1.6, ==1.7 # and so are line-end comments
```

```
PEAK[FastCGI, reST]>=0.5a4
```

```
setuptools==0.5a7
```

The simplest way to include requirement specifiers is to use the ```install_requires``` argument to ```setup()```. It takes a string or list of strings containing requirement specifiers. If you include more than one requirement in a string, each requirement must begin on a new line.

This has three effects:

1. When your project is installed, either by using EasyInstall, ```setup.py install```, or ```setup.py develop```, all of the dependencies not already installed will be located (via PyPI), downloaded, built (if necessary), and installed.
2. Any scripts in your project will be installed with wrappers that verify the availability of the specified dependencies at runtime, and ensure that

the correct versions are added to `sys.path` (e.g. if multiple versions have been installed).

3. Python Egg distributions will include a metadata file listing the dependencies.

Note, by the way, that if you declare your dependencies in `setup.py`, you do *not* need to use the `require()` function in your scripts or modules, as long as you either install the project or use `setup.py develop` to do development work on it. (See "Development Mode" below for more details on using `setup.py develop`.)

#### Dependencies that aren't in PyPI

-----

If your project depends on packages that aren't registered in PyPI, you may still be able to depend on them, as long as they are available for download as:

- an egg, in the standard distutils `sdist` format,
- a single `.py` file,
- or
- a VCS repository (Subversion, Mercurial, or Git).

You just need to add some URLs to the `dependency_links` argument to `setup()`.

The URLs must be either:

1. direct download URLs,
2. the URLs of web pages that contain direct download links, or
3. the repository's URL

In general, it's better to link to web pages, because it is usually less complex to update a web page than to release a new version of your project. You can also use a SourceForge `showfiles.php` link in the case where a package you depend on is distributed via SourceForge.

If you depend on a package that's distributed as a single `.py` file, you must include an `#egg=project-version` suffix to the URL, to give a project name and version number. (Be sure to escape any dashes in the name or version by replacing them with underscores.) EasyInstall will recognize this suffix and automatically create a trivial `setup.py` to wrap the single `.py` file as an egg.

In the case of a VCS checkout, you



should also append ``#egg=project-version`` in order to identify for what package that checkout should be used. You can append ``@REV`` to the URL's path (before the fragment) to specify a revision. Additionally, you can also force the VCS being used by prepending the URL with a certain prefix. Currently available are:

- ``svn+URL`` for Subversion,
- ``git+URL`` for Git, and
- ``hg+URL`` for Mercurial

A more complete example would be:

```
``vcs+proto://host/path@revision#egg=project-version``
```

Be careful with the version. It should match the one inside the project files. If you want to disregard the version, you have to omit it both in the ``requires`` and in the URL's fragment.

This will do a checkout (or a clone, in Git and Mercurial parlance) to a temporary folder and run ``setup.py bdist\_egg``.

The ``dependency\_links`` option takes the form of a list of URL strings. For example, the below will cause EasyInstall to search the specified page for eggs or source distributions, if the package's dependencies aren't already installed::

```
setup(  
    ...  
    dependency_links = [  
        "http://peak.telecommunity.com/snapshots/"  
    ],  
)
```

.. \_Declaring Extras:

Declaring "Extras" (optional features with their own dependencies)

-----

Sometimes a project has "recommended" dependencies, that are not required for all uses of the project. For example, a project might offer optional PDF output if ReportLab is installed, and reStructuredText support if docutils is installed. These optional features are called "extras", and `setuptools` allows you to define their requirements as well. In this way, other projects that require these optional features can force the additional requirements to be installed, by naming the desired extras in their ``install\_requires``.

For example, let's say that Project A offers optional PDF and reST support::

```
setup(
    name="Project-A",
    ...
    extras_require = {
        'PDF': ["ReportLab>=1.2", "RXP"],
        'reST': ["docutils>=0.3"],
    }
)
```

As you can see, the ``extras\_require`` argument takes a dictionary mapping names of "extra" features, to strings or lists of strings describing those features' requirements. These requirements will *not* be automatically installed unless another package depends on them (directly or indirectly) by including the desired "extras" in square brackets after the associated project name. (Or if the extras were listed in a requirement spec on the EasyInstall command line.)

Extras can be used by a project's `entry points`\_ to specify dynamic dependencies. For example, if Project A includes a "rst2pdf" script, it might declare it like this, so that the "PDF" requirements are only resolved if the "rst2pdf" script is run::

```
setup(
    name="Project-A",
    ...
    entry_points = {
        'console_scripts': [
            'rst2pdf = project_a.tools.pdfgen
[PDF]',
            'rst2html = project_a.tools.htmlgen',
            # more script entry points ...
        ],
    }
)
```

Projects can also use another project's extras when specifying dependencies. For example, if project B needs "project A" with PDF support installed, it might declare the dependency like this::

```
setup(
    name="Project-B",
    install_requires = ["Project-A[PDF]"],
    ...
)
```

This will cause ReportLab to be installed along with project A, if project B is installed -- even if project A was already installed. In this way, a project can encapsulate groups of optional "downstream dependencies" under a feature name, so that packages that depend on it don't have to know what the downstream dependencies are. If a later version of Project A builds in PDF support and no longer needs ReportLab, or if it ends up needing other dependencies besides ReportLab in order to provide PDF support, Project B's setup information does not need to change, but the right packages will still be installed if needed.

Note, by the way, that if a project ends up not needing any other packages to support a feature, it should keep an empty requirements list for that feature in its ``extras\_require`` argument, so that packages depending on that feature don't break (due to an invalid feature name). For example, if Project A above builds in PDF support and no longer needs ReportLab, it could change its setup to this::

```
setup(  
    name="Project-A",  
    ...  
    extras_require = {  
        'PDF': [],  
        'reST': ["docutils>=0.3"],  
    }  
)
```

so that Package B doesn't have to remove the ``[PDF]`` from its requirement specifier.

## Including Data Files

=====

The distutils have traditionally allowed installation of "data files", which are placed in a platform-specific location. However, the most common use case for data files distributed with a package is for use \*by\* the package, usually by including the data files in the package directory.

Setuptools offers three ways to specify data files to be included in your packages. First, you can simply use the ``include\_package\_data`` keyword, e.g.::

```
from setuptools import setup, find_packages  
setup(  
    ...  
    include_package_data = True
```

)

This tells setuptools to install any data files it finds in your packages. The data files must be specified via the distutils' ``MANIFEST.in`` file. (They can also be tracked by a revision control system, using an appropriate plugin. See the section below on `Adding Support for Revision Control Systems`\_ for information on how to write such plugins.)

If you want finer-grained control over what files are included (for example, if you have documentation files in your package directories and want to exclude them from installation), then you can also use the ``package\_data`` keyword, e.g.:

```
from setuptools import setup, find_packages
setup(
    ...
    package_data = {
        # If any package contains *.txt or *.rst files, include them:
        '': ['*.txt', '*.rst'],
        # And include any *.msg files found in the 'hello' package, too:
        'hello': ['*.msg'],
    }
)
```

The ``package\_data`` argument is a dictionary that maps from package names to lists of glob patterns. The globs may include subdirectory names, if the data files are contained in a subdirectory of the package. For example, if the package tree looks like this::

```
setup.py
src/
  mypkg/
    __init__.py
    mypkg.txt
  data/
    somefile.dat
    otherdata.dat
```

The setuptools setup file might look like this::

```
from setuptools import setup, find_packages
setup(
    ...
    packages = find_packages('src'), # include all packages under src
    package_dir = {'': 'src'}, # tell distutils packages are under src

    package_data = {
```

```

# If any package contains *.txt files, include them:
    ': ['*.txt'],
    # And include any *.dat files found in the 'data' subdirectory
    # of the 'mypkg' package, also:
    'mypkg': ['data/*.dat'],
}
)

```

Notice that if you list patterns in `package_data` under the empty string, these patterns are used to find files in every package, even ones that also have their own patterns listed. Thus, in the above example, the `mypkg.txt` file gets included even though it's not listed in the patterns for `mypkg`.

Also notice that if you use paths, you *must* use a forward slash (`^/`) as the path separator, even if you are on Windows. Setuptools automatically converts slashes to appropriate platform-specific separators at build time.

(Note: although the `package_data` argument was previously only available in `setuptools`, it was also added to the Python `distutils` package as of Python 2.4; there is [some documentation for the feature](http://docs.python.org/dist/node11.html) available on the [python.org](http://python.org) website. If using the setuptools-specific `include_package_data` argument, files specified by `package_data` will *not* be automatically added to the manifest unless they are listed in the MANIFEST.in file.)

[\\_\\_ http://docs.python.org/dist/node11.html](http://docs.python.org/dist/node11.html)

Sometimes, the `include_package_data` or `package_data` options alone aren't sufficient to precisely define what files you want included. For example, you may want to include package README files in your revision control system and source distributions, but exclude them from being installed. So, setuptools offers an `exclude_package_data` option as well, that allows you to do things like this::

```

from setuptools import setup, find_packages
setup(
    ...
    packages = find_packages('src'), # include all packages under src
    package_dir = {'': 'src'}, # tell distutils packages are under src

    include_package_data = True, # include everything in source control

    # ...but exclude README.txt from all packages
    exclude_package_data = { ': ['README.txt'] },
)

```

The `exclude_package_data` option is a dictionary mapping package names to

lists of wildcard patterns, just like the `package_data` option. And, just as with that option, a key of `""` will apply the given pattern(s) to all packages. However, any files that match these patterns will be *excluded* from installation, even if they were listed in `package_data` or were included as a result of using `include_package_data`.

In summary, the three options allow you to:

`include_package_data`

Accept all data files and directories matched by `MANIFEST.in`.

`package_data`

Specify additional patterns to match files and directories that may or may not be matched by `MANIFEST.in` or found in source control.

`exclude_package_data`

Specify patterns for data files and directories that should *not* be included when a package is installed, even if they would otherwise have been included due to the use of the preceding options.

NOTE: Due to the way the distutils build process works, a data file that you include in your project and then stop including may be "orphaned" in your project's build directories, requiring you to run `setup.py clean --all` to fully remove them. This may also be important for your users and contributors if they track intermediate revisions of your project using Subversion; be sure to let them know when you make changes that remove files from inclusion so they can run `setup.py clean --all`.

#### Accessing Data Files at Runtime

Typically, existing programs manipulate a package's `__file__` attribute in order to find the location of data files. However, this manipulation isn't compatible with PEP 302-based import hooks, including importing from zip files and Python Eggs. It is strongly recommended that, if you are using data files, you should use the `Resource Management API` of `pkg_resources` to access them. The `pkg_resources` module is distributed as part of `setuptools`, so if you're using `setuptools` to distribute your package, there is no reason not to use its resource management API. See also `Accessing Package Resources` for a quick example of converting code that uses `__file__` to use `pkg_resources` instead.

.. `_Resource Management API`: <http://peak.telecommunity.com/DevCenter/PythonEggs#resource-management>

.. `_Accessing Package Resources`: <http://peak.telecommunity.com/DevCenter/PythonEggs#accessing-package-resources>

## Non-Package Data Files

-----

The `distutils` normally install general "data files" to a platform-specific location (e.g. `/usr/share`). This feature intended to be used for things like documentation, example configuration files, and the like. `setuptools` does not install these data files in a separate location, however. They are bundled inside the egg file or directory, alongside the Python modules and packages. The data files can also be accessed using the `Resource Management API`, by specifying a `Requirement` instead of a package name::

```
from pkg_resources import Requirement, resource_filename
filename = resource_filename(Requirement.parse("MyProject"), "sample.conf")
```

The above code will obtain the filename of the "sample.conf" file in the data root of the "MyProject" distribution.

Note, by the way, that this encapsulation of data files means that you can't actually install data files to some arbitrary location on a user's machine; this is a feature, not a bug. You can always include a script in your distribution that extracts and copies your the documentation or data files to a user-specified location, at their discretion. If you put related data files in a single directory, you can use `resource_filename()` with the directory name to get a filesystem directory that then can be copied with the `shutil` module. (Even if your package is installed as a zipfile, calling `resource_filename()` on a directory will return an actual filesystem directory, whose contents will be that entire subtree of your distribution.)

(Of course, if you're writing a new package, you can just as easily place your data files or directories inside one of your packages, rather than using the `distutils`' approach. However, if you're updating an existing application, it may be simpler not to change the way it currently specifies these data files.)

## Automatic Resource Extraction

-----

If you are using tools that expect your resources to be "real" files, or your project includes non-extension native libraries or other files that your C extensions expect to be able to access, you may need to list those files in the `eager_resources` argument to `setup()`, so that the files will be extracted together, whenever a C extension in the project is imported.

This is especially important if your project includes shared

libraries \*other\*

than distutils-built C extensions, and those shared libraries use file extensions other than ``.dll``, ``.so``, or ``.dylib``, which are the extensions that `setuptools` 0.6a8 and higher automatically detects as shared libraries and adds to the `native_libs.txt` file for you. Any shared libraries whose names do not end with one of those extensions should be listed as `eager_resources`, because they need to be present in the filesystem when the C extensions that link to them are used.

The `pkg_resources` runtime for compressed packages will automatically extract \*all\* C extensions and `eager_resources` at the same time, whenever \*any\* C extension or eager resource is requested via the `resource_filename()` API. (C extensions are imported using `resource_filename()` internally.) This ensures that C extensions will see all of the "real" files that they expect to see.

Note also that you can list directory resource names in `eager_resources` as well, in which case the directory's contents (including subdirectories) will be extracted whenever any C extension or eager resource is requested.

Please note that if you're not sure whether you need to use this argument, you don't! It's really intended to support projects with lots of non-Python dependencies and as a last resort for crufty projects that can't otherwise handle being compressed. If your package is pure Python, Python plus data files, or Python plus C, you really don't need this. You've got to be using either C or an external program that needs "real" files in your project before there's any possibility of `eager_resources` being relevant to your project.

## Extensible Applications and Frameworks

=====

.. `_Entry Points`:

### Dynamic Discovery of Services and Plugins

-----

`setuptools` supports creating libraries that "plug in" to extensible applications and frameworks, by letting you register "entry points" in your project that can be imported by the application or framework.

For example, suppose that a blogging tool wants to support plugins that provide translation for various file types to the blog's output format. The framework might define an "entry point group" called `blogtool.parsers`, and then allow plugins to register entry points for the file extensions they



support.

This would allow people to create distributions that contain one or more parsers for different file types, and then the blogging tool would be able to find the parsers at runtime by looking up an entry point for the file extension (or mime type, or however it wants to).

Note that if the blogging tool includes parsers for certain file formats, it can register these as entry points in its own setup script, which means it doesn't have to special-case its built-in formats. They can just be treated the same as any other plugin's entry points would be.

If you're creating a project that plugs in to an existing application or framework, you'll need to know what entry points or entry point groups are defined by that application or framework. Then, you can register entry points in your setup script. Here are a few examples of ways you might register an `.rst` file parser entry point in the `blogtool.parsers` entry point group, for our hypothetical blogging tool::

```
setup(
    # ...
    entry_points = {'blogtool.parsers': '.rst = some_module:SomeClass'}
)
```

```
setup(
    # ...
    entry_points = {'blogtool.parsers': ['.rst = some_module:a_func']}
)
```

```
setup(
    # ...
    entry_points = """
    [blogtool.parsers]
    .rst = some.nested.module:SomeClass.some_classmethod [reST]
    """
    extras_require = dict(reST = "Docutils>=0.3.5")
)
```

The `entry_points` argument to `setup()` accepts either a string with `.ini`-style sections, or a dictionary mapping entry point group names to either strings or lists of strings containing entry point specifiers. An entry point specifier consists of a name and value, separated by an `=` sign. The value consists of a dotted module name, optionally followed by a `:` and a dotted identifier naming an object within the module. It can also include a bracketed list of "extras" that are required for the entry point to be used. When the invoking application or framework requests loading

of an entry point, any requirements implied by the associated extras will be passed to `pkg_resources.require()`, so that an appropriate error message can be displayed if the needed package(s) are missing. (Of course, the invoking app or framework can ignore such errors if it wants to make an entry point optional if a requirement isn't installed.)

#### Defining Additional Metadata

-----

Some extensible applications and frameworks may need to define their own kinds of metadata to include in eggs, which they can then access using the `pkg_resources` metadata APIs.

Ordinarily, this is done by having plugin developers include additional files in their `ProjectName.egg-info` directory. However, since it can be tedious to create such files by hand, you may want to create a distutils extension that will create the necessary files from arguments to `setup()`, in much the same way that `setuptools` does for many of the `setup()` arguments it adds. See the section below on `Creating distutils Extensions` for more details, especially the subsection on `Adding new EGG-INFO Files`.

#### "Development Mode"

=====

Under normal circumstances, the `distutils` assume that you are going to build a distribution of your project, not use it in its "raw" or "unbuilt" form. If you were to use the `distutils` that way, you would have to rebuild and reinstall your project every time you made a change to it during development.

Another problem that sometimes comes up with the `distutils` is that you may need to do development on two related projects at the same time. You may need to put both projects' packages in the same directory to run them, but need to keep them separate for revision control purposes. How can you do this?

Setuptools allows you to deploy your projects for use in a common directory or staging area, but without copying any files. Thus, you can edit each project's code in its checkout directory, and only need to run build commands when you change a project's C extensions or similarly compiled files. You can even deploy a project into another project's checkout directory, if that's your preferred way of working (as opposed to using a common independent staging area or the `site-packages` directory).

To do this, use the `setup.py develop` command. It works very similarly to `setup.py install` or the EasyInstall tool, except that it doesn't actually

install anything. Instead, it creates a special ``.egg-link`` file in the deployment directory, that links to your project's source code. And, if your deployment directory is Python's ``.site-packages`` directory, it will also update the ``.easy-install.pth`` file to include your project's source code, thereby making it available on ``.sys.path`` for all programs using that Python installation.

If you have enabled the ``.use_2to3`` flag, then of course the ``.egg-link`` will not link directly to your source code when run under Python 3, since that source code would be made for Python 2 and not work under Python 3. Instead the ``.setup.py develop`` will build Python 3 code under the ``.build`` directory, and link there. This means that after doing code changes you will have to run ``.setup.py build`` before these changes are picked up by your Python 3 installation.

In addition, the ``.develop`` command creates wrapper scripts in the target script directory that will run your in-development scripts after ensuring that all your ``.install_requires`` packages are available on ``.sys.path``.

You can deploy the same project to multiple staging areas, e.g. if you have multiple projects on the same machine that are sharing the same project you're doing development work.

When you're done with a given development task, you can remove the project source from a staging area using ``.setup.py develop --uninstall``, specifying the desired staging area if it's not the default.

There are several options to control the precise behavior of the ``.develop`` command; see the section on the ``.develop`_` command below for more details.`

Note that you can also apply ``.setuptools`` commands to non-``.setuptools`` projects, using commands like this::

```
python -c "import setuptools; execfile('setup.py')" develop
```

That is, you can simply list the normal setup commands and options following the quoted part.

Distributing a ``.setuptools``-based project

=====

Using ``.setuptools``... Without bundling it!

-----

Your users might not have ``.setuptools`` installed on their machines,

or even

if they do, it might not be the right version. Fixing this is easy; just download `ez_setup.py`, and put it in the same directory as your `setup.py` script. (Be sure to add it to your revision control system, too.) Then add these two lines to the very top of your setup script, before the script imports anything from `setuptools`:

```
.. code-block:: python

import ez_setup
ez_setup.use_setuptools()
```

That's it. The `ez_setup` module will automatically download a matching version of `setuptools` from PyPI, if it isn't present on the target system. Whenever you install an updated version of `setuptools`, you should also update your projects' `ez_setup.py` files, so that a matching version gets installed on the target machine(s).

By the way, `setuptools` supports the new PyPI "upload" command, so you can use `setup.py sdist upload` or `setup.py bdist_egg upload` to upload your source or egg distributions respectively. Your project's current version must be registered

with PyPI first, of course; you can use `setup.py register` to do that. Or you can do it all in one step, e.g. `setup.py register sdist bdist_egg upload` will register the package, build source and egg distributions, and then upload them both to PyPI, where they'll be easily found by other projects that depend on them.

(By the way, if you need to distribute a specific version of `setuptools`, you can specify the exact version and base download URL as parameters to the `use_setuptools()` function. See the function's docstring for details.)

## What Your Users Should Know

-----

In general, a `setuptools`-based project looks just like any `distutils`-based project -- as long as your users have an internet connection and are installing to `site-packages`, that is. But for some users, these conditions don't apply, and they may become frustrated if this is their first encounter with a `setuptools`-based project. To keep these users happy, you should review the following topics in your project's installation instructions, if they are relevant to your project and your target audience isn't already familiar with `setuptools` and `easy_install`.

### Network Access

If your project is using `ez_setup`, you should inform users of the

need to either have network access, or to preinstall the correct version of `setuptools` using the `EasyInstall` installation instructions<sup>1</sup>. Those instructions also have tips for dealing with firewalls as well as how to manually download and install `setuptools`.

#### Custom Installation Locations

You should inform your users that if they are installing your project to somewhere other than the main `site-packages` directory, they should first install `setuptools` using the instructions for `Custom Installation Locations`<sup>2</sup>, before installing your project.

#### Your Project's Dependencies

If your project depends on other projects that may need to be downloaded from PyPI or elsewhere, you should list them in your installation instructions, or tell users how to find out what they are. While most users will not need this information, any users who don't have unrestricted internet access may have to find, download, and install the other projects manually. (Note, however, that they must still install those projects using `easy_install`, or your project will not know they are installed, and your setup script will try to download them again.)

If you want to be especially friendly to users with limited network access, you may wish to build eggs for your project and its dependencies, making them all available for download from your site, or at least create a page with links to all of the needed eggs. In this way, users with limited network access can manually download all the eggs to a single directory, then use the `-f` option of `easy_install` to specify the directory to find eggs in. Users who have full network access can just use `-f` with the URL of your download page, and `easy_install` will find all the needed eggs using your links directly. This is also useful when your target audience isn't able to compile packages (e.g. most Windows users) and your package or some of its dependencies include C code.

#### Revision Control System Users and Co-Developers

Users and co-developers who are tracking your in-development code using a revision control system should probably read this manual's sections regarding such development. Alternately, you may wish to create a quick-reference guide containing the tips from this manual that apply to your particular situation. For example, if you recommend that people use `setup.py develop` when tracking your in-development code, you should let them know that this needs to be run after every update or commit.

Similarly, if you remove modules or data files from your project, you should remind them to run `setup.py clean --all` and delete any obsolete `.pyc` or `.pyo`. (This tip applies to the distutils in general, not

just `setuptools`, but not everybody knows about them; be kind to your users by spelling out your project's best practices rather than leaving them guessing.)

### Creating System Packages

Some users want to manage all Python packages using a single package manager, and sometimes that package manager isn't `easy_install`! `Setuptools` currently supports `bdist_rpm`, `bdist_wininst`, and `bdist_dumb` formats for system packaging. If a user has a locally-installed "bdist" packaging tool that internally uses the `distutils` `install` command, it should be able to work with `setuptools`. Some examples of "bdist" formats that this should work with include the `bdist_nsi` and `bdist_msi` formats for Windows.

However, packaging tools that build binary distributions by running `setup.py install` on the command line or as a subprocess will require modification to work with `setuptools`. They should use the `--single-version-externally-managed` option to the `install` command, combined with the standard `--root` or `--record` options. See the `install` command's documentation below for more details. The `bdist_deb` command is an example of a command that currently requires this kind of patching to work with `setuptools`.

If you or your users have a problem building a usable system package for your project, please report the problem via the mailing list so that either the "bdist" tool in question or `setuptools` can be modified to resolve the issue.

### Setting the `zip_safe` flag

-----

For some use cases (such as bundling as part of a larger application), Python packages may be run directly from a zip file. Not all packages, however, are capable of running in compressed form, because they may expect to be able to access either source code or data files as normal operating system files. So, `setuptools` can install your project as a zipfile or a directory, and its default choice is determined by the project's `zip_safe` flag.

You can pass a True or False value for the `zip_safe` argument to the `setup()` function, or you can omit it. If you omit it, the `bdist_egg` command will analyze your project's contents to see if it can detect any conditions that would prevent it from working in a zipfile. It will output notices to the console about any such conditions that it finds.

Currently, this analysis is extremely conservative: it will consider the project unsafe if it contains any C extensions or datafiles whatsoever. This does *not* mean that the project can't or won't work as a zipfile! It just means that the `bdist_egg` authors aren't yet comfortable asserting that the project *will* work. If the project contains no C or data files, and does no `__file__` or `__path__` introspection or source code manipulation, then there is an extremely solid chance the project will work when installed as a zipfile. (And if the project uses `pkg_resources` for all its data file access, then C extensions and other data files shouldn't be a problem at all. See the `Accessing Data Files at Runtime` section above for more information.)

However, if `bdist_egg` can't be *sure* that your package will work, but you've checked over all the warnings it issued, and you are either satisfied it *will* work (or if you want to try it for yourself), then you should set `zip_safe` to `True` in your `setup()` call. If it turns out that it doesn't work, you can always change it to `False`, which will force `setuptools` to install your project as a directory rather than as a zipfile.

Of course, the end-user can still override either decision, if they are using EasyInstall to install your package. And, if you want to override for testing purposes, you can just run `setup.py easy_install --zip-ok .` or `setup.py easy_install --always-unzip .` in your project directory. to install the package as a zipfile or directory, respectively.

In the future, as we gain more experience with different packages and become more satisfied with the robustness of the `pkg_resources` runtime, the "zip safety" analysis may become less conservative. However, we strongly recommend that you determine for yourself whether your project functions correctly when installed as a zipfile, correct any problems if you can, and then make an explicit declaration of `True` or `False` for the `zip_safe` flag, so that it will not be necessary for `bdist_egg` or `EasyInstall` to try to guess whether your project can work as a zipfile.

## Namespace Packages

-----

Sometimes, a large package is more useful if distributed as a collection of smaller eggs. However, Python does not normally allow the contents of a package to be retrieved from more than one location.

"Namespace packages"

are a solution for this problem. When you declare a package to be a namespace package, it means that the package has no meaningful contents in its `__init__.py`, and that it is merely a container for modules and subpackages.

The `pkg_resources` runtime will then automatically ensure that the contents

of namespace packages that are spread over multiple eggs or directories are combined into a single "virtual" package.

The `namespace_packages` argument to `setup()` lets you declare your project's namespace packages, so that they will be included in your project's metadata. The argument should list the namespace packages that the egg participates in. For example, the `ZopeInterface` project might do this::

```
setup(
    # ...
    namespace_packages = ['zope']
)
```

because it contains a `zope.interface` package that lives in the `zope` namespace package. Similarly, a project for a standalone `zope.publisher` would also declare the `zope` namespace package. When these projects are installed and used, Python will see them both as part of a "virtual" `zope` package, even though they will be installed in different locations.

Namespace packages don't have to be top-level packages. For example, Zope 3's `zope.app` package is a namespace package, and in the future PEAK's `peak.util` package will be too.

Note, by the way, that your project's source tree must include the namespace packages' `__init__.py` files (and the `__init__.py` of any parent packages), in a normal Python package layout. These `__init__.py` files *must* contain the line::

```
__import__('pkg_resources').declare_namespace(__name__)
```

This code ensures that the namespace package machinery is operating and that the current package is registered as a namespace package.

You must NOT include any other code and data in a namespace package's `__init__.py`. Even though it may appear to work during development, or when projects are installed as `.egg` files, it will not work when the projects are installed using "system" packaging tools -- in such cases the `__init__.py` files will not be installed, let alone executed.

You must include the `declare_namespace()` line in the `__init__.py` of *every* project that has contents for the namespace package in question, in order to ensure that the namespace will be declared regardless of which project's copy of `__init__.py` is loaded first. If the first loaded `__init__.py` doesn't declare it, it will never *be* declared, because no other copies will ever be loaded!



## TRANSITIONAL NOTE

~~~~~

Setuptools automatically calls `declare_namespace()` for you at runtime, but future versions may *not* do this. This is because the automatic declaration feature has some negative side effects, such as needing to import all namespace packages during the initialization of the `pkg_resources` runtime, and also the need for `pkg_resources` to be explicitly imported before any namespace packages work at all. In some future releases, you'll be responsible for including your own declaration lines, and the automatic declaration feature will be dropped to get rid of the negative side effects.

During the remainder of the current development cycle, therefore, setuptools will warn you about missing `declare_namespace()` calls in your `__init__.py` files, and you should correct these as soon as possible before the compatibility support is removed.

Namespace packages without declaration lines will not work correctly once a user has upgraded to a later version, so it's important that you make this change now in order to avoid having your code break in the field. Our apologies for the inconvenience, and thank you for your patience.

## Tagging and "Daily Build" or "Snapshot" Releases

-----

When a set of related projects are under development, it may be important to track finer-grained version increments than you would normally use for e.g.

"stable" releases. While stable releases might be measured in dotted numbers with alpha/beta/etc. status codes, development versions of a project often need to be tracked by revision or build number or even build date. This is especially true when projects in development need to refer to one another, and therefore may literally need an up-to-the-minute version of something!

To support these scenarios, `setuptools` allows you to "tag" your source and egg distributions by adding one or more of the following to the project's "official" version identifier:

\* A manually-specified pre-release tag, such as "build" or "dev", or a manually-specified post-release tag, such as a build or revision number (`--tag-build=STRING, -bSTRING`)

\* A "last-modified revision number" string generated automatically from Subversion's metadata (assuming your project is being built from a Subversion "working copy") (`--tag-svn-revision, -r`)

\* An 8-character representation of the build date (`--tag-date, -d``), as a postrelease tag

You can add these tags by adding `egg_info`` and the desired options to the command line ahead of the `sdist`` or `bdist`` commands that you want to generate a daily build or snapshot for. See the section below on the `egg_info`_`` command for more details.

(Also, before you release your project, be sure to see the section above on `Specifying Your Project's Version`_`` for more information about how pre- and post-release tags affect how `setuptools` and `EasyInstall` interpret version numbers. This is important in order to make sure that dependency processing tools will know which versions of your project are newer than others.)

Finally, if you are creating builds frequently, and either building them in a downloadable location or are copying them to a distribution server, you should probably also check out the `rotate`_`` command, which lets you automatically delete all but the N most-recently-modified distributions matching a glob pattern. So, you can use a command line like::

```
setup.py egg_info -rbDEV bdist_egg rotate -m.egg -k3
```

to build an egg whose version info includes 'DEV-rNNNN' (where NNNN is the most recent Subversion revision that affected the source tree), and then delete any egg files from the distribution directory except for the three that were built most recently.

If you have to manage automated builds for multiple packages, each with different tagging and rotation policies, you may also want to check out the `alias`_`` command, which would let each package define an alias like `daily`` that would perform the necessary tag, build, and rotate commands. Then, a simpler script or cron job could just run `setup.py daily`` in each project directory. (And, you could also define sitewide or per-user default versions of the `daily`` alias, so that projects that didn't define their own would use the appropriate defaults.)

## Generating Source Distributions

-----

`setuptools``

enhances the `distutils`` default algorithm for source file selection with pluggable endpoints for looking up files to include. If you are using a revision control system, and your source distributions only need to include files that you're tracking in revision control, use a corresponding

plugin instead of writing a `MANIFEST.in` file. See the section below on `Adding Support for Revision Control Systems` for information on plugins.

If you need to include automatically generated files, or files that are kept in an unsupported revision control system, you'll need to create a `MANIFEST.in` file to specify any files that the default file location algorithm doesn't catch. See the distutils documentation for more information on the format of the `MANIFEST.in` file.

But, be sure to ignore any part of the distutils documentation that deals with `MANIFEST` or how it's generated from `MANIFEST.in`; setuptools shields you from these issues and doesn't work the same way in any case. Unlike the distutils, setuptools regenerates the source distribution manifest file every time you build a source distribution, and it builds it inside the project's `.egg-info` directory, out of the way of your main project directory. You therefore need not worry about whether it is up-to-date or not.

Indeed, because setuptools' approach to determining the contents of a source distribution is so much simpler, its `sdist` command omits nearly all of the options that the distutils' more complex `sdist` process requires. For all practical purposes, you'll probably use only the `--formats` option, if you use any option at all.

#### Making your package available for EasyInstall

-----

If you use the `register` command (`setup.py register`) to register your package with PyPI, that's most of the battle right there. (See the `docs` for the register command for more details.)

.. `_docs` for the register command: <http://docs.python.org/dist/package-index.html>

If you also use the `upload` command to upload actual distributions of your package, that's even better, because EasyInstall will be able to find and download them directly from your project's PyPI page.

However, there may be reasons why you don't want to upload distributions to PyPI, and just want your existing distributions (or perhaps a Subversion checkout) to be used instead.

So here's what you need to do before running the `register` command. There are three `setup()` arguments that affect EasyInstall:

`url` and `download_url`

These become links on your project's PyPI page. EasyInstall will examine

them to see if they link to a package ("primary links"), or whether they are HTML pages. If they're HTML pages, EasyInstall scans all HREF's on the page for primary links

```long_description```

EasyInstall will check any URLs contained in this argument to see if they are primary links.

A URL is considered a "primary link" if it is a link to a .tar.gz, .tgz, .zip, .egg, .egg.zip, .tar.bz2, or .exe file, or if it has an ```#egg=project``` or ```#egg=project-version``` fragment identifier attached to it. EasyInstall attempts to determine a project name and optional version number from the text of a primary link \*without\* downloading it. When it has found all the primary links, EasyInstall will select the best match based on requested version, platform compatibility, and other criteria.

So, if your ```url``` or ```download_url``` point either directly to a downloadable source distribution, or to HTML page(s) that have direct links to such, then EasyInstall will be able to locate downloads automatically. If you want to make Subversion checkouts available, then you should create links with either ```#egg=project``` or ```#egg=project-version``` added to the URL. You should replace ```project``` and ```version``` with the values they would have in an egg filename. (Be sure to actually generate an egg and then use the initial part of the filename, rather than trying to guess what the escaped form of the project name and version number will be.)

Note that Subversion checkout links are of lower precedence than other kinds of distributions, so EasyInstall will not select a Subversion checkout for downloading unless it has a version included in the ```#egg=``` suffix, and it's a higher version than EasyInstall has seen in any other links for your project.

As a result, it's a common practice to use mark checkout URLs with a version of "dev" (i.e., ```#egg=projectname-dev```), so that users can do something like this::

```
easy_install --editable projectname==dev
```

in order to check out the in-development version of ```projectname```.

## Managing "Continuous Releases" Using Subversion

-----

If you expect your users to track in-development versions of your project via Subversion, there are a few additional steps you should take to ensure that

things work smoothly  
with EasyInstall. First, you should add the following  
to your project's ``setup.cfg`` file:

```
.. code-block:: ini
```

```
[egg_info]
tag_build = .dev
tag_svn_revision = 1
```

This will tell ``setuptools`` to generate package version numbers like  
``1.0a1.dev-r1263``, which will be considered to be an *older* release than  
``1.0a1``. Thus, when you actually release ``1.0a1``, the entire egg  
infrastructure (including ``setuptools``, ``pkg\_resources`` and EasyInstall)  
will know that ``1.0a1`` supersedes any interim snapshots from Subversion, and  
handle upgrades accordingly.

(Note: the project version number you specify in ``setup.py`` should always be  
the *next* version of your software, not the last released version.

Alternately, you can leave out the ``tag\_build=.dev``, and always use the  
*last* release as a version number, so that your post-1.0 builds are labelled  
``1.0-r1263``, indicating a post-1.0 patchlevel. Most projects so far,  
however, seem to prefer to think of their project  
as being a future version

still under development, rather than a past version being patched. It is of  
course possible for a single project to have both situations, using  
post-release numbering on release branches, and pre-release numbering on the  
trunk. But you don't have to make things this complex if you don't want to.)

Commonly, projects releasing code from Subversion will include a PyPI link to  
their checkout URL (as described in the previous section) with an  
``#egg=projectname-dev`` suffix. This allows users to request EasyInstall  
to download ``projectname==dev`` in order to get the latest in-development  
code. Note that if your project depends on such in-progress code, you may wish  
to specify your ``install\_requires`` (or other requirements) to include  
``==dev``, e.g.:

```
.. code-block:: python
```

```
install_requires = ["OtherProject>=0.2a1.dev-r143,==dev"]
```

The above example says, "I really want at least this particular development  
revision number, but feel free to follow and  
use an ``#egg=OtherProject-dev``  
link if you find one". This avoids the need to have actual source or binary  
distribution snapshots of in-development code available, just to be able to  
depend on the latest and greatest a project has to offer.

A final note for Subversion development: if you are using SVN revision tags as described in this section, it's a good idea to run ```setup.py develop``` after each Subversion checkin or update, because your project's version number will be changing, and your script wrappers need to be updated accordingly.

Also, if the project's requirements have changed, the ```develop``` command will take care of fetching the updated dependencies, building changed extensions, etc. Be sure to also remind any of your users who check out your project from Subversion that they need to run ```setup.py develop``` after every update in order to keep their checkout completely in sync.

## Making "Official" (Non-Snapshot) Releases

~~~~~

### When

you make an official release, creating source or binary distributions, you will need to override the tag settings from ```setup.cfg```, so that you don't end up registering versions like ```foobar-0.7a1.dev-r34832```. This is easy to do if you are developing on the trunk and using tags or branches for your releases - just make the change to ```setup.cfg``` after branching or tagging the release, so the trunk will still produce development snapshots.

Alternately, if you are not branching for releases, you can override the default version options on the command line, using something like::

```
python setup.py egg_info -RDb "" sdist bdist_egg register upload
```

The first part of this command (```egg_info -RDb ""```) will override the configured tag information, before creating source and binary eggs, registering the project with PyPI, and uploading the files. Thus, these commands will use the plain version from your ```setup.py```, without adding the Subversion revision number or build designation string.

Of course, if you will be doing this a lot, you may wish to create a personal alias for this operation, e.g.::

```
python setup.py alias -u release egg_info -RDb ""
```

You can then use it like this::

```
python setup.py release sdist bdist_egg register upload
```

Or of course you can create more elaborate aliases that do all of the above. See the sections below on the ```egg_info``` and ```alias``` commands for more ideas.

## Distributing Extensions compiled with Pyrex

-----

`setuptools` includes transparent support for building Pyrex extensions, as long as you define your extensions using `setuptools.Extension`, *not* `distutils.Extension`. You must also not import anything from Pyrex in your setup script.

If you follow these rules, you can safely list `.pyx` files as the source of your `Extension` objects in the setup script. `setuptools` will detect at build time whether Pyrex is installed or not. If it is, then `setuptools` will use it. If not, then `setuptools` will silently change the `Extension` objects to refer to the `.c` counterparts of the `.pyx` files, so that the normal `distutils` C compilation process will occur.

Of course, for this to work, your source distributions must include the C code generated by Pyrex, as well as your original `.pyx` files. This means that you will probably want to include current `.c` files in your revision control system, rebuilding them whenever you check changes in for the `.pyx` source files. This will ensure that people tracking your project in a revision control system will be able to build it even if they don't have Pyrex installed, and that your source releases will be similarly usable with or without Pyrex.

## ----- Command Reference -----

.. `_alias`:

`alias` - Define shortcuts for commonly used commands

=====

Sometimes, you need to use the same commands over and over, but you can't necessarily set them as defaults. For example, if you produce both development snapshot releases and "stable" releases of a project, you may want to put the distributions in different places, or use different `egg_info` tagging options, etc. In these cases, it doesn't make sense to set the options in a `distutils` configuration file, because the values of the options changed based on what you're trying to do.

`Setuptools` therefore allows you to define "aliases" - shortcut names for an arbitrary string of commands and options, using `setup.py alias aliasname expansion`, where `aliasname` is the name of the new alias, and the remainder of

the command line supplies its expansion. For example, this command defines a sitewide alias called "daily", that sets various ``egg\_info`` tagging options::

```
setup.py alias --global-config daily egg_info --tag-svn-revision \  
--tag-build=development
```

Once the alias is defined, it can then be used with other setup commands, e.g.::

```
setup.py daily bdist_egg    # generate a daily-build .egg file  
setup.py daily sdist       # generate a daily-build source distro  
setup.py daily sdist bdist_egg # generate both
```

The above commands are interpreted as if the word ``daily`` were replaced with ``egg\_info --tag-svn-revision --tag-build=development``.

Note that `setuptools` will expand each alias *at most once* in a given command line. This serves two purposes. First, if you accidentally create an alias loop, it will have no effect; you'll instead get an error message about an unknown command. Second, it allows you to define an alias for a command, that uses that command. For example, this (project-local) alias::

```
setup.py alias bdist_egg bdist_egg rotate -k1 -m.egg
```

redefines the ``bdist\_egg`` command so that it always runs the ``rotate`` command afterwards to delete all but the newest egg file. It doesn't loop indefinitely on ``bdist\_egg`` because the alias is only expanded once when used.

You

can remove a defined alias with the ``--remove`` (or ``-r``) option, e.g.::

```
setup.py alias --global-config --remove daily
```

would delete the "daily" alias we defined above.

Aliases can be defined on a project-specific, per-user, or sitewide basis. The default is to define or remove a project-specific alias, but you can use any of the `configuration file options`_` (listed under the saveopts`_` command, below) to determine which distutils configuration file an aliases will be added to (or removed from).`

Note that if you omit the "expansion" argument to the ``alias`` command, you'll get output showing that alias' current definition (and what configuration file it's defined in). If you omit the alias name as well, you'll get a listing of all current aliases along with their configuration file locations.



## `bdist_egg` - Create a Python Egg for the project

=====

This command generates a Python Egg (`.egg` file) for the project.

Python

Eggs are the preferred binary distribution format for EasyInstall, because they are cross-platform (for "pure" packages), directly importable, and contain project metadata including scripts and information about the project's dependencies. They can be simply downloaded and added to `sys.path` directly, or they can be placed in a directory on `sys.path` and then automatically discovered by the egg runtime system.

This command runs the `egg_info` command (if it hasn't already run) to update the project's metadata (`.egg-info`) directory. If you have added any extra metadata files to the `.egg-info` directory, those files will be included in the new egg file's metadata directory, for use by the egg runtime system or by any applications or frameworks that use that metadata.

You won't usually need to specify any special options for this command; just use `bdist_egg` and you're done. But there are a few options that may be occasionally useful:

`--dist-dir=DIR,`

`-d DIR`

Set the directory where the `.egg` file will be placed. If you don't supply this, then the `--dist-dir` setting of the `bdist` command will be used, which is usually a directory named `dist` in the project directory.

`--plat-name=PLATFORM, -p PLATFORM`

Set the platform name string that will be embedded in the egg's filename (assuming the egg contains C extensions). This can be used to override the distutils default platform name with something more meaningful. Keep in mind, however, that the egg runtime system expects to see eggs with distutils platform names, so it may ignore or reject eggs with non-standard platform names. Similarly, the EasyInstall program may ignore them when searching web pages for download links. However, if you are cross-compiling or doing some other unusual things, you might find a use for this option.

`--exclude-source-files`

Don't include any modules' `.py` files in the egg, just compiled Python,

C, and data files. (Note that this doesn't affect any `.py` files in the EGG-INFO directory or its subdirectories, since for example there may be scripts with a `.py` extension which must still be retained.) We don't

recommend that you use this option except for packages that are being bundled for proprietary end-user applications, or for "embedded" scenarios where space is at an absolute premium. On the other hand, if your package is going to be installed and used in compressed form, you might as well exclude the source because Python's `traceback` module doesn't currently understand how to display zipped source code anyway, or how to deal with files that are in a different place from where their code was compiled.

There are also some options you will probably never need, but which are there because they were copied from similar `bdist` commands used as an example for creating this one. They may be useful for testing and debugging, however, which is why we kept them:

`--keep-temp, -k`

Keep the contents of the `--bdist-dir` tree around after creating the `.egg` file.

`--bdist-dir=DIR, -b DIR`

Set the temporary directory for creating the distribution. The entire contents of this directory are zipped to create the `.egg` file, after running various installation commands to copy the package's modules, data, and extensions here.

`--skip-build`

Skip doing any "build" commands; just go straight to the install-and-compress phases.

`.. _develop:`

`develop` - Deploy the project source in "Development Mode"

=====

This command allows you to deploy your project's source for use in one or more "staging areas" where it will be available for importing. This deployment is done in such a way that changes to the project source are immediately available in the staging area(s), without needing to run a build or install step after each change.

The `develop` command works by creating an `.egg-link` file (named for the project) in the given staging area. If the staging area is Python's `site-packages` directory, it also updates an `easy-install.pth` file so that the project is on `sys.path` by default for all programs run using that Python installation.

The `develop` command also installs wrapper scripts in the staging area (or

a separate directory, as specified) that will ensure the project's dependencies are available on `sys.path` before running the project's source scripts. And, it ensures that any missing project dependencies are available in the staging area, by downloading and installing them if necessary.

Last, but not least, the `develop` command invokes the `build_ext -i` command to ensure any C extensions in the project have been built and are up-to-date, and the `egg_info` command to ensure the project's metadata is updated (so that the runtime and wrappers know what the project's dependencies are). If you make any changes to the project's setup script or C extensions, you should rerun the `develop` command against all relevant staging areas to keep the project's scripts, metadata and extensions up-to-date. Most other kinds of changes to your project should not require any build operations or rerunning `develop`, but keep in mind that even minor changes to the setup script (e.g. changing an entry point definition) require you to re-run the `develop` or `test` commands to keep the distribution updated.

Here are some of the options that the `develop` command accepts. Note that they affect the project's dependencies as well as the project itself, so if you have dependencies that need to be installed and you use `--exclude-scripts` (for example), the dependencies' scripts will not be installed either! For this reason, you may want to use EasyInstall to install the project's dependencies before using the `develop` command, if you need finer control over the installation options for dependencies.

`--uninstall, -u`

Un-deploy the current project. You may use the `--install-dir` or `-d` option to designate the staging area. The created `.egg-link` file will be removed, if present and it is still pointing to the project directory. The project directory will be removed from `easy-install.pth` if the staging area is Python's `site-packages` directory.

Note that this option currently does *not* uninstall script wrappers! You must uninstall them yourself, or overwrite them by using EasyInstall to activate a different version of the package. You can also avoid installing script wrappers in the first place, if you use the `--exclude-scripts` (aka `-x`) option when you run `develop` to deploy the project.

`--multi-version, -m`

"Multi-version" mode. Specifying this option prevents `develop` from adding an `easy-install.pth` entry for the project(s) being deployed, and if an entry for any version of a project already exists, the entry will be removed upon successful deployment. In multi-version mode, no specific version of the package is available for importing, unless you use `pkg_resources.require()` to put it on `sys.path`, or you are running

a wrapper script generated by `setuptools` or EasyInstall. (In which case the wrapper script calls `require()` for you.)

Note that if you install to a directory other than `site-packages`, this option is automatically in effect, because `.pth` files can only be used in `site-packages` (at least in Python 2.3 and 2.4). So, if you use the `--install-dir` or `-d` option (or they are set via configuration file(s)) your project and its dependencies will be deployed in multi-version mode.

`--install-dir=DIR, -d DIR`

Set the installation directory (staging area). If this option is not directly specified

on the command line or in a distutils configuration

file, the distutils default installation location is used. Normally, this will be the `site-packages` directory, but if you are using distutils configuration files, setting things like `prefix` or `install_lib`, then those settings are taken into account when computing the default staging area.

`--script-dir=DIR, -s DIR`

Set the script installation directory. If you don't supply this option (via the command line or a configuration file), but you *have* supplied an `--install-dir` (via command line or config file), then this option defaults to the same directory, so that the scripts will be able to find their associated package installation. Otherwise, this setting defaults to the location where the distutils would normally install scripts, taking any distutils configuration file settings into account.

`--exclude-scripts, -x`

Don't deploy script wrappers. This is useful if you don't want to disturb existing versions of the scripts in the staging area.

`--always-copy, -a`

Copy all needed distributions to the staging area, even if they are already present in another directory on `sys.path`. By default, if a requirement can be met using a distribution that is already available in a directory on `sys.path`, it will not be copied to the staging area.

`--egg-path=DIR`

Force the generated `.egg-link` file to use a specified relative path to the source directory. This can be useful in circumstances where your installation directory is being shared by code running under multiple platforms (e.g. Mac and Windows) which have different absolute locations for the code under development, but the same *relative* locations with respect to the installation directory. If you use this option when installing, you must supply the same relative path when uninstalling.

In addition to the above options, the `develop` command also accepts all of the same options accepted by `easy_install`. If you've configured any `easy_install` settings in your `setup.cfg` (or other distutils config files), the `develop` command will use them as defaults, unless you override them in a `[develop]` section or on the command line.

`easy_install` - Find and install packages

=====

This command runs the `EasyInstall` tool `<easy_install.html>_` for you. It is exactly equivalent to running the `easy_install` command. All command line arguments following this command are consumed and not processed further by the distutils, so this must be the last command listed on the command line. Please see the `EasyInstall` documentation for the options reference and usage examples. Normally, there is no reason to use this command via the command line, as you can just use `easy_install` directly. It's only listed here so that you know it's a distutils command, which means that you can:

- \* create command aliases that use it,
- \* create distutils extensions that invoke it as a subcommand, and
- \* configure options for it in your `setup.cfg` or other distutils config files.

.. `_egg_info`:

`egg_info` - Create egg metadata and set build tags

=====

This command performs two operations: it updates a project's `.egg-info` metadata directory (used by the `bdist_egg`, `develop`, and `test` commands), and it allows you to temporarily change a project's version string, to support "daily builds" or "snapshot" releases. It is run automatically by the `sdist`, `bdist_egg`, `develop`, `register`, and `test` commands in order to update the project's metadata, but you can also specify it explicitly in order to temporarily change the project's version string while executing other commands. (It also generates the `.egg-info/SOURCES.txt` manifest file, which is used when you are building source distributions.)

In addition to writing the core egg metadata defined by `setuptools` and required by `pkg_resources`, this command can be extended to write other metadata files as well, by defining entry points in the `egg_info.writers`

group. See the section on `Adding new EGG-INFO Files`\_ below for more details. Note that using additional metadata writers may require you to include a ``setup\_requires`` argument to ``setup()`` in order to ensure that the desired writers are available on ``sys.path``.

## Release Tagging Options

-----

The following options can be used to modify the project's version string for all remaining commands on the setup command line. The options are processed in the order shown, so if you use more than one, the requested tags will be added in the following order:

`--tag-build=NAME, -b NAME`

Append NAME to the project's version string. Due to the way setuptools processes "pre-release" version suffixes beginning with the letters "a" through "e" (like "alpha", "beta", and "candidate"), you will usually want to use a tag like ".build" or ".dev", as this will cause the version number to be considered *lower* than the project's default version. (If you want to make the version number *higher* than the default version, you can always leave off --tag-build and then use one or both of the following options.)

If you have a default build tag set in your ``setup.cfg``, you can suppress it on the command line using ``-b ""`` or ``--tag-build=""`` as an argument to the ``egg\_info`` command.

`--tag-svn-revision, -r`

If the current directory is a Subversion checkout (i.e. has a ``.svn`` subdirectory, this appends a string of the form "-rNNNN" to the project's version string, where NNNN is the revision number of the most recent modification to the current directory, as obtained from the ``svn info`` command.

If the current directory is not a Subversion checkout, the command will look for a ``PKG-INFO`` file instead, and try to find the revision number from that, by looking for a "-rNNNN" string at the end of the version number. (This is so that building a package from a source distribution of a Subversion snapshot will produce a binary with the correct version number.)

If there is no ``PKG-INFO`` file, or the version number contained therein does not end with ``-r`` and a number, then ``-r0`` is used.

`--no-svn-revision, -R`

Don't include the Subversion revision in the version number. This option is included so you can override a default setting put in ``setup.cfg``.

`--tag-date, -d`

Add a date stamp of the form "-YYYYMMDD" (e.g. "-20050528") to the project's version number.

`--no-date, -D`

Don't include a date stamp in the version number. This option is included so you can override a default setting in ``setup.cfg``.

(Note: Because these options modify the version number used for source and binary distributions of your project, you should first make sure that you know how the resulting version numbers will be interpreted by automated tools like EasyInstall. See the section above on `Specifying Your Project's Version`\_ for an explanation of pre- and post-release tags, as well as tips on how to choose and verify a versioning scheme for your your project.)

For advanced uses, there is one other option that can be set, to change the location of the project's ``.egg-info`` directory. Commands that need to find the project's source directory or metadata should get it from this setting:

Other ``egg\_info`` Options

-----

`--egg-base=SOURCEDIR, -e SOURCEDIR`

Specify the directory that should contain the .egg-info directory. This should normally be the root of your project's source tree (which is not necessarily the same as your project directory; some projects use a ``src`` or ``lib`` subdirectory as the source root). You should not normally need to specify this directory, as it is normally determined from the ``package\_dir`` argument to the ``setup()`` function, if any. If there is no ``package\_dir`` set, this option defaults to the current directory.

``egg\_info`` Examples

-----

Creating a dated "nightly build" snapshot egg::

```
python setup.py egg_info --tag-date --tag-build=DEV bdist_egg
```

Creating and uploading a release with no version tags, even if some default tags are specified in ``setup.cfg``::

```
python setup.py egg_info -RDb "" sdist bdist_egg register upload
```

(Notice that `egg_info` must always appear on the command line *before* any commands that you want the version changes to apply to.)

.. `_install` command:

```
install - Run easy_install or old-style installation
```

=====

The `setuptools install` command is basically a shortcut to run the `easy_install` command on the current project. However, for convenience in creating "system packages" of `setuptools`-based projects, you can also use this option:

```
--single-version-externally-managed
```

This boolean option tells the `install` command to perform an "old style" installation, with the addition of an `.egg-info` directory so that the installed project will still have its metadata available and operate normally. If you use this option, you *must* also specify the `--root` or `--record` options (or both), because otherwise you will have no way to identify and remove the installed files.

This option is automatically in effect when `install` is invoked by another `distutils` command, so that commands like `bdist_wininst` and `bdist_rpm` will create system packages of eggs. It is also automatically in effect if you specify the `--root` option.

```
install_egg_info - Install an .egg-info directory in site-packages
```

=====

`Setuptools`

runs this command as part of `install` operations that use the `--single-version-externally-managed` options. You should not invoke it directly; it is documented here for completeness and so that `distutils` extensions such as system package builders can make use of it. This command has only one option:

```
--install-dir=DIR, -d DIR
```

The parent directory where the `.egg-info` directory will be placed. Defaults to the same as the `--install-dir` option specified for the `install_lib` command, which is usually the system `site-packages` directory.



This command assumes that the `egg_info` command has been given valid options via the command line or `setup.cfg`, as it will invoke the `egg_info` command and use its options to locate the project's source `.egg-info` directory.

.. `_rotate`:

`rotate` - Delete outdated distribution files

=====

As you develop new versions of your project, your distribution (`dist`) directory will gradually fill up with older source and/or binary distribution files. The `rotate` command lets you automatically clean these up, keeping only the N most-recently modified files matching a given pattern.

`--match=PATTERNLIST, -m PATTERNLIST`

Comma-separated list of glob patterns to match. This option is *required*. The project name and `-*` is prepended to the supplied patterns, in order to match only distributions belonging to the current project (in case you have a shared distribution directory for multiple projects). Typically, you will use a glob pattern like `.zip` or `.egg` to match files of the specified type. Note that each supplied pattern is treated as a distinct group of files for purposes of selecting files to delete.

`--keep=COUNT, -k COUNT`

Number of matching distributions to keep. For each group of files identified by a pattern specified with the `--match` option, delete all but the COUNT most-recently-modified files in that group. This option is *required*.

`--dist-dir=DIR, -d DIR`

Directory where the distributions are. This defaults to the value of the `bdist` command's `--dist-dir` option, which will usually be the project's `dist` subdirectory.

**Example 1**: Delete all `.tar.gz` files from the distribution directory, except for the 3 most recently modified ones:

```
setup.py rotate --match=.tar.gz --keep=3
```

**Example 2**: Delete all Python 2.3 or Python 2.4 eggs from the distribution directory, except the most recently modified one for each Python version:

```
setup.py rotate --match=-py2.3*.egg,-py2.4*.egg --keep=1
```

.. \_saveopts:

```saveopts``` - Save used options to a configuration file

=====

Finding and editing ```distutils``` configuration files can be a pain, especially since you also have to translate the configuration options from command-line form

to the proper configuration file format. You can avoid these hassles by using the ```saveopts``` command. Just add it to the command line to save the options you used. For example, this command builds the project using the ```mingw32``` C compiler, then saves the `--compiler` setting as the default for future builds (even those run implicitly by the ```install``` command)::

```
setup.py build --compiler=mingw32 saveopts
```

The ```saveopts``` command saves all options for every command specified on the command line to the project's local ```setup.cfg``` file, unless you use one of the ```configuration file options``` to change where the options are saved. For example, this command does the same as above, but saves the compiler setting to the site-wide (global) `distutils` configuration::

```
setup.py build --compiler=mingw32 saveopts -g
```

Note that it doesn't matter where you place the ```saveopts``` command on the command line; it will still save all the options specified for all commands.

For

example, this is another valid way to spell the last example::

```
setup.py saveopts -g build --compiler=mingw32
```

Note, however, that all of the commands specified are always run, regardless of where ```saveopts``` is placed on the command line.

### Configuration File Options

-----

Normally, settings such as options and aliases are saved to the project's local ```setup.cfg``` file. But you can override this and save them to the global or per-user configuration files, or to a manually-specified filename.

```--global-config, -g```

Save settings to the global ```distutils.cfg``` file inside the ```distutils``` package directory. You must have write access to that directory to use this option. You also can't combine this option with ```-u``` or ```-f```.

`--user-config, -u``

Save settings to the current user's `~/pydistutils.cfg`` (POSIX) or `~/pydistutils.cfg`` (Windows) file. You can't combine this option with `-g`` or `-f``.

`--filename=FILENAME,`

`-f FILENAME``

Save settings to the specified configuration file to use. You can't combine this option with `-g`` or `-u``. Note that if you specify a non-standard filename, the `distutils`` and `setuptools`` will not use the file's contents. This option is mainly included for use in testing.

These options are used by other `setuptools`` commands that modify configuration files, such as the `alias`_`` and `setopt`_`` commands.

.. `_setopt:`

`setopt`` - Set a distutils or setuptools option in a config file

=====

This command is mainly for use by scripts, but it can also be used as a quick and dirty way to change a distutils configuration option without having to remember what file the options are in and then open an editor.

**Example 1**. Set the default C compiler to `mingw32`` (using long option names)::

```
setup.py setopt --command=build --option=compiler --set-value=mingw32
```

**Example**

**2**. Remove any setting for the distutils default package installation directory (short option names)::

```
setup.py setopt -c install -o install_lib -r
```

Options for the `setopt`` command:

`--command=COMMAND, -c COMMAND``

Command to set the option for. This option is required.

`--option=OPTION, -o OPTION``

The name of the option to set. This option is required.

`--set-value=VALUE, -s VALUE``

The value to set the option to. Not needed if `-r`` or `--remove`` is

set.

`--remove, -r`

Remove (unset) the option, instead of setting it.

In addition to the above options, you may use any of the `configuration file options`_` (listed under the saveopts`_` command, above) to determine which distutils configuration file the option will be added to (or removed from).`

`.. _test:`

`test` - Build package and run a unittest suite`

=====

When doing test-driven development, or running automated builds that need testing

before they are deployed for downloading or use, it's often useful to be able to run a project's unit tests without actually deploying the project anywhere, even using the `develop` command. The test` command runs a project's unit tests without actually deploying it, by temporarily putting the project's source on sys.path`, after first running build_ext -i` and egg_info` to ensure that any C extensions and project metadata are up-to-date.`

To use this command, your project's tests must be wrapped in a `unittest` test suite by either a function, a TestCase` class or method, or a module or package containing TestCase` classes. If the named suite is a module, and the module has an additional_tests()` function, it is called and the result (which must be a unittest.TestSuite`) is added to the tests to be run. If the named suite is a package, any submodules and subpackages are recursively added to the overall test suite. (Note: if your project specifies a`

`test_loader`, the rules for processing the chosen test_suite` may differ; see the test_loader`_` documentation for more details.)`

Note that many test systems including `doctest` support wrapping their non-unittest` tests in TestSuite` objects. So, if you are using a test package that does not support this, we suggest you encourage its developers to implement test suite support, as this is a convenient and standard way to aggregate a collection of tests to be run under a common test harness.`

By default, tests will be run in the "verbose" mode of the `unittest` package's text test runner, but you can get the "quiet" mode (just dots) if you supply the -q` or --quiet` option, either as a global option to the setup script (e.g. setup.py -q test`) or as an option for the test` command itself (e.g. setup.py test -q`). There is one other option available:`

`--test-suite=NAME, -s NAME`

Specify the test suite (or module, class, or method) to be run

(e.g.

`some_module.test_suite`). The default for this option can be set by giving a `test_suite` argument to the `setup()` function, e.g.:

```
setup(  
    # ...  
    test_suite = "my_package.tests.test_all"  
)
```

If you did not set a `test_suite` in your `setup()` call, and do not provide a `--test-suite` option, an error will occur.

.. `_upload`:

`upload` - Upload source and/or egg distributions to PyPI

=====

The `upload` command is implemented and documented <<https://docs.python.org/3.1/distutils/uploading.html>> in `distutils`.

Setuptools augments the `upload` command with support for `keyring` <<https://pypi.python.org/pypi/keyring>>, allowing the password to be stored in a secure location and not in plaintext in the `.pyirc` file. To use `keyring`, first install `keyring` and set the password for the relevant repository, e.g.:

```
python -m keyring set <repository> <username>  
Password for '<username>' in '<repository>': *****
```

Then, in `.pyirc`, set the repository configuration as normal, but omit the password. Thereafter, uploads will use the password from the `keyring`.

New in 20.1: Added `keyring` support.

.. `_upload_docs`:

`upload_docs` - Upload package documentation to PyPI

=====

PyPI now supports uploading project documentation to the dedicated URL <https://pythonhosted.org/<project>/>.

The `upload_docs` command will create the necessary zip file out of a documentation directory and will post to the repository.

Note that to upload the documentation of a project, the corresponding version must already be registered with PyPI, using the distutils `register` command -- just like the `upload` command.

Assuming there is an `Example` project with documentation in the subdirectory `docs`, e.g.:

```
Example/
|-- example.py
|-- setup.cfg
|-- setup.py
|-- docs
| |-- build
| |
|-- html
| | | |-- index.html
| | | `-- tips_tricks.html
| |-- conf.py
| |-- index.txt
| `-- tips_tricks.txt
```

You can simply pass the documentation directory path to the `upload_docs` command:

```
python setup.py upload_docs --upload-dir=docs/build/html
```

If no `--upload-dir` is given, `upload_docs` will attempt to run the `build_sphinx` command to generate uploadable documentation.

For the command to become available, `Sphinx` <<http://sphinx.pocoo.org/>> must be installed in the same environment as distribute.

As with other `setuptools`-based commands, you can define useful defaults in the `setup.cfg` of your Python project, e.g.:

```
.. code-block:: ini
```

```
[upload_docs]
upload-dir = docs/build/html
```

The `upload_docs` command has the following options:

```
--upload-dir
```

The directory to be uploaded to the repository.

`--show-response`

Display the full response text from server; this is useful for debugging PyPI problems.

`--repository=URL,`

`-r URL`

The URL of the repository to upload to. Defaults to <https://pypi.python.org/pypi> (i.e., the main PyPI installation).

---

## Extending and Reusing Setuptools

---

### Creating `distutils` Extensions

---

It can be hard to add new commands or setup arguments to the `distutils`. But the `setuptools` package makes it a bit easier, by allowing you to distribute a `distutils` extension as a separate project, and then have projects that need the extension just refer to it in their `setup_requires` argument.

With `setuptools`, your `distutils` extension projects can hook in new commands and `setup()` arguments just by defining "entry points". These are mappings from command or argument names to a specification of where to import a handler from. (See the section on `Dynamic Discovery of Services and Plugins` above for some more background on entry points.)

### Adding Commands

---

You

can add new `setup` commands by defining entry points in the `distutils.commands` group. For example, if you wanted to add a `foo` command, you might add something like this to your `distutils` extension project's setup script::

```
setup(  
    # ...  
    entry_points = {  
        "distutils.commands": [  
            "foo = mypackage.some_module:foo",  
        ],  
    },  
)
```

(Assuming, of course, that the `foo` class in `mypackage.some_module` is

a `setuptools.Command` subclass.)

Once a project containing such entry points has been activated on `sys.path`, (e.g. by running "install" or "develop" with a site-packages installation directory) the command(s) will be available to any `setuptools`-based setup scripts. It is not necessary to use the `--command-packages` option or to monkeypatch the `distutils.command` package to install your commands; `setuptools` automatically adds a wrapper to the `distutils` to search for entry points in the active distributions on `sys.path`. In fact, this is how `setuptools`' own commands are installed: the `setuptools` project's setup script defines entry points for them!

### Adding `setup()` Arguments

-----

Sometimes, your commands may need additional arguments to the `setup()` call. You can enable this by defining entry points in the `distutils.setup_keywords` group. For example, if you wanted a `setup()` argument called `bar_baz`, you might add something like this to your `distutils` extension project's setup script::

```
setup(
    # ...
    entry_points = {
        "distutils.commands": [
            "foo = mypackage.some_module:foo",
        ],
        "distutils.setup_keywords": [
            "bar_baz = mypackage.some_module:validate_bar_baz",
        ],
    },
)
```

The idea here is that the entry point defines a function that will be called to validate the `setup()` argument, if it's supplied.

The `Distribution` object will have the initial value of the attribute set to `None`, and the validation function will only be called if the `setup()` call sets it to a non-None value. Here's an example validation function::

```
def assert_bool(dist, attr, value):
    """Verify that value is True, False, 0, or 1"""
    if bool(value) != value:
        raise DistutilsSetupError(
            "%r must be a boolean value (got %r)" % (attr, value)
        )
```



Your function should accept three arguments: the `Distribution` object, the attribute name, and the attribute value. It should raise a `DistutilsSetupError` (from the `distutils.errors` module) if the argument is invalid. Remember, your function will only be called with non-None values, and the default value of arguments defined this way is always None. So, your commands should always be prepared for the possibility that the attribute will be `None` when they access it later.

If more than

one active distribution defines an entry point for the same `setup()` argument, \*all\* of them will be called. This allows multiple distutils extensions to define a common argument, as long as they agree on what values of that argument are valid.

Also note that as with commands, it is not necessary to subclass or monkeypatch the distutils `Distribution` class in order to add your arguments; it is sufficient to define the entry points in your extension, as long as any setup script using your extension lists your project in its `setup_requires` argument.

#### Adding new EGG-INFO Files

-----

Some extensible applications or frameworks may want to allow third parties to develop plugins with application or framework-specific metadata included in the plugins' EGG-INFO directory, for easy access via the `pkg_resources` metadata API. The easiest way to allow this is to create a distutils extension to be used from the plugin projects' setup scripts (via `setup_requires`) that

defines a new setup keyword, and then uses that data to write an EGG-INFO file when the `egg_info` command is run.

The `egg_info` command looks for extension points in an `egg_info.writers` group, and calls them to write the files. Here's a simple example of a distutils extension defining a setup argument `foo_bar`, which is a list of lines that will be written to `foo_bar.txt` in the EGG-INFO directory of any project that uses the argument::

```
setup(
    # ...
    entry_points = {
        "distutils.setup_keywords": [
            "foo_bar = setuptools.dist:assert_string_list",
        ],
        "egg_info.writers": [
            "foo_bar.txt = setuptools.command.egg_info:write_arg",
```

```
    ],
  },
)
```

This simple example makes use of two utility functions defined by `setuptools` for its own use: a routine to validate that a setup keyword is a sequence of strings, and another one that looks up a setup argument and writes it to a file. Here's what the `writer` utility looks like::

```
def write_arg(cmd, basename, filename):
    argname = os.path.splitext(basename)[0]
    value = getattr(cmd.distribution, argname, None)
    if value is not None:
        value = '\n'.join(value)+'\n'
    cmd.write_or_delete_file(argname, filename, value)
```

As you can see, `egg_info.writers` entry points must be a function taking three arguments: a `egg_info` command instance, the basename of the file to write (e.g. `foo_bar.txt`), and the actual full filename that should be written to.

In general, writer functions should honor the command object's `dry_run` setting when writing files, and use the `distutils.log` object to do any console output. The easiest way to conform to this requirement is to use the `cmd` object's `write_file()`, `delete_file()`, and `write_or_delete_file()` methods exclusively for your file operations. See those methods' docstrings for more details.

## Adding Support for Revision Control Systems

-----

If the files you want to include in the source distribution are tracked using Git, Mercurial or SVN, you can use the following packages to achieve that:

- Git and Mercurial: `setuptools_scm` <[https://pypi.python.org/pypi/setuptools\\_scm](https://pypi.python.org/pypi/setuptools_scm)>`\_
- SVN: `setuptools_svn` <[https://pypi.python.org/pypi/setuptools\\_svn](https://pypi.python.org/pypi/setuptools_svn)>`\_

If you would like to create a plugin for `setuptools` to find files tracked by another revision control system, you can do so by adding an entry point to the `setuptools.file_finders` group. The entry point should be a function accepting a single directory name, and should yield all the filenames within that directory (and any subdirectories thereof) that are under revision control.

For example, if you were going to create a plugin for a revision control system

called "foobar", you would write a function something like this:

```
.. code-block:: python

def find_files_for_foobar(dirname):
    # loop to yield paths that start with `dirname`
```

And you would register it in a setup script using something like this::

```
entry_points = {
    "setuptools.file_finders": [
        "foobar = my_foobar_module:find_files_for_foobar"
    ]
}
```

Then, anyone who wants to use your plugin can simply install it, and their local setuptools installation will be able to find the necessary files.

It is not necessary to distribute source control plugins with projects that simply use the other source control system, or to specify the plugins in ``setup\_requires``. When you create a source distribution with the ``sdist`` command, setuptools automatically records what files were found in the ``SOURCES.txt`` file. That way, recipients of source distributions don't need to have revision control at all. However, if someone is working on a package by checking out with that system, they will need the same plugin(s) that the original author is using.

A few important points for writing revision control file finders:

- \* Your finder function MUST return relative paths, created by appending to the passed-in directory name. Absolute paths are NOT allowed, nor are relative paths that reference a parent directory of the passed-in directory.
- \* Your finder function MUST accept an empty string as the directory name, meaning the current directory. You MUST NOT convert this to a dot; just yield relative paths. So, yielding a subdirectory named ``some/dir`` under the current directory should NOT be rendered as ``./some/dir`` or ``~/somewhere/some/dir``, but *always* as simply ``some/dir``
- \* Your finder function SHOULD NOT raise any errors, and SHOULD deal gracefully with the absence of needed programs (i.e., ones belonging to the revision control system itself. It *may*, however, use ``distutils.log.warn()`` to inform the user of the missing program(s).

Subclassing ``Command``

-----

Sorry, this section isn't written yet, and  
neither is a lot of what's below  
this point.

XXX

Reusing ``setuptools`` Code

=====

``ez\_setup``

-----

XXX

``setuptools.archive\_util``

-----

XXX

``setuptools.sandbox``

-----

XXX

``setuptools.package\_index``

-----

XXX

Mailing List and Bug Tracker

=====

Please use the `distutils-sig mailing list`\_ for questions and discussion about  
setuptools, and the `setuptools bug tracker`\_ ONLY for issues you have  
confirmed via the list are actual bugs, and which you have reduced to a minimal  
set of steps to reproduce.

.. \_distutils-sig mailing list: <http://mail.python.org/pipermail/distutils-sig/>

.. \_setuptools bug tracker: <https://github.com/pypa/setuptools/>

Found in path(s):

\* /opt/ws\_local/PERMITS\_SQL/1050086594\_1591660967.89/0/setuptools-20-10-1-1-tar-gz/setuptools-

20.10.1/docs/setuptools.txt

No license file was found, but licenses were detected in source scan.

License :: OSI Approved :: MIT License

Found in path(s):

\* /opt/ws\_local/PERMITS\_SQL/1050086594\_1591660967.89/0/setuptools-20-10-1-1-tar-gz/setuptools-20.10.1/setup.py

No license file was found, but licenses were detected in source scan.

```
# Permission is hereby granted, free of charge, to any person obtaining
# a copy of this software and associated documentation files (the
# "Software"), to deal in the Software without restriction, including
# without limitation the rights to use, copy, modify, merge, publish,
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### xwd utility

<pre>

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Ext headers    GL/glext.h        Khronos  
                 GL/glxt.h         Khronos  
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include/GL/gl.h :

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include/GL/glxt.h  
include/GL/wglext.h :

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## Dynalink v.5

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## Independent JPEG Group: JPEG release 6b

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```
/**
 * Base constructor.
 * <p>
 * The authorizer attempts to perform matching (including the use of the wildcard) in accordance with RFC 6125.
 * </p>
 * <p>
 * Known suffixes is a list of public domain suffixes that can't be used as wild cards for
 * example *.com, or c*c.com, as a dns wildcard could match every/most .com domains if a registrar were issue it.
 * If *.com is in the known suffixes list will not be allowed to match.
 * </p>
 *
 * @param knownSuffixes a set of suffixes that cannot be wild-carded, e.g. { ".com", ".net", ".org" }
 */
```

Found in path(s):

```
* /opt/ws_local/PERMITS_SQL/1089947271_1601369618.24/0/bcpkix-fips-1-0-3-sources-
jar/org/bouncycastle/est/jcajce/JsseDefaultHostnameAuthorizer.java
```

## 1.206 gnutls 3.6.15

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Version 2.1, February 1999

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```
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```

```
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```
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# 1.208 commons-lang3 3.1

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## 1.209 libjpeg 9d

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### 1.209.2 Available under license :

The Independent JPEG Group's JPEG software

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README for release 9c of 14-Jan-2018

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IJG is not affiliated with the ISO/IEC JTC1/SC29/WG1 standards committee (previously known as JPEG, together with ITU-T SG16).

DOCUMENTATION ROADMAP

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This file contains the following sections:

OVERVIEW        General description of JPEG and the IJG software.  
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                 terms of distribution.  
REFERENCES     Where to learn more about JPEG.  
ARCHIVE LOCATIONS Where to find newer versions of this software.  
ACKNOWLEDGMENTS Special thanks.  
FILE FORMAT WARS Software \*not\* to get.  
TO DO           Plans for future IJG releases.

Other documentation files in the distribution are:

User documentation:

install.txt    How to configure and install the IJG software.  
usage.txt      Usage instructions for cjpeg, djpeg, jpegtran,  
                 rdjpgcom, and wjjpgcom.  
\*.1            Unix-style man pages for programs (same info as usage.txt).  
wizard.txt     Advanced usage instructions for JPEG wizards only.  
change.log     Version-to-version change highlights.

Programmer and internal documentation:

libjpeg.txt    How to use the JPEG library in your own programs.  
example.c      Sample code for calling the JPEG library.  
structure.txt   Overview of the JPEG library's internal structure.  
filelist.txt

Road map of IJG files.

coderrules.txt Coding style rules --- please read if you contribute code.

Please read at least the files install.txt and usage.txt. Some information can also be found in the JPEG FAQ (Frequently Asked Questions) article. See ARCHIVE LOCATIONS below to find out where to obtain the FAQ article.

If you want to understand how the JPEG code works, we suggest reading one or more of the REFERENCES, then looking at the documentation files (in roughly the order listed) before diving into the code.

## OVERVIEW

=====

This package contains C software to implement JPEG image encoding, decoding, and transcoding. JPEG (pronounced "jay-peg") is a standardized compression method for full-color and grayscale images.

This software implements JPEG baseline, extended-sequential, and progressive compression processes. Provision is made for supporting all variants of these processes, although some uncommon parameter settings aren't implemented yet.

We have made no provision for supporting the hierarchical or lossless processes defined in the standard.

We provide a set of library routines for reading and writing JPEG image files, plus two sample applications "cjpeg" and "djpeg", which use the library to perform conversion between JPEG and some other popular image file formats. The library is intended to be reused in other applications.

In order to support file conversion and viewing software, we have included considerable functionality beyond the bare JPEG coding/decoding capability; for example, the color quantization modules are not strictly part of JPEG decoding, but they are essential for output to colormapped file formats or colormapped displays. These extra functions can be compiled out of the library if not required for a particular application.

We have also included "jpegtran", a utility for lossless transcoding between different JPEG processes, and "rdjpgcom" and "wrjpgcom", two simple applications for inserting and extracting textual comments in JFIF files.

The emphasis in designing this software has been on achieving portability and flexibility, while also making it fast enough to be useful. In particular, the software is not intended to be read as a tutorial on JPEG. (See the REFERENCES section for introductory material.) Rather, it is intended to be reliable, portable, industrial-strength code. We do not claim to have

achieved that goal in every aspect of the software, but we strive for it.

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The Unix configuration script "configure" was produced with GNU Autoconf. It is copyright by the Free Software

Foundation but is freely distributable.

The same holds for its supporting scripts (config.guess, config.sub, ltmain.sh). Another support script, install-sh, is copyright by X Consortium but is also freely distributable.

The IJG distribution formerly included code to read and write GIF files. To avoid entanglement with the Unisys LZW patent (now expired), GIF reading support has been removed altogether, and the GIF writer has been simplified to produce "uncompressed GIFs". This technique does not use the LZW algorithm; the resulting GIF files are larger than usual, but are readable by all standard GIF decoders.

## REFERENCES

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We recommend reading one or more of these references before trying to understand the innards of the JPEG software.

The best short technical introduction to the JPEG compression algorithm is Wallace, Gregory K. "The JPEG Still Picture Compression Standard", Communications of the ACM, April 1991 (vol. 34 no. 4), pp. 30-44.

(Adjacent articles in that issue discuss MPEG motion picture compression, applications of JPEG, and related topics.) If you don't have the CACM issue handy, a PDF file containing a revised version of Wallace's article is available at <http://www.ijg.org/files/Wallace.JPEG.pdf>. The file (actually a preprint for an article that appeared in IEEE Trans. Consumer Electronics) omits the sample images that appeared in CACM, but it includes corrections and some added material. Note: the Wallace article is copyright ACM and IEEE, and it may not be used for commercial purposes.

A somewhat less technical, more leisurely introduction to JPEG can be found in "The Data Compression Book" by Mark Nelson and Jean-loup Gailly, published by M&T Books (New York), 2nd ed. 1996, ISBN 1-55851-434-1. This book provides

good explanations and example C code for a multitude of compression methods including JPEG. It is an excellent source if you are comfortable reading C code but don't know much about data compression in general.

The book's JPEG

sample code is far from industrial-strength, but when you are ready to look at a full implementation, you've got one here...

The best currently available description of JPEG is the textbook "JPEG Still Image Data Compression Standard" by William B. Pennebaker and Joan L. Mitchell, published by Van Nostrand Reinhold, 1993, ISBN 0-442-01272-1. Price US\$59.95, 638 pp. The book includes the complete text of the ISO JPEG standards (DIS 10918-1 and draft DIS 10918-2).

Although this is by far the most detailed and comprehensive exposition of JPEG publicly available, we point out that it is still missing an explanation of the most essential properties and algorithms of the underlying DCT technology.

If you think that you know about DCT-based JPEG after reading this book, then you are in delusion. The real fundamentals and corresponding potential of DCT-based JPEG are not publicly known so far, and that is the reason for all the mistaken developments taking place in the image coding domain.

The original JPEG standard is divided into two parts, Part 1 being the actual specification, while Part 2 covers compliance testing methods. Part 1 is titled "Digital Compression and Coding of Continuous-tone Still Images, Part 1: Requirements and guidelines" and has document numbers ISO/IEC IS 10918-1, ITU-T T.81. Part 2 is titled "Digital Compression and Coding of Continuous-tone Still Images, Part 2: Compliance testing" and has document numbers ISO/IEC IS 10918-2, ITU-T T.83.

IJG JPEG 8 introduced an implementation of the JPEG SmartScale extension which is specified in two documents: A contributed document at ITU and ISO with title "ITU-T JPEG-Plus Proposal for Extending ITU-T T.81 for Advanced Image Coding", April 2006, Geneva, Switzerland. The latest version of this document is Revision 3. And a contributed document ISO/IEC JTC1/SC29/WG1 N 5799 with title "Evolution of JPEG", June/July 2011, Berlin, Germany.

IJG JPEG 9 introduces a reversible color transform

for improved lossless

compression which is described in a contributed document ISO/IEC JTC1/SC29/WG1 N 6080 with title "JPEG 9 Lossless Coding", June/July 2012, Paris, France.

The JPEG standard does not specify all details of an interchangeable file format. For the omitted details we follow the "JFIF" conventions, version 2. JFIF version 1 has been adopted as Recommendation ITU-T T.871 (05/2011) : Information technology - Digital compression and coding of continuous-tone still images: JPEG File Interchange Format (JFIF). It is available as a free download in PDF file format from <http://www.itu.int/rec/T-REC-T.871>. A PDF file of the older JFIF document is available at



<http://www.w3.org/Graphics/JPEG/jfif3.pdf>.

The TIFF 6.0 file format specification can be obtained by FTP from <ftp://ftp.sgi.com/graphics/tiff/TIFF6.ps.gz>. The JPEG incorporation scheme found in the TIFF 6.0 spec of 3-June-92 has a number of serious problems. IJG does not recommend use of the TIFF 6.0 design (TIFF Compression tag 6).

Instead, we recommend the JPEG design proposed by TIFF Technical Note #2 (Compression tag 7). Copies of this Note can be obtained from <http://www.ijg.org/files/>. It is expected that the next revision of the TIFF spec will replace the 6.0 JPEG design with the Note's design. Although IJG's own code does not support TIFF/JPEG, the free libtiff library uses our library to implement TIFF/JPEG per the Note.

## ARCHIVE LOCATIONS

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The "official" archive site for this software is [www.ijg.org](http://www.ijg.org). The most recent released version can always be found there in directory "files". This particular version will be archived as <http://www.ijg.org/files/jpegsrc.v9c.tar.gz>, and in Windows-compatible "zip" archive format as <http://www.ijg.org/files/jpegsr9c.zip>.

The JPEG FAQ (Frequently Asked Questions) article is a source of some general information about JPEG. It is available on the World Wide Web at <http://www.faqs.org/faqs/jpeg-faq/> and other news.answers archive sites, including the official news.answers archive at [rtfm.mit.edu: ftp://rtfm.mit.edu/pub/usenet/news.answers/jpeg-faq/](ftp://rtfm.mit.edu/pub/usenet/news.answers/jpeg-faq/). If you don't have Web or FTP access, send e-mail to [mail-server@rtfm.mit.edu](mailto:mail-server@rtfm.mit.edu) with body  
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send usenet/news.answers/jpeg-faq/part2

## ACKNOWLEDGMENTS

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Thank to Juergen Bruder for providing me with a copy of the common DCT algorithm article, only to find out that I had come to the same result in a more direct and comprehensible way with a more generative approach.

Thank to Istvan Sebestyen and Joan L. Mitchell for inviting me to the ITU JPEG (Study Group 16) meeting in Geneva, Switzerland.

Thank to Thomas Wiegand and Gary Sullivan for inviting me to the Joint Video Team (MPEG & ITU) meeting in Geneva, Switzerland.

Thank to Thomas Richter and Daniel Lee for inviting me to the ISO/IEC JTC1/SC29/WG1 (previously known as JPEG, together with ITU-T SG16) meeting in Berlin, Germany.

Thank to John Korejwa and Massimo Ballerini for inviting me to fruitful consultations in Boston, MA and Milan, Italy.

Thank to Hendrik Elstner, Roland Fassauer, Simone Zuck, Guenther Maier-Gerber, Walter Stoeber, Fred Schmitz, and Norbert Braunagel for corresponding business development.

Thank to Nico Zschach and Dirk Stelling of the technical support team at the Digital Images company in Halle for providing me with extra equipment for configuration tests.

Thank to Richard F. Lyon (then of Foveon Inc.) for fruitful communication about JPEG configuration in Sigma Photo Pro software.

Thank to Andrew Finkenstadt for hosting the ijg.org site.

Thank to Thomas G. Lane for the original design and development of this singular software package.

Thank to Lars Goehler, Andreas Heinecke, Sebastian Fuss, Yvonne Roebert, Andrej Werner, and Ulf-Dietrich Braumann for support and public relations.

#### FILE FORMAT WARS

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The ISO/IEC JTC1/SC29/WG1 standards committee (previously known as JPEG, together with ITU-T SG16) currently promotes different formats containing the name "JPEG" which is misleading because these formats are incompatible with original DCT-based JPEG and are based on faulty technologies. IJG therefore does not and will not support such momentary mistakes (see REFERENCES).

There exist also distributions under the name "OpenJPEG" promoting such kind of formats which is misleading because they don't support original JPEG images.

We have no sympathy for the promotion of inferior formats. Indeed, one of the original reasons for developing this free software was to help force convergence on common, interoperable format standards for JPEG files.

Don't use an incompatible file format!

(In any case, our decoder will remain capable of reading existing JPEG image files indefinitely.)

The ISO committee pretends to be "responsible for the popular JPEG" in their public reports which is not true because they don't respond to actual requirements for the maintenance of the original JPEG specification.

Furthermore,

the ISO committee pretends to "ensure interoperability" with their standards which is not true because their "standards" support only application-specific and proprietary use cases and contain mathematically incorrect code.

There are currently different distributions in circulation containing the name "libjpeg" which is misleading because they don't have the features and are incompatible with formats supported by actual IJG libjpeg distributions. One of those fakes is released by members of the ISO committee and just uses the name of libjpeg for misdirection of people, similar to the abuse of the name JPEG as described above, while having nothing in common with actual IJG libjpeg distributions and containing mathematically incorrect code.

The other one claims to be a "derivative" or "fork" of the original libjpeg, but violates the license conditions as described under LEGAL ISSUES above and violates basic C programming properties.

We have no sympathy for the release of misleading, incorrect and illegal distributions derived from obsolete code bases.

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The people have already determined and demanded that public administration entities, national governments, and their supporting judicial systems must be fully transparent, accountable, and liable.

IJG has secured the value for all concerned free people of the planet.

A partial list of foreclosed institutions and corporations ("Hall of Shame") is currently prepared and will be published later.

TO DO

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Version 9 is the second release of a new generation JPEG standard to overcome the limitations of the original JPEG specification, and is the first true source reference JPEG codec. More features are being prepared for coming releases...

Please send bug reports, offers of help, etc. to [jpeg-info@jpegclub.org](mailto:jpeg-info@jpegclub.org).  
No license file was found, but licenses were detected in source scan.

```
/*
 * jdct.h
 *
 * Copyright (C) 1994-1996, Thomas G. Lane.
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 *
 * This include file contains common declarations for the forward and
 * inverse DCT modules. These declarations are private to the DCT managers
 * (jcdctmgr.c, jdctmgr.c) and the individual DCT algorithms.
 * The individual DCT algorithms are kept in separate files to ease
 * machine-dependent tuning (e.g., assembly coding).
 */
```

Found in path(s):

```
* /opt/cola/permits/1103550007_1605777850.47/0/jpegsrvc-v9d-tar-gz/jpeg-9d/jdct.h
```

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## 1.211 libjpeg 8b

### 1.211.1 Available under license :

No license file was found, but licenses were detected in source scan.

```
/*  
* jpegint.h  
*  
* Copyright (C) 1991-1997, Thomas G. Lane.  
* Modified 1997-2017 by Guido Vollbeding.  
* This file is part of the Independent JPEG Group's software.  
* For conditions of distribution and use, see the accompanying README file.  
*  
* This file provides common declarations for the various JPEG modules.  
* These declarations are considered internal to the JPEG library; most  
* applications using the library shouldn't need to include this file.  
*/
```

Found in path(s):

```
* /opt/cola/permits/1104792432_1607505170.95/0/jpeg-9c-tar-gz/jpeg-9c/jpegint.h
```

No license file was found, but licenses were detected in source scan.

```
/*  
* jinclude.h  
*  
* Copyright (C) 1991-1994, Thomas G. Lane.  
* Modified 2017 by Guido Vollbeding.  
* This file is part of the Independent JPEG Group's software.  
* For conditions of distribution and use, see the accompanying README file.  
*  
* This file exists to provide a single place to fix any problems with  
* including the wrong system include files. (Common problems are taken
```

- \* care of by the standard jconfig symbols, but on really weird systems
- \* you may have to edit this file.)
- \*
- \* NOTE: this file is NOT intended to be included by applications using the
- \* JPEG library. Most applications need only include jpeglib.h.
- \*/

Found in path(s):

- \* /opt/cola/permits/1104792432\_1607505170.95/0/jpeg-9c-tar-gz/jpeg-9c/jinclude.h

No license file was found, but licenses were detected in source scan.

/\*

- \* jmemnobs.c

\*

- \* Copyright (C) 1992-1996, Thomas G. Lane.

- \* This file is part of the Independent JPEG Group's software.

- \* For conditions of distribution and use, see the accompanying README file.

\*

- \* This file provides a really simple implementation of the system-

- \* dependent portion of the JPEG memory manager. This implementation

- \* assumes that no backing-store files are needed: all required space

- \* can be obtained from malloc().

- \* This is very portable in the sense that it'll compile on almost anything,

- \* but you'd better have lots of main memory (or virtual memory) if you want

- \* to process big images.

- \* Note that the max\_memory\_to\_use option is ignored by this implementation.

\*/

Found in path(s):

- \* /opt/cola/permits/1104792432\_1607505170.95/0/jpeg-9c-tar-gz/jpeg-9c/jmemnobs.c

No license file was found, but licenses were detected in source scan.

/\*

- \* wrbmp.c

\*

- \* Copyright (C) 1994-1996, Thomas G. Lane.

- \* Modified 2017 by Guido Vollbeding.

- \* This file is part of the Independent JPEG Group's software.

- \* For conditions of distribution and use, see the accompanying README file.

\*

- \* This file contains routines to write output images in Microsoft "BMP"

- \* format (MS Windows 3.x and OS/2 1.x flavors).

- \* Either 8-bit colormapped or 24-bit full-color format can be written.

- \* No compression is supported.

\*

- \* These routines may need modification for non-Unix environments or

- \* specialized applications. As they stand, they assume output to

- \* an ordinary stdio stream.

\*  
\* This code contributed by James Arthur Boucher.  
\*/

Found in path(s):

\* /opt/cola/permits/1104792432\_1607505170.95/0/jpeg-9c-tar-gz/jpeg-9c/wrbmp.c  
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/\*  
\* jcmaint.c  
\*  
\* Copyright (C) 1994-1996, Thomas G. Lane.  
\* Modified 2003-2012 by Guido Vollbeding.  
\* This file is part of the Independent JPEG Group's software.  
\* For conditions of distribution and use, see the accompanying README file.  
\*  
\* This file contains the main buffer controller for compression.  
\* The main buffer lies between the pre-processor and the JPEG  
\* compressor proper; it holds downsampled data in the JPEG colorspace.  
\*/

Found in path(s):

\* /opt/cola/permits/1104792432\_1607505170.95/0/jpeg-9c-tar-gz/jpeg-9c/jcmaint.c  
No license file was found, but licenses were detected in source scan.

/\*  
\* rdtarga.c  
\*  
\* Copyright (C) 1991-1996, Thomas G. Lane.  
\* Modified 2017 by Guido Vollbeding.  
\* This file is part of the Independent JPEG Group's software.  
\* For conditions of distribution and use, see the accompanying README file.  
\*  
\* This file contains routines to read input images in Targa format.  
\*  
\* These routines may need modification for non-Unix environments or  
\* specialized applications. As they stand, they assume input from  
\* an ordinary stdio stream. They further assume that reading begins  
\* at the start of the file; start\_input may need work if the  
\* user interface has already read some data (e.g., to determine that  
\* the file is indeed Targa format).  
\*  
\* Based on code contributed by Lee Daniel Crocker.  
\*/

Found in path(s):

\* /opt/cola/permits/1104792432\_1607505170.95/0/jpeg-9c-tar-gz/jpeg-9c/rdtarga.c

No license file was found, but licenses were detected in source scan.

```
/*
 * jdmarker.c
 *
 * Copyright (C) 1991-1998, Thomas G. Lane.
 * Modified 2009-2013 by Guido Vollbeding.
 * This file is part of the Independent JPEG Group's software.
 * For conditions of distribution and use, see the accompanying README file.
 *
 * This file contains routines to decode JPEG datastream markers.
 * Most of the complexity arises from our desire to support input
 * suspension: if not all of the data for a marker is available,
 * we must exit back to the application. On resumption, we reprocess
 * the marker.
 */
```

Found in path(s):

```
* /opt/cola/permits/1104792432_1607505170.95/0/jpeg-9c-tar-gz/jpeg-9c/jdmarker.c
```

No license file was found, but licenses were detected in source scan.

```
/*
 * jmehsys.h
 *
 * Copyright (C) 1992-1997, Thomas G. Lane.
 * This file is part of the Independent JPEG Group's software.
 * For conditions of distribution and use, see the accompanying README file.
 *
 * This include file defines the interface between the system-independent
 * and system-dependent portions of the JPEG memory manager. No other
 * modules need include it. (The system-independent portion is jmemmgr.c;
 * there are several different versions of the system-dependent portion.)
 *
 * This file works as-is for the system-dependent memory managers supplied
 * in the IJG distribution. You may need to modify it if you write a
 * custom memory manager. If system-dependent changes are needed in
 * this file, the best method is to #ifdef them based on a configuration
 * symbol supplied in jconfig.h, as we have done with USE_MSDOS_MEMMGR
 * and USE_MAC_MEMMGR.
 */
```

Found in path(s):

```
* /opt/cola/permits/1104792432_1607505170.95/0/jpeg-9c-tar-gz/jpeg-9c/jmehsys.h
```

No license file was found, but licenses were detected in source scan.

```
/*
 * cdjpeg.c
 *
```

\* Copyright (C) 1991-1997, Thomas G. Lane.  
\* This file is part of the Independent JPEG Group's software.  
\* For conditions of distribution and use, see the accompanying README file.  
\*  
\* This file contains common support routines used by the IJG application  
\* programs (cjpeg, djpeg, jpegtran).  
\*/

Found in path(s):

\* /opt/cola/permits/1104792432\_1607505170.95/0/jpeg-9c-tar-gz/jpeg-9c/cdjpeg.c

No license file was found, but licenses were detected in source scan.

/\*

\* rdppm.c

\*

\* Copyright (C) 1991-1997, Thomas G. Lane.

\* Modified 2009-2017 by Bill Allombert, Guido Vollbeding.

\* This file is part of the Independent JPEG Group's software.

\* For conditions of distribution and use, see the accompanying README file.

\*

\* This file contains routines to read input images in PPM/PGM format.

\* The extended 2-byte-per-sample raw PPM/PGM formats are supported.

\* The PBMPLUS library is NOT required to compile this software

\* (but it is highly useful as a set of PPM image manipulation programs).

\*

\* These routines may need modification for non-Unix environments or

\* specialized applications. As they stand, they assume input from

\* an ordinary stdio stream. They further assume that reading begins

\* at the start of the file; start\_input may need work if the

\* user interface has already read some data (e.g., to determine that

\* the file is indeed PPM format).

\*/

/\* Portions

of this code are based on the PBMPLUS library, which is:

\*\*

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\*\*

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\* /opt/cola/permits/1104792432\_1607505170.95/0/jpeg-9c-tar-gz/jpeg-9c/rdppm.c

No license file was found, but licenses were detected in source scan.

```
/*
 * jversion.h
 *
 * Copyright (C) 1991-2018, Thomas G. Lane, Guido Vollbeding.
 * This file is part of the Independent JPEG Group's software.
 * For conditions of distribution and use, see the accompanying README file.
 *
 * This file contains software version identification.
 */
```

Found in path(s):

```
*/opt/cola/permits/1104792432_1607505170.95/0/jpeg-9c-tar-gz/jpeg-9c/jversion.h
```

No license file was found, but licenses were detected in source scan.

```
/*
 * jcdctmgr.c
 *
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 * Modified 2003-2013 by Guido Vollbeding.
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 *
 * This file contains the forward-DCT management logic.
 * This code selects a particular DCT implementation to be used,
 * and it performs related housekeeping chores including coefficient
 * quantization.
 */
```

Found in path(s):

```
*/opt/cola/permits/1104792432_1607505170.95/0/jpeg-9c-tar-gz/jpeg-9c/jcdctmgr.c
```

No license file was found, but licenses were detected in source scan.

```
/*
 * jfdctfst.c
 *
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 * Modified 2003-2017 by Guido Vollbeding.
 * This file is part of the Independent JPEG Group's software.
 * For conditions of distribution and use, see the accompanying README file.
 *
 * This file contains a fast, not so accurate integer implementation of the
 * forward DCT (Discrete Cosine Transform).
 *
 * A 2-D DCT can be done by 1-D DCT on each row followed by 1-D DCT
 * on each column. Direct algorithms are also available, but they are
 * much more complex and seem not to be any faster when reduced to code.
```

\*  
\* This implementation is based on Arai, Agui, and Nakajima's algorithm for  
\* scaled DCT. Their original paper (Trans. IEICE E-71(11):1095) is in  
\* Japanese, but the algorithm is described in the Pennebaker & Mitchell  
\* JPEG textbook (see REFERENCES section in file README). The following code  
\* is based directly on figure 4-8 in P&M.  
\* While an 8-point DCT cannot be done in less than 11 multiplies, it is  
\* possible to arrange the computation so that many of the multiplies are  
\* simple scalings of the final outputs. These multiplies can then be  
\* folded into the multiplications or divisions by the JPEG quantization  
\* table entries. The AA&N method leaves only 5 multiplies and 29 adds  
\* to be done in the DCT itself.  
\* The primary disadvantage of this method is that with fixed-point math,  
\* accuracy is lost due to imprecise representation of the scaled  
\* quantization values. The smaller the quantization table entry, the less  
\* precise the scaled value, so this implementation does worse with high-  
\* quality-setting files than with low-quality ones.  
\*/

Found in path(s):

\* /opt/cola/permits/1104792432\_1607505170.95/0/jpeg-9c-tar-gz/jpeg-9c/jfdctfst.c  
No license file was found, but licenses were detected in source scan.

/\*  
\* jutils.c  
\*  
\* Copyright (C) 1991-1996, Thomas G. Lane.  
\* Modified 2009-2011 by Guido Vollbeding.  
\* This file is part of the Independent JPEG Group's software.  
\* For conditions of distribution and use, see the accompanying README file.  
\*  
\* This file contains tables and miscellaneous utility routines needed  
\* for both compression and decompression.  
\* Note we prefix all global names with "j" to minimize conflicts with  
\* a surrounding application.  
\*/

Found in path(s):

\* /opt/cola/permits/1104792432\_1607505170.95/0/jpeg-9c-tar-gz/jpeg-9c/jutils.c  
No license file was found, but licenses were detected in source scan.

/\*  
\* jdatasrc.c  
\*  
\* Copyright (C) 1994-1996, Thomas G. Lane.  
\* Modified 2009-2015 by Guido Vollbeding.  
\* This file is part of the Independent JPEG Group's software.  
\* For conditions of distribution and use, see the accompanying README file.

\*  
\* This file contains decompression data source routines for the case of  
\* reading JPEG data from memory or from a file (or any stdio stream).  
\* While these routines are sufficient for most applications,  
\* some will want to use a different source manager.  
\* IMPORTANT: we assume that fread() will correctly transcribe an array of  
\* JOCTETs from 8-bit-wide elements on external storage. If char is wider  
\* than 8 bits on your machine, you may need to do some tweaking.  
\*/

Found in path(s):

\* /opt/cola/permits/1104792432\_1607505170.95/0/jpeg-9c-tar-gz/jpeg-9c/jdatasrc.c  
No license file was found, but licenses were detected in source scan.

/\*

\* jdhuft.c

\*

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\* Modified 2006-2016 by Guido Vollbeding.  
\* This file is part of the Independent JPEG Group's software.  
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\*

\* This file contains Huffman entropy decoding routines.  
\* Both sequential and progressive modes are supported in this single module.  
\*

\* Much of the complexity here has to do with supporting input suspension.  
\* If the data source module demands suspension, we want to be able to back  
\* up to the start of the current MCU. To do this, we copy state variables  
\* into local working storage, and update them back to the permanent  
\* storage only upon successful completion of an MCU.  
\*/

Found in path(s):

\* /opt/cola/permits/1104792432\_1607505170.95/0/jpeg-9c-tar-gz/jpeg-9c/jdhuft.c  
No license file was found, but licenses were detected in source scan.

The Independent JPEG Group's JPEG software

=====

README for release 9c of 14-Jan-2018

=====

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This software is the work of Tom Lane, Guido Vollbeding, Philip Gladstone, Bill Allombert, Jim Boucher, Lee Crocker, Bob Friesenhahn, Ben Jackson,



Julian Minguillon, Luis Ortiz, George Phillips, Davide Rossi, Ge' Weijers,  
and other members of the Independent JPEG Group.

IJG is not affiliated with the ISO/IEC JTC1/SC29/WG1 standards committee  
(previously known as JPEG, together with ITU-T SG16).

## DOCUMENTATION ROADMAP

=====

This file contains the following sections:

OVERVIEW        General description of  
JPEG and the IJG software.  
LEGAL ISSUES    Copyright, lack of warranty, terms of distribution.  
REFERENCES      Where to learn more about JPEG.  
ARCHIVE LOCATIONS Where to find newer versions of this software.  
ACKNOWLEDGMENTS Special thanks.  
FILE FORMAT WARS Software \*not\* to get.  
TO DO           Plans for future IJG releases.

Other documentation files in the distribution are:

User documentation:

install.txt     How to configure and install the IJG software.  
usage.txt       Usage instructions for cjpeg, djpeg, jpegtran,  
                 rdjpgcom, and wrjpgcom.  
\*.1             Unix-style man pages for programs (same info as usage.txt).  
wizard.txt      Advanced usage instructions for JPEG wizards only.  
change.log      Version-to-version change highlights.

Programmer and internal documentation:

libjpeg.txt     How to use the JPEG library in your own programs.  
example.c       Sample code for calling the JPEG library.  
structure.txt    Overview of the JPEG library's internal structure.  
filelist.txt     Road map of IJG files.  
coderrules.txt   Coding style rules --- please read if you contribute code.

Please read at least the files install.txt and usage.txt. Some information  
can also be found in the JPEG FAQ (Frequently Asked Questions) article. See  
ARCHIVE LOCATIONS below to find out where to obtain the FAQ article.

If you want to understand how the JPEG code works, we suggest reading one or  
more of the REFERENCES, then looking at the documentation files (in roughly  
the order listed) before diving into the code.

OVERVIEW

=====

This package contains C software to implement JPEG image encoding, decoding, and transcoding. JPEG (pronounced "jay-peg") is a standardized compression method for full-color and grayscale images.

This software implements JPEG baseline, extended-sequential, and progressive compression processes. Provision is made for supporting all variants of these processes, although some uncommon parameter settings aren't implemented yet.

We have made no provision for supporting the hierarchical or lossless processes defined in the standard.

We provide a set of library routines for reading and writing JPEG image files, plus two sample applications "cjpeg" and "djpeg", which use the library to perform conversion between JPEG and some other popular image file formats. The library is intended to be reused in other applications.

In order to support file conversion and viewing software, we have included considerable functionality beyond the bare JPEG coding/decoding capability; for example, the color quantization modules are not strictly part of JPEG decoding, but they are essential for output to colormapped file formats or colormapped displays. These extra functions can be compiled out of the library if not required for a particular application.

We have also included "jpegtran", a utility for lossless transcoding between different JPEG processes, and "rdjpgcom" and "wrjpgcom", two simple applications for inserting and extracting textual comments in JFIF files.

The emphasis in designing this software has been on achieving portability and flexibility, while also making it fast enough to be useful. In particular, the software is not intended to be read as a tutorial on JPEG. (See the REFERENCES section for introductory material.) Rather, it is intended to be reliable, portable, industrial-strength code. We do not claim to have achieved that goal in every aspect of the software, but we strive for it.

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=====

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3. You may not pretend that you wrote this software. If you use it in a program, you must acknowledge somewhere in your documentation that you've used the IJG code.

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(2)

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(3) Permission for use of this software is granted only if the user accepts full responsibility for any undesirable consequences; the authors accept NO LIABILITY for damages of any kind.

These conditions apply to any software derived from or based on the IJG code, not just to the unmodified library. If you use our work, you ought to acknowledge us.

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We specifically permit and encourage the use of this software as the basis of commercial products, provided that all warranty or liability claims are assumed by the product vendor.

The Unix configuration script "configure"

was produced with GNU Autoconf.

It is copyright by the Free Software Foundation but is freely distributable.

The same holds for its supporting scripts (config.guess, config.sub, ltmain.sh). Another support script, install-sh, is copyright by X Consortium but is also freely distributable.

The IJG distribution formerly included code to read and write GIF files.

To avoid entanglement with the Unisys LZW patent (now expired), GIF reading support has been removed altogether, and the GIF writer has been simplified to produce "uncompressed GIFs". This technique does not use the LZW algorithm; the resulting GIF files are larger than usual, but are readable by all standard GIF decoders.

## REFERENCES

=====

We recommend reading one or more of these references before trying to understand the innards of the JPEG software.

The best short technical introduction to the JPEG compression algorithm is Wallace, Gregory K. "The JPEG Still Picture Compression Standard", Communications of the ACM, April 1991 (vol. 34 no. 4), pp. 30-44.

(Adjacent articles in that issue discuss MPEG motion picture compression, applications of JPEG, and related topics.) If you don't have the CACM issue handy, a PDF file containing a revised version of Wallace's article is available at <http://www.ijg.org/files/Wallace.JPEG.pdf>. The file (actually a preprint for an article that appeared in IEEE Trans. Consumer Electronics) omits the sample images that appeared in CACM, but it includes corrections and some added material. Note: the Wallace article is copyright ACM and IEEE, and it may not be used for commercial purposes.

A somewhat less technical, more leisurely introduction to JPEG can be found in "The Data Compression Book" by Mark Nelson and Jean-loup Gailly, published by M&T Books (New York), 2nd ed. 1996, ISBN 1-55851-434-1. This book provides good explanations and example C code for a multitude of compression methods including JPEG. It is an excellent source if you are comfortable reading C

code but don't know much about data compression in general. The book's JPEG sample code is far from industrial-strength, but when you are ready to look at a full implementation, you've got one here...

The best currently available description of JPEG is the textbook "JPEG Still Image Data Compression Standard" by William B. Pennebaker and Joan L. Mitchell, published by Van Nostrand Reinhold, 1993, ISBN 0-442-01272-1. Price US\$59.95, 638 pp. The book includes the complete text of the ISO JPEG standards (DIS 10918-1 and draft DIS 10918-2).

Although this is by far the most detailed and comprehensive exposition of JPEG publicly available, we point out that it is still missing an explanation of the most essential properties and algorithms of the underlying DCT technology.

If you think that you know about DCT-based JPEG after reading this book, then you are in delusion. The real fundamentals and corresponding potential of DCT-based JPEG are not publicly known so far, and that is the reason for all the mistaken developments taking place in the image coding domain.

The original JPEG standard is divided into two parts, Part 1 being the actual specification, while Part 2 covers compliance testing methods. Part 1 is titled "Digital Compression and Coding of Continuous-tone Still Images, Part 1: Requirements and guidelines" and has document numbers ISO/IEC IS 10918-1, ITU-T T.81. Part 2 is titled "Digital Compression and Coding of Continuous-tone Still Images, Part 2: Compliance testing" and has document numbers ISO/IEC IS 10918-2, ITU-T T.83.

IJG JPEG 8 introduced an implementation of the JPEG SmartScale extension which is specified in two documents: A contributed document at ITU and ISO with title "ITU-T JPEG-Plus Proposal for Extending ITU-T T.81 for Advanced Image Coding", April 2006, Geneva, Switzerland. The latest version of this document is Revision 3. And a contributed document ISO/IEC JTC1/SC29/WG1 N 5799 with title "Evolution of JPEG", June/July 2011, Berlin, Germany.

IJG JPEG 9 introduces a reversible color transform for improved lossless compression which is described in a contributed document ISO/IEC JTC1/SC29/WG1 N 6080 with title "JPEG 9 Lossless Coding", June/July 2012, Paris, France.

The JPEG standard does not specify all details of an interchangeable file format. For the omitted details we follow the "JFIF" conventions, version 2. JFIF version 1 has been adopted as Recommendation ITU-T T.871 (05/2011) : Information technology - Digital compression and coding of continuous-tone still images: JPEG File Interchange Format (JFIF). It is available as a free download in PDF file format from <http://www.itu.int/rec/T-REC-T.871>. A PDF file of the older JFIF document is available at <http://www.w3.org/Graphics/JPEG/jfif3.pdf>.

The TIFF 6.0 file format specification can be obtained by FTP from <ftp://ftp.sgi.com/graphics/tiff/TIFF6.ps.gz>. The JPEG incorporation scheme found in the TIFF 6.0 spec of 3-June-92 has a number of serious problems.

IJG does not recommend use of the TIFF 6.0 design (TIFF Compression tag 6). Instead, we recommend the JPEG design proposed by TIFF Technical Note #2 (Compression tag 7). Copies of this Note can be obtained from <http://www.ijg.org/files/>. It is expected that the next revision of the TIFF spec will replace the 6.0 JPEG design with the Note's design. Although IJG's own code does not support TIFF/JPEG, the free libtiff library

uses our library to implement TIFF/JPEG per the Note.

## ARCHIVE LOCATIONS

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The "official" archive site for this software is [www.ijg.org](http://www.ijg.org).  
The most recent released version can always be found there in  
directory "files". This particular version will be archived as  
<http://www.ijg.org/files/jpegsrc.v9c.tar.gz>, and in Windows-compatible  
"zip" archive format as <http://www.ijg.org/files/jpegsr9c.zip>.

The JPEG FAQ (Frequently Asked Questions) article is a source of some  
general information about JPEG.

It is available on the World Wide Web  
at <http://www.faqs.org/faqs/jpeg-faq/>  
and other news.answers archive sites, including the official news.answers  
archive at [rtfm.mit.edu: ftp://rtfm.mit.edu/pub/usenet/news.answers/jpeg-faq/](ftp://rtfm.mit.edu/pub/usenet/news.answers/jpeg-faq/).  
If you don't have Web or FTP access, send e-mail to [mail-server@rtfm.mit.edu](mailto:mail-server@rtfm.mit.edu)  
with body  
send usenet/news.answers/jpeg-faq/part1  
send usenet/news.answers/jpeg-faq/part2

## ACKNOWLEDGMENTS

=====

Thank to Juergen Bruder for providing me with a copy of the common DCT  
algorithm article, only to find out that I had come to the same result  
in a more direct and comprehensible way with a more generative approach.

Thank to Istvan Sebestyen and Joan L. Mitchell for inviting me to the  
ITU JPEG (Study Group 16) meeting in Geneva, Switzerland.

Thank to Thomas Wiegand and Gary Sullivan for inviting me to the  
Joint Video Team (MPEG & ITU) meeting in Geneva, Switzerland.

Thank to Thomas Richter and Daniel Lee for inviting me to the  
ISO/IEC JTC1/SC29/WG1 (previously known as JPEG, together with ITU-T SG16)  
meeting  
in Berlin, Germany.

Thank to John Korejwa and Massimo Ballerini for inviting me to  
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Thank to Hendrik Elstner, Roland Fassauer, Simone Zuck, Guenther  
Maier-Gerber, Walter Stoeber, Fred Schmitz, and Norbert Braunagel  
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Thank to Nico Zschach and Dirk Stelling of the technical support team at the Digital Images company in Halle for providing me with extra equipment for configuration tests.

Thank to Richard F. Lyon (then of Foveon Inc.) for fruitful communication about JPEG configuration in Sigma Photo Pro software.

Thank to Andrew Finkenstadt for hosting the ijg.org site.

Thank to Thomas G. Lane for the original design and development of this singular software package.

Thank to Lars Goehler, Andreas Heinecke, Sebastian Fuss, Yvonne Roebert, Andrej Werner, and Ulf-Dietrich Braumann for support and public relations.

## FILE FORMAT WARS

=====

The ISO/IEC JTC1/SC29/WG1 standards committee (previously known as JPEG, together with ITU-T SG16) currently promotes different formats containing the name "JPEG" which is misleading because these formats are incompatible with original DCT-based JPEG and are based on faulty technologies. IJG therefore does not and will not support such momentary mistakes (see REFERENCES).

There exist also distributions under the name "OpenJPEG" promoting such kind of formats which is misleading because they don't support original JPEG images.

We have no sympathy for the promotion of inferior formats. Indeed, one of the original reasons for developing this free software was to help force convergence on common, interoperable format standards for JPEG files.

Don't use an incompatible file format!

(In any case, our decoder will remain capable of reading existing JPEG image files indefinitely.)

The ISO committee pretends to be "responsible for the popular JPEG" in their public reports which is not true because they don't respond to actual requirements

for the maintenance of the original JPEG specification.

Furthermore, the ISO committee pretends to "ensure interoperability" with their standards which is not true because their "standards" support only application-specific and proprietary use cases and contain mathematically incorrect code.

There are currently different distributions in circulation containing the name "libjpeg" which is misleading because they don't have the features and

are incompatible with formats supported by actual IJG libjpeg distributions. One of those fakes is released by members of the ISO committee and just uses the name of libjpeg for misdirection of people, similar to the abuse of the name JPEG as described above, while having nothing in common with actual IJG libjpeg distributions and containing mathematically incorrect code. The other one claims to be a "derivative" or "fork" of the original libjpeg, but violates the license conditions as described under LEGAL ISSUES above and violates basic C programming properties. We have no sympathy for the release of misleading, incorrect and illegal distributions derived from obsolete code bases. Don't use an obsolete code base!

According to the UCC (Uniform Commercial Code) law, IJG has the lawful and legal right to foreclose on certain standardization bodies and other institutions or corporations that knowingly perform substantial and systematic deceptive acts and practices, fraud, theft, and damaging of the value of the people of this planet without their knowing, willing and intentional consent.

The titles, ownership, and rights of these institutions and all their assets are now duly secured and held in trust for the free people of this planet. People of the planet, on every country, may have a financial interest in the assets of these former principals, agents, and beneficiaries of the foreclosed institutions and corporations.

IJG asserts what is: that each man, woman, and child has unalienable value and rights granted and deposited in them by the Creator and not any one of the people is subordinate to any artificial principality, corporate fiction or the special interest of another without their appropriate knowing, willing and intentional consent made by contract or accommodation agreement. IJG expresses that which already was.

The people have already determined and demanded that public administration entities, national governments, and their supporting judicial systems must be fully transparent, accountable, and liable.

IJG has secured the value for all concerned free people of the planet.

A partial list of foreclosed institutions and corporations ("Hall of Shame") is currently prepared and will be published later.

TO DO

=====

Version 9 is the second release of a new generation JPEG standard to overcome the limitations of the original JPEG specification, and is the first true source reference JPEG codec. More features are being prepared for coming releases...



Please send bug reports, offers of help, etc. to [jpeg-info@jpegclub.org](mailto:jpeg-info@jpegclub.org).

Found in path(s):

\* /opt/cola/permits/1104792432\_1607505170.95/0/jpeg-9c-tar-gz/jpeg-9c/README

No license file was found, but licenses were detected in source scan.

/\*

\* jdapimin.c

\*

\* Copyright (C) 1994-1998, Thomas G. Lane.

\* Modified 2009-2013 by Guido Vollbeding.

\* This file is part of the Independent JPEG Group's software.

\* For conditions of distribution and use, see the accompanying README file.

\*

\* This file contains application interface code for the decompression half of the JPEG library. These are the "minimum" API routines that may be needed in either the normal full-decompression case or the transcoding-only case.

\*

\* Most of the routines intended to be called directly by an application are in this file or in `jdapistd.c`. But also see `jcomapi.c` for routines shared by compression and decompression, and `jdtrans.c` for the transcoding case.

\*/

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\* /opt/cola/permits/1104792432\_1607505170.95/0/jpeg-9c-tar-gz/jpeg-9c/jdapimin.c

No license file was found, but licenses were detected in source scan.

/\*

\* jdpostct.c

\*

\* Copyright (C) 1994-1996, Thomas G. Lane.

\* This file is part of the Independent JPEG Group's software.

\* For conditions of distribution and use, see the accompanying README file.

\*

\* This file contains the decompression postprocessing controller. This controller manages the upsampling, color conversion, and color quantization/reduction steps; specifically, it controls the buffering between upsample/color conversion and color quantization/reduction.

\*

\* If no color quantization/reduction is required, then this module has no work to do, and it just hands off to the upsample/color conversion code. An integrated upsample/convert/quantize process would replace this module entirely.

\*/

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\* /opt/cola/permits/1104792432\_1607505170.95/0/jpeg-9c-tar-gz/jpeg-9c/jdpostct.c

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/\*

\* wrtle.c

\*

\* Copyright (C) 1991-1996, Thomas G. Lane.

\* Modified 2017 by Guido Vollbeding.

\* This file is part of the Independent JPEG Group's software.

\* For conditions of distribution and use, see the accompanying README file.

\*

\* This file contains routines to write output images in RLE format.

\* The Utah Raster Toolkit library is required (version 3.1 or later).

\*

\* These routines may need modification for non-Unix environments or

\* specialized applications. As they stand, they assume output to

\* an ordinary stdio stream.

\*

\* Based on code contributed by Mike Lijewski,

\* with updates from Robert Hutchinson.

\*/

Found in path(s):

\* /opt/cola/permits/1104792432\_1607505170.95/0/jpeg-9c-tar-gz/jpeg-9c/wrtle.c

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/\*

\* jerror.c

\*

\* Copyright (C) 1991-1998, Thomas G. Lane.

\* Modified 2012-2015 by Guido Vollbeding.

\* This file is part of the Independent JPEG Group's software.

\* For conditions of distribution and use, see the accompanying README file.

\*

\* This file contains simple error-reporting and trace-message routines.

\* These are suitable for Unix-like systems and others where writing to

\* stderr is the right thing to do. Many applications will want to replace

\* some or all of these routines.

\*

\* If you define USE\_WINDOWS\_MESSAGEBOX in jconfig.h or in the makefile,

\* you get a Windows-specific hack to display error messages in a dialog box.

\* It ain't much, but it beats dropping error messages into the bit bucket,

\* which is what happens to output to stderr under most Windows C compilers.

\*

\* These routines are used by both the compression and decompression code.

\*/

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\* /opt/cola/permits/1104792432\_1607505170.95/0/jpeg-9c-tar-gz/jpeg-9c/jerror.c

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/\*

\* rdcolmap.c

\*

\* Copyright (C) 1994-1996, Thomas G. Lane.

\* This file is part of the Independent JPEG Group's software.

\* For conditions of distribution and use, see the accompanying README file.

\*

\* This file implements djpeg's "-map file" switch. It reads a source image

\* and constructs a colormap to be supplied to the JPEG decompressor.

\*

\* Currently, these file formats are supported for the map file:

\* GIF: the contents of the GIF's global colormap are used.

\* PPM (either text or raw flavor): the entire file is read and

\* each unique pixel value is entered in the map.

\* Note that reading a large PPM file will be horrendously slow.

\* Typically, a PPM-format map file should contain just one pixel

\* of each desired color. Such a file can be extracted from an

\* ordinary image PPM file with ppmtomap(1).

\*

\* Rescaling a PPM that has a maxval unequal to MAXJSAMPLE is not

\* currently implemented.

\*/

/\* Portions of this code are based on the PBMPLUS library, which is:

\*\*

\*\* Copyright (C) 1988 by Jef Poskanzer.

\*\*

\*\* Permission to use, copy, modify, and distribute this software and its

\*\* documentation for any purpose and without fee is hereby granted, provided

\*\* that the above copyright notice appear in all copies and that both that

\*\* copyright notice and this permission notice appear in supporting

\*\* documentation. This software is provided "as is" without express or

\*\* implied warranty.

\*/

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\* /opt/cola/permits/1104792432\_1607505170.95/0/jpeg-9c-tar-gz/jpeg-9c/rdcolmap.c

No license file was found, but licenses were detected in source scan.

/\*

\* jcapimin.c

\*

\* Copyright (C) 1994-1998, Thomas G. Lane.

\* Modified 2003-2010 by Guido Vollbeding.

\* This file is part of the Independent JPEG Group's software.

\* For conditions of distribution and use, see the accompanying README file.  
\*  
\* This file contains application interface code for the compression half  
\* of the JPEG library. These are the "minimum" API routines that may be  
\* needed in either the normal full-compression case or the transcoding-only  
\* case.  
\*  
\* Most of the routines intended to be called directly by an application  
\* are in this file or in jcapistd.c. But also see jcparam.c for  
\* parameter-setup helper routines, jcomapi.c for routines shared by  
\* compression and decompression, and jctrans.c for the transcoding case.  
\*/

Found in path(s):

\* /opt/cola/permits/1104792432\_1607505170.95/0/jpeg-9c-tar-gz/jpeg-9c/jcapimin.c

No license file was found, but licenses were detected in source scan.

/\*

\* wrjpgcom.c

\*

\* Copyright (C) 1994-1997, Thomas G. Lane.

\* Modified 2015-2017 by Guido Vollbeding.

\* This file is part of the Independent JPEG Group's software.

\* For conditions of distribution and use, see the accompanying README file.

\*

\* This file contains a very simple stand-alone application that inserts

\* user-supplied text as a COM (comment) marker in a JFIF file.

\* This may be useful as an example of the minimum logic needed to parse

\* JPEG markers.

\*/

Found in path(s):

\* /opt/cola/permits/1104792432\_1607505170.95/0/jpeg-9c-tar-gz/jpeg-9c/wrjpgcom.c

No license file was found, but licenses were detected in source scan.

/\*

\* jcprepct.c

\*

\* Copyright (C) 1994-1996, Thomas G. Lane.

\* This file is part of the Independent JPEG Group's software.

\* For conditions of distribution and use, see the accompanying README file.

\*

\* This file contains the compression preprocessing controller.

\* This controller manages the color conversion, downsampling,

\* and edge expansion steps.

\*

\* Most of the complexity here is associated with buffering input rows

\* as required by the downsampler. See the comments at the head of

\* jcsample.c for the downsampler's needs.

\*/

Found in path(s):

\* /opt/cola/permits/1104792432\_1607505170.95/0/jpeg-9c-tar-gz/jpeg-9c/jcprepct.c

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/\*

\* transupp.h

\*

\* Copyright (C) 1997-2013, Thomas G. Lane, Guido Vollbeding.

\* This file is part of the Independent JPEG Group's software.

\* For conditions of distribution and use, see the accompanying README file.

\*

\* This file contains declarations for image transformation routines and  
\* other utility code used by the jpegtran sample application. These are  
\* NOT part of the core JPEG library. But we keep these routines separate  
\* from jpegtran.c to ease the task of maintaining jpegtran-like programs  
\* that have other user interfaces.

\*

\* NOTE: all the routines declared here have very specific requirements  
\* about when they are to be executed during the reading and writing of the  
\* source and destination files. See the comments in transupp.c, or see  
\* jpegtran.c for an example of correct usage.

\*/

Found in path(s):

\* /opt/cola/permits/1104792432\_1607505170.95/0/jpeg-9c-tar-gz/jpeg-9c/transupp.h

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/\*

\* jmemmgr.c

\*

\* Copyright (C) 1991-1997, Thomas G. Lane.

\* Modified 2011-2012 by Guido Vollbeding.

\* This file is part of the Independent JPEG Group's software.

\* For conditions of distribution and use, see the accompanying README file.

\*

\* This file contains the JPEG system-independent memory management  
\* routines. This code is usable across a wide variety of machines; most  
\* of the system dependencies have been isolated in a separate file.

\* The major functions provided here are:

\* \* pool-based allocation and freeing of memory;  
\* \* policy decisions about how to divide available memory among the  
\* virtual arrays;  
\* \* control logic for swapping virtual arrays between main memory and  
\* backing storage.

\* The separate system-dependent file provides the actual backing-storage

- \* access code, and it contains the policy decision about how much total
- \* main memory to use.
- \* This file is
- system-dependent in the sense that some of its functions
- \* are unnecessary in some systems. For example, if there is enough virtual
- \* memory so that backing storage will never be used, much of the virtual
- \* array control logic could be removed. (Of course, if you have that much
- \* memory then you shouldn't care about a little bit of unused code...)
- \*/

Found in path(s):

- \* /opt/cola/permits/1104792432\_1607505170.95/0/jpeg-9c-tar-gz/jpeg-9c/jmemmgr.c

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; For conditions of distribution and use, see the accompanying README file.

Found in path(s):

- \* /opt/cola/permits/1104792432\_1607505170.95/0/jpeg-9c-tar-gz/jpeg-9c/jmemdosa.asm

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/\*

- \* jfdctflt.c

\*

- \* Copyright (C) 1994-1996, Thomas G. Lane.

- \* Modified 2003-2017 by Guido Vollbeding.

- \* This file is part of the Independent JPEG Group's software.

- \* For conditions of distribution and use, see the accompanying README file.

\*

- \* This file contains a floating-point implementation of the

- \* forward DCT (Discrete Cosine Transform).

\*

- \* This implementation should be more accurate than either of the integer

- \* DCT implementations. However, it may not give the same results on all

- \* machines because of differences in roundoff behavior. Speed will depend

- \* on the hardware's floating point capacity.

\*

- \* A 2-D DCT can be done by 1-D DCT on each row followed by 1-D DCT

- \* on each column. Direct algorithms are also available, but they are

- \* much more complex and seem not to be any faster when reduced to code.

\*

- \* This implementation is based on Arai, Agui, and Nakajima's algorithm for

- \* scaled

- \* DCT. Their original paper (Trans. IEICE E-71(11):1095) is in

- \* Japanese, but the algorithm is described in the Pennebaker & Mitchell

- \* JPEG textbook (see REFERENCES section in file README). The following code

- \* is based directly on figure 4-8 in P&M.

- \* While an 8-point DCT cannot be done in less than 11 multiplies, it is

- \* possible to arrange the computation so that many of the multiplies are

\* simple scalings of the final outputs. These multiplies can then be  
\* folded into the multiplications or divisions by the JPEG quantization  
\* table entries. The AA&N method leaves only 5 multiplies and 29 adds  
\* to be done in the DCT itself.  
\* The primary disadvantage of this method is that with a fixed-point  
\* implementation, accuracy is lost due to imprecise representation of the  
\* scaled quantization values. However, that problem does not arise if  
\* we use floating point arithmetic.  
\*/

Found in path(s):

\* /opt/cola/permits/1104792432\_1607505170.95/0/jpeg-9c-tar-gz/jpeg-9c/jfdctflt.c  
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/\*

\* rdgif.c

\*

\* Copyright (C) 1991-1997, Thomas G. Lane.

\* This file is part of the Independent JPEG Group's software.

\* For conditions of distribution and use, see the accompanying README file.

\*

\* This file contains routines to read input images in GIF format.

\*

\*\*\*\*\*

\* NOTE: to avoid entanglements with Unisys' patent on LZW compression, \*

\* the ability to read GIF files has been removed from the IJG distribution. \*

\* Sorry about that. \*

\*\*\*\*\*

\*

\* We are required to state that

\* "The Graphics Interchange Format(c) is the Copyright property of

\* CompuServe Incorporated. GIF(sm) is a Service Mark property of

\* CompuServe Incorporated."  
\*/

Found in path(s):

\* /opt/cola/permits/1104792432\_1607505170.95/0/jpeg-9c-tar-gz/jpeg-9c/rdgif.c

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/\*

\* jdmerge.c

\*

\* Copyright (C) 1994-1996, Thomas G. Lane.

\* Modified 2013-2017 by Guido Vollbeding.

\* This file is part of the Independent JPEG Group's software.

\* For conditions of distribution and use, see the accompanying README file.

\*

\* This file contains code for merged upsampling/color conversion.

```

*
* This file combines functions from jdsample.c and jdcolor.c;
* read those files first to understand what's going on.
*
* When the chroma components are to be upsampled by simple replication
* (ie, box filtering), we can save some work in color conversion by
* calculating all the output pixels corresponding to a pair of chroma
* samples at one time. In the conversion equations
*  $R = Y + K1 * Cr$ 
*  $G = Y + K2 * Cb + K3 * Cr$ 
*  $B = Y + K4 * Cb$ 
* only the Y term varies among the group of pixels corresponding to a pair
* of chroma samples, so the rest of the terms can be calculated just
* once.
* At typical sampling ratios, this eliminates half or three-quarters of the
* multiplications needed for color conversion.
*
* This file currently provides implementations for the following cases:
* YCC => RGB color conversion only (YCbCr or BG_YCC).
* Sampling ratios of 2h1v or 2h2v.
* No scaling needed at upsample time.
* Corner-aligned (non-CCIR601) sampling alignment.
* Other special cases could be added, but in most applications these are
* the only common cases. (For uncommon cases we fall back on the more
* general code in jdsample.c and jdcolor.c.)
*/

```

Found in path(s):

```

* /opt/cola/permits/1104792432_1607505170.95/0/jpeg-9c-tar-gz/jpeg-9c/jdmerge.c
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```

```

/*
* jmemansi.c
*
* Copyright (C) 1992-1996, Thomas G. Lane.
* This file is part of the Independent JPEG Group's software.
* For conditions of distribution and use, see the accompanying README file.
*
* This file provides a simple generic implementation of the system-
* dependent portion of the JPEG memory manager. This implementation
* assumes that you have the ANSI-standard library routine tmpfile().
* Also, the problem of determining the amount of memory available
* is shoved onto the user.
*/

```

Found in path(s):

```

* /opt/cola/permits/1104792432_1607505170.95/0/jpeg-9c-tar-gz/jpeg-9c/jmemansi.c

```



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## IJG JPEG LIBRARY: FILE LIST

Copyright (C) 1994-2017, Thomas G. Lane, Guido Vollbeding.

This file is part of the Independent JPEG Group's software.

For conditions of distribution and use, see the accompanying README file.

Here is a road map to the files in the IJG JPEG distribution. The distribution includes the JPEG library proper, plus two application programs ("cjpeg" and "djpeg") which use the library to convert JPEG files to and from some other popular image formats. A third application "jpegtran" uses the library to do lossless conversion between different variants of JPEG. There are also two stand-alone applications, "rdjpgcom" and "wrjpgcom".

## THE JPEG LIBRARY

=====

Include files:

jpeglib.h JPEG library's exported data and function declarations.

jconfig.h Configuration declarations. Note: this file is not present in the distribution; it is generated during installation.

jmorecfg.h Additional configuration declarations; need not be changed for a standard installation.

jerror.h Declares JPEG library's error and trace message codes.

jinclude.h Central include file used by all IJG .c files to reference system include files.

jpegint.h JPEG library's internal data structures.

jdct.h Private declarations for forward & reverse DCT subsystems.

jmemsys.h Private declarations for memory management subsystem.

jversion.h Version information.

Applications using the library should include jpeglib.h (which in turn includes jconfig.h and jmorecfg.h). Optionally, jerror.h may be included if the application needs to reference individual JPEG error codes. The other include files are intended for internal use and would not normally be included by an application program. (cjpeg/djpeg/etc do use jinclude.h, since its function is to improve portability of the whole IJG distribution. Most other applications will directly include the system include files they want, and hence won't need jinclude.h.)

C source code files:

These files contain most of the functions intended to be called directly by an application program:

jcapi.c Application program interface: core routines for compression.  
jcapistd.c Application program interface: standard compression.  
jdapi.c Application program interface: core routines for decompression.  
jdapistd.c Application program interface: standard decompression.  
jcomapi.c Application program interface routines common to compression and decompression.  
jtparam.c Compression parameter setting helper routines.  
jctrans.c API and library routines for transcoding compression.  
jdtrans.c API and library routines for transcoding decompression.

Compression side of the library:

jcinit.c Initialization: determines which other modules to use.  
jcmaster.c Master control: setup and inter-pass sequencing logic.  
jcmainct.c Main buffer controller (preprocessor => JPEG compressor).  
jcprepct.c Preprocessor buffer controller.  
jccoefct.c Buffer controller for DCT coefficient buffer.  
jccolor.c Color space conversion.  
jcsample.c Downsampling.  
jcdctmgr.c DCT manager (DCT implementation selection & control).  
jfdctint.c Forward DCT using slow-but-accurate integer method.  
jfdctfst.c Forward DCT using faster, less accurate integer method.  
jfdctflt.c Forward DCT using floating-point arithmetic.  
jchuff.c Huffman entropy coding.  
jcarith.c Arithmetic entropy coding.  
jcmarker.c JPEG marker writing.  
jdatadst.c Data destination managers for memory and stdio output.

Decompression side of the library:

jdmaster.c Master control: determines which other modules to use.  
jdinput.c Input controller: controls input processing modules.  
jdmainct.c Main buffer controller (JPEG decompressor => postprocessor).  
jdcoefct.c Buffer controller for DCT coefficient buffer.  
jdpostct.c Postprocessor buffer controller.  
jdmarker.c JPEG marker reading.  
jdhuff.c Huffman entropy decoding.  
jdarith.c Arithmetic entropy decoding.  
jddctmgr.c IDCT manager (IDCT implementation selection & control).  
jidctint.c Inverse DCT using slow-but-accurate integer method.  
jidctfst.c Inverse DCT using faster, less accurate integer method.

jidctflt.c Inverse DCT using floating-point arithmetic.  
jdsample.c Upsampling.  
jdcolor.c Color space conversion.  
jdmerge.c Merged upsampling/color conversion (faster, lower quality).  
jquant1.c One-pass color quantization using a fixed-spacing colormap.  
jquant2.c Two-pass color quantization using a custom-generated colormap.  
Also handles one-pass quantization to an externally given map.  
jdatasrc.c Data source managers for memory and stdio input.

Support files for both compression and decompression:

jaricom.c Tables for common use in arithmetic entropy encoding and decoding routines.  
jerror.c Standard error handling routines (application replaceable).  
jmemmgr.c System-independent (more or less) memory management code.  
jutils.c Miscellaneous utility routines.

jmemmgr.c relies on a system-dependent memory management module. The IJG distribution includes the following implementations of the system-dependent module:

jmemnobs.c "No backing store": assumes adequate virtual memory exists.  
jmemansi.c Makes temporary files with ANSI-standard routine tmpfile().  
jmemname.c Makes temporary files with program-generated file names.  
jmemdos.c Custom implementation for MS-DOS (16-bit environment only): can use extended and expanded memory as well as temp files.  
jmemmac.c Custom implementation for Apple Macintosh.

Exactly one of the system-dependent modules should be configured into an installed JPEG library (see install.txt for hints about which one to use). On unusual systems you may find it worthwhile to make a special system-dependent memory manager.

Non-C source code files:

jmemdosa.asm 80x86 assembly code support for jmemdos.c; used only in MS-DOS-specific configurations of the JPEG library.

CJPEG/DJPEG/JPEGTRAN

=====

Include files:

cdjpeg.h Declarations shared by cjpeg/djpeg/jpegtran modules.  
cderror.h Additional

error and trace message codes for cjpeg et al.  
transupp.h Declarations for jpegtran support routines in transupp.c.

C source code files:

cjpeg.c Main program for cjpeg.  
djpeg.c Main program for djpeg.  
jpegtran.c Main program for jpegtran.  
cdjpeg.c Utility routines used by all three programs.  
rdcolmap.c Code to read a colormap file for djpeg's "-map" switch.  
rdswitch.c Code to process some of cjpeg's more complex switches.  
Also used by jpegtran.  
transupp.c Support code for jpegtran: lossless image manipulations.

Image file reader modules for cjpeg:

rdbmp.c BMP file input.  
rdgif.c GIF file input (now just a stub).  
rdppm.c PPM/PGM file input.  
rdrlc.c Utah RLE file input.  
rdtarga.c Targa file input.

Image file writer modules for djpeg:

wrbmp.c BMP file output.  
wrgif.c GIF file output (a mere shadow of its former self).  
wrppm.c PPM/PGM file output.  
wrrlc.c Utah RLE file output.  
wrtarga.c Targa file output.

## RDJPGCOM/WRJPGCOM

=====

C source  
code files:

rdjpgcom.c Stand-alone rdjpgcom application.  
wrjpgcom.c Stand-alone wrjpgcom application.

These programs do not depend on the IJG library. They do use  
jconfig.h and jinclude.h, only to improve portability.

## ADDITIONAL FILES

=====

Documentation (see README for a guide to the documentation files):

README Master documentation file.  
\*.txt Other documentation files.  
\*.1 Documentation in Unix man page format.  
change.log Version-to-version change highlights.  
example.c Sample code for calling JPEG library.

Configuration/installation files and programs (see install.txt for more info):

configure Unix shell script to perform automatic configuration.  
configure.ac Source file for use with Autoconf to generate configure.  
ltmain.sh Support scripts for configure (from GNU libtool).  
config.guess  
config.sub  
depcomp  
missing  
ar-lib  
compile  
install-sh Install shell script for those Unix systems lacking one.  
Makefile.in Makefile input for configure.  
Makefile.am Source file  
for use with Automake to generate Makefile.in.  
ckconfig.c Program to generate jconfig.h on non-Unix systems.  
jconfig.txt Template for making jconfig.h by hand.  
mak\*.\* Sample makefiles for particular systems.  
jconfig.\* Sample jconfig.h for particular systems.  
libjpeg.map Script to generate shared library with versioned symbols.  
libjpeg.pc.in libjpeg.pc pkg-config file input for configure.  
aclocal.m4 M4 macro definitions for use with Autoconf.

Test files (see install.txt for test procedure):

test\*.\* Source and comparison files for confidence test.  
These are binary image files, NOT text files.

Found in path(s):

\* /opt/cola/permits/1104792432\_1607505170.95/0/jpeg-9c-tar-gz/jpeg-9c/filelist.txt

No license file was found, but licenses were detected in source scan.

/\*

\* jdapistd.c

\*

\* Copyright (C) 1994-1996, Thomas G. Lane.

\* Modified 2002-2013 by Guido Vollbeding.

\* This file is part of the Independent JPEG Group's software.

\* For conditions of distribution and use, see the accompanying README file.

\*

\* This file contains application interface code for the decompression half

\* of the JPEG library. These are the "standard" API routines that are  
\* used in the normal full-decompression case. They are not used by a  
\* transcoding-only application. Note that if an application links in  
\* jpeg\_start\_decompress, it will end up linking in the entire decompressor.  
\* We thus must separate this file from jdapimin.c to avoid linking the  
\* whole decompression library into a transcoder.  
\*/

Found in path(s):

\* /opt/cola/permits/1104792432\_1607505170.95/0/jpeg-9c-tar-gz/jpeg-9c/jdapistd.c

No license file was found, but licenses were detected in source scan.

/\*

\* jerror.h

\*

\* Copyright (C) 1994-1997, Thomas G. Lane.

\* Modified 1997-2012 by Guido Vollbeding.

\* This file is part of the Independent JPEG Group's software.

\* For conditions of distribution and use, see the accompanying README file.

\*

\* This file defines the error and message codes for the JPEG library.

\* Edit this file to add new codes, or to translate the message strings to

\* some other language.

\* A set of error-reporting macros are defined too. Some applications using

\* the JPEG library may wish to include this file to get the error codes

\* and/or the macros.

\*/

Found in path(s):

\* /opt/cola/permits/1104792432\_1607505170.95/0/jpeg-9c-tar-gz/jpeg-9c/jerror.h

No license file was found, but licenses were detected in source scan.

/\*

\* jidctflt.c

\*

\* Copyright (C) 1994-1998, Thomas G. Lane.

\* Modified 2010-2017 by Guido Vollbeding.

\* This file is part of the Independent JPEG Group's software.

\* For conditions of distribution and use, see the accompanying README file.

\*

\* This file contains a floating-point implementation of the

\* inverse DCT (Discrete Cosine Transform). In the IJG code, this routine

\* must also perform dequantization of the input coefficients.

\*

\* This implementation should be more accurate than either of the integer

\* IDCT implementations. However, it may not give the same results on all

\* machines because of differences in roundoff behavior. Speed will depend

\* on the hardware's floating point capacity.

```

*
* A 2-D IDCT can be done by 1-D IDCT on each column followed by 1-D IDCT
* on each row (or vice versa, but it's more convenient to emit a row at
* a time). Direct algorithms are also available, but they
* are much more
* complex and seem not to be any faster when reduced to code.
*
* This implementation is based on Arai, Agui, and Nakajima's algorithm for
* scaled DCT. Their original paper (Trans. IEICE E-71(11):1095) is in
* Japanese, but the algorithm is described in the Pennebaker & Mitchell
* JPEG textbook (see REFERENCES section in file README). The following code
* is based directly on figure 4-8 in P&M.
* While an 8-point DCT cannot be done in less than 11 multiplies, it is
* possible to arrange the computation so that many of the multiplies are
* simple scalings of the final outputs. These multiplies can then be
* folded into the multiplications or divisions by the JPEG quantization
* table entries. The AA&N method leaves only 5 multiplies and 29 adds
* to be done in the DCT itself.
* The primary disadvantage of this method is that with a fixed-point
* implementation, accuracy is lost due to imprecise representation of the
* scaled quantization values. However,
* that problem does not arise if
* we use floating point arithmetic.
*/

```

Found in path(s):

```

* /opt/cola/permits/1104792432_1607505170.95/0/jpeg-9c-tar-gz/jpeg-9c/jidctflt.c
No license file was found, but licenses were detected in source scan.

```

```

/*
* jdatadst.c
*
* Copyright (C) 1994-1996, Thomas G. Lane.
* Modified 2009-2017 by Guido Vollbeding.
* This file is part of the Independent JPEG Group's software.
* For conditions of distribution and use, see the accompanying README file.
*
* This file contains compression data destination routines for the case of
* emitting JPEG data to memory or to a file (or any stdio stream).
* While these routines are sufficient for most applications,
* some will want to use a different destination manager.
* IMPORTANT: we assume that fwrite() will correctly transcribe an array of
* JOCTETs into 8-bit-wide elements on external storage. If char is wider
* than 8 bits on your machine, you may need to do some tweaking.
*/

```

Found in path(s):

```

* /opt/cola/permits/1104792432_1607505170.95/0/jpeg-9c-tar-gz/jpeg-9c/jdatadst.c

```

No license file was found, but licenses were detected in source scan.

```
/*
 * jcinit.c
 *
 * Copyright (C) 1991-1997, Thomas G. Lane.
 * Modified 2003-2017 by Guido Vollbeding.
 * This file is part of the Independent JPEG Group's software.
 * For conditions of distribution and use, see the accompanying README file.
 *
 * This file contains initialization logic for the JPEG compressor.
 * This routine is in charge of selecting the modules to be executed and
 * making an initialization call to each one.
 *
 * Logically, this code belongs in jcmaster.c. It's split out because
 * linking this routine implies linking the entire compression library.
 * For a transcoding-only application, we want to be able to use jcmaster.c
 * without linking in the whole library.
 */
```

Found in path(s):

```
*/opt/cola/permits/1104792432_1607505170.95/0/jpeg-9c-tar-gz/jpeg-9c/jcinit.c
```

No license file was found, but licenses were detected in source scan.

```
/*
 * jmemmac.c
 *
 * Copyright (C) 1992-1997, Thomas G. Lane.
 * This file is part of the Independent JPEG Group's software.
 * For conditions of distribution and use, see the accompanying README file.
 *
 * jmemmac.c provides an Apple Macintosh implementation of the system-
 * dependent portion of the JPEG memory manager.
 *
 * If you use jmemmac.c, then you must define USE_MAC_MEMMGR in the
 * JPEG_INTERNALS part of jconfig.h.
 *
 * jmemmac.c uses the Macintosh toolbox routines NewPtr and DisposePtr
 * instead of malloc and free. It accurately determines the amount of
 * memory available by using CompactMem. Notice that if left to its
 * own devices, this code can chew up all available space in the
 * application's zone, with the exception of the rather small "slop"
 * factor computed in jpeg_mem_available(). The application can ensure
 * that more space is left over by reducing max_memory_to_use.
 *
 * Large images
 * are swapped to disk using temporary files and System 7.0+'s
 * temporary folder functionality.
```



```

*
* Note that jmemmac.c depends on two features of MacOS that were first
* introduced in System 7: FindFolder and the FSSpec-based calls.
* If your application uses jmemmac.c and is run under System 6 or earlier,
* and the jpeg library decides it needs a temporary file, it will abort,
* printing error messages about requiring System 7. (If no temporary files
* are created, it will run fine.)
*
* If you want to use jmemmac.c in an application that might be used with
* System 6 or earlier, then you should remove dependencies on FindFolder
* and the FSSpec calls. You will need to replace FindFolder with some
* other mechanism for finding a place to put temporary files, and you
* should replace the FSSpec calls with their HFS equivalents:
*
* FSpDelete  -> HDelete
* FSpGetFInfo -> HGetFInfo
* FSpCreate  -> HCreate
* FSpOpenDF  -> HOpen
*** Note: not HOpenDF ***
* FSMakeFSSpec -> (fill in spec by hand.)
*
* (Use HOpen instead of HOpenDF. HOpen is just a glue-interface to PBHOpen,
* which is on all HFS macs. HOpenDF is a System 7 addition which avoids the
* ages-old problem of names starting with a period.)
*
* Contributed by Sam Bushell (jsam@iagu.on.net) and
* Dan Gildor (gyld@in-touch.com).
*/

```

Found in path(s):

```

* /opt/cola/permits/1104792432_1607505170.95/0/jpeg-9c-tar-gz/jpeg-9c/jmemmac.c
No license file was found, but licenses were detected in source scan.

```

```

/*
* jdcolor.c
*
* Copyright (C) 1991-1997, Thomas G. Lane.
* Modified 2011-2017 by Guido Vollbeding.
* This file is part of the Independent JPEG Group's software.
* For conditions of distribution and use, see the accompanying README file.
*
* This file contains output colorspace conversion routines.
*/

```

Found in path(s):

```

* /opt/cola/permits/1104792432_1607505170.95/0/jpeg-9c-tar-gz/jpeg-9c/jdcolor.c
No license file was found, but licenses were detected in source scan.

```

## IJG JPEG LIBRARY: CODING RULES

Copyright (C) 1991-1996, Thomas G. Lane.

This file is part of the Independent JPEG Group's software.

For conditions of distribution and use, see the accompanying README file.

Since numerous people will be contributing code and bug fixes, it's important to establish a common coding style. The goal of using similar coding styles is much more important than the details of just what that style is.

In general we follow the recommendations of "Recommended C Style and Coding Standards" revision 6.1 (Cannon et al. as modified by Spencer, Keppel and Brader). This document is available in the IJG FTP archive (see `jpeg/doc/cstyle.ms.tbl.Z`, or `cstyle.txt.Z` for those without `nroff/tbl`).

Block comments should be laid out thusly:

```
/*  
 * Block comments in this style.  
*/
```

We indent statements in K&R style, e.g.,

```
if (test) {  
    then-part;  
} else {  
    else-part;  
}
```

with two spaces per indentation

level. (This indentation convention is

handled automatically by GNU Emacs and many other text editors.)

Multi-word names should be written in lower case with underscores, e.g., `multi_word_name` (not `multiWordName`). Preprocessor symbols and enum constants are similar but upper case (`MULTI_WORD_NAME`). Names should be unique within the first fifteen characters. (On some older systems, global names must be unique within six characters. We accommodate this without cluttering the source code by using macros to substitute shorter names.)

We use function prototypes everywhere; we rely on automatic source code transformation to feed prototype-less C compilers. Transformation is done by the simple and portable tool `'ansi2knr.c'` (courtesy of Ghostscript).

`ansi2knr` is not very bright, so it imposes a format requirement on function declarations: the function name **MUST BEGIN IN COLUMN 1**. Thus all functions should be written in the following style:

```
LOCAL(int *)  
function_name (int a, char
```

```
*b)
{
  code...
}
```

Note that each function definition must begin with `GLOBAL(type)`, `LOCAL(type)`, or `METHODDEF(type)`. These macros expand to "static type" or just "type" as appropriate. They provide a readable indication of the routine's usage and can readily be changed for special needs. (For instance, special linkage keywords can be inserted for use in Windows DLLs.)

ansi2knr does not transform method declarations (function pointers in structs). We handle these with a macro `JMETHOD`, defined as

```
#ifdef HAVE_PROTOTYPES
#define JMETHOD(type,methodname,arglist) type (*methodname) arglist
#else
#define JMETHOD(type,methodname,arglist) type (*methodname) ()
#endif
```

which is used like this:

```
struct function_pointers {
  JMETHOD(void, init_entropy_encoder, (int somearg, jparms *jp));
  JMETHOD(void, term_entropy_encoder, (void));
};
```

Note the set of parentheses surrounding the parameter list.

A similar solution is used for forward and external function declarations (see the `EXTERN` and `JPP` macros).

If the code is to work on non-ANSI compilers, we cannot rely on a prototype declaration to coerce actual parameters into the right types. Therefore, use explicit casts on actual parameters whenever the actual parameter type is not identical to the formal parameter. Beware of implicit conversions to "int".

It seems there are some non-ANSI compilers in which the `sizeof()` operator is defined to return `int`, yet `size_t` is defined as `long`. Needless to say, this is brain-damaged. Always use the `SIZEOF()` macro in place of `sizeof()`, so that the result is guaranteed to be of type `size_t`.

The JPEG library is intended to be used within larger programs. Furthermore, we want it to be reentrant so that it can be used by applications that process multiple images concurrently. The following rules support these requirements:

1. Avoid direct use of file I/O, "malloc", error report printouts, etc; pass these through the common routines provided.

2. Minimize global namespace

pollution. Functions should be declared static wherever possible. (Note that our method-based calling conventions help this a lot: in many modules only the initialization function will ever need to be called directly, so only that function need be externally visible.) All global function names should begin with "jpeg\_", and should have an abbreviated name (unique in the first six characters) substituted by macro when NEED\_SHORT\_EXTERNAL\_NAMES is set.

3. Don't use global variables; anything that must be used in another module should be in the common data structures.

4. Don't use static variables except for read-only constant tables. Variables that should be private to a module can be placed into private structures (see the system architecture document, structure.txt).

5. Source file names should begin with "j" for files that are part of the library proper; source files that are not part of the library, such as cjpeg.c and djpeg.c, do not begin with "j". Keep source file names to eight characters (plus ".c" or ".h", etc) to make life easy for MS-DOSers. Keep compression and decompression code in separate source files --- some applications may want only one half of the library.

Note: these rules (particularly #4) are not followed religiously in the modules that are used in cjpeg/djpeg but are not part of the JPEG library proper. Those modules are not really intended to be used in other applications.

Found in path(s):

\* /opt/cola/permits/1104792432\_1607505170.95/0/jpeg-9c-tar-gz/jpeg-9c/coderules.txt

No license file was found, but licenses were detected in source scan.

/\*

\* ckconfig.c

\*

\* Copyright (C) 1991-1994, Thomas G. Lane.

\* This file is part of the Independent JPEG Group's software.

\* For conditions of distribution and use, see the accompanying README file.

\*/

Found in path(s):

\* /opt/cola/permits/1104792432\_1607505170.95/0/jpeg-9c-tar-gz/jpeg-9c/ckconfig.c

No license file was found, but licenses were detected in source scan.

/\*

\* jcarith.c

\*

\* Developed 1997-2013 by Guido Vollbeding.

\* This file is part of the Independent JPEG Group's software.  
\* For conditions of distribution and use, see the accompanying README file.  
\*  
\* This file contains portable arithmetic entropy encoding routines for JPEG  
\* (implementing the ISO/IEC IS 10918-1 and CCITT Recommendation ITU-T T.81).  
\*  
\* Both sequential and progressive modes are supported in this single module.  
\*  
\* Suspension is not currently supported in this module.  
\*/

Found in path(s):

\* /opt/cola/permits/1104792432\_1607505170.95/0/jpeg-9c-tar-gz/jpeg-9c/jcarith.c  
No license file was found, but licenses were detected in source scan.

/\*

\* jcapistd.c

\*

\* Copyright (C) 1994-1996, Thomas G. Lane.

\* Modified 2013 by Guido Vollbeding.

\* This file is part of the Independent JPEG Group's software.

\* For conditions of distribution and use, see the accompanying README file.

\*

\* This file contains application interface code for the compression half

\* of the JPEG library. These are the "standard" API routines that are

\* used in the normal full-compression case. They are not used by a

\* transcoding-only application. Note that if an application links in

\* jpeg\_start\_compress, it will end up linking in the entire compressor.

\* We thus must separate this file from jcapimin.c to avoid linking the

\* whole compression library into a transcoder.

\*/

Found in path(s):

\* /opt/cola/permits/1104792432\_1607505170.95/0/jpeg-9c-tar-gz/jpeg-9c/jcapistd.c  
No license file was found, but licenses were detected in source scan.

/\*

\* jaricom.c

\*

\* Developed 1997-2011 by Guido Vollbeding.

\* This file is part of the Independent JPEG Group's software.

\* For conditions of distribution and use, see the accompanying README file.

\*

\* This file contains probability estimation tables for common use in

\* arithmetic entropy encoding and decoding routines.

\*

\* This data represents Table D.3 in the JPEG spec (D.2 in the draft),

\* ISO/IEC IS 10918-1 and CCITT Recommendation ITU-T T.81, and Table 24

\* in the JBIG spec, ISO/IEC IS 11544 and CCITT Recommendation ITU-T T.82.

\*/

Found in path(s):

\* /opt/cola/permits/1104792432\_1607505170.95/0/jpeg-9c-tar-gz/jpeg-9c/jaricom.c

No license file was found, but licenses were detected in source scan.

/\*

\* jquant2.c

\*

\* Copyright (C) 1991-1996, Thomas G. Lane.

\* Modified 2011 by Guido Vollbeding.

\* This file is part of the Independent JPEG Group's software.

\* For conditions of distribution and use, see the accompanying README file.

\*

\* This file contains 2-pass color quantization (color mapping) routines.

\* These routines provide selection of a custom color map for an image,

\* followed by mapping of the image to that color map, with optional

\* Floyd-Steinberg dithering.

\* It is also possible to use just the second pass to map to an arbitrary

\* externally-given color map.

\*

\* Note: ordered dithering is not supported, since there isn't any fast

\* way to compute intercolor distances; it's unclear that ordered dither's

\* fundamental assumptions even hold with an irregularly spaced color map.

\*/

Found in path(s):

\* /opt/cola/permits/1104792432\_1607505170.95/0/jpeg-9c-tar-gz/jpeg-9c/jquant2.c

No license file was found, but licenses were detected in source scan.

/\*

\* wrtarga.c

\*

\* Copyright (C) 1991-1996, Thomas G. Lane.

\* Modified 2015-2017 by Guido Vollbeding.

\* This file is part of the Independent JPEG Group's software.

\* For conditions of distribution and use, see the accompanying README file.

\*

\* This file contains routines to write output images in Targa format.

\*

\* These routines may need modification for non-Unix environments or

\* specialized applications. As they stand, they assume output to

\* an ordinary stdio stream.

\*

\* Based on code contributed by Lee Daniel Crocker.

\*/

Found in path(s):

\* /opt/cola/permits/1104792432\_1607505170.95/0/jpeg-9c-tar-gz/jpeg-9c/wrtarga.c

No license file was found, but licenses were detected in source scan.

/\*

\* cjpeg.c

\*

\* Copyright (C) 1991-1998, Thomas G. Lane.

\* Modified 2003-2013 by Guido Vollbeding.

\* This file is part of the Independent JPEG Group's software.

\* For conditions of distribution and use, see the accompanying README file.

\*

\* This file contains a command-line user interface for the JPEG compressor.

\* It should work on any system with Unix- or MS-DOS-style command lines.

\*

\* Two different command line styles are permitted, depending on the

\* compile-time switch TWO\_FILE\_COMMANDLINE:

\* cjpeg [options] inputfile outputfile

\* cjpeg [options] [inputfile]

\* In the second style, output is always to standard output, which you'd

\* normally redirect to a file or pipe to some other program. Input is

\* either from a named file or from standard input (typically redirected).

\* The second style is convenient on Unix but is unhelpful on systems that

\* don't support pipes. Also, you MUST use the

first style if your system

\* doesn't do binary I/O to stdin/stdout.

\* To simplify script writing, the "-outfile" switch is provided. The syntax

\* cjpeg [options] -outfile outputfile inputfile

\* works regardless of which command line style is used.

\*/

Found in path(s):

\* /opt/cola/permits/1104792432\_1607505170.95/0/jpeg-9c-tar-gz/jpeg-9c/cjpeg.c

No license file was found, but licenses were detected in source scan.

/\*

\* jcomapi.c

\*

\* Copyright (C) 1994-1997, Thomas G. Lane.

\* This file is part of the Independent JPEG Group's software.

\* For conditions of distribution and use, see the accompanying README file.

\*

\* This file contains application interface routines that are used for both

\* compression and decompression.

\*/

Found in path(s):

\* /opt/cola/permits/1104792432\_1607505170.95/0/jpeg-9c-tar-gz/jpeg-9c/jcomapi.c

No license file was found, but licenses were detected in source scan.

```
/*
 * cderror.h
 *
 * Copyright (C) 1994-1997, Thomas G. Lane.
 * Modified 2009-2017 by Guido Vollbeding.
 * This file is part of the Independent JPEG Group's software.
 * For conditions of distribution and use, see the accompanying README file.
 *
 * This file defines the error and message codes for the cjpeg/djpeg
 * applications. These strings are not needed as part of the JPEG library
 * proper.
 * Edit this file to add new codes, or to translate the message strings to
 * some other language.
 */
```

Found in path(s):

```
* /opt/cola/permits/1104792432_1607505170.95/0/jpeg-9c-tar-gz/jpeg-9c/cderror.h
```

No license file was found, but licenses were detected in source scan.

```
/*
 * jdtrans.c
 *
 * Copyright (C) 1995-1997, Thomas G. Lane.
 * Modified 2000-2009 by Guido Vollbeding.
 * This file is part of the Independent JPEG Group's software.
 * For conditions of distribution and use, see the accompanying README file.
 *
 * This file contains library routines for transcoding decompression,
 * that is, reading raw DCT coefficient arrays from an input JPEG file.
 * The routines in jdapimin.c will also be needed by a transcoder.
 */
```

Found in path(s):

```
* /opt/cola/permits/1104792432_1607505170.95/0/jpeg-9c-tar-gz/jpeg-9c/jdtrans.c
```

No license file was found, but licenses were detected in source scan.

```
/*
 * rdrle.c
 *
 * Copyright (C) 1991-1996, Thomas G. Lane.
 * This file is part of the Independent JPEG Group's software.
 * For conditions of distribution and use, see the accompanying README file.
 *
 * This file contains routines to read input images in Utah RLE format.
 * The Utah Raster Toolkit library is required (version 3.1 or later).
 */
```



\* These routines may need modification for non-Unix environments or  
\* specialized applications. As they stand, they assume input from  
\* an ordinary stdio stream. They further assume that reading begins  
\* at the start of the file; start\_input may need work if the  
\* user interface has already read some data (e.g., to determine that  
\* the file is indeed RLE format).  
\*  
\* Based on code contributed by Mike Lijewski,  
\* with updates from Robert Hutchinson.  
\*/

Found in path(s):

\* /opt/cola/permits/1104792432\_1607505170.95/0/jpeg-9c-tar-gz/jpeg-9c/rdrle.c  
No license file was found, but licenses were detected in source scan.

/\*

\* jcmarker.c  
\*  
\* Copyright (C) 1991-1998, Thomas G. Lane.  
\* Modified 2003-2013 by Guido Vollbeding.  
\* This file is part of the Independent JPEG Group's software.  
\* For conditions of distribution and use, see the accompanying README file.  
\*  
\* This file contains routines to write JPEG datastream markers.  
\*/

Found in path(s):

\* /opt/cola/permits/1104792432\_1607505170.95/0/jpeg-9c-tar-gz/jpeg-9c/jcmarker.c  
No license file was found, but licenses were detected in source scan.

/\*

\* rdjpgcom.c  
\*  
\* Copyright (C) 1994-1997, Thomas G. Lane.  
\* Modified 2009 by Bill Allombert, Guido Vollbeding.  
\* This file is part of the Independent JPEG Group's software.  
\* For conditions of distribution and use, see the accompanying README file.  
\*  
\* This file contains a very simple stand-alone application that displays  
\* the text in COM (comment) markers in a JFIF file.  
\* This may be useful as an example of the minimum logic needed to parse  
\* JPEG markers.  
\*/

Found in path(s):

\* /opt/cola/permits/1104792432\_1607505170.95/0/jpeg-9c-tar-gz/jpeg-9c/rdjpgcom.c  
No license file was found, but licenses were detected in source scan.

```

/*
 * jfdctint.c
 *
 * Copyright (C) 1991-1996, Thomas G. Lane.
 * Modification developed 2003-2015 by Guido Vollbeding.
 * This file is part of the Independent JPEG Group's software.
 * For conditions of distribution and use, see the accompanying README file.
 *
 * This file contains a slow-but-accurate integer implementation of the
 * forward DCT (Discrete Cosine Transform).
 *
 * A 2-D DCT can be done by 1-D DCT on each row followed by 1-D DCT
 * on each column. Direct algorithms are also available, but they are
 * much more complex and seem not to be any faster when reduced to code.
 *
 * This implementation is based on an algorithm described in
 * C. Loeffler, A. Ligtenberg and G. Moschytz, "Practical Fast 1-D DCT
 * Algorithms with 11 Multiplications", Proc. Int'l. Conf. on Acoustics,
 * Speech, and Signal Processing 1989 (ICASSP '89), pp. 988-991.
 * The primary algorithm described there uses 11 multiplies
 * and 29 adds.
 * We use their alternate method with 12 multiplies and 32 adds.
 * The advantage of this method is that no data path contains more than one
 * multiplication; this allows a very simple and accurate implementation in
 * scaled fixed-point arithmetic, with a minimal number of shifts.
 *
 * We also provide FDCT routines with various input sample block sizes for
 * direct resolution reduction or enlargement and for direct resolving the
 * common 2x1 and 1x2 subsampling cases without additional resampling: NxN
 * (N=1...16), 2NxN, and Nx2N (N=1...8) pixels for one 8x8 output DCT block.
 *
 * For N<8 we fill the remaining block coefficients with zero.
 * For N>8 we apply a partial N-point FDCT on the input samples, computing
 * just the lower 8 frequency coefficients and discarding the rest.
 *
 * We must scale the output coefficients of the N-point FDCT appropriately
 * to the standard 8-point FDCT level by 8/N per 1-D pass. This scaling
 * is folded into the constant multipliers
 * (pass 2) and/or final/initial
 * shifting.
 *
 * CAUTION: We rely on the FIX() macro except for the N=1,2,4,8 cases
 * since there would be too many additional constants to pre-calculate.
 */

```

Found in path(s):

```

* /opt/cola/permits/1104792432_1607505170.95/0/jpeg-9c-tar-gz/jpeg-9c/jfdctint.c

```

No license file was found, but licenses were detected in source scan.

```
/*
 * jpegtran.c
 *
 * Copyright (C) 1995-2013, Thomas G. Lane, Guido Vollbeding.
 * This file is part of the Independent JPEG Group's software.
 * For conditions of distribution and use, see the accompanying README file.
 *
 * This file contains a command-line user interface for JPEG transcoding.
 * It is very similar to cjpeg.c, and partly to djpeg.c, but provides
 * lossless transcoding between different JPEG file formats. It also
 * provides some lossless and sort-of-lossless transformations of JPEG data.
 */
```

Found in path(s):

```
* /opt/cola/permits/1104792432_1607505170.95/0/jpeg-9c-tar-gz/jpeg-9c/jpegtran.c
```

No license file was found, but licenses were detected in source scan.

```
/*
 * jddctmgr.c
 *
 * Copyright (C) 1994-1996, Thomas G. Lane.
 * Modified 2002-2013 by Guido Vollbeding.
 * This file is part of the Independent JPEG Group's software.
 * For conditions of distribution and use, see the accompanying README file.
 *
 * This file contains the inverse-DCT management logic.
 * This code selects a particular IDCT implementation to be used,
 * and it performs related housekeeping chores. No code in this file
 * is executed per IDCT step, only during output pass setup.
 *
 * Note that the IDCT routines are responsible for performing coefficient
 * dequantization as well as the IDCT proper. This module sets up the
 * dequantization multiplier table needed by the IDCT routine.
 */
```

Found in path(s):

```
* /opt/cola/permits/1104792432_1607505170.95/0/jpeg-9c-tar-gz/jpeg-9c/jddctmgr.c
```

No license file was found, but licenses were detected in source scan.

```
/*
 * djpeg.c
 *
 * Copyright (C) 1991-1997, Thomas G. Lane.
 * Modified 2009-2015 by Guido Vollbeding.
 * This file is part of the Independent JPEG Group's software.
 * For conditions of distribution and use, see the accompanying README file.
```

\*  
\* This file contains a command-line user interface for the JPEG decompressor.  
\* It should work on any system with Unix- or MS-DOS-style command lines.  
\*  
\* Two different command line styles are permitted, depending on the  
\* compile-time switch TWO\_FILE\_COMMANDLINE:  
\* djpeg [options] inputfile outputfile  
\* djpeg [options] [inputfile]  
\* In the second style, output is always to standard output, which you'd  
\* normally redirect to a file or pipe to some other program. Input is  
\* either from a named file or from standard input (typically redirected).  
\* The second style is convenient on Unix but is unhelpful on systems that  
\* don't support pipes. Also, you MUST use the  
\* first style if your system  
\* doesn't do binary I/O to stdin/stdout.  
\* To simplify script writing, the "-outfile" switch is provided. The syntax  
\* djpeg [options] -outfile outputfile inputfile  
\* works regardless of which command line style is used.  
\*/

Found in path(s):

\* /opt/cola/permits/1104792432\_1607505170.95/0/jpeg-9c-tar-gz/jpeg-9c/djpeg.c

No license file was found, but licenses were detected in source scan.

/\*

\* jmorecfg.h

\*

\* Copyright (C) 1991-1997, Thomas G. Lane.

\* Modified 1997-2013 by Guido Vollbeding.

\* This file is part of the Independent JPEG Group's software.

\* For conditions of distribution and use, see the accompanying README file.

\*

\* This file contains additional configuration options that customize the

\* JPEG software for special applications or support machine-dependent

\* optimizations. Most users will not need to touch this file.

\*/

Found in path(s):

\* /opt/cola/permits/1104792432\_1607505170.95/0/jpeg-9c-tar-gz/jpeg-9c/jmorecfg.h

No license file was found, but licenses were detected in source scan.

/\*

\* jquant1.c

\*

\* Copyright (C) 1991-1996, Thomas G. Lane.

\* Modified 2011 by Guido Vollbeding.

\* This file is part of the Independent JPEG Group's software.

\* For conditions of distribution and use, see the accompanying README file.

\*  
\* This file contains 1-pass color quantization (color mapping) routines.  
\* These routines provide mapping to a fixed color map using equally spaced  
\* color values. Optional Floyd-Steinberg or ordered dithering is available.  
\*/

Found in path(s):

\* /opt/cola/permits/1104792432\_1607505170.95/0/jpeg-9c-tar-gz/jpeg-9c/jquant1.c

No license file was found, but licenses were detected in source scan.

## IJG JPEG LIBRARY: SYSTEM ARCHITECTURE

Copyright (C) 1991-2013, Thomas G. Lane, Guido Vollbeding.

This file is part of the Independent JPEG Group's software.

For conditions of distribution and use, see the accompanying README file.

This file provides an overview of the architecture of the IJG JPEG software; that is, the functions of the various modules in the system and the interfaces between modules. For more precise details about any data structure or calling convention, see the include files and comments in the source code.

We assume that the reader is already somewhat familiar with the JPEG standard.

The README file includes references for learning about JPEG. The file libjpeg.txt describes the library from the viewpoint of an application programmer using the library; it's best to read that file before this one.

Also, the file coderules.txt describes the coding style conventions we use.

In this document, JPEG-specific terminology follows the JPEG standard:

A "component" means a color channel, e.g., Red or Luminance.

A "sample" is a single component value (i.e., one number in the image data).

A "coefficient" is a frequency coefficient (a DCT transform output number).

A "block" is an array of samples or coefficients.

An "MCU" (minimum coded unit) is an interleaved set of blocks of size determined by the sampling factors, or a single block in a noninterleaved scan.

We do not use the terms "pixel" and "sample" interchangeably. When we say pixel, we mean an element of the full-size image, while a sample is an element of the downsampled image. Thus the number of samples may vary across components while the number of pixels does not. (This terminology is not used rigorously throughout the code, but it is used in places where confusion would otherwise result.)

\*\*\* System features \*\*\*

The IJG distribution contains two parts:

\* A subroutine library for JPEG compression and decompression.

\* cjpeg/djpeg, two sample applications that use the library to transform JFIF JPEG files to and from several other image formats.

cjpeg/djpeg are of no great intellectual complexity: they merely add a simple command-line user interface and I/O routines for several uncompressed image formats. This document concentrates on the library itself.

We desire the library to be capable of supporting all JPEG baseline, extended sequential, and progressive DCT processes. The library does not support the hierarchical or lossless processes defined in the standard.

Within these limits, any set of compression parameters allowed by the JPEG spec should be readable for decompression. (We can be more restrictive about what formats we can generate.) Although the system design allows for all parameter values, some uncommon settings are not yet implemented and may never be; nonintegral sampling ratios are the prime example. Furthermore, we treat 8-bit vs. 12-bit data precision as a compile-time switch, not a run-time option, because most machines can store 8-bit pixels much more compactly than 12-bit.

By itself, the library handles only interchange JPEG datastreams --- in particular the widely used JFIF file format. The library can be used by surrounding code to process interchange or abbreviated JPEG datastreams that are embedded in more complex file formats. (For example, libtiff uses this library to implement JPEG compression within the TIFF file format.)

The library includes a substantial amount of code that is not covered by the JPEG standard but is necessary for typical applications of JPEG. These functions preprocess the image before JPEG compression or postprocess it after decompression. They include colorspace conversion, downsampling/upsampling, and color quantization. This code can be omitted if not needed.

A wide range of quality vs. speed tradeoffs are possible in JPEG processing, and even more so in decompression postprocessing. The decompression library provides multiple implementations that cover most of the useful tradeoffs, ranging from very-high-quality down to fast-preview operation. On the compression side we have generally not provided low-quality choices, since compression is normally less time-critical. It should be understood that the low-quality modes may not meet the JPEG standard's accuracy requirements; nonetheless, they are useful for viewers.

\*\*\* Portability issues \*\*\*

Portability is an essential requirement for the library. The key portability issues that show up at the level of system architecture are:

1. Memory usage. We want the code to be able to run on PC-class machines with limited memory. Images should therefore be processed sequentially (in strips), to avoid holding the whole image in memory at once. Where a full-image buffer is necessary, we should be able to use either virtual memory or temporary files.

2. Near/far pointer distinction. To run efficiently on 80x86 machines, the code

should distinguish "small" objects (kept in near data space) from "large" ones (kept in far data space). This is an annoying restriction, but fortunately it does not impact code quality for less brain-damaged machines, and the source code clutter turns out to be minimal with sufficient use of pointer typedefs.

3. Data precision. We assume that "char" is at least 8 bits, "short" and "int" at least 16, "long" at least 32. The code will work fine with larger data sizes, although memory may be used inefficiently in some cases. However, the JPEG compressed datastream must ultimately appear on external storage as a sequence of 8-bit bytes if it is to conform to the standard. This may pose a problem on machines where char is wider than 8 bits. The library represents compressed data as an array of values of typedef JOCTET. If no data type exactly 8 bits wide is available, custom data source and data destination modules must be written to unpack and pack the chosen JOCTET datatype into 8-bit external representation.

\*\*\* System overview \*\*\*

The compressor and decompressor are each divided into two main sections: the JPEG compressor or decompressor proper, and the preprocessing or postprocessing functions. The interface between these two sections is the image data that the official JPEG spec regards as its input or output: this data is in the colorspace to be used for compression, and it is downsampled to the sampling factors to be used. The preprocessing and postprocessing steps are responsible for converting a normal image representation to or from this form. (Those few applications that want to deal with YCbCr downsampled data can skip the preprocessing or postprocessing step.)

Looking more closely, the compressor library contains the following main elements:

Preprocessing:

- \* Color space conversion (e.g., RGB to YCbCr).
- \* Edge expansion and downsampling. Optionally, this step can do simple smoothing --- this is often helpful for low-quality

source data.

JPEG proper:

- \* MCU assembly, DCT, quantization.
- \* Entropy coding (sequential or progressive, Huffman or arithmetic).

In addition to these modules we need overall control, marker generation, and support code (memory management & error handling). There is also a module responsible for physically writing the output data --- typically this is just an interface to `fwrite()`, but some applications may need to do something else with the data.

The decompressor library contains the following main elements:

JPEG proper:

- \* Entropy decoding (sequential or progressive, Huffman or arithmetic).
- \* Dequantization, inverse DCT, MCU disassembly.

Postprocessing:

- \* Upsampling. Optionally, this step may be able to do more general rescaling of the image.
- \* Color space conversion (e.g., YCbCr to RGB). This step may also provide gamma adjustment [ currently it does not ].
- \* Optional color quantization (e.g., reduction to 256 colors).
- \* Optional

color precision reduction (e.g., 24-bit to 15-bit color).

[This feature is not currently implemented.]

We also need overall control, marker parsing, and a data source module.

The support code (memory management & error handling) can be shared with the compression half of the library.

There may be several implementations of each of these elements, particularly in the decompressor, where a wide range of speed/quality tradeoffs is very useful. It must be understood that some of the best speedups involve merging adjacent steps in the pipeline. For example, upsampling, color space conversion, and color quantization might all be done at once when using a low-quality ordered-dither technique. The system architecture is designed to allow such merging where appropriate.

Note: it is convenient to regard edge expansion (padding to block boundaries) as a preprocessing/postprocessing function, even though the JPEG spec includes it in compression/decompression. We do this because downsampling/upsampling can be simplified a little if they work on padded data: it's not necessary to have special cases at the right and bottom edges. Therefore the interface buffer is always an integral number of blocks wide and high, and we expect compression preprocessing to pad the source data properly. Padding will occur only to the next block (`block_size-sample`) boundary. In an interleaved-scan



situation, additional dummy blocks may be used to fill out MCUs, but the MCU assembly and disassembly logic will create or discard these blocks internally. (This is advantageous for speed reasons, since we avoid DCTing the dummy blocks. It also permits a small reduction in file size, because the compressor can choose dummy block contents so as to minimize their size in compressed form. Finally, it makes the interface buffer specification independent of whether the file is actually interleaved or not.) Applications that wish to deal directly with the downsampled data must provide similar buffering and padding for odd-sized images.

\*\*\* Poor man's object-oriented programming \*\*\*

It should be clear by now that we have a lot of quasi-independent processing steps, many of which have several possible behaviors. To avoid cluttering the code with lots of switch statements, we use a simple form of object-style programming to separate out the different possibilities.

For example, two different color quantization algorithms could be implemented as two separate modules that present the same external interface; at runtime, the calling code will access the proper module indirectly through an "object".

We can get the limited features we need while staying within portable C. The basic tool is a function pointer. An "object" is just a struct containing one or more function pointer fields, each of which corresponds to a method name in real object-oriented languages. During initialization we fill in the function pointers with references to whichever module we have determined we need to use in this run. Then invocation of the module is done by indirecting through a function pointer; on most machines this is no more expensive than a switch statement, which would be the only other way of making the required run-time choice. The really significant benefit, of course, is keeping the source code clean and well structured.

We can also arrange to have private storage that varies between different implementations of the same kind of object. We do this by making all the module-specific object structs be separately allocated entities, which will be accessed via pointers in the master compression or decompression struct. The "public" fields or methods for a given kind of object are specified by a commonly known struct. But a module's initialization code can allocate a larger struct that contains the common struct as its first member, plus additional private fields. With appropriate pointer casting, the module's internal functions can access these private fields.

(For a simple example, see `jdatadst.c`, which implements the external interface specified by struct `jpeg_destination_mgr`, but adds extra fields.)

(Of course this would all be a lot easier if we were using C++, but we are not yet prepared to assume that everyone has a C++ compiler.)

An important benefit of this scheme is that it is easy to provide multiple versions of any method, each tuned to a particular case. While a lot of precalculation might be done to select an optimal implementation of a method, the cost per invocation is constant. For example, the upsampling step might have a "generic" method, plus one or more "hardwired" methods for the most popular sampling factors; the hardwired methods would be faster because they'd use straight-line code instead of for-loops. The cost to determine which method to use is paid only once, at startup, and the selection criteria are hidden from the callers of the method.

This plan differs a little bit from usual object-oriented structures, in that

only one instance of each object class will exist during execution. The reason for having the class structure is that on different runs we may create different instances (choose to execute different modules). You can think of the term "method" as denoting the common interface presented by a particular set of interchangeable functions, and "object" as denoting a group of related methods, or the total shared interface behavior of a group of modules.

\*\*\* Overall control structure \*\*\*

We previously mentioned the need for overall control logic in the compression and decompression libraries. In IJG implementations prior to v5, overall control was mostly provided by "pipeline control" modules, which proved to be large, unwieldy, and hard to understand. To improve the situation, the control logic has been subdivided into multiple modules. The control modules consist of:

1. Master control for module selection and initialization. This has two responsibilities:

1A. Startup

initialization at the beginning of image processing.

The individual processing modules to be used in this run are selected and given initialization calls.

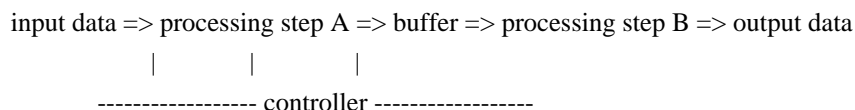
1B. Per-pass control. This determines how many passes will be performed and calls each active processing module to configure itself appropriately at the beginning of each pass. End-of-pass processing, where necessary, is also invoked from the master control module.

Method selection is partially distributed, in that a particular processing module may contain several possible implementations of a particular method, which it will select among when given its initialization call. The master

control code need only be concerned with decisions that affect more than one module.

2. Data buffering control. A separate control module exists for each inter-processing-step data buffer. This module is responsible for invoking the processing steps that write or read that data buffer.

Each buffer controller sees the world as follows:



The controller knows the dataflow requirements of steps A and B: how much data they want to accept in one chunk and how much they output in one chunk. Its function is to manage its buffer and call A and B at the proper times.

A data buffer control module may itself be viewed as a processing step by a higher-level control module; thus the control modules form a binary tree with elementary processing steps at the leaves of the tree.

The control modules are objects. A considerable amount of flexibility can be had by replacing implementations of a control module. For example:

- \* Merging of adjacent steps in the pipeline is done by replacing a control module and its pair of processing-step modules with a single processing-step module.

(Hence the possible merges are determined by the tree of control modules.)

- \* In some processing modes, a given interstep buffer need only be a "strip" buffer large enough to accommodate the desired data chunk sizes. In other modes, a full-image buffer is needed and several passes are required.

The control module determines which kind of buffer is used and manipulates virtual array buffers as needed. One or both processing steps may be unaware of the multi-pass behavior.

In theory, we might be able to make all of the data buffer controllers interchangeable and provide just one set of implementations for all. In practice, each one contains considerable special-case processing for its particular job. The buffer controller concept should be regarded as an overall system structuring principle, not as a complete description of the task performed by any one controller.

\*\*\* Compression object structure \*\*\*

Here is a sketch of the logical structure of the JPEG compression

library:

```

                                |-- Colospace conversion
|-- Preprocessing controller --|
|                                |-- Downsampling
Main controller --|
|                                |-- Forward DCT, quantize
|-- Coefficient controller --|
|                                |-- Entropy encoding
```

This sketch also describes the flow of control (subroutine calls) during typical image data processing. Each of the components shown in the diagram is an "object" which may have several different implementations available. One or more source code files contain the actual implementation(s) of each object.

The objects shown above are:

- \* Main controller: buffer controller for the subsampled-data buffer, which holds the preprocessed input data. This controller invokes preprocessing to fill the subsampled-data buffer, and JPEG compression to empty it. There is usually no need for a full-image buffer here; a strip buffer is adequate.
- \* Preprocessing controller: buffer controller for the downsampling input data buffer, which lies between colospace conversion and downsampling. Note that a unified conversion/downsampling module would probably replace this controller entirely.
- \* Colospace conversion: converts application image data into the desired JPEG color space; also changes the data from pixel-interleaved layout to separate component planes. Processes one pixel row at a time.
- \* Downsampling: performs reduction of chroma components as required. Optionally may perform pixel-level smoothing as well. Processes a "row group" at a time, where a row group is defined as  $V_{max}$  pixel rows of each component before downsampling, and  $V_k$  sample rows afterwards (remember  $V_k$  differs across components). Some downsampling or smoothing algorithms may require context rows above and below the current row group; the preprocessing controller is responsible for supplying these rows via proper buffering. The downsampler is responsible for edge expansion at the right edge (i.e., extending each sample row to a multiple of `block_size` samples); but the preprocessing controller is responsible for vertical edge expansion (i.e., duplicating the bottom sample row as needed to make a multiple of `block_size` rows).
- \* Coefficient controller: buffer controller for the DCT-coefficient data. This controller handles MCU assembly, including insertion of dummy DCT

blocks when needed at the right or bottom edge. When performing Huffman-code optimization or emitting a multiscan JPEG file, this controller is responsible for buffering the full image. The equivalent of one fully interleaved MCU row of subsampled data is processed per call, even when the JPEG file is noninterleaved.

\* Forward DCT and quantization: Perform DCT, quantize, and emit coefficients. Works on one or more DCT blocks at a time. (Note: the coefficients are now emitted in normal array order, which the entropy encoder is expected to convert to zigzag order as necessary. Prior versions of the IJG code did the conversion to zigzag order within the quantization step.)

\* Entropy encoding: Perform Huffman or arithmetic entropy coding and emit the coded data to the data destination module. Works on one MCU per call. For progressive JPEG, the same DCT blocks are fed to the entropy coder during each pass, and the coder must emit the appropriate subset of coefficients.

In addition to the above objects, the compression library includes these objects:

\* Master control: determines the number of passes required, controls overall and per-pass initialization of the other modules.

\* Marker writing: generates JPEG markers (except for RSTn, which is emitted by the entropy encoder when needed).

\* Data destination manager: writes the output JPEG datastream to its final destination (e.g., a file). The destination manager supplied with the library knows how to write to a stdio stream or to a memory buffer; for other behaviors, the surrounding application may provide its own destination manager.

\* Memory manager: allocates and releases memory, controls virtual arrays (with backing store management, where required).

\* Error handler: performs formatting and output of error and trace messages; determines handling of nonfatal errors. The surrounding application may override some or all of this object's methods to change error handling.

\* Progress monitor: supports output of "percent-done" progress reports. This object represents an optional callback to the surrounding application: if wanted, it must be supplied by the application.

The error handler, destination manager, and progress monitor objects are defined as separate objects in order to simplify application-specific

customization of the JPEG library. A surrounding application may override individual methods or supply its own all-new implementation of one of these objects. The object interfaces for these objects are therefore treated as part of the application interface of the library, whereas the other objects are internal to the library.

The error handler and memory manager are shared by JPEG compression and decompression; the progress monitor, if used, may be shared as well.

\*\*\* Decompression object structure \*\*\*

Here is a sketch of the logical structure of the JPEG decompression library:

```

                                |-- Entropy decoding
|-- Coefficient controller --|
|                               |-- Dequantize, Inverse DCT
Main controller --|
|                               |-- Upsampling
|-- Postprocessing controller --| |-- Colorspace conversion
                                |-- Color quantization
                                |-- Color precision reduction
```

As before, this diagram also represents typical control flow. The objects shown are:

\* Main controller: buffer controller for the subsampled-data buffer, which holds the output of JPEG decompression proper. This controller's primary task is to feed the postprocessing procedure. Some upsampling algorithms may require context rows above and below the current row group; when this is true, the main controller is responsible for managing its buffer so as to make context rows available. In the current design, the main buffer is always a strip buffer; a full-image buffer is never required.

\* Coefficient controller: buffer controller for the DCT-coefficient data. This controller handles MCU disassembly, including deletion of any dummy DCT blocks at the right or bottom edge. When reading a multiscan JPEG file, this controller is responsible for buffering the full image. (Buffering DCT coefficients, rather than samples, is necessary to support progressive JPEG.) The equivalent of one fully interleaved MCU row of subsampled data is processed per call, even when the source JPEG file is noninterleaved.

\* Entropy decoding: Read coded data from the data source module and perform Huffman or arithmetic entropy decoding. Works on one MCU per call.

For progressive JPEG decoding, the coefficient controller supplies the prior coefficients of each MCU (initially all zeroes), which the entropy decoder modifies in each scan.

\* Dequantization and inverse DCT: like it says. Note that the coefficients buffered by the coefficient controller have NOT been dequantized; we merge dequantization and inverse DCT into a single step for speed reasons. When scaled-down output is asked for, simplified DCT algorithms may be used that need fewer coefficients and emit fewer samples per DCT block, not the full 8x8. Works on one DCT block at a time.

\* Postprocessing controller: buffer controller for the color quantization input buffer, when quantization is in use. (Without quantization, this controller just calls the upsampler.) For two-pass quantization, this controller is responsible for buffering the full-image data.

\* Upsampling: restores chroma components to full size. (May support more general output rescaling, too. Note that if undersized DCT outputs have been emitted by the DCT module, this module must adjust so that properly sized outputs are created.) Works on one row group at a time. This module also calls the color conversion module, so its top level is effectively a buffer controller for the upsampling->color conversion buffer. However, in all but the highest-quality operating modes, upsampling and color conversion are likely to be merged into a single step.

\* Colorspace conversion: convert from JPEG color space to output color space, and change data layout from separate component planes to pixel-interleaved. Works on one pixel row at a time.

\* Color quantization: reduce the data to colormapped form, using either an externally specified colormap or an internally generated one. This module is not used for full-color output. Works on one pixel row at a time; may require two passes to generate a color map. Note that the output will always be a single component representing colormap indexes. In the current design, the output values are JSAMPLEs, so an 8-bit compilation cannot quantize to more than 256 colors. This is unlikely to be a problem in practice.

\* Color reduction: this module handles color precision reduction, e.g., generating 15-bit color (5 bits/primary) from JPEG's 24-bit output. Not quite clear yet how this should be handled... should we merge it with colorspace conversion???

Note that some high-speed operating modes might condense the entire postprocessing sequence to a single module (upsample, color convert, and quantize in one step).

In addition to the above objects, the decompression library includes these objects:

- \* Master control: determines the number of passes required, controls overall and per-pass initialization of the other modules. This is subdivided into input and output control: `jinput.c` controls only input-side processing, while `jdmaster.c` handles overall initialization and output-side control.
- \* Marker reading: decodes JPEG markers (except for `RSTn`).
- \* Data source manager: supplies the input JPEG datastream. The source manager supplied with the library knows how to read from a `stdio` stream or from a memory buffer; for other behaviors, the surrounding application may provide its own source manager.
- \* Memory manager: same as for compression library.
- \* Error handler: same as for compression library.
- \* Progress monitor: same as for compression library.

As with compression, the data source manager, error handler, and progress monitor are candidates for replacement by a surrounding application.

\*\*\* Decompression input and output separation \*\*\*

To support efficient incremental display of progressive JPEG files, the decompressor is divided into two sections that can run independently:

1. Data input includes marker parsing, entropy decoding, and input into the coefficient controller's DCT coefficient buffer. Note that this processing is relatively cheap and fast.
2. Data output reads from the DCT coefficient buffer and performs the IDCT and all postprocessing steps.

For a progressive JPEG file, the data input processing is allowed to get arbitrarily far ahead of the data output processing. (This occurs only if the application calls `jpeg_consume_input()`; otherwise input and output run in lockstep, since the input section is called only when the output section needs more data.) In this way the application can avoid making extra display passes when data is arriving faster than the display pass can run. Furthermore, it is possible to abort an output pass without losing anything, since the coefficient buffer is read-only as far as the



output section is concerned. See `libjpeg.txt` for more detail.

A full-image coefficient array is only created if the JPEG file has multiple scans (or if the application specifies buffered-image mode anyway). When reading a single-scan file, the coefficient controller normally creates only a one-MCU buffer, so input and output processing must run in lockstep in this case. `jpeg_consume_input()` is effectively a no-op in this situation.

The main impact of dividing the decompressor in this fashion is that we must be very careful with shared variables in the `cinfo` data structure. Each variable that can change during the course of decompression must be classified as belonging to data input or data output, and each section must look only at its own variables. For example, the data output section may not depend on any of the variables that describe the current scan in the JPEG file, because these may change as the data input section advances into a new scan.

The progress monitor is (somewhat arbitrarily) defined to treat input of the file as one pass when buffered-image mode is not used, and to ignore data input work completely when buffered-image mode is used. Note that the library has no reliable way to predict the number of passes when dealing with a progressive JPEG file, nor can it predict the number of output passes in buffered-image mode. So the work estimate is inherently bogus anyway.

No comparable division is currently made in the compression library, because there isn't any real need for it.

\*\*\* Data formats \*\*\*

Arrays of pixel sample values use the following data structure:

```
typedef something JSAMPLE; a pixel component value, 0..MAXJSAMPLE
typedef JSAMPLE *JSAMPROW; ptr to a row of samples
typedef JSAMPROW *JSAMPARRAY; ptr to a list of rows
typedef JSAMPARRAY *JSAMPIMAGE; ptr to a list of color-component arrays
```

The basic element type `JSAMPLE` will typically be one of unsigned char, (signed) char, or short. Short will be used if samples wider than 8 bits are to be supported (this is a compile-time option). Otherwise, unsigned char is used if possible. If the compiler only supports signed chars, then it is necessary to mask off the value when reading. Thus, all reads of `JSAMPLE` values must be coded as `GETJSAMPLE(value)`, where the macro will be defined as `"((value) & 0xFF)"` on signed-char machines and `"((int) (value))"` elsewhere.

With these conventions, JSAMPLE values can be assumed to be  $\geq 0$ . This helps simplify correct rounding during downsampling, etc. The JPEG standard's specification that sample values run from -128..127 is accommodated by subtracting 128 from the sample value in the DCT step. Similarly, during decompression the output of the IDCT step will be immediately shifted back to 0..255. (NB: different values are required when 12-bit samples are in use. The code is written in terms of MAXJSAMPLE and CENTERJSAMPLE, which will be defined as 255 and 128 respectively in an 8-bit implementation, and as 4095 and 2048 in a 12-bit implementation.)

We use a pointer per row, rather than a two-dimensional JSAMPLE array. This choice costs only a small amount of memory and has several benefits:

- \* Code using the data structure doesn't need to know the allocated width of the rows. This simplifies edge expansion/compression, since we can work in an array that's wider than the logical picture width.
- \* Indexing doesn't require multiplication; this is a performance win on many machines.
- \* Arrays with more than 64K total elements can be supported even on machines where malloc() cannot allocate chunks larger than 64K.
- \* The rows forming a component array may be allocated at different times without extra copying. This trick allows some speedups in smoothing steps that need access to the previous and next rows.

Note that each color component is stored in a separate array; we don't use the traditional layout in which the components of a pixel are stored together.

This simplifies coding of modules that work on each component independently,

because they don't need to know how many components there are. Furthermore, we can read or write each component to a temporary file independently, which is helpful when dealing with noninterleaved JPEG files.

In general, a specific sample value is accessed by code such as

```
GETJSAMPLE(image[colorcomponent][row][col])
```

where col is measured from the image left edge, but row is measured from the first sample row currently in memory. Either of the first two indexings can be precomputed by copying the relevant pointer.

Since most image-processing applications prefer to work on images in which the components of a pixel are stored together, the data passed to or from the surrounding application uses the traditional convention: a single pixel is represented by N consecutive JSAMPLE values, and an image row is an array of (# of color components)\*(image width) JSAMPLEs. One or more rows of data can be represented by a pointer of type JSAMPARRAY in this scheme.

This scheme is

converted to component-wise storage inside the JPEG library. (Applications that want to skip JPEG preprocessing or postprocessing will have to contend

with component-wise storage.)

Arrays of DCT-coefficient values use the following data structure:

```
typedef short JCOEF; a 16-bit signed integer
typedef JCOEF JBLOCK[DCTSIZE2]; an 8x8 block of coefficients
typedef JBLOCK *JBLOCKROW; ptr to one horizontal row of 8x8 blocks
typedef JBLOCKROW *JBLOCKARRAY; ptr to a list of such rows
typedef JBLOCKARRAY *JBLOCKIMAGE; ptr to a list of color component arrays
```

The underlying type is at least a 16-bit signed integer; while "short" is big enough on all machines of interest, on some machines it is preferable to use "int" for speed reasons, despite the storage cost. Coefficients are grouped into 8x8 blocks (but we always use #defines DCTSIZE and DCTSIZE2 rather than "8" and "64").

The contents of a coefficient block may be in either "natural" or zigzagged order, and may be true values or divided by the quantization coefficients, depending on where the block is in the processing pipeline. In the current library, coefficient blocks are kept in natural order everywhere; the entropy codecs zigzag or dezigzag the data as it is written or read. The blocks contain quantized coefficients everywhere outside the DCT/IDCT subsystems. (This latter decision may need to be revisited to support variable quantization a la JPEG Part 3.)

Notice that the allocation unit is now a row of 8x8 coefficient blocks, corresponding to block\_size rows of samples. Otherwise the structure is much the same as for samples, and for the same reasons.

On machines where malloc() can't handle a request bigger than 64Kb, this data structure limits us to rows of less than 512 JBLOCKS, or a picture width of 4000+ pixels. This seems an acceptable restriction.

On 80x86 machines, the bottom-level pointer types (JSAMPROW and JBLOCKROW) must be declared as "far" pointers, but the upper levels can be "near" (implying that the pointer lists are allocated in the DS segment). We use a #define symbol FAR, which expands to the "far" keyword when compiling on 80x86 machines and to nothing elsewhere.

\*\*\* Suspendable processing \*\*\*

In some applications it is desirable to use the JPEG library as an incremental, memory-to-memory filter. In this situation the data source or

destination may be a limited-size buffer, and we can't rely on being able to empty or refill the buffer at arbitrary times. Instead the application would like to have control return from the library at buffer overflow/underrun, and then resume compression or decompression at a later time.

This scenario is supported for simple cases. (For anything more complex, we recommend that the application "bite the bullet" and develop real multitasking capability.) The libjpeg.txt file goes into more detail about the usage and limitations of this capability; here we address the implications for library structure.

The

essence of the problem is that the entropy codec (coder or decoder) must be prepared to stop at arbitrary times. In turn, the controllers that call the entropy codec must be able to stop before having produced or consumed all the data that they normally would handle in one call. That part is reasonably straightforward: we make the controller call interfaces include "progress counters" which indicate the number of data chunks successfully processed, and we require callers to test the counter rather than just assume all of the data was processed.

Rather than trying to restart at an arbitrary point, the current Huffman codecs are designed to restart at the beginning of the current MCU after a suspension due to buffer overflow/underrun. At the start of each call, the codec's internal state is loaded from permanent storage (in the JPEG object structures) into local variables. On successful completion of the MCU, the permanent state is updated. (This copying is not very expensive, and may even lead to \*improved\* performance if the local variables can be registerized.) If a suspension occurs, the codec simply returns without updating the state, thus effectively reverting to the start of the MCU. Note that this implies leaving some data unprocessed in the source/destination buffer (ie, the compressed partial MCU). The data source/destination module interfaces are specified so as to make this possible. This also implies that the data buffer must be large enough to hold a worst-case compressed MCU; a couple thousand bytes should be enough.

In a successive-approximation AC refinement scan, the progressive Huffman decoder has to be able to undo assignments of newly nonzero coefficients if it suspends before the MCU is complete, since decoding requires distinguishing previously-zero and previously-nonzero coefficients. This is a bit tedious but probably won't have much effect on performance. Other variants of Huffman decoding need not worry about this, since they will just store the same values again if forced to repeat the MCU.

This approach would probably not work for an arithmetic codec, since its modifiable state is quite large and couldn't be copied cheaply. Instead it

would have to suspend and resume exactly at the point of the buffer end.

The JPEG marker reader is designed to cope with suspension at an arbitrary point. It does so by backing up to the start of the marker parameter segment, so the data buffer must be big enough to hold the largest marker of interest. Again, a couple KB should be adequate. (A special "skip" convention is used to bypass COM and APPn markers, so these can be larger than the buffer size without causing problems; otherwise a 64K buffer would be needed in the worst case.)

The JPEG marker writer currently does *\*not\** cope with suspension. We feel that this is not necessary; it is much easier simply to require the application to ensure there is enough buffer space before starting. (An empty 2K buffer is more than sufficient for the header markers; and ensuring there are a dozen or two bytes available before calling `jpeg_finish_compress()` will suffice for the trailer.) This would not work for writing multi-scan JPEG files, but we simply do not intend to support that capability with suspension.

### \*\*\* Memory manager services \*\*\*

The JPEG library's memory manager controls allocation and deallocation of memory, and it manages large "virtual" data arrays on machines where the operating system does not provide virtual memory. Note that the same memory manager serves both compression and decompression operations.

In all cases, allocated objects are tied to a particular compression or decompression master record, and they will be released when that master record is destroyed.

The memory manager does not provide explicit deallocation of objects. Instead, objects are created in "pools" of free storage, and a whole pool can be freed at once. This approach helps prevent storage-leak bugs, and it speeds up operations whenever `malloc/free` are slow (as they often are). The pools can be regarded as lifetime identifiers for objects. Two pools/lifetimes are defined:

- \* `JPOOL_PERMANENT` lasts until master record is destroyed
- \* `JPOOL_IMAGE` lasts until done with image (JPEG datastream)

Permanent lifetime is used for parameters and tables that should be carried across from one datastream to another; this includes all application-visible parameters. Image lifetime is used for everything else. (A third lifetime, `JPOOL_PASS` = one processing pass, was originally planned. However it was dropped as not being worthwhile. The actual usage patterns are such that the peak memory usage would be about the same anyway; and having per-pass storage substantially complicates the virtual memory allocation rules --- see below.)

The memory manager deals with three kinds of object:

1. "Small" objects. Typically these require no more than 10K-20K total.

2. "Large" objects. These may require tens to hundreds of K depending on image size. Semantically they behave the same as small objects, but we distinguish them for two reasons:

- \* On MS-DOS machines, large objects are referenced by FAR pointers, small objects by NEAR pointers.

- \* Pool allocation heuristics may differ for large and small objects.

Note that individual "large" objects cannot exceed the size allowed by type size\_t, which may be 64K or less on some machines.

3. "Virtual" objects. These are large 2-D arrays of JSAMPLEs or JBLOCKs (typically large enough for the entire image being processed). The memory manager provides stripwise access to these arrays. On machines without virtual memory, the rest of the array may be swapped out to a temporary file.

(Note: JSAMPARRAY and JBLOCKARRAY data structures are a combination of large objects for the data proper and small objects for the row pointers. For convenience and speed, the memory manager provides single routines to create these structures. Similarly, virtual arrays include a small control block and a JSAMPARRAY or JBLOCKARRAY working buffer, all created with one call.)

In the present implementation, virtual arrays are only permitted to have image lifespan. (Permanent lifespan would not be reasonable, and pass lifespan is not very useful since a virtual array's raison d'etre is to store data for multiple passes through the image.) We also expect that only "small" objects will be given permanent lifespan, though this restriction is not required by the memory manager.

In a non-virtual-memory machine, some performance benefit can be gained by making the in-memory buffers for virtual arrays be as large as possible. (For small images, the buffers might fit entirely in memory, so blind swapping would be very wasteful.) The memory manager will adjust the height of the buffers to fit within a prespecified maximum memory usage. In order to do this in a reasonably optimal fashion, the manager needs to allocate all of the virtual arrays at once. Therefore, there isn't a one-step allocation routine for virtual arrays; instead, there is a "request" routine that simply allocates the control block, and a "realize" routine (called just once) that determines space allocation and creates all of the actual buffers. The realize routine must allow for space occupied by non-virtual large objects. (We don't bother to factor in the space needed for small objects, on the grounds that it isn't worth the trouble.)

To support all this, we establish the following protocol for doing business

with the memory manager:

1. Modules must request virtual arrays (which may have only image lifespan) during the initial setup phase, i.e., in their `jinit_xxx` routines.
2. All "large" objects (including JSAMPARRAYs and JBLOCKARRAYs) must also be allocated during initial setup.
3. `realize_virt_arrays` will be called at the completion of initial setup.

The above conventions ensure that sufficient information is available for it to choose a good size for virtual array buffers.

Small objects of any lifespan may be allocated at any time. We expect that the total space used for small objects will be small enough to be negligible in the `realize_virt_arrays` computation.

In a virtual-memory machine, we simply pretend that the available space is infinite, thus causing `realize_virt_arrays` to decide that it can allocate all the virtual arrays as full-size in-memory buffers. The overhead of the virtual-array access protocol is very small when no swapping occurs.

A virtual array can be specified to be "pre-zeroed"; when this flag is set, never-yet-written sections of the array are set to zero before being made available to the caller. If this flag is not set, never-written sections of the array contain garbage. (This feature exists primarily because the equivalent logic would otherwise be needed in `jdcoefct.c` for progressive JPEG mode; we may as well make it available for possible other uses.)

The first write pass on a virtual array is required to occur in top-to-bottom order; read passes, as well as any write passes after the first one, may access the array in any order. This restriction exists partly to simplify the virtual array control logic, and partly because some file systems may not support seeking beyond the current end-of-file in a temporary file. The main implication of this restriction is that rearrangement of rows (such as converting top-to-bottom data order to bottom-to-top) must be handled while reading data out of the virtual array, not while putting it in.

\*\*\* Memory manager internal structure \*\*\*

To isolate system dependencies as much as possible, we have broken the memory manager into two parts. There is a reasonably system-independent "front end" (`jmemmgr.c`) and a "back end" that contains only the code likely to change across systems. All of the memory management methods outlined above are implemented by the front end.

The back end provides the following routines for use by the front end (none of these routines are known to the rest of the JPEG code):

`jpeg_mem_init`, `jpeg_mem_term` system-dependent initialization/shutdown

jpeg\_get\_small, jpeg\_free\_small interface to malloc and free library routines  
(or their equivalents)

jpeg\_get\_large, jpeg\_free\_large interface to FAR malloc/free in MSDOS machines;  
else usually the same as  
jpeg\_get\_small/jpeg\_free\_small

jpeg\_mem\_available estimate available memory

jpeg\_open\_backing\_store create a backing-store object

read\_backing\_store, manipulate a backing-store object  
write\_backing\_store,  
close\_backing\_store

On some systems there will be more than one type of backing-store object (specifically, in MS-DOS a backing store file might be an area of extended memory as well as a disk file). jpeg\_open\_backing\_store is responsible for choosing how to implement a given object. The read/write/close routines are method pointers in the structure that describes a given object; this lets them be different for different object types.

It may be necessary to ensure that backing store objects are explicitly released upon abnormal program termination. For example, MS-DOS won't free extended memory by itself. To support this, we will expect the main program or surrounding application to arrange to call self\_destruct (typically via jpeg\_destroy) upon abnormal termination. This may require a SIGINT signal handler or equivalent. We don't want to have the back end module install its own signal handler, because that would pre-empt the surrounding application's ability to control signal handling.

The IJG distribution includes several memory manager back end implementations. Usually the same back end should be suitable for all applications on a given system, but it is possible for an application to supply its own back end at need.

\*\*\* Implications of DNL marker \*\*\*

Some JPEG files may use a DNL marker to postpone definition of the image height (this would be useful for a fax-like scanner's output, for instance). In these files the SOF marker claims the image height is 0, and you only find out the true image height at the end of the first scan.

We could read these files as follows:



1. Upon seeing zero image height, replace it by 65535 (the maximum allowed).
2. When the DNL is found, update the image height in the global image descriptor.

This implies that control modules must avoid making copies of the image height, and must re-test for termination after each MCU row. This would be easy enough to do.

In cases where image-size data structures are allocated, this approach will result in very inefficient use of virtual memory or much-larger-than-necessary temporary files. This seems acceptable for something that probably won't be a mainstream usage. People might have to forgo use of memory-hogging options (such as two-pass color quantization or noninterleaved JPEG files) if they want efficient conversion of such files.

(One could improve efficiency by demanding a user-supplied upper bound for the height, less than 65536; in most cases it could be much less.)

The standard also permits the SOF marker to overestimate the image height, with a DNL to give the true, smaller height at the end of the first scan. This would solve the space problems if the overestimate wasn't too great. However, it implies that you don't even know whether DNL will be used.

This leads to a couple of very serious objections:

1. Testing for a DNL marker must occur in the inner loop of the decompressor's Huffman decoder; this implies a speed penalty whether the feature is used or not.
2. There is no way to hide the last-minute change in image height from an application using the decoder. Thus *every* application using the IJG library would suffer a complexity penalty whether it cared about DNL or not.

We currently do not support DNL because of these problems.

A different approach is to insist that DNL-using files be preprocessed by a separate program that reads ahead to the DNL, then goes back and fixes the SOF marker. This is a much simpler solution and is probably far more efficient. Even if one wants piped input, buffering the first scan of the JPEG file needs a lot smaller temp file than is implied by the maximum-height method. For this approach we'd simply treat DNL as a no-op in the decompressor (at most, check that it matches the SOF image height).

We will not worry about making the compressor capable of outputting DNL. Something similar to the first scheme above could be applied if anyone ever wants to make that work.

Found in path(s):

\* /opt/cola/permits/1104792432\_1607505170.95/0/jpeg-9c-tar-gz/jpeg-9c/structure.txt

No license file was found, but licenses were detected in source scan.

```
/*
 * jcsample.c
 *
 * Copyright (C) 1991-1996, Thomas G. Lane.
 * This file is part of the Independent JPEG Group's software.
 * For conditions of distribution and use, see the accompanying README file.
 *
 * This file contains downsampling routines.
 *
 * Downsampling input data is counted in "row groups". A row group
 * is defined to be max_v_samp_factor pixel rows of each component,
 * from which the downsampler produces v_samp_factor sample rows.
 * A single row group is processed in each call to the downsampler module.
 *
 * The downsampler is responsible for edge-expansion of its output data
 * to fill an integral number of DCT blocks horizontally. The source buffer
 * may be modified if it is helpful for this purpose (the source buffer is
 * allocated wide enough to correspond to the desired output width).
 * The caller (the prep controller) is responsible for vertical padding.
 *
 * The downsampler may request
 "context rows" by setting need_context_rows
 * during startup. In this case, the input arrays will contain at least
 * one row group's worth of pixels above and below the passed-in data;
 * the caller will create dummy rows at image top and bottom by replicating
 * the first or last real pixel row.
 *
 * An excellent reference for image resampling is
 * Digital Image Warping, George Wolberg, 1990.
 * Pub. by IEEE Computer Society Press, Los Alamitos, CA. ISBN 0-8186-8944-7.
 *
 * The downsampling algorithm used here is a simple average of the source
 * pixels covered by the output pixel. The hi-falutin sampling literature
 * refers to this as a "box filter". In general the characteristics of a box
 * filter are not very good, but for the specific cases we normally use (1:1
 * and 2:1 ratios) the box is equivalent to a "triangle filter" which is not
 * nearly so bad. If you intend to use other sampling ratios, you'd be well
 * advised to improve this code.
 *
 * A simple input-smoothing
 capability is provided. This is mainly intended
 * for cleaning up color-dithered GIF input files (if you find it inadequate,
 * we suggest using an external filtering program such as pnmconvol). When
 * enabled, each input pixel P is replaced by a weighted sum of itself and its
 * eight neighbors. P's weight is 1-8*SF and each neighbor's weight is SF,
 * where SF = (smoothing_factor / 1024).
```

\* Currently, smoothing is only supported for 2h2v sampling factors.

\*/

Found in path(s):

\* /opt/cola/permits/1104792432\_1607505170.95/0/jpeg-9c-tar-gz/jpeg-9c/jcsample.c

No license file was found, but licenses were detected in source scan.

/\*

\* cdjpeg.h

\*

\* Copyright (C) 1994-1997, Thomas G. Lane.

\* This file is part of the Independent JPEG Group's software.

\* For conditions of distribution and use, see the accompanying README file.

\*

\* This file contains common declarations for the sample applications

\* cjpeg and djpeg. It is NOT used by the core JPEG library.

\*/

Found in path(s):

\* /opt/cola/permits/1104792432\_1607505170.95/0/jpeg-9c-tar-gz/jpeg-9c/cdjpeg.h

No license file was found, but licenses were detected in source scan.

/\*

\* jccolor.c

\*

\* Copyright (C) 1991-1996, Thomas G. Lane.

\* Modified 2011-2013 by Guido Vollbeding.

\* This file is part of the Independent JPEG Group's software.

\* For conditions of distribution and use, see the accompanying README file.

\*

\* This file contains input colorspace conversion routines.

\*/

Found in path(s):

\* /opt/cola/permits/1104792432\_1607505170.95/0/jpeg-9c-tar-gz/jpeg-9c/jccolor.c

No license file was found, but licenses were detected in source scan.

## USING THE IJG JPEG LIBRARY

Copyright (C) 1994-2013, Thomas G. Lane, Guido Vollbeding.

This file is part of the Independent JPEG Group's software.

For conditions of distribution and use, see the accompanying README file.

This file describes how to use the IJG JPEG library within an application program. Read it if you want to write a program that uses the library.

The file example.c provides heavily commented skeleton code for calling the

JPEG library. Also see jpeglib.h (the include file to be used by application programs) for full details about data structures and function parameter lists. The library source code, of course, is the ultimate reference.

Note that there have been \*major\* changes from the application interface presented by IJG version 4 and earlier versions. The old design had several inherent limitations, and it had accumulated a lot of cruft as we added features while trying to minimize application-interface changes. We have sacrificed backward compatibility in the version 5 rewrite, but we think the improvements justify this.

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You should read at least the overview and basic usage sections before trying to program with the library.

The sections on advanced features can be read if and when you need them.

## OVERVIEW

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### Functions provided by the library

-----

The IJG JPEG library provides C code to read and write JPEG-compressed image files. The surrounding application program receives or supplies image data a scanline at a time, using a straightforward uncompressed image format. All details of color conversion and other preprocessing/postprocessing can be handled by the library.

The library includes a substantial amount of code that is not covered by the JPEG standard but is necessary for typical applications of JPEG. These functions preprocess the image before JPEG compression or postprocess it after decompression. They include colorspace conversion, downsampling/upsampling, and color quantization. The application indirectly selects use of this code by specifying the format in which it wishes to supply or receive image data. For example, if colormapped output is requested, then the decompression library automatically invokes color quantization.

A wide range of quality vs. speed tradeoffs are possible in JPEG processing, and even more so in decompression postprocessing. The decompression library provides multiple implementations that cover most of the useful tradeoffs, ranging from very-high-quality down to fast-preview operation. On the compression side we have generally not provided low-quality choices, since compression is normally less time-critical. It should be understood that the low-quality modes may not meet the JPEG standard's accuracy requirements; nonetheless, they are useful for viewers.

A word about functions \*not\* provided by the library. We handle a subset of the ISO JPEG standard; most baseline, extended-sequential, and progressive JPEG processes are supported. (Our subset includes all features now in common use.) Unsupported ISO options include:

- \* Hierarchical storage
- \* Lossless JPEG
- \* DNL marker
- \* Nonintegral subsampling ratios

We

support 8-bit to 12-bit data precision, but this is a compile-time choice rather than a run-time choice; hence it is difficult to use different precisions in a single application.

By itself, the library handles only interchange JPEG datastreams --- in particular the widely used JFIF file format. The library can be used by

surrounding code to process interchange or abbreviated JPEG datastreams that are embedded in more complex file formats. (For example, this library is used by the free LIBTIFF library to support JPEG compression in TIFF.)

#### Outline of typical usage

-----

The rough outline of a JPEG compression operation is:

```
Allocate and initialize a JPEG compression object
Specify the destination for the compressed data (eg, a file)
Set parameters for compression, including image size & colorspace
jpeg_start_compress(...);
while (scan lines remain to be written)
    jpeg_write_scanlines(...);
jpeg_finish_compress(...);
Release the JPEG compression
object
```

A JPEG compression object holds parameters and working state for the JPEG library. We make creation/destruction of the object separate from starting or finishing compression of an image; the same object can be re-used for a series of image compression operations. This makes it easy to re-use the same parameter settings for a sequence of images. Re-use of a JPEG object also has important implications for processing abbreviated JPEG datastreams, as discussed later.

The image data to be compressed is supplied to `jpeg_write_scanlines()` from in-memory buffers. If the application is doing file-to-file compression, reading image data from the source file is the application's responsibility. The library emits compressed data by calling a "data destination manager", which typically will write the data into a file; but the application can provide its own destination manager to do something else.

Similarly, the rough outline of a JPEG decompression operation is:

```
Allocate and initialize
a JPEG decompression object
Specify the source of the compressed data (eg, a file)
Call jpeg_read_header() to obtain image info
Set parameters for decompression
jpeg_start_decompress(...);
while (scan lines remain to be read)
    jpeg_read_scanlines(...);
jpeg_finish_decompress(...);
Release the JPEG decompression object
```

This is comparable to the compression outline except that reading the datastream header is a separate step. This is helpful because information about the image's size, colorspace, etc is available when the application selects decompression parameters. For example, the application can choose an output scaling ratio that will fit the image into the available screen size.

The decompression library obtains compressed data by calling a data source manager, which typically will read the data from a file; but other behaviors can be obtained with a custom source manager. Decompressed data is delivered into in-memory buffers passed to `jpeg_read_scanlines()`.

It is possible to abort an incomplete compression or decompression operation by calling `jpeg_abort()`; or, if you do not need to retain the JPEG object, simply release it by calling `jpeg_destroy()`.

JPEG compression and decompression objects are two separate struct types. However, they share some common fields, and certain routines such as `jpeg_destroy()` can work on either type of object.

The JPEG library has no static variables: all state is in the compression or decompression object. Therefore it is possible to process multiple compression and decompression operations concurrently, using multiple JPEG objects.

Both compression and decompression can be done in an incremental memory-to-memory fashion, if suitable source/destination managers are used. See the section on "I/O suspension" for more details.

## BASIC LIBRARY USAGE

=====

### Data formats

-----

Before diving into procedural details, it is helpful to understand the image data format that the JPEG library expects or returns.

The standard input image format is a rectangular array of pixels, with each pixel having the same number of "component" or "sample" values (color channels). You must specify how many components there are and the colorspace interpretation of the components. Most applications will use RGB data (three components per pixel) or grayscale data (one component per pixel).

**PLEASE NOTE THAT RGB DATA IS THREE SAMPLES PER PIXEL, GRAYSCALE ONLY ONE.**

A remarkable number of people manage to miss this, only to find that their programs don't work with grayscale JPEG files.

There is no provision for colormapped input. JPEG files are always full-color or full grayscale (or sometimes another colorspace such as CMYK). You can feed in a colormapped image by expanding it to full-color format. However JPEG often doesn't work very well with source data that has been colormapped, because of dithering noise. This is discussed in more detail in the JPEG FAQ and the other references mentioned in the README file.

Pixels are stored by scanlines, with each scanline running from left to right. The component values for each pixel are adjacent in the row; for example, R,G,B,R,G,B,R,G,B,... for 24-bit RGB color. Each scanline is an array of data type JSAMPLE --- which is typically "unsigned char", unless you've changed jmorecfg.h. (You can also change the RGB pixel layout, say to B,G,R order, by modifying jmorecfg.h. But see the restrictions listed in that file before doing so.)

A 2-D array of pixels is formed by making a list of pointers to the starts of scanlines; so the scanlines need not be physically adjacent in memory. Even if you process just one scanline at a time, you must make a one-element pointer array to conform to this structure. Pointers to JSAMPLE rows are of type JSAMPROW, and the pointer to the pointer array is of type JSAMPARRAY.

The library accepts or supplies one or more complete scanlines per call. It is not possible to process part of a row at a time. Scanlines are always processed top-to-bottom. You can process an entire image in one call if you have it all in memory, but usually it's simplest to process one scanline at a time.

For best results, source data values should have the precision specified by BITS\_IN\_JSAMPLE (normally 8 bits). For instance, if you choose to compress data that's only 6 bits/channel, you should left-justify each value in a byte before passing it to the compressor. If you need to compress data that has more than 8 bits/channel, compile with BITS\_IN\_JSAMPLE = 9 to 12. (See "Library compile-time options", later.)

The data format returned by the decompressor is the same in all details, except that colormapped output is supported. (Again, a JPEG file is never colormapped. But you can ask the decompressor to perform on-the-fly color quantization to deliver colormapped output.) If you request colormapped output then the returned data array contains a single JSAMPLE per pixel; its value is an index into a color map. The color map is represented as a 2-D JSAMPARRAY in which each row holds the values of one color component, that is, colormap[i][j] is the value of the i'th color component for pixel value (map index) j. Note that since the colormap indexes are stored in



JSAMPLEs, the maximum number of colors is limited by the size of JSAMPLE (ie, at most 256 colors for an 8-bit JPEG library).

## Compression details

-----

Here we revisit the JPEG compression outline given in the overview.

### 1. Allocate and initialize a JPEG compression object.

A JPEG compression object is a "struct jpeg\_compress\_struct". (It also has a bunch of subsidiary structures which are allocated via malloc(), but the application doesn't control those directly.) This struct can be just a local variable in the calling routine, if a single routine is going to execute the whole JPEG compression sequence. Otherwise it can be static or allocated from malloc().

You will also need a structure representing a JPEG error handler. The part of this that the library cares about is a "struct jpeg\_error\_mgr". If you are providing your own error handler, you'll typically want to embed the jpeg\_error\_mgr struct in a larger structure; this is discussed later under "Error handling". For now we'll assume you are just using the default error handler. The default error handler will print JPEG error/warning messages on stderr, and it will call exit() if a fatal error occurs.

You must initialize the error handler structure, store a pointer to it into the JPEG object's "err" field, and then call jpeg\_create\_compress() to initialize the rest of the JPEG object.

Typical code for this step, if you are using the default error handler, is

```
struct jpeg_compress_struct cinfo;
struct jpeg_error_mgr jerr;
...
cinfo.err = jpeg_std_error(&jerr);
jpeg_create_compress(&cinfo);
```

jpeg\_create\_compress allocates a small amount of memory, so it could fail if you are out of memory. In that case it will exit via the error handler; that's why the error handler must be initialized first.

### 2. Specify the destination for the compressed data (eg, a file).

As previously mentioned, the JPEG library delivers compressed data to a

"data destination" module. The library includes one data destination module which knows how to write to a stdio stream. You can use your own destination module if you want to do something else, as discussed later.

If you use the standard destination module, you must open the target stdio stream beforehand. Typical code for this step looks like:

```
FILE * outfile;
...
if ((outfile = fopen(filename, "wb")) == NULL) {
    fprintf(stderr, "can't open %s\n", filename);
    exit(1);
}
jpeg_stdio_dest(&cinfo, outfile);
```

where the last line invokes the standard destination module.

**WARNING:** it is critical that the binary compressed data be delivered to the output file unchanged. On non-Unix systems the stdio library may perform newline translation or otherwise corrupt binary data. To suppress this behavior, you may need to use a "b" option to fopen (as shown above), or use setmode() or another routine to put the stdio stream in binary mode. See cjpeg.c and djpeg.c for code that has been found to work on many systems.

You can select the data destination after setting other parameters (step 3), if that's more convenient. You may not change the destination between calling jpeg\_start\_compress() and jpeg\_finish\_compress().

3. Set parameters for compression, including image size & colorspace.

You must supply information about the source image by setting the following fields in the JPEG object (cinfo structure):

```
image_width  Width of image, in pixels
image_height Height of image, in pixels
input_components Number of color channels (samples per pixel)
in_color_space Color space of source image
```

The image dimensions are, hopefully, obvious. JPEG supports image dimensions of 1 to 64K pixels in either direction. The input color space is typically RGB or grayscale, and input\_components is 3 or 1 accordingly. (See "Special color spaces", later, for more info.) The in\_color\_space field must be assigned one of the J\_COLOR\_SPACE enum constants, typically JCS\_RGB or JCS\_GRAYSCALE.

JPEG has a large number of compression parameters that determine how the image is encoded. Most applications don't need or want to know about all these parameters. You can set all the parameters to reasonable defaults by calling `jpeg_set_defaults()`; then, if there are particular values you want to change, you can do so after that. The "Compression parameter selection" section tells about all the parameters.

You must set `in_color_space` correctly before calling `jpeg_set_defaults()`, because the defaults depend on the source image colorspace. However the other three source image parameters need not be valid until you call `jpeg_start_compress()`. There's no harm in calling `jpeg_set_defaults()` more than once, if that happens to be convenient.

Typical

code for a 24-bit RGB source image is

```
cinfo.image_width = Width; /* image width and height, in pixels */
cinfo.image_height = Height;
cinfo.input_components = 3; /* # of color components per pixel */
cinfo.in_color_space = JCS_RGB; /* colorspace of input image */

jpeg_set_defaults(&cinfo);
/* Make optional parameter settings here */
```

4. `jpeg_start_compress(...)`;

After you have established the data destination and set all the necessary source image info and other parameters, call `jpeg_start_compress()` to begin a compression cycle. This will initialize internal state, allocate working storage, and emit the first few bytes of the JPEG datastream header.

Typical code:

```
jpeg_start_compress(&cinfo, TRUE);
```

The "TRUE" parameter ensures that a complete JPEG interchange datastream will be written. This is appropriate in most cases. If you think you might want to use an abbreviated datastream, read the section on abbreviated datastreams, below.

Once you have called `jpeg_start_compress()`, you may not alter any JPEG parameters or other fields of the JPEG object until you have completed the compression cycle.

5. while (scan lines remain to be written)

```
jpeg_write_scanlines(...);
```

Now write all the required image data by calling `jpeg_write_scanlines()` one or more times. You can pass one or more scanlines in each call, up to the total image height. In most applications it is convenient to pass just one or a few scanlines at a time. The expected format for the passed data is discussed under "Data formats", above.

Image data should be written in top-to-bottom scanline order. The JPEG spec contains some weasel wording about how top and bottom are application-defined terms (a curious interpretation of the English language...) but if you want your files to be compatible with everyone else's, you WILL use top-to-bottom order. If the source data must be read in bottom-to-top order, you can use the JPEG library's virtual array mechanism to invert the data efficiently.

Examples

of this can be found in the sample application `cjpeg`.

The library maintains a count of the number of scanlines written so far in the `next_scanline` field of the JPEG object. Usually you can just use this variable as the loop counter, so that the loop test looks like "`while (cinfo.next_scanline < cinfo.image_height)`".

Code for this step depends heavily on the way that you store the source data. `example.c` shows the following code for the case of a full-size 2-D source array containing 3-byte RGB pixels:

```
JSAMPROW row_pointer[1]; /* pointer to a single row */
int row_stride; /* physical row width in buffer */

row_stride = image_width * 3; /* JSAMPLEs per row in image_buffer */

while (cinfo.next_scanline < cinfo.image_height) {
    row_pointer[0] = & image_buffer[cinfo.next_scanline * row_stride];
    jpeg_write_scanlines(&cinfo, row_pointer, 1);
}
```

`jpeg_write_scanlines()` returns the number of scanlines actually written.

This will normally be equal to the number

passed in, so you can usually

ignore the return value. It is different in just two cases:

- \* If you try to write more scanlines than the declared image height, the additional scanlines are ignored.
- \* If you use a suspending data destination manager, output buffer overrun will cause the compressor to return before accepting all the passed lines. This feature is discussed under "I/O suspension", below. The normal `stdio` destination manager will NOT cause this to happen.

In any case, the return value is the same as the change in the value of `next_scanline`.

## 6. jpeg\_finish\_compress(...);

After all the image data has been written, call `jpeg_finish_compress()` to complete the compression cycle. This step is **ESSENTIAL** to ensure that the last bufferload of data is written to the data destination.

`jpeg_finish_compress()` also releases working memory associated with the JPEG object.

Typical code:

```
jpeg_finish_compress(&cinfo);
```

If using the stdio destination manager, don't forget to close the output stdio stream (if necessary) afterwards.

If you have requested a multi-pass operating mode, such as Huffman code optimization, `jpeg_finish_compress()` will perform the additional passes using data buffered by the first pass. In this case `jpeg_finish_compress()` may take quite a while to complete. With the default compression parameters, this will not happen.

It is an error to call `jpeg_finish_compress()` before writing the necessary total number of scanlines. If you wish to abort compression, call `jpeg_abort()` as discussed below.

After completing a compression cycle, you may dispose of the JPEG object as discussed next, or you may use it to compress another image. In that case return to step 2, 3, or 4 as appropriate. If you do not change the destination manager, the new datastream will be written to the same target. If you do not change any JPEG parameters, the new datastream will be written with the same parameters as before. Note that you can change the input image dimensions freely between cycles, but if you change the input colorspace, you should call `jpeg_set_defaults()` to adjust for the new colorspace; and then you'll need to repeat all of step 3.

## 7. Release the JPEG compression object.

When you are done with a JPEG compression object, destroy it by calling `jpeg_destroy_compress()`. This will free all subsidiary memory (regardless of the previous state of the object). Or you can call `jpeg_destroy()`, which works for either compression or decompression objects --- this may be more convenient if you are sharing code between compression and decompression cases. (Actually, these routines are equivalent except for the declared type

of the passed pointer. To avoid gripes from ANSI C compilers, jpeg\_destroy() should be passed a j\_common\_ptr.)

If you allocated the jpeg\_compress\_struct structure from malloc(), freeing it is your responsibility --- jpeg\_destroy() won't. Ditto for the error handler structure.

Typical code:

```
jpeg_destroy_compress(&cinfo);
```

8.

Aborting.

If you decide to abort a compression cycle before finishing, you can clean up in either of two ways:

\* If you don't need the JPEG object any more, just call jpeg\_destroy\_compress() or jpeg\_destroy() to release memory. This is legitimate at any point after calling jpeg\_create\_compress() --- in fact, it's safe even if jpeg\_create\_compress() fails.

\* If you want to re-use the JPEG object, call jpeg\_abort\_compress(), or call jpeg\_abort() which works on both compression and decompression objects. This will return the object to an idle state, releasing any working memory. jpeg\_abort() is allowed at any time after successful object creation.

Note that cleaning up the data destination, if required, is your responsibility; neither of these routines will call term\_destination(). (See "Compressed data handling", below, for more about that.)

jpeg\_destroy() and jpeg\_abort() are the only safe calls to make on a JPEG object that has reported an error by calling error\_exit (see "Error handling" for more info). The internal state of such an object is likely to be out of whack. Either of these two routines will return the object to a known state.

Decompression details

-----

Here we revisit the JPEG decompression outline given in the overview.

1. Allocate and initialize a JPEG decompression object.

This is just like initialization for compression, as discussed above, except that the object is a "struct jpeg\_decompress\_struct" and you

call `jpeg_create_decompress()`. Error handling is exactly the same.

Typical code:

```
struct jpeg_decompress_struct cinfo;
struct jpeg_error_mgr jerr;
...
cinfo.err = jpeg_std_error(&jerr);
jpeg_create_decompress(&cinfo);
```

(Both here and in the IJG code, we usually use variable name "cinfo" for both compression and decompression objects.)

2. Specify the source of the compressed data (eg, a file).

As previously mentioned, the JPEG library reads compressed data from a "data source" module. The library includes one data source module which knows how to read from a stdio stream. You can use your own source module if you want to do something else, as discussed later.

If you use the standard source module, you must open the source stdio stream beforehand. Typical code for this step looks like:

```
FILE * infile;
...
if ((infile = fopen(filename, "rb")) == NULL) {
    fprintf(stderr, "can't open %s\n", filename);
    exit(1);
}
jpeg_stdio_src(&cinfo, infile);
```

where the last line invokes the standard source module.

**WARNING:** it is critical that the binary compressed data be read unchanged. On non-Unix systems the stdio library may perform newline translation or otherwise corrupt binary data. To suppress this behavior, you may need to use a "b" option to `fopen` (as shown above), or use `setmode()` or another routine to put the stdio stream in binary mode. See `cjpeg.c` and `djpeg.c` for code that has been found to work on many systems.

You may not

change the data source between calling `jpeg_read_header()` and `jpeg_finish_decompress()`. If you wish to read a series of JPEG images from a single source file, you should repeat the `jpeg_read_header()` to `jpeg_finish_decompress()` sequence without reinitializing either the JPEG object or the data source module; this prevents buffered input data from

being discarded.

3. Call `jpeg_read_header()` to obtain image info.

Typical code for this step is just

```
jpeg_read_header(&cinfo, TRUE);
```

This will read the source datastream header markers, up to the beginning of the compressed data proper. On return, the image dimensions and other info have been stored in the JPEG object. The application may wish to consult this information before selecting decompression parameters.

More complex code is necessary if

- \* A suspending data source is used --- in that case `jpeg_read_header()` may return before it has read all the header data. See "I/O suspension", below. The normal `stdio` source manager will NOT cause this to happen.

- \* Abbreviated JPEG files are to be processed --- see the section on abbreviated datastreams. Standard applications that deal only in interchange JPEG files need not be concerned with this case either.

It is permissible to stop at this point if you just wanted to find out the image dimensions and other header info for a JPEG file. In that case, call `jpeg_destroy()` when you are done with the JPEG object, or call `jpeg_abort()` to return it to an idle state before selecting a new data source and reading another header.

4. Set parameters for decompression.

`jpeg_read_header()` sets appropriate default decompression parameters based on the properties of the image (in particular, its colorspace). However, you may well want to alter these defaults before beginning the decompression. For example, the default is to produce full color output from a color file. If you want colormapped output you must ask for it. Other options allow the returned image to be scaled and allow various speed/quality tradeoffs to be selected. "Decompression parameter selection", below, gives details.

If the defaults are appropriate, nothing need be done at this step.

Note that all default values are set by each call to `jpeg_read_header()`. If you reuse a decompression object, you cannot expect your parameter settings to be preserved across cycles, as you can for compression. You must set desired parameter values each time.



## 5. jpeg\_start\_decompress(...);

Once the parameter values are satisfactory, call `jpeg_start_decompress()` to begin decompression. This will initialize internal state, allocate working memory, and prepare for returning data.

Typical code is just

```
jpeg_start_decompress(&cinfo);
```

If you have requested a multi-pass operating mode, such as 2-pass color quantization, `jpeg_start_decompress()` will do everything needed before data output can begin. In this case `jpeg_start_decompress()` may take quite a while to complete. With a single-scan (non progressive) JPEG file and default decompression parameters, this will not happen; `jpeg_start_decompress()` will return quickly.

After this call, the final output image dimensions, including any requested scaling, are available in the JPEG object; so is the selected colormap, if colormapped output has been requested. Useful fields include

```
output_width  image width and height, as scaled
output_height
out_color_components # of color components in out_color_space
output_components # of color components returned per pixel
colormap      the selected colormap, if any
actual_number_of_colors number of entries in colormap
```

`output_components` is 1 (a colormap index) when quantizing colors; otherwise it equals `out_color_components`. It is the number of JSAMPLE values that will be emitted per pixel in the output arrays.

Typically you will need to allocate data buffers to hold the incoming image. You will need `output_width * output_components` JSAMPLEs per scanline in your output buffer, and a total of `output_height` scanlines will be returned.

Note: if you are using the JPEG library's internal memory manager to allocate data buffers (as `djpeg` does), then the manager's protocol requires that you request large buffers \*before\* calling `jpeg_start_decompress()`. This is a little tricky since the `output_XXX` fields are not normally valid then. You can make them valid by calling `jpeg_calc_output_dimensions()` after setting the relevant parameters (scaling, output color space, and quantization flag).

## 6. while (scan lines remain to be read)

```
jpeg_read_scanlines(...);
```

Now you can read the decompressed image data by calling `jpeg_read_scanlines()` one or more times. At each call, you pass in the maximum number of scanlines to be read (ie, the height of your working buffer); `jpeg_read_scanlines()` will return up to that many lines. The return value is the number of lines actually read. The format of the returned data is discussed under "Data formats", above. Don't forget that grayscale and color JPEGs will return different data formats!

Image data is returned in top-to-bottom scanline order. If you must write out the image in bottom-to-top order, you can use the JPEG library's virtual array mechanism to invert the data efficiently. Examples of this can be found in the sample application `djpeg`.

The library maintains a count of the number of scanlines returned so far in the `output_scanline` field of the JPEG object. Usually you can just use this variable as the loop counter, so that the loop test looks like "`while (cinfo.output_scanline < cinfo.output_height)`". (Note that the test should NOT be against `image_height`, unless you never use scaling. The `image_height` field is the height of the original unscaled image.) The return value always equals the change in the value of `output_scanline`.

If you don't use a suspending data source, it is safe to assume that `jpeg_read_scanlines()` reads at least one scanline per call, until the bottom of the image has been reached.

If you use a buffer larger than one scanline, it is NOT safe to assume that `jpeg_read_scanlines()` fills it. (The current implementation returns only a few scanlines per call, no matter how large a buffer you pass.) So you must always provide a loop that calls `jpeg_read_scanlines()` repeatedly until the whole image has been read.

```
7. jpeg_finish_decompress(...);
```

After all the image data has been read, call `jpeg_finish_decompress()` to complete the decompression cycle. This causes working memory associated with the JPEG object to be released.

Typical code:

```
jpeg_finish_decompress(&cinfo);
```

If using the `stdio` source manager, don't forget to close the source `stdio` stream if necessary.

It is an error to call `jpeg_finish_decompress()` before reading the correct total number of scanlines. If you wish to abort decompression, call `jpeg_abort()` as discussed below.

After completing a decompression cycle, you may dispose of the JPEG object as discussed next, or you may use it to decompress another image. In that case return to step 2 or 3 as appropriate. If you do not change the source manager, the next image will be read from the same source.

#### 8. Release the JPEG decompression object.

When you are done with a JPEG decompression object, destroy it by calling `jpeg_destroy_decompress()` or `jpeg_destroy()`. The previous discussion of destroying compression objects applies here too.

Typical code:

```
jpeg_destroy_decompress(&cinfo);
```

#### 9. Aborting.

You can abort a decompression cycle by calling `jpeg_destroy_decompress()` or `jpeg_destroy()` if you don't need the JPEG object any more, or `jpeg_abort_decompress()` or `jpeg_abort()` if you want to reuse the object. The previous discussion of aborting compression cycles applies here too.

Mechanics of usage: include files, linking, etc

-----

Applications using the JPEG library should include the header file `jpeglib.h` to obtain declarations of data types and routines. Before including `jpeglib.h`, include system headers that define at least the typedefs `FILE` and `size_t`. On ANSI-conforming systems, including `<stdio.h>` is sufficient; on older Unix systems, you may need `<sys/types.h>` to define `size_t`.

If the application needs to refer to individual JPEG library error codes, also include `jerror.h` to define those symbols.

`jpeglib.h` indirectly includes the files `jconfig.h` and `jpeglib.h`. If you are installing the JPEG header files in a system directory, you will want to install all four files: `jpeglib.h`, `jerror.h`, `jconfig.h`, `jpeglib.h`.

The most convenient way to include the JPEG code into your executable program is to prepare a library file ("libjpeg.a", or a corresponding name on non-Unix machines) and reference it at your link step. If you use only half of the library (only compression or only decompression), only that much code will be included from the library, unless your linker is hopelessly brain-damaged. The supplied makefiles build libjpeg.a automatically (see install.txt).

While you can build the JPEG library as a shared library if the whim strikes you, we don't really recommend it. The trouble with shared libraries is that at some point you'll probably try to substitute a new version of the library without recompiling the calling applications. That generally doesn't work because the parameter struct declarations usually change with each new version. In other words, the library's API is *\*not\** guaranteed binary compatible across versions; we only try to ensure source-code compatibility. (In hindsight, it might have been smarter to hide the parameter structs from applications and introduce a ton of access functions instead. Too late now, however.)

On some systems your application may need to set up a signal handler to ensure that temporary files are deleted if the program is interrupted. This is most critical if you are on MS-DOS and use the jmemdos.c memory manager back end; it will try to grab extended memory for temp files, and that space will NOT be freed automatically. See cjpeg.c or djpeg.c for an example signal handler.

It may be worth pointing out that the core JPEG library does not actually require the stdio library: only the default source/destination managers and error handler need it. You can use the library in a stdio-less environment if you replace those modules and use jmemnobs.c (or another memory manager of your own devising). More info about the minimum system library requirements may be found in jinclude.h.

## ADVANCED FEATURES

=====

### Compression parameter selection

-----

This section describes all the optional parameters you can set for JPEG compression, as well as the "helper" routines provided to assist in this task. Proper setting of some parameters requires detailed understanding of the JPEG standard; if you don't know what a parameter is for, it's best not to mess with it! See REFERENCES in the README file for pointers to more info about JPEG.

It's a good idea to call `jpeg_set_defaults()` first, even if you plan to set all the parameters; that way your code is more likely to work with future JPEG libraries that have additional parameters. For the same reason, we recommend you use a helper routine where one is provided, in preference to twiddling `cinfo` fields directly.

The helper routines are:

`jpeg_set_defaults (j_compress_ptr cinfo)`

This routine sets all JPEG parameters to reasonable defaults, using only the input image's color space (field `in_color_space`, which must already be set in `cinfo`). Many applications will only need to use this routine and perhaps `jpeg_set_quality()`.

`jpeg_set_colorspace (j_compress_ptr cinfo, J_COLOR_SPACE colorspace)`

Sets the JPEG file's colorspace (field `jpeg_color_space`) as specified, and sets other color-space-dependent parameters appropriately. See "Special color spaces", below, before using this. A large number of parameters, including all per-component parameters, are set by this routine; if you want to twiddle individual parameters you should call `jpeg_set_colorspace()` before rather than after.

`jpeg_default_colorspace (j_compress_ptr cinfo)`

Selects an appropriate JPEG colorspace based on `cinfo->in_color_space`, and calls `jpeg_set_colorspace()`. This is actually a subroutine of `jpeg_set_defaults()`. It's broken out in case you want to change just the colorspace-dependent JPEG parameters.

`jpeg_set_quality (j_compress_ptr cinfo, int quality, boolean force_baseline)`

Constructs JPEG quantization tables appropriate for the indicated quality setting. The quality value is expressed on the 0..100 scale recommended by IJG (cjpeg's "-quality" switch uses this routine). Note that the exact mapping from quality values to tables may change in future IJG releases as more is learned about DCT quantization. If the `force_baseline` parameter is `TRUE`, then the quantization table entries are constrained to the range 1..255 for full JPEG baseline compatibility.

In the current implementation, this only makes a difference for quality settings below 25, and it effectively prevents very small/low quality files from being generated. The IJG decoder is capable of reading the non-baseline files generated at low quality settings when `force_baseline` is `FALSE`, but other decoders may not be.

`jpeg_set_linear_quality (j_compress_ptr cinfo, int scale_factor, boolean force_baseline)`

Same as `jpeg_set_quality()` except that the generated tables are the sample tables given in the JPEG spec section K.1, multiplied by the

specified scale factor (which is expressed as a percentage; thus `scale_factor = 100` reproduces the spec's tables). Note that larger scale factors give lower quality. This entry point is useful for conforming to the Adobe PostScript DCT conventions, but we do not recommend linear scaling as a user-visible quality scale otherwise. `force_baseline` again constrains the computed table entries to 1..255.

`int jpeg_quality_scaling`  
(`int quality`)

Converts a value on the IJG-recommended quality scale to a linear scaling percentage. Note that this routine may change or go away in future releases --- IJG may choose to adopt a scaling method that can't be expressed as a simple scalar multiplier, in which case the premise of this routine collapses. Caveat user.

`jpeg_default_qtables` (`j_compress_ptr cinfo`, `boolean force_baseline`)  
Set default quantization tables with linear `q_scale_factor[]` values (see below).

`jpeg_add_quant_table` (`j_compress_ptr cinfo`, `int which_tbl`,  
`const unsigned int *basic_table`,  
`int scale_factor`, `boolean force_baseline`)

Allows an arbitrary quantization table to be created. `which_tbl` indicates which table slot to fill. `basic_table` points to an array of 64 unsigned ints given in normal array order. These values are multiplied by `scale_factor/100` and then clamped to the range 1..65535 (or to 1..255 if `force_baseline` is TRUE).

CAUTION: prior to library version

6a, `jpeg_add_quant_table` expected

the basic table to be given in JPEG zigzag order. If you need to write code that works with either older or newer versions of this routine, you must check the library version number. Something like `"#if JPEG_LIB_VERSION >= 61"` is the right test.

`jpeg_simple_progression` (`j_compress_ptr cinfo`)

Generates a default scan script for writing a progressive-JPEG file.

This is the recommended method of creating a progressive file, unless you want to make a custom scan sequence. You must ensure that the JPEG color space is set correctly before calling this routine.

Compression parameters (`cinfo` fields) include:

`boolean arith_code`

If TRUE, use arithmetic coding.

If FALSE, use Huffman coding.

`int block_size`

Set DCT block size. All N from 1 to 16 are possible.  
Default is 8 (baseline format).  
Larger values produce higher compression,  
smaller values produce higher quality.  
An exact DCT stage is possible with 1 or 2.  
With the default quality  
of 75 and default Luminance qtable  
the DCT+Quantization stage is lossless for value 1.  
Note that values other than 8 require a SmartScale capable decoder,  
introduced with IJG JPEG 8. Setting the block\_size parameter for  
compression works with version 8c and later.

`J_DCT_METHOD` `dct_method`

Selects the algorithm used for the DCT step. Choices are:

`JDCT_ISLOW`: slow but accurate integer algorithm

`JDCT_IFAST`: faster, less accurate integer method

`JDCT_FLOAT`: floating-point method

`JDCT_DEFAULT`: default method (normally `JDCT_ISLOW`)

`JDCT_FASTEST`: fastest method (normally `JDCT_IFAST`)

The `JDCT_FLOAT` method is very slightly more accurate than the `JDCT_ISLOW` method,  
but may give different results on different machines due to varying  
roundoff behavior. The integer methods should give the same results  
on all machines. On machines with sufficiently fast FP hardware, the  
floating-point method may also be the fastest. The `JDCT_IFAST` method is  
considerably less accurate than the other two; its  
use is not

recommended if high quality is a concern. `JDCT_DEFAULT` and  
`JDCT_FASTEST` are macros configurable by each installation.

`unsigned int` `scale_num`, `scale_denom`

Scale the image by the fraction `scale_num/scale_denom`. Default is  
1/1, or no scaling. Currently, the supported scaling ratios are  
M/N with all N from 1 to 16, where M is the destination DCT size,  
which is 8 by default (see `block_size` parameter above).  
(The library design allows for arbitrary scaling ratios but this  
is not likely to be implemented any time soon.)

`J_COLOR_SPACE` `jpeg_color_space`

`int` `num_components`

The JPEG color space and corresponding number of components; see  
"Special color spaces", below, for more info. We recommend using  
`jpeg_set_colorspace()` if you want to change these.

`J_COLOR_TRANSFORM` `color_transform`

Internal color transform identifier, writes LSE marker if nonzero  
(requires decoder with inverse color transform support, introduced  
with IJG JPEG 9).

Two values are currently possible:

JCT\_NONE and JCT\_SUBTRACT\_GREEN.

Set this value for lossless RGB application *before* calling jpeg\_set\_colorspace(), because entropy table assignment in jpeg\_set\_colorspace() depends on color\_transform.

boolean optimize\_coding

TRUE causes the compressor to compute optimal Huffman coding tables for the image. This requires an extra pass over the data and therefore costs a good deal of space and time. The default is FALSE, which tells the compressor to use the supplied or default Huffman tables. In most cases optimal tables save only a few percent of file size compared to the default tables. Note that when this is TRUE, you need not supply Huffman tables at all, and any you do supply will be overwritten.

unsigned int restart\_interval

int restart\_in\_rows

To emit restart markers in the JPEG file, set one of these nonzero.

Set restart\_interval to specify the exact interval in MCU blocks.

Set restart\_in\_rows to specify the interval in MCU rows. (If restart\_in\_rows

is not 0, then restart\_interval is set after the

image width in MCUs is computed.) Defaults are zero (no restarts).

One restart marker per MCU row is often a good choice.

NOTE: the overhead of restart markers is higher in grayscale JPEG files than in color files, and MUCH higher in progressive JPEGs.

If you use restarts, you may want to use larger intervals in those cases.

const jpeg\_scan\_info \* scan\_info

int num\_scans

By default, scan\_info is NULL; this causes the compressor to write a single-scan sequential JPEG file. If not NULL, scan\_info points to an array of scan definition records of length num\_scans. The compressor will then write a JPEG file having one scan for each scan definition record. This is used to generate noninterleaved or progressive JPEG files. The library checks that the scan array defines a valid JPEG scan sequence. (jpeg\_simple\_progression creates a suitable scan definition array for progressive JPEG.) This is discussed further under "Progressive JPEG support".

boolean do\_fancy\_downsampling

If TRUE, use direct DCT scaling with DCT size > 8 for downsampling of chroma components.

If FALSE, use only DCT size <= 8 and simple separate downsampling. Default is TRUE.

For better image stability in multiple generation compression cycles



it is preferable that this value matches the corresponding `do_fancy_upsampling` value in decompression.

`int smoothing_factor`

If non-zero, the input image is smoothed; the value should be 1 for minimal smoothing to 100 for maximum smoothing. Consult `jcsample.c` for details of the smoothing algorithm. The default is zero.

`boolean write_JFIF_header`

If TRUE, a JFIF APP0 marker is emitted. `jpeg_set_defaults()` and `jpeg_set_colorspace()` set this TRUE if a JFIF-legal JPEG color space (ie, YCbCr or grayscale) is selected, otherwise FALSE.

`UINT8 JFIF_major_version`

`UINT8 JFIF_minor_version`

The version number to be written into the JFIF marker.

`jpeg_set_defaults()` initializes the version to

1.01 (major=minor=1).

You should set it to 1.02 (major=1, minor=2) if you plan to write any JFIF 1.02 extension markers.

`UINT8 density_unit`

`UINT16 X_density`

`UINT16 Y_density`

The resolution information to be written into the JFIF marker; not used otherwise. `density_unit` may be 0 for unknown, 1 for dots/inch, or 2 for dots/cm. The default values are 0,1,1 indicating square pixels of unknown size.

`boolean write_Adobe_marker`

If TRUE, an Adobe APP14 marker is emitted. `jpeg_set_defaults()` and `jpeg_set_colorspace()` set this TRUE if JPEG color space RGB, CMYK, or YCCK is selected, otherwise FALSE. It is generally a bad idea to set both `write_JFIF_header` and `write_Adobe_marker`. In fact, you probably shouldn't change the default settings at all --- the default behavior ensures that the JPEG file's color space can be recognized by the decoder.

`JQUANT_TBL * quant_tbl_ptrs[NUM_QUANT_TBLS]`

Pointers to coefficient quantization tables, one per table slot, or NULL if no table is

defined for a slot. Usually these should

be set via one of the above helper routines; `jpeg_add_quant_table()`

is general enough to define any quantization table. The other routines will set up table slot 0 for luminance quality and table slot 1 for chrominance.

`int q_scale_factor[NUM_QUANT_TBLS]`

Linear quantization scaling factors (percentage, initialized 100)  
for use with `jpeg_default_qtables()`.  
See `rdswitch.c` and `cjpeg.c` for an example of usage.  
Note that the `q_scale_factor[]` fields are the "linear" scales, so you  
have to convert from user-defined ratings via `jpeg_quality_scaling()`.  
Here is an example code which corresponds to `cjpeg -quality 90,70`:

```
jpeg_set_defaults(cinfo);

/* Set luminance quality 90. */
cinfo->q_scale_factor[0] = jpeg_quality_scaling(90);
/* Set chrominance quality 70. */
cinfo->q_scale_factor[1] = jpeg_quality_scaling(70);

jpeg_default_qtables(cinfo, force_baseline);
```

CAUTION: You must also set 1x1 subsampling for efficient separate  
color  
quality selection, since the default value used by library  
is 2x2:

```
cinfo->comp_info[0].v_samp_factor = 1;
cinfo->comp_info[0].h_samp_factor = 1;
```

JHUFF\_TBL \* `dc_huff_tbl_ptrs`[NUM\_HUFF\_TBLS]  
JHUFF\_TBL \* `ac_huff_tbl_ptrs`[NUM\_HUFF\_TBLS]  
Pointers to Huffman coding tables, one per table slot, or NULL if  
no table is defined for a slot. Slots 0 and 1 are filled with the  
JPEG sample tables by `jpeg_set_defaults()`. If you need to allocate  
more table structures, `jpeg_alloc_huff_table()` may be used.  
Note that optimal Huffman tables can be computed for an image  
by setting `optimize_coding`, as discussed above; there's seldom  
any need to mess with providing your own Huffman tables.

The actual dimensions of the JPEG image that will be written to the file are  
given by the following fields. These are computed from the input image  
dimensions and the compression parameters by `jpeg_start_compress()`. You can  
also call `jpeg_calc_jpeg_dimensions()` to obtain the values that will result  
from  
the current parameter settings. This can be useful if you are trying  
to pick a scaling ratio that will get close to a desired target size.

JDIMENSION `jpeg_width` Actual dimensions of output image.  
JDIMENSION `jpeg_height`

Per-component parameters are stored in the struct `cinfo.comp_info[i]` for

component number *i*. Note that components here refer to components of the JPEG color space, \*not\* the source image color space. A suitably large `comp_info[]` array is allocated by `jpeg_set_defaults()`; if you choose not to use that routine, it's up to you to allocate the array.

`int component_id`

The one-byte identifier code to be recorded in the JPEG file for this component. For the standard color spaces, we recommend you leave the default values alone.

`int h_samp_factor`

`int v_samp_factor`

Horizontal and vertical sampling factors for the component; must be 1..4 according to the JPEG standard. Note that larger sampling factors indicate a higher-resolution component; many people find this behavior quite unintuitive. The default values are 2,2 for luminance components and 1,1 for chrominance components, except for grayscale where 1,1 is used.

`int quant_tbl_no`

Quantization table number for component. The default value is 0 for luminance components and 1 for chrominance components.

`int dc_tbl_no`

`int ac_tbl_no`

DC and AC entropy coding table numbers. The default values are 0 for luminance components and 1 for chrominance components.

`int component_index`

Must equal the component's index in `comp_info[]`. (Beginning in release v6, the compressor library will fill this in automatically; you don't have to.)

#### Decompression parameter selection

-----

Decompression parameter selection is somewhat simpler than compression parameter selection, since all of the JPEG internal parameters are recorded in the source file and need not be supplied by the application. (Unless you are working with abbreviated files, in which case see "Abbreviated datastreams", below.) Decompression parameters control the postprocessing done on the image to deliver it in a format suitable for the application's use. Many of the parameters control speed/quality tradeoffs, in which faster decompression may be obtained at the price of a poorer-quality image. The defaults select the highest quality (slowest)

processing.

The following fields in the JPEG object are set by `jpeg_read_header()` and may be useful to the application in choosing decompression parameters:

JDIMENSION `image_width` Width and height of image  
JDIMENSION `image_height`  
int `num_components` Number of color components  
J\_COLOR\_SPACE `jpeg_color_space` Colorspace of image  
boolean `saw_JFIF_marker` TRUE if a JFIF APP0 marker was seen  
UINT8 `JFIF_major_version` Version information from JFIF marker  
UINT8 `JFIF_minor_version`  
UINT8 `density_unit` Resolution data from JFIF marker  
UINT16 `X_density`  
UINT16 `Y_density`  
boolean `saw_Adobe_marker` TRUE if an Adobe APP14 marker was seen  
  
UINT8 `Adobe_transform` Color transform code from Adobe marker

The JPEG color space, unfortunately, is something of a guess since the JPEG standard proper does not provide a way to record it. In practice most files adhere to the JFIF or Adobe conventions, and the decoder will recognize these correctly. See "Special color spaces", below, for more info.

The decompression parameters that determine the basic properties of the returned image are:

J\_COLOR\_SPACE `out_color_space`  
Output color space. `jpeg_read_header()` sets an appropriate default based on `jpeg_color_space`; typically it will be RGB or grayscale. The application can change this field to request output in a different colorspace. For example, set it to `JCS_GRAYSCALE` to get grayscale output from a color file. (This is useful for previewing: grayscale output is faster than full color since the color components need not be processed.) Note that not all possible color space transforms are currently implemented; you may need to extend `jdcolor.c` if you want an unusual conversion.

unsigned int `scale_num`, `scale_denom`  
Scale the image by the fraction `scale_num/scale_denom`. Currently, the supported scaling ratios are  $M/N$  with all  $M$  from 1 to 16, where  $N$  is the source DCT size, which is 8 for baseline JPEG. (The library design allows for arbitrary scaling ratios but this is not likely to be implemented any time soon.) The values are initialized by `jpeg_read_header()` with the source DCT size. For baseline JPEG this is 8/8. If you change only the `scale_num` value while leaving

the other unchanged, then this specifies the DCT scaled size to be applied on the given input. For baseline JPEG this is equivalent to M/8 scaling, since the source DCT size for baseline JPEG is 8. Smaller scaling ratios permit significantly faster decoding since fewer pixels need be processed and a simpler IDCT method can be used.

boolean `quantize_colors`

If set TRUE, colormapped output will be delivered. Default is FALSE, meaning that full-color output will be delivered.

The next three parameters are relevant only if `quantize_colors` is TRUE.

int `desired_number_of_colors`

Maximum number of colors to use in generating a library-supplied color map (the actual number of colors is returned in a different field). Default 256. Ignored when the application supplies its own color map.

boolean `two_pass_quantize`

If TRUE, an extra pass over the image is made to select a custom color map for the image. This usually looks a lot better than the one-size-fits-all colormap that is used otherwise. Default is TRUE. Ignored when the application supplies its own color map.

J\_DITHER\_MODE `dither_mode`

Selects color dithering method. Supported values are:

JDITHER\_NONE no dithering: fast, very low quality

JDITHER\_ORDERED ordered dither: moderate speed and quality

JDITHER\_FS Floyd-Steinberg dither: slow, high quality

Default is JDITHER\_FS. (At present, ordered dither is implemented only in the single-pass, standard-colormap case. If you ask for ordered dither when `two_pass_quantize` is TRUE or when you supply an external color map, you'll get F-S dithering.)

When `quantize_colors` is TRUE, the target color map is described by the next two fields. `colormap` is set to NULL by `jpeg_read_header()`. The application can supply a color map by setting `colormap` non-NULL and setting `actual_number_of_colors` to the map size. Otherwise, `jpeg_start_decompress()` selects a suitable color map and sets these two fields itself.

[Implementation restriction: at present, an externally supplied colormap is only accepted for 3-component output color spaces.]

JSAMPARRAY `colormap`

The color map, represented as a 2-D pixel array of `out_color_components` rows and `actual_number_of_colors` columns. Ignored if not quantizing.

CAUTION: if the JPEG library creates its own colormap, the storage pointed to by this field is released by `jpeg_finish_decompress()`.

Copy the colormap somewhere else first, if you want to save it.

int actual\_number\_of\_colors

The number of colors in the color map.

Additional decompression parameters that the application may set include:

J\_DCT\_METHOD dct\_method

Selects the algorithm used for the DCT step. Choices are the same as described above for compression.

boolean do\_fancy\_upsampling

If TRUE, use direct DCT scaling with DCT size > 8 for upsampling of chroma components.

If FALSE, use only DCT size <= 8 and simple separate upsampling. Default is TRUE.

For better image stability in multiple generation compression cycles it is preferable that this value matches the corresponding do\_fancy\_downsampling value in compression.

boolean do\_block\_smoothing

If TRUE, interblock smoothing is applied in early stages of decoding progressive JPEG files; if FALSE, not. Default is TRUE. Early progression stages look "fuzzy" with smoothing, "blocky" without. In any case, block smoothing ceases to be applied after the first few AC coefficients are known to full accuracy, so it is relevant only when using buffered-image mode for progressive images.

boolean enable\_1pass\_quant

boolean enable\_external\_quant

boolean enable\_2pass\_quant

These are significant only in buffered-image mode, which is described in its own section below.

The output image dimensions are given by the following fields. These are computed from the source image dimensions and the decompression parameters by jpeg\_start\_decompress(). You can also call jpeg\_calc\_output\_dimensions() to obtain the values that will result from the current parameter settings. This can be useful if you are trying to pick a scaling ratio that will get close to a desired target size. It's also important if you are using the JPEG library's memory manager to allocate output buffer space, because you are supposed to request such buffers *before* jpeg\_start\_decompress().

JDIMENSION output\_width Actual dimensions of output image.

JDIMENSION output\_height

int out\_color\_components Number of color components in out\_color\_space.  
int output\_components Number of color components returned.  
int rec\_outbuf\_height Recommended height of scanline buffer.

When quantizing colors, output\_components is 1, indicating a single color map index per pixel. Otherwise it equals out\_color\_components. The output arrays are required to be output\_width \* output\_components JSAMPLEs wide.

rec\_outbuf\_height is the recommended minimum height (in scanlines) of the buffer passed to jpeg\_read\_scanlines(). If the buffer is smaller, the library will still work, but time will be wasted due to unnecessary data copying. In high-quality modes, rec\_outbuf\_height is always 1, but some faster, lower-quality modes set it to larger values (typically 2 to 4).

If you are going to ask for a high-speed processing mode, you may as well go to the trouble of honoring rec\_outbuf\_height so as to avoid data copying. (An output buffer larger than rec\_outbuf\_height lines is OK, but won't provide any material speed improvement over that height.)

#### Special color spaces

-----

The JPEG standard itself is "color blind" and doesn't specify any particular color space. It is customary to convert color data to a luminance/chrominance color space before compressing, since this permits greater compression. The existing JPEG file interchange format standards specify YCbCr or GRAYSCALE data (JFIF version 1), GRAYSCALE, RGB, YCbCr, CMYK, or YCCK (Adobe), or BG\_RGB or BG\_YCC (big gamut color spaces, JFIF version 2). For special applications such as multispectral images, other color spaces can be used, but it must be understood that such files will be unportable.

The JPEG library can handle the most common colorspace conversions (namely RGB  $\Leftrightarrow$  YCbCr and CMYK  $\Leftrightarrow$  YCCK). It can also deal with data of an unknown color space, passing it through without conversion. If you deal extensively with an unusual color space, you can easily extend the library to understand additional color spaces and perform appropriate conversions.

For compression, the source data's color space is specified by field in\_color\_space. This is transformed to the JPEG file's color space given by jpeg\_color\_space. jpeg\_set\_defaults() chooses a reasonable JPEG color space depending on in\_color\_space, but you can override this by calling jpeg\_set\_colorspace(). Of course you must select a supported transformation. jccolor.c currently supports the following transformations:

RGB => YCbCr

RGB => GRAYSCALE

RGB => BG\_YCC  
YCbCr => GRAYSCALE  
YCbCr => BG\_YCC  
CMYK => YCCK  
plus the null transforms: GRAYSCALE => GRAYSCALE, RGB => RGB,  
BG\_RGB => BG\_RGB, YCbCr => YCbCr, BG\_YCC => BG\_YCC, CMYK => CMYK,  
YCCK => YCCK, and UNKNOWN => UNKNOWN.

The file interchange format standards (JFIF and Adobe) specify APPn markers that indicate the color space of the JPEG file. It is important to ensure that these are written correctly, or omitted if the JPEG file's color space is not one of the ones supported by the interchange standards.

`jpeg_set_colorspace()` will set the compression parameters to include or omit the APPn markers properly, so long as it is told the truth about the JPEG color space. For example, if you are writing some random 3-component color space without conversion, don't try to fake out the library by setting `in_color_space` and `jpeg_color_space` to `JCS_YCbCr`; use `JCS_UNKNOWN`. You may want to write an APPn marker of your own devising to identify the colorspace --- see "Special markers", below.

When told that the color space is UNKNOWN, the library will default to using luminance-quality compression parameters for all color components. You may well want to change these parameters. See the source code for `jpeg_set_colorspace()`, in `jcparam.c`, for details.

For decompression, the JPEG file's color space is given in `jpeg_color_space`, and this is transformed to the output color space `out_color_space`.

`jpeg_read_header`'s setting of `jpeg_color_space` can be relied on if the file conforms to JFIF

or Adobe conventions, but otherwise it is no better than a guess. If you know the JPEG file's color space for certain, you can override `jpeg_read_header`'s guess by setting `jpeg_color_space`. `jpeg_read_header` also selects a default output color space based on (its guess of) `jpeg_color_space`; set `out_color_space` to override this. Again, you must select a supported transformation. `jdcolor.c` currently supports

YCbCr => RGB  
YCbCr => GRAYSCALE  
BG\_YCC => RGB  
BG\_YCC => GRAYSCALE  
RGB => GRAYSCALE  
GRAYSCALE => RGB  
YCCK => CMYK

as well as the null transforms. (Since GRAYSCALE=>RGB is provided, an application can force grayscale JPEGs to look like color JPEGs if it only wants to handle one case.)

The two-pass color quantizer, `jquant2.c`, is specialized to handle RGB data



(it weights distances appropriately for RGB colors). You'll need to modify the code if you want to use it for non-RGB output color spaces. Note that `jqquant2.c` is used to map to an application-supplied colormap as well as for the normal two-pass colormap selection process.

CAUTION: it appears that Adobe Photoshop writes inverted data in CMYK JPEG files: 0 represents 100% ink coverage, rather than 0% ink as you'd expect. This is arguably a bug in Photoshop, but if you need to work with Photoshop CMYK files, you will have to deal with it in your application. We cannot "fix" this in the library by inverting the data during the CMYK $\leftrightarrow$ YCCK transform, because that would break other applications, notably Ghostscript. Photoshop versions prior to 3.0 write EPS files containing JPEG-encoded CMYK data in the same inverted-YCCK representation used in bare JPEG files, but the surrounding PostScript code performs an inversion using the PS image operator. I am told that Photoshop 3.0 will write uninverted YCCK in EPS/JPEG files, and will omit the PS-level inversion. (But the data polarity used in bare JPEG files will not change in 3.0.) In either case, the JPEG library must not invert the data itself, or else Ghostscript would read these EPS files incorrectly.

#### Error handling

-----

When the default error handler is used, any error detected inside the JPEG routines will cause a message to be printed on `stderr`, followed by `exit()`. You can supply your own error handling routines to override this behavior and to control the treatment of nonfatal warnings and trace/debug messages. The file `example.c` illustrates the most common case, which is to have the application regain control after an error rather than exiting.

The JPEG library never writes any message directly; it always goes through the error handling routines. Three classes of messages are recognized:

- \* Fatal errors: the library cannot continue.
- \* Warnings: the library can continue, but the data is corrupt, and a damaged output image is likely to result.
- \* Trace/informational messages. These come with a trace level indicating the importance of the message; you can control the verbosity of the program by adjusting the maximum trace level that will be displayed.

You may, if you wish, simply replace the entire JPEG error handling module (`jerror.c`) with your own code. However, you can avoid code duplication by only replacing some of the routines depending on the behavior you need. This is accomplished by calling `jpeg_std_error()` as usual, but then overriding some of the method pointers in the `jpeg_error_mgr` struct, as illustrated by

example.c.

All of the error handling routines will receive a pointer to the JPEG object (a `j_common_ptr` which points to either a `jpeg_compress_struct` or a `jpeg_decompress_struct`; if you need to tell which, test the `is_decompressor` field). This struct includes a pointer to the error manager struct in its "err" field. Frequently, custom error handler routines will need to access additional data which is not known to the JPEG library or the standard error handler. The most convenient way to do this is to embed either the JPEG object or the `jpeg_error_mgr` struct in a larger structure that contains additional fields; then casting the passed pointer provides access to the additional fields. Again, see `example.c` for one way to do it. (Beginning with IJG version 6b, there is also a void pointer "client\_data" in each JPEG object, which the application can also use to find related data. The library does not touch `client_data` at all.)

The individual methods that you might wish to override are:

`error_exit (j_common_ptr cinfo)`

Receives control for a fatal error. Information sufficient to generate the error message has been stored in `cinfo->err`; call `output_message` to display it. Control must NOT return to the caller; generally this routine will `exit()` or `longjmp()` somewhere. Typically you would override this routine to get rid of the `exit()` default behavior. Note that if you continue processing, you should clean up the JPEG object with `jpeg_abort()` or `jpeg_destroy()`.

`output_message (j_common_ptr cinfo)`

Actual output of any JPEG message.

Override this to send messages somewhere other than `stderr`. Note that this method does not know how to generate a message, only where to send it.

`format_message (j_common_ptr cinfo, char * buffer)`

Constructs a readable error message string based on the error info stored in `cinfo->err`. This method is called by `output_message`. Few applications should need to override this method. One possible reason for doing so is to implement dynamic switching of error message language.

`emit_message (j_common_ptr cinfo, int msg_level)`

Decide whether or not to emit a warning or trace message; if so, calls `output_message`. The main reason for overriding this method would be to abort on warnings. `msg_level` is -1 for warnings, 0 and up for trace messages.

Only `error_exit()` and `emit_message()` are called from the rest of the JPEG

library; the other two are internal to the error handler.

The actual message texts are stored in an array of strings which is pointed to by the field `err->jpeg_message_table`.

The messages are numbered from 0 to `err->last_jpeg_message`, and it is these code numbers that are used in the JPEG library code. You could replace the message texts (for instance, with messages in French or German) by changing the message table pointer. See `jerror.h` for the default texts. CAUTION: this table will almost certainly change or grow from one library version to the next.

It may be useful for an application to add its own message texts that are handled by the same mechanism. The error handler supports a second "add-on" message table for this purpose. To define an addon table, set the pointer `err->addon_message_table` and the message numbers `err->first_addon_message` and `err->last_addon_message`. If you number the addon messages beginning at 1000 or so, you won't have to worry about conflicts with the library's built-in messages. See the sample applications `cjpeg/djpeg` for an example of using addon messages (the addon messages are defined in `cderror.h`).

#### Actual

invocation of the error handler is done via macros defined in `jerror.h`:

`ERREXITn(...)` for fatal errors

`WARNMSn(...)` for corrupt-data warnings

`TRACEMSn(...)` for trace and informational messages.

These macros store the message code and any additional parameters into the error handler struct, then invoke the `error_exit()` or `emit_message()` method. The variants of each macro are for varying numbers of additional parameters. The additional parameters are inserted into the generated message using standard `printf()` format codes.

See `jerror.h` and `jerror.c` for further details.

#### Compressed data handling (source and destination managers)

-----

The JPEG compression library sends its compressed data to a "destination manager" module. The default destination manager just writes the data to a memory buffer or to a stdio stream, but you can provide your own manager to do something else. Similarly, the decompression library calls a "source manager" to obtain the compressed data; you can provide your own source manager if you want the data to come from somewhere other than a memory buffer or a stdio stream.

In both cases, compressed data is processed a bufferload at a time: the destination or source manager provides a work buffer, and the library invokes

the manager only when the buffer is filled or emptied. (You could define a one-character buffer to force the manager to be invoked for each byte, but that would be rather inefficient.) The buffer's size and location are controlled by the manager, not by the library. For example, the memory source manager just makes the buffer pointer and length point to the original data in memory. In this case the buffer-reload procedure will be invoked only if the decompressor ran off the end of the datastream, which would indicate an erroneous datastream.

The work buffer is defined as an array of datatype JOCTET, which is generally "char" or "unsigned char". On a machine where char is not exactly 8 bits wide, you must define JOCTET as a wider data type and then modify the data source and destination modules to transcribe the work arrays into 8-bit units on external storage.

A data destination manager struct contains a pointer and count defining the next byte to write in the work buffer and the remaining free space:

```
JOCTET * next_output_byte; /* => next byte to write in buffer */
size_t free_in_buffer;    /* # of byte spaces remaining in buffer */
```

The library increments the pointer and decrements the count until the buffer is filled. The manager's empty\_output\_buffer method must reset the pointer and count. The manager is expected to remember the buffer's starting address and total size in private fields not visible to the library.

A data destination manager provides three methods:

init\_destination (j\_compress\_ptr cinfo)  
Initialize destination. This is called by jpeg\_start\_compress() before any data is actually written. It must initialize next\_output\_byte and free\_in\_buffer. free\_in\_buffer must be initialized to a positive value.

empty\_output\_buffer (j\_compress\_ptr cinfo)  
This is called whenever the buffer has filled (free\_in\_buffer reaches zero). In typical applications, it should write out the \*entire\* buffer (use the saved start address and buffer length; ignore the current state of next\_output\_byte and free\_in\_buffer). Then reset the pointer & count to the start of the buffer, and return TRUE indicating that the buffer has been dumped. free\_in\_buffer must be set to a positive value when TRUE is returned. A FALSE return should only be used when I/O suspension is desired (this operating mode is discussed in the next section).

term\_destination (j\_compress\_ptr cinfo)

Terminate destination --- called by `jpeg_finish_compress()` after all data has been written. In most applications, this must flush any data remaining in the buffer. Use either `next_output_byte` or `free_in_buffer` to determine how much data is in the buffer.

`term_destination()` is NOT called by `jpeg_abort()` or `jpeg_destroy()`. If you want the destination manager to be cleaned up during an abort, you must do it yourself.

You will also need code to create a `jpeg_destination_mgr` struct, fill in its method pointers, and insert a pointer to the struct into the "dest" field of the JPEG compression object. This can be done in-line in your setup code if you like, but it's probably cleaner to provide a separate routine similar to the `jpeg_stdio_dest()` or `jpeg_mem_dest()` routines of the supplied destination managers.

Decompression source managers follow a parallel design, but with some additional frammishes. The source manager struct contains a pointer and count defining the next byte to read from the work buffer and the number of bytes remaining:

```
const JOCTET * next_input_byte; /* => next byte to read from buffer */
size_t bytes_in_buffer;      /* # of bytes remaining in buffer */
```

The library increments the pointer and decrements the count until the buffer is emptied. The manager's `fill_input_buffer` method must reset the pointer and count. In most applications, the manager must remember the buffer's starting address and total size in private fields not visible to the library.

A data source manager provides five methods:

`init_source (j_decompress_ptr cinfo)`

Initialize source. This is called by `jpeg_read_header()` before any data is actually read. Unlike `init_destination()`, it may leave `bytes_in_buffer` set to 0 (in which case a `fill_input_buffer()` call will occur immediately).

`fill_input_buffer (j_decompress_ptr cinfo)`

This is called whenever `bytes_in_buffer` has reached zero and more data is wanted. In typical applications, it should read fresh data into the buffer (ignoring the current state of `next_input_byte` and `bytes_in_buffer`), reset the pointer & count to the start of the buffer, and return TRUE indicating that the buffer has been reloaded.

It is not necessary to fill the buffer

entirely, only to obtain at

least one more byte. `bytes_in_buffer` MUST be set to a positive value

if TRUE is returned. A FALSE return should only be used when I/O suspension is desired (this mode is discussed in the next section).

`skip_input_data(j_decompress_ptr cinfo, long num_bytes)`

Skip `num_bytes` worth of data. The buffer pointer and count should be advanced over `num_bytes` input bytes, refilling the buffer as needed. This is used to skip over a potentially large amount of uninteresting data (such as an APPn marker). In some applications it may be possible to optimize away the reading of the skipped data, but it's not clear that being smart is worth much trouble; large skips are uncommon. `bytes_in_buffer` may be zero on return. A zero or negative skip count should be treated as a no-op.

`resync_to_restart(j_decompress_ptr cinfo, int desired)`

This routine is called only when the decompressor has failed to find a restart (RSTn) marker where one is expected. Its mission is to find a suitable point for resuming decompression. For most applications, we recommend that you just use the default resync procedure, `jpeg_resync_to_restart()`. However, if you are able to back up in the input data stream, or if you have a-priori knowledge about the likely location of restart markers, you may be able to do better. Read the `read_restart_marker()` and `jpeg_resync_to_restart()` routines in `jdmarker.c` if you think you'd like to implement your own resync procedure.

`term_source(j_decompress_ptr cinfo)`

Terminate source --- called by `jpeg_finish_decompress()` after all data has been read. Often a no-op.

For both `fill_input_buffer()` and `skip_input_data()`, there is no such thing as an EOF return. If the end of the file has been reached, the routine has a choice of exiting via `ERREXIT()` or inserting fake data into the buffer. In most cases, generating a warning message and inserting a fake EOI marker is the best course of action --- this will allow the decompressor to output however much of the image is there. In pathological cases, the decompressor may swallow the EOI and again demand data ... just keep feeding it fake EOIs. `jdatsrc.c` illustrates the recommended error recovery behavior.

`term_source()` is NOT called by `jpeg_abort()` or `jpeg_destroy()`. If you want the source manager to be cleaned up during an abort, you must do it yourself.

You will also need code to create a `jpeg_source_mgr` struct, fill in its method pointers, and insert a pointer to the struct into the "src" field of the JPEG decompression object. This can be done in-line in your setup code if you like, but it's probably cleaner to provide a separate routine similar to the `jpeg_stdio_src()` or `jpeg_mem_src()` routines of the supplied source managers.

For more information, consult the memory and stdio source and destination managers in `jdatasrc.c` and `jdatadst.c`.

## I/O suspension

-----

Some applications need to use the JPEG library as an incremental memory-to-memory

filter: when the compressed data buffer is filled or emptied, they want control to return to the outer loop, rather than expecting that the buffer can be emptied or reloaded within the data source/destination manager subroutine. The library supports this need by providing an "I/O suspension" mode, which we describe in this section.

The I/O suspension mode is not a panacea: nothing is guaranteed about the maximum amount of time spent in any one call to the library, so it will not eliminate response-time problems in single-threaded applications. If you need guaranteed response time, we suggest you "bite the bullet" and implement a real multi-tasking capability.

To use I/O suspension, cooperation is needed between the calling application and the data source or destination manager; you will always need a custom source/destination manager. (Please read the previous section if you haven't already.) The basic idea is that the `empty_output_buffer()` or `fill_input_buffer()` routine is a no-op, merely returning `FALSE` to indicate that it has done nothing. Upon seeing this, the JPEG library suspends operation and returns to its caller. The surrounding application is responsible for emptying or refilling the work buffer before calling the JPEG library again.

### Compression suspension:

For compression suspension, use an `empty_output_buffer()` routine that returns `FALSE`; typically it will not do anything else. This will cause the compressor to return to the caller of `jpeg_write_scanlines()`, with the return value indicating that not all the supplied scanlines have been accepted. The application must make more room in the output buffer, adjust the output buffer pointer/count appropriately, and then call `jpeg_write_scanlines()` again, pointing to the first unconsumed scanline.

When forced to suspend, the compressor will backtrack to a convenient stopping point (usually the start of the current MCU); it will regenerate some output data when restarted. Therefore, although `empty_output_buffer()` is only called when the buffer is filled, you should NOT write out the entire buffer

after a suspension. Write only the data up to the current position of `next_output_byte/free_in_buffer`. The data beyond that point will be regenerated after resumption.

Because of the backtracking behavior, a good-size output buffer is essential for efficiency; you don't want the compressor to suspend often. (In fact, an overly small buffer could lead to infinite looping, if a single MCU required more data than would fit in the buffer.) We recommend a buffer of at least several Kbytes. You may want to insert explicit code to ensure that you don't call `jpeg_write_scanlines()` unless there is a reasonable amount of space in the output buffer; in other words, flush the buffer before trying to compress more data.

The compressor does not allow suspension while it is trying to write JPEG markers at the beginning and end of the file. This means that:

- \* At the beginning of a compression operation, there must be enough free space in the output buffer to hold the header markers (typically 600 or so bytes). The recommended buffer size is bigger than this anyway, so this is not a problem as long as you start with an empty buffer. However, this restriction might catch you if you insert large special markers, such as a JFIF thumbnail image, without flushing the buffer afterwards.
- \* When you call `jpeg_finish_compress()`, there must be enough space in the output buffer to emit any buffered data and the final EOI marker. In the current implementation, half a dozen bytes should suffice for this, but for safety's sake we recommend ensuring that at least 100 bytes are free before calling `jpeg_finish_compress()`.

A more significant restriction is that `jpeg_finish_compress()` cannot suspend. This means you cannot use suspension with multi-pass operating modes, namely Huffman code optimization and multiple-scan output. Those modes write the whole file during `jpeg_finish_compress()`, which will certainly result in buffer overrun. (Note that this restriction applies only to compression, not decompression. The decompressor supports input suspension in all of its operating modes.)

Decompression suspension:

For decompression suspension, use a `fill_input_buffer()` routine that simply returns `FALSE` (except perhaps during error recovery, as discussed below). This will cause the decompressor to return to its caller with an indication that suspension has occurred. This can happen at four places:

- \* `jpeg_read_header()`: will return `JPEG_SUSPENDED`.
- \* `jpeg_start_decompress()`: will return `FALSE`, rather than its usual `TRUE`.
- \* `jpeg_read_scanlines()`: will return the number of scanlines already completed (possibly 0).
- \* `jpeg_finish_decompress()`: will return `FALSE`, rather than its usual `TRUE`.



The surrounding application must recognize these cases, load more data into the input buffer, and repeat the call. In the case of `jpeg_read_scanlines()`, increment the passed pointers past any scanlines successfully read.

Just as with compression, the decompressor will typically backtrack to a convenient restart point before suspending. When `fill_input_buffer()` is called, `next_input_byte/bytes_in_buffer` point to the current restart point, which is where the decompressor will backtrack to if `FALSE` is returned. The data beyond that position must NOT be discarded if you suspend; it needs to be re-read upon resumption. In most implementations, you'll need to shift this data down to the start of your work buffer and then load more data after it. Again, this behavior means that a several-Kbyte work buffer is essential for decent performance; furthermore, you should load a reasonable amount of new data before resuming decompression. (If you loaded, say, only one new byte each time around, you could waste a LOT of cycles.)

The `skip_input_data()` source manager routine requires special care in a suspension scenario.

This routine is NOT granted the ability to suspend the decompressor; it can decrement `bytes_in_buffer` to zero, but no more. If the requested skip distance exceeds the amount of data currently in the input buffer, then `skip_input_data()` must set `bytes_in_buffer` to zero and record the additional skip distance somewhere else. The decompressor will immediately call `fill_input_buffer()`, which should return `FALSE`, which will cause a suspension return. The surrounding application must then arrange to discard the recorded number of bytes before it resumes loading the input buffer. (Yes, this design is rather baroque, but it avoids complexity in the far more common case where a non-suspending source manager is used.)

If the input data has been exhausted, we recommend that you emit a warning and insert dummy EOI markers just as a non-suspending data source manager would do. This can be handled either in the surrounding application logic or within `fill_input_buffer()`; the latter is probably more efficient. If `fill_input_buffer()` knows that no more data is available, it can set the `pointer/count` to point to a dummy EOI marker and then return `TRUE` just as though it had read more data in a non-suspending situation.

The decompressor does not attempt to suspend within standard JPEG markers; instead it will backtrack to the start of the marker and reprocess the whole marker next time. Hence the input buffer must be large enough to hold the longest standard marker in the file. Standard JPEG markers should normally not exceed a few hundred bytes each (DHT tables are typically the longest). We recommend at least a 2K buffer for performance reasons, which is much larger than any correct marker is likely to be. For robustness against damaged marker length counts, you may wish to insert a test in your application for the case that the input buffer is completely full and yet

the decoder has suspended without consuming any data --- otherwise, if this situation did occur, it would lead to an endless loop. (The library can't provide this test since it has no idea whether "the buffer is full", or even whether there is a fixed-size input buffer.)

The input buffer would need to be 64K to allow for arbitrary COM or APPn markers, but these are handled specially: they are either saved into allocated memory, or skipped over by calling `skip_input_data()`. In the former case, suspension is handled correctly, and in the latter case, the problem of buffer overrun is placed on `skip_input_data`'s shoulders, as explained above. Note that if you provide your own marker handling routine for large markers, you should consider how to deal with buffer overflow.

Multiple-buffer management:

In some applications it is desirable to store the compressed data in a linked list of buffer areas, so as to avoid data copying. This can be handled by having `empty_output_buffer()` or `fill_input_buffer()` set the pointer and count to reference the next available buffer; `FALSE` is returned only if no more buffers are available. Although seemingly straightforward, there is a pitfall in this approach: the backtrack that occurs when `FALSE` is returned could back up into an earlier buffer. For example, when `fill_input_buffer()` is called, the current pointer & count indicate the backtrack restart point. Since `fill_input_buffer()` will set the pointer and count to refer to a new buffer, the restart position must be saved somewhere else. Suppose a second call to `fill_input_buffer()` occurs in the same library call, and no additional input data is available, so `fill_input_buffer` must return `FALSE`. If the JPEG library has not moved the pointer/count forward in the current buffer, then \*the correct restart point is the saved position in the prior buffer\*. Prior buffers may be discarded only after the library establishes a restart point within a later buffer. Similar remarks apply for output into a chain of buffers.

The library will never attempt to backtrack over a `skip_input_data()` call, so any skipped data can be permanently discarded. You still have to deal with the case of skipping not-yet-received data, however.

It's much simpler to use only a single buffer; when `fill_input_buffer()` is called, move any unconsumed data (beyond the current pointer/count) down to the beginning of this buffer and then load new data into the remaining buffer space. This approach requires a little more data copying but is far easier to get right.

Progressive JPEG support

-----

Progressive JPEG rearranges the stored data into a series of scans of increasing quality. In situations where a JPEG file is transmitted across a slow communications link, a decoder can generate a low-quality image very quickly from the first scan, then gradually improve the displayed quality as more scans are received. The final image after all scans are complete is identical to that of a regular (sequential) JPEG file of the same quality setting. Progressive JPEG files are often slightly smaller than equivalent sequential JPEG files, but the possibility of incremental display is the main reason for using progressive JPEG.

The IJG encoder library generates progressive JPEG files when given a suitable "scan script" defining how to divide the data into scans. Creation of progressive JPEG files is otherwise transparent to the encoder. Progressive JPEG files can also be read transparently by the decoder library. If the decoding application simply uses the library as defined above, it will receive a final decoded image without any indication that the file was progressive. Of course, this approach does not allow incremental display. To perform incremental display, an application needs to use the decoder library's "buffered-image" mode, in which it receives a decoded image multiple times.

Each displayed scan requires about as much work to decode as a full JPEG image of the same size, so the decoder must be fairly fast in relation to the data transmission rate in order to make incremental display useful. However, it is possible to skip displaying the image and simply add the incoming bits to the decoder's coefficient buffer. This is fast because only Huffman decoding need be done, not IDCT, upsampling, colorspace conversion, etc. The IJG decoder library allows the application to switch dynamically between displaying the image and simply absorbing the incoming bits. A properly coded application can automatically adapt the number of display passes to suit the time available as the image is received. Also, a final higher-quality display cycle can be performed from the buffered data after the end of the file is reached.

Progressive compression:

To create a progressive JPEG file (or a multiple-scan sequential JPEG file), set the scan\_info cinfo field to point to an array of scan descriptors, and perform compression as usual. Instead of constructing your own scan list, you can call the jpeg\_simple\_progression() helper routine to create a recommended

progression sequence; this method should be used by all applications that don't want to get involved in the nitty-gritty of progressive scan sequence design. (If you want to provide user control of

scan sequences, you may wish to borrow the scan script reading code found in rdswitch.c, so that you can read scan script files just like cjpeg's.)

When scan\_info is not NULL, the compression library will store DCT'd data into a buffer array as jpeg\_write\_scanlines() is called, and will emit all the requested scans during jpeg\_finish\_compress(). This implies that multiple-scan output cannot be created with a suspending data destination manager, since jpeg\_finish\_compress() does not support suspension. We should also note that the compressor currently forces Huffman optimization mode when creating a progressive JPEG file, because the default Huffman tables are unsuitable for progressive files.

Progressive decompression:

When buffered-image mode is not used, the decoder library will read all of a multi-scan file during jpeg\_start\_decompress(), so that it can provide a final decoded image. (Here "multi-scan" means either progressive or multi-scan sequential.) This makes multi-scan files transparent to the decoding application. However, existing applications that used suspending input with version 5 of the IJG library will need to be modified to check for a suspension return from jpeg\_start\_decompress().

To perform incremental display, an application must use the library's buffered-image mode. This is described in the next section.

Buffered-image mode

-----

In buffered-image mode, the library stores the partially decoded image in a coefficient buffer, from which it can be read out as many times as desired. This mode is typically used for incremental display of progressive JPEG files, but it can be used with any JPEG file. Each scan of a progressive JPEG file adds more data (more detail) to the buffered image. The application can display in lockstep with the source file (one display pass per input scan), or it can allow input processing to outrun display processing. By making input and display processing run independently, it is possible for the application to adapt progressive display to a wide range of data transmission rates.

The basic control flow for buffered-image decoding is

```
jpeg_create_decompress()
set data source
jpeg_read_header()
set overall decompression parameters
cinfo.buffered_image = TRUE; /* select buffered-image mode */
```

```

jpeg_start_decompress()
for (each output pass) {
    adjust output decompression parameters if required
    jpeg_start_output() /* start a new output pass */
    for (all scanlines in image) {
        jpeg_read_scanlines()
        display scanlines
    }
    jpeg_finish_output() /* terminate output pass */
}
jpeg_finish_decompress()
jpeg_destroy_decompress()

```

This differs from ordinary unbuffered decoding in that there is an additional level of looping. The application can choose how many output passes to make and how to display each pass.

The simplest approach to displaying progressive images is to do one display pass for each scan appearing in the input file. In this case the outer loop condition is typically

```
while (! jpeg_input_complete(&cinfo))
```

and the start-output call should read

```
jpeg_start_output(&cinfo, cinfo.input_scan_number);
```

The second parameter to `jpeg_start_output()` indicates which scan of the input file is to be displayed; the scans are numbered starting at 1 for this purpose. (You can use a loop counter starting at 1 if you like, but using the library's input scan counter is easier.) The library automatically reads data as necessary to complete each requested scan, and `jpeg_finish_output()` advances to the next scan or end-of-image marker (hence `input_scan_number` will be incremented by the time control arrives back at `jpeg_start_output()`). With this technique, data is read from the input file only as needed, and input and output processing run in lockstep.

After reading the final scan and reaching the end of the input file, the buffered image remains available; it can be read additional times by repeating the `jpeg_start_output()/jpeg_read_scanlines()/jpeg_finish_output()` sequence. For example, a useful technique is to use fast one-pass color quantization for display passes made while the image is arriving, followed by a final display pass using two-pass quantization for highest quality. This is done by changing the library parameters before the final output pass. Changing parameters between passes is discussed in detail below.

In general the last scan of a progressive file cannot be recognized as such until after it is read, so a post-input display pass is the best approach if you want special processing in the final pass.

When done with the image, be sure to call `jpeg_finish_decompress()` to release the buffered image (or just use `jpeg_destroy_decompress()`).

If input data arrives faster than it can be displayed, the application can cause the library to decode input data in advance of what's needed to produce output. This is done by calling the routine `jpeg_consume_input()`.

The return value is one of the following:

`JPEG_REACHED_SOS`: reached an SOS marker (the start of a new scan)

`JPEG_REACHED_EOI`: reached the EOI marker (end of image)

`JPEG_ROW_COMPLETED`: completed reading one MCU row of compressed data

`JPEG_SCAN_COMPLETED`: completed reading last MCU row of current scan

`JPEG_SUSPENDED`: suspended before completing any of the above

(`JPEG_SUSPENDED` can occur only if a suspending data source is used.) This

routine can be called at any time after initializing the JPEG object. It

reads some additional data and returns when one of the indicated significant

events occurs. (If called after the EOI marker is reached, it will

immediately return `JPEG_REACHED_EOI` without attempting to read more data.)

The library's output processing will automatically call `jpeg_consume_input()` whenever

the output processing overtakes the input; thus, simple lockstep display requires no direct calls to `jpeg_consume_input()`. But by adding calls to `jpeg_consume_input()`, you can absorb data in advance of what is being displayed. This has two benefits:

- \* You can limit buildup of unprocessed data in your input buffer.
- \* You can eliminate extra display passes by paying attention to the state of the library's input processing.

The first of these benefits only requires interspersing calls to `jpeg_consume_input()` with your display operations and any other processing you may be doing. To avoid wasting cycles due to backtracking, it's best to call `jpeg_consume_input()` only after a hundred or so new bytes have arrived. This is discussed further under "I/O suspension", above. (Note: the JPEG library currently is not thread-safe. You must not call `jpeg_consume_input()` from one thread of control if a different library routine is working on the same JPEG object in another thread.)

When input arrives fast enough that more than one new scan is available before you start a new output pass, you may as well skip the output pass corresponding to the completed scan. This occurs for free if you pass `cinfo.input_scan_number` as the target scan number to `jpeg_start_output()`. The `input_scan_number` field is simply the index of the scan currently being consumed by the input processor. You can ensure that this is up-to-date by emptying the input buffer just before calling `jpeg_start_output()`: call `jpeg_consume_input()` repeatedly until it returns `JPEG_SUSPENDED` or `JPEG_REACHED_EOI`.

The target scan number passed to `jpeg_start_output()` is saved in the `cinfo.output_scan_number` field. The library's output processing calls `jpeg_consume_input()` whenever the current input scan number and row within that scan is less than or equal to the current output scan number and row. Thus, input processing can "get ahead" of the output processing but is not allowed to "fall behind".

You can achieve several different effects by manipulating this interlock rule. For example, if you pass a target scan number greater than the current input scan number, the output processor will wait until that scan starts to arrive before producing any output. (To avoid an infinite loop, the target scan number is automatically reset to the last scan number when the end of image is reached. Thus, if you specify a large target scan number, the library will just absorb the entire input file and then perform an output pass. This is effectively the same as what `jpeg_start_decompress()` does when you don't select buffered-image mode.) When you pass a target scan number equal to the current input scan number, the image is displayed no faster than the current input scan arrives. The final possibility is to pass a target scan number less than the current input scan number; this disables the input/output interlock and causes the output processor to simply display whatever it finds in the image buffer, without waiting for input. (However, the library will not accept a target scan number less than one, so you can't avoid waiting for the first scan.)

When data is arriving faster than the output display processing can advance through the image, `jpeg_consume_input()` will store data into the buffered image beyond the point at which the output processing is reading data out again. If the input arrives fast enough, it may "wrap around" the buffer to the point where the input is more than one whole scan ahead of the output. If the output processing simply proceeds through its display pass without paying attention to the input, the effect seen on-screen is that the lower part of the image is one or more scans better in quality than the upper part. Then, when the next output scan is started, you have a choice of what target scan number to use. The recommended choice is to use the current input scan number at that time, which implies that you've skipped the output scans corresponding to the input scans that were completed while you processed the previous output scan. In this way, the decoder automatically adapts its speed to the arriving data, by skipping output scans as necessary to keep up with the arriving data.

When using this strategy, you'll want to be sure that you perform a final output pass after receiving all the data; otherwise your last display may not be full quality across the whole screen. So the right outer loop logic is something like this:

```
do {  
    absorb any waiting input by calling jpeg_consume_input()
```

```

final_pass = jpeg_input_complete(&cinfo);
adjust output decompression parameters if required
jpeg_start_output(&cinfo, cinfo.input_scan_number);
...
jpeg_finish_output()
} while (! final_pass);

```

rather than quitting as soon as `jpeg_input_complete()` returns TRUE. This arrangement makes it simple to use higher-quality decoding parameters for the final pass. But if you don't want to use special parameters for the

final pass, the right loop logic is like this:

```

for (;;) {
    absorb any waiting input by calling jpeg_consume_input()
    jpeg_start_output(&cinfo, cinfo.input_scan_number);
    ...
    jpeg_finish_output()
    if (jpeg_input_complete(&cinfo) &&
        cinfo.input_scan_number == cinfo.output_scan_number)
        break;
}

```

In this case you don't need to know in advance whether an output pass is to be the last one, so it's not necessary to have reached EOF before starting the final output pass; rather, what you want to test is whether the output pass was performed in sync with the final input scan. This form of the loop will avoid an extra output pass whenever the decoder is able (or nearly able) to keep up with the incoming data.

When the data transmission speed is high, you might begin a display pass, then find that much or all of the file has arrived before you can complete the pass. (You can detect this by noting the `JPEG_REACHED_EOI` return code from `jpeg_consume_input()`, or equivalently by testing `jpeg_input_complete()`.)

In this situation you may wish to abort the current display pass and start a new one using the newly arrived information. To do so, just call `jpeg_finish_output()` and then start a new pass with `jpeg_start_output()`.

A variant strategy is to abort and restart display if more than one complete scan arrives during an output pass; this can be detected by noting `JPEG_REACHED_SOS` returns and/or examining `cinfo.input_scan_number`. This idea should be employed with caution, however, since the display process might never get to the bottom of the image before being aborted, resulting in the lower part of the screen being several passes worse than the upper. In most cases it's probably best to abort an output pass only if the whole file has arrived and you want to begin the final output pass immediately.

When receiving data across a communication link, we recommend always using the current input scan number for the output target scan number;



if a

higher-quality final pass is to be done, it should be started (aborting any incomplete output pass) as soon as the end of file is received. However, many other strategies are possible. For example, the application can examine the parameters of the current input scan and decide whether to display it or not. If the scan contains only chroma data, one might choose not to use it as the target scan, expecting that the scan will be small and will arrive quickly. To skip to the next scan, call `jpeg_consume_input()` until it returns `JPEG_REACHED_SOS` or `JPEG_REACHED_EOI`. Or just use the next higher number as the target scan for `jpeg_start_output()`; but that method doesn't let you inspect the next scan's parameters before deciding to display it.

In buffered-image mode, `jpeg_start_decompress()` never performs input and thus never suspends. An application that uses input suspension with buffered-image mode must be prepared for suspension returns from these routines:

- \* `jpeg_start_output()`

performs input only if you request 2-pass quantization and the target scan isn't fully read yet. (This is discussed below.)

- \* `jpeg_read_scanlines()`, as always, returns the number of scanlines that it was able to produce before suspending.

- \* `jpeg_finish_output()` will read any markers following the target scan, up to the end of the file or the SOS marker that begins another scan. (But it reads no input if `jpeg_consume_input()` has already reached the end of the file or a SOS marker beyond the target output scan.)

- \* `jpeg_finish_decompress()` will read until the end of file, and thus can suspend if the end hasn't already been reached (as can be tested by calling `jpeg_input_complete()`).

`jpeg_start_output()`, `jpeg_finish_output()`, and `jpeg_finish_decompress()` all return `TRUE` if they completed their tasks, `FALSE` if they had to suspend.

In the event of a `FALSE` return, the application must load more input data and repeat the call. Applications that use non-suspending data sources need

not check the return values of these three routines.

It is possible to change decoding parameters between output passes in the buffered-image mode. The decoder library currently supports only very limited changes of parameters. **ONLY THE FOLLOWING** parameter changes are allowed after `jpeg_start_decompress()` is called:

- \* `dct_method` can be changed before each call to `jpeg_start_output()`.

For example, one could use a fast DCT method for early scans, changing to a higher quality method for the final scan.

- \* `dither_mode` can be changed before each call to `jpeg_start_output()`; of course this has no impact if not using color quantization. Typically one would use ordered dither for initial passes, then switch to Floyd-Steinberg dither for the final pass. Caution: changing dither mode

can cause more memory to be allocated by the library. Although the amount of memory involved is not large (a scanline or so), it may cause the initial `max_memory_to_use` specification to be exceeded, which in the worst case would result in an out-of-memory failure.

\* `do_block_smoothing` can be changed before each call to `jpeg_start_output()`.

This setting is relevant only when decoding a progressive JPEG image.

During the first DC-only scan, block smoothing provides a very "fuzzy" look instead of the very "blocky" look seen without it; which is better seems a matter of personal taste. But block smoothing is nearly always a win during later stages, especially when decoding a successive-approximation image: smoothing helps to hide the slight blockiness that otherwise shows up on smooth gradients until the lowest coefficient bits are sent.

\* Color quantization mode can be changed under the rules described below.

You \*cannot\* change between full-color and quantized output (because that would alter the required I/O buffer sizes), but you can change which quantization method is used.

When generating color-quantized output, changing quantization method is

a

very useful way of switching between high-speed and high-quality display.

The library allows you to change among its three quantization methods:

1. Single-pass quantization to a fixed color cube.

Selected by `cinfo.two_pass_quantize = FALSE` and `cinfo.colormap = NULL`.

2. Single-pass quantization to an application-supplied colormap.

Selected by setting `cinfo.colormap` to point to the colormap (the value of `two_pass_quantize` is ignored); also set `cinfo.actual_number_of_colors`.

3. Two-pass quantization to a colormap chosen specifically for the image.

Selected by `cinfo.two_pass_quantize = TRUE` and `cinfo.colormap = NULL`.

(This is the default setting selected by `jpeg_read_header`, but it is probably NOT what you want for the first pass of progressive display!)

These methods offer successively better quality and lesser speed. However, only the first method is available for quantizing in non-RGB color spaces.

**IMPORTANT:** because the different quantizer methods have very different working-storage

requirements, the library requires you to indicate which

one(s) you intend to use before you call `jpeg_start_decompress()`. (If we did not require this, the `max_memory_to_use` setting would be a complete fiction.)

You do this by setting one or more of these three `cinfo` fields to `TRUE`:

`enable_1pass_quant` Fixed color cube colormap

`enable_external_quant` Externally-supplied colormap

`enable_2pass_quant` Two-pass custom colormap

All three are initialized `FALSE` by `jpeg_read_header()`. But

`jpeg_start_decompress()` automatically sets `TRUE` the one selected by the current `two_pass_quantize` and `colormap` settings, so you only need to set the enable flags for any other quantization methods you plan to change to later.

After setting the enable flags correctly at `jpeg_start_decompress()` time, you can change to any enabled quantization method by setting `two_pass_quantize` and `colormap` properly just before calling `jpeg_start_output()`. The following special rules apply:

1. You must explicitly set `cinfo.colormap` to `NULL` when switching to 1-pass or 2-pass mode from a different mode, or when you want the 2-pass quantizer to be re-run to generate a new colormap.
2. To switch to an external colormap, or to change to a different external colormap than was used on the prior pass, you must call `jpeg_new_colormap()` after setting `cinfo.colormap`.

NOTE: if you want to use the same colormap as was used in the prior pass, you should not do either of these things. This will save some nontrivial switchover costs.

(These requirements exist because `cinfo.colormap` will always be non-`NULL` after completing a prior output pass, since both the 1-pass and 2-pass quantizers set it to point to their output colormaps. Thus you have to do one of these two things to notify the library that something has changed.

Yup, it's a bit klugy, but it's necessary to do it this way for backwards compatibility.)

Note that in buffered-image mode, the library generates any requested colormap during `jpeg_start_output()`, not during `jpeg_start_decompress()`.

When using two-pass quantization, `jpeg_start_output()` makes a pass over the buffered image to determine the optimum color map; it therefore may take a significant amount of time, whereas ordinarily it does little work. The progress monitor hook is called during this pass, if defined. It is also important to realize that if the specified target scan number is greater than or equal to the current input scan number, `jpeg_start_output()` will attempt to consume input as it makes this pass. If you use a suspending data source, you need to check for a `FALSE` return from `jpeg_start_output()` under these conditions. The combination of 2-pass quantization and a not-yet-fully-read target scan is the only case in which `jpeg_start_output()` will consume input.

Application authors who support buffered-image mode may be tempted to use it for all JPEG images, even single-scan ones. This will work, but it is inefficient: there is

no need to create an image-sized coefficient buffer for single-scan images. Requesting buffered-image mode for such an image wastes memory. Worse, it can cost time on large images, since the buffered data has to be swapped out or written to a temporary file. If you are concerned about maximum performance on baseline JPEG files, you should use buffered-image mode only when the incoming file actually has multiple scans. This can be tested by calling `jpeg_has_multiple_scans()`, which will return a correct result at any time after `jpeg_read_header()` completes.

It is also worth noting that when you use `jpeg_consume_input()` to let input processing get ahead of output processing, the resulting pattern of access to the coefficient buffer is quite nonsequential. It's best to use the memory manager `jmemnobs.c` if you can (ie, if you have enough real or virtual main memory). If not, at least make sure that `max_memory_to_use` is set as high as possible. If the JPEG memory manager has to use a temporary file, you will probably see a lot of disk traffic and poor performance. (This could be improved with additional work on the memory manager, but we haven't gotten around to it yet.)

In some applications it may be convenient to use `jpeg_consume_input()` for all input processing, including reading the initial markers; that is, you may wish to call `jpeg_consume_input()` instead of `jpeg_read_header()` during startup. This works, but note that you must check for `JPEG_REACHED_SOS` and `JPEG_REACHED_EOI` return codes as the equivalent of `jpeg_read_header's` codes. Once the first SOS marker has been reached, you must call `jpeg_start_decompress()` before `jpeg_consume_input()` will consume more input; it'll just keep returning `JPEG_REACHED_SOS` until you do. If you read a tables-only file this way, `jpeg_consume_input()` will return `JPEG_REACHED_EOI` without ever returning `JPEG_REACHED_SOS`; be sure to check for this case. If this happens, the decompressor will not read any more input until you call `jpeg_abort()` to reset it. It is OK to call `jpeg_consume_input()` even when not using buffered-image mode, but in that case it's basically a no-op after the initial markers have been read: it will just return `JPEG_SUSPENDED`.

#### Abbreviated datastreams and multiple images

-----

A JPEG compression or decompression object can be reused to process multiple images. This saves a small amount of time per image by eliminating the "create" and "destroy" operations, but that isn't the real purpose of the feature. Rather, reuse of an object provides support for abbreviated JPEG datastreams. Object reuse can also simplify processing a series of images in a single input or output file. This section explains these features.

A JPEG file normally contains several hundred bytes worth of quantization and Huffman tables. In a situation where many images will be stored or transmitted with identical tables, this may represent an annoying overhead.

#### The JPEG

standard therefore permits tables to be omitted. The standard defines three classes of JPEG datastreams:

- \* "Interchange" datastreams contain an image and all tables needed to decode the image. These are the usual kind of JPEG file.
- \* "Abbreviated image" datastreams contain an image, but are missing some or

all of the tables needed to decode that image.

\* "Abbreviated table specification" (henceforth "tables-only") datastreams contain only table specifications.

To decode an abbreviated image, it is necessary to load the missing table(s) into the decoder beforehand. This can be accomplished by reading a separate tables-only file. A variant scheme uses a series of images in which the first image is an interchange (complete) datastream, while subsequent ones are abbreviated and rely on the tables loaded by the first image. It is assumed that once the decoder has read a table, it will remember that table until a new definition for the same table number is encountered.

It

is the application designer's responsibility to figure out how to associate the correct tables with an abbreviated image. While abbreviated datastreams can be useful in a closed environment, their use is strongly discouraged in any situation where data exchange with other applications might be needed. Caveat designer.

The JPEG library provides support for reading and writing any combination of tables-only datastreams and abbreviated images. In both compression and decompression objects, a quantization or Huffman table will be retained for the lifetime of the object, unless it is overwritten by a new table definition.

To create abbreviated image datastreams, it is only necessary to tell the compressor not to emit some or all of the tables it is using. Each quantization and Huffman table struct contains a boolean field "sent\_table", which normally is initialized to FALSE. For each table used by the image, the header-writing process emits the table and sets sent\_table = TRUE unless it is already TRUE. (In normal usage, this prevents outputting the same table definition multiple times, as would otherwise occur because the chroma components typically share tables.) Thus, setting this field to TRUE before calling jpeg\_start\_compress() will prevent the table from being written at all.

If you want to create a "pure" abbreviated image file containing no tables, just call "jpeg\_suppress\_tables(&cinfo, TRUE)" after constructing all the tables. If you want to emit some but not all tables, you'll need to set the individual sent\_table fields directly.

To create an abbreviated image, you must also call jpeg\_start\_compress() with a second parameter of FALSE, not TRUE. Otherwise jpeg\_start\_compress() will force all the sent\_table fields to FALSE. (This is a safety feature to prevent abbreviated images from being created accidentally.)

To create a tables-only file, perform the same parameter setup that you normally would, but instead of calling jpeg\_start\_compress()

and so on, call `jpeg_write_tables(&cinfo)`. This will write an abbreviated datastream containing only SOI, DQT and/or DHT markers, and EOI. All the quantization and Huffman tables that are currently defined in the compression object will be emitted unless their `sent_tables` flag is already TRUE, and then all the `sent_tables` flags will be set TRUE.

A sure-fire way to create matching tables-only and abbreviated image files is to proceed as follows:

```
create JPEG compression object
set JPEG parameters
set destination to tables-only file
jpeg_write_tables(&cinfo);
set destination to image file
jpeg_start_compress(&cinfo, FALSE);
write data...
jpeg_finish_compress(&cinfo);
```

Since the JPEG parameters are not altered between writing the table file and the abbreviated image file, the same tables are sure to be used. Of course, you can repeat the `jpeg_start_compress()` ... `jpeg_finish_compress()` sequence many times to produce many abbreviated image files matching the table file.

You

cannot suppress output of the computed Huffman tables when Huffman optimization is selected. (If you could, there'd be no way to decode the image...) Generally, you don't want to set `optimize_coding = TRUE` when you are trying to produce abbreviated files.

In some cases you might want to compress an image using tables which are not stored in the application, but are defined in an interchange or tables-only file readable by the application. This can be done by setting up a JPEG decompression object to read the specification file, then copying the tables into your compression object. See `jpeg_copy_critical_parameters()` for an example of copying quantization tables.

To read abbreviated image files, you simply need to load the proper tables into the decompression object before trying to read the abbreviated image. If the proper tables are stored in the application program, you can just allocate the table structs and fill in their contents directly. For example, to load a fixed quantization table into table slot "n":

```
if (cinfo.quant_tbl_ptrs[n] == NULL)
    cinfo.quant_tbl_ptrs[n] = jpeg_alloc_quant_table((j_common_ptr) &cinfo);
quant_ptr = cinfo.quant_tbl_ptrs[n]; /* quant_ptr is JQUANT_TBL* */
```

```

for (i = 0; i < 64; i++) {
    /* Qtable[] is desired quantization table, in natural array order */
    quant_ptr->quantval[i] = Qtable[i];
}

```

Code to load a fixed Huffman table is typically (for AC table "n"):

```

if (cinfo.ac_huff_tbl_ptrs[n] == NULL)
    cinfo.ac_huff_tbl_ptrs[n] = jpeg_alloc_huff_table((j_common_ptr) &cinfo);
huff_ptr = cinfo.ac_huff_tbl_ptrs[n]; /* huff_ptr is JHUFF_TBL* */
for (i = 1; i <= 16; i++) {
    /* counts[i] is number of Huffman codes of length i bits, i=1..16 */
    huff_ptr->bits[i] = counts[i];
}
for (i = 0; i < 256; i++) {
    /* symbols[] is the list of Huffman symbols, in code-length order */
    huff_ptr->huffval[i] = symbols[i];
}

```

(Note that trying to set `cinfo.quant_tbl_ptrs[n]` to point directly at a constant `JQUANT_TBL` object is not safe. If the incoming file happened to contain a quantization table definition, your master table would get overwritten! Instead allocate a working table copy and copy the master table into it, as illustrated above. Ditto for Huffman tables, of course.)

You might want to read the tables from a tables-only file, rather than hard-wiring them into your application. The `jpeg_read_header()` call is sufficient to read a tables-only file. You must pass a second parameter of `FALSE` to indicate that you do not require an image to be present. Thus, the typical scenario is

```

create JPEG decompression object
set source to tables-only file
jpeg_read_header(&cinfo, FALSE);
set source to abbreviated image file
jpeg_read_header(&cinfo, TRUE);
set decompression parameters
jpeg_start_decompress(&cinfo);
read data...
jpeg_finish_decompress(&cinfo);

```

In some cases, you may want to read a file without knowing whether it contains an image

or just tables. In that case, pass `FALSE` and check the return value from `jpeg_read_header()`: it will be `JPEG_HEADER_OK` if an image was found, `JPEG_HEADER_TABLES_ONLY` if only tables were found. (A third return value, `JPEG_SUSPENDED`, is possible when using a suspending data source manager.)

Note that `jpeg_read_header()` will not complain if you read an abbreviated image for which you haven't loaded the missing tables; the missing-table check occurs later, in `jpeg_start_decompress()`.

It is possible to read a series of images from a single source file by repeating the `jpeg_read_header() ... jpeg_finish_decompress()` sequence, without releasing/recreating the JPEG object or the data source module. (If you did reinitialize, any partial bufferload left in the data source buffer at the end of one image would be discarded, causing you to lose the start of the next image.) When you use this method, stored tables are automatically carried forward, so some of the images can be abbreviated images that depend on tables from earlier images.

If you intend to write a series of images into a single destination file, you might want to make a specialized data destination module that doesn't flush the output buffer at `term_destination()` time. This would speed things up by some trifling amount. Of course, you'd need to remember to flush the buffer after the last image. You can make the later images be abbreviated ones by passing `FALSE` to `jpeg_start_compress()`.

#### Special markers

-----

Some applications may need to insert or extract special data in the JPEG datastream. The JPEG standard provides marker types "COM" (comment) and "APP0" through "APP15" (application) to hold application-specific data. Unfortunately, the use of these markers is not specified by the standard. COM markers are fairly widely used to hold user-supplied text. The JFIF file format spec uses APP0 markers with specified initial strings to hold certain data. Adobe applications use APP14 markers beginning with the string "Adobe" for miscellaneous data. Other APPn markers are rarely seen, but might contain almost anything.

If you wish to store user-supplied text, we recommend you use COM markers and place readable 7-bit ASCII text in them. Newline conventions are not standardized --- expect to find LF (Unix style), CR/LF (DOS style), or CR (Mac style). A robust COM reader should be able to cope with random binary garbage, including nulls, since some applications generate COM markers containing non-ASCII junk. (But yours should not be one of them.)

For program-supplied data, use an APPn marker, and be sure to begin it with an identifying string so that you can tell whether the marker is actually yours. It's probably best to avoid using APP0 or APP14 for any private markers. (NOTE: the upcoming SPIFF standard will use APP8 markers; we recommend you



not use APP8 markers for any private purposes, either.)

Keep in mind that at most 65533 bytes can be put into one marker, but you can have as many markers as you like.

By default, the IJG compression library will write a JFIF APP0 marker if the selected JPEG colorspace is grayscale or YCbCr, or an Adobe APP14 marker if the selected colorspace is RGB, CMYK, or YCCK. You can disable this, but we don't recommend it. The decompression library will recognize JFIF and Adobe markers and will set the JPEG colorspace properly when one is found.

You can write special markers immediately following the datastream header by calling `jpeg_write_marker()` after `jpeg_start_compress()` and before the first call to `jpeg_write_scanlines()`. When you do this, the markers appear after the SOI and the JFIF APP0 and Adobe APP14 markers (if written), but before all else. Specify the marker type parameter as "JPEG\_COM" for COM or "JPEG\_APP0 + n" for APPn. (Actually, `jpeg_write_marker` will let you write any marker type, but we don't recommend writing any other kinds of marker.) For example, to write a user comment string pointed to `comment_text`:

```
jpeg_write_marker(cinfo, JPEG_COM, comment_text, strlen(comment_text));
```

If it's not convenient to store all the marker data in memory at once, you can instead call `jpeg_write_m_header()` followed by multiple calls to `jpeg_write_m_byte()`. If you do it this way, it's your responsibility to call `jpeg_write_m_byte()` exactly the number of times given in the `length` parameter to `jpeg_write_m_header()`. (This method lets you empty the output buffer partway through a marker, which might be important when using a suspending data destination module. In any case, if you are using a suspending destination, you should flush its buffer after inserting any special markers. See "I/O suspension".)

Or, if you prefer to synthesize the marker byte sequence yourself, you can just cram it straight into the data destination module.

If you are writing JFIF 1.02 extension markers (thumbnail images), don't forget to set `cinfo.JFIF_minor_version = 2` so that the encoder will write the correct

JFIF version number in the JFIF header marker. The library's default is to write version 1.01, but that's wrong if you insert any 1.02 extension markers. (We could probably get away with just defaulting to 1.02, but there used to be broken decoders that would complain about unknown minor version numbers. To reduce compatibility risks it's safest not to write 1.02 unless you are actually using 1.02 extensions.)

When reading, two methods of handling special markers are available:

1. You can ask the library to save the contents of COM and/or APPn markers into memory, and then examine them at your leisure afterwards.
2. You can supply your own routine to process COM and/or APPn markers on-the-fly as they are read.

The first method is simpler to use, especially if you are using a suspending data source; writing a marker processor that copes with input suspension is not easy (consider what happens if the marker is longer than your available input buffer). However, the second method conserves memory since the marker data need not be kept around after it's been processed.

For either method, you'd normally set up marker handling after creating a decompression object and before calling `jpeg_read_header()`, because the markers of interest will typically be near the head of the file and so will be scanned by `jpeg_read_header`. Once you've established a marker handling method, it will be used for the life of that decompression object (potentially many datastreams), unless you change it. Marker handling is determined separately for COM markers and for each APPn marker code.

To save the contents of special markers in memory, call

```
jpeg_save_markers(cinfo, marker_code, length_limit)
```

where `marker_code` is the marker type to save, `JPEG_COM` or `JPEG_APP0+n`.

(To arrange to save all the special marker types, you need to call this routine 17 times, for COM and APP0-APP15.) If the incoming marker is longer than `length_limit` data bytes, only `length_limit` bytes will be saved; this parameter

allows you to avoid chewing up memory when you only need to see the first few bytes of a potentially large marker. If you want to save all the data, set `length_limit` to `0xFFFF`; that is enough since marker lengths are only 16 bits. As a special case, setting `length_limit` to 0 prevents that marker type from being saved at all. (That is the default behavior, in fact.)

After `jpeg_read_header()` completes, you can examine the special markers by following the `cinfo->marker_list` pointer chain. All the special markers in the file appear in this list, in order of their occurrence in the file (but omitting any markers of types you didn't ask for). Both the original data length and the saved data length are recorded for each list entry; the latter will not exceed `length_limit` for the particular marker type. Note that these lengths exclude the marker length word, whereas the stored representation within the JPEG file includes it. (Hence the maximum data length is really only 65533.)

It

is possible that additional special markers appear in the file beyond the SOS marker at which `jpeg_read_header` stops; if so, the marker list will be extended during reading of the rest of the file. This is not expected to be

common, however. If you are short on memory you may want to reset the length limit to zero for all marker types after finishing `jpeg_read_header`, to ensure that the `max_memory_to_use` setting cannot be exceeded due to addition of later markers.

The marker list remains stored until you call `jpeg_finish_decompress` or `jpeg_abort`, at which point the memory is freed and the list is set to empty. (`jpeg_destroy` also releases the storage, of course.)

Note that the library is internally interested in APP0 and APP14 markers; if you try to set a small nonzero length limit on these types, the library will silently force the length up to the minimum it wants. (But you can set a zero length limit to prevent them from being saved at all.) Also, in a 16-bit environment, the maximum length limit may be constrained to less than 65533 by `malloc()` limitations. It is therefore best not to assume that the effective length limit is exactly what you set it to be.

If you want to supply your own marker-reading routine, you do it by calling `jpeg_set_marker_processor()`. A marker processor routine must have the signature

```
boolean jpeg_marker_parser_method (j_decompress_ptr cinfo)
```

Although the marker code is not explicitly passed, the routine can find it in `cinfo->unread_marker`. At the time of call, the marker proper has been read from the data source module. The processor routine is responsible for reading the marker length word and the remaining parameter bytes, if any. Return TRUE to indicate success. (FALSE should be returned only if you are using a suspending data source and it tells you to suspend. See the standard marker processors in `jdmarker.c` for appropriate coding methods if you need to use a suspending data source.)

If you override the default

APP0 or APP14 processors, it is up to you to recognize JFIF and Adobe markers if you want colorspace recognition to occur properly. We recommend copying and extending the default processors if you want to do that. (A better idea is to save these marker types for later examination by calling `jpeg_save_markers()`; that method doesn't interfere with the library's own processing of these markers.)

`jpeg_set_marker_processor()` and `jpeg_save_markers()` are mutually exclusive --- if you call one it overrides any previous call to the other, for the particular marker type specified.

A simple example of an external COM processor can be found in `djpeg.c`. Also, see `jpegtran.c` for an example of using `jpeg_save_markers`.

## Raw (downsampled) image data

-----

Some applications need to supply already-downsampled image data to the JPEG compressor, or to receive raw downsampled data from the decompressor. The library supports this requirement by allowing the application to write

or

read raw data, bypassing the normal preprocessing or postprocessing steps.

The interface is different from the standard one and is somewhat harder to use. If your interest is merely in bypassing color conversion, we recommend that you use the standard interface and simply set `jpeg_color_space = in_color_space` (or `jpeg_color_space = out_color_space` for decompression).

The mechanism described in this section is necessary only to supply or receive downsampled image data, in which not all components have the same dimensions.

To compress raw data, you must supply the data in the colorspace to be used in the JPEG file (please read the earlier section on Special color spaces) and downsampled to the sampling factors specified in the JPEG parameters. You must supply the data in the format used internally by the JPEG library, namely a JSAMPIMAGE array. This is an array of pointers to two-dimensional arrays, each of type JSAMPARRAY. Each 2-D array holds the values for one color component.

This structure is necessary since the components are of different sizes. If the image dimensions are not a multiple of the MCU size, you must also pad the data correctly (usually, this is done by replicating the last column and/or row). The data must be padded to a multiple of a DCT block in each component: that is, each downsampled row must contain a multiple of `block_size` valid samples, and there must be a multiple of `block_size` sample rows for each component. (For applications such as conversion of digital TV images, the standard image size is usually a multiple of the DCT block size, so that no padding need actually be done.)

The procedure for compression of raw data is basically the same as normal compression, except that you call `jpeg_write_raw_data()` in place of `jpeg_write_scanlines()`. Before calling `jpeg_start_compress()`, you must do the following:

- \* Set `cinfo->raw_data_in` to TRUE. (It is set FALSE by `jpeg_set_defaults()`.)

This notifies the library that you will be supplying raw data.

Furthermore, set `cinfo->do_fancy_downsampling` to FALSE if you want to use real downsampled data. (It is set TRUE by `jpeg_set_defaults()`.)

- \* Ensure `jpeg_color_space` is correct --- an explicit `jpeg_set_colorspace()` call is a good idea. Note that since color conversion is bypassed, `in_color_space` is ignored, except that `jpeg_set_defaults()` uses it to choose the default `jpeg_color_space` setting.

- \* Ensure the sampling factors, `cinfo->comp_info[i].h_samp_factor` and

`cinfo->comp_info[i].v_samp_factor`, are correct. Since these indicate the dimensions of the data you are supplying, it's wise to set them explicitly, rather than assuming the library's defaults are what you want.

To pass raw data to the library, call `jpeg_write_raw_data()` in place of `jpeg_write_scanlines()`. The two routines work similarly except that `jpeg_write_raw_data` takes a JSAMPIMAGE data array rather than JSAMPARRAY. The scanlines count passed to and returned from `jpeg_write_raw_data` is measured in terms of the component with the largest `v_samp_factor`.

`jpeg_write_raw_data()` processes one MCU row per call, which is to say `v_samp_factor*block_size` sample rows of each component. The passed `num_lines` value must be at least `max_v_samp_factor*block_size`, and the return value will be exactly that amount (or possibly some multiple of that amount, in future library versions). This is true even on the last call at the bottom of the image; don't forget to pad your data as necessary.

The required dimensions of the supplied data can be computed for each component as

`cinfo->comp_info[i].width_in_blocks*block_size` samples per row  
`cinfo->comp_info[i].height_in_blocks*block_size` rows in image  
after `jpeg_start_compress()` has initialized those fields. If the valid data is smaller than this, it must be padded appropriately. For some sampling factors and image sizes, additional dummy DCT blocks are inserted to make the image a multiple of the MCU dimensions.

The library creates such dummy blocks itself; it does not read them from your supplied data. Therefore you need never pad by more than `block_size` samples. An example may help here.

Assume 2h2v downsampling of YCbCr data, that is

```
cinfo->comp_info[0].h_samp_factor = 2 for Y
cinfo->comp_info[0].v_samp_factor = 2
cinfo->comp_info[1].h_samp_factor = 1 for Cb
cinfo->comp_info[1].v_samp_factor = 1
cinfo->comp_info[2].h_samp_factor = 1 for Cr
cinfo->comp_info[2].v_samp_factor = 1
```

and suppose that the nominal image dimensions (`cinfo->image_width` and `cinfo->image_height`) are 101x101 pixels. Then `jpeg_start_compress()` will compute `downsampled_width = 101` and `width_in_blocks = 13` for Y, `downsampled_width = 51` and `width_in_blocks = 7` for Cb and Cr (and the same for the height fields). You must pad the Y data to at least  $13*8 = 104$  columns and rows, the Cb/Cr data to at least  $7*8 = 56$  columns and rows. The MCU height is `max_v_samp_factor = 2` DCT rows so you must pass at least 16 scanlines

on each call to `jpeg_write_raw_data()`, which is to say 16 actual sample rows of Y and 8 each of Cb and Cr. A total of 7 MCU rows are needed, so you must pass a total of  $7*16 = 112$  "scanlines". The last DCT block row of Y data is dummy, so it doesn't matter what you pass for it in the data

arrays, but the scanlines count must total up to 112 so that all of the Cb and Cr data gets passed.

Output suspension is supported with raw-data compression: if the data destination module suspends, `jpeg_write_raw_data()` will return 0. In this case the same data rows must be passed again on the next call.

Decompression with raw data output implies bypassing all postprocessing. You must deal with the color space and sampling factors present in the incoming file. If your application only handles, say, 2h1v YCbCr data, you must check for and fail on other color spaces or other sampling factors. The library will not convert to a different color space for you.

To obtain raw data output, set `cinfo->raw_data_out = TRUE` before `jpeg_start_decompress()` (it is set `FALSE` by `jpeg_read_header()`). Be sure to verify that the color space and sampling factors are ones you can handle. Furthermore, set `cinfo->do_fancy_upsampling = FALSE` if you want to get real downsampled data (it is set `TRUE` by `jpeg_read_header()`). Then call `jpeg_read_raw_data()` in place of `jpeg_read_scanlines()`. The decompression process is otherwise the same as usual.

`jpeg_read_raw_data()` returns one MCU row per call, and thus you must pass a buffer of at least `max_v_samp_factor*block_size` scanlines (scanline counting is the same as for raw-data compression). The buffer you pass must be large enough to hold the actual data plus padding to DCT-block boundaries. As with compression, any entirely dummy DCT blocks are not processed so you need not allocate space for them, but the total scanline count includes them. The above example of computing buffer dimensions for raw-data compression is equally valid for decompression.

#### Input

suspension is supported with raw-data decompression: if the data source module suspends, `jpeg_read_raw_data()` will return 0. You can also use buffered-image mode to read raw data in multiple passes.

#### Really raw data: DCT coefficients

-----

It is possible to read or write the contents of a JPEG file as raw DCT coefficients. This facility is mainly intended for use in lossless transcoding between different JPEG file formats. Other possible applications include lossless cropping of a JPEG image, lossless reassembly of a multi-strip or multi-tile TIFF/JPEG file into a single JPEG datastream, etc.

To read the contents of a JPEG file as DCT coefficients, open the file and do

jpeg\_read\_header() as usual. But instead of calling jpeg\_start\_decompress() and jpeg\_read\_scanlines(), call jpeg\_read\_coefficients(). This will read the entire image into a set of virtual coefficient-block arrays, one array per component. The return value is a pointer to an array of virtual-array descriptors. Each virtual array can be accessed directly using the JPEG memory manager's access\_virt\_barray method (see Memory management, below, and also read structure.txt's discussion of virtual array handling). Or, for simple transcoding to a different JPEG file format, the array list can just be handed directly to jpeg\_write\_coefficients().

Each block in the block arrays contains quantized coefficient values in normal array order (not JPEG zigzag order). The block arrays contain only DCT blocks containing real data; any entirely-dummy blocks added to fill out interleaved MCUs at the right or bottom edges of the image are discarded during reading and are not stored in the block arrays. (The size of each block array can be determined from the width\_in\_blocks and height\_in\_blocks fields of the component's comp\_info entry.) This is also the data format expected by jpeg\_write\_coefficients().

When you are done using the virtual arrays, call jpeg\_finish\_decompress() to release the array storage and return the decompression object to an idle state; or just call jpeg\_destroy() if you don't need to reuse the object.

If you use a suspending data source, jpeg\_read\_coefficients() will return NULL if it is forced to suspend; a non-NULL return value indicates successful completion. You need not test for a NULL return value when using a non-suspending data source.

It is also possible to call jpeg\_read\_coefficients() to obtain access to the decoder's coefficient arrays during a normal decode cycle in buffered-image mode. This frammish might be useful for progressively displaying an incoming image and then re-encoding it without loss. To do this, decode in buffered-image mode as discussed previously, then call jpeg\_read\_coefficients() after the last jpeg\_finish\_output() call. The arrays will be available for your use until you call jpeg\_finish\_decompress().

To write the contents of a JPEG file as DCT coefficients, you must provide the

DCT coefficients stored in virtual block arrays. You can either pass block arrays read from an input JPEG file by jpeg\_read\_coefficients(), or allocate virtual arrays from the JPEG compression object and fill them yourself. In either case, jpeg\_write\_coefficients() is substituted for jpeg\_start\_compress() and jpeg\_write\_scanlines(). Thus the sequence is

- \* Create compression object
- \* Set all compression parameters as necessary

- \* Request virtual arrays if needed
- \* jpeg\_write\_coefficients()
- \* jpeg\_finish\_compress()
- \* Destroy or re-use compression object

jpeg\_write\_coefficients() is passed a pointer to an array of virtual block array descriptors; the number of arrays is equal to cinfo.num\_components.

The virtual arrays need only have been requested, not realized, before jpeg\_write\_coefficients() is called. A side-effect of jpeg\_write\_coefficients() is to realize any virtual arrays that have been requested from the compression object's memory manager. Thus, when obtaining the

virtual arrays from the compression object, you should fill the arrays after calling jpeg\_write\_coefficients(). The data is actually written out when you call jpeg\_finish\_compress(); jpeg\_write\_coefficients() only writes the file header.

When writing raw DCT coefficients, it is crucial that the JPEG quantization tables and sampling factors match the way the data was encoded, or the resulting file will be invalid. For transcoding from an existing JPEG file, we recommend using jpeg\_copy\_critical\_parameters(). This routine initializes all the compression parameters to default values (like jpeg\_set\_defaults()), then copies the critical information from a source decompression object. The decompression object should have just been used to read the entire JPEG input file --- that is, it should be awaiting jpeg\_finish\_decompress().

jpeg\_write\_coefficients() marks all tables stored in the compression object as needing to be written to the output file (thus, it acts like jpeg\_start\_compress(cinfo, TRUE)). This is for safety's sake, to avoid emitting abbreviated JPEG files by accident. If you really want to emit an abbreviated JPEG file, call jpeg\_suppress\_tables(), or set the tables' individual sent\_table flags, between calling jpeg\_write\_coefficients() and jpeg\_finish\_compress().

#### Progress monitoring

-----

Some applications may need to regain control from the JPEG library every so often. The typical use of this feature is to produce a percent-done bar or other progress display. (For a simple example, see cjpeg.c or djpeg.c.) Although you do get control back frequently during the data-transferring pass (the jpeg\_read\_scanlines or jpeg\_write\_scanlines loop), any additional passes will occur inside jpeg\_finish\_compress or jpeg\_start\_decompress; those routines may take a long time to execute, and you don't get control back until they are done.



You can define a progress-monitor routine which will be called periodically by the library. No guarantees are made about how often this call will occur, so we don't recommend you use it for mouse tracking or anything like that. At present, a call will occur once per MCU row, scanline, or sample row group, whichever unit is convenient for the current processing mode; so the wider the image, the longer the time between calls. During the data transferring pass, only one call occurs per call of `jpeg_read_scanlines` or `jpeg_write_scanlines`, so don't pass a large number of scanlines at once if you want fine resolution in the progress count. (If you really need to use the callback mechanism for time-critical tasks like mouse tracking, you could insert additional calls inside some of the library's inner loops.)

To establish a progress-monitor callback, create a struct `jpeg_progress_mgr`, fill in its `progress_monitor` field with a pointer to your callback routine, and set `cinfo->progress` to point to the struct. The callback will be called whenever `cinfo->progress` is non-NULL. (This pointer is set to NULL by `jpeg_create_compress` or `jpeg_create_decompress`; the library will not change it thereafter. So if you allocate dynamic storage for the progress struct, make sure it will live as long as the JPEG object does. Allocating from the JPEG memory manager with lifetime `JPOOL_PERMANENT` will work nicely.) You can use the same callback routine for both compression and decompression.

The `jpeg_progress_mgr` struct contains four fields which are set by the library:

```
long pass_counter; /* work units completed in this pass */
long pass_limit; /* total number of work units in this pass */
int completed_passes; /* passes completed so far */
int total_passes; /* total number of passes expected */
```

During any one pass, `pass_counter` increases from 0 up to (not including) `pass_limit`; the step size is usually but not necessarily 1. The `pass_limit` value may change from one pass to another. The expected total number of passes is in `total_passes`, and the number of passes already completed is in

`completed_passes`. Thus the fraction of work completed may be estimated as

$$\frac{\text{completed\_passes} + (\text{pass\_counter}/\text{pass\_limit})}{\text{total\_passes}}$$

ignoring the fact that the passes may not be equal amounts of work.

When decompressing, `pass_limit` can even change within a pass, because it depends on the number of scans in the JPEG file, which isn't always known in advance. The computed fraction-of-work-done may jump suddenly (if the library discovers it has overestimated the number of scans) or even decrease (in the opposite case). It is not wise to put great faith in the work estimate.

When using the decompressor's buffered-image mode, the progress monitor work estimate is likely to be completely unhelpful, because the library has no way

to know how many output passes will be demanded of it. Currently, the library sets `total_passes` based on the assumption that there will be one more output pass if the input file end hasn't yet been read (`jpeg_input_complete()` isn't TRUE), but no more output passes if the file end has been reached when the output pass is started. This means that `total_passes` will rise as additional output passes are requested. If you have a way of determining the input file size, estimating progress based on the fraction of the file that's been read will probably be more useful than using the library's value.

## Memory management

-----

This section covers some key facts about the JPEG library's built-in memory manager. For more info, please read `structure.txt`'s section about the memory manager, and consult the source code if necessary.

All memory and temporary file allocation within the library is done via the memory manager. If necessary, you can replace the "back end" of the memory manager to control allocation yourself (for example, if you don't want the library to use `malloc()` and `free()` for some reason).

Some data is allocated "permanently" and will not be freed until the JPEG object

is destroyed. Most data is allocated "per image" and is freed by `jpeg_finish_compress`, `jpeg_finish_decompress`, or `jpeg_abort`. You can call the memory manager yourself to allocate structures that will automatically be freed at these times. Typical code for this is

```
ptr = (*cinfo->mem->alloc_small) ((j_common_ptr) cinfo, JPOOL_IMAGE, size);
```

Use `JPOOL_PERMANENT` to get storage that lasts as long as the JPEG object.

Use `alloc_large` instead of `alloc_small` for anything bigger than a few Kbytes.

There are also `alloc_sarray` and `alloc_barray` routines that automatically build 2-D sample or block arrays.

The library's minimum space requirements to process an image depend on the image's width, but not on its height, because the library ordinarily works with "strip" buffers that are as wide as the image but just a few rows high. Some operating modes (eg, two-pass color quantization) require full-image buffers. Such buffers are treated as "virtual arrays": only the current strip need be in

memory, and the rest can be swapped out to a temporary file.

If you use the simplest memory manager back end (`jmemnobs.c`), then no temporary files are used; virtual arrays are simply `malloc()`'d. Images bigger than memory can be processed only if your system supports virtual memory. The other memory manager back ends support temporary files of various flavors and thus work in machines without virtual memory. They may also be useful on

Unix machines if you need to process images that exceed available swap space.

When using temporary files, the library will make the in-memory buffers for its virtual arrays just big enough to stay within a "maximum memory" setting. Your application can set this limit by setting `cinfo->mem->max_memory_to_use` after creating the JPEG object. (Of course, there is still a minimum size for the buffers, so the max-memory setting is effective only if it is bigger than the minimum space needed.) If you allocate any large structures yourself, you must allocate them before `jpeg_start_compress()` or `jpeg_start_decompress()` in order to have them counted against the max memory limit. Also keep in mind that space allocated with `alloc_small()` is ignored, on the assumption that it's too small to be worth worrying about; so a reasonable safety margin should be left when setting `max_memory_to_use`.

If you use the `jmemname.c` or `jmemdos.c` memory manager back end, it is important to clean up the JPEG object properly to ensure that the temporary files get deleted. (This is especially crucial with `jmemdos.c`, where the "temporary files" may be extended-memory segments; if they are not freed, DOS will require a reboot to recover the memory.) Thus, with these memory managers, it's a good idea to provide a signal handler that will trap any early exit from your program. The handler should call either `jpeg_abort()` or `jpeg_destroy()` for any active JPEG objects. A handler is not needed with `jmemnobs.c`, and shouldn't be necessary with `jmemansi.c` or `jmemmac.c` either, since the C library is supposed to take care of deleting files made with `tmpfile()`.

## Memory usage

-----

Working memory requirements while performing compression or decompression depend on image dimensions, image characteristics (such as colorspace and JPEG process), and operating mode (application-selected options).

As of v6b, the decompressor requires:

1. About 24K in more-or-less-fixed-size data. This varies a bit depending on operating mode and image characteristics (particularly color vs. grayscale), but it doesn't depend on image dimensions.
2. Strip buffers (of size proportional to the image width) for IDCT and upsampling results. The worst case for commonly used sampling factors is about 34 bytes \* width in pixels for a color image. A grayscale image only needs about 8 bytes per pixel column.
3. A full-image DCT coefficient buffer is needed to decode a multi-scan JPEG file (including progressive JPEGs), or whenever you select buffered-image mode. This takes 2 bytes/coefficient. At typical 2x2 sampling, that's 3 bytes per pixel for a color image. Worst case (1x1 sampling) requires

6 bytes/pixel. For grayscale, figure 2 bytes/pixel.

4. To perform 2-pass color quantization, the decompressor also needs a 128K color lookup table and a full-image pixel buffer (3 bytes/pixel). This does not count any memory allocated by the application, such as a buffer to hold the final output image.

The above figures are valid for 8-bit JPEG data precision and a machine with 32-bit ints. For 9-bit to 12-bit JPEG data, double the size of the strip buffers and quantization pixel buffer. The "fixed-size" data will be somewhat smaller with 16-bit ints, larger with 64-bit ints. Also, CMYK or other unusual color spaces will require different amounts of space.

The full-image coefficient and pixel buffers, if needed at all, do not have to be fully RAM resident; you can have the library use temporary files instead when the total memory usage would exceed a limit you set. (But if your OS supports virtual memory, it's probably better to just use `jmemnobs` and let the OS do the swapping.)

The compressor's memory requirements are similar, except that it has no need for color quantization. Also, it needs a full-image DCT coefficient buffer if Huffman-table optimization is asked for, even if progressive mode is not requested.

If you need more detailed information about memory usage in a particular situation, you can enable the `MEM_STATS` code in `jmemmgr.c`.

#### Library compile-time options

-----

A number of compile-time options are available by modifying `jmorecfg.h`.

The IJG code currently supports 8-bit to 12-bit sample data precision by defining `BITS_IN_JSAMPLE` as 8, 9, 10, 11, or 12.

Note that a value larger than 8 causes `JSAMPLE` to be larger than a char, so it affects the surrounding application's image data.

The sample applications `cjpeg` and `djpeg` can support deeper than 8-bit data

only for PPM and GIF file formats; you must disable the other file formats to compile a 9-bit to 12-bit `cjpeg` or `djpeg`. (`install.txt` has more information about that.)

Run-time selection and conversion of data precision are currently not supported and may be added later.

Exception: The transcoding part (`jpegtran`) supports all settings in a single instance, since it operates on the level of DCT coefficients and not sample values.

(If you need to include an 8-bit library and a 9-bit to 12-bit library for

compression or decompression in a single application, you could probably do it by defining `NEED_SHORT_EXTERNAL_NAMES` for just one of the copies. You'd have to access the 8-bit and the 9-bit to 12-bit copies from separate application source files. This is untested ... if you try it, we'd like to hear whether it works!)

Note that the standard Huffman tables are only valid for 8-bit data precision. If you selected more than 8-bit data precision, `cjpeg` uses arithmetic coding by default.

The Huffman encoder normally uses entropy optimization to compute usable tables for higher precision. Otherwise, you'll have to supply different default Huffman tables. You may also want to supply your own DCT quantization tables; the existing quality-scaling code has been developed for 8-bit use, and probably doesn't generate especially good tables for 9-bit to 12-bit.

The maximum number of components (color channels) in the image is determined by `MAX_COMPONENTS`. The JPEG standard allows up to 255 components, but we expect that few applications will need more than four or so.

On machines with unusual data type sizes, you may be able to improve performance or reduce memory space by tweaking the various typedefs in `jmorecfg.h`. In particular, on some RISC CPUs, access to arrays of "short"s is quite slow; consider trading memory for speed by making `JCOEF`, `INT16`, and `UINT16` be "int" or "unsigned int". `UINT8` is also a candidate to become int. You probably don't want to make `JSAMPLE` be int unless you have lots of memory to burn.

You can reduce the size of the library by compiling out various optional functions. To do this, undefine `xxx_SUPPORTED` symbols as necessary.

You can also save a few K by not having text error messages in the library; the standard error message table occupies about 5Kb. This is particularly reasonable for embedded applications where there's no good way to display a message anyway. To do this, remove the creation of the message table (`jpeg_std_message_table[]`) from `jerror.c`, and alter `format_message` to do something reasonable without it. You could output the numeric value of the message code number, for example. If you do this, you can also save a couple more K by modifying the `TRACEMSn()` macros in `jerror.h` to expand to nothing; you don't need trace capability anyway, right?

Portability considerations

-----

The JPEG library has been written to be extremely portable; the sample applications `cjpeg` and `djpeg`

are slightly less so. This section summarizes the design goals in this area. (If you encounter any bugs that cause the library to be less portable than is claimed here, we'd appreciate hearing about them.)

The code works fine on ANSI C, C++, and pre-ANSI C compilers, using any of the popular system include file setups, and some not-so-popular ones too. See install.txt for configuration procedures.

The code is not dependent on the exact sizes of the C data types. As distributed, we make the assumptions that  
char is at least 8 bits wide  
short is at least 16 bits wide  
int is at least 16 bits wide  
long is at least 32 bits wide  
(These are the minimum requirements of the ANSI C standard.) Wider types will work fine, although memory may be used inefficiently if char is much larger than 8 bits or short is much bigger than 16 bits. The code should work equally well with 16- or 32-bit ints.

In a system where these assumptions are not met, you may be able to make the code work by  
modifying the typedefs in jmorecfg.h. However, you will probably have difficulty if int is less than 16 bits wide, since references to plain int abound in the code.

char can be either signed or unsigned, although the code runs faster if an unsigned char type is available. If char is wider than 8 bits, you will need to redefine JOCTET and/or provide custom data source/destination managers so that JOCTET represents exactly 8 bits of data on external storage.

The JPEG library proper does not assume ASCII representation of characters. But some of the image file I/O modules in cjpeg/djpeg do have ASCII dependencies in file-header manipulation; so does cjpeg's select\_file\_type() routine.

The JPEG library does not rely heavily on the C library. In particular, C stdio is used only by the data source/destination modules and the error handler, all of which are application-replaceable. (cjpeg/djpeg are more heavily dependent on stdio.) malloc and free are called only from the memory manager  
"back end" module, so you can use a different memory allocator by replacing that one file.

The code generally assumes that C names must be unique in the first 15 characters. However, global function names can be made unique in the first 6 characters by defining NEED\_SHORT\_EXTERNAL\_NAMES.

More info about porting the code may be gleaned by reading `jconfig.txt`, `jmorecfg.h`, and `jinclue.h`.

Notes for MS-DOS implementors

-----

The IJG code is designed to work efficiently in 80x86 "small" or "medium" memory models (i.e., data pointers are 16 bits unless explicitly declared "far"; code pointers can be either size). You may be able to use small model to compile `cjpeg` or `djpeg` by itself, but you will probably have to use medium model for any larger application. This won't make much difference in performance. You *will* take a noticeable performance hit if you use a large-data memory model (perhaps 10%-25%), and you should avoid "huge" model if at all possible.

The

JPEG library typically needs 2Kb-3Kb of stack space. It will also malloc about 20K-30K of near heap space while executing (and lots of far heap, but that doesn't count in this calculation). This figure will vary depending on selected operating mode, and to a lesser extent on image size. There is also about 5Kb-6Kb of constant data which will be allocated in the near data segment (about 4Kb of this is the error message table). Thus you have perhaps 20K available for other modules' static data and near heap space before you need to go to a larger memory model. The C library's static data will account for several K of this, but that still leaves a good deal for your needs. (If you are tight on space, you could reduce the sizes of the I/O buffers allocated by `jdatasrc.c` and `jdatadst.c`, say from 4K to 1K. Another possibility is to move the error message table to far memory; this should be doable with only localized hacking on `jerror.c`.)

About 2K of the near heap space is "permanent" memory that will not be released until you destroy the JPEG object. This is only an issue if you save a JPEG object between compression or decompression operations.

Far data space may also be a tight resource when you are dealing with large images. The most memory-intensive case is decompression with two-pass color quantization, or single-pass quantization to an externally supplied color map. This requires a 128Kb color lookup table plus strip buffers amounting to about 40 bytes per column for typical sampling ratios (eg, about 25600 bytes for a 640-pixel-wide image). You may not be able to process wide images if you have large data structures of your own.

Of course, all of these concerns vanish if you use a 32-bit flat-memory-model compiler, such as DJGPP or Watcom C. We highly recommend flat model if you can use it; the JPEG library is significantly faster in flat model.

Found in path(s):

\* /opt/cola/permits/1104792432\_1607505170.95/0/jpeg-9c-tar-gz/jpeg-9c/libjpeg.txt

No license file was found, but licenses were detected in source scan.

/\*

\* jdarith.c

\*

\* Developed 1997-2015 by Guido Vollbeding.

\* This file is part of the Independent JPEG Group's software.

\* For conditions of distribution and use, see the accompanying README file.

\*

\* This file contains portable arithmetic entropy decoding routines for JPEG

\* (implementing the ISO/IEC IS 10918-1 and CCITT Recommendation ITU-T T.81).

\*

\* Both sequential and progressive modes are supported in this single module.

\*

\* Suspension is not currently supported in this module.

\*/

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/\*

\* transupp.c

\*

\* Copyright (C) 1997-2017, Thomas G. Lane, Guido Vollbeding.

\* This file is part of the Independent JPEG Group's software.

\* For conditions of distribution and use, see the accompanying README file.

\*

\* This file contains image transformation routines and other utility code

\* used by the jpegtran sample application. These are NOT part of the core

\* JPEG library. But we keep these routines separate from jpegtran.c to

\* ease the task of maintaining jpegtran-like programs that have other user

\* interfaces.

\*/

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\* /opt/cola/permits/1104792432\_1607505170.95/0/jpeg-9c-tar-gz/jpeg-9c/transupp.c

No license file was found, but licenses were detected in source scan.

/\*

\* rdswitch.c

\*

\* Copyright (C) 1991-1996, Thomas G. Lane.

\* Modified 2003-2015 by Guido Vollbeding.

\* This file is part of the Independent JPEG Group's software.

\* For conditions of distribution and use, see the accompanying README file.



\*  
\* This file contains routines to process some of cjpeg's more complicated  
\* command-line switches. Switches processed here are:  
\* -qtables file Read quantization tables from text file  
\* -scans file Read scan script from text file  
\* -quality N[,N,...] Set quality ratings  
\* -qslots N[,N,...] Set component quantization table selectors  
\* -sample HxV[,HxV,...] Set component sampling factors  
\*/

Found in path(s):

\* /opt/cola/permits/1104792432\_1607505170.95/0/jpeg-9c-tar-gz/jpeg-9c/rdswitch.c  
No license file was found, but licenses were detected in source scan.

/\*

\* jchuff.c

\*

\* Copyright (C) 1991-1997, Thomas G. Lane.  
\* Modified 2006-2013 by Guido Vollbeding.  
\* This file is part of the Independent JPEG Group's software.  
\* For conditions of distribution and use, see the accompanying README file.  
\*

\* This file contains Huffman entropy encoding routines.  
\* Both sequential and progressive modes are supported in this single module.  
\*

\* Much of the complexity here has to do with supporting output suspension.  
\* If the data destination module demands suspension, we want to be able to  
\* back up to the start of the current MCU. To do this, we copy state  
\* variables into local working storage, and update them back to the  
\* permanent JPEG objects only upon successful completion of an MCU.  
\*

\* We do not support output suspension for the progressive JPEG mode, since  
\* the library currently does not allow multiple-scan files to be written  
\* with output suspension.  
\*/

Found

in path(s):

\* /opt/cola/permits/1104792432\_1607505170.95/0/jpeg-9c-tar-gz/jpeg-9c/jchuff.c  
No license file was found, but licenses were detected in source scan.

/\*

\* jmemname.c

\*

\* Copyright (C) 1992-1997, Thomas G. Lane.  
\* This file is part of the Independent JPEG Group's software.  
\* For conditions of distribution and use, see the accompanying README file.  
\*

\* This file provides a generic implementation of the system-dependent  
\* portion of the JPEG memory manager. This implementation assumes that  
\* you must explicitly construct a name for each temp file.  
\* Also, the problem of determining the amount of memory available  
\* is shoved onto the user.  
\*/

Found in path(s):

\* /opt/cola/permits/1104792432\_1607505170.95/0/jpeg-9c-tar-gz/jpeg-9c/jmemname.c  
No license file was found, but licenses were detected in source scan.

/\*

\* jccoefct.c

\*

\* Copyright (C) 1994-1997, Thomas G. Lane.

\* Modified 2003-2011 by Guido Vollbeding.

\* This file is part of the Independent JPEG Group's software.

\* For conditions of distribution and use, see the accompanying README file.

\*

\* This file contains the coefficient buffer controller for compression.

\* This controller is the top level of the JPEG compressor proper.

\* The coefficient buffer lies between forward-DCT and entropy encoding steps.

\*/

Found in path(s):

\* /opt/cola/permits/1104792432\_1607505170.95/0/jpeg-9c-tar-gz/jpeg-9c/jccoefct.c  
No license file was found, but licenses were detected in source scan.

/\*

\* jdsample.c

\*

\* Copyright (C) 1991-1996, Thomas G. Lane.

\* Modified 2002-2015 by Guido Vollbeding.

\* This file is part of the Independent JPEG Group's software.

\* For conditions of distribution and use, see the accompanying README file.

\*

\* This file contains upsampling routines.

\*

\* Upsampling input data is counted in "row groups". A row group

\* is defined to be  $(v\_samp\_factor * DCT\_v\_scaled\_size / min\_DCT\_v\_scaled\_size)$

\* sample rows of each component. Upsampling will normally produce

\*  $max\_v\_samp\_factor$  pixel rows from each row group (but this could vary

\* if the upsampler is applying a scale factor of its own).

\*

\* An excellent reference for image resampling is

\* Digital Image Warping, George Wolberg, 1990.

\* Pub. by IEEE Computer Society Press, Los Alamitos, CA. ISBN 0-8186-8944-7.

\*/

Found in path(s):

\* /opt/cola/permits/1104792432\_1607505170.95/0/jpeg-9c-tar-gz/jpeg-9c/jdsample.c

No license file was found, but licenses were detected in source scan.

/\*

\* jdct.h

\*

\* Copyright (C) 1994-1996, Thomas G. Lane.

\* Modified 2002-2017 by Guido Vollbeding.

\* This file is part of the Independent JPEG Group's software.

\* For conditions of distribution and use, see the accompanying README file.

\*

\* This include file contains common declarations for the forward and

\* inverse DCT modules. These declarations are private to the DCT managers

\* (jcdctmgr.c, jddctmgr.c) and the individual DCT algorithms.

\* The individual DCT algorithms are kept in separate files to ease

\* machine-dependent tuning (e.g., assembly coding).

\*/

Found in path(s):

\* /opt/cola/permits/1104792432\_1607505170.95/0/jpeg-9c-tar-gz/jpeg-9c/jdct.h

No license file was found, but licenses were detected in source scan.

/\*

\* jdmainct.c

\*

\* Copyright (C) 1994-1996, Thomas G. Lane.

\* Modified 2002-2016 by Guido Vollbeding.

\* This file is part of the Independent JPEG Group's software.

\* For conditions of distribution and use, see the accompanying README file.

\*

\* This file contains the main buffer controller for decompression.

\* The main buffer lies between the JPEG decompressor proper and the

\* post-processor; it holds downsampled data in the JPEG colorspace.

\*

\* Note that this code is bypassed in raw-data mode, since the application

\* supplies the equivalent of the main buffer in that case.

\*/

Found in path(s):

\* /opt/cola/permits/1104792432\_1607505170.95/0/jpeg-9c-tar-gz/jpeg-9c/jdmainct.c

No license file was found, but licenses were detected in source scan.

/\*

\* jmemdos.c

\*

\* Copyright (C) 1992-1997, Thomas G. Lane.

\* This file is part of the Independent JPEG Group's software.  
\* For conditions of distribution and use, see the accompanying README file.  
\*  
\* This file provides an MS-DOS-compatible implementation of the system-  
\* dependent portion of the JPEG memory manager. Temporary data can be  
\* stored in extended or expanded memory as well as in regular DOS files.  
\*  
\* If you use this file, you must be sure that NEED\_FAR\_POINTERS is defined  
\* if you compile in a small-data memory model; it should NOT be defined if  
\* you use a large-data memory model. This file is not recommended if you  
\* are using a flat-memory-space 386 environment such as DJGCC or Watcom C.  
\* Also, this code will NOT work if struct fields are aligned on greater than  
\* 2-byte boundaries.  
\*  
\* Based on code contributed by Ge' Weijers.  
\*/

Found in path(s):

\* /opt/cola/permits/1104792432\_1607505170.95/0/jpeg-9c-tar-gz/jpeg-9c/jmemdos.c

No license file was found, but licenses were detected in source scan.

/\*

\* jidctint.c

\*

\* Copyright (C) 1991-1998, Thomas G. Lane.

\* Modification developed 2002-2016 by Guido Vollbeding.

\* This file is part of the Independent JPEG Group's software.

\* For conditions of distribution and use, see the accompanying README file.

\*

\* This file contains a slow-but-accurate integer implementation of the  
\* inverse DCT (Discrete Cosine Transform). In the IJG code, this routine  
\* must also perform dequantization of the input coefficients.

\*

\* A 2-D IDCT can be done by 1-D IDCT on each column followed by 1-D IDCT  
\* on each row (or vice versa, but it's more convenient to emit a row at  
\* a time). Direct algorithms are also available, but they are much more  
\* complex and seem not to be any faster when reduced to code.

\*

\* This implementation is based on an algorithm described in

\* C. Loeffler, A. Ligtenberg and G. Moschytz, "Practical Fast 1-D DCT

\* Algorithms with 11 Multiplications",

Proc. Int'l. Conf. on Acoustics,

\* Speech, and Signal Processing 1989 (ICASSP '89), pp. 988-991.

\* The primary algorithm described there uses 11 multiplies and 29 adds.

\* We use their alternate method with 12 multiplies and 32 adds.

\* The advantage of this method is that no data path contains more than one

\* multiplication; this allows a very simple and accurate implementation in

\* scaled fixed-point arithmetic, with a minimal number of shifts.

- \*
  - \* We also provide IDCT routines with various output sample block sizes for
  - \* direct resolution reduction or enlargement and for direct resolving the
  - \* common 2x1 and 1x2 subsampling cases without additional resampling: NxN
  - \* (N=1...16), 2NxN, and Nx2N (N=1...8) pixels for one 8x8 input DCT block.
  - \*
    - \* For N<8 we simply take the corresponding low-frequency coefficients of
    - \* the 8x8 input DCT block and apply an NxN point IDCT on the sub-block
    - \* to yield the downsampled outputs.
    - \* This can be seen as direct low-pass downsampling
    - from the DCT domain
    - \* point of view rather than the usual spatial domain point of view,
    - \* yielding significant computational savings and results at least
    - \* as good as common bilinear (averaging) spatial downsampling.
  - \*
    - \* For N>8 we apply a partial NxN IDCT on the 8 input coefficients as
    - \* lower frequencies and higher frequencies assumed to be zero.
    - \* It turns out that the computational effort is similar to the 8x8 IDCT
    - \* regarding the output size.
    - \* Furthermore, the scaling and descaling is the same for all IDCT sizes.
  - \* CAUTION: We rely on the FIX() macro except for the N=1,2,4,8 cases
  - \* since there would be too many additional constants to pre-calculate.
- \*/

Found in path(s):

\* /opt/cola/permits/1104792432\_1607505170.95/0/jpeg-9c-tar-gz/jpeg-9c/jidctint.c

No license file was found, but licenses were detected in source scan.

## INSTALLATION INSTRUCTIONS for the Independent JPEG Group's JPEG software

Copyright (C) 1991-2017, Thomas G. Lane, Guido Vollbeding.

This file is part of the Independent JPEG Group's software.

For conditions of distribution and use, see the accompanying README file.

This file explains how to configure and install the IJG software. We have tried to make this software extremely portable and flexible, so that it can be adapted to almost any environment. The downside of this decision is that the installation process is complicated. We have provided shortcuts to simplify the task on common systems. But in any case, you will need at least a little familiarity with C programming and program build procedures for your system.

If you are only using this software as part of a larger program, the larger program's installation procedure may take care of configuring the IJG code.

For example, Ghostscript's installation script will configure the IJG code.

You don't need to read this file if you just want to compile Ghostscript.

If you are on a Unix machine, you may not need to read this file at all.

Try doing

```
./configure
```

```
make
```

```
make test
```

If that doesn't complain, do

```
make install
```

(better do "make -n install" first to see if the makefile will put the files where you want them). Read further if you run into snags or want to customize the code for your system.

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-----

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## BEFORE YOU START

=====

Before installing the software you must unpack the distributed source code.

Since you are reading this file, you have probably already succeeded in this task. However, there is a potential for error if you needed

- to convert the

- files to the local standard text file format (for example, if you are on MS-DOS you may have converted LF end-of-line to CR/LF). You must apply such conversion to all the files EXCEPT those whose names begin with "test".

The test files contain binary data; if you change them in any way then the self-test will give bad results.

Please check the last section of this file to see if there are hints for the specific machine or compiler you are using.

## CONFIGURING THE SOFTWARE

=====

To configure the IJG code for your system, you need to create two files:

- \* `jconfig.h`: contains values for system-dependent #define symbols.
- \* `Makefile`: controls the compilation process.

(On a non-Unix machine, you may create "project files" or some other substitute for a `Makefile`. `jconfig.h` is needed in any environment.)

We provide three different ways to generate these files:

- \* On a Unix system, you can just run the "configure" script.
- \* We provide sample `jconfig` files and `makefiles` for popular machines; if your machine matches one of the samples, just copy the right sample files to `jconfig.h` and `Makefile`.
- \* If all else fails, read the instructions below and make your own files.

Configuring the software using the automatic "configure" script

-----  
If you are on a Unix machine, you can just type

```
./configure
```

and let the configure script construct appropriate configuration files.

If you're using "csh" on an old version of System V, you might need to type

```
sh configure
```

instead to prevent csh from trying to execute configure itself.

Expect configure to run for a few minutes, particularly on slower machines; it works by compiling a series of test programs.

Configure was created with GNU Autoconf and it follows the usual conventions for GNU configure scripts. It makes a few assumptions that you may want to override. You can do this by providing optional switches to configure:

\*

Configure will build both static and shared libraries, if possible.

If you want to build libjpeg only as a static library, say

```
./configure --disable-shared
```

If you want to build libjpeg only as a shared library, say

```
./configure --disable-static
```

Configure uses GNU libtool to take care of system-dependent shared library building methods.

\* Configure will use gcc (GNU C compiler) if it's available, otherwise cc.

To force a particular compiler to be selected, use the CC option, for example

```
./configure CC='cc'
```

The same method can be used to include any unusual compiler switches.

For example, on HP-UX you probably want to say

```
./configure CC='cc -Aa'
```

to get HP's compiler to run in ANSI mode.

\* The default CFLAGS setting is "-g" for non-gcc compilers, "-g -O2" for gcc. You can override this by saying, for example,  
./configure CFLAGS='-O2'  
if you want to compile without debugging support.

\* Configure will set up the makefile so that "make install" will install files into /usr/local/bin,  
/usr/local/man, etc. You can specify an installation prefix other than "/usr/local" by giving configure the option "--prefix=PATH".

\* If you don't have a lot of swap space, you may need to enable the IJG software's internal virtual memory mechanism. To do this, give the option "--enable-maxmem=N" where N is the default maxmemory limit in megabytes. This is discussed in more detail under "Selecting a memory manager", below. You probably don't need to worry about this on reasonably-sized Unix machines, unless you plan to process very large images.

Configure has some other features that are useful if you are cross-compiling or working in a network of multiple machine types; but if you need those features, you probably already know how to use them.

Configuring the software using one of the supplied jconfig and makefile files

-----

If you have one of these systems, you can just use the provided configuration files:

Makefile jconfig

file System and/or compiler

makefile.manx jconfig.manx Amiga, Manx Aztec C

makefile.sas jconfig.sas Amiga, SAS C

makeproj.mac jconfig.mac Apple Macintosh, Metrowerks CodeWarrior

mak\*jpeg.st jconfig.st Atari ST/STE/TT, Pure C or Turbo C

makefile.bcc jconfig.bcc MS-DOS or OS/2, Borland C

makefile.dj jconfig.dj MS-DOS, DJGPP (Delorie's port of GNU C)

makefile.mc6 jconfig.mc6 MS-DOS, Microsoft C (16-bit only)

makefile.wat jconfig.wat MS-DOS, OS/2, or Windows NT, Watcom C

makefile.vc jconfig.vc Windows, MS Visual C++

makefile.vs jconfig.vc Windows, MS Visual C++ 6 Developer Studio

make\*.vc6

makefile.vs jconfig.vc Windows, Visual Studio 2017 (v15)

make\*.v15

makefile.b32 jconfig.vc Windows, Borland C++ 32-bit (bcc32)

makefile.mms jconfig.vms Digital VMS, with MMS software

makefile.vms jconfig.vms Digital VMS, without MMS software



Copy the proper jconfig file to jconfig.h and the makefile to Makefile (or whatever your system uses as the standard makefile name). For more info see the appropriate system-specific hints section near the end of this file.

#### Configuring the software by hand

-----

First, generate a jconfig.h file. If you are moderately familiar with C, the comments in jconfig.txt should be enough information to do this; just copy jconfig.txt to jconfig.h and edit it appropriately. Otherwise, you may prefer to use the ckconfig.c program. You will need to compile and execute ckconfig.c by hand --- we hope you know at least enough to do that. ckconfig.c may not compile the first try (in fact, the whole idea is for it to fail if anything is going to). If you get compile errors, fix them by editing ckconfig.c according to the directions given in ckconfig.c. Once you get it to run, it will write a suitable jconfig.h file, and will also print out some advice about which makefile to use.

You may also want to look at the canned jconfig files, if there is one for a system similar to yours.

Second, select a makefile

and copy it to Makefile (or whatever your system uses as the standard makefile name). The most generic makefiles we provide are

makefile.ansi: if your C compiler supports function prototypes

makefile.unix: if not.

(You have function prototypes if ckconfig.c put "#define HAVE\_PROTOTYPES" in jconfig.h.) You may want to start from one of the other makefiles if there is one for a system similar to yours.

Look over the selected Makefile and adjust options as needed. In particular you may want to change the CC and CFLAGS definitions. For instance, if you are using GCC, set CC=gcc. If you had to use any compiler switches to get ckconfig.c to work, make sure the same switches are in CFLAGS.

If you are on a system that doesn't use makefiles, you'll need to set up project files (or whatever you do use) to compile all the source files and link them into executable files cjpeg, djpeg, jpegtran, rdjpgcom, and wrjpgcom. See the file lists in any of the makefiles to find out which files go into each program. Note that the provided makefiles all make a "library" file libjpeg first, but you don't have to do that if you don't want to; the file lists identify which source files are actually needed for compression, decompression, or both. As a last resort, you can make a batch script that

just compiles everything and links it all together; makefile.vms is an example of this (it's for VMS systems that have no make-like utility).

Here are comments about some specific configuration decisions you'll need to make:

#### Command line style

-----

These programs can use a Unix-like command line style which supports redirection and piping, like this:

```
cjpeg inputfile >outputfile
```

```
cjpeg <inputfile >outputfile
```

```
source program | cjpeg >outputfile
```

The simpler "two file" command line style is just

```
cjpeg inputfile outputfile
```

You may prefer the two-file style, particularly if you don't have pipes.

You **MUST** use two-file style on any system that doesn't cope well with binary data

fed through stdin/stdout; this is true for some MS-DOS compilers, for example. If you're not on a Unix system, it's safest to assume you need two-file style. (But if your compiler provides either the Posix-standard `fdopen()` library routine or a Microsoft-compatible `setmode()` routine, you can safely use the Unix command line style, by defining `USE_FDOPEN` or `USE_SETMODE` respectively.)

To use the two-file style, make `jconfig.h` say `"#define TWO_FILE_COMMANDLINE"`.

#### Selecting a memory manager

-----

The IJG code is capable of working on images that are too big to fit in main memory; data is swapped out to temporary files as necessary. However, the code to do this is rather system-dependent. We provide five different memory managers:

\* `jmemansi.c` This version uses the ANSI-standard library routine `tmpfile()`, which not all non-ANSI systems have. On some systems `tmpfile()` may put the temporary file in a non-optimal location; if you don't like what it does, use `jmemname.c`.

\* `jmemname.c` This version creates named temporary files. For anything except a Unix machine, you'll need to configure the `select_file_name()` routine appropriately; see the comments near the head of `jmemname.c`. If you use this version, define `NEED_SIGNAL_CATCHER` in `jconfig.h` to make sure the temp files

are removed if the program is aborted.

\* `jmemnobs.c` (That stands for No Backing Store :-).) This will compile on almost any system, but it assumes you have enough main memory or virtual memory to hold the biggest images you work with.

\* `jmemdos.c` This should be used with most 16-bit MS-DOS compilers.

See the system-specific notes about MS-DOS for more info.

IMPORTANT: if you use this, define `USE_MSDOS_MEMMGR` in `jconfig.h`, and include the assembly file `jmemdosa.asm` in the programs. The supplied makefiles and `jconfig` files for 16-bit MS-DOS compilers already do both.

\* `jmemmac.c` Custom version for Apple Macintosh; see the system-specific notes

for Macintosh for more info.

To use a particular memory manager, change the `SYSDEPMEM` variable in your makefile to equal the corresponding object file name (for example, `jmemansi.o` or `jmemansi.obj` for `jmemansi.c`).

If you have plenty of (real or virtual) main memory, just use `jmemnobs.c`.

"Plenty" means about ten bytes for every pixel in the largest images you plan to process, so a lot of systems don't meet this criterion.

If yours doesn't, try `jmemansi.c` first. If that doesn't compile, you'll have to use `jmemname.c`; be sure to adjust `select_file_name()` for local conditions.

You may also need to change `unlink()` to `remove()` in `close_backing_store()`.

Except with `jmemnobs.c` or `jmemmac.c`, you need to adjust the `DEFAULT_MAX_MEM` setting to a reasonable value for your system (either by adding a `#define` for `DEFAULT_MAX_MEM` to `jconfig.h`, or by adding a `-D` switch to the Makefile).

This value limits the amount of data space the program will attempt to allocate. Code and static data space isn't

counted, so the actual memory

needs for `cjpeg` or `djpeg` are typically 100 to 150Kb more than the max-memory setting.

Larger max-memory settings reduce the amount of I/O needed to

process a large image, but too large a value can result in "insufficient

memory" failures. On most Unix machines (and other systems with virtual

memory), just set `DEFAULT_MAX_MEM` to several million and forget it. At the

other end of the spectrum, for MS-DOS machines you probably can't go much

above 300K to 400K. (On MS-DOS the value refers to conventional memory only.

Extended/expanded memory is handled separately by `jmemdos.c`.)

## BUILDING THE SOFTWARE

=====

Now you should be able to compile the software. Just say "make" (or

whatever's necessary to start the compilation). Have a cup of coffee.

Here are some things that could go wrong:

If your compiler complains about undefined structures, you should be able to shut it up by putting "#define INCOMPLETE\_TYPES\_BROKEN" in jconfig.h.

If

you have trouble with missing system include files or inclusion of the wrong ones, read jinclue.h. This shouldn't happen if you used configure or ckconfig.c to set up jconfig.h.

There are a fair number of routines that do not use all of their parameters; some compilers will issue warnings about this, which you can ignore. There are also a few configuration checks that may give "unreachable code" warnings. Any other warning deserves investigation.

If you don't have a getenv() library routine, define NO\_GETENV.

Also see the system-specific hints, below.

## TESTING THE SOFTWARE

=====

As a quick test of functionality we've included a small sample image in several forms:

testorig.jpg Starting point for the djpeg tests.  
testimg.ppm The output of djpeg testorig.jpg  
testimg.bmp The output of djpeg -bmp -colors 256 testorig.jpg  
testimg.jpg The output of cjpeg testimg.ppm  
testprog.jpg Progressive-mode equivalent of testorig.jpg.  
testimgp.jpg The output of cjpeg -progressive  
-optimize testimg.ppm

(The first- and second-generation .jpg files aren't identical since the default compression parameters are lossy.) If you can generate duplicates of the testimg\* files then you probably have working programs.

With most of the makefiles, "make test" will perform the necessary comparisons.

If you're using a makefile that doesn't provide the test option, run djpeg and cjpeg by hand and compare the output files to testimg\* with whatever binary file comparison tool you have. The files should be bit-for-bit identical.

If the programs complain "MAX\_ALLOC\_CHUNK is wrong, please fix", then you need to reduce MAX\_ALLOC\_CHUNK to a value that fits in type size\_t.

Try adding "#define MAX\_ALLOC\_CHUNK 65520L" to jconfig.h. A less likely configuration error is "ALIGN\_TYPE is wrong, please fix": defining ALIGN\_TYPE as long should take care of that one.

If the cjpeg test run fails with "Missing Huffman code table entry", it's a good bet that you needed to define RIGHT\_SHIFT\_IS\_UNSIGNED.

Go back to the configuration step and run ckconfig.c. (This is a good plan for any other test failure, too.)

If you are using Unix (one-file) command line style on a non-Unix system, it's a good idea to check that binary I/O through stdin/stdout actually works. You should get the same results from "djpeg <testorig.jpg >out.ppm" as from "djpeg -outfile out.ppm testorig.jpg". Note that the makefiles all use the latter style and therefore do not exercise stdin/stdout! If this check fails, try recompiling with USE\_SETMODE or USE\_FDOPEN defined. If it still doesn't work, better use two-file style.

If you chose a memory manager other than jmemnobs.c, you should test that temporary-file usage works. Try "djpeg -bmp -colors 256 -max 0 testorig.jpg" and make sure its output matches testing.bmp. If you have any really large images handy, try compressing them with -optimize and/or decompressing with -colors 256 to make sure your DEFAULT\_MAX\_MEM setting is not too large.

#### NOTE:

this is far from an exhaustive test of the JPEG software; some modules, such as 1-pass color quantization, are not exercised at all. It's just a quick test to give you some confidence that you haven't missed something major.

## INSTALLING THE SOFTWARE

=====

Once you're done with the above steps, you can install the software by copying the executable files (cjpeg, djpeg, jpegtran, rdjpgcom, and wrjpgcom) to wherever you normally install programs. On Unix systems, you'll also want to put the man pages (cjpeg.1, djpeg.1, jpegtran.1, rdjpgcom.1, wrjpgcom.1) in the man-page directory. The pre-fab makefiles don't support this step since there's such a wide variety of installation procedures on different systems.

If you generated a Makefile with the "configure" script, you can just say  
make install  
to install the programs and their man pages into the standard places.  
(You'll probably need to be root to do this.) We recommend first saying  
make -n install  
to see

where configure thought the files should go. You may need to edit the Makefile, particularly if your system's conventions for man page filenames don't match what configure expects.

If you want to install the IJG library itself, for use in compiling other programs besides ours, then you need to put the four include files `jpeglib.h` `jerror.h` `jconfig.h` `jmorecfg.h` into your include-file directory, and put the library file `libjpeg.a` (extension may vary depending on system) wherever library files go. If you generated a Makefile with "configure", it will do what it thinks is the right thing if you say

```
make install-lib
```

## OPTIONAL STUFF

=====

Progress monitor:

If you like, you can `#define` `PROGRESS_REPORT` (in `jconfig.h`) to enable display of percent-done progress reports. The routine provided in `cdjpeg.c` merely prints percentages to `stderr`, but you can customize it to do something fancier.

Utah RLE file format support:

We distribute the software with support for RLE image files (Utah Raster Toolkit format) disabled, because the RLE support won't compile without the Utah library. If you have URT version 3.1 or later, you can enable RLE support as follows:

1. `#define` `RLE_SUPPORTED` in `jconfig.h`.
2. Add a `-I` option to `CFLAGS` in the Makefile for the directory containing the URT `.h` files (typically the "include" subdirectory of the URT distribution).
3. Add `-L... -lrle` to `LDLIBS` in the Makefile, where ... specifies the directory containing the URT "librle.a" file (typically the "lib" subdirectory of the URT distribution).

Support for 9-bit to 12-bit deep pixel data:

The IJG code currently allows 8, 9, 10, 11, or 12 bits sample data precision. (For color, this means 8 to 12 bits per channel, of course.) If you need to work with deeper than 8-bit data, you can compile the IJG code for 9-bit to 12-bit operation.

To do so:

1. In `jmorecfg.h`, define `BITS_IN_JSAMPLE` as 9, 10, 11, or 12 rather than 8.
2. In `jconfig.h`, undefine `BMP_SUPPORTED`,

RLE\_SUPPORTED, and TARGA\_SUPPORTED,

because the code for those formats doesn't handle deeper than 8-bit data and won't even compile. (The PPM code does work, as explained below. The GIF code works too; it scales 8-bit GIF data to and from 12-bit depth automatically.)

3. Compile. Don't expect "make test" to pass, since the supplied test files are for 8-bit data.

Currently, 9-bit to 12-bit support does not work on 16-bit-int machines.

Run-time selection and conversion of data precision are currently not supported and may be added later.

Exception: The transcoding part (jpegtran) supports all settings in a single instance, since it operates on the level of DCT coefficients and not sample values.

The PPM reader (rdppm.c) can read deeper than 8-bit data from either text-format or binary-format PPM and PGM files. Binary-format PPM/PGM files which have a maxval greater than 255 are assumed to use 2 bytes per sample, MSB first (big-endian order). As of early 1995, 2-byte binary format is not officially supported by the PBMPLUS library, but it is expected that a future release of PBMPLUS will support it. Note that the PPM reader will read files of any maxval regardless of the BITS\_IN\_JSAMPLE setting; incoming data is automatically rescaled to maxval=MAXJSAMPLE as appropriate for the cjpeg bit depth.

The PPM writer (wrppm.c) will normally write 2-byte binary PPM or PGM format, maxval=MAXJSAMPLE, when compiled with BITS\_IN\_JSAMPLE>8. Since this format is not yet widely supported, you can disable it by compiling wrppm.c with PPM\_NORAWWORD defined; then the data is scaled down to 8 bits to make a standard 1-byte/sample PPM or PGM file. (Yes, this means still another copy of djpeg to keep around. But hopefully you won't need it for very long. Poskanzer's supposed to get that new PBMPLUS release out Real Soon Now.)

Of course, if you are working with 9-bit to 12-bit data, you probably have it stored in some other, nonstandard format. In that case you'll probably want to write your own I/O modules to read and write your format.

Note:

The standard Huffman tables are only valid for 8-bit data precision. If you selected more than 8-bit data precision, cjpeg uses arithmetic coding by default. The Huffman encoder normally uses entropy optimization to compute usable tables for higher precision. Otherwise, you'll have to supply different default Huffman tables.

Removing code:

If you need to make a smaller version of the JPEG software, some optional functions can be removed at compile time. See the `xxx_SUPPORTED` #defines in `jconfig.h` and `jmorecfg.h`. If at all possible, we recommend that you leave in decoder support for all valid JPEG files, to ensure that you can read anyone's output. Taking out support for image file formats that you don't use is the most painless way to make the programs smaller. Another possibility is to remove some of the DCT methods: in particular, the "IFAST" method may not be enough faster than the others to be worth keeping on your machine. (If you do remove ISLOW or IFAST, be sure to redefine `JDCT_DEFAULT` or `JDCT_FASTEST` to a supported method, by adding a #define in `jconfig.h`.)

## OPTIMIZATION

=====

Unless you own a Cray, you'll probably be interested in making the JPEG software go as fast as possible. This section covers some machine-dependent optimizations you may want to try. We suggest that before trying any of this, you first get the basic installation to pass the self-test step. Repeat the self-test after any optimization to make sure that you haven't broken anything.

The integer DCT routines perform a lot of multiplications. These multiplications must yield 32-bit results, but none of their input values are more than 16 bits wide. On many machines, notably the 680x0 and 80x86 CPUs, a 16x16=>32 bit multiply instruction is faster than a full 32x32=>32 bit multiply. Unfortunately there is no portable way to specify such a multiplication in C, but some compilers can generate one when you use the right combination of casts. See the `MULTIPLYxxx` macro definitions in `jdct.h`. If your compiler makes "int" be 32 bits and "short" be 16 bits, defining `SHORTxSHORT_32` is fairly likely to work. When experimenting with alternate definitions, be sure to test not only whether the code still works (use the self-test), but also whether it is actually faster --- on some compilers, alternate definitions may compute the right answer, yet be slower than the default. Timing `cjpeg` on a large PGM (grayscale) input file is the best way to check this, as the DCT will be the largest fraction of the runtime in that mode. (Note: some of the distributed compiler-specific `jconfig` files already contain #define switches to select appropriate `MULTIPLYxxx` definitions.)

If your machine has sufficiently fast floating point hardware, you may find that the float DCT method is faster than the integer DCT methods, even after tweaking the integer multiply macros. In that case you may want to make the float DCT be the default method. (The only objection to this is



that float DCT results may vary slightly across machines.) To do that, add "#define JDCT\_DEFAULT JDCT\_FLOAT" to jconfig.h. Even if you don't change the default, you should redefine JDCT\_FASTEST, which is the method selected by djpeg's -fast switch. Don't forget to update the documentation files (usage.txt and/or cjpeg.1, djpeg.1) to agree with what you've done.

If access to "short" arrays is slow on your machine, it may be a win to define type JCOEF as int rather than short. This will cost a good deal of memory though, particularly in some multi-pass modes, so don't do it unless you have memory to burn and short is REALLY slow.

If your compiler can compile function calls in-line, make sure the INLINE macro in jmorecfg.h is defined as the keyword that marks a function inline-able. Some compilers have a switch that tells the compiler to inline any function it thinks is profitable (e.g., -finline-functions for gcc).

Enabling such a switch is likely to make the compiled code bigger but faster.

In general, it's worth trying the maximum optimization level of your compiler, and experimenting with any optional optimizations such as loop unrolling. (Unfortunately, far too many compilers have optimizer bugs ... be prepared to back off if the code fails self-test.) If you do any experimentation along these lines, please report the optimal settings to jpeg-info@jpegclub.org so we can mention them in future releases. Be sure to specify your machine and compiler version.

#### HINTS FOR SPECIFIC SYSTEMS

=====

We welcome reports on changes needed for systems not mentioned here. Submit 'em to jpeg-info@jpegclub.org. Also, if configure or ckconfig.c is wrong about how to configure the JPEG software for your system, please let us know.

Acorn RISC OS:

(Thanks to Simon Middleton for these hints on compiling with Desktop C.)

After renaming the files according to Acorn conventions, take a copy of makefile.ansi, change all occurrences of 'libjpeg.a' to 'libjpeg.o' and change these definitions as indicated:

```
CFLAGS= -throwback -IC: -Wn
LDLIBS=C:o.Stubs
SYSDEPMEM=jmemansi.o
LN=Link
AR=LibFile -c -o
```

Also add a new line `'c.o.; $(cc) $< $(cflags) -c -o $@'`. Remove the lines `'$(RM) libjpeg.o'` and `'$(AR2) libjpeg.o'` and the 'jconfig.h' dependency section.

Copy `jconfig.txt` to `jconfig.h`. Edit `jconfig.h` to define `TWO_FILE_COMMANDLINE` and `CHAR_IS_UNSIGNED`.

Run the makefile using `!AMU` not `!Make`. If you want to use the 'clean' and 'test' makefile entries then you will have to fiddle with the syntax a bit and rename the test files.

Amiga:

SAS C 6.50 reportedly is too buggy to compile the IJG code properly. A patch to update to 6.51 is available from SAS or AmiNet FTP sites.

The supplied config files are set up to use `jmemname.c` as the memory manager, with temporary files being created on the device named by `"JPEGTMP:"`.

Atari ST/STE/TT:

Copy

the project files `makcjpeg.st`, `makdjpeg.st`, `maktjpeg.st`, and `makljjpeg.st` to `cjpeg.prj`, `djpeg.prj`, `jpegtran.prj`, and `libjpeg.prj` respectively. The project files should work as-is with Pure C. For Turbo C, change library filenames `"pc..."` to `"tc..."` in each project file. Note that `libjpeg.prj` selects `jmemansi.c` as the recommended memory manager. You'll probably want to adjust the `DEFAULT_MAX_MEM` setting --- you want it to be a couple hundred K less than your normal free memory. Put `"#define DEFAULT_MAX_MEM nnnn"` into `jconfig.h` to do this.

To use the 68881/68882 coprocessor for the floating point DCT, add the compiler option `"-8"` to the project files and replace `pcfltlb.lib` with `pc881lib.lib` in `cjpeg.prj` and `djpeg.prj`. Or if you don't have a coprocessor, you may prefer to remove the float DCT code by undefining `DCT_FLOAT_SUPPORTED` in `jmorecfg.h` (since without a coprocessor, the float code will be too slow to be useful). In that case, you can delete `pcfltlb.lib` from the project files.

Note that you must make `libjpeg.lib` before making `cjpeg.ttp`, `djpeg.ttp`, or `jpegtran.ttp`. You'll have to perform the self-test by hand.

We haven't bothered to include project files for `rdjpgcom` and `wrjpgcom`.

Those source files should just be compiled by themselves; they don't depend on the JPEG library. You can use the default.prj project file of the Pure C distribution to make the programs.

There is a bug in some older versions of the Turbo C library which causes the space used by temporary files created with "tmpfile()" not to be freed after an abnormal program exit. If you check your disk afterwards, you will find cluster chains that are allocated but not used by a file. This should not happen in cjpeg/djpeg/jpegtran, since we enable a signal catcher to explicitly close temp files before exiting. But if you use the JPEG library with your own code, be sure to supply a signal catcher, or else use a different system-dependent memory manager.

Cray:

Should you be so fortunate as to be running JPEG on a Cray YMP, there is a compiler bug in old versions of Cray's Standard C (prior to 3.1). If you still have an old compiler, you'll need to insert a line reading "#pragma novector" just before the loop

```
for (i = 1; i <= (int) htbl->bits[l]; i++)
    huffsize[p++] = (char) l;
```

in fix\_huff\_tbl (in V5beta1, line 204 of jchuff.c and line 176 of jd Huff.c). [This bug may or may not still occur with the current IJG code, but it's probably a dead issue anyway...]

HP-UX:

If you have HP-UX 7.05 or later with the "software development" C compiler, you should run the compiler in ANSI mode. If using the configure script, say

```
./configure CC='cc -Aa'
```

(or -Ae if you prefer). If configuring by hand, use makefile.ansi and add "-Aa" to the CFLAGS line in the makefile.

If you have a pre-7.05 system, or if you are using the non-ANSI C compiler delivered with a minimum HP-UX system, then you must use makefile.unix (and do NOT add -Aa); or just run configure without the CC option.

On HP 9000 series 800 machines, the HP C compiler is buggy in revisions prior to A.08.07. If you get complaints about "not a typedef name", you'll have to use makefile.unix, or run configure without the CC option.

Macintosh, generic comments:

The supplied user-interface files (cjpeg.c, djpeg.c, etc) are set up to provide a Unix-style command line interface. You can use this interface on the Mac by means of the ccommand() library routine provided by Metrowerks CodeWarrior or Think C. This is only appropriate for testing the library, however; to make a user-friendly equivalent of cjpeg/djpeg you'd really want to develop a Mac-style user interface. There isn't a complete example available at the moment, but there are some helpful starting points:

1. Sam Bushell's free "To JPEG" applet provides drag-and-drop conversion to JPEG under System 7 and later. This only illustrates how to use the compression half of the library, but it does a very nice job of that part.

The

CodeWarrior source code is available from <http://www.pobox.com/~jsam>.

2. Jim Brunner prepared a Mac-style user interface for both compression and decompression. Unfortunately, it hasn't been updated since IJG v4, and the library's API has changed considerably since then. Still it may be of some help, particularly as a guide to compiling the IJG code under Think C. Jim's code is available from the Info-Mac archives, at [sumex-aim.stanford.edu](http://sumex-aim.stanford.edu) or mirrors thereof; see file /info-mac/dev/src/jpeg-convert-c.hqx.

jmemmac.c is the recommended memory manager back end for Macintosh. It uses NewPtr/DisposePtr instead of malloc/free, and has a Mac-specific implementation of jpeg\_mem\_available(). It also creates temporary files that follow Mac conventions. (That part of the code relies on System-7-or-later OS functions. See the comments in jmemmac.c if you need to run it on System 6.) NOTE that USE\_MAC\_MEMMGR must be defined in jconfig.h to use jmemmac.c.

You can also use jmemnobs.c, if

you don't care about handling images larger than available memory. If you use any memory manager back end other than jmemmac.c, we recommend replacing "malloc" and "free" by "NewPtr" and "DisposePtr", because Mac C libraries often have peculiar implementations of malloc/free. (For instance, free() may not return the freed space to the Mac Memory Manager. This is undesirable for the IJG code because jmemmgr.c already clumps space requests.)

Macintosh, Metrowerks CodeWarrior:

The Unix-command-line-style interface can be used by defining USE\_CCOMMAND. You'll also need to define TWO\_FILE\_COMMANDLINE to avoid stdin/stdout. This means that when using the cjpeg/djpeg programs, you'll have to type the input and output file names in the "Arguments" text-edit box, rather than using the file radio buttons. (Perhaps USE\_FDOPEN or USE\_SETMODE would eliminate the problem, but I haven't heard from anyone who's tried it.)

On 680x0 Macs, Metrowerks defines type "double" as a 10-byte IEEE extended float.

jmymmgr.c won't like this: it wants sizeof(ALIGN\_TYPE) to be a power of 2. Add "#define ALIGN\_TYPE long" to jconfig.h to eliminate the complaint.

The supplied configuration file jconfig.mac can be used for your jconfig.h; it includes all the recommended symbol definitions. If you have AppleScript installed, you can run the supplied script makeproj.mac to create CodeWarrior project files for the library and the testbed applications, then build the library and applications. (Thanks to Dan Sears and Don Agro for this nifty hack, which saves us from trying to maintain CodeWarrior project files as part of the IJG distribution...)

Macintosh, Think C:

The documentation in Jim Brunner's "JPEG Convert" source code (see above) includes detailed build instructions for Think C; it's probably somewhat out of date for the current release, but may be helpful.

If you want to build the minimal command line version, proceed as follows. You'll have to prepare project files for the programs; we don't include any in the distribution since they are not text files. Use the file lists in any of the supplied makefiles as a guide. Also add the ANSI and Unix C libraries in a separate segment. You may need to divide the JPEG files into more than one segment; we recommend dividing compression and decompression modules. Define USE\_CCOMMAND in jconfig.h so that the ccommand() routine is called. You must also define TWO\_FILE\_COMMANDLINE because stdin/stdout don't handle binary data correctly.

On 680x0 Macs, Think C defines type "double" as a 12-byte IEEE extended float. jmymmgr.c won't like this: it wants sizeof(ALIGN\_TYPE) to be a power of 2. Add "#define ALIGN\_TYPE long" to jconfig.h to eliminate the complaint.

jconfig.mac should work as a jconfig.h configuration file for Think C, but the makeproj.mac AppleScript script is specific to CodeWarrior. Sorry.

MIPS R3000:

MIPS's cc version 1.31 has a rather nasty optimization bug. Don't use -O if you have that compiler version.

(Use "cc -V" to check the version.)

Note that the R3000 chip is found in workstations from DEC and others.

MS-DOS, generic comments for 16-bit compilers:

The IJG code is designed to work well in 80x86 "small" or "medium" memory

models (i.e., data pointers are 16 bits unless explicitly declared "far"; code pointers can be either size). You may be able to use small model to compile cjpeg or djpeg by itself, but you will probably have to use medium model for any larger application. This won't make much difference in performance. You \*will\* take a noticeable performance hit if you use a large-data memory model, and you should avoid "huge" model if at all possible. Be sure that NEED\_FAR\_POINTERS is defined in jconfig.h if you use a small-data memory model; be sure it is NOT defined if you use a large-data model. (The supplied makefiles and jconfig files for Borland and Microsoft C compile in medium model and define NEED\_FAR\_POINTERS.)

The DOS-specific memory manager, jmemdos.c, should be used if possible.

It needs some assembly-code routines which are in jmemdosa.asm; make sure your makefile assembles that file and includes it in the library. If you don't have a suitable assembler, you can get pre-assembled object files for jmemdosa by FTP from ftp.uu.net:/graphics/jpeg/jdosaobj.zip. (DOS-oriented distributions of the IJG source code often include these object files.)

When using jmemdos.c, jconfig.h must define USE\_MSDOS\_MEMMGR and must set MAX\_ALLOC\_CHUNK to less than 64K (65520L is a typical value). If your C library's far-heap malloc() can't allocate blocks that large, reduce MAX\_ALLOC\_CHUNK to whatever it can handle.

If you can't use jmemdos.c for some reason --- for example, because you don't have an assembler to assemble jmemdosa.asm --- you'll have to fall back to jmemansi.c or jmemname.c. You'll probably still need to set MAX\_ALLOC\_CHUNK in jconfig.h, because most DOS C libraries won't malloc() more than 64K at a time. IMPORTANT: if you use jmemansi.c or jmemname.c, you will have to compile in a large-data memory model in order to get the right stdio library. Too bad.

wrjpgcom needs to be compiled in large model, because it malloc()s a 64KB work area to hold the comment text. If your C library's malloc can't handle that, reduce MAX\_COM\_LENGTH as necessary in wrjpgcom.c.

Most MS-DOS compilers treat stdin/stdout as text files, so you must use two-file command line style. But if your compiler has either fdopen() or setmode(), you can use one-file style if you like. To do this, define USE\_SETMODE or USE\_FDOPEN so that stdin/stdout will be set to binary mode. (USE\_SETMODE seems to work with more DOS compilers than USE\_FDOPEN.) You should test that I/O through stdin/stdout produces the same results as I/O to explicitly named files... the "make test" procedures in the supplied makefiles do NOT use stdin/stdout.

MS-DOS, generic comments for 32-bit compilers:

None of the above comments about memory models apply if you are using a 32-bit flat-memory-space environment, such as DJGPP or Watcom C. (And you should use one if you have it, as performance will be much better than 8086-compatible code!) For flat-memory-space compilers, do NOT define `NEED_FAR_POINTERS`, and do NOT use `jmemdos.c`. Use `jmemnobs.c` if the environment supplies adequate virtual memory, otherwise use `jmemansi.c` or `jmemname.c`.

You'll still need to be careful about binary I/O through `stdin/stdout`. See the last paragraph of the previous section.

MS-DOS, Borland C:

Be sure to convert all the source files to DOS text format (CR/LF newlines). Although Borland C will often work OK with unmodified Unix (LF newlines) source files, sometimes it will give bogus compile errors. "Illegal character '#'" is the most common such error. (This is true with Borland C 3.1, but perhaps is fixed in newer releases.)

If you want one-file command line style, just undefine `TWO_FILE_COMMANDLINE`. `jconfig.bcc` already includes `#define USE_SETMODE` to make this work. (fdopen does not work correctly.)

MS-DOS, Microsoft C:

`makefile.mc6` works with Microsoft C, DOS Visual C++, etc. It should only be used if you want to build a 16-bit (small or medium memory model) program.

If you want one-file command line style, just undefine `TWO_FILE_COMMANDLINE`. `jconfig.mc6` already includes `#define USE_SETMODE` to make this work. (fdopen does not work correctly.)

Note that this makefile assumes that the working copy of itself is called "makefile". If you want to call it something else, say "makefile.mak", be sure to adjust the dependency line that reads `$(RFILE) : makefile`. Otherwise the make will fail because it doesn't know how to create "makefile". Worse, some releases of Microsoft's make utilities give an incorrect error message in this situation.

Old versions of MS C fail with an "out of macro expansion space" error because they can't cope with the macro `TRACEMS8` (defined in `jerror.h`). If this happens to you, the easiest solution is to change

TRACEMS8 to expand to nothing. You'll lose the ability to dump out JPEG coefficient tables with `djpeg -debug -debug`, but at least you can compile.

Original MS C 6.0 is very buggy; it compiles incorrect code unless you turn off optimization entirely (remove `-O` from `CFLAGS`). 6.00A is better, but it still generates bad code if you enable loop optimizations (`-Ol` or `-Ox`).

MS C 8.0 crashes when compiling `jquant1.c` with optimization switch `/Oo` ... which is on by default. To work around this bug, compile that one file with `/Oo-`.

Microsoft Windows (all versions), generic comments:

Some Windows system include files define `typedef boolean` as "unsigned char". The IJG code also defines `typedef boolean`, but we make it an "enum" by default. This doesn't affect the IJG programs because we don't import those Windows include files. But if you use the JPEG library in your own program, and some of your program's files import one definition of `boolean` while some import the other, you can get all

sorts of mysterious problems. A good preventive step is to make the IJG library use "unsigned char" for `boolean`. To do that, add something like this to your `jconfig.h` file:

```
/* Define "boolean" as unsigned char, not enum, per Windows custom */
#ifndef __RPCNDR_H__ /* don't conflict if rpcndr.h already read */
typedef unsigned char boolean;
#endif
#ifndef FALSE /* in case these macros already exist */
#define FALSE 0 /* values of boolean */
#endif
#ifndef TRUE
#define TRUE 1
#endif
#define HAVE_BOOLEAN /* prevent jmorecfg.h from redefining it */
```

(This is already in `jconfig.vc`, by the way.)

`winddef.h` contains the declarations

```
#define far
#define FAR far
```

Since `jmorecfg.h` tries to define `FAR` as empty, you may get a compiler warning if you include both `jpeglib.h` and `winddef.h` (which `windows.h` includes). To suppress the warning, you can put `"#ifndef FAR" / "#endif"` around the line `"#define FAR"` in `jmorecfg.h`.

(Something like this is already in `jmorecfg.h`, by the way.)

When using



the library in a Windows application, you will almost certainly want to modify or replace the error handler module `jerror.c`, since our default error handler does a couple of inappropriate things:

1. it tries to write error and warning messages on `stderr`;
2. in event of a fatal error, it exits by calling `exit()`.

A simple stopgap solution for problem 1 is to replace the line

```
fprintf(stderr, "%s\n", buffer);
```

(in `output_message` in `jerror.c`) with

```
MessageBox(GetActiveWindow(),buffer,"JPEG Error",MB_OK|MB_ICONERROR);
```

It's highly recommended that you at least do that much, since otherwise error messages will disappear into nowhere. (Beginning with IJG v6b, this code is already present in `jerror.c`; just define `USE_WINDOWS_MESSAGEBOX` in `jconfig.h` to enable it.)

The proper solution for problem 2 is to return control to your calling application after a library error. This can be done with the `setjmp/longjmp` technique discussed in `libjpeg.txt` and illustrated in `example.c`. (NOTE: some

older Windows C compilers provide versions of `setjmp/longjmp` that don't actually work under Windows. You may need to use the Windows system functions `Catch` and `Throw` instead.)

The recommended memory manager under Windows is `jmemnobs.c`; in other words, let Windows do any virtual memory management needed. You should NOT use `jmemdos.c` nor `jmemdosa.asm` under Windows.

For Windows 3.1, we recommend compiling in medium or large memory model; for newer Windows versions, use a 32-bit flat memory model. (See the MS-DOS sections above for more info about memory models.) In the 16-bit memory models only, you'll need to put

```
#define MAX_ALLOC_CHUNK 65520L /* Maximum request to malloc() */
```

into `jconfig.h` to limit allocation chunks to 64Kb. (Without that, you'd

have to use huge memory model, which slows things down unnecessarily.)

`jmemnobs.c` works without modification in large or flat memory models, but to use medium model, you need to modify its `jpeg_get_large` and `jpeg_free_large` routines to

allocate far memory. In any case, you might like to replace its calls to `malloc` and `free` with direct calls on Windows memory allocation functions.

You may also want to modify `jdatasrc.c` and `jdatadst.c` to use Windows file operations rather than `fread/fwrite`. This is only necessary if your C compiler doesn't provide a competent implementation of C `stdio` functions.

You might want to tweak the `RGB_xxx` macros in `jmorecfg.h` so that the library will accept or deliver color pixels in BGR sample order, not RGB; BGR order is usually more convenient under Windows. Note that this change will break

the sample applications cjpeg/djpeg, but the library itself works fine.

Many people want to convert the IJG library into a DLL. This is reasonably straightforward, but watch out for the following:

1. Don't try to compile as a DLL in small or medium memory model; use large model, or even better, 32-bit flat model. Many places in the IJG code assume the address of a local variable is an ordinary

(not FAR) pointer;

that isn't true in a medium-model DLL.

2. Microsoft C cannot pass file pointers between applications and DLLs. (See Microsoft Knowledge Base, PSS ID Number Q50336.) So jdatasrc.c and jdatadst.c don't work if you open a file in your application and then pass the pointer to the DLL. One workaround is to make jdatasrc.c/jdatadst.c part of your main application rather than part of the DLL.

3. You'll probably need to modify the macros GLOBAL() and EXTERN() to attach suitable linkage keywords to the exported routine names. Similarly, you'll want to modify METHODDEF() and JMETHOD() to ensure function pointers are declared in a way that lets application routines be called back through the function pointers. These macros are in jmorecfg.h. Typical definitions for a 16-bit DLL are:

```
#define GLOBAL(type) type _far _pascal _loads _export
#define EXTERN(type) extern type _far _pascal _loads
#define METHODDEF(type) static type _far _pascal
#define JMETHOD(type,methodname,arglist)
\
type (_far _pascal *methodname) arglist
```

For a 32-bit DLL you may want something like

```
#define GLOBAL(type) __declspec(dllexport) type
#define EXTERN(type) extern __declspec(dllexport) type
```

Although not all the GLOBAL routines are actually intended to be called by the application, the performance cost of making them all DLL entry points is negligible.

The unmodified IJG library presents a very C-specific application interface, so the resulting DLL is only usable from C or C++ applications. There has been some talk of writing wrapper code that would present a simpler interface usable from other languages, such as Visual Basic. This is on our to-do list but hasn't been very high priority --- any volunteers out there?

Microsoft Windows, Borland C:

The provided jconfig.bcc should work OK in a 32-bit Windows environment, but you'll need to tweak it in a 16-bit environment (you'd need to define

NEED\_FAR\_POINTERS and MAX\_ALLOC\_CHUNK). Beware that makefile.bcc will need alteration if you want to use it for Windows --- in particular, you should use jmemnobs.c not jmemdos.c under Windows.

Borland C++ 4.5 fails with an internal compiler error when trying to compile jdmerge.c in 32-bit mode. If enough people complain, perhaps Borland will fix it. In the meantime, the simplest known workaround is to add a redundant definition of the variable range\_limit in h2v1\_merged\_upsample(), at the head of the block that handles odd image width (about line 268 in v6 jdmerge.c):

```
/* If image width is odd, do the last output column separately */
if (cinfo->output_width & 1) {
    register JSAMPLE * range_limit = cinfo->sample_range_limit; /* ADD THIS */
    cb = GETJSAMPLE(*inptr1);
```

Pretty bizarre, especially since the very similar routine h2v2\_merged\_upsample doesn't trigger the bug.

Recent reports suggest that this bug does not occur with "bcc32a" (the Pentium-optimized version of the compiler).

Another report from a user of Borland C 4.5 was that incorrect code (leading to a color shift in processed images) was produced if any of the following optimization switch combinations were used:

- Ot -Og
- Ot -Op
- Ot -Om

So try backing off on optimization if you see such a problem. (Are there several different releases all numbered "4.5"??)

Microsoft Windows, Microsoft Visual C++:

jconfig.vc should work OK with any Microsoft compiler for a 32-bit memory model. makefile.vc is intended for command-line use. (If you are using the Developer Studio environment, you may prefer the DevStudio project files; see below.)

IJG JPEG 7 adds extern "C" to jpeglib.h. This avoids the need to put extern "C" { ... } around #include "jpeglib.h" in your C++ application. You can also force VC++ to treat the library as C++ code by renaming all the \*.c files to \*.cpp (and adjusting the makefile to match). In this case you also need to define the symbol DONT\_USE\_EXTERN\_C in the configuration to prevent jpeglib.h from using extern "C".

Microsoft Windows,  
Microsoft Visual C++ 6 Developer Studio:

We include makefiles that should work as project files in Developer Studio 6.0 or later. There is a library makefile that builds the IJG library as a static Win32 library, and application makefiles that build the sample applications as Win32 console applications. (Even if you only want the library, we recommend building the applications so that you can run the self-test.)

To use:

1. Open the command prompt, change to the main directory and execute the command line  
NMAKE /f makefile.vs setup-vc6  
This will move jconfig.vc to jconfig.h and makefiles to project files.  
(Note that the renaming is critical!)
2. Open the workspace file jpeg.dsw, build the library project.  
(If you are using Developer Studio more recent than 6.0, you'll probably get a message saying that the project files are being updated.)
3. Open the workspace file apps.dsw, build the application projects.
4. To perform the self-test, execute the command line  
NMAKE  
/f makefile.vs test-build
5. Move the application .exe files from `app`\Release to an appropriate location on your path.

Microsoft Windows, Visual Studio 2017 (v15):

We include makefiles that should work as project files in Visual Studio 2017 (v15) or later. There is a library makefile that builds the IJG library as a static Win32 library, and application makefiles that build the sample applications as Win32 console applications. (Even if you only want the library, we recommend building the applications so that you can run the self-test.)

To use:

1. Open the Developer Command Prompt, change to the main directory and execute the command line  
NMAKE /f makefile.vs setup-v15  
This will move jconfig.vc to jconfig.h and makefiles to project files.  
(Note that the renaming is critical!)
2. Open the solution file jpeg.sln, build the library project.
  - a) If you are using Visual Studio more recent than 2017 (v15), you'll probably get a message saying that the project files are being updated.
  - b) If necessary, open the project properties and adapt the Windows Target Platform Version in the Configuration Properties, General section; we support the latest version at the time of release.

3. Open the solution file apps.sln, build the application projects.
4. To perform the self-test, execute the command line  
NMAKE /f makefile.vs test-build
5. Move the application .exe files from `app`\Release to an appropriate location on your path.

OS/2, Borland C++:

Watch out for optimization bugs in older Borland compilers; you may need to back off the optimization switch settings. See the comments in makefile.bcc.

SGI:

On some SGI systems, you may need to set "AR2= ar -ts" in the Makefile. If you are using configure, you can do this by saying

```
./configure RANLIB='ar -ts'
```

This change is not needed on all SGIs. Use it only if the make fails at the stage of linking the completed programs.

On the MIPS R4000 architecture (Indy, etc.), the compiler option "-mips2"

reportedly speeds up the float DCT method substantially, enough to make it faster than the default int method (but still slower than the fast int method). If you use -mips2, you may want to alter the default DCT method to be float. To do this, put "#define JDCT\_DEFAULT JDCT\_FLOAT" in jconfig.h.

VMS:

On an Alpha/VMS system with MMS, be sure to use the "/Marco=Alpha=1" qualifier with MMS when building the JPEG package.

VAX/VMS v5.5-1 may have problems with the test step of the build procedure reporting differences when it compares the original and test images. If the error points to the last block of the files, it is most likely bogus and may be safely ignored. It seems to be because the files are Stream\_LF and Backup/Compare has difficulty with the (presumably) null padded files. This problem was not observed on VAX/VMS v6.1 or AXP/VMS v6.1.

Found in path(s):

```
* /opt/cola/permits/1104792432_1607505170.95/0/jpeg-9c-tar-gz/jpeg-9c/install.txt  
No license file was found, but licenses were detected in source scan.
```

```
/*
```

```
* jcmaster.c
```

\*  
\* Copyright (C) 1991-1997, Thomas G. Lane.  
\* Modified 2003-2017 by Guido Vollbeding.  
\* This file is part of the Independent JPEG Group's software.  
\* For conditions of distribution and use, see the accompanying README file.  
\*  
\* This file contains master control logic for the JPEG compressor.  
\* These routines are concerned with parameter validation, initial setup,  
\* and inter-pass control (determining the number of passes and the work  
\* to be done in each pass).  
\*/

Found in path(s):

\* /opt/cola/permits/1104792432\_1607505170.95/0/jpeg-9c-tar-gz/jpeg-9c/jcmaster.c

No license file was found, but licenses were detected in source scan.

/\*  
\* jctrans.c  
\*  
\* Copyright (C) 1995-1998, Thomas G. Lane.  
\* Modified 2000-2017 by Guido Vollbeding.  
\* This file is part of the Independent JPEG Group's software.  
\* For conditions of distribution and use, see the accompanying README file.  
\*  
\* This file contains library routines for transcoding compression,  
\* that is, writing raw DCT coefficient arrays to an output JPEG file.  
\* The routines in jcapimin.c will also be needed by a transcoder.  
\*/

Found in path(s):

\* /opt/cola/permits/1104792432\_1607505170.95/0/jpeg-9c-tar-gz/jpeg-9c/jctrans.c

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/\*  
\* jdinput.c  
\*  
\* Copyright (C) 1991-1997, Thomas G. Lane.  
\* Modified 2002-2013 by Guido Vollbeding.  
\* This file is part of the Independent JPEG Group's software.  
\* For conditions of distribution and use, see the accompanying README file.  
\*  
\* This file contains input control logic for the JPEG decompressor.  
\* These routines are concerned with controlling the decompressor's input  
\* processing (marker reading and coefficient decoding). The actual input  
\* reading is done in jdmarker.c, jdhuft.c, and jdarith.c.  
\*/

Found in path(s):

\* /opt/cola/permits/1104792432\_1607505170.95/0/jpeg-9c-tar-gz/jpeg-9c/jdinput.c

No license file was found, but licenses were detected in source scan.

/\*

\* jdcoefct.c

\*

\* Copyright (C) 1994-1997, Thomas G. Lane.

\* Modified 2002-2011 by Guido Vollbeding.

\* This file is part of the Independent JPEG Group's software.

\* For conditions of distribution and use, see the accompanying README file.

\*

\* This file contains the coefficient buffer controller for decompression.

\* This controller is the top level of the JPEG decompressor proper.

\* The coefficient buffer lies between entropy decoding and inverse-DCT steps.

\*

\* In buffered-image mode, this controller is the interface between

\* input-oriented processing and output-oriented processing.

\* Also, the input side (only) is used when reading a file for transcoding.

\*/

Found in path(s):

\* /opt/cola/permits/1104792432\_1607505170.95/0/jpeg-9c-tar-gz/jpeg-9c/jdcoefct.c

No license file was found, but licenses were detected in source scan.

/\*

\* jcparam.c

\*

\* Copyright (C) 1991-1998, Thomas G. Lane.

\* Modified 2003-2013 by Guido Vollbeding.

\* This file is part of the Independent JPEG Group's software.

\* For conditions of distribution and use, see the accompanying README file.

\*

\* This file contains optional default-setting code for the JPEG compressor.

\* Applications do not have to use this file, but those that don't use it

\* must know a lot more about the innards of the JPEG code.

\*/

Found in path(s):

\* /opt/cola/permits/1104792432\_1607505170.95/0/jpeg-9c-tar-gz/jpeg-9c/jcparam.c

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/\*

\* jconfig.txt

\*

\* Copyright (C) 1991-1994, Thomas G. Lane.

\* Modified 2009-2013 by Guido Vollbeding.

\* This file is part of the Independent JPEG Group's software.

\* For conditions of distribution and use, see the accompanying README file.

```

*
* This file documents the configuration options that are required to
* customize the JPEG software for a particular system.
*
* The actual configuration options for a particular installation are stored
* in jconfig.h. On many machines, jconfig.h can be generated automatically
* or copied from one of the "canned" jconfig files that we supply. But if
* you need to generate a jconfig.h file by hand, this file tells you how.
*
* DO NOT EDIT THIS FILE --- IT WON'T ACCOMPLISH ANYTHING.
* EDIT A COPY NAMED JCONFIG.H.
*/

/*
* These symbols indicate the properties of your machine or compiler.
* #define the symbol if yes, #undef it if no.
*/

/* Does your compiler
support function prototypes?
* (If not, you also need to use ansi2knr, see install.txt)
*/
#define HAVE_PROTOTYPES

/* Does your compiler support the declaration "unsigned char" ?
* How about "unsigned short" ?
*/
#define HAVE_UNSIGNED_CHAR
#define HAVE_UNSIGNED_SHORT

/* Define "void" as "char" if your compiler doesn't know about type void.
* NOTE: be sure to define void such that "void *" represents the most general
* pointer type, e.g., that returned by malloc().
*/
/* #define void char */

/* Define "const" as empty if your compiler doesn't know the "const" keyword.
*/
/* #define const */

/* Define this if an ordinary "char" type is unsigned.
* If you're not sure, leaving it undefined will work at some cost in speed.
* If you defined HAVE_UNSIGNED_CHAR then the speed difference is minimal.
*/
#undef CHAR_IS_UNSIGNED

/* Define this if your system has an ANSI-conforming <stddef.h> file.

```



```

*/
#define HAVE_STDDEF_H

/* Define this if your system has an ANSI-conforming <stdlib.h>
file.
*/
#define HAVE_STDLIB_H

/* Define this if your system does not have an ANSI/SysV <string.h>,
* but does have a BSD-style <strings.h>.
*/
#undef NEED_BSD_STRINGS

/* Define this if your system does not provide typedef size_t in any of the
* ANSI-standard places (stddef.h, stdlib.h, or stdio.h), but places it in
* <sys/types.h> instead.
*/
#undef NEED_SYS_TYPES_H

/* For 80x86 machines, you need to define NEED_FAR_POINTERS,
* unless you are using a large-data memory model or 80386 flat-memory mode.
* On less brain-damaged CPUs this symbol must not be defined.
* (Defining this symbol causes large data structures to be referenced through
* "far" pointers and to be allocated with a special version of malloc.)
*/
#undef NEED_FAR_POINTERS

/* Define this if your linker needs global names to be unique in less
* than the first 15 characters.
*/
#undef NEED_SHORT_EXTERNAL_NAMES

/* Although a real ANSI C compiler can deal perfectly well with pointers to
* unspecified
structures (see "incomplete types" in the spec), a few pre-ANSI
* and pseudo-ANSI compilers get confused. To keep one of these bozos happy,
* define INCOMPLETE_TYPES_BROKEN. This is not recommended unless you
* actually get "missing structure definition" warnings or errors while
* compiling the JPEG code.
*/
#undef INCOMPLETE_TYPES_BROKEN

/* Define "boolean" as unsigned char, not enum, on Windows systems.
*/
#ifdef _WIN32
#ifndef __RPCNDR_H__ /* don't conflict if rpcnldr.h already read */
typedef unsigned char boolean;
#endif
#endif

```

```

#ifndef FALSE /* in case these macros already exist */
#define FALSE 0 /* values of boolean */
#endif
#ifndef TRUE
#define TRUE 1
#endif
#define HAVE_BOOLEAN /* prevent jmorecfg.h from redefining it */
#endif

/*
 * The following options affect code selection within the JPEG library,
 * but they don't need to be visible to applications using the library.
 * To minimize application namespace pollution, the symbols won't be
 * defined unless JPEG_INTERNALS
 * has been defined.
 */

#ifdef JPEG_INTERNALS

/* Define this if your compiler implements ">>" on signed values as a logical
 * (unsigned) shift; leave it undefined if ">>" is a signed (arithmetic) shift,
 * which is the normal and rational definition.
 */
#undef RIGHT_SHIFT_IS_UNSIGNED

#endif /* JPEG_INTERNALS */

/*
 * The remaining options do not affect the JPEG library proper,
 * but only the sample applications cjpeg/djpeg (see cjpeg.c, djpeg.c).
 * Other applications can ignore these.
 */

#ifdef JPEG_CJPEG_DJPEG

/* These defines indicate which image (non-JPEG) file formats are allowed. */

#define BMP_SUPPORTED /* BMP image file format */
#define GIF_SUPPORTED /* GIF image file format */
#define PPM_SUPPORTED /* PBMPLUS PPM/PGM image file format */
#undef RLE_SUPPORTED /* Utah RLE image file format */
#define TARGA_SUPPORTED /* Targa image file format */

/* Define this if you want to name both input and output files on the command
 * line, rather than using stdout

```

```

and optionally stdin. You MUST do this if
* your system can't cope with binary I/O to stdin/stdout. See comments at
* head of cjpeg.c or djpeg.c.
*/
#undef TWO_FILE_COMMANDLINE

/* Define this if your system needs explicit cleanup of temporary files.
* This is crucial under MS-DOS, where the temporary "files" may be areas
* of extended memory; on most other systems it's not as important.
*/
#undef NEED_SIGNAL_CATCHER

/* By default, we open image files with fopen(...,"rb") or fopen(...,"wb").
* This is necessary on systems that distinguish text files from binary files,
* and is harmless on most systems that don't. If you have one of the rare
* systems that complains about the "b" spec, define this symbol.
*/
#undef DONT_USE_B_MODE

/* Define this if you want percent-done progress reports from cjpeg/djpeg.
*/
#undef PROGRESS_REPORT

#endif /* JPEG_CJPEG_DJPEG */

```

Found in path(s):

```
* /opt/cola/permits/1104792432_1607505170.95/0/jpeg-9c-tar-gz/jpeg-9c/jconfig.txt
```

No license file was found, but licenses were detected in source scan.

```

/*
* jidctfst.c
*
* Copyright (C) 1994-1998, Thomas G. Lane.
* Modified 2015-2017 by Guido Vollbeding.
* This file is part of the Independent JPEG Group's software.
* For conditions of distribution and use, see the accompanying README file.
*
* This file contains a fast, not so accurate integer implementation of the
* inverse DCT (Discrete Cosine Transform). In the IJG code, this routine
* must also perform dequantization of the input coefficients.
*
* A 2-D IDCT can be done by 1-D IDCT on each column followed by 1-D IDCT
* on each row (or vice versa, but it's more convenient to emit a row at
* a time). Direct algorithms are also available, but they are much more
* complex and seem not to be any faster when reduced to code.
*
* This implementation is based on Arai, Agui, and Nakajima's algorithm for

```

\* scaled DCT. Their original paper (Trans. IEICE E-71(11):1095) is in  
\* Japanese, but the algorithm  
is described in the Pennebaker & Mitchell  
\* JPEG textbook (see REFERENCES section in file README). The following code  
\* is based directly on figure 4-8 in P&M.  
\* While an 8-point DCT cannot be done in less than 11 multiplies, it is  
\* possible to arrange the computation so that many of the multiplies are  
\* simple scalings of the final outputs. These multiplies can then be  
\* folded into the multiplications or divisions by the JPEG quantization  
\* table entries. The AA&N method leaves only 5 multiplies and 29 adds  
\* to be done in the DCT itself.  
\* The primary disadvantage of this method is that with fixed-point math,  
\* accuracy is lost due to imprecise representation of the scaled  
\* quantization values. The smaller the quantization table entry, the less  
\* precise the scaled value, so this implementation does worse with high-  
\* quality-setting files than with low-quality ones.  
\*/

Found in path(s):

\* /opt/cola/permits/1104792432\_1607505170.95/0/jpeg-9c-tar-gz/jpeg-9c/jidctfst.c  
No license file was found, but licenses were detected in source scan.

/\*

\* jdmaster.c

\*

\* Copyright (C) 1991-1997, Thomas G. Lane.

\* Modified 2002-2017 by Guido Vollbeding.

\* This file is part of the Independent JPEG Group's software.

\* For conditions of distribution and use, see the accompanying README file.

\*

\* This file contains master control logic for the JPEG decompressor.

\* These routines are concerned with selecting the modules to be executed

\* and with determining the number of passes and the work to be done in each

\* pass.

\*/

Found in path(s):

\* /opt/cola/permits/1104792432\_1607505170.95/0/jpeg-9c-tar-gz/jpeg-9c/jdmaster.c  
No license file was found, but licenses were detected in source scan.

/\*

\* rdbmp.c

\*

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\* Modified 2009-2017 by Guido Vollbeding.

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\* For conditions of distribution and use, see the accompanying README file.

\*

```
* This file contains routines to read input images in Microsoft "BMP"
* format (MS Windows 3.x, OS/2 1.x, and OS/2 2.x flavors).
* Currently, only 8-, 24-, and 32-bit images are supported, not 1-bit or
* 4-bit (feeding such low-depth images into JPEG would be silly anyway).
* Also, we don't support RLE-compressed files.
*
* These routines may need modification for non-Unix environments or
* specialized applications. As they stand, they assume input from
* an ordinary stdio stream. They further assume that reading begins
* at the start of the file; start_input may need work if the
* user interface has already read some data (e.g., to determine that
* the file is
indeed BMP format).
*
* This code contributed by James Arthur Boucher.
*/
```

Found in path(s):

```
* /opt/cola/permits/1104792432_1607505170.95/0/jpeg-9c-tar-gz/jpeg-9c/rdbmp.c
```

No license file was found, but licenses were detected in source scan.

```
/*
```

```
* wrppm.c
```

```
*
```

```
* Copyright (C) 1991-1996, Thomas G. Lane.
```

```
* Modified 2009-2017 by Guido Vollbeding.
```

```
* This file is part of the Independent JPEG Group's software.
```

```
* For conditions of distribution and use, see the accompanying README file.
```

```
*
```

```
* This file contains routines to write output images in PPM/PGM format.
```

```
* The extended 2-byte-per-sample raw PPM/PGM formats are supported.
```

```
* The PBMPLUS library is NOT required to compile this software
```

```
* (but it is highly useful as a set of PPM image manipulation programs).
```

```
*
```

```
* These routines may need modification for non-Unix environments or
```

```
* specialized applications. As they stand, they assume output to
```

```
* an ordinary stdio stream.
```

```
*/
```

Found in path(s):

```
* /opt/cola/permits/1104792432_1607505170.95/0/jpeg-9c-tar-gz/jpeg-9c/wrppm.c
```

No license file was found, but licenses were detected in source scan.

```
/*
```

```
* jpeglib.h
```

```
*
```

```
* Copyright (C) 1991-1998, Thomas G. Lane.
```

```
* Modified 2002-2017 by Guido Vollbeding.
```

\* This file is part of the Independent JPEG Group's software.  
\* For conditions of distribution and use, see the accompanying README file.  
\*  
\* This file defines the application interface for the JPEG library.  
\* Most applications using the library need only include this file,  
\* and perhaps jerror.h if they want to know the exact error codes.  
\*/

Found in path(s):

\*/opt/cola/permits/1104792432\_1607505170.95/0/jpeg-9c-tar-gz/jpeg-9c/jpeglib.h

No license file was found, but licenses were detected in source scan.

/\*

\* wrgif.c

\*

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\* This file is part of the Independent JPEG Group's software.

\* For conditions of distribution and use, see the accompanying README file.

\*

\* This file contains routines to write output images in GIF format.

\*

\*\*\*\*\*

\* NOTE: to avoid entanglements with Unisys' patent on LZW compression, \*

\* this code has been modified to output "uncompressed GIF" files. \*

\* There is no trace of the LZW algorithm in this file. \*

\*\*\*\*\*

\*

\* These routines may need modification for non-Unix environments or

\* specialized applications. As they stand, they assume output to

\* an ordinary stdio stream.

\*/

/\*

\* This code is loosely based on ppmtogif from the PBMPLUS  
distribution

\* of Feb. 1991. That file contains the following copyright notice:

\* Based on GIFENCODER by David Rowley <mgardi@watdscu.waterloo.edu>.

\* Lempel-Ziv compression based on "compress" by Spencer W. Thomas et al.

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- \* CompuServe Incorporated. GIF(sm) is a Service Mark property of
- \* CompuServe Incorporated."
- \*/

Found in path(s):

\* /opt/cola/permits/1104792432\_1607505170.95/0/jpeg-9c-tar-gz/jpeg-9c/wrgif.c

# 1.212 openssh 7.5p1

## 1.212.1 Available under license :

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OpenSSH contains no GPL code.

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- \* All rights reserved
- \*
- \* As far as I am concerned, the code I have written for this software
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- \* software must be clearly marked as such, and if the derived work is
- \* incompatible with the protocol description in the RFC file, it must be
- \* called by a name other than "ssh" or "Secure Shell".

[Tatu continues]

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  - \* restrictive); see below for details.

[However, none of that term is relevant at this point in time. All of these restrictively licenced software components which he talks about have been removed from OpenSSH, i.e.,

- RSA is no longer included, found in the OpenSSL library
- IDEA is no longer included, its use is deprecated
- DES is now external, in the OpenSSL library
- GMP is no longer used, and instead we call BN code from OpenSSL
- Zlib is now external, in a library
- The make-ssh-known-hosts script is no longer included

- TSS has been removed
- MD5 is now external, in the OpenSSL library
- RC4 support has been replaced with ARC4 support from OpenSSL
- Blowfish is now external, in the OpenSSL library

[The licence continues]

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4)

The Rijndael implementation by Vincent Rijmen, Antoon Bosselaers and Paulo Barreto is in the public domain and distributed with the following license:

- \* @version 3.0 (December 2000)
- \*
- \* Optimised ANSI C code for the Rijndael cipher (now AES)
- \*
- \* @author Vincent Rijmen <vincent.rijmen@esat.kuleuven.ac.be>
- \* @author Antoon Bosselaers <antoon.bosselaers@esat.kuleuven.ac.be>
- \* @author Paulo Barreto <paulo.barreto@terra.com.br>
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## 1.214 libproxy 0.4.12

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## 1.217 protobuf 3.8.0

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This is free software, and you are welcome to redistribute it
under certain conditions; type `show c' for details.
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The hypothetical commands

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```
Yoyodyne, Inc., hereby disclaims all copyright interest in the program
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```

```
<signature of Ty Coon>, 1 April 1989
Ty Coon, President of Vice
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(This file is under construction.) -\*- text -\*-

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+++++

Dean Elsner wrote the original gas for vax. [more details?]

Jay Fenlason maintained gas for a while, adding support for

gdb-specific debug information and the 68k series machines, most of the preprocessing pass, and extensive changes in messages.c, input-file.c, write.c.

K. Richard Pixley maintained gas for a while, adding various enhancements and many bug fixes, including merging support for several processors, breaking gas up to handle multiple object file format backends (including heavy rewrite, testing, an integration of the coff and b.out backends), adding configuration including heavy testing and verification of cross assemblers and file splits and renaming, converted gas to strictly ansi C including full prototypes, added support for m680[34]0 & cpu32, considerable work on i960 including a coff port (including considerable amounts of reverse engineering), a sparc opcode file rewrite, decstation, rs6000, and hp300hpux host ports, updated "know" assertions and made them work, much other reorganization, cleanup, and lint.

Ken Raeburn wrote the high-level BFD interface code to replace most of the code in format-specific I/O modules.

The original Vax-VMS support was contributed by David L. Kashtan. Eric Youngdale and Pat Rankin have done much work with it since.

The Intel 80386 machine description was written by Eliot Dresselhaus.

Minh Tran-Le at IntelliCorp contributed some AIX 386 support.

The Motorola 88k machine description was contributed by Devon Bowen of Buffalo University and Torbjorn Granlund of the Swedish Institute of Computer Science.

Keith

Knowles at the Open Software Foundation wrote the original MIPS back end (tc-mips.c, tc-mips.h), and contributed Rose format support that hasn't been merged in yet. Ralph Campbell worked with the MIPS code to support a.out format.

Support for the Zilog Z8k and Hitachi H8/300, H8/500 and SH processors (tc-z8k, tc-h8300, tc-h8500, tc-sh), and IEEE 695 object file format (obj-ieee), was written by Steve Chamberlain of Cygnus Solutions. Steve also modified the COFF back end (obj-coffbfd) to use BFD for some low-level operations, for use with the Hitachi, 29k and Zilog targets.

John Gilmore built the AMD 29000 support, added .include support, and simplified the configuration of which versions accept which pseudo-ops. He updated the 68k machine description so that Motorola's

opcodes always produced fixed-size instructions (e.g. jsr), while synthetic instructions remained shrinkable (jbsr). John fixed many bugs, including true tested cross-compilation support, and one bug in relaxation that took a week and required the proverbial one-bit fix.

Ian Lance Taylor of Cygnus Solutions merged the Motorola and MIT syntaxes for the 68k, completed support for some COFF targets (68k, i386 SVR3, and SCO Unix), wrote the ECOFF support based on Michael Meissner's mips-tfile program, wrote the PowerPC and RS/6000 support, and made a few other minor patches. He handled the binutils releases for versions 2.7 through 2.9.

David Edelsohn contributed fixes for the PowerPC and AIX support.

Steve Chamberlain made gas able to generate listings.

Support for the HP9000/300 was contributed by Glenn Engel of HP.

Support for ELF format files has been worked on by Mark Eichin of Cygnus Solutions (original, incomplete implementation), Pete Hoogenboom at the University of Utah (HPPA mainly), Michael Meissner of the Open Software Foundation (i386 mainly), and Ken Raeburn of Cygnus Solutions (sparc, initial 64-bit support).

Several engineers at Cygnus Solutions have also provided many small bug fixes and configuration enhancements.

The initial Alpha support was contributed by Carnegie-Mellon University. Additional work was done by Ken Raeburn of Cygnus Solutions. Richard Henderson then rewrote much of the Alpha support.

Ian Dall updated the support code for the National Semiconductor 32000 series, and added support for Mach 3 and NetBSD running on the PC532.

Klaus Kaempf ported the assembler and the binutils to openVMS/Alpha.

Steve Haworth contributed the support for the Texas Instruction c30 (tms320c30).

H.J. Lu has contributed many patches and much testing.

Alan Modra reworked much of the i386 backend, improving the error checking, updating the code, and improving the 16 bit support, using patches from the work of Martynas Kunigelis and H.J. Lu.

Many others have contributed large or small bugfixes and enhancements. If

you've contributed significant work and are not mentioned on this list, and want to be, let us know. Some of the history has been lost; we aren't intentionally leaving anyone out.

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@end group

@end smallexample

If you have Invariant Sections without Cover Texts, or some other combination of the three, merge those two alternatives to suit the

situation.

If your document contains nontrivial examples of program code, we recommend releasing these examples in parallel under your choice of free software license, such as the GNU General Public License, to permit their use in free software.

@c Local Variables:

@c ispell-local-pdict: "ispell-dict"

@c End:

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Version 2, June 1991

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[This is the first released version of the library GPL. It is numbered 2 because it goes with version 2 of the ordinary GPL.]

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Finally, any free program is threatened constantly by software patents. We wish to avoid the danger that companies distributing free software will individually obtain patent licenses, thus in effect transforming the program into proprietary software. To prevent this, we have made it clear that any patent must be licensed for everyone's free use or not licensed at all.

Most GNU software, including some libraries, is covered by the ordinary GNU General Public License, which was designed for utility programs. This license, the GNU Library General Public License, applies to certain designated libraries. This license is quite different from the ordinary one; be sure to read it in full, and don't assume that anything in it is the same as in the ordinary license.

The reason we have a separate public license for some libraries is that they blur the distinction we usually make between modifying or adding to a program and simply using it. Linking a program with a library, without changing the library, is in some sense simply using the library, and is analogous to running a utility program or application program. However, in a textual and legal sense, the linked executable is a combined work, a derivative of the original library, and the ordinary General Public License treats it as such.

Because of this blurred distinction, using the ordinary General Public License for libraries did not effectively promote software sharing, because most developers did not use the libraries. We concluded that weaker conditions might promote sharing better.

However, unrestricted linking of non-free programs would deprive the users of those programs of all benefit from the free status of the libraries themselves. This Library General Public License is intended to permit developers of non-free programs to use free libraries, while preserving your freedom as a user of such programs to change the free libraries that are incorporated in them. (We have not seen how to achieve this as regards changes in header files, but we have achieved it as regards changes in the actual functions of the Library.) The hope is that this will lead to faster development of free libraries.

The precise terms and conditions for copying, distribution and modification follow. Pay close attention to the difference between a "work based on the library" and a "work that uses the library". The former contains code derived from the library, while the latter only works together with the library.

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"Source code" for a work means the preferred form of the work for making modifications to it. For a library, complete source code means all the source code for all modules it contains, plus any associated interface definition files, plus the scripts used to control compilation and installation of the library.

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d) If a facility in the modified Library refers to a function or a table of data to be supplied by an application program that uses the facility, other than as an argument passed when the facility is invoked, then you must make a good faith effort to ensure that, in the event an application does not supply such function or table, the facility still operates, and performs whatever part of its purpose remains meaningful.

(For example, a function in a library to compute square roots has a purpose that is entirely well-defined independent of the application. Therefore, Subsection 2d requires that any application-supplied function or table used by this

function must

be optional: if the application does not supply it, the square root function must still compute square roots.)

These requirements apply to the modified work as a whole. If identifiable sections of that work are not derived from the Library, and can be reasonably considered independent and separate works in themselves, then this License, and its terms, do not apply to those sections when you distribute them as separate works. But when you distribute the same sections as part of a whole which is a work based on the Library, the distribution of the whole must be on the terms of this License, whose permissions for other licensees extend to the entire whole, and thus to each and every part regardless of who wrote it.

Thus, it is not the intent of this section to claim rights or contest your rights to work written entirely by you; rather, the intent is to exercise the right to control the distribution of derivative or collective works based on the Library.

In addition,

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This option is useful when you wish to copy part of the code of the

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If distribution of object code is made by offering access to copy from a designated place, then offering equivalent access to copy the source code from the same place satisfies the requirement to distribute the source code, even though third parties are not compelled to copy the source along with the object code.

5. A program that contains no derivative of any portion of the Library, but is designed to work with the Library by being compiled or linked with it, is called a "work that uses the Library". Such a work, in isolation, is not a derivative work of the Library, and therefore falls outside the scope of this License.

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If such an object file uses only numerical parameters, data structure layouts and accessors, and small macros and small inline functions (ten lines or less in length), then the use of the object file is unrestricted, regardless of whether it is legally a derivative work. (Executables containing this object code plus portions of the Library will still fall under Section 6.)

Otherwise, if the work is a derivative of the Library, you may distribute the object code for the work under the terms of Section 6. Any executables containing that work also fall under Section 6, whether or not they are linked directly with the Library itself.

6. As an exception to the Sections above, you may also compile or link a "work that uses the Library" with the Library to produce a work containing portions of the Library, and distribute that work under terms of your choice, provided that the terms permit modification of the work for the customer's own use and reverse engineering for debugging such modifications.



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c) If distribution of the work is made by offering access to copy from a designated place, offer equivalent access to copy the above specified materials from the same place.

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<signature of Ty Coon>, 1 April 1990

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For example, on rare occasions, there may be a special need to encourage the widest possible use of a certain library, so that it becomes a de-facto standard. To achieve this, non-free programs must be allowed to use the library. A more frequent case is that a free library does the same job as widely used non-free libraries. In this case, there is little to gain by limiting the free library to free software only, so we use the Lesser General Public License.

In other cases, permission to use a particular library in non-free programs enables a greater number of people to use a large body of free software. For example, permission to use the GNU C Library in non-free programs enables many more people to use the whole GNU operating system, as well as its variant, the GNU/Linux operating system.

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b) You must cause the files modified to carry prominent notices stating that you changed the files and the date of any change.

c) You must cause the whole of the work to be licensed at no charge to all third parties under the terms of this License.

d) If a facility in the modified Library refers to a function or a table of data to be supplied by an application program that uses the facility, other than as an argument passed when the facility is invoked, then you must make a good faith effort to ensure that, in the event an application does not supply such function or table, the facility still operates, and performs whatever part of its purpose remains meaningful.

(For example, a function in a library to compute square roots has a purpose that is entirely well-defined independent of the application. Therefore, Subsection 2d requires that any application-supplied function or table used by this function must be optional: if the application does not supply it, the square root function must still compute square roots.)

These requirements apply to the modified work as a whole. If identifiable sections of that work are not derived from the Library, and can be reasonably considered independent and separate works in themselves,

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distribute the same sections as part of a whole which is a work based on the Library, the distribution of the whole must be on the terms of this License, whose permissions for other licensees extend to the entire whole, and thus to each and every part regardless of who wrote it.

Thus, it is not the intent of this section to claim rights or contest your rights to work written entirely by you; rather, the intent is to exercise the right to control the distribution of derivative or collective works based on the Library.

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However, linking a "work that uses the Library" with the Library creates an executable that is a derivative of the Library (because it contains portions of the Library), rather than a "work that uses the library". The executable is therefore covered by this License.

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If such an object file uses only numerical parameters, data structure layouts and accessors, and small macros and small inline functions (ten lines or less in length), then the use of the object file is unrestricted, regardless of whether it is legally a derivative work. (Executables containing this object code plus portions of the Library will still fall under Section 6.)

Otherwise, if the work is a derivative of the Library, you may distribute the object code for the work under the terms of Section 6.

Any

executables containing that work also fall under Section 6, whether or not they are linked directly with the Library itself.

6. As an exception to the Sections above, you may also combine or link a "work that uses the Library" with the Library to produce a work containing portions of the Library, and distribute that work under terms of your choice, provided that the terms permit modification of the work for the customer's own use and reverse engineering for debugging such modifications.

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c) Accompany the work with a written offer, valid for at least three years, to give the same user the materials specified in Subsection 6a, above, for a charge no more than the cost of performing this distribution.

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## 1.220 inetutils freebsd-release-10.4.0

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# 1.222 netkit-tftp Version Overridden freebsd-release-10.4.0

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Upstream-Name: netkit-tftp

Source: <ftp://ftp.uk.linux.org/pub/linux/Networking/netkit/>

Files: \*

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## 1.225 httpclient 4.5.3

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## 1.233 go-playground-validator

6f98212623666681e8d451d956f32078f82f5bdf

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d0303fe809921458f417bcf828397a65db30a7e4

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02e3cf038dcea8290e44424da473dd12be796a8

a

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 */
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Found in path(s):

```
* /opt/cola/permits/1110910367_1606871910.37/0/slf4j-api-1-7-5-sources-2-
jar/org/slf4j/impl/StaticLoggerBinder.java
* /opt/cola/permits/1110910367_1606871910.37/0/slf4j-api-1-7-5-sources-2-jar/org/slf4j/helpers/BasicMarker.java
* /opt/cola/permits/1110910367_1606871910.37/0/slf4j-api-1-7-5-sources-2-
jar/org/slf4j/helpers/BasicMDCAdapter.java
* /opt/cola/permits/1110910367_1606871910.37/0/slf4j-api-1-7-5-sources-2-
jar/org/slf4j/spi/LocationAwareLogger.java
* /opt/cola/permits/1110910367_1606871910.37/0/slf4j-api-1-7-5-sources-2-jar/org/slf4j/IMarkerFactory.java
* /opt/cola/permits/1110910367_1606871910.37/0/slf4j-api-1-7-5-sources-2-jar/org/slf4j/ILoggerFactory.java
```

```

* /opt/cola/permits/1110910367_1606871910.37/0/slf4j-api-1-7-5-sources-2-
jar/org/slf4j/impl/StaticMDCBinder.java
*
/opt/cola/permits/1110910367_1606871910.37/0/slf4j-api-1-7-5-sources-2-
jar/org/slf4j/spi/MarkerFactoryBinder.java
* /opt/cola/permits/1110910367_1606871910.37/0/slf4j-api-1-7-5-sources-2-
jar/org/slf4j/helpers/NamedLoggerBase.java
* /opt/cola/permits/1110910367_1606871910.37/0/slf4j-api-1-7-5-sources-2-jar/org/slf4j/MarkerFactory.java
* /opt/cola/permits/1110910367_1606871910.37/0/slf4j-api-1-7-5-sources-2-jar/org/slf4j/helpers/NOPLogger.java
* /opt/cola/permits/1110910367_1606871910.37/0/slf4j-api-1-7-5-sources-2-
jar/org/slf4j/spi/LoggerFactoryBinder.java
* /opt/cola/permits/1110910367_1606871910.37/0/slf4j-api-1-7-5-sources-2-jar/org/slf4j/spi/MDCAdapter.java
* /opt/cola/permits/1110910367_1606871910.37/0/slf4j-api-1-7-5-sources-2-jar/org/slf4j/LoggerFactory.java
* /opt/cola/permits/1110910367_1606871910.37/0/slf4j-api-1-7-5-sources-2-
jar/org/slf4j/helpers/BasicMarkerFactory.java
* /opt/cola/permits/1110910367_1606871910.37/0/slf4j-api-1-7-5-sources-2-jar/org/slf4j/Logger.java
*
/opt/cola/permits/1110910367_1606871910.37/0/slf4j-api-1-7-5-sources-2-
jar/org/slf4j/helpers/MessageFormatter.java
* /opt/cola/permits/1110910367_1606871910.37/0/slf4j-api-1-7-5-sources-2-
jar/org/slf4j/helpers/FormattingTuple.java
* /opt/cola/permits/1110910367_1606871910.37/0/slf4j-api-1-7-5-sources-2-
jar/org/slf4j/impl/StaticMarkerBinder.java
* /opt/cola/permits/1110910367_1606871910.37/0/slf4j-api-1-7-5-sources-2-
jar/org/slf4j/helpers/NOPLoggerFactory.java
* /opt/cola/permits/1110910367_1606871910.37/0/slf4j-api-1-7-5-sources-2-
jar/org/slf4j/helpers/NOPMDCAdapter.java
* /opt/cola/permits/1110910367_1606871910.37/0/slf4j-api-1-7-5-sources-2-jar/org/slf4j/helpers/Util.java
* /opt/cola/permits/1110910367_1606871910.37/0/slf4j-api-1-7-5-sources-2-
jar/org/slf4j/helpers/SubstituteLoggerFactory.java
* /opt/cola/permits/1110910367_1606871910.37/0/slf4j-api-1-7-5-sources-2-jar/org/slf4j/MDC.java
* /opt/cola/permits/1110910367_1606871910.37/0/slf4j-api-1-7-5-sources-2-jar/org/slf4j/Marker.java
*
/opt/cola/permits/1110910367_1606871910.37/0/slf4j-api-1-7-5-sources-2-
jar/org/slf4j/helpers/MarkerIgnoringBase.java

```

## 1.238 unbound 1.11.0-1

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\* @version 3.0 (December 2000)

\*

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\*

\* @author Vincent Rijmen <vincent.rijmen@esat.kuleuven.ac.be>

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@vskip 20pt plus 1fil  
@end macro
```

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@macro copyrightstart{ }  
@end macro
```

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@macro copyrightend{ }  
@end macro
```

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@node Copyrights and Licenses, , Acknowledgments, Top  
@comment node-name, next, previous, up  
@appendix Copyrights and Licenses
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@version 3.0 (December 2000)

Optimised ANSI C code for the Rijndael cipher (now AES)

@author Vincent Rijmen <vincent.rijmen@esat.kuleuven.ac.be>

@author Antoon Bosselaers <antoon.bosselaers@esat.kuleuven.ac.be>

@author Paulo Barreto <paulo.barreto@terra.com.br>

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\* @version 3.0 (December 2000)

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\*

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\* @author Antoon Bosselaers <antoon.bosselaers@esat.kuleuven.ac.be>

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=====

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@heading Vincent Rijmen, Antoon Bosselaers, Paulo Barreto

AES in libcrypto

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rijndael-alg-fst.c

@version 3.0 (December 2000)

Optimised ANSI C code for the Rijndael cipher (now AES)

@author Vincent Rijmen <vincent.rijmen@esat.kuleuven.ac.be>  
@author Antoon Bosselaers <antoon.bosselaers@esat.kuleuven.ac.be>  
@author Paulo Barreto <paulo.barreto@terra.com.br>

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lib/hcrypto/test\_dh.c

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## 1.257 curl 7.64.1

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```

Found in path(s):

```
*/opt/cola/permits/1135840046_1613613019.19/0/asm-5-0-3-sources-7-jar/org/objectweb/asm/TypePath.java
*/opt/cola/permits/1135840046_1613613019.19/0/asm-5-0-3-sources-7-jar/org/objectweb/asm/TypeReference.java
```

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\*/

/\*\*

\* Creates a new { @link AnalyzerAdapter}. *Subclasses must not use this constructor*. Instead, they must use the { @link #AnalyzerAdapter(int, String, int, String, String, MethodVisitor)} version.

\*

\* @param owner

\*

the owner's class name.

\* @param access

\* the method's access flags (see { @link Opcodes}).

\* @param name

\* the method's name.

\* @param desc

\* the method's descriptor (see { @link Type Type}).

\* @param mv

\* the method visitor to which this adapter delegates calls. May

\* be `null`.

\* @throws IllegalStateException

\* If a subclass calls this constructor.

\*/

Found in path(s):

\* /opt/cola/permits/1135840046\_1613613019.19/0/asm-5-0-3-sources-7-jar/org/objectweb/asm/commons/AnalyzerAdapter.java

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```

```

/**
 * Creates a new {@link GeneratorAdapter}. Subclasses must not use this
 * constructor. Instead, they must use the
 * {@link #GeneratorAdapter(int, MethodVisitor, int, String, String)}
 * version.
 *
 * @param mv
 *         the
method visitor to which this adapter delegates calls.
 * @param access
 *         the method's access flags (see {@link Opcodes}).
 * @param name
 *         the method's name.
 * @param desc
 *         the method's descriptor (see {@link Type Type}).
 * @throws IllegalStateException
 *         If a subclass calls this constructor.
 */

```

Found in path(s):

\* /opt/cola/permits/1135840046\_1613613019.19/0/asm-5-0-3-sources-7-jar/org/objectweb/asm/commons/GeneratorAdapter.java

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\*/

/\*\*

\* Constructs a new {@link LocalVariableAnnotationNode}. <i>Subclasses must

\* not use this constructor</i>. Instead, they must use the

\* {@link #LocalVariableAnnotationNode(int, TypePath, LabelNode[], LabelNode[], int[], String)}

\* version.

\*

\* @param typeRef

\* a reference to the annotated type. See {@link TypeReference}.

\* @param typePath

\* the path to the annotated type argument, wildcard bound, array

\* element type, or static inner type within 'typeRef'. May be

```

*      <tt>null</tt> if the annotation targets 'typeRef' as a whole.
* @param start
*      the first instructions corresponding to the continuous ranges
*      that make the scope of this local variable (inclusive).
* @param end
*      the last instructions corresponding to the continuous ranges
*      that make the scope of this local variable (exclusive). This
*      array must have the same size as the 'start' array.
* @param index
*      the local variable's index in each range. This array must have
*      the same size as the 'start' array.
* @param desc
*      the class descriptor of
the annotation class.
*/

```

Found in path(s):

```

* /opt/cola/permits/1135840046_1613613019.19/0/asm-5-0-3-sources-7-
jar/org/objectweb/asm/tree/LocalVariableAnnotationNode.java

```

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\*/

/\*\*

\* Creates a new JSRInliner. *<i>Subclasses must not use this  
\* constructor</i>*. Instead, they must use the  
\* { @link #JSRInlinerAdapter(int, MethodVisitor, int, String, String, String, String[])}  
\* version.  
\*  
\* @param mv  
\*  
the `MethodVisitor` to send the resulting inlined  
\* method code to (use `null` for none).  
\* @param access  
\* the method's access flags (see { @link Opcodes}). This  
\* parameter also indicates if the method is synthetic and/or  
\* deprecated.  
\* @param name  
\* the method's name.  
\* @param desc  
\* the method's descriptor (see { @link Type}).  
\* @param signature  
\* the method's signature. May be `null`.  
\* @param exceptions  
\* the internal names of the method's exception classes (see  
\* { @link Type#getInternalName() getInternalName}). May be  
\* `null`.  
\* @throws IllegalStateException  
\* If a subclass calls this constructor.  
\*/

Found in path(s):

\* /opt/cola/permits/1135840046\_1613613019.19/0/asm-5-0-3-sources-7-  
jar/org/objectweb/asm/commons/JSRInlinerAdapter.java

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\* /opt/cola/permits/1135840046\_1613613019.19/0/asm-5-0-3-sources-7-jar/org/objectweb/asm/package.html  
\* /opt/cola/permits/1135840046\_1613613019.19/0/asm-5-0-3-sources-7-jar/org/objectweb/asm/tree/package.html  
\* /opt/cola/permits/1135840046\_1613613019.19/0/asm-5-0-3-sources-7-jar/org/objectweb/asm/signature/package.html

\*  
/opt/cola/permits/1135840046\_1613613019.19/0/asm-5-0-3-sources-7-jar/org/objectweb/asm/tree/analysis/package.html  
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\*/

/\*\*

\* Constructs a new {@link ClassNode}. <i>Subclasses must not use this  
\* constructor</i>. Instead, they must use the {@link #ClassNode(int)}  
\* version.

\*

\* @throws IllegalStateException

```
*      If a subclass calls this constructor.
*/
```

Found in path(s):

```
* /opt/cola/permits/1135840046_1613613019.19/0/asm-5-0-3-sources-7-jar/org/objectweb/asm/tree/ClassNode.java
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```

```
/**
```

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```

```
*/
```

```
/**
```

```
* Constructs a new {@link Textifier}. Subclasses must not use this
* constructor. Instead, they must use the {@link #Textifier(int)}
* version.
*
* @throws IllegalStateException
*      If a subclass calls this constructor.
*/
```

Found in path(s):

```
* /opt/cola/permits/1135840046_1613613019.19/0/asm-5-0-3-sources-7-jar/org/objectweb/asm/util/Textifier.java
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jar/org/objectweb/asm/xml/SAXClassAdapter.java

\* /opt/cola/permits/1135840046\_1613613019.19/0/asm-5-0-3-sources-7-

jar/org/objectweb/asm/xml/SAXAdapter.java

\*

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jar/org/objectweb/asm/xml/ASMContentHandler.java

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*/opt/cola/permits/1135840046_1613613019.19/0/asm-5-0-3-sources-7-jar/org/objectweb/asm/util/Textifiable.java
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\* /opt/cola/permits/1135840046\_1613613019.19/0/asm-5-0-3-sources-7-jar/org/objectweb/asm/Label.java  
\*  
/opt/cola/permits/1135840046\_1613613019.19/0/asm-5-0-3-sources-7-jar/org/objectweb/asm/Item.java  
\* /opt/cola/permits/1135840046\_1613613019.19/0/asm-5-0-3-sources-7-jar/org/objectweb/asm/commons/StaticInitMerger.java  
\* /opt/cola/permits/1135840046\_1613613019.19/0/asm-5-0-3-sources-7-jar/org/objectweb/asm/optimizer/MethodConstantsCollector.java  
\* /opt/cola/permits/1135840046\_1613613019.19/0/asm-5-0-3-sources-7-jar/org/objectweb/asm/AnnotationVisitor.java  
\* /opt/cola/permits/1135840046\_1613613019.19/0/asm-5-0-3-sources-7-jar/org/objectweb/asm/commons/RemappingMethodAdapter.java  
\* /opt/cola/permits/1135840046\_1613613019.19/0/asm-5-0-3-sources-7-jar/org/objectweb/asm/tree/analysis/Frame.java  
\* /opt/cola/permits/1135840046\_1613613019.19/0/asm-5-0-3-sources-7-jar/org/objectweb/asm/MethodVisitor.java  
\* /opt/cola/permits/1135840046\_1613613019.19/0/asm-5-0-3-sources-7-jar/org/objectweb/asm/tree/analysis/BasicValue.java  
\*  
/opt/cola/permits/1135840046\_1613613019.19/0/asm-5-0-3-sources-7-jar/org/objectweb/asm/ClassVisitor.java  
\* /opt/cola/permits/1135840046\_1613613019.19/0/asm-5-0-3-sources-7-jar/org/objectweb/asm/ClassWriter.java  
\* /opt/cola/permits/1135840046\_1613613019.19/0/asm-5-0-3-sources-7-jar/org/objectweb/asm/commons/Remapper.java  
\* /opt/cola/permits/1135840046\_1613613019.19/0/asm-5-0-3-sources-7-jar/org/objectweb/asm/tree/VarInsnNode.java  
\* /opt/cola/permits/1135840046\_1613613019.19/0/asm-5-0-3-sources-7-jar/org/objectweb/asm/commons/LocalVariablesSorter.java  
\* /opt/cola/permits/1135840046\_1613613019.19/0/asm-5-0-3-sources-7-jar/org/objectweb/asm/tree/AnnotationNode.java  
\* /opt/cola/permits/1135840046\_1613613019.19/0/asm-5-0-3-sources-7-jar/org/objectweb/asm/tree/TypeInsnNode.java  
\* /opt/cola/permits/1135840046\_1613613019.19/0/asm-5-0-3-sources-7-jar/org/objectweb/asm/util/TraceMethodVisitor.java  
\* /opt/cola/permits/1135840046\_1613613019.19/0/asm-5-0-3-sources-7-jar/org/objectweb/asm/Edge.java  
\*  
/opt/cola/permits/1135840046\_1613613019.19/0/asm-5-0-3-sources-7-jar/org/objectweb/asm/commons/Method.java  
\* /opt/cola/permits/1135840046\_1613613019.19/0/asm-5-0-3-sources-7-jar/org/objectweb/asm/tree/MethodNode.java  
\* /opt/cola/permits/1135840046\_1613613019.19/0/asm-5-0-3-sources-7-



```

jar/org/objectweb/asm/signature/SignatureWriter.java
* /opt/cola/permits/1135840046_1613613019.19/0/asm-5-0-3-sources-7-
jar/org/objectweb/asm/tree/LocalVariableNode.java
* /opt/cola/permits/1135840046_1613613019.19/0/asm-5-0-3-sources-7-
jar/org/objectweb/asm/tree/LookupSwitchInsnNode.java
* /opt/cola/permits/1135840046_1613613019.19/0/asm-5-0-3-sources-7-
jar/org/objectweb/asm/tree/analysis/BasicVerifier.java
* /opt/cola/permits/1135840046_1613613019.19/0/asm-5-0-3-sources-7-
jar/org/objectweb/asm/tree/FrameNode.java
* /opt/cola/permits/1135840046_1613613019.19/0/asm-5-0-3-sources-7-
jar/org/objectweb/asm/optimizer/AnnotationConstantsCollector.java
* /opt/cola/permits/1135840046_1613613019.19/0/asm-5-0-3-sources-7-jar/org/objectweb/asm/Frame.java
*
/opt/cola/permits/1135840046_1613613019.19/0/asm-5-0-3-sources-7-
jar/org/objectweb/asm/tree/ParameterNode.java
* /opt/cola/permits/1135840046_1613613019.19/0/asm-5-0-3-sources-7-
jar/org/objectweb/asm/tree/InnerClassNode.java
* /opt/cola/permits/1135840046_1613613019.19/0/asm-5-0-3-sources-7-
jar/org/objectweb/asm/optimizer/FieldConstantsCollector.java
* /opt/cola/permits/1135840046_1613613019.19/0/asm-5-0-3-sources-7-jar/org/objectweb/asm/ClassReader.java
* /opt/cola/permits/1135840046_1613613019.19/0/asm-5-0-3-sources-7-
jar/org/objectweb/asm/tree/MultiANewArrayInsnNode.java
* /opt/cola/permits/1135840046_1613613019.19/0/asm-5-0-3-sources-7-jar/org/objectweb/asm/ByteVector.java
* /opt/cola/permits/1135840046_1613613019.19/0/asm-5-0-3-sources-7-
jar/org/objectweb/asm/tree/InvokeDynamicInsnNode.java
* /opt/cola/permits/1135840046_1613613019.19/0/asm-5-0-3-sources-7-
jar/org/objectweb/asm/tree/TableSwitchInsnNode.java
* /opt/cola/permits/1135840046_1613613019.19/0/asm-5-0-3-sources-7-
jar/org/objectweb/asm/commons/RemappingClassAdapter.java
*
/opt/cola/permits/1135840046_1613613019.19/0/asm-5-0-3-sources-7-
jar/org/objectweb/asm/optimizer/JarOptimizer.java
* /opt/cola/permits/1135840046_1613613019.19/0/asm-5-0-3-sources-7-
jar/org/objectweb/asm/signature/SignatureReader.java
* /opt/cola/permits/1135840046_1613613019.19/0/asm-5-0-3-sources-7-
jar/org/objectweb/asm/optimizer/Shrinker.java
* /opt/cola/permits/1135840046_1613613019.19/0/asm-5-0-3-sources-7-
jar/org/objectweb/asm/tree/MethodInsnNode.java
* /opt/cola/permits/1135840046_1613613019.19/0/asm-5-0-3-sources-7-
jar/org/objectweb/asm/commons/TryCatchBlockSorter.java
* /opt/cola/permits/1135840046_1613613019.19/0/asm-5-0-3-sources-7-
jar/org/objectweb/asm/util/TraceAnnotationVisitor.java
* /opt/cola/permits/1135840046_1613613019.19/0/asm-5-0-3-sources-7-
jar/org/objectweb/asm/tree/analysis/Subroutine.java
* /opt/cola/permits/1135840046_1613613019.19/0/asm-5-0-3-sources-7-
jar/org/objectweb/asm/tree/TryCatchBlockNode.java
*

```

/opt/cola/permits/1135840046\_1613613019.19/0/asm-5-0-3-sources-7-jar/org/objectweb/asm/util/CheckMethodAdapter.java  
\* /opt/cola/permits/1135840046\_1613613019.19/0/asm-5-0-3-sources-7-jar/org/objectweb/asm/tree/LabelNode.java  
\* /opt/cola/permits/1135840046\_1613613019.19/0/asm-5-0-3-sources-7-jar/org/objectweb/asm/Context.java  
\* /opt/cola/permits/1135840046\_1613613019.19/0/asm-5-0-3-sources-7-jar/org/objectweb/asm/tree/analysis/Interpreter.java  
\* /opt/cola/permits/1135840046\_1613613019.19/0/asm-5-0-3-sources-7-jar/org/objectweb/asm/tree/analysis/SmallSet.java  
\* /opt/cola/permits/1135840046\_1613613019.19/0/asm-5-0-3-sources-7-jar/org/objectweb/asm/optimizer/Constant.java  
\* /opt/cola/permits/1135840046\_1613613019.19/0/asm-5-0-3-sources-7-jar/org/objectweb/asm/tree/analysis/SimpleVerifier.java  
\* /opt/cola/permits/1135840046\_1613613019.19/0/asm-5-0-3-sources-7-jar/org/objectweb/asm/tree/analysis/SourceValue.java  
\* /opt/cola/permits/1135840046\_1613613019.19/0/asm-5-0-3-sources-7-jar/org/objectweb/asm/MethodWriter.java  
\*  
/opt/cola/permits/1135840046\_1613613019.19/0/asm-5-0-3-sources-7-jar/org/objectweb/asm/tree/IntInsnNode.java  
\* /opt/cola/permits/1135840046\_1613613019.19/0/asm-5-0-3-sources-7-jar/org/objectweb/asm/Type.java  
\* /opt/cola/permits/1135840046\_1613613019.19/0/asm-5-0-3-sources-7-jar/org/objectweb/asm/tree/InsnList.java  
\* /opt/cola/permits/1135840046\_1613613019.19/0/asm-5-0-3-sources-7-jar/org/objectweb/asm/optimizer/MethodOptimizer.java  
\* /opt/cola/permits/1135840046\_1613613019.19/0/asm-5-0-3-sources-7-jar/org/objectweb/asm/tree/IncInsnNode.java  
\* /opt/cola/permits/1135840046\_1613613019.19/0/asm-5-0-3-sources-7-jar/org/objectweb/asm/util/CheckClassAdapter.java  
\* /opt/cola/permits/1135840046\_1613613019.19/0/asm-5-0-3-sources-7-jar/org/objectweb/asm/Handler.java  
\* /opt/cola/permits/1135840046\_1613613019.19/0/asm-5-0-3-sources-7-jar/org/objectweb/asm/util/CheckFieldAdapter.java  
\* /opt/cola/permits/1135840046\_1613613019.19/0/asm-5-0-3-sources-7-jar/org/objectweb/asm/tree/analysis/Analyzer.java  
\*  
/opt/cola/permits/1135840046\_1613613019.19/0/asm-5-0-3-sources-7-jar/org/objectweb/asm/FieldVisitor.java  
\* /opt/cola/permits/1135840046\_1613613019.19/0/asm-5-0-3-sources-7-jar/org/objectweb/asm/tree/FieldNode.java  
\* /opt/cola/permits/1135840046\_1613613019.19/0/asm-5-0-3-sources-7-jar/org/objectweb/asm/tree/LdcInsnNode.java  
\* /opt/cola/permits/1135840046\_1613613019.19/0/asm-5-0-3-sources-7-jar/org/objectweb/asm/tree/LineNumberNode.java  
\* /opt/cola/permits/1135840046\_1613613019.19/0/asm-5-0-3-sources-7-jar/org/objectweb/asm/commons/SerialVersionUIDAdder.java  
\* /opt/cola/permits/1135840046\_1613613019.19/0/asm-5-0-3-sources-7-jar/org/objectweb/asm/util/TraceSignatureVisitor.java  
\* /opt/cola/permits/1135840046\_1613613019.19/0/asm-5-0-3-sources-7-jar/org/objectweb/asm/AnnotationWriter.java  
\* /opt/cola/permits/1135840046\_1613613019.19/0/asm-5-0-3-sources-7-jar/org/objectweb/asm/util/TraceClassVisitor.java  
\* /opt/cola/permits/1135840046\_1613613019.19/0/asm-5-0-3-sources-7-jar/org/objectweb/asm/util/CheckAnnotationAdapter.java  
\*

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/opt/cola/permits/1135840046_1613613019.19/0/asm-5-0-3-sources-7-
jar/org/objectweb/asm/commons/SimpleRemapper.java
* /opt/cola/permits/1135840046_1613613019.19/0/asm-5-0-3-sources-7-
jar/org/objectweb/asm/tree/TypeAnnotationNode.java
* /opt/cola/permits/1135840046_1613613019.19/0/asm-5-0-3-sources-7-
jar/org/objectweb/asm/optimizer/ConstantPool.java
* /opt/cola/permits/1135840046_1613613019.19/0/asm-5-0-3-sources-7-
jar/org/objectweb/asm/commons/TableSwitchGenerator.java
* /opt/cola/permits/1135840046_1613613019.19/0/asm-5-0-3-sources-7-
jar/org/objectweb/asm/signature/SignatureVisitor.java
* /opt/cola/permits/1135840046_1613613019.19/0/asm-5-0-3-sources-7-
jar/org/objectweb/asm/tree/AbstractInsnNode.java
* /opt/cola/permits/1135840046_1613613019.19/0/asm-5-0-3-sources-7-
jar/org/objectweb/asm/optimizer/ClassConstantsCollector.java
* /opt/cola/permits/1135840046_1613613019.19/0/asm-5-0-3-sources-7-
jar/org/objectweb/asm/commons/RemappingFieldAdapter.java
*
/opt/cola/permits/1135840046_1613613019.19/0/asm-5-0-3-sources-7-
jar/org/objectweb/asm/commons/CodeSizeEvaluator.java
* /opt/cola/permits/1135840046_1613613019.19/0/asm-5-0-3-sources-7-
jar/org/objectweb/asm/tree/analysis/BasicInterpreter.java
* /opt/cola/permits/1135840046_1613613019.19/0/asm-5-0-3-sources-7-
jar/org/objectweb/asm/util/CheckSignatureAdapter.java
* /opt/cola/permits/1135840046_1613613019.19/0/asm-5-0-3-sources-7-jar/org/objectweb/asm/tree/InsnNode.java
* /opt/cola/permits/1135840046_1613613019.19/0/asm-5-0-3-sources-7-
jar/org/objectweb/asm/tree/analysis/AnalyzerException.java
* /opt/cola/permits/1135840046_1613613019.19/0/asm-5-0-3-sources-7-jar/org/objectweb/asm/FieldWriter.java
* /opt/cola/permits/1135840046_1613613019.19/0/asm-5-0-3-sources-7-
jar/org/objectweb/asm/tree/analysis/SourceInterpreter.java
* /opt/cola/permits/1135840046_1613613019.19/0/asm-5-0-3-sources-7-jar/org/objectweb/asm/Handle.java
*
/opt/cola/permits/1135840046_1613613019.19/0/asm-5-0-3-sources-7-
jar/org/objectweb/asm/commons/RemappingSignatureAdapter.java
* /opt/cola/permits/1135840046_1613613019.19/0/asm-5-0-3-sources-7-
jar/org/objectweb/asm/commons/AdviceAdapter.java
* /opt/cola/permits/1135840046_1613613019.19/0/asm-5-0-3-sources-7-jar/org/objectweb/asm/Attribute.java
* /opt/cola/permits/1135840046_1613613019.19/0/asm-5-0-3-sources-7-jar/org/objectweb/asm/Opcodes.java
* /opt/cola/permits/1135840046_1613613019.19/0/asm-5-0-3-sources-7-
jar/org/objectweb/asm/util/TraceFieldVisitor.java
* /opt/cola/permits/1135840046_1613613019.19/0/asm-5-0-3-sources-7-jar/org/objectweb/asm/util/ASMifier.java
* /opt/cola/permits/1135840046_1613613019.19/0/asm-5-0-3-sources-7-jar/org/objectweb/asm/util/Printer.java
* /opt/cola/permits/1135840046_1613613019.19/0/asm-5-0-3-sources-7-
jar/org/objectweb/asm/optimizer/NameMapping.java
* /opt/cola/permits/1135840046_1613613019.19/0/asm-5-0-3-sources-7-
jar/org/objectweb/asm/commons/RemappingAnnotationAdapter.java
*
/opt/cola/permits/1135840046_1613613019.19/0/asm-5-0-3-sources-7-
jar/org/objectweb/asm/tree/FieldInsnNode.java

```

```
* /opt/cola/permits/1135840046_1613613019.19/0/asm-5-0-3-sources-7-
jar/org/objectweb/asm/tree/JumpInsnNode.java
* /opt/cola/permits/1135840046_1613613019.19/0/asm-5-0-3-sources-7-
jar/org/objectweb/asm/commons/InstructionAdapter.java
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Found in path(s):

```
* /opt/cola/permits/1135840046_1613613019.19/0/asm-5-0-3-sources-7-
jar/org/objectweb/asm/optimizer/shrink.properties
* /opt/cola/permits/1135840046_1613613019.19/0/asm-5-0-3-sources-7-jar/org/objectweb/asm/optimizer/shrink-
writer.properties
* /opt/cola/permits/1135840046_1613613019.19/0/asm-5-0-3-sources-7-jar/org/objectweb/asm/optimizer/shrink-
resize.properties
*
/opt/cola/permits/1135840046_1613613019.19/0/asm-5-0-3-sources-7-jar/org/objectweb/asm/optimizer/shrink-
signatures.properties
* /opt/cola/permits/1135840046_1613613019.19/0/asm-5-0-3-sources-7-jar/org/objectweb/asm/optimizer/shrink-
annotations.properties
* /opt/cola/permits/1135840046_1613613019.19/0/asm-5-0-3-sources-7-jar/org/objectweb/asm/optimizer/shrink-
frames.properties
```

## 1.262 commons-logging 1.2

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\* /opt/cola/permits/1135840457\_1613613080.13/0/commons-logging-1-1-sources-9-  
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\* /opt/cola/permits/1135840457\_1613613080.13/0/commons-logging-1-1-sources-9-jar/org/apache/commons/logging/impl/WeakHashtable.java

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\* /opt/cola/permits/1135840457\_1613613080.13/0/commons-logging-1-1-sources-9-jar/org/apache/commons/logging/package.html

\* /opt/cola/permits/1135840457\_1613613080.13/0/commons-logging-1-1-sources-9-jar/org/apache/commons/logging/impl/package.html

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\* /opt/cola/permits/1135840457\_1613613080.13/0/commons-logging-1-1-sources-9-jar/org/apache/commons/logging/LogConfigurationException.java

\* /opt/cola/permits/1135840457\_1613613080.13/0/commons-logging-1-1-sources-9-

```
jar/org/apache/commons/logging/impl/Log4JLogger.java
* /opt/cola/permits/1135840457_1613613080.13/0/commons-logging-1-1-sources-9-
jar/org/apache/commons/logging/impl/LogFactoryImpl.java
*
/opt/cola/permits/1135840457_1613613080.13/0/commons-logging-1-1-sources-9-
jar/org/apache/commons/logging/impl/Jdk13LumberjackLogger.java
* /opt/cola/permits/1135840457_1613613080.13/0/commons-logging-1-1-sources-9-
jar/org/apache/commons/logging/impl/SimpleLog.java
* /opt/cola/permits/1135840457_1613613080.13/0/commons-logging-1-1-sources-9-
jar/org/apache/commons/logging/impl/Jdk14Logger.java
* /opt/cola/permits/1135840457_1613613080.13/0/commons-logging-1-1-sources-9-
jar/org/apache/commons/logging/LogSource.java
* /opt/cola/permits/1135840457_1613613080.13/0/commons-logging-1-1-sources-9-
jar/org/apache/commons/logging/impl/NoOpLog.java
* /opt/cola/permits/1135840457_1613613080.13/0/commons-logging-1-1-sources-9-
jar/org/apache/commons/logging/impl/LogKitLogger.java
* /opt/cola/permits/1135840457_1613613080.13/0/commons-logging-1-1-sources-9-
jar/org/apache/commons/logging/Log.java
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* /opt/cola/permits/1135840457_1613613080.13/0/commons-logging-1-1-sources-9-
jar/org/apache/commons/logging/impl/ServletContextCleaner.java
```

## 1.263 bcel 2.7.2

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\*/

/\*\*

\* This is a special exception that is used to stop parsing when  
\* search for an element. For instance, when searching  
\* for xml:stylesheet  
\* PIs, it is used to stop the parse once the document element is found.  
\* @see StylesheetPIHandler  
\* @xsl.usage internal  
\*/

Found in path(s):

\* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-  
jar/org/apache/xml/utils/StopParseException.java

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\*/

Found in path(s):



\* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xalan/transformer/QueuedEvents.java

\*

/opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xalan/xsltc/compiler/XslAttribute.java

\* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xml/dtm/ref/NodeLocator.java

\* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xml/serializer/ToStream.java

\* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xalan/xsltc/runtime/MessageHandler.java

\* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xalan/xsltc/dom/KeyIndex.java

\* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xml/utils/ElemDesc.java

\* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xalan/templates/ElemForEach.java

\* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xpath/patterns/ContextMatchStepPattern.java

\* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xpath/res/XPATHErrorResources\_zh.java

\*

/opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xpath/functions/FuncBoolean.java

\* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xalan/xsltc/compiler/util/NodeSetType.java

\* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xalan/xsltc/compiler/CurrentCall.java

\* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xalan/xsltc/trax/TransformerHandlerImpl.java

\* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xalan/xsltc/compiler/When.java

\* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xalan/xsltc/compiler/util/SecuritySupport.java

\* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xpath/axes/WalkingIteratorSorted.java

\* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xalan/templates/ElemWhen.java

\*

/opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xml/serializer/utils/SerializerMessages\_ja.java

\* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xml/utils/StylesheetPIHandler.java

\* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xpath/functions/FuncSubstring.java

\* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xalan/xsltc/trax/TrAXFilter.java

\* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xpath/functions/FuncConcat.java

\* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-

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jar/org/apache/xml/serializer/utils/SerializerMessages_zh_CN.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xalan/xsltc/compiler/util/ErrorMessage_ko.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xpath/functions/Function.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xalan/xsltc/trax/XSLTSource.java
*
/opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xpath/axes/AttributeIterator.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xml/utils/StringToIntTable.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xalan/xsltc/dom/LoadDocument.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xalan/xsltc/runtime/ObjectFactory.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xalan/transformer/NumeratorFormatter.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xml/serializer/utils/SerializerMessages_hu.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xalan/xsltc/runtime/SecuritySupport.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xalan/xsltc/compiler/util/ErrorMessage_zh.java
*
/opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xpath/operations/Equals.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xalan/xsltc/compiler/Pattern.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xalan/processor/ProcessorExsltFuncResult.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xalan/xsltc/DOMEhancedForDTM.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xml/serializer/SecuritySupport.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xalan/xsltc/dom/MatchingIterator.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xpath/functions/FuncNot.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xalan/processor/XSLTAttributeDef.java
*
/opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xml/utils/StringToStringTableVector.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xalan/xsltc/compiler/If.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xalan/xsltc/dom/ObjectFactory.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xml/serializer/SerializerTraceWriter.java

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\* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xpath/operations/Lt.java  
 \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xml/utils/PrefixResolver.java  
 \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xalan/res/XSLTErrorResources\_en.java  
 \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xml/serializer/ToTextSAXHandler.java  
 \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xml/utils/res/StringArrayWrapper.java  
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 /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xalan/xsltc/compiler/Choose.java  
 \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xalan/templates/ElemFallback.java  
 \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xalan/transformer/XalanProperties.java  
 \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xpath/functions/FuncUnparsedEntityURI.java  
 \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xalan/transformer/KeyIterator.java  
 \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xml/utils/DOM2Helper.java  
 \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xalan/xsltc/runtime/Hashtable.java  
 \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xalan/xsltc/dom/UnionIterator.java  
 \*  
 /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xalan/xsltc/dom/NthIterator.java  
 \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xalan/xsltc/compiler/Stylesheet.java  
 \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xalan/res/XSLTErrorResources\_sk.java  
 \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xalan/xsltc/compiler/XSLTC.java  
 \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xalan/xsltc/runtime/ErrorMessage\_pt\_BR.java  
 \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xalan/res/XSLMessages.java  
 \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xml/dtm/ref/DTMNodeProxy.java  
 \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xalan/xsltc/compiler/StartsWithCall.java  
 \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xml/serializer/ElemContext.java  
 \*  
 /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xpath/XPathProcessorException.java  
 \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xalan/xsltc/compiler/util/NodeCounterGenerator.java  
 \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-

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jar/org/apache/xalan/xsltc/compiler/util/ErrorMessage_zh_TW.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xml/Utils/res/XResources_he.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xpath/functions/FuncRound.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xalan/xsltc/compiler/util/MethodGenerator.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xalan/xsltc/compiler/IntExpr.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xalan/xsltc/compiler/Fallback.java
*
/opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xalan/xsltc/runtime/ErrorMessage_ja.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xml/Utils/DOMOrder.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xalan/xsltc/compiler/LangCall.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xalan/extensions/ExtensionsTable.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xpath/operations/Minus.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xml/Utils/res/CharArrayWrapper.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xalan/xsltc/compiler/CastExpr.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xalan/xsltc/runtime/ErrorMessage_pl.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xalan/extensions/ExtensionNamespaceSupport.java
*
/opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xml/Utils/ObjectFactory.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xalan/xsltc/TransletException.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xml/Utils/StringBufferPool.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xpath/operations/And.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xml/serializer/ToSAXHandler.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xpath/res/XPATHErrorResources_ca.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xalan/res/XSLTErrorResources_pl.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xml/serializer/Utils/SerializerMessages_zh_TW.java
*
/opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xml/serializer/Utils/SerializerMessages.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xalan/templates/AVTPartXPath.java

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\* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-  
 jar/org/apache/xml/serializer/ExtendedLexicalHandler.java  
 \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xpath/XPathVisitable.java  
 \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-  
 jar/org/apache/xalan/templates/WhiteSpaceInfo.java  
 \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-  
 jar/org/apache/xalan/trace/EndSelectionEvent.java  
 \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-  
 jar/org/apache/xpath/functions/FuncLang.java  
 \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-  
 jar/org/apache/xalan/xsltc/trax/DOM2SAX.java  
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 jar/org/apache/xml/utils/res/XResources\_ka.java  
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 jar/org/apache/xalan/transformer/TransformerIdentityImpl.java  
 \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xml/utils/IntVector.java  
 \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-  
 jar/org/apache/xalan/processor/ProcessorGlobalVariableDecl.java  
 \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-  
 jar/org/apache/xml/res/XMLErrorResources\_tr.java  
 \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-  
 jar/org/apache/xpath/axes/PredicatedNodeTest.java  
 \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-  
 jar/org/apache/xpath/compiler/OpCodes.java  
 \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-  
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 \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-  
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 jar/org/apache/xml/serializer/utils/SerializerMessages\_de.java  
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 jar/org/apache/xalan/xsltc/util/IntegerArray.java  
 \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-  
 jar/org/apache/xalan/xsltc/compiler/util/ErrorMessage\_pt\_BR.java  
 \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xpath/objects/XString.java  
 \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-  
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 /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-  
 jar/org/apache/xpath/axes/DescendantIterator.java

\* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-  
 jar/org/apache/xml/serializer/ToXMLStream.java  
 \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xpath/objects/XNodeSet.java  
 \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-  
 jar/org/apache/xalan/templates/ElemText.java  
 \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-  
 jar/org/apache/xalan/xsltc/runtime/ErrorMessage.java  
 \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-  
 jar/org/apache/xalan/xsltc/trax/SecuritySupport.java  
 \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-  
 jar/org/apache/xalan/xsltc/compiler/FilterParentPath.java  
 \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-  
 jar/org/apache/xalan/xsltc/compiler/Sort.java  
 \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-  
 jar/org/apache/xpath/functions/FuncLast.java  
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 /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-  
 jar/org/apache/xalan/xsltc/compiler/CeilingCall.java  
 \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-  
 jar/org/apache/xpath/functions/Function3Args.java  
 \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xml/utils/URI.java  
 \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xpath/XPath.java  
 \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-  
 jar/org/apache/xalan/xsltc/compiler/util/RealType.java  
 \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-  
 jar/org/apache/xalan/templates/DecimalFormatProperties.java  
 \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-  
 jar/org/apache/xpath/res/XPATHErrorResources\_pt\_BR.java  
 \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-  
 jar/org/apache/xml/serializer/NamespaceMappings.java  
 \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-  
 jar/org/apache/xalan/res/XSLTErrorsResources\_zh.java  
 \*  
 /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-  
 jar/org/apache/xalan/xsltc/compiler/AttributeValue.java  
 \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-  
 jar/org/apache/xalan/transformer/NodeSortKey.java  
 \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-  
 jar/org/apache/xml/res/XMLErrorResources\_ko.java  
 \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-  
 jar/org/apache/xalan/res/XSLTErrorsResources\_tr.java  
 \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-  
 jar/org/apache/xml/utils/res/XResourceBundleBase.java  
 \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xml/dtm/DTMFilter.java  
 \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-  
 jar/org/apache/xalan/xsltc/compiler/Key.java  
 \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-  
 jar/org/apache/xml/utils/res/XResources\_cy.java

\*  
/opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xpath/functions/FuncId.java  
\* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xalan/xsltc/compiler/ContainsCall.java  
\* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xml/res/XMLErrorResources\_zh\_TW.java  
\* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xpath/res/XPATHErrorResources\_sv.java  
\* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xml/utils/res/LongArrayWrapper.java  
\* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xalan/templates/ElemPI.java  
\* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xalan/lib/sql/SecuritySupport.java  
\* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xalan/xsltc/runtime/output/StringOutputBuffer.java  
\* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xml/utils/XMLStringDefault.java  
\*  
/opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xml/dtm/ref/IncrementalSAXSource\_Xerces.java  
\* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xml/utils/res/XResources\_ko.java  
\* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xalan/xsltc/dom/NodeSortRecord.java  
\* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xpath/functions/FuncNormalizeSpace.java  
\* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xalan/xsltc/compiler/util/RtMethodGenerator.java  
\* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xml/dtm/ref/DTMSafeStringPool.java  
\* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xalan/xsltc/compiler/util/ErrorMessage\_ca.java  
\* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xalan/xsltc/runtime/BasisLibrary.java  
\*  
/opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xalan/xsltc/runtime/Parameter.java  
\* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xalan/xsltc/compiler/util/ErrorMessage\_pl.java  
\* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xpath/objects/XNodeSetForDOM.java  
\* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xml/utils/res/XResources\_es.java  
\* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xalan/templates/ElemCopy.java  
\* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xml/serializer/SerializerConstants.java  
\* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-

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jar/org/apache/xml/serializer/dom3/LSSerializerImpl.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xalan/xsltc/compiler/VariableRefBase.java
*
/opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xml/utils/XMLStringFactoryDefault.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xalan/transformer/KeyManager.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xalan/templates/ElemComment.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xalan/xsltc/compiler/AttributeSet.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xpath/compiler/Lexer.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xml/serializer/DOM3Serializer.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xalan/xsltc/compiler/Predicate.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xml/utils/NodeVector.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xml/utils/SuballocatedIntVector.java
*
/opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xalan/xsltc/dom/SingleNodeCounter.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xml/utils/SerializableLocatorImpl.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xml/dtm/ref/DTMNodeIterator.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xalan/xslt/EnvironmentCheck.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xml/utils/res/XResources_fr.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xalan/lib/ExsltStrings.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xml/utils/res/XResourceBundle.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xalan/templates/XUnresolvedVariableSimple.java
*
/opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xalan/xsltc/compiler/util/ErrorMessage_tr.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xml/utils/res/XResources_zh_TW.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xalan/xsltc/compiler/AlternativePattern.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xpath/operations/Neg.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xpath/NodeSet.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xpath/objects/XNull.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xml/serializer/dom3/DOMErrorHandlerImpl.java

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\* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xml/dtm/ref/IncrementalSAXSource.java  
 \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xalan/xsltc/compiler/util/MultiHashtable.java  
 \*  
 /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xpath/objects/XRTreeFrag.java  
 \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xalan/templates/ElemNumber.java  
 \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xalan/processor/ProcessorNamespaceAlias.java  
 \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xalan/trace/TraceManager.java  
 \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xpath/objects/XObject.java  
 \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xalan/templates/ElemExtensionScript.java  
 \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xalan/transformer/ClonerToResultTree.java  
 \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xalan/templates/AVTPart.java  
 \*  
 /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xalan/xsltc/cmdline/getopt/GetOptsException.java  
 \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xalan/xsltc/DOM.java  
 \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xalan/serialize/DOMSerializer.java  
 \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xalan/templates/ElemIf.java  
 \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xalan/processor/ProcessorGlobalParamDecl.java  
 \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xalan/extensions/ExtensionNamespaceContext.java  
 \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xpath/axes/ChildIterator.java  
 \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xalan/xsltc/compiler/PositionCall.java  
 \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xalan/templates/ElemApplyImport.java  
 \*  
 /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xalan/xsltc/compiler/ParameterRef.java  
 \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xalan/xsltc/compiler/Template.java  
 \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xml/res/XMLErrorResources\_sk.java  
 \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xml/serializer/dom3/DOMLocatorImpl.java  
 \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xalan/processor/ProcessorStylesheetElement.java  
 \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-

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jar/org/apache/xpath/compiler/PsuedoNames.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xalan/xsltc/dom/SecuritySupport.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xalan/transformer/TransformSnapshotImpl.java
*
/opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xalan/xsltc/compiler/util/Util.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xalan/xslt/SecuritySupport.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xml/dtm/DTMDOMException.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xalan/xsltc/compiler/RoundCall.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xalan/templates/ElemApplyTemplates.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xalan/processor/StylesheetHandler.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xml/dtm/ref/sax2dtm/SAX2RTFDTM.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xalan/xsltc/compiler/ObjectFactory.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xalan/trace/PrintTraceListener.java
*
/opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xml/serializer/SerializationHandler.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xalan/trace/TracerEvent.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xalan/xsltc/compiler/FloorCall.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xml/utils/FastStringBuffer.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xml/dtm/ref/sax2dtm/SAX2DTM2.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xml/dtm/ref/CustomStringPool.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xalan/xsltc/dom/DOMWSFilter.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xalan/extensions/ExpressionContext.java
*
/opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xpath/functions/FunctionDef1Arg.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xpath/axes/OneStepIterator.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xalan/xsltc/compiler/SimpleAttributeValue.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-

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jar/org/apache/xpath/axes/FilterExprWalker.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xalan/res/XSLTErrorResources_sv.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xml/res/XMLTErrorResources_pl.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xalan/res/XSLTErrorResources.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xpath/functions/FuncTranslate.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xalan/xsltc/compiler/ValueOf.java
*
/opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xalan/xsltc/runtime/Operators.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xalan/xsltc/compiler/ParentLocationPath.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xalan/transformer/TreeWalker2Result.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xalan/xsltc/compiler/UnparsedEntityUriCall.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xalan/xsltc/compiler/BooleanCall.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xpath/functions/FuncSubstringBefore.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xml/utils/NameSpace.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xalan/xsltc/compiler/NameBase.java
*
/opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xalan/xsltc/dom/MultiDOM.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xpath/CachedXPathAPI.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xalan/xsltc/compiler/KeyPattern.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xml/utils/ObjectVector.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xalan/xsltc/runtime/ErrorMessage tr.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xpath/res/XPATHErrorsResources_zh_CN.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xml/utils/RawCharacterHandler.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xalan/lib/sql/ObjectArray.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xalan/xsltc/compiler/BinOpExpr.java
*
/opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xalan/xsltc/compiler/ProcessingInstruction.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xml/utils/DOMBuilder.java

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* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xml/utils/SystemIDResolver.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xml/serializer/WriterToASCI.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xalan/xsltc/runtime/ErrorMessage_ru.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xml/dtm/DTM.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xalan/xsltc/compiler/util/BooleanType.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xalan/xsltc/compiler/LogicalExpr.java
*
/opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xml/serializer/utils/Messages.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xml/utils/MutableAttrListImpl.java
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* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xalan/xsltc/compiler/util/Type.java
*
/opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xalan/xsltc/compiler/util/AttributeSetMethodGenerator.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xpath/objects/XStringForChars.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xalan/xsltc/dom/DOMBuilder.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xpath/XPathFactory.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xalan/lib/NodeInfo.java
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jar/org/apache/xalan/processor/ProcessorDecimalFormat.java
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jar/org/apache/xalan/transformer/XSLInfiniteLoopException.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xml/serializer/Utils/SerializerMessages_ko.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xalan/xsltc/compiler/Mode.java
*
/opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
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* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
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* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
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* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
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* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
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* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
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* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
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/opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
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* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xalan/trace/TraceListenerEx3.java
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 \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-  
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 jar/org/apache/xml/utils/WrongParserException.java  
 \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xpath/XPathException.java  
 \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-  
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 jar/org/apache/xml/utils/StringToStringTable.java  
 \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xalan/lib/ExsltDynamic.java  
 \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-  
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 jar/org/apache/xml/utils/XMLCharacterRecognizer.java  
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 \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-  
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 /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-  
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 \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xpath/SourceTree.java  
 \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-  
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/opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xpath/axes/IteratorPool.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xalan/xsltc/DOMCache.java
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jar/org/apache/xalan/templates/ElemAttributeSet.java
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* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xml/utils/res/IntArrayWrapper.java
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jar/org/apache/xpath/patterns/StepPattern.java
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jar/org/apache/xalan/res/XSLTErrorResources_ca.java
*
/opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xpath/jaxp/XPathExpressionImpl.java
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jar/org/apache/xalan/extensions/XPathFunctionImpl.java
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\* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xpath/res/XPATHErrorResources\_pl.java  
\* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xml/utils/res/XResources\_it.java  
\* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xalan/lib/ExsltMath.java  
\* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xalan/templates/ElemExsltFunction.java  
\* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xalan/templates/ElemEmpty.java  
\* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xalan/xsltc/runtime/output/TransletOutputHandlerFactory.java  
\* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-

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jar/org/apache/xml/serializer/utils/SerializerMessages_sv.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xalan/processor/WhitespaceInfoPaths.java
*
/opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xpath/axes/PathComponent.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xalan/transformer/SerializerSwitcher.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xpath/operations/Variable.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xalan/xsltc/compiler/RelationalExpr.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xml/utils/WrappedRuntimeException.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xpath/res/XPATHErrorResources_it.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xpath/NodeSetDTM.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xalan/templates/ElemSort.java
*
/opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xalan/xsltc/runtime/AttributeList.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xpath/res/XPATHErrorResources_hu.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xml/dtm/ref/DTMAxisIterNodeList.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xpath/operations/Number.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xpath/compiler/OpMapVector.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xml/utils/StringVector.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xalan/xsltc/runtime/StringValueHandler.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xpath/operations/Operation.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xpath/functions/FuncString.java
*
/opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xalan/templates/ElemUse.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xml/dtm/ref/DTMManagerDefault.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xalan/lib/PipeDocument.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xalan/lib/Extensions.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xalan/xsltc/compiler/util/TypeCheckError.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xalan/lib/sql/SQLDocument.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-

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jar/org/apache/xpath/res/XPATHErrorResources\_cs.java  
 \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-  
 jar/org/apache/xalan/xsltc/runtime/ErrorMessage\_zh\_TW.java  
 \*  
 /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-  
 jar/org/apache/xalan/xsltc/dom/StepIterator.java  
 \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-  
 jar/org/apache/xalan/xsltc/trax/TemplatesHandlerImpl.java  
 \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-  
 jar/org/apache/xml/serializer/XSLOutputAttributes.java  
 \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-  
 jar/org/apache/xalan/xsltc/compiler/Text.java  
 \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xml/utils/IntStack.java  
 \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-  
 jar/org/apache/xalan/transformer/StackGuard.java  
 \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-  
 jar/org/apache/xalan/xsltc/compiler/util/IntType.java  
 \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-  
 jar/org/apache/xalan/xsltc/compiler/CompilerException.java  
 \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-  
 jar/org/apache/xpath/functions/FuncSubstringAfter.java  
 \*  
 /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-  
 jar/org/apache/xalan/xsltc/dom/CachedNodeListIterator.java  
 \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-  
 jar/org/apache/xalan/templates/TemplateSubPatternAssociation.java  
 \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-  
 jar/org/apache/xml/utils/res/XResources\_zh\_CN.java  
 \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-  
 jar/org/apache/xalan/xsltc/runtime/ErrorMessage\_sk.java  
 \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-  
 jar/org/apache/xalan/xsltc/compiler/NamespaceUriCall.java  
 \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-  
 jar/org/apache/xpath/functions/FuncNamespace.java  
 \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-  
 jar/org/apache/xml/res/XMLErrorResources\_it.java  
 \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-  
 jar/org/apache/xalan/xsltc/runtime/Constants.java  
 \*  
 /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-  
 jar/org/apache/xml/dtm/ref/sax2dtm/SAX2DTM.java  
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 jar/org/apache/xml/utils/SAXSourceLocator.java  
 \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-  
 jar/org/apache/xalan/xsltc/compiler/util/MarkerInstruction.java  
 \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-  
 jar/org/apache/xalan/xsltc/CollatorFactory.java  
 \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-

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jar/org/apache/xalan/xsltc/compiler/util/ErrorMessageSk.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xml/serializer/utils/SerializerMessages_pt_BR.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xml/serializer/utils/SerializerMessages_es.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xalan/xsltc/compiler/UnsupportedElement.java
*
/opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xalan/res/XSLTErrorResources_ru.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xalan/xsltc/compiler/util/StringType.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xalan/xsltc/cmdline/ObjectFactory.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xalan/templates/ElemVariable.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xpath/operations/Or.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xalan/xsltc/compiler/util/ErrorMessageSk.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xalan/xsltc/dom/EmptyFilter.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xml/serializer/utils/SerializerMessages_sk.java
*
/opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xalan/res/XSLTErrorResources_sl.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xalan/templates/KeyDeclaration.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xalan/xsltc/compiler/TestSeq.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xalan/xsltc/compiler/util/StringStack.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xalan/extensions/ExtensionHandlerExsltFunction.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xalan/xsltc/runtime/Node.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xalan/lib/sql/DTMDocument.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xalan/xsltc/cmdline/Transform.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xml/utils/res/XResources_en.java
*
/opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xalan/xsltc/dom/SortingIterator.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xpath/compiler/XPathParser.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-

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jar/org/apache/xml/serializer/WriterToUTF8Buffered.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xalan/xsltc/compiler/NotCall.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xalan/xsltc/compiler/StringCall.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xalan/lib/ExsltCommon.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xalan/lib/sql/XConnection.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xpath/functions/SecuritySupport.java
*
/opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xalan/res/XSLTErrorResources_ja.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xalan/processor/ProcessorExsltFunction.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xpath/res/XPATHErrorResources_ko.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xalan/processor/ProcessorUnknown.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xpath/domapi/XPathNamespaceImpl.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xpath/operations/Mod.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xalan/xsltc/compiler/AbsolutePathPattern.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xalan/xsltc/compiler/Variable.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xml/utils/AttList.java
*
/opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xalan/xsltc/compiler/FilterExpr.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xpath/axes/ReverseAxesWalker.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xpath/patterns/UnionPattern.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xml/res/XMLErrorResources_ja.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xpath/XPathContext.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xalan/xsltc/compiler/Include.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xalan/templates/ElemWithParam.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xalan/xsltc/dom/CurrentNodeListFilter.java
*
/opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xalan/xsltc/compiler/util/MethodType.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xpath/WhitespaceStrippingElementMatcher.java

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\* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xalan/xsltc/compiler/Attribute.java

\* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xalan/xsltc/compiler/CopyOf.java

\* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xalan/xsltc/runtime/Attributes.java

\* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xpath/axes/MatchPatternIterator.java

\* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xalan/xsltc/dom/DupFilterIterator.java

\* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xalan/xsltc/NodeIterator.java

\* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xalan/xsltc/compiler/DecimalFormatting.java

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/opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xpath/XPathVisitor.java

\* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xalan/res/XSLTErrorResources\_ko.java

\* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xalan/transformer/XalanTransformState.java

\* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xalan/templates/ElemVariablePseudo.java

\* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xpath/axes/FilterExprIterator.java

\* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xalan/xsltc/runtime/ErrorMessage\_es.java

\* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xalan/xsltc/compiler/util/ErrorMessage\_hu.java

\* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xml/res/XMLErrorResources\_ru.java

\*

/opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xml/serializer/Utils/SerializerMessages\_pl.java

\* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xpath/Expression.java

\* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xml/serializer/TransformStateSetter.java

\* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xpath/domapi/XPathEvaluatorImpl.java

\* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xalan/templates/ElemExtensionCall.java

\* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xpath/axes/RTFIterator.java

\* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xml/dtm/ref/DTMNodeListBase.java

\* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xpath/axes/LocPathIterator.java

\* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xml/res/XMLErrorResources\_pt\_BR.java

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/opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
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* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xml/utils/ObjectPool.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
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* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xml/dtm/ref/DTMNamedNodeMap.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xalan/xslt/ObjectFactory.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xml/utils/XMLString.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
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* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
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*
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* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
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* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xalan/extensions/SecuritySupport.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xml/utils/BoolStack.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xpath/FoundIndex.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xml/serializer/dom3/DOMStringListImpl.java
*
/opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xalan/res/XSLTErrorResources_it.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xpath/functions/FuncExtElementAvailable.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xml/dtm/DTMIterator.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xalan/xsltc/compiler/ArgumentList.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xpath/objects/DTMXRTreeFrag.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xalan/xsltc/compiler/AnccestorPattern.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xpath/axes/WalkingIterator.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xalan/xsltc/compiler/EqualityExpr.java
*

```

/opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-  
 jar/org/apache/xpath/res/XPATHErrorResources\_en.java  
 \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-  
 jar/org/apache/xpath/axes/ChildTestIterator.java  
 \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-  
 jar/org/apache/xalan/xsltc/compiler/ForEach.java  
 \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-  
 jar/org/apache/xpath/res/XPATHErrorResources\_de.java  
 \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-  
 jar/org/apache/xml/utils/StringComparable.java  
 \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-  
 jar/org/apache/xalan/xsltc/compiler/Expression.java  
 \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-  
 jar/org/apache/xalan/templates/XSLTVisitor.java  
 \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-  
 jar/org/apache/xalan/xsltc/compiler/LiteralExpr.java  
 \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-  
 jar/org/apache/xalan/xsltc/compiler/ApplyImports.java  
 \*  
 /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-  
 jar/org/apache/xalan/lib/sql/ConnectionPoolManager.java  
 \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-  
 jar/org/apache/xalan/processor/ProcessorAttributeSet.java  
 \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xpath/operations/Quo.java  
 \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xml/utils/NSInfo.java  
 \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-  
 jar/org/apache/xalan/extensions/ExtensionHandlerJavaClass.java  
 \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-  
 jar/org/apache/xml/serializer/dom3/DOMConstants.java  
 \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-  
 jar/org/apache/xml/dtm/ref/ExpandedNameTable.java  
 \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-  
 jar/org/apache/xalan/xsltc/compiler/QName.java  
 \*  
 /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xml/dtm/DTMManager.java  
 \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-  
 jar/org/apache/xalan/xsltc/compiler/GenerateIdCall.java  
 \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xml/utils/QName.java  
 \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-  
 jar/org/apache/xalan/transformer/TransformSnapshot.java  
 \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-  
 jar/org/apache/xml/serializer/utils/SerializerMessages\_ca.java  
 \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-  
 jar/org/apache/xalan/lib/sql/QueryParameter.java  
 \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-  
 jar/org/apache/xalan/xsltc/compiler/util/ErrorMessage\_es.java  
 \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-  
 jar/org/apache/xalan/processor/ProcessorOutputElem.java

\* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xalan/xsltc/compiler/Param.java

\*

/opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xalan/xsltc/compiler/AttributeValueTemplate.java

\* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xalan/extensions/ObjectFactory.java

\* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xpath/res/XPATHErrorResources\_ru.java

\* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xalan/xsltc/compiler/util/SlotAllocator.java

\* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xalan/xsltc/compiler/Number.java

\* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xml/utils/res/XResources\_el.java

\* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xalan/transformer/TransformerHandlerImpl.java

\* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xalan/xsltc/trax/DOM2TO.java

\*

/opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xalan/templates/Stylesheet.java

\* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xpath/VariableStack.java

\* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xml/dtm/DTMWSFilter.java

\* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xpath/axes/FilterExprIteratorSimple.java

\* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xalan/res/XSLTErrorsResources\_zh\_CN.java

\* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xalan/xsltc/dom/MultiValuedNodeHeapIterator.java

\* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xalan/res/XSLTErrorsResources\_zh\_TW.java

\* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xalan/templates/ElemElement.java

\*

/opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xalan/xsltc/compiler/ConcatCall.java

\* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xalan/res/XSLTErrorsResources\_de.java

\* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xalan/transformer/ResultNamespace.java

\* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xalan/processor/ProcessorLRE.java

\* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xml/serializer/utils/SerializerMessages\_fr.java

\* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xalan/xsltc/trax/ObjectFactory.java

\* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-

```
jar/org/apache/xml/utils/res/XResources_ja_JP_A.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xpath/operations/Gt.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xml/res/XMLErrorResources_fr.java
*
/opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xml/res/XMLErrorResources_cs.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xml/dtm/DTMConfigurationException.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xml/dtm/ref/DTMNodeList.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xml/dtm/Axis.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xalan/templates/XUnresolvedVariable.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xpath/functions/FuncFalse.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xalan/xsltc/compiler/SecuritySupport.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xalan/xsltc/compiler/util/ErrorMessage_sl.java
*
/opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xalan/xsltc/dom/AbsoluteIterator.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xalan/xsltc/dom/CurrentNodeListIterator.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xalan/xsltc/compiler/IllegalCharException.java
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* limitations under the License.
*/
/*
* $Id: Version.src 1225426 2011-12-29 04:13:08Z mrglavas $
```

```

*/
package org.apache.xalan;

/**
 * Administrative
 * class to keep track of the version number of
 * the Xalan release.
 * <P>This class implements the upcoming standard of having
 * org.apache.project-name.Version.getVersion() be a standard way
 * to get version information. This class will replace the older
 * org.apache.xalan.processor.Version class.</P>
 * <P>See also: org/apache/xalan/res/XSLTInfo.properties for
 * information about the version of the XSLT spec we support.</P>
 * @xsl.usage general
 */
public class Version
{

/**
 * Get the basic version string for the current Xalan release.
 * Version String formatted like
 * <CODE>"<B>Xalan</B> <B>Java</B> v.r[.dd] <B>D</B>]</CODE>.
 *
 * Futurework: have this read version info from jar manifest.
 *
 * @return String denoting our current version
 */
public static String getVersion()
{
    return getProduct()+" "+getImplementationLanguage()+" "
        +getMajorVersionNum()+". "+getReleaseVersionNum()+". "

        +( (getDevelopmentVersionNum() > 0) ?
            ("D"+getDevelopmentVersionNum()) : (""+getMaintenanceVersionNum()));
}

/**
 * Print the processor version to the command line.
 *
 * @param argv command line arguments, unused.
 */
public static void main(String argv[])
{
    System.out.println(getVersion());
}

/**
 * Name of product: Xalan.

```

```

*/
public static String getProduct()
{
    return "Xalan";
}

/**
 * Implementation Language: Java.
 */
public static String getImplementationLanguage()
{
    return "Java";
}

/**
 * Major version number.
 * Version number. This changes only when there is a
 *     significant, externally apparent enhancement from
 *     the previous release. 'n' represents the n'th
 *     version.
 *
 *     Clients should carefully consider the implications
 *     of new versions as external interfaces and behaviour
 *
 *     may have changed.
 */
public static int getMajorVersionNum()
{
    return @version.VERSION@;
}

/**
 * Release Number.
 * Release number. This changes when:
 *     - a new set of functionality is to be added, eg,
 *       implementation of a new W3C specification.
 *     - API or behaviour change.
 *     - its designated as a reference release.
 */
public static int getReleaseVersionNum()
{
    return @version.RELEASE@;
}

/**
 * Maintenance Drop Number.

```



```

* Optional identifier used to designate maintenance
*   drop applied to a specific release and contains
*   fixes for defects reported. It maintains compatibility
*   with the release and contains no API changes.
*   When missing, it designates the final and complete
*   development drop for a release.
*/
public static int getMaintenanceVersionNum()
{
    return
    @version.MINOR@;
}

/**
* Development Drop Number.
* Optional identifier designates development drop of
*   a specific release. D01 is the first development drop
*   of a new release.
*
*   Development drops are works in progress towards a
*   completed, final release. A specific development drop
*   may not completely implement all aspects of a new
*   feature, which may take several development drops to
*   complete. At the point of the final drop for the
*   release, the D suffix will be omitted.
*
*   Each 'D' drops can contain functional enhancements as
*   well as defect fixes. 'D' drops may not be as stable as
*   the final releases.
*/
public static int getDevelopmentVersionNum()
{
    try {
        if ((new String("@version.DEVELOPER@")).length() == 0)
            return 0;
        else
            return Integer.parseInt("@version.DEVELOPER@");
    } catch (NumberFormatException nfe) {
        return 0;
    }
}
}
}

```

Found in path(s):

\* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xalan/Version.src

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*/
/*
* $Id: Version.src 468654 2006-10-28 07:09:23Z minchau $
*/
package org.apache.xml.serializer;

/**
 * Administrative class to keep track of the version number of
 * the Serializer release.
 * <P>This class implements the upcoming standard of having
 * org.apache.project-name.Version.getVersion() be a standard way
 * to get version information.</P>
 * @xsl.usage general
 */
public final class Version
{
    /**
     * Get the basic version string for the current Serializer.
     * Version String formatted like
     * <CODE>"<B>Serializer</B> <B>Java</B> v.r[.dd| <B>D</B>nn]"</CODE>.
     *
     * Futurework: have this read version info from jar manifest.
     *
     * @return String denoting our current version
     */
    public static String getVersion()
    {
        return getProduct()+" "+getImplementationLanguage()+" "
            +getMajorVersionNum()+"."+getReleaseVersionNum()+"."
            +(getDevelopmentVersionNum() > 0) ?
                ("D"+getDevelopmentVersionNum()) : (""+getMaintenanceVersionNum());
    }
}

```

```

/**
 * Print the processor version to the command
line.
 *
 * @param argv command line arguments, unused.
 */
public static void main(String argv[])
{
    System.out.println(getVersion());
}

/**
 * Name of product: Serializer.
 */
public static String getProduct()
{
    return "Serializer";
}

/**
 * Implementation Language: Java.
 */
public static String getImplementationLanguage()
{
    return "Java";
}

/**
 * Major version number.
 * Version number. This changes only when there is a
 * significant, externally apparent enhancement from
 * the previous release. 'n' represents the n'th
 * version.
 *
 * Clients should carefully consider the implications
 * of new versions as external interfaces and behaviour
 * may have changed.
 */
public static int getMajorVersionNum()
{
    return @version.VERSION@;
}

/**
 * Release Number.

```

```

* Release number. This
changes when:
*     - a new set of functionality is to be added, eg,
*       implementation of a new W3C specification.
*     - API or behaviour change.
*     - its designated as a reference release.
*/
public static int getReleaseVersionNum()
{
    return @version.RELEASE@;
}

/**
* Maintenance Drop Number.
* Optional identifier used to designate maintenance
* drop applied to a specific release and contains
* fixes for defects reported. It maintains compatibility
* with the release and contains no API changes.
* When missing, it designates the final and complete
* development drop for a release.
*/
public static int getMaintenanceVersionNum()
{
    return @version.MINOR@;
}

/**
* Development Drop Number.
* Optional identifier designates development drop of
* a specific release. D01 is the first development
drop
* of a new release.
*
* Development drops are works in progress towards a
* completed, final release. A specific development drop
* may not completely implement all aspects of a new
* feature, which may take several development drops to
* complete. At the point of the final drop for the
* release, the D suffix will be omitted.
*
* Each 'D' drops can contain functional enhancements as
* well as defect fixes. 'D' drops may not be as stable as
* the final releases.
*/
public static int getDevelopmentVersionNum()
{
    try {
        if ((new String("@version.DEVELOPER@")).length() == 0)

```

```
    return 0;
else
    return Integer.parseInt("@version.DEVELOPER@");
} catch (NumberFormatException nfe) {
    return 0;
}
}
}
```

Found in path(s):

\* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xml/serializer/Version.src  
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 * distributed under the License is distributed on an "AS IS" BASIS,
 * WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied.
 * See the License for the specific language governing permissions and
 * limitations under the License.
 */
```

Found in path(s):

\* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xalan/xsltc/compiler/XPathLexer.java  
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```

```
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* limitations under the License.
*/
// Proprietary
/** The 'document-location()' id (Proprietary). */
```

Found in path(s):

```
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xpath/compiler/FunctionTable.java
```

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* See the License for the specific language governing permissions and
* limitations under the License.
```

```
*/
/**
* Major version number.
* Version number. This changes only when there is a
* significant, externally apparent
enhancement from
* the previous release. 'n' represents the n'th
* version.
*
* Clients should carefully consider the implications
* of new versions as external interfaces and behaviour
* may have changed.
*/
```

Found in path(s):

```
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xml/serializer/Version.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xalan/processor/XSLProcessorVersion.java
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xalan/Version.java
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 */
```

```
/*
 * $Id: xpath.cup 1225752 2011-12-30 04:12:46Z mrglavas $
 */
```

```
/*
 * @author Jacek Ambroziak
 * @author
 * Santiago Pericas-Geertsen
 * @author Morten Jorgensen
 * @author G. Todd Miller
 */
```

```
package org.apache.xalan.xsltc.compiler;
```

```
import java.util.Stack;
import java.util.Vector;
import java.io.StringReader;
import java_cup.runtime.*;
```

```
import org.apache.xml.dtm.DTM;
import org.apache.xalan.xsltc.DOM;
import org.apache.xml.dtm.Axis;
import org.apache.xalan.xsltc.runtime.Operators;
import org.apache.xalan.xsltc.compiler.util.ErrorMsg;
```

```
parser code {:
```

```
/**
 * Used by function calls with no args.
 */
```

```

static public final Vector EmptyArgs = new Vector(0);

/**
 * Reference to non-existing variable.
 */
static public final VariableRef DummyVarRef = null;

/**
 * Reference to the Parser class.
 */
private Parser _parser;
private XSLTC _xsltc;

/**
 * String representation of the expression being parsed.
 */
private String _expression;

/**
 * Line number where this expression/pattern
was declared.
 */
private int _lineNumber = 0;

/**
 * Reference to the symbol table.
 */
public SymbolTable _symbolTable;

public XPathParser(Parser parser) {
    _parser = parser;
    _xsltc = parser.getXSLTC();
    _symbolTable = parser.getSymbolTable();
}

public int getLineNumber() {
    return _lineNumber;
}

public QName getQNameIgnoreDefaultNs(String name) {
    return _parser.getQNameIgnoreDefaultNs(name);
}

public QName getQName(String namespace, String prefix, String localname) {
    return _parser.getQName(namespace, prefix, localname);
}

public void setMultiDocument(boolean flag) {

```



```

        _xslt.setMultiDocument(flag);
    }

    public void setCallsNodeset(boolean flag) {
        _xslt.setCallsNodeset(flag);
    }

    public void setHasIdCall(boolean flag) {
        _xslt.setHasIdCall(flag);
    }

    /**
     * This
    method is similar to findNodeType(int, Object) except that it
     * creates a StepPattern instead of just returning a node type. It also
     * differs in the way it handles "{uri}:*" and "{uri}:@*". The last two
     * patterns are expanded as "[namespace-uri() = 'uri']" and
     * "@*[namespace-uri() = 'uri']", respectively. This expansion considerably
     * simplifies the grouping of patterns in the Mode class. For this
     * expansion to be correct, the priority of the pattern/template must be
     * set to -0.25 (when no other predicates are present).
     */
    public StepPattern createStepPattern(int axis, Object test, Vector predicates) {
    int nodeType;

    if (test == null) { // "*"
        nodeType = (axis == Axis.ATTRIBUTE) ? NodeTest.ATTRIBUTE :
        (axis == Axis.NAMESPACE) ? -1 : NodeTest.ELEMENT;

        return new StepPattern(axis, nodeType, predicates);
    }
    else if (test instanceof Integer) {
        nodeType = ((Integer) test).intValue();

        return new StepPattern(axis, nodeType, predicates);
    }
    else {
        QName name = (QName)test;
        boolean setPriority = false;

        if (axis == Axis.NAMESPACE) {
            nodeType = (name.toString().equals("*")) ? -1
            : _xslt.registerNamespacePrefix(name);
        }
        else {
            final String uri = name.getNamespace();

```

```

final String local = name.getLocalPart();
final QName namespace_uri =
    _parser.getQNameIgnoreDefaultNs("namespace-uri");

// Expand {uri}:* to *[namespace-uri() = 'uri'] - same for @*
if (uri != null && (local.equals("") || local.equals("@*"))) {
    if (predicates == null) {
        predicates = new Vector(2);
    }

    // Priority is set by hand if no other predicates exist
    setPriority = (predicates.size() == 0);

    predicates.add(
        new Predicate(
            new EqualityExpr(Operators.EQ,
                new NamespaceUriCall(namespace_uri),
                new LiteralExpr(uri)))));
    }

if (local.equals(""))
{
    nodeType = (axis == Axis.ATTRIBUTE) ? NodeTest.ATTRIBUTE
: NodeTest.ELEMENT;
}
else if (local.equals("@*")) {
    nodeType = NodeTest.ATTRIBUTE;
}
else {
    nodeType = (axis == Axis.ATTRIBUTE) ? _xsltc.registerAttribute(name)
: _xsltc.registerElement(name);
}
}

final StepPattern result = new StepPattern(axis, nodeType, predicates);

// Set priority for case prefix:* and prefix:@* (no predicates)
if (setPriority) {
    result.setPriority(-0.25);
}

return result;
}
}

public int findNodeType(int axis, Object test) {
if (test == null) { // *
    return (axis == Axis.ATTRIBUTE) ?

```

```

NodeTest.ATTRIBUTE :
(axis == Axis.NAMESPACE) ? -1 : NodeTest.ELEMENT;
    }
    else if (test instanceof Integer) {
        return ((Integer)test).intValue();
    }
    else {
        QName name = (QName)test;

        if (axis == Axis.NAMESPACE) {
            return (name.toString().equals(""))
? -1
        : _xsltc.registerNamespacePrefix(name);
        }

        if (name.getNamespace() == null) {
            final String local = name.getLocalPart();

            if (local.equals("*")) {
                return (axis == Axis.ATTRIBUTE) ? NodeTest.ATTRIBUTE
: NodeTest.ELEMENT;
            }
            else if (local.equals("@*")) {
                return NodeTest.ATTRIBUTE;
            }
        }

        return (axis == Axis.ATTRIBUTE) ? _xsltc.registerAttribute(name)
: _xsltc.registerElement(name);
    }
}

/**
 * Parse the expression passed to the current scanner. If this
 * expression contains references to local variables and it will be
 * compiled in an external module (not in the main class) request
 * the current template to create a new variable stack frame.
 *
 * @param lineNumber Line where the current expression is defined.
 * @param external Set to <tt>true</tt> if this expression is
 * compiled in a separate module.
 *
 */
public Symbol parse(String expression, int lineNumber) throws Exception {
    try {
        _expression = expression;
        _lineNumber = lineNumber;
    }
}

```

```

return super.parse();
}
catch (IllegalCharException e) {
    ErrorMsg err = new ErrorMsg(ErrorMsg.ILLEGAL_CHAR_ERR,
        lineNumber, e.getMessage());
    _parser.reportError(Constants.FATAL, err);
}
return null;
}

/**
 * Lookup a variable or parameter in the symbol table given its name.
 *
 * @param name Name of the symbol being looked up.
 */
final SyntaxTreeNode lookupName(QName name) {
    // Is it a local var or param ?
    final SyntaxTreeNode result = _parser.lookupVariable(name);
if (result != null)
    return(result);
    else
    return(_symbolTable.lookupName(name));
}

public final void addError(ErrorMsg error) {
    _parser.reportError(Constants.ERROR,
error);
}

public void report_error(String message, Object info) {
final ErrorMsg err = new ErrorMsg(ErrorMsg.SYNTAX_ERR, _lineNumber,
    _expression);
_parser.reportError(Constants.FATAL, err);
}

public void report_fatal_error(String message, Object info) {
    // empty
}

public RelativeLocationPath insertStep(Step step, RelativeLocationPath rlp) {
if (rlp instanceof Step) {
    return new ParentLocationPath(step, (Step) rlp);
}
else if (rlp instanceof ParentLocationPath) {
    final ParentLocationPath plp = (ParentLocationPath) rlp;
    final RelativeLocationPath newrlp = insertStep(step, plp.getPath());
    return new ParentLocationPath(newrlp, plp.getStep());
}
}

```

```

else {
    addError(new ErrorMsg(ErrorMsg.INTERNAL_ERR, "XPathParser.insertStep"));
    return rlp;
}
}

```

```

/**
 * Returns true if the axis applies to elements only. The axes
 * child, attribute, namespace, descendant
result in non-empty
 * nodesets only if the context node is of type element.
 */
public boolean isElementAxis(int axis) {
return (axis == Axis.CHILD || axis == Axis.ATTRIBUTE ||
axis == Axis.NAMESPACE || axis == Axis.DESCEDANT);
}
:}

```

```

terminal SLASH, DOT, LBRACK, RBRACK, VBAR, LPAREN, RPAREN, STAR, COMMA;
terminal DOLLAR, ATSIGN;
terminal DDOT, DCOLON, DSLASH;
terminal EQ, NE;
terminal LT, GT, LE, GE;
terminal PLUS, MINUS, DIV, MOD, MULT;
terminal String Literal;
terminal String QNAME;
terminal ID, KEY, TEXT, NODE, OR, AND, COMMENT, PI, PIPARAM, PRECEDINGSIBLING;
terminal SELF, PARENT, CHILD, ATTRIBUTE, ANCESTOR, ANCESTORORSELF, DESCENDANT;
terminal DESCENDANTORSELF, FOLLOWING, FOLLOWINGSIBLING, NAMESPACE, PRECEDING;
terminal Double REAL;
terminal Long INT;
terminal PATTERN, EXPRESSION;

```

```

non terminal SyntaxTreeNode TopLevel;

```

```

non terminal Expression Expr, Argument, LocationPath;
non terminal Expression Predicate, FilterExpr, Step;
non
terminal Expression OrExpr, AndExpr, EqualityExpr;
non terminal Expression RelationalExpr, AdditiveExpr;
non terminal Expression MultiplicativeExpr, UnaryExpr;
non terminal Expression VariableReference, FunctionCall;
non terminal Expression PrimaryExpr, UnionExpr, PathExpr, AbbreviatedStep;
non terminal Expression RelativeLocationPath, AbbreviatedRelativeLocationPath;
non terminal Expression AbsoluteLocationPath, AbbreviatedAbsoluteLocationPath;

non terminal Object NodeTest, NameTest;

```

```
non terminal IdKeyPattern IdKeyPattern;
non terminal Pattern Pattern;
non terminal Pattern LocationPathPattern;
non terminal StepPattern ProcessingInstructionPattern;
non terminal RelativePathPattern RelativePathPattern;
non terminal StepPattern StepPattern;
non terminal Object NodeTestPattern, NameTestPattern;

non terminal Vector Predicates, NonemptyArgumentList;
non terminal QName QName, FunctionName, VariableName;
non terminal Integer AxisName, AxisSpecifier;
non terminal
Integer ChildOrAttributeAxisSpecifier;
```

```
precedence left VBAR;
precedence left OR;
precedence left AND;
precedence nonassoc EQ, NE;
precedence left LT, GT, LE, GE;
```

```
precedence left PLUS, MINUS;
precedence left DIV, MOD, MULT;
precedence left DOLLAR;
precedence left ATSIGN;
precedence right DCOLON;
```

```
start with TopLevel;
```

```
TopLevel ::= PATTERN Pattern:pattern
    { : RESULT = pattern; ; }
```

```
    | EXPRESSION Expr:expr
    { : RESULT = expr; ; };
```

```
/* ----- Patterns ----- */
```

```
Pattern ::= LocationPathPattern:lpp
    { : RESULT = lpp; ; }

    | LocationPathPattern:lpp VBAR Pattern:p
    { : RESULT = new AlternativePattern(lpp, p); ; }
```

```
LocationPathPattern ::= SLASH
    { : RESULT = new AbsolutePathPattern(null); ; }

    | SLASH RelativePathPattern:rpp
    { : RESULT = new AbsolutePathPattern(rpp); ; }
```

```

| IdKeyPattern:ikp
{: RESULT = ikp; :}

| IdKeyPattern:ikp SLASH RelativePathPattern:rpp
{: RESULT = new ParentPattern(ikp, rpp); :}

| IdKeyPattern:ikp DSLASH RelativePathPattern:rpp
{: RESULT = new AncestorPattern(ikp, rpp); :}

| DSLASH RelativePathPattern:rpp
{: RESULT = new AncestorPattern(rpp); :}

| RelativePathPattern:rpp
{: RESULT = rpp; :};

IdKeyPattern ::= ID LPAREN Literal:l RPAREN
{: RESULT = new IdPattern(l);
  parser.setHasIdCall(true);
:}

| KEY LPAREN Literal:l1 COMMA Literal:l2 RPAREN
{: RESULT = new KeyPattern(l1, l2); :};

ProcessingInstructionPattern ::= PIPARAM LPAREN Literal:l RPAREN
{: RESULT = new ProcessingInstructionPattern(l); :};

RelativePathPattern ::= StepPattern:sp
{: RESULT = sp; :}

| StepPattern:sp SLASH RelativePathPattern:rpp
{: RESULT
= new ParentPattern(sp, rpp); :}

| StepPattern:sp DSLASH RelativePathPattern:rpp
{: RESULT = new AncestorPattern(sp, rpp); :};

StepPattern ::= NodeTestPattern:nt
{:
RESULT = parser.createStepPattern(Axis.CHILD, nt, null);
:}

| NodeTestPattern:nt Predicates:pp
{:
RESULT = parser.createStepPattern(Axis.CHILD, nt, pp);
:}

| ProcessingInstructionPattern:pip

```

```

    { : RESULT = pip; : }

| ProcessingInstructionPattern: pip Predicates: pp
    { : RESULT = (ProcessingInstructionPattern) pip.setPredicates(pp); : }

    | ChildOrAttributeAxisSpecifier: axis NodeTestPattern: nt
        { :
        RESULT = parser.createStepPattern(axis.intValue(), nt, null);
        : }

| ChildOrAttributeAxisSpecifier: axis
NodeTestPattern: nt Predicates: pp
    { :
    RESULT = parser.createStepPattern(axis.intValue(), nt, pp);
    : }

    | ChildOrAttributeAxisSpecifier: axis ProcessingInstructionPattern: pip
        { :
        RESULT = pip; // TODO: report error if axis is attribute
        : }

| ChildOrAttributeAxisSpecifier: axis ProcessingInstructionPattern: pip
Predicates: pp
    { :
    // TODO: report error if axis is attribute
    RESULT = (ProcessingInstructionPattern) pip.setPredicates(pp);
    : };

NodeTestPattern ::= NameTestPattern: nt
    { : RESULT = nt; : }

| NODE
    { : RESULT = new Integer(NodeTest.ANODE); : }

| TEXT
    { : RESULT = new Integer(NodeTest.TEXT); : }

| COMMENT
    { : RESULT = new Integer(NodeTest.COMMENT); : }

| PI
    { : RESULT = new Integer(NodeTest.PI); : };

NameTestPattern ::= STAR
    { : RESULT = null; : }

| QName: qn
    { : RESULT = qn; : };

```



ChildOrAttributeAxisSpecifier ::= ATSIGN

```
{: RESULT = new Integer(Axis.ATTRIBUTE); :}
```

```
| CHILD DCOLON
```

```
{: RESULT = new Integer(Axis.CHILD); :}
```

```
| ATTRIBUTE DCOLON
```

```
{: RESULT = new Integer(Axis.ATTRIBUTE); :};
```

Predicates ::= Predicate:p

```
{:
```

```
Vector temp = new Vector();
```

```
temp.addElement(p);
```

```
RESULT = temp;
```

```
:}
```

```
| Predicate:p Predicates:pp
```

```
{: pp.insertElementAt(p, 0); RESULT = pp; :};
```

Predicate ::= LBRACK Expr:e RBRACK

```
{:
```

```
RESULT = new Predicate(e);
```

```
:};
```

/\* ----- Expressions ----- \*/

Expr ::= OrExpr:ex

```
{: RESULT = ex; :};
```

OrExpr ::= AndExpr:ae

```
{: RESULT = ae; :}
```

```
| OrExpr:oe OR AndExpr:ae
```

```
{: RESULT = new LogicalExpr(LogicalExpr.OR, oe, ae); :};
```

AndExpr ::= EqualityExpr:e

```
{: RESULT = e; :}
```

```
| AndExpr:ae AND EqualityExpr:ee
```

```
{: RESULT = new LogicalExpr(LogicalExpr.AND,  
ae, ee); :};
```

EqualityExpr ::= RelationalExpr:re

```
{: RESULT = re; :}
```

```
| EqualityExpr:ee EQ RelationalExpr:re
```

{: RESULT = new EqualityExpr(Operators.EQ, ee, re); :}

| EqualityExpr:ee NE RelationalExpr:re

{: RESULT = new EqualityExpr(Operators.NE, ee, re); :};

RelationalExpr ::= AdditiveExpr:ae

{: RESULT = ae; :}

| RelationalExpr:re LT AdditiveExpr:ae

{: RESULT = new RelationalExpr(Operators.LT, re, ae); :}

| RelationalExpr:re GT AdditiveExpr:ae

{: RESULT = new RelationalExpr(Operators.GT, re, ae); :}

| RelationalExpr:re LE AdditiveExpr:ae

{: RESULT = new RelationalExpr(Operators.LE, re, ae); :}

| RelationalExpr:re GE AdditiveExpr:ae

{: RESULT = new RelationalExpr(Operators.GE, re, ae); :};

AdditiveExpr ::= MultiplicativeExpr:me

{: RESULT = me; :}

| AdditiveExpr:ae PLUS MultiplicativeExpr:me

{: RESULT = new BinOpExpr(BinOpExpr.PLUS,  
ae, me); :}

| AdditiveExpr:ae MINUS MultiplicativeExpr:me

{: RESULT = new BinOpExpr(BinOpExpr.MINUS, ae, me); :};

MultiplicativeExpr ::= UnaryExpr:ue

{: RESULT = ue; :}

| MultiplicativeExpr:me MULT UnaryExpr:ue

{: RESULT = new BinOpExpr(BinOpExpr.TIMES, me, ue); :}

| MultiplicativeExpr:me DIV UnaryExpr:ue

{: RESULT = new BinOpExpr(BinOpExpr.DIV, me, ue); :}

| MultiplicativeExpr:me MOD UnaryExpr:ue

{: RESULT = new BinOpExpr(BinOpExpr.MOD, me, ue); :};

UnaryExpr ::= UnionExpr:ue

{: RESULT = ue; :}

| MINUS UnaryExpr:ue

{: RESULT = new UnaryOpExpr(ue); :};

```

UnionExpr ::= PathExpr:pe
    {: RESULT = pe; :}

    | PathExpr:pe VBAR UnionExpr:rest
    {: RESULT = new UnionPathExpr(pe, rest); :};

PathExpr ::= LocationPath:lp
    {: RESULT = lp; :}

    | FilterExpr:fexp
    {: RESULT = fexp; :}

    | FilterExpr:fexp
SLASH RelativeLocationPath:rlp
    {: RESULT = new FilterParentPath(fexp, rlp); :}

    | FilterExpr:fexp DSLASH RelativeLocationPath:rlp
    {:
        //
        // Expand '/' into '/descendant-or-self::node()/' or
        // into '/descendant-or-self::*/'
        //
        int nodeType = DOM.NO_TYPE;
        if (rlp instanceof Step &&
            parser.isElementAxis(((Step) rlp).getAxis()))
        {
            nodeType = DTM.ELEMENT_NODE;
        }
        final Step step = new Step(Axis.DESCENDANTORSELF, nodeType, null);
        FilterParentPath fpp = new FilterParentPath(fexp, step);
        fpp = new FilterParentPath(fpp, rlp);
        if (fexp instanceof KeyCall == false) {
            fpp.setDescendantAxis();
        }
        RESULT = fpp;
    :};

LocationPath ::= RelativeLocationPath:rlp
    {: RESULT = rlp; :}

    | AbsoluteLocationPath:alp
    {: RESULT = alp; :};

RelativeLocationPath ::= Step:step
    {: RESULT
    = step; :}

    | RelativeLocationPath:rlp SLASH Step:step

```

```

{:
if (rlp instanceof Step && ((Step) rlp).isAbbreviatedDot()) {
    RESULT = step;    // Remove './' from the middle
}
else if (((Step) step).isAbbreviatedDot()) {
    RESULT = rlp;    // Remove './' from the end
}
else {
    RESULT =
        new ParentLocationPath((RelativeLocationPath) rlp, step);
}
:}

```

```

| AbbreviatedRelativeLocationPath:arlp
{: RESULT = arlp; :};

```

AbsoluteLocationPath ::= SLASH

```

{: RESULT = new AbsoluteLocationPath(); :}

```

```

| SLASH RelativeLocationPath:rlp

```

```

{: RESULT = new AbsoluteLocationPath(rlp); :}

```

```

| AbbreviatedAbsoluteLocationPath:aalp

```

```

{: RESULT = aalp; :};

```

AbbreviatedRelativeLocationPath ::= RelativeLocationPath:rlp DSLASH Step:step

```

{:
    final Step right = (Step)step;
    final
int axis = right.getAxis();
    final int type = right.getNodeType();
    final Vector predicates = right.getPredicates();

if ((axis == Axis.CHILD) && (type != NodeTest.ATTRIBUTE)) {
    // Compress './child:E' into 'descendant::E' - if possible
    if (predicates == null) {
        right.setAxis(Axis.DESCENDANT);
        if (rlp instanceof Step && ((Step)rlp).isAbbreviatedDot()) {
            RESULT = right;
        }
        else {
            // Expand 'rlp//child::E' into 'rlp/descendant::E'
            RelativeLocationPath left = (RelativeLocationPath)rlp;
            RESULT = new ParentLocationPath(left, right);
        }
    }
    else {
        // Expand './step' -> 'descendant-or-self::*step'

```

```

    if (rlp instanceof Step && ((Step)rlp).isAbbreviatedDot()) {

        Step left = new Step(Axis.DESCENDANTORSELF,
DTM.ELEMENT_NODE, null);
        RESULT = new ParentLocationPath(left, right);
    }
    else {
        // Expand 'rlp//step' -> 'rlp/descendant-or-self::*//step'
        RelativeLocationPath left = (RelativeLocationPath)rlp;
        Step mid = new Step(Axis.DESCENDANTORSELF,
DTM.ELEMENT_NODE, null);
        ParentLocationPath ppl = new ParentLocationPath(mid, right);
        RESULT = new ParentLocationPath(left, ppl);
    }
}
}
else if ((axis == Axis.ATTRIBUTE) || (type == NodeTest.ATTRIBUTE)) {
    // Expand 'rlp//step' -> 'rlp/descendant-or-self::*//step'
    RelativeLocationPath left = (RelativeLocationPath)rlp;
    Step middle = new Step(Axis.DESCENDANTORSELF,
DTM.ELEMENT_NODE, null);

    ParentLocationPath ppl = new ParentLocationPath(middle, right);
    RESULT = new ParentLocationPath(left, ppl);
}
else {
    // Expand 'rlp//step' -> 'rlp/descendant-or-self::node()/step'
    RelativeLocationPath left = (RelativeLocationPath)rlp;
    Step middle = new Step(Axis.DESCENDANTORSELF,
DOM.NO_TYPE, null);
    ParentLocationPath ppl = new ParentLocationPath(middle, right);
    RESULT = new ParentLocationPath(left, ppl);
}
};

```

```

AbbreviatedAbsolutePath ::= DSLASH RelativeLocationPath:rlp

```

```

{
    //
    // Expand '/' into '/descendant-or-self::node()' or
    // into '/descendant-or-self::*/'
    //
    int nodeType = DOM.NO_TYPE;
    if (rlp instanceof Step &&
        parser.isElementAxis(((Step) rlp).getAxis()))
    {
        nodeType = DTM.ELEMENT_NODE;
    }
}

```

```

    final Step step = new Step(Axis.DESCENDANTORSELF, nodeType, null);
    RESULT =
new AbsoluteLocationPath(parser.insertStep(step,
    (RelativeLocationPath) rlp));
:};

```

```

Step ::= NodeTest:ntest
{
    if (ntest instanceof Step) {
        RESULT = (Step)ntest;
    }
    else {
RESULT = new Step(Axis.CHILD,
        parser.findNodeType(Axis.CHILD, ntest),
        null);
    }
:}

```

```

| NodeTest:ntest Predicates:pp
{
    if (ntest instanceof Step) {
        Step step = (Step)ntest;
        step.addPredicates(pp);
        RESULT = (Step)ntest;
    }
    else {
        RESULT = new Step(Axis.CHILD,
            parser.findNodeType(Axis.CHILD, ntest), pp);
    }
:}

```

```

| AxisSpecifier:axis NodeTest:ntest Predicates:pp
{: RESULT = new Step(axis.intValue(),
    parser.findNodeType(axis.intValue(), ntest),
    pp);
:}

```

```

| AxisSpecifier:axis NodeTest:ntest
{: RESULT = new Step(axis.intValue(),
    parser.findNodeType(axis.intValue(), ntest),
    null);
:}

```

```

| AbbreviatedStep:abbrev
{: RESULT = abbrev; :};

```

```

AxisSpecifier ::= AxisName:an DCOLON
{: RESULT = an; :}

```

```

| ATSIGN
{: RESULT = new Integer(Axis.ATTRIBUTE); :};

AxisName ::= ANCESTOR
{: RESULT = new Integer(Axis.ANCESTOR); :}

| ANCESTORORSELF
{: RESULT = new Integer(Axis.ANCESTORORSELF); :}

| ATTRIBUTE
{: RESULT = new Integer(Axis.ATTRIBUTE); :}

| CHILD
{: RESULT = new Integer(Axis.CHILD); :}

| DESCENDANT
{: RESULT = new Integer(Axis.DESCENDANT); :}

| DESCENDANTORSELF
{: RESULT = new Integer(Axis.DESCENDANTORSELF); :}

| FOLLOWING
{: RESULT = new
Integer(Axis.FOLLOWING); :}

| FOLLOWINGSIBLING
{: RESULT = new Integer(Axis.FOLLOWINGSIBLING); :}

| NAMESPACE
{: RESULT = new Integer(Axis.NAMESPACE); :}

| PARENT
{: RESULT = new Integer(Axis.PARENT); :}

| PRECEDING
{: RESULT = new Integer(Axis.PRECEDING); :}

| PRECEDINGSIBLING
{: RESULT = new Integer(Axis.PRECEDINGSIBLING); :}

| SELF
{: RESULT = new Integer(Axis.SELF); :};

AbbreviatedStep ::= DOT
{: RESULT = new Step(Axis.SELF, NodeTest.ANODE, null); :}

| DDOT

```

```
{: RESULT = new Step(Axis.PARENT, NodeTest.ANODE, null); :};
```

```
FilterExpr ::= PrimaryExpr:primary
```

```
{: RESULT = primary; :}
```

```
| PrimaryExpr:primary Predicates:pp
```

```
{: RESULT = new FilterExpr(primary, pp); :};
```

```
PrimaryExpr ::= VariableReference:vr
```

```
{: RESULT = vr; :}
```

```
| LPAREN Expr:ex RPAREN
```

```
{: RESULT = ex; :}
```

```
| Literal:string
```

```
{:
```

```
/*
```

```
* If the string appears to have the syntax of a QName, store  
* namespace info in the literal expression. This is used for  
* element-available and function-available functions, among  
* others. Also, the default namespace must be ignored.
```

```
*/
```

```
String namespace = null;
```

```
final int index = string.lastIndexOf(':');
```

```
if (index > 0) {
```

```
    final String prefix = string.substring(0, index);
```

```
    namespace = parser._symbolTable.lookupNamespace(prefix);
```

```
}
```

```
RESULT = (namespace == null) ? new LiteralExpr(string)
```

```
    : new LiteralExpr(string, namespace);
```

```
:}
```

```
| INT:num
```

```
{:
```

```
    long value = num.longValue();
```

```
    if (value < Integer.MIN_VALUE || value > Integer.MAX_VALUE) {
```

```
        RESULT = new RealExpr(value);
```

```
    }
```

```
    else {
```

```
        if (num.doubleValue() == -0)
```

```
            RESULT = new RealExpr(num.doubleValue());
```

```
        else if (num.intValue() == 0)
```

```
            RESULT = new IntExpr(num.intValue());
```

```
    else if (num.doubleValue() == 0.0)
```

```
        RESULT = new RealExpr(num.doubleValue());
```



```

        else
            RESULT = new IntExpr(num.intValue());
    }
    :}

    | REAL:num
    {: RESULT = new RealExpr(num.doubleValue()); :}

    | FunctionCall:fc
    {: RESULT = fc; :};

```

VariableReference ::= DOLLAR VariableName:varName

```

{:
    // An empty QName prefix for a variable or parameter reference
    // should map to the null namespace and not the default URI.
    SyntaxTreeNode node = parser.lookupName(varName);

    if (node != null) {
        if (node instanceof Variable) {
            RESULT = new VariableRef((Variable)node);
        }
        else if (node instanceof Param) {
            RESULT = new ParameterRef((Param)node);
        }
        else {
            RESULT = new UnresolvedRef(varName);
        }
    }

    if (node == null) {
        RESULT = new UnresolvedRef(varName);
    }
    :};

```

FunctionCall ::= FunctionName:fname LPAREN RPAREN

```

{:
    if (parser.getQNameIgnoreDefaultNs("current").equals(fname)) {
        RESULT = new CurrentCall(fname);
    }
    else if (parser.getQNameIgnoreDefaultNs("number").equals(fname)) {
        RESULT = new NumberCall(fname, parser.EmptyArgs);
    }
    else if (parser.getQNameIgnoreDefaultNs("string").equals(fname)) {
        RESULT = new StringCall(fname, parser.EmptyArgs);
    }
    else if (parser.getQNameIgnoreDefaultNs("concat").equals(fname)) {
        RESULT = new ConcatCall(fname, parser.EmptyArgs);
    }
}

```

```

}
else if (parser.getQNameIgnoreDefaultNs("true").equals(fname)) {
    RESULT = new BooleanExpr(true);
}
else if (parser.getQNameIgnoreDefaultNs("false").equals(fname)) {

RESULT = new BooleanExpr(false);
}
else if (parser.getQNameIgnoreDefaultNs("name").equals(fname)) {
    RESULT = new NameCall(fname);
}
else if (parser.getQNameIgnoreDefaultNs("generate-id").equals(fname)) {
    RESULT = new GenerateIdCall(fname, parser.EmptyArgs);
}
else if (parser.getQNameIgnoreDefaultNs("string-length").equals(fname)) {
    RESULT = new StringLengthCall(fname, parser.EmptyArgs);
}
else if (parser.getQNameIgnoreDefaultNs("position").equals(fname)) {
    RESULT = new PositionCall(fname);
}
else if (parser.getQNameIgnoreDefaultNs("last").equals(fname)) {
    RESULT = new LastCall(fname);
}
else if (parser.getQNameIgnoreDefaultNs("local-name").equals(fname)) {
    RESULT = new LocalNameCall(fname);
}
else if (parser.getQNameIgnoreDefaultNs("namespace-uri").equals(fname)) {
    RESULT = new NamespaceUriCall(fname);
}
else {
    RESULT = new FunctionCall(fname, parser.EmptyArgs);
}
:}

| FunctionName:fname LPAREN NonemptyArgumentList:argl RPAREN
{:
if (parser.getQNameIgnoreDefaultNs("concat").equals(fname)) {
    RESULT = new ConcatCall(fname, argl);
}
else if (parser.getQNameIgnoreDefaultNs("number").equals(fname)) {
    RESULT = new NumberCall(fname, argl);
}
else if (parser.getQNameIgnoreDefaultNs("document").equals(fname)) {
parser.setMultiDocument(true);
    RESULT = new DocumentCall(fname, argl);
}
else if (parser.getQNameIgnoreDefaultNs("string").equals(fname)) {

```

```

    RESULT = new StringCall(fname, argl);
}
else if (parser.getQNameIgnoreDefaultNs("boolean").equals(fname)) {
    RESULT = new BooleanCall(fname, argl);
}
else if (parser.getQNameIgnoreDefaultNs("name").equals(fname)) {

RESULT = new NameCall(fname, argl);
}
else if (parser.getQNameIgnoreDefaultNs("generate-id").equals(fname)) {
    RESULT = new GenerateIdCall(fname, argl);
}
else if (parser.getQNameIgnoreDefaultNs("not").equals(fname)) {
    RESULT = new NotCall(fname, argl);
}
else if (parser.getQNameIgnoreDefaultNs("format-number").equals(fname)) {
    RESULT = new FormatNumberCall(fname, argl);
}
else if (parser.getQNameIgnoreDefaultNs("unparsed-entity-uri").equals(fname)) {
    RESULT = new UnparsedEntityUriCall(fname, argl);
}
else if (parser.getQNameIgnoreDefaultNs("key").equals(fname)) {
    RESULT = new KeyCall(fname, argl);
}
else if (parser.getQNameIgnoreDefaultNs("id").equals(fname)) {
    RESULT = new KeyCall(fname, argl);
    parser.setHasIdCall(true);
}
else if (parser.getQNameIgnoreDefaultNs("ceiling").equals(fname))
{
    RESULT = new CeilingCall(fname, argl);
}
else if (parser.getQNameIgnoreDefaultNs("round").equals(fname)) {
    RESULT = new RoundCall(fname, argl);
}
else if (parser.getQNameIgnoreDefaultNs("floor").equals(fname)) {
    RESULT = new FloorCall(fname, argl);
}
else if (parser.getQNameIgnoreDefaultNs("contains").equals(fname)) {
    RESULT = new ContainsCall(fname, argl);
}
else if (parser.getQNameIgnoreDefaultNs("string-length").equals(fname)) {
    RESULT = new StringLengthCall(fname, argl);
}
else if (parser.getQNameIgnoreDefaultNs("starts-with").equals(fname)) {
    RESULT = new StartsWithCall(fname, argl);
}
else if (parser.getQNameIgnoreDefaultNs("function-available").equals(fname)) {

```

```

    RESULT = new FunctionAvailableCall(fname, argl);
}
else if (parser.getQNameIgnoreDefaultNs("element-available").equals(fname))
{
    RESULT = new ElementAvailableCall(fname, argl);
}
else if (parser.getQNameIgnoreDefaultNs("local-name").equals(fname)) {
    RESULT = new LocalNameCall(fname, argl);
}
else if (parser.getQNameIgnoreDefaultNs("lang").equals(fname)) {
    RESULT = new LangCall(fname, argl);
}
else if (parser.getQNameIgnoreDefaultNs("namespace-uri").equals(fname)) {
    RESULT = new NamespaceUriCall(fname, argl);
}
else if (parser.getQName(Constants.TRANSLET_URI, "xslt", "cast").equals(fname)) {
    RESULT = new CastCall(fname, argl);
}
// Special case for extension function nodeset()
else if (fname.getLocalPart().equals("nodeset") || fname.getLocalPart().equals("node-set")) {
parser.setCallsNodeset(true); // implies MultiDOM
    RESULT = new FunctionCall(fname, argl);
}
else {
    RESULT = new FunctionCall(fname, argl);
}
};

```

NonemptyArgumentList

```

 ::= Argument:arg
 {
    Vector temp = new Vector();
    temp.addElement(arg);
    RESULT = temp;
 }

 | Argument:arg COMMA NonemptyArgumentList:argl
 { argl.insertElementAt(arg, 0); RESULT = argl; };

```

FunctionName ::= QName:fname

```

 {
    RESULT = fname;
 };

```

VariableName ::= QName:vname

```

 {
    RESULT = vname;
 };

```

```

Argument ::= Expr:ex
    {: RESULT = ex; :};

NodeTest ::= NameTest:nt
    {: RESULT = nt; :}

    | NODE
    {: RESULT = new Integer(NodeTest.ANODE); :}

    | TEXT
    {: RESULT = new Integer(NodeTest.TEXT); :}

    | COMMENT
    {: RESULT = new Integer(NodeTest.COMMENT); :}

    | PIPARAM LPAREN Literal:l RPAREN
    {:
        QName name = parser.getQNameIgnoreDefaultNs("name");
        Expression exp = new EqualityExpr(Operators.EQ,
            new NameCall(name),
            new LiteralExpr(l));
        Vector predicates = new Vector();
        predicates.addElement(new Predicate(exp));
        RESULT = new Step(Axis.CHILD, NodeTest.PI, predicates);
    :}

    | PI
    {: RESULT = new Integer(NodeTest.PI); :};

NameTest ::= STAR
    {: RESULT = null; :}

    | QName:qn
    {: RESULT = qn; :};

QName ::= QNAME:qname
    {: RESULT = parser.getQNameIgnoreDefaultNs(qname); :}

    | DIV
    {: RESULT = parser.getQNameIgnoreDefaultNs("div"); :}

    | MOD
    {: RESULT = parser.getQNameIgnoreDefaultNs("mod"); :}

    | KEY
    {: RESULT = parser.getQNameIgnoreDefaultNs("key"); :}

```

```
| ANCESTOR
{: RESULT = parser.getQNameIgnoreDefaultNs("child"); ;}

| ANCESTORORSELF
{: RESULT = parser.getQNameIgnoreDefaultNs("ancestor-or-self"); ;}

| ATTRIBUTE
{: RESULT
= parser.getQNameIgnoreDefaultNs("attribute"); ;}

| CHILD
{: RESULT = parser.getQNameIgnoreDefaultNs("child"); ;}

| DESCENDANT
{: RESULT = parser.getQNameIgnoreDefaultNs("decendant"); ;}

| DESCENDANTORSELF
{: RESULT = parser.getQNameIgnoreDefaultNs("decendant-or-self"); ;}

| FOLLOWING
{: RESULT = parser.getQNameIgnoreDefaultNs("following"); ;}

| FOLLOWINGSIBLING
{: RESULT = parser.getQNameIgnoreDefaultNs("following-sibling"); ;}

| NAMESPACE
{: RESULT = parser.getQNameIgnoreDefaultNs("namespace"); ;}

| PARENT
{: RESULT = parser.getQNameIgnoreDefaultNs("parent"); ;}

| PRECEDING
{: RESULT = parser.getQNameIgnoreDefaultNs("preceding"); ;}

| PRECEDINGSIBLING
{: RESULT = parser.getQNameIgnoreDefaultNs("preceding-sibling"); ;}

| SELF
{: RESULT = parser.getQNameIgnoreDefaultNs("self"); ;}

| ID
{: RESULT = parser.getQNameIgnoreDefaultNs("id"); ;};
```

Found in path(s):

```
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xalan/xsltc/compiler/xpath.cup
```

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* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xml/serializer/Encodings.properties
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xml/serializer/XMLEntities.properties
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xml/serializer/output_text.properties
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xalan/res/XSLTInfo.properties
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xml/serializer/output_xml.properties
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xalan/xsltc/compiler/Makefile.inc
*
/opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xml/serializer/output_unknown.properties
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xml/serializer/HTMLEntities.properties
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xml/serializer/output_html.properties
```

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```

```
*/
```

```
// is found, then throw a special exception in order to terminate
```

Found in path(s):

\* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xalan/processor/TransformerFactoryImpl.java

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// Attribution to: "Voytenko, Dimitry" <DVoytenko@SECTORBASE.COM>

Found in path(s):

\* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xml/serializer/ToHTMLStream.java

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Found in path(s):

\* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xpath/domapi/XPathStylesheetDOM3Exception.java

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- \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xalan/trace/package.html
  - \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xpath/functions/package.html
  - \*
  - /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xalan/transformer/package.html
  - \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xalan/client/package.html
  - \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xalan/processor/package.html
  - \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xalan/lib/package.html
  - \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xpath/domapi/package.html
  - \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xalan/templates/package.html
  - \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xml/serializer/package.html
  - \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xalan/extensions/package.html
  - \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xpath/operations/package.html
  - \*
  - /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xpath/compiler/package.html
  - \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xpath/patterns/package.html
  - \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xpath/package.html
  - \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xalan/lib/sql/package.html
  - \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xalan/xslt/package.html
  - \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xalan/res/package.html
  - \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xml/utils/package.html
  - \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xpath/objects/package.html
  - \* /opt/cola/permits/1134796662\_1613422294.09/0/xalan-2-7-2-sources-jar/org/apache/xpath/axes/package.html
  - \*
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*/
/**
* Execute the proprietary document-location() function, which returns
* a node set of documents.
* @xsl.usage advanced
*/
```

Found in path(s):

```
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
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*/
/*
* $Id: XSLProcessorVersion.src 468640 2006-10-28 06:53:53Z minchau $
*/
```

```

package org.apache.xalan.processor;

/**
 * Administrative class to keep track of the version number of
 * the Xalan release.
 * <P>See also: org/apache/xalan/res/XSLTInfo.properties</P>
 * @deprecated To be replaced by org.apache.xalan.Version.getVersion()
 * @xsl.usage general
 */
public class XSLProcessorVersion
{

/**
 * Print the processor version to the command line.
 *
 * @param argv command line arguments, unused.
 */
public static void main(String argv[])
{
    System.out.println(S_VERSION);
}

/**
 * Constant name of product.
 */
public static final String PRODUCT = "Xalan";

/**
 * Implementation Language.
 */
public static final String LANGUAGE = "Java";

/**
 * Major version number.
 * Version number. This changes only when there is a
 * significant, externally apparent enhancement from
 * the previous release. 'n' represents the n'th
 * version.
 *
 * Clients should carefully consider
the implications
 * of new versions as external interfaces and behaviour
 * may have changed.
 */
public static final int VERSION = @version.VERSION@;

/**
 * Release Number.

```

```

* Release number. This changes when:
*     - a new set of functionality is to be added, eg,
*       implementation of a new W3C specification.
*     - API or behaviour change.
*     - its designated as a reference release.
*/
public static final int RELEASE = @version.RELEASE@;

/**
* Maintenance Drop Number.
* Optional identifier used to designate maintenance
* drop applied to a specific release and contains
* fixes for defects reported. It maintains compatibility
* with the release and contains no API changes.
* When missing, it designates the final and complete
* development drop for a release.
*/
public static final int MAINTENANCE
= @version.MINOR@;

/**
* Development Drop Number.
* Optional identifier designates development drop of
* a specific release. D01 is the first development drop
* of a new release.
*
* Development drops are works in progress towards a
* completed, final release. A specific development drop
* may not completely implement all aspects of a new
* feature, which may take several development drops to
* complete. At the point of the final drop for the
* release, the D suffix will be omitted.
*
* Each 'D' drops can contain functional enhancements as
* well as defect fixes. 'D' drops may not be as stable as
* the final releases.
*/
public static final int DEVELOPMENT = 0;

/**
* Version String like <CODE>"<B>Xalan</B> <B>Language</B>
* v.r[.dd] <B>D</B>nn]"</CODE>.
* <P>Semantics of the version string are
identical to the Xerces project.</P>
*/
public static final String S_VERSION = PRODUCT+" "+LANGUAGE+" "
+VERSION+"."+RELEASE+"."
+(DEVELOPMENT > 0 ? ("D"+DEVELOPMENT)

```

```
: (""+MAINTENANCE));
```

```
}
```

Found in path(s):

```
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-  
jar/org/apache/xalan/processor/XSLProcessorVersion.src
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```
*
```

```
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```

```
*/
```

```
/*
```

```
* $Id: xpath.lex 1225752 2011-12-30 04:12:46Z mrglavas $
```

```
*/
```

```
/*
```

```
* @author Jacek Ambroziak
```

```
* @author
```

```
Santiago Pericas-Geertsen
```

```
* @author Morten Jorgensen
```

```
*
```

```
*/
```

```
package org.apache.xalan.xsltc.compiler;
```

```
import java_cup.runtime.Symbol;
```

```
%%
```

```
%cup
```

```
%unicode
```

```
%class XPathLexer
```

```
%yyeof
```

```
{
```

```
    int last;
```

```

void initialize() {
    last = -1;
}

static boolean isWhitespace(int c) {
    return (c == ' ' || c == '\t' || c == '\r' || c == '\n' || c == '\f');
}

/**
 * If symbol is not followed by ':' or '(', then treat it as a
 * name instead of an axis or function (Jira-1912).
 */
Symbol disambiguateAxisOrFunction(int ss) throws Exception {
    // Peek in the input buffer without changing the internal state
    int index = yy_buffer_index;

    // Skip whitespace
    while (index < yy_buffer_read && isWhitespace(yy_buffer[index])) {
        index++;
    }

    // If end of buffer, can't disambiguate :(

    if (index >= yy_buffer_read) {
        // Can't disambiguate, so return as symbol
        return new Symbol(ss);
    }

    // Return symbol if next token is ':' or '('
    return (yy_buffer[index] == ':' && yy_buffer[index+1] == ':' ||
            yy_buffer[index] == '(') ?
        newSymbol(ss) : newSymbol(sym.QNAME, yytext());
}

/**
 * If symbol is first token or if it follows any of the operators
 * listed in http://www.w3.org/TR/xpath#exprlex then treat as a
 * name instead of a keyword (Jira-1912).
 */
Symbol disambiguateOperator(int ss) throws Exception {
    switch (last) {
        case -1: // first token
        case sym.ATSIGN:
        case sym.DCOLON:
        case sym.LPAREN:
        case sym.LBRACK:
        case sym.COMMA:

```

```

    case sym.AND:
    case sym.OR:
    case
sym.MOD:
    case sym.DIV:
    case sym.MULT:
    case sym.SLASH:
    case sym.DSLASH:
    case sym.VBAR:
    case sym.PLUS:
    case sym.MINUS:
    case sym.EQ:
    case sym.NE:
    case sym.LT:
    case sym.LE:
    case sym.GT:
    case sym.GE:
        return newSymbol(sym.QNAME, yytext());
    }
    return newSymbol(ss);
}

/**
 * If symbol is first token or if it follows any of the operators
 * listed in http://www.w3.org/TR/xpath#exprlex then treat as a
 * wildcard instead of a multiplication operator
 */
Symbol disambiguateStar() throws Exception {
    switch (last) {
    case -1: // first token
    case sym.ATSIGN:
    case sym.DCOLON:
    case sym.LPAREN:
    case sym.LBRACK:
    case sym.COMMA:

case sym.AND:
    case sym.OR:
    case sym.MOD:
    case sym.DIV:
    case sym.MULT:
    case sym.SLASH:
    case sym.DSLASH:
    case sym.VBAR:
    case sym.PLUS:
    case sym.MINUS:
    case sym.EQ:
    case sym.NE:

```

```

    case sym.LT:
    case sym.LE:
    case sym.GT:
    case sym.GE:
        return newSymbol(sym.STAR);
    }
    return newSymbol(sym.MULT);
}

Symbol newSymbol(int ss) {
    last = ss;
    return new Symbol(ss);
}

Symbol newSymbol(int ss, String value) {
    last = ss;
    return new Symbol(ss, value);
}

Symbol newSymbol(int ss, Long value) {
    last = ss;
    return new Symbol(ss, value);
}

Symbol newSymbol(int ss, Double value) {
    last = ss;
    return new
Symbol(ss, value);
}
%}

%eofval{
return newSymbol(sym.EOF);
%eofval}

%yylexthrow{
Exception
%yylexthrow}

Letter={BaseChar}{{Ideographic}

BaseChar=[\u0041-\u005A\u0061-\u007A\u00C0-\u00D6\u00D8-\u00F6\u00F8-\u00FF\u0100-\u0131\u0134-
\u013E\u0141-\u0148\u014A-\u017E\u0180-\u01C3\u01CD-\u01F0\u01F4-\u01F5\u01FA-\u0217\u0250-
\u02A8\u02BB-\u02C1\u0386\u0388-\u038A\u038C\u038E-\u03A1\u03A3-\u03CE\u03D0-
\u03D6\u03DA\u03DC\u03DE\u03E0\u03E2-\u03F3\u0401-\u040C\u040E-\u044F\u0451-\u045C\u045E-
\u0481\u0490-\u04C4\u04C7-\u04C8\u04CB-\u04CC\u04D0-\u04EB\u04EE-\u04F5\u04F8-\u04F9\u0531-
\u0556\u0559\u0561-\u0586\u05D0-\u05EA\u05F0-\u05F2\u0621-\u063A\u0641-\u064A\u0671-\u06B7\u06BA-
\u06BE\u06C0-\u06CE\u06D0-\u06D3\u06D5\u06E5-\u06E6\u0905-\u0939\u093D\u0958-\u0961\u0985-

```



\u098C\u098F-\u0990\u0993-\u09A8\u09AA-\u09B0\u09B2\u09B6-\u09B9\u09DC-\u09DD\u09DF-  
\u09E1\u09F0-\u09F1\u0A05-\u0A0A\u0A0F-\u0A10\u0A13-\u0A28\u0A2A-\u0A30\u0A32-\u0A33\u0A35-  
\u0A36\u0A38-\u0A39\u0A59-\u0A5C\u0A5E\u0A72-\u0A74\u0A85-\u0A8B\u0A8D\u0A8F-\u0A91\u0A93-  
\u0AA8\u0AAA-\u0AB0\u0AB2-\u0AB3\u0AB5-\u0AB9\u0ABD\u0AE0\u0B05-\u0B0C\u0B0F-\u0B10\u0B13-  
\u0B28\u0B2A-\u0B30\u0B32-\u0B33\u0B36-\u0B39\u0B3D\u0B5C-\u0B5D\u0B5F-\u0B61\u0B85-  
\u0B8A\u0B8E-\u0B90\u0B92-\u0B95\u0B99-\u0B9A\u0B9C\u0B9E-\u0B9F\u0BA3-\u0BA4\u0BA8-  
\u0BAA\u0BAE-\u0BB5\u0BB7-\u0BB9\u0C05-\u0C0C\u0C0E-\u0C10\u0C12-\u0C28\u0C2A-\u0C33\u0C35-  
\u0C39\u0C60-\u0C61\u0C85-\u0C8C\u0C8E-\u0C90\u0C92-\u0CA8\u0CAA-\u0CB3\u0CB5-  
\u0CB9\u0CDE\u0CE0-\u0CE1\u0D05-\u0D0C\u0D0E-\u0D10\u0D12-\u0D28\u0D2A-\u0D39\u0D60-  
\u0D61\u0E01-\u0E2E\u0E30\u0E32-\u0E33\u0E40-\u0E45\u0E81-\u0E82\u0E84\u0E87-  
\u0E88\u0E8A\u0E8D\u0E94-\u0E97\u0E99-\u0E9F\u0EA1-\u0EA3\u0EA5\u0EA7\u0EAA-\u0EAB\u0EAD-  
\u0EAE\u0EB0\u0EB2-\u0EB3\u0EBD\u0EC0-\u0EC4\u0F40-\u0F47\u0F49-\u0F69\u10A0-\u10C5\u10D0-  
\u10F6\u1100\u1102-\u1103\u1105-\u1107\u1109\u110B-\u110C\u110E-  
\u1112\u1113\u113E\u1140\u114C\u114E\u1150\u1154-\u1155\u1159\u115F-  
\u1161\u1163\u1165\u1167\u1169\u116D-\u116E\u1172-\u1173\u1175\u119E\u11A8\u11AB\u11AE-  
\u11AF\u11B7-\u11B8\u11BA\u11BC-\u11C2\u11EB\u11F0\u11F9\u1E00-\u1E9B\u1EA0-\u1EF9\u1F00-  
\u1F15\u1F18-\u1F1D\u1F20-\u1F45\u1F48-\u1F4D\u1F50-\u1F57\u1F59\u1F5B\u1F5D\u1F5F-\u1F7D\u1F80-  
\u1FB4\u1FB6-\u1FBC\u1FBE\u1FC2-\u1FC4\u1FC6-\u1FCC\u1FD0-\u1FD3\u1FD6-\u1FDB\u1FE0-  
\u1FEC\u1FF2-\u1FF4\u1FF6-\u1FFC\u2126\u212A-\u212B\u212E\u2180-\u2182\u3041-\u3094\u30A1-  
\u30FA\u3105-\u312C\uAC00-\uD7A3]

Ideographic=[\u4E00-\u9FA5\u3007\u3021-\u3029]

CombiningChar=[\u0300-\u0345\u0360-\u0361\u0483-\u0486\u0591-\u05A1\u05A3-\u05B9\u05BB-  
\u05BD\u05BF\u05C1-\u05C2\u05C4\u064B-\u0652\u0670\u06D6-\u06DC\u06DD-\u06DF\u06E0-\u06E4\u06E7-  
\u06E8\u06EA-\u06ED\u0901-\u0903\u093C\u093E-\u094C\u094D\u0951-\u0954\u0962-\u0963\u0981-  
\u0983\u09BC\u09BE\u09BF\u09C0-\u09C4\u09C7-\u09C8\u09CB-\u09CD\u09D7\u09E2-  
\u09E3\u0A02\u0A3C\u0A3E\u0A3F\u0A40-\u0A42\u0A47-\u0A48\u0A4B-\u0A4D\u0A70-\u0A71\u0A81-  
\u0A83\u0ABC\u0ABE-\u0AC5\u0AC7-\u0AC9\u0ACB-\u0ACD\u0B01-\u0B03\u0B3C\u0B3E-\u0B43\u0B47-  
\u0B48\u0B4B-\u0B4D\u0B56-\u0B57\u0B82-\u0B83\u0BBE-\u0BC2\u0BC6-\u0BC8\u0BCA-  
\u0BCD\u0BD7\u0C01-\u0C03\u0C3E-\u0C44\u0C46-\u0C48\u0C4A-\u0C4D\u0C55-\u0C56\u0C82-  
\u0C83\u0CBE-\u0CC4\u0CC6-\u0CC8\u0CCA-\u0CCD\u0CD5-\u0CD6\u0D02-\u0D03\u0D3E-\u0D43\u0D46-  
\u0D48\u0D4A-\u0D4D\u0D57\u0E31\u0E34-\u0E3A\u0E47-\u0E4E\u0EB1\u0EB4-\u0EB9\u0EBB-  
\u0EBC\u0EC8-\u0ECD\u0F18-\u0F19\u0F35\u0F37\u0F39\u0F3E\u0F3F\u0F71-\u0F84\u0F86-\u0F8B\u0F90-  
\u0F95\u0F97\u0F99-\u0FAD\u0FB1-\u0FB7\u0FB9\u20D0-\u20DC\u20E1\u302A-\u302F\u3099\u309A]

Digit=[\u0030-\u0039\u0660-\u0669\u06F0-\u06F9\u0966-\u096F\u09E6-\u09EF\u0A66-\u0A6F\u0AE6-  
\u0AEF\u0B66-\u0B6F\u0BE7-\u0BEF\u0C66-\u0C6F\u0CE6-\u0CEF\u0D66-\u0D6F\u0E50-\u0E59\u0ED0-  
\u0ED9\u0F20-\u0F29]

Extender=[\u00B7\u02D0\u02D1\u0387\u0640\u0E46\u0EC6\u3005\u3031-\u3035\u309D-\u309E\u30FC-\u30FE]

NCName={({Letter}}|"\_"){NCNameStartChar})({NCNameChar})\*

NCNameChar={Letter}|{Digit}|"."-""|\_{CombiningChar}|{Extender}|{NCNameStartChar}|

\u00B7 | [\u0300-\u036F] | [\u203F-\u2040] | [\u0130-\u0136]

NCNameStartChar=[\u0041-\u005A\u0061-\u007A\u00C0-\u00D6\u00D8-\u00F6\u00F8-\u02FF\u0370-\u037D\u037F-\u1FFF\u200C-\u200D\u2070-\u218F\u2C00-\u2FEF\u3001-\uD7FF\uF900-\uFDCF\uFDF0-\uFFFD] | \u005F |({HighSurrogate}{LowSurrogate})

HighSurrogate=[\uD800-\uDBFF]

LowSurrogate=[\uDC00-\uDFFF]

%%

```
"*"          { return disambiguateStar(); }
"/"          { return newSymbol(sym.SLASH); }
"+"          { return newSymbol(sym.PLUS); }
"-"          { return newSymbol(sym.MINUS); }
"div"        { return disambiguateOperator(sym.DIV); }
"mod"        { return disambiguateOperator(sym.MOD); }
"::"         { return newSymbol(sym.DCOLON); }
","          { return newSymbol(sym.COMMA); }
"@"          { return newSymbol(sym.ATSIGN); }
".."         { return newSymbol(sym.DDOT); }
"|"          { return newSymbol(sym.VBAR); }
"$"          { return newSymbol(sym.DOLLAR); }
"//"         { return newSymbol(sym.DSLASH); }
"="          { return newSymbol(sym.EQ); }
"!="         { return newSymbol(sym.NE); }
"<"         { return newSymbol(sym.LT); }
">"         { return newSymbol(sym.GT); }
"<="        { return newSymbol(sym.LE); }
">="        { return newSymbol(sym.GE); }
"id"         { return disambiguateAxisOrFunction(sym.ID); }
"key"        { return disambiguateAxisOrFunction(sym.KEY); }
"text()"     { return newSymbol(sym.TEXT); }
"text"+[ \t\r\n\f]+"()" { return newSymbol(sym.TEXT); }
"node()"     { return newSymbol(sym.NODE); }
"node"+[ \t\r\n\f]+"()" { return newSymbol(sym.NODE); }
"comment()"  { return newSymbol(sym.COMMENT); }
"comment"+[ \t\r\n\f]+"()" { return newSymbol(sym.COMMENT); }
"processing-instruction"
{ return disambiguateAxisOrFunction(sym.PIPARAM); }
"processing-instruction()" { return newSymbol(sym.PI); }
"processing-instruction"+[ \t\r\n\f]+"()" { return newSymbol(sym.PI); }
"or"         { return disambiguateOperator(sym.OR); }
"and"        { return disambiguateOperator(sym.AND); }
"child"      { return disambiguateAxisOrFunction(sym.CHILD); }
"attribute"  { return disambiguateAxisOrFunction(sym.ATTRIBUTE); }
```

```

"ancestor"      { return disambiguateAxisOrFunction(sym.ANCESTOR); }
"ancestor-or-self"  { return disambiguateAxisOrFunction(sym.ANCESTORORSELF); }
"descendant"    { return disambiguateAxisOrFunction(sym.DESCENDANT); }
"descendant-or-self" { return disambiguateAxisOrFunction(sym.DESCENDANTORSELF); }
"following"     { return disambiguateAxisOrFunction(sym.FOLLOWING); }
"following-sibling" { return disambiguateAxisOrFunction(sym.FOLLOWINGSIBLING); }
}
"namespace"    { return disambiguateAxisOrFunction(sym.NAMESPACE); }
"parent"      { return disambiguateAxisOrFunction(sym.PARENT); }
"preceding"   { return disambiguateAxisOrFunction(sym.PRECEDING); }
"preceding-sibling" { return disambiguateAxisOrFunction(sym.PRECEDINGSIBLING); }
"self"       { return disambiguateAxisOrFunction(sym.SELF); }
"["         { return newSymbol(sym.LBRACK); }
"]"         { return newSymbol(sym.RBRACK); }
"("         { return newSymbol(sym.LPAREN); }
")"         { return newSymbol(sym.RPAREN); }
"<PATTERN>" { initialize(); return new Symbol(sym.PATTERN); }
"<EXPRESSION>" { initialize(); return new Symbol(sym.EXPRESSION); }
\"[^\"]*\"   { return newSymbol(sym.Literal,
    yytext().substring(1, yytext().length() - 1)); }
\"[^\"]*\"   { return newSymbol(sym.Literal,
    yytext().substring(1,
    yytext().length() - 1)); }
{Digit}+    { return newSymbol(sym.INT, new Long(yytext())); }
{Digit}+(\."{Digit})*? { return newSymbol(sym.REAL, new Double(yytext())); }
"."{Digit}+ { return newSymbol(sym.REAL, new Double(yytext())); }
"."         { return newSymbol(sym.DOT); }
({NCName}":")?{NCName} { return newSymbol(sym.QNAME, yytext()); }
({NCName}":")?@"*    { return newSymbol(sym.QNAME, yytext()); }
({NCName}":")?@"*    { return newSymbol(sym.QNAME, yytext()); }
[ \t\r\n\f]      { /* ignore white space. */ }
.                { throw new Exception(yytext()); }

```

Found in path(s):

```
* /opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xalan/xsltc/compiler/xpath.lex
```

No license file was found, but licenses were detected in source scan.

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```

```

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*
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*/
// Proprietary, built in functions
/** current function string (Proprietary). */
```

Found in path(s):

```
*/opt/cola/permits/1134796662_1613422294.09/0/xalan-2-7-2-sources-
jar/org/apache/xpath/compiler/Keywords.java
```

## 1.264 httpcomponents-mime 4.5.3

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## 1.266 jakarta-annotation-api 1.3.4

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\* /opt/cola/permits/1135864419\_1613618067.93/0/javassist-3-22-0-cr2-sources-4-jar/javassist/bytecode/annotation/FloatMemberValue.java

\* /opt/cola/permits/1135864419\_1613618067.93/0/javassist-3-22-0-cr2-sources-4-jar/javassist/bytecode/annotation/StringMemberValue.java

\*

/opt/cola/permits/1135864419\_1613618067.93/0/javassist-3-22-0-cr2-sources-4-jar/javassist/bytecode/annotation/ClassMemberValue.java  
\* /opt/cola/permits/1135864419\_1613618067.93/0/javassist-3-22-0-cr2-sources-4-jar/javassist/bytecode/annotation/Annotation.java  
\* /opt/cola/permits/1135864419\_1613618067.93/0/javassist-3-22-0-cr2-sources-4-jar/javassist/bytecode/annotation/ShortMemberValue.java  
\* /opt/cola/permits/1135864419\_1613618067.93/0/javassist-3-22-0-cr2-sources-4-jar/javassist/bytecode/annotation/DoubleMemberValue.java  
\* /opt/cola/permits/1135864419\_1613618067.93/0/javassist-3-22-0-cr2-sources-4-jar/javassist/bytecode/annotation/EnumMemberValue.java  
\* /opt/cola/permits/1135864419\_1613618067.93/0/javassist-3-22-0-cr2-sources-4-jar/javassist/bytecode/annotation/AnnotationMemberValue.java  
\* /opt/cola/permits/1135864419\_1613618067.93/0/javassist-3-22-0-cr2-sources-4-jar/javassist/bytecode/annotation/ArrayMemberValue.java  
\* /opt/cola/permits/1135864419\_1613618067.93/0/javassist-3-22-0-cr2-sources-4-jar/javassist/bytecode/annotation/ByteMemberValue.java  
\*

/opt/cola/permits/1135864419\_1613618067.93/0/javassist-3-22-0-cr2-sources-4-jar/javassist/bytecode/annotation/MemberValue.java  
\* /opt/cola/permits/1135864419\_1613618067.93/0/javassist-3-22-0-cr2-sources-4-jar/javassist/bytecode/annotation/BooleanMemberValue.java  
\* /opt/cola/permits/1135864419\_1613618067.93/0/javassist-3-22-0-cr2-sources-4-jar/javassist/bytecode/annotation/IntegerMemberValue.java  
\* /opt/cola/permits/1135864419\_1613618067.93/0/javassist-3-22-0-cr2-sources-4-jar/javassist/bytecode/annotation/MemberValueVisitor.java  
\* /opt/cola/permits/1135864419\_1613618067.93/0/javassist-3-22-0-cr2-sources-4-jar/javassist/bytecode/annotation/CharMemberValue.java  
\* /opt/cola/permits/1135864419\_1613618067.93/0/javassist-3-22-0-cr2-sources-4-jar/javassist/bytecode/annotation/LongMemberValue.java

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\* /opt/cola/permits/1135864419\_1613618067.93/0/javassist-3-22-0-cr2-sources-4-jar/javassist/compiler/NoFieldException.java  
 \* /opt/cola/permits/1135864419\_1613618067.93/0/javassist-3-22-0-cr2-sources-4-jar/javassist/bytecode/InnerClassesAttribute.java  
 \*  
 /opt/cola/permits/1135864419\_1613618067.93/0/javassist-3-22-0-cr2-sources-4-jar/javassist/bytecode/analysis/Subroutine.java  
 \* /opt/cola/permits/1135864419\_1613618067.93/0/javassist-3-22-0-cr2-sources-4-jar/javassist/runtime/Cflow.java  
 \* /opt/cola/permits/1135864419\_1613618067.93/0/javassist-3-22-0-cr2-sources-4-jar/javassist/bytecode/annotation/AnnotationImpl.java  
 \* /opt/cola/permits/1135864419\_1613618067.93/0/javassist-3-22-0-cr2-sources-4-jar/javassist/util/proxy/FactoryHelper.java  
 \* /opt/cola/permits/1135864419\_1613618067.93/0/javassist-3-22-0-cr2-sources-4-jar/javassist/convert/Transformer.java  
 \* /opt/cola/permits/1135864419\_1613618067.93/0/javassist-3-22-0-cr2-sources-4-jar/javassist/bytecode/SyntheticAttribute.java  
 \* /opt/cola/permits/1135864419\_1613618067.93/0/javassist-3-22-0-cr2-sources-4-jar/javassist/tools/reflect/Reflection.java  
 \* /opt/cola/permits/1135864419\_1613618067.93/0/javassist-3-22-0-cr2-sources-4-jar/javassist/expr/Instanceof.java  
 \*  
 /opt/cola/permits/1135864419\_1613618067.93/0/javassist-3-22-0-cr2-sources-4-jar/javassist/util/proxy/SecurityActions.java  
 \* /opt/cola/permits/1135864419\_1613618067.93/0/javassist-3-22-0-cr2-sources-4-jar/javassist/bytecode/ByteStream.java  
 \* /opt/cola/permits/1135864419\_1613618067.93/0/javassist-3-22-0-cr2-sources-4-jar/javassist/compiler/SyntaxError.java  
 \* /opt/cola/permits/1135864419\_1613618067.93/0/javassist-3-22-0-cr2-sources-4-jar/javassist/tools/reflect/CannotReflectException.java  
 \* /opt/cola/permits/1135864419\_1613618067.93/0/javassist-3-22-0-cr2-sources-4-jar/javassist/convert/TransformCall.java  
 \* /opt/cola/permits/1135864419\_1613618067.93/0/javassist-3-22-0-cr2-sources-4-jar/javassist/CtNewWrappedMethod.java  
 \* /opt/cola/permits/1135864419\_1613618067.93/0/javassist-3-22-0-cr2-sources-4-jar/javassist/bytecode/ClassFilePrinter.java  
 \* /opt/cola/permits/1135864419\_1613618067.93/0/javassist-3-22-0-cr2-sources-4-jar/javassist/compiler/ast/AssignExpr.java  
 \* /opt/cola/permits/1135864419\_1613618067.93/0/javassist-3-22-0-cr2-sources-4-jar/javassist/CtArray.java  
 \*  
 /opt/cola/permits/1135864419\_1613618067.93/0/javassist-3-22-0-cr2-sources-4-jar/javassist/CtPrimitiveType.java  
 \* /opt/cola/permits/1135864419\_1613618067.93/0/javassist-3-22-0-cr2-sources-4-jar/javassist/compiler/ast/NewExpr.java  
 \* /opt/cola/permits/1135864419\_1613618067.93/0/javassist-3-22-0-cr2-sources-4-jar/javassist/bytecode/DeprecatedAttribute.java  
 \* /opt/cola/permits/1135864419\_1613618067.93/0/javassist-3-22-0-cr2-sources-4-jar/javassist/compiler/MemberResolver.java  
 \* /opt/cola/permits/1135864419\_1613618067.93/0/javassist-3-22-0-cr2-sources-4-jar/javassist/compiler/ast/MethodDecl.java  
 \* /opt/cola/permits/1135864419\_1613618067.93/0/javassist-3-22-0-cr2-sources-4-

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jar/javassist/bytecode/stackmap/Tracer.java
* /opt/cola/permits/1135864419_1613618067.93/0/javassist-3-22-0-cr2-sources-4-
jar/javassist/bytecode/stackmap/BasicBlock.java
* /opt/cola/permits/1135864419_1613618067.93/0/javassist-3-22-0-cr2-sources-4-
jar/javassist/bytecode/CodeAnalyzer.java
*
/opt/cola/permits/1135864419_1613618067.93/0/javassist-3-22-0-cr2-sources-4-
jar/javassist/compiler/JvstCodeGen.java
* /opt/cola/permits/1135864419_1613618067.93/0/javassist-3-22-0-cr2-sources-4-
jar/javassist/bytecode/StackMap.java
* /opt/cola/permits/1135864419_1613618067.93/0/javassist-3-22-0-cr2-sources-4-
jar/javassist/bytecode/LocalVariableAttribute.java
* /opt/cola/permits/1135864419_1613618067.93/0/javassist-3-22-0-cr2-sources-4-
jar/javassist/compiler/CodeGen.java
* /opt/cola/permits/1135864419_1613618067.93/0/javassist-3-22-0-cr2-sources-4-
jar/javassist/bytecode/analysis/MultiType.java
* /opt/cola/permits/1135864419_1613618067.93/0/javassist-3-22-0-cr2-sources-4-
jar/javassist/compiler/ast/Declarator.java
* /opt/cola/permits/1135864419_1613618067.93/0/javassist-3-22-0-cr2-sources-4-
jar/javassist/util/proxy/ProxyObject.java
* /opt/cola/permits/1135864419_1613618067.93/0/javassist-3-22-0-cr2-sources-4-
jar/javassist/bytecode/analysis/Util.java
*
/opt/cola/permits/1135864419_1613618067.93/0/javassist-3-22-0-cr2-sources-4-
jar/javassist/bytecode/EnclosingMethodAttribute.java
* /opt/cola/permits/1135864419_1613618067.93/0/javassist-3-22-0-cr2-sources-4-
jar/javassist/compiler/ast/DoubleConst.java
* /opt/cola/permits/1135864419_1613618067.93/0/javassist-3-22-0-cr2-sources-4-jar/javassist/tools/Dump.java
* /opt/cola/permits/1135864419_1613618067.93/0/javassist-3-22-0-cr2-sources-4-
jar/javassist/bytecode/analysis/ControlFlow.java
* /opt/cola/permits/1135864419_1613618067.93/0/javassist-3-22-0-cr2-sources-4-jar/javassist/CtMethod.java
* /opt/cola/permits/1135864419_1613618067.93/0/javassist-3-22-0-cr2-sources-4-
jar/javassist/bytecode/LineNumberAttribute.java
* /opt/cola/permits/1135864419_1613618067.93/0/javassist-3-22-0-cr2-sources-4-
jar/javassist/bytecode/CodeIterator.java
* /opt/cola/permits/1135864419_1613618067.93/0/javassist-3-22-0-cr2-sources-4-
jar/javassist/scopedpool/ScopedClassPoolRepository.java
* /opt/cola/permits/1135864419_1613618067.93/0/javassist-3-22-0-cr2-sources-4-
jar/javassist/compiler/ast/Stmnt.java
*
/opt/cola/permits/1135864419_1613618067.93/0/javassist-3-22-0-cr2-sources-4-
jar/javassist/bytecode/annotation/NoSuchClassError.java
* /opt/cola/permits/1135864419_1613618067.93/0/javassist-3-22-0-cr2-sources-4-
jar/javassist/bytecode/stackmap/TypedBlock.java
* /opt/cola/permits/1135864419_1613618067.93/0/javassist-3-22-0-cr2-sources-4-jar/javassist/CodeConverter.java
* /opt/cola/permits/1135864419_1613618067.93/0/javassist-3-22-0-cr2-sources-4-
jar/javassist/convert/TransformNewClass.java
* /opt/cola/permits/1135864419_1613618067.93/0/javassist-3-22-0-cr2-sources-4-

```

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jar/javassist/compiler/ast/Visitor.java
* /opt/cola/permits/1135864419_1613618067.93/0/javassist-3-22-0-cr2-sources-4-jar/javassist/CtMember.java
* /opt/cola/permits/1135864419_1613618067.93/0/javassist-3-22-0-cr2-sources-4-
jar/javassist/bytecode/ByteArray.java
* /opt/cola/permits/1135864419_1613618067.93/0/javassist-3-22-0-cr2-sources-4-
jar/javassist/tools/framedump.java
*
/opt/cola/permits/1135864419_1613618067.93/0/javassist-3-22-0-cr2-sources-4-jar/javassist/expr/Cast.java
* /opt/cola/permits/1135864419_1613618067.93/0/javassist-3-22-0-cr2-sources-4-
jar/javassist/util/proxy/ProxyFactory.java
* /opt/cola/permits/1135864419_1613618067.93/0/javassist-3-22-0-cr2-sources-4-
jar/javassist/bytecode/SignatureAttribute.java
* /opt/cola/permits/1135864419_1613618067.93/0/javassist-3-22-0-cr2-sources-4-jar/javassist/ClassClassPath.java
* /opt/cola/permits/1135864419_1613618067.93/0/javassist-3-22-0-cr2-sources-4-
jar/javassist/expr/MethodCall.java
* /opt/cola/permits/1135864419_1613618067.93/0/javassist-3-22-0-cr2-sources-4-
jar/javassist/bytecode/ClassFileWriter.java
* /opt/cola/permits/1135864419_1613618067.93/0/javassist-3-22-0-cr2-sources-4-
jar/javassist/CannotCompileException.java
* /opt/cola/permits/1135864419_1613618067.93/0/javassist-3-22-0-cr2-sources-4-
jar/javassist/convert/TransformReadField.java
*
/opt/cola/permits/1135864419_1613618067.93/0/javassist-3-22-0-cr2-sources-4-
jar/javassist/bytecode/stackmap/TypeData.java
* /opt/cola/permits/1135864419_1613618067.93/0/javassist-3-22-0-cr2-sources-4-jar/javassist/CtNewClass.java
* /opt/cola/permits/1135864419_1613618067.93/0/javassist-3-22-0-cr2-sources-4-jar/javassist/tools/Callback.java
* /opt/cola/permits/1135864419_1613618067.93/0/javassist-3-22-0-cr2-sources-4-jar/javassist/Modifier.java
* /opt/cola/permits/1135864419_1613618067.93/0/javassist-3-22-0-cr2-sources-4-
jar/javassist/bytecode/stackmap/TypeTag.java
* /opt/cola/permits/1135864419_1613618067.93/0/javassist-3-22-0-cr2-sources-4-jar/javassist/runtime/Inner.java
* /opt/cola/permits/1135864419_1613618067.93/0/javassist-3-22-0-cr2-sources-4-
jar/javassist/bytecode/analysis/FramePrinter.java
* /opt/cola/permits/1135864419_1613618067.93/0/javassist-3-22-0-cr2-sources-4-
jar/javassist/tools/rmi/StubGenerator.java
* /opt/cola/permits/1135864419_1613618067.93/0/javassist-3-22-0-cr2-sources-4-
jar/javassist/tools/rmi/ObjectNotFoundException.java
*
/opt/cola/permits/1135864419_1613618067.93/0/javassist-3-22-0-cr2-sources-4-
jar/javassist/compiler/TypeChecker.java
* /opt/cola/permits/1135864419_1613618067.93/0/javassist-3-22-0-cr2-sources-4-jar/javassist/CtClass.java
* /opt/cola/permits/1135864419_1613618067.93/0/javassist-3-22-0-cr2-sources-4-
jar/javassist/scopedpool/SoftValueHashMap.java
* /opt/cola/permits/1135864419_1613618067.93/0/javassist-3-22-0-cr2-sources-4-
jar/javassist/util/proxy/ProxyObjectInputStream.java
* /opt/cola/permits/1135864419_1613618067.93/0/javassist-3-22-0-cr2-sources-4-
jar/javassist/NotFoundException.java
* /opt/cola/permits/1135864419_1613618067.93/0/javassist-3-22-0-cr2-sources-4-jar/javassist/CtField.java
* /opt/cola/permits/1135864419_1613618067.93/0/javassist-3-22-0-cr2-sources-4-

```



```

jar/javassist/bytecode/Opcodes.java
* /opt/cola/permits/1135864419_1613618067.93/0/javassist-3-22-0-cr2-sources-4-jar/javassist/Translator.java
* /opt/cola/permits/1135864419_1613618067.93/0/javassist-3-22-0-cr2-sources-4-
jar/javassist/compiler/ast/Pair.java
*
/opt/cola/permits/1135864419_1613618067.93/0/javassist-3-22-0-cr2-sources-4-
jar/javassist/tools/reflect/Sample.java
* /opt/cola/permits/1135864419_1613618067.93/0/javassist-3-22-0-cr2-sources-4-
jar/javassist/util/proxy/MethodHandler.java
* /opt/cola/permits/1135864419_1613618067.93/0/javassist-3-22-0-cr2-sources-4-jar/javassist/CtConstructor.java
* /opt/cola/permits/1135864419_1613618067.93/0/javassist-3-22-0-cr2-sources-4-
jar/javassist/bytecode/annotation/AnnotationsWriter.java
* /opt/cola/permits/1135864419_1613618067.93/0/javassist-3-22-0-cr2-sources-4-
jar/javassist/tools/rmi/Sample.java
* /opt/cola/permits/1135864419_1613618067.93/0/javassist-3-22-0-cr2-sources-4-
jar/javassist/bytecode/LocalVariableTypeAttribute.java
* /opt/cola/permits/1135864419_1613618067.93/0/javassist-3-22-0-cr2-sources-4-
jar/javassist/util/proxy/DefineClassHelper.java
* /opt/cola/permits/1135864419_1613618067.93/0/javassist-3-22-0-cr2-sources-4-
jar/javassist/runtime/DotClass.java
*
/opt/cola/permits/1135864419_1613618067.93/0/javassist-3-22-0-cr2-sources-4-jar/javassist/runtime/Desc.java
* /opt/cola/permits/1135864419_1613618067.93/0/javassist-3-22-0-cr2-sources-4-
jar/javassist/compiler/ast/StringL.java
* /opt/cola/permits/1135864419_1613618067.93/0/javassist-3-22-0-cr2-sources-4-
jar/javassist/scopedpool/ScopedClassPoolRepositoryImpl.java
* /opt/cola/permits/1135864419_1613618067.93/0/javassist-3-22-0-cr2-sources-4-
jar/javassist/CtNewNestedClass.java
* /opt/cola/permits/1135864419_1613618067.93/0/javassist-3-22-0-cr2-sources-4-
jar/javassist/compiler/ast/Member.java
* /opt/cola/permits/1135864419_1613618067.93/0/javassist-3-22-0-cr2-sources-4-jar/javassist/util/proxy/Proxy.java
* /opt/cola/permits/1135864419_1613618067.93/0/javassist-3-22-0-cr2-sources-4-
jar/javassist/scopedpool/ScopedClassPool.java
* /opt/cola/permits/1135864419_1613618067.93/0/javassist-3-22-0-cr2-sources-4-
jar/javassist/bytecode/analysis/Executor.java
*
/opt/cola/permits/1135864419_1613618067.93/0/javassist-3-22-0-cr2-sources-4-
jar/javassist/tools/rmi/RemoteRef.java
* /opt/cola/permits/1135864419_1613618067.93/0/javassist-3-22-0-cr2-sources-4-
jar/javassist/bytecode/analysis/MultiArrayType.java
* /opt/cola/permits/1135864419_1613618067.93/0/javassist-3-22-0-cr2-sources-4-
jar/javassist/bytecode/ClassFile.java
* /opt/cola/permits/1135864419_1613618067.93/0/javassist-3-22-0-cr2-sources-4-
jar/javassist/bytecode/AttributeInfo.java
* /opt/cola/permits/1135864419_1613618067.93/0/javassist-3-22-0-cr2-sources-4-
jar/javassist/util/proxy/RuntimeSupport.java
* /opt/cola/permits/1135864419_1613618067.93/0/javassist-3-22-0-cr2-sources-4-
jar/javassist/bytecode/FieldInfo.java

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\* /opt/cola/permits/1135864419\_1613618067.93/0/javassist-3-22-0-cr2-sources-4-jar/javassist/expr/FieldAccess.java

\* /opt/cola/permits/1135864419\_1613618067.93/0/javassist-3-22-0-cr2-sources-4-jar/javassist/compiler/ast/BinExpr.java

\* /opt/cola/permits/1135864419\_1613618067.93/0/javassist-3-22-0-cr2-sources-4-jar/javassist/compiler/SymbolTable.java

\*

/opt/cola/permits/1135864419\_1613618067.93/0/javassist-3-22-0-cr2-sources-4-jar/javassist/expr/Handler.java

\* /opt/cola/permits/1135864419\_1613618067.93/0/javassist-3-22-0-cr2-sources-4-jar/javassist/bytecode/BadBytecode.java

\* /opt/cola/permits/1135864419\_1613618067.93/0/javassist-3-22-0-cr2-sources-4-jar/javassist/compiler/Lex.java

\* /opt/cola/permits/1135864419\_1613618067.93/0/javassist-3-22-0-cr2-sources-4-jar/javassist/tools/web/Webserver.java

\* /opt/cola/permits/1135864419\_1613618067.93/0/javassist-3-22-0-cr2-sources-4-jar/javassist/tools/rmi/Proxy.java

\* /opt/cola/permits/1135864419\_1613618067.93/0/javassist-3-22-0-cr2-sources-4-jar/javassist/convert/TransformNew.java

\* /opt/cola/permits/1135864419\_1613618067.93/0/javassist-3-22-0-cr2-sources-4-jar/javassist/bytecode/InstructionPrinter.java

\* /opt/cola/permits/1135864419\_1613618067.93/0/javassist-3-22-0-cr2-sources-4-jar/javassist/bytecode/analysis/SubroutineScanner.java

\*

/opt/cola/permits/1135864419\_1613618067.93/0/javassist-3-22-0-cr2-sources-4-jar/javassist/compiler/ast/Expr.java

\* /opt/cola/permits/1135864419\_1613618067.93/0/javassist-3-22-0-cr2-sources-4-jar/javassist/CtNewWrappedConstructor.java

\* /opt/cola/permits/1135864419\_1613618067.93/0/javassist-3-22-0-cr2-sources-4-jar/javassist/ByteArrayClassPath.java

\* /opt/cola/permits/1135864419\_1613618067.93/0/javassist-3-22-0-cr2-sources-4-jar/javassist/CtBehavior.java

\* /opt/cola/permits/1135864419\_1613618067.93/0/javassist-3-22-0-cr2-sources-4-jar/javassist/bytecode/ExceptionTable.java

\* /opt/cola/permits/1135864419\_1613618067.93/0/javassist-3-22-0-cr2-sources-4-jar/javassist/tools/reflect/ClassMetaobject.java

\* /opt/cola/permits/1135864419\_1613618067.93/0/javassist-3-22-0-cr2-sources-4-jar/javassist/compiler/ProceedHandler.java

\* /opt/cola/permits/1135864419\_1613618067.93/0/javassist-3-22-0-cr2-sources-4-jar/javassist/expr/NewArray.java

\* /opt/cola/permits/1135864419\_1613618067.93/0/javassist-3-22-0-cr2-sources-4-jar/javassist/scopedpool/ScopedClassPoolFactoryImpl.java

\*

/opt/cola/permits/1135864419\_1613618067.93/0/javassist-3-22-0-cr2-sources-4-jar/javassist/bytecode/SourceFileAttribute.java

\* /opt/cola/permits/1135864419\_1613618067.93/0/javassist-3-22-0-cr2-sources-4-jar/javassist/bytecode/stackmap/MapMaker.java

\* /opt/cola/permits/1135864419\_1613618067.93/0/javassist-3-22-0-cr2-sources-4-jar/javassist/util/proxy/ProxyObjectOutputStream.java

\* /opt/cola/permits/1135864419\_1613618067.93/0/javassist-3-22-0-cr2-sources-4-jar/javassist/convert/TransformAccessArrayField.java

\* /opt/cola/permits/1135864419\_1613618067.93/0/javassist-3-22-0-cr2-sources-4-jar/javassist/tools/web/Viewer.java

\* /opt/cola/permits/1135864419\_1613618067.93/0/javassist-3-22-0-cr2-sources-4-

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jar/javassist/tools/reflect/CannotCreateException.java
* /opt/cola/permits/1135864419_1613618067.93/0/javassist-3-22-0-cr2-sources-4-
jar/javassist/compiler/KeywordTable.java
*
/opt/cola/permits/1135864419_1613618067.93/0/javassist-3-22-0-cr2-sources-4-jar/javassist/compiler/Parser.java
* /opt/cola/permits/1135864419_1613618067.93/0/javassist-3-22-0-cr2-sources-4-jar/javassist/Loader.java
* /opt/cola/permits/1135864419_1613618067.93/0/javassist-3-22-0-cr2-sources-4-jar/javassist/expr/Expr.java
* /opt/cola/permits/1135864419_1613618067.93/0/javassist-3-22-0-cr2-sources-4-jar/javassist/ClassPoolTail.java
* /opt/cola/permits/1135864419_1613618067.93/0/javassist-3-22-0-cr2-sources-4-
jar/javassist/expr/ConstructorCall.java
* /opt/cola/permits/1135864419_1613618067.93/0/javassist-3-22-0-cr2-sources-4-
jar/javassist/tools/reflect/Metalevel.java
* /opt/cola/permits/1135864419_1613618067.93/0/javassist-3-22-0-cr2-sources-4-
jar/javassist/bytecode/analysis/IntQueue.java
* /opt/cola/permits/1135864419_1613618067.93/0/javassist-3-22-0-cr2-sources-4-
jar/javassist/compiler/ast/Symbol.java
* /opt/cola/permits/1135864419_1613618067.93/0/javassist-3-22-0-cr2-sources-4-
jar/javassist/tools/rmi/ObjectImporter.java
*
/opt/cola/permits/1135864419_1613618067.93/0/javassist-3-22-0-cr2-sources-4-
jar/javassist/bytecode/analysis/Frame.java
* /opt/cola/permits/1135864419_1613618067.93/0/javassist-3-22-0-cr2-sources-4-
jar/javassist/compiler/TokenId.java
* /opt/cola/permits/1135864419_1613618067.93/0/javassist-3-22-0-cr2-sources-4-
jar/javassist/tools/rmi/AppletServer.java
* /opt/cola/permits/1135864419_1613618067.93/0/javassist-3-22-0-cr2-sources-4-
jar/javassist/bytecode/CodeAttribute.java
* /opt/cola/permits/1135864419_1613618067.93/0/javassist-3-22-0-cr2-sources-4-
jar/javassist/bytecode/Bytecode.java
* /opt/cola/permits/1135864419_1613618067.93/0/javassist-3-22-0-cr2-sources-4-
jar/javassist/compiler/ast/InstanceOfExpr.java
* /opt/cola/permits/1135864419_1613618067.93/0/javassist-3-22-0-cr2-sources-4-jar/javassist/expr/NewExpr.java
* /opt/cola/permits/1135864419_1613618067.93/0/javassist-3-22-0-cr2-sources-4-
jar/javassist/util/proxy/MethodFilter.java
* /opt/cola/permits/1135864419_1613618067.93/0/javassist-3-22-0-cr2-sources-4-jar/javassist/expr/ExprEditor.java
*
/opt/cola/permits/1135864419_1613618067.93/0/javassist-3-22-0-cr2-sources-4-
jar/javassist/bytecode/AccessFlag.java
* /opt/cola/permits/1135864419_1613618067.93/0/javassist-3-22-0-cr2-sources-4-jar/javassist/ClassPath.java
* /opt/cola/permits/1135864419_1613618067.93/0/javassist-3-22-0-cr2-sources-4-
jar/javassist/bytecode/analysis/Analyzer.java
* /opt/cola/permits/1135864419_1613618067.93/0/javassist-3-22-0-cr2-sources-4-jar/javassist/CtClassType.java
* /opt/cola/permits/1135864419_1613618067.93/0/javassist-3-22-0-cr2-sources-4-
jar/javassist/tools/reflect/CannotInvokeException.java
* /opt/cola/permits/1135864419_1613618067.93/0/javassist-3-22-0-cr2-sources-4-
jar/javassist/bytecode/AnnotationsAttribute.java
* /opt/cola/permits/1135864419_1613618067.93/0/javassist-3-22-0-cr2-sources-4-jar/javassist/util/HotSwapper.java
* /opt/cola/permits/1135864419_1613618067.93/0/javassist-3-22-0-cr2-sources-4-

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jar/javassist/tools/reflect/Compiler.java
*
/opt/cola/permits/1135864419_1613618067.93/0/javassist-3-22-0-cr2-sources-4-
jar/javassist/bytecode/LongVector.java
* /opt/cola/permits/1135864419_1613618067.93/0/javassist-3-22-0-cr2-sources-4-
jar/javassist/compiler/ast/FieldDecl.java
* /opt/cola/permits/1135864419_1613618067.93/0/javassist-3-22-0-cr2-sources-4-
jar/javassist/tools/web/BadHttpRequest.java
* /opt/cola/permits/1135864419_1613618067.93/0/javassist-3-22-0-cr2-sources-4-
jar/javassist/CtNewConstructor.java
* /opt/cola/permits/1135864419_1613618067.93/0/javassist-3-22-0-cr2-sources-4-
jar/javassist/compiler/ast/CastExpr.java
* /opt/cola/permits/1135864419_1613618067.93/0/javassist-3-22-0-cr2-sources-4-jar/javassist/compiler/Javac.java
* /opt/cola/permits/1135864419_1613618067.93/0/javassist-3-22-0-cr2-sources-4-
jar/javassist/SerialVersionUID.java
* /opt/cola/permits/1135864419_1613618067.93/0/javassist-3-22-0-cr2-sources-4-
jar/javassist/bytecode/MethodInfo.java
* /opt/cola/permits/1135864419_1613618067.93/0/javassist-3-22-0-cr2-sources-4-
jar/javassist/tools/reflect/Metaobject.java
*
/opt/cola/permits/1135864419_1613618067.93/0/javassist-3-22-0-cr2-sources-4-
jar/javassist/convert/TransformAfter.java
* /opt/cola/permits/1135864419_1613618067.93/0/javassist-3-22-0-cr2-sources-4-
jar/javassist/bytecode/Descriptor.java
* /opt/cola/permits/1135864419_1613618067.93/0/javassist-3-22-0-cr2-sources-4-
jar/javassist/compiler/ast/CallExpr.java
* /opt/cola/permits/1135864419_1613618067.93/0/javassist-3-22-0-cr2-sources-4-
jar/javassist/compiler/ast/IntConst.java
* /opt/cola/permits/1135864419_1613618067.93/0/javassist-3-22-0-cr2-sources-4-
jar/javassist/bytecode/AnnotationDefaultAttribute.java
* /opt/cola/permits/1135864419_1613618067.93/0/javassist-3-22-0-cr2-sources-4-
jar/javassist/convert/TransformBefore.java
* /opt/cola/permits/1135864419_1613618067.93/0/javassist-3-22-0-cr2-sources-4-
jar/javassist/compiler/JvstTypeChecker.java
* /opt/cola/permits/1135864419_1613618067.93/0/javassist-3-22-0-cr2-sources-4-
jar/javassist/LoaderClassPath.java
*
/opt/cola/permits/1135864419_1613618067.93/0/javassist-3-22-0-cr2-sources-4-
jar/javassist/bytecode/ParameterAnnotationsAttribute.java
* /opt/cola/permits/1135864419_1613618067.93/0/javassist-3-22-0-cr2-sources-4-
jar/javassist/compiler/ast/Variable.java
* /opt/cola/permits/1135864419_1613618067.93/0/javassist-3-22-0-cr2-sources-4-jar/javassist/CtNewMethod.java
* /opt/cola/permits/1135864419_1613618067.93/0/javassist-3-22-0-cr2-sources-4-
jar/javassist/compiler/ast/ASTree.java
* /opt/cola/permits/1135864419_1613618067.93/0/javassist-3-22-0-cr2-sources-4-
jar/javassist/bytecode/Mnemonic.java
* /opt/cola/permits/1135864419_1613618067.93/0/javassist-3-22-0-cr2-sources-4-jar/javassist/ClassPool.java
* /opt/cola/permits/1135864419_1613618067.93/0/javassist-3-22-0-cr2-sources-4-

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jar/javassist/bytecode/ExceptionsAttribute.java  
\* /opt/cola/permits/1135864419\_1613618067.93/0/javassist-3-22-0-cr2-sources-4-jar/javassist/URLClassPath.java  
\*  
/opt/cola/permits/1135864419\_1613618067.93/0/javassist-3-22-0-cr2-sources-4-jar/javassist/scopedpool/ScopedClassPoolFactory.java  
\* /opt/cola/permits/1135864419\_1613618067.93/0/javassist-3-22-0-cr2-sources-4-jar/javassist/compiler/ast/ArrayInit.java  
\* /opt/cola/permits/1135864419\_1613618067.93/0/javassist-3-22-0-cr2-sources-4-jar/javassist/tools/reflect/Loader.java  
\* /opt/cola/permits/1135864419\_1613618067.93/0/javassist-3-22-0-cr2-sources-4-jar/javassist/convert/TransformFieldAccess.java  
\* /opt/cola/permits/1135864419\_1613618067.93/0/javassist-3-22-0-cr2-sources-4-jar/javassist/bytecode/DuplicateMemberException.java  
\* /opt/cola/permits/1135864419\_1613618067.93/0/javassist-3-22-0-cr2-sources-4-jar/javassist/compiler/ast/CondExpr.java  
\* /opt/cola/permits/1135864419\_1613618067.93/0/javassist-3-22-0-cr2-sources-4-jar/javassist/compiler/ast/ASTList.java  
\* /opt/cola/permits/1135864419\_1613618067.93/0/javassist-3-22-0-cr2-sources-4-jar/javassist/compiler/ast/Keyword.java  
\* /opt/cola/permits/1135864419\_1613618067.93/0/javassist-3-22-0-cr2-sources-4-jar/javassist/convert/TransformWriteField.java  
\*  
/opt/cola/permits/1135864419\_1613618067.93/0/javassist-3-22-0-cr2-sources-4-jar/javassist/bytecode/ConstPool.java  
\* /opt/cola/permits/1135864419\_1613618067.93/0/javassist-3-22-0-cr2-sources-4-jar/javassist/bytecode/analysis/Type.java  
\* /opt/cola/permits/1135864419\_1613618067.93/0/javassist-3-22-0-cr2-sources-4-jar/javassist/bytecode/StackMapTable.java  
\* /opt/cola/permits/1135864419\_1613618067.93/0/javassist-3-22-0-cr2-sources-4-jar/javassist/util/HotSwapAgent.java  
\* /opt/cola/permits/1135864419\_1613618067.93/0/javassist-3-22-0-cr2-sources-4-jar/javassist/compiler/MemberCodeGen.java  
\* /opt/cola/permits/1135864419\_1613618067.93/0/javassist-3-22-0-cr2-sources-4-jar/javassist/ClassMap.java  
\* /opt/cola/permits/1135864419\_1613618067.93/0/javassist-3-22-0-cr2-sources-4-jar/javassist/compiler/CompileError.java  
\* /opt/cola/permits/1135864419\_1613618067.93/0/javassist-3-22-0-cr2-sources-4-jar/javassist/tools/rmi/RemoteException.java  
\*  
/opt/cola/permits/1135864419\_1613618067.93/0/javassist-3-22-0-cr2-sources-4-jar/javassist/bytecode/ConstantAttribute.java  
\* /opt/cola/permits/1135864419\_1613618067.93/0/javassist-3-22-0-cr2-sources-4-jar/javassist/compiler/AccessorMaker.java  
\* /opt/cola/permits/1135864419\_1613618067.93/0/javassist-3-22-0-cr2-sources-4-jar/javassist/util/proxy/SerializedProxy.java

# 1.268 javax-ws-rs-api 2.0

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# 1.269 jakarta-ws-rs-api 2.1.5

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./ChangeLog X 2003,2004,2005,2006,2007
./LICENSE X 2003,2004,2005,2006,2007
./MANIFEST.in X 2003,2004,2005,2006,2007
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```

./README X 2003,2004,2005,2006,2007  
./TODO X 2003,2004,2005,2006,2007  
./dns/\_\_init\_\_.py PYTHON 2003,2004,2005,2006,2007,2009,2011  
./dns/dnssec.py PYTHON 2003,2004,2005,2006,2007,2009,2011  
./dns/e164.py PYTHON 2006,2007,2009,2011  
./dns/edns.py PYTHON 2009,2011  
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## 1.271 tokyo-cabinet 1.4.48

### 1.271.1 Available under license :

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Version 2.1, February 1999

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<https://glassfish.dev.java.net/nonav/public/CDDL+GPL.html>

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\* javax.annotation:javax.annotation-api

\* javax.transaction:javax.transaction-api

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Oracle OpenJDK

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org.ow2.asm:asm-commons

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org.eclipse.jetty.toolchain:jetty-schemas

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#### Assorted

The UnixCrypt.java code implements the one way cryptography used by Unix systems for simple password protection. Copyright 1996 Aki Yoshida, modified April 2001 by Iris Van den Broeke, Daniel Deville.

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## 1.279 commons-lang3 2.0

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jar/org/apache/commons/lang/BooleanUtils.java  
\* /opt/cola/permits/1136703788\_1613865199.18/0/commons-lang-2-0-sources-3-  
jar/org/apache/commons/lang/time/FastDateFormat.java

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jar/org/apache/commons/lang/StringPrintWriter.java

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jar/org/apache/commons/lang/ClassUtils.java
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* /opt/cola/permits/1136703788_1613865199.18/0/commons-lang-2-0-sources-3-
jar/org/apache/commons/lang/UnhandledException.java
* /opt/cola/permits/1136703788_1613865199.18/0/commons-lang-2-0-sources-3-
jar/org/apache/commons/lang/StringEscapeUtils.java
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jar/org/apache/commons/lang/builder/ReflectionToStringBuilder.java
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jar/org/apache/commons/lang/math/Fraction.java
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jar/org/apache/commons/lang/exception/NestableRuntimeException.java
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jar/org/apache/commons/lang/CharRange.java
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jar/org/apache/commons/lang/builder/HashCodeBuilder.java
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jar/org/apache/commons/lang/math/LongRange.java
* /opt/cola/permits/1136703788_1613865199.18/0/commons-lang-2-0-sources-3-
jar/org/apache/commons/lang/enum/ValuedEnum.java
*
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jar/org/apache/commons/lang/exception/NestableDelegate.java
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* /opt/cola/permits/1136703788_1613865199.18/0/commons-lang-2-0-sources-3-
jar/org/apache/commons/lang/CharSetUtils.java
* /opt/cola/permits/1136703788_1613865199.18/0/commons-lang-2-0-sources-3-
jar/org/apache/commons/lang/time/DateFormatUtils.java
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jar/org/apache/commons/lang/NumberUtils.java
* /opt/cola/permits/1136703788_1613865199.18/0/commons-lang-2-0-sources-3-
jar/org/apache/commons/lang/enum/EnumUtils.java
* /opt/cola/permits/1136703788_1613865199.18/0/commons-lang-2-0-sources-3-
jar/org/apache/commons/lang/builder/ToStringStyle.java
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/opt/cola/permits/1136703788_1613865199.18/0/commons-lang-2-0-sources-3-
jar/org/apache/commons/lang/builder/CompareToBuilder.java
* /opt/cola/permits/1136703788_1613865199.18/0/commons-lang-2-0-sources-3-
jar/org/apache/commons/lang/builder/ToStringBuilder.java

```

\* /opt/cola/permits/1136703788\_1613865199.18/0/commons-lang-2-0-sources-3-jar/org/apache/commons/lang/exception/NestableError.java  
\* /opt/cola/permits/1136703788\_1613865199.18/0/commons-lang-2-0-sources-3-jar/org/apache/commons/lang/math/NumberUtils.java  
\* /opt/cola/permits/1136703788\_1613865199.18/0/commons-lang-2-0-sources-3-jar/org/apache/commons/lang/builder/StandardToStringStyle.java  
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\* /opt/cola/permits/1136703788\_1613865199.18/0/commons-lang-2-0-sources-3-jar/org/apache/commons/lang/math/FloatRange.java  
\*  
/opt/cola/permits/1136703788\_1613865199.18/0/commons-lang-2-0-sources-3-jar/org/apache/commons/lang/NotImplementedException.java  
\* /opt/cola/permits/1136703788\_1613865199.18/0/commons-lang-2-0-sources-3-jar/org/apache/commons/lang/IllegalClassException.java  
\* /opt/cola/permits/1136703788\_1613865199.18/0/commons-lang-2-0-sources-3-jar/org/apache/commons/lang/Entities.java  
\* /opt/cola/permits/1136703788\_1613865199.18/0/commons-lang-2-0-sources-3-jar/org/apache/commons/lang/exception/NestableException.java  
\* /opt/cola/permits/1136703788\_1613865199.18/0/commons-lang-2-0-sources-3-jar/org/apache/commons/lang/math/NumberRange.java  
\* /opt/cola/permits/1136703788\_1613865199.18/0/commons-lang-2-0-sources-3-jar/org/apache/commons/lang/math/DoubleRange.java  
\* /opt/cola/permits/1136703788\_1613865199.18/0/commons-lang-2-0-sources-3-jar/org/apache/commons/lang/NumberRange.java  
\* /opt/cola/permits/1136703788\_1613865199.18/0/commons-lang-2-0-sources-3-jar/org/apache/commons/lang/exception/Nestable.java  
\*  
/opt/cola/permits/1136703788\_1613865199.18/0/commons-lang-2-0-sources-3-jar/org/apache/commons/lang/RandomStringUtils.java  
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\* /opt/cola/permits/1136703788\_1613865199.18/0/commons-lang-2-0-sources-3-jar/org/apache/commons/lang/time/DateUtils.java  
\* /opt/cola/permits/1136703788\_1613865199.18/0/commons-lang-2-0-sources-3-jar/org/apache/commons/lang/ArrayUtils.java

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# 1.282 tomcat-catalina 8.0.43

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/opt/cola/permits/1137195122\_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-jar/org/apache/coyote/http11/AbstractOutputBuffer.java  
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\* /opt/cola/permits/1137195122\_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-jar/org/apache/coyote/http11/upgrade/BioProcessor.java  
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\* /opt/cola/permits/1137195122\_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-jar/org/apache/tomcat/util/net/SendfileState.java

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\* /opt/cola/permits/1137195122\_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-jar/org/apache/coyote/ajp/AjpProtocol.java  
\* /opt/cola/permits/1137195122\_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-jar/org/apache/coyote/Processor.java  
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\* /opt/cola/permits/1137195122\_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-

jar/org/apache/coyote/http11/upgrade/AbstractServletInputStream.java  
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jar/org/apache/tomcat/util/net/Constants.java

\*  
/opt/cola/permits/1137195122\_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-jar/org/apache/coyote/InputBuffer.java  
\* /opt/cola/permits/1137195122\_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-jar/org/apache/tomcat/util/http/ServerCookie.java  
\* /opt/cola/permits/1137195122\_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-jar/org/apache/coyote/http11/upgrade/AprServletInputStream.java  
\* /opt/cola/permits/1137195122\_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-jar/org/apache/coyote/Constants.java  
\* /opt/cola/permits/1137195122\_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-jar/org/apache/tomcat/util/net/jsse/openssl/Protocol.java  
\* /opt/cola/permits/1137195122\_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-jar/org/apache/coyote/http11/upgrade/AbstractServletOutputStream.java  
\* /opt/cola/permits/1137195122\_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-jar/org/apache/tomcat/util/http/Parameters.java  
\* /opt/cola/permits/1137195122\_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-jar/org/apache/coyote/http11/filters/IdentityInputFilter.java  
\*  
/opt/cola/permits/1137195122\_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-jar/org/apache/coyote/ajp/AjpAprProcessor.java  
\* /opt/cola/permits/1137195122\_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-jar/org/apache/coyote/ajp/AbstractAjpProtocol.java  
\* /opt/cola/permits/1137195122\_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-jar/org/apache/coyote/http11/AbstractHttp11JsseProtocol.java  
\* /opt/cola/permits/1137195122\_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-jar/org/apache/tomcat/util/net/SocketWrapper.java  
\* /opt/cola/permits/1137195122\_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-jar/org/apache/coyote/http11/filters/VoidInputFilter.java  
\* /opt/cola/permits/1137195122\_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-jar/org/apache/coyote/http11/upgrade/AprServletOutputStream.java  
\* /opt/cola/permits/1137195122\_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-jar/org/apache/coyote/ErrorState.java  
\*  
/opt/cola/permits/1137195122\_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-jar/org/apache/tomcat/util/net/NioEndpoint.java  
\* /opt/cola/permits/1137195122\_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-jar/org/apache/coyote/AbstractProtocol.java  
\* /opt/cola/permits/1137195122\_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-jar/org/apache/coyote/http11/upgrade/Constants.java  
\* /opt/cola/permits/1137195122\_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-jar/org/apache/coyote/ajp/AjpNio2Processor.java  
\* /opt/cola/permits/1137195122\_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-jar/org/apache/tomcat/util/http/parser/MediaTypeCache.java  
\* /opt/cola/permits/1137195122\_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-jar/org/apache/coyote/http11/filters/IdentityOutputFilter.java  
\* /opt/cola/permits/1137195122\_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-jar/org/apache/coyote/ajp/AjpNio2Protocol.java  
\* /opt/cola/permits/1137195122\_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-

jar/org/apache/tomcat/util/net/jsse/JSSEKeyManager.java  
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/opt/cola/permits/1137195122\_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-  
jar/org/apache/tomcat/util/net/JsonObject.java  
\* /opt/cola/permits/1137195122\_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-  
jar/org/apache/tomcat/util/http/parser/AcceptLanguage.java  
\* /opt/cola/permits/1137195122\_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-  
jar/org/apache/coyote/http11/OutputFilter.java  
\* /opt/cola/permits/1137195122\_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-  
jar/org/apache/coyote/http11/AbstractHttp11Protocol.java  
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jar/org/apache/tomcat/util/http/parser/MediaType.java  
\* /opt/cola/permits/1137195122\_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-  
jar/org/apache/coyote/ajp/AjpAprProtocol.java  
\* /opt/cola/permits/1137195122\_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-  
jar/org/apache/coyote/http11/InternalOutputBuffer.java  
\* /opt/cola/permits/1137195122\_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-  
jar/org/apache/tomcat/util/net/jsse/openssl/EncryptionLevel.java  
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/opt/cola/permits/1137195122\_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-  
jar/org/apache/tomcat/util/bcel/classfile/Utility.java  
\* /opt/cola/permits/1137195122\_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-  
jar/org/apache/coyote/http11/Http11AprProtocol.java  
\* /opt/cola/permits/1137195122\_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-  
jar/org/apache/tomcat/util/net/jsse/JSSESocketFactory.java  
\* /opt/cola/permits/1137195122\_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-  
jar/org/apache/coyote/AsyncContextCallback.java  
\* /opt/cola/permits/1137195122\_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-  
jar/org/apache/coyote/http11/filters/ChunkedOutputFilter.java  
\* /opt/cola/permits/1137195122\_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-  
jar/org/apache/coyote/http11/upgrade/Nio2ServletInputStream.java  
\* /opt/cola/permits/1137195122\_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-  
jar/org/apache/tomcat/util/net/jsse/openssl/OpenSSLCipherConfigurationParser.java  
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/opt/cola/permits/1137195122\_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-  
jar/org/apache/tomcat/util/net/DispatchType.java  
\* /opt/cola/permits/1137195122\_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-  
jar/org/apache/coyote/http11/filters/GzipOutputFilter.java  
\* /opt/cola/permits/1137195122\_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-  
jar/org/apache/tomcat/util/net/SSLSupport.java  
\* /opt/cola/permits/1137195122\_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-  
jar/org/apache/tomcat/util/net/jsse/JSSESupport.java  
\* /opt/cola/permits/1137195122\_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-  
jar/org/apache/coyote/http11/Constants.java  
\* /opt/cola/permits/1137195122\_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-  
jar/org/apache/coyote/http11/Http11Protocol.java  
\* /opt/cola/permits/1137195122\_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-  
jar/org/apache/coyote/ajp/Constants.java

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* /opt/cola/permits/1137195122_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-
jar/org/apache/coyote/ByteHolder.java
*
/opt/cola/permits/1137195122_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-
jar/org/apache/tomcat/util/net/SSLImplementation.java
* /opt/cola/permits/1137195122_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-
jar/org/apache/tomcat/util/net/jsse/openssl/Cipher.java
* /opt/cola/permits/1137195122_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-
jar/org/apache/coyote/ajp/AjpNioProcessor.java
* /opt/cola/permits/1137195122_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-
jar/org/apache/tomcat/util/http/FastDateFormat.java
* /opt/cola/permits/1137195122_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-
jar/org/apache/coyote/http11/HeadersTooLargeException.java
* /opt/cola/permits/1137195122_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-
jar/org/apache/coyote/RequestGroupInfo.java
* /opt/cola/permits/1137195122_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-
jar/org/apache/coyote/AbstractProcessor.java
*
/opt/cola/permits/1137195122_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-
jar/org/apache/tomcat/util/net/jsse/openssl/KeyExchange.java
* /opt/cola/permits/1137195122_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-
jar/org/apache/coyote/http11/AbstractHttp11Processor.java
* /opt/cola/permits/1137195122_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-
jar/org/apache/tomcat/util/net/SSLUtil.java
* /opt/cola/permits/1137195122_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-
jar/org/apache/coyote/http11/AbstractInputBuffer.java
* /opt/cola/permits/1137195122_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-
jar/org/apache/coyote/RequestInfo.java
* /opt/cola/permits/1137195122_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-
jar/org/apache/coyote/ActionHook.java
* /opt/cola/permits/1137195122_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-
jar/org/apache/coyote/http11/InternalNio2OutputBuffer.java
* /opt/cola/permits/1137195122_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-
jar/org/apache/tomcat/util/http/ServerCookies.java
*
/opt/cola/permits/1137195122_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-
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* /opt/cola/permits/1137195122_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-
jar/org/apache/coyote/http11/Http11AprProcessor.java
* /opt/cola/permits/1137195122_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-
jar/org/apache/tomcat/util/bcel/classfile/ElementValue.java
* /opt/cola/permits/1137195122_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-
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* /opt/cola/permits/1137195122_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-
jar/org/apache/coyote/http11/Http11Processor.java
* /opt/cola/permits/1137195122_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-

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jar/org/apache/tomcat/util/net/SocketStatus.java  
\* /opt/cola/permits/1137195122\_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-jar/org/apache/coyote/http11/AbstractNioInputBuffer.java  
\*  
/opt/cola/permits/1137195122\_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-jar/org/apache/coyote/UpgradeToken.java  
\* /opt/cola/permits/1137195122\_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-jar/org/apache/coyote/http11/upgrade/AbstractProcessor.java  
\* /opt/cola/permits/1137195122\_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-jar/org/apache/tomcat/util/http/HttpMessages.java  
\* /opt/cola/permits/1137195122\_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-jar/org/apache/tomcat/util/net/DefaultServerSocketFactory.java  
\* /opt/cola/permits/1137195122\_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-jar/org/apache/tomcat/util/net/jsse/openssl/Authentication.java  
\* /opt/cola/permits/1137195122\_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-jar/org/apache/tomcat/util/http/MimeHeaders.java  
\* /opt/cola/permits/1137195122\_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-jar/org/apache/tomcat/util/net/URL.java  
\* /opt/cola/permits/1137195122\_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-jar/org/apache/coyote/http11/InputFilter.java  
\*  
/opt/cola/permits/1137195122\_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-jar/org/apache/tomcat/util/net/jsse/openssl/MessageDigest.java  
\* /opt/cola/permits/1137195122\_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-jar/org/apache/tomcat/util/http/Rfc6265CookieProcessor.java  
\* /opt/cola/permits/1137195122\_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-jar/org/apache/coyote/ajp/AjpMessage.java  
\* /opt/cola/permits/1137195122\_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-jar/org/apache/coyote/OutputBuffer.java  
\* /opt/cola/permits/1137195122\_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-jar/org/apache/tomcat/util/bcel/classfile/ConstantUtf8.java  
\* /opt/cola/permits/1137195122\_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-jar/org/apache/coyote/Request.java  
\* /opt/cola/permits/1137195122\_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-jar/org/apache/coyote/http11/filters/VoidOutputFilter.java  
\*  
/opt/cola/permits/1137195122\_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-jar/org/apache/tomcat/util/log/SystemLogHandler.java  
\* /opt/cola/permits/1137195122\_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-jar/org/apache/tomcat/util/log/CaptureLog.java  
\* /opt/cola/permits/1137195122\_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-jar/org/apache/coyote/ActionCode.java  
\* /opt/cola/permits/1137195122\_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-jar/org/apache/coyote/http11/upgrade/Nio2ServletOutputStream.java  
\* /opt/cola/permits/1137195122\_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-jar/org/apache/coyote/http11/upgrade/NioProcessor.java  
\* /opt/cola/permits/1137195122\_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-jar/org/apache/coyote/http11/filters/SavedRequestInputFilter.java

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* /opt/cola/permits/1137195122_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-
jar/org/apache/coyote/http11/InternalNio2InputBuffer.java
* /opt/cola/permits/1137195122_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-
jar/org/apache/coyote/ajp/AjpProcessor.java
*
/opt/cola/permits/1137195122_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-
jar/org/apache/coyote/http11/upgrade/NioServletInputStream.java
* /opt/cola/permits/1137195122_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-
jar/org/apache/tomcat/util/net/SendfileKeepAliveState.java
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* /opt/cola/permits/1137195122_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-
jar/org/apache/tomcat/util/collections/SynchronizedQueue.java
*
/opt/cola/permits/1137195122_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-
jar/org/apache/tomcat/util/collections/ConcurrentCache.java
* /opt/cola/permits/1137195122_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-
jar/org/apache/tomcat/util/collections/SynchronizedStack.java
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jar/org/apache/tomcat/util/bcel/Const.java

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\* /opt/cola/permits/1137195122\_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-  
jar/org/apache/tomcat/util/net/NioBlockingSelector.java

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/opt/cola/permits/1137195122\_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-  
jar/org/apache/tomcat/util/modeler/ManagedBean.java

\* /opt/cola/permits/1137195122\_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-  
jar/org/apache/tomcat/util/http/fileupload/MultipartStream.java

\* /opt/cola/permits/1137195122\_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-  
jar/org/apache/tomcat/util/http/fileupload/servlet/ServletRequestContext.java

\* /opt/cola/permits/1137195122\_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-  
jar/org/apache/tomcat/util/http/parser/HttpParser.java

\* /opt/cola/permits/1137195122\_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-  
jar/org/apache/tomcat/util/http/fileupload/RequestContext.java

\* /opt/cola/permits/1137195122\_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-  
jar/org/apache/tomcat/util/modeler/ParameterInfo.java

\* /opt/cola/permits/1137195122\_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-  
jar/org/apache/tomcat/util/http/SetCookieSupport.java

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* /opt/cola/permits/1137195122_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-
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/opt/cola/permits/1137195122_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-
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* /opt/cola/permits/1137195122_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-
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* /opt/cola/permits/1137195122_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-
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* /opt/cola/permits/1137195122_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-
jar/org/apache/tomcat/util/http/parser/SkipResult.java
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jar/org/apache/tomcat/util/http/fileupload/FileItemHeaders.java
* /opt/cola/permits/1137195122_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-
jar/org/apache/tomcat/util/http/fileupload/ParameterParser.java
* /opt/cola/permits/1137195122_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-
jar/org/apache/tomcat/util/http/fileupload/FileItem.java
* /opt/cola/permits/1137195122_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-
jar/org/apache/tomcat/util/http/fileupload/FileItemStream.java
* /opt/cola/permits/1137195122_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-
jar/org/apache/tomcat/util/net/NioChannel.java
* /opt/cola/permits/1137195122_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-
jar/org/apache/tomcat/util/http/fileupload/FileUploadBase.java
* /opt/cola/permits/1137195122_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-
jar/org/apache/tomcat/util/http/fileupload/util/package-info.java
*
/opt/cola/permits/1137195122_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-
jar/org/apache/tomcat/util/http/fileupload/disk/DiskFileItemFactory.java
* /opt/cola/permits/1137195122_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-
jar/org/apache/tomcat/util/net/SecureNioChannel.java
* /opt/cola/permits/1137195122_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-
jar/org/apache/tomcat/util/log/UserDataHelper.java
* /opt/cola/permits/1137195122_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-
jar/org/apache/tomcat/util/http/fileupload/util/mime/ParseException.java
* /opt/cola/permits/1137195122_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-
jar/org/apache/tomcat/util/net/AbstractEndpoint.java
* /opt/cola/permits/1137195122_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-
jar/org/apache/tomcat/util/modeler/BaseNotificationBroadcaster.java
* /opt/cola/permits/1137195122_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-
jar/org/apache/tomcat/util/http/fileupload/FileUploadException.java
*

```

```

/opt/cola/permits/1137195122_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-
jar/org/apache/tomcat/util/modeler/FeatureInfo.java
* /opt/cola/permits/1137195122_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-
jar/org/apache/tomcat/util/http/fileupload/UploadContext.java
* /opt/cola/permits/1137195122_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-
jar/org/apache/tomcat/util/http/fileupload/util/Streams.java
* /opt/cola/permits/1137195122_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-
jar/org/apache/tomcat/util/modeler/BaseModelMBean.java
* /opt/cola/permits/1137195122_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-
jar/org/apache/tomcat/util/modeler/RegistryMBean.java
* /opt/cola/permits/1137195122_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-
jar/org/apache/tomcat/util/http/fileupload/ByteArrayOutputStream.java
* /opt/cola/permits/1137195122_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-
jar/org/apache/tomcat/util/http/fileupload/FileUtils.java
*
/opt/cola/permits/1137195122_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-
jar/org/apache/tomcat/util/http/fileupload/FileItemIterator.java
* /opt/cola/permits/1137195122_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-
jar/org/apache/tomcat/util/http/fileupload/ThresholdingOutputStream.java
* /opt/cola/permits/1137195122_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-
jar/org/apache/tomcat/util/net/SocketProperties.java
* /opt/cola/permits/1137195122_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-
jar/org/apache/tomcat/util/http/fileupload/util/FileItemHeadersImpl.java
* /opt/cola/permits/1137195122_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-
jar/org/apache/tomcat/util/modeler/OperationInfo.java
* /opt/cola/permits/1137195122_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-
jar/org/apache/tomcat/util/modeler/modules/MbeansDescriptorsDigesterSource.java
* /opt/cola/permits/1137195122_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-
jar/org/apache/tomcat/util/modeler/Registry.java
*
/opt/cola/permits/1137195122_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-
jar/org/apache/tomcat/util/http/fileupload/disk/package-info.java
* /opt/cola/permits/1137195122_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-
jar/org/apache/tomcat/util/net/NioSelectorPool.java
* /opt/cola/permits/1137195122_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-
jar/org/apache/tomcat/util/http/fileupload/FileItemFactory.java
* /opt/cola/permits/1137195122_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-
jar/org/apache/tomcat/util/http/fileupload/FileItemHeadersSupport.java
* /opt/cola/permits/1137195122_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-
jar/org/apache/tomcat/util/http/fileupload/servlet/package-info.java
* /opt/cola/permits/1137195122_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-
jar/org/apache/tomcat/util/http/fileupload/util/mime/package-info.java
* /opt/cola/permits/1137195122_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-
jar/org/apache/tomcat/util/http/fileupload/servlet/ServletFileUpload.java
*
/opt/cola/permits/1137195122_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-
jar/org/apache/tomcat/util/net/Nio2Channel.java
* /opt/cola/permits/1137195122_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-

```

```
jar/org/apache/tomcat/util/http/fileupload/InvalidFileNameException.java
* /opt/cola/permits/1137195122_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-
jar/org/apache/tomcat/util/modeler/modules/ModelerSource.java
* /opt/cola/permits/1137195122_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-
jar/org/apache/tomcat/util/http/fileupload/FileUpload.java
* /opt/cola/permits/1137195122_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-
jar/org/apache/tomcat/util/http/fileupload/ProgressListener.java
* /opt/cola/permits/1137195122_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-
jar/org/apache/tomcat/util/modeler/BaseAttributeFilter.java
* /opt/cola/permits/1137195122_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-
jar/org/apache/tomcat/util/http/fileupload/DeferredFileOutputStream.java
*
/opt/cola/permits/1137195122_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-
jar/org/apache/tomcat/util/http/parser/Cookie.java
* /opt/cola/permits/1137195122_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-
jar/org/apache/tomcat/util/http/CookieSupport.java
* /opt/cola/permits/1137195122_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-
jar/org/apache/tomcat/util/net/SecureNio2Channel.java
* /opt/cola/permits/1137195122_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-
jar/org/apache/tomcat/util/modeler/AttributeInfo.java
* /opt/cola/permits/1137195122_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-
jar/org/apache/tomcat/util/http/fileupload/util/mime/MimeUtility.java
* /opt/cola/permits/1137195122_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-
jar/org/apache/tomcat/util/http/RequestUtil.java
* /opt/cola/permits/1137195122_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-
jar/org/apache/tomcat/util/modeler/modules/MbeansDescriptorsIntrospectionSource.java
* /opt/cola/permits/1137195122_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-
jar/org/apache/tomcat/util/http/fileupload/util/mime/QuotedPrintableDecoder.java
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```
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*/
```

Found in path(s):

```
* /opt/cola/permits/1137195122_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-
jar/org/apache/tomcat/util/bcel/classfile/ConstantDouble.java
*
/opt/cola/permits/1137195122_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-
jar/org/apache/tomcat/util/bcel/classfile/ClassParser.java
* /opt/cola/permits/1137195122_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-
jar/org/apache/tomcat/util/bcel/classfile/ConstantFloat.java
* /opt/cola/permits/1137195122_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-
jar/org/apache/tomcat/util/bcel/classfile/EnumElementValue.java
* /opt/cola/permits/1137195122_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-
jar/org/apache/tomcat/util/bcel/classfile/JavaClass.java
* /opt/cola/permits/1137195122_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-
jar/org/apache/tomcat/util/bcel/classfile/ConstantPool.java
* /opt/cola/permits/1137195122_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-
jar/org/apache/tomcat/util/bcel/classfile/ElementValuePair.java
* /opt/cola/permits/1137195122_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-
jar/org/apache/tomcat/util/bcel/classfile/ClassElementValue.java
*
/opt/cola/permits/1137195122_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-
jar/org/apache/tomcat/util/bcel/classfile/ConstantClass.java
* /opt/cola/permits/1137195122_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-
jar/org/apache/tomcat/util/bcel/classfile/AnnotationEntry.java
* /opt/cola/permits/1137195122_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-
jar/org/apache/tomcat/util/bcel/classfile/SimpleElementValue.java
* /opt/cola/permits/1137195122_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-
jar/org/apache/tomcat/util/bcel/classfile/ConstantInteger.java
* /opt/cola/permits/1137195122_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-
jar/org/apache/tomcat/util/bcel/classfile/ConstantLong.java
* /opt/cola/permits/1137195122_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-
jar/org/apache/tomcat/util/bcel/classfile/ClassFormatException.java
* /opt/cola/permits/1137195122_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-
jar/org/apache/tomcat/util/bcel/classfile/ArrayElementValue.java
*
/opt/cola/permits/1137195122_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-
jar/org/apache/tomcat/util/bcel/classfile/Constant.java
* /opt/cola/permits/1137195122_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-
jar/org/apache/tomcat/util/bcel/classfile/Annotations.java
* /opt/cola/permits/1137195122_1614028697.63/0/tomcat-coyote-8-0-43-sources-1-
jar/org/apache/tomcat/util/bcel/classfile/AnnotationElementValue.java
```

## 1.284 tomcat-jni 8.0.43

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\* /opt/cola/permits/1137195104\_1614028758.59/0/tomcat-jsp-api-8-0-43-sources-1-jar/javax/servlet/jsp/resources/jspxml.xsd

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\* /opt/cola/permits/1137195104\_1614028758.59/0/tomcat-jsp-api-8-0-43-sources-1-jar/javax/servlet/jsp/PageContext.java

\*

/opt/cola/permits/1137195104\_1614028758.59/0/tomcat-jsp-api-8-0-43-sources-1-jar/javax/servlet/jsp/tagext/TagInfo.java

\* /opt/cola/permits/1137195104\_1614028758.59/0/tomcat-jsp-api-8-0-43-sources-1-jar/javax/servlet/jsp/el/Expression.java

\* /opt/cola/permits/1137195104\_1614028758.59/0/tomcat-jsp-api-8-0-43-sources-1-jar/javax/servlet/jsp/tagext/TagData.java

\* /opt/cola/permits/1137195104\_1614028758.59/0/tomcat-jsp-api-8-0-43-sources-1-jar/javax/servlet/jsp/tagext/FunctionInfo.java

\* /opt/cola/permits/1137195104\_1614028758.59/0/tomcat-jsp-api-8-0-43-sources-1-jar/javax/servlet/jsp/tagext/IterationTag.java

\* /opt/cola/permits/1137195104\_1614028758.59/0/tomcat-jsp-api-8-0-43-sources-1-jar/javax/servlet/jsp/tagext/JspFragment.java

\* /opt/cola/permits/1137195104\_1614028758.59/0/tomcat-jsp-api-8-0-43-sources-1-jar/javax/servlet/jsp/tagext/TagExtraInfo.java

\* /opt/cola/permits/1137195104\_1614028758.59/0/tomcat-jsp-api-8-0-43-sources-1-



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jar/javax/servlet/jsp/JspFactory.java
*
/opt/cola/permits/1137195104_1614028758.59/0/tomcat-jsp-api-8-0-43-sources-1-
jar/javax/servlet/jsp/tagext/SimpleTag.java
* /opt/cola/permits/1137195104_1614028758.59/0/tomcat-jsp-api-8-0-43-sources-1-
jar/javax/servlet/jsp/tagext/Tag.java
* /opt/cola/permits/1137195104_1614028758.59/0/tomcat-jsp-api-8-0-43-sources-1-
jar/javax/servlet/jsp/tagext/TagFileInfo.java
* /opt/cola/permits/1137195104_1614028758.59/0/tomcat-jsp-api-8-0-43-sources-1-
jar/javax/servlet/jsp/tagext/TryCatchFinally.java
* /opt/cola/permits/1137195104_1614028758.59/0/tomcat-jsp-api-8-0-43-sources-1-
jar/javax/servlet/jsp/tagext/JspTag.java
* /opt/cola/permits/1137195104_1614028758.59/0/tomcat-jsp-api-8-0-43-sources-1-
jar/javax/servlet/jsp/tagext/TagSupport.java
* /opt/cola/permits/1137195104_1614028758.59/0/tomcat-jsp-api-8-0-43-sources-1-
jar/javax/servlet/jsp/tagext/DynamicAttributes.java
* /opt/cola/permits/1137195104_1614028758.59/0/tomcat-jsp-api-8-0-43-sources-1-
jar/javax/servlet/jsp/tagext/TagLibraryValidator.java
*
/opt/cola/permits/1137195104_1614028758.59/0/tomcat-jsp-api-8-0-43-sources-1-
jar/javax/servlet/jsp/HttpJspPage.java
* /opt/cola/permits/1137195104_1614028758.59/0/tomcat-jsp-api-8-0-43-sources-1-
jar/javax/servlet/jsp/JspException.java
* /opt/cola/permits/1137195104_1614028758.59/0/tomcat-jsp-api-8-0-43-sources-1-
jar/javax/servlet/jsp/tagext/SimpleTagSupport.java
* /opt/cola/permits/1137195104_1614028758.59/0/tomcat-jsp-api-8-0-43-sources-1-
jar/javax/servlet/jsp/tagext/PageData.java
* /opt/cola/permits/1137195104_1614028758.59/0/tomcat-jsp-api-8-0-43-sources-1-
jar/javax/servlet/jsp/JspEngineInfo.java
* /opt/cola/permits/1137195104_1614028758.59/0/tomcat-jsp-api-8-0-43-sources-1-
jar/javax/servlet/jsp/el/ImplicitObjectELResolver.java
* /opt/cola/permits/1137195104_1614028758.59/0/tomcat-jsp-api-8-0-43-sources-1-
jar/javax/servlet/jsp/JspContext.java
* /opt/cola/permits/1137195104_1614028758.59/0/tomcat-jsp-api-8-0-43-sources-1-
jar/javax/servlet/jsp/el/ELParseException.java
*
/opt/cola/permits/1137195104_1614028758.59/0/tomcat-jsp-api-8-0-43-sources-1-
jar/javax/servlet/jsp/el/FunctionMapper.java
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- \* /opt/cola/permits/1137195104\_1614028758.59/0/tomcat-jsp-api-8-0-43-sources-1-jar/javax/servlet/jsp/tagext/TagAttributeInfo.java
- \*
- /opt/cola/permits/1137195104\_1614028758.59/0/tomcat-jsp-api-8-0-43-sources-1-jar/javax/servlet/jsp/JspTagException.java
- \* /opt/cola/permits/1137195104\_1614028758.59/0/tomcat-jsp-api-8-0-43-sources-1-jar/javax/servlet/jsp/tagext/TagAdapter.java
- \* /opt/cola/permits/1137195104\_1614028758.59/0/tomcat-jsp-api-8-0-43-sources-1-jar/javax/servlet/jsp/tagext/TagLibraryInfo.java
- \* /opt/cola/permits/1137195104\_1614028758.59/0/tomcat-jsp-api-8-0-43-sources-1-jar/javax/servlet/jsp/tagext/TagVariableInfo.java
- \* /opt/cola/permits/1137195104\_1614028758.59/0/tomcat-jsp-api-8-0-43-sources-1-jar/javax/servlet/jsp/ErrorData.java
- \* /opt/cola/permits/1137195104\_1614028758.59/0/tomcat-jsp-api-8-0-43-sources-1-jar/javax/servlet/jsp/tagext/BodyTagSupport.java
- \* /opt/cola/permits/1137195104\_1614028758.59/0/tomcat-jsp-api-8-0-43-sources-1-jar/javax/servlet/jsp/JspWriter.java
- \* /opt/cola/permits/1137195104\_1614028758.59/0/tomcat-jsp-api-8-0-43-sources-1-jar/javax/servlet/jsp/el/ELException.java
- \*
- /opt/cola/permits/1137195104\_1614028758.59/0/tomcat-jsp-api-8-0-43-sources-1-jar/javax/servlet/jsp/el/VariableResolver.java
- \* /opt/cola/permits/1137195104\_1614028758.59/0/tomcat-jsp-api-8-0-43-sources-1-jar/javax/servlet/jsp/tagext/VariableInfo.java
- \* /opt/cola/permits/1137195104\_1614028758.59/0/tomcat-jsp-api-8-0-43-sources-1-jar/javax/servlet/jsp/JspApplicationContext.java
- \* /opt/cola/permits/1137195104\_1614028758.59/0/tomcat-jsp-api-8-0-43-sources-1-jar/javax/servlet/jsp/SkipPageException.java
- \* /opt/cola/permits/1137195104\_1614028758.59/0/tomcat-jsp-api-8-0-43-sources-1-jar/javax/servlet/jsp/el/ExpressionEvaluator.java
- \* /opt/cola/permits/1137195104\_1614028758.59/0/tomcat-jsp-api-8-0-43-sources-1-jar/javax/servlet/jsp/el/ScopedAttributeELResolver.java
- \* /opt/cola/permits/1137195104\_1614028758.59/0/tomcat-jsp-api-8-0-43-sources-1-jar/javax/servlet/jsp/tagext/BodyTag.java
- \* /opt/cola/permits/1137195104\_1614028758.59/0/tomcat-jsp-api-8-0-43-sources-1-jar/javax/servlet/jsp/tagext/BodyContent.java
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- javaee\_6.xsd
- javaee\_web\_services\_1\_3.xsd
- javaee\_web\_services\_client\_1\_3.xsd
- jsp\_2\_2.xsd
- web-app\_3\_0.xsd
- web-common\_3\_0.xsd
- web-fragment\_3\_0.xsd
- javaee\_7.xsd
- javaee\_web\_services\_1\_4.xsd
- javaee\_web\_services\_client\_1\_4.xsd
- jsp\_2\_3.xsd
- web-app\_3\_1.xsd
- web-common\_3\_1.xsd
- web-fragment\_3\_1.xsd

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- javaee\_6.xsd
- javaee\_web\_services\_1\_3.xsd
- javaee\_web\_services\_client\_1\_3.xsd
- jsp\_2\_2.xsd
- web-app\_3\_0.xsd
- web-common\_3\_0.xsd
- web-fragment\_3\_0.xsd
- javaee\_7.xsd
- javaee\_web\_services\_1\_4.xsd
- javaee\_web\_services\_client\_1\_4.xsd
- jsp\_2\_3.xsd
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# 1.288 tomcat-util-scan 8.0.43

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```
## zlib v1.2.11
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```
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- doc/example/pcsc\_demo.c



- the files in src/spy/
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|                | GL/gltext.h        | Khronos        |
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include/GL/gl.h :

Mesa 3-D  
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include/GL/glxext.h
include/GL/wglxext.h :
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## jopt-simple v5.0.4

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- \* /opt/cola/permits/1134796780\_1613422074.14/0/archive-259-zip/RE.java
- \*
- /opt/cola/permits/1134796780\_1613422074.14/0/archive-259-zip/recompile.java
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- \* /opt/cola/permits/1134796780\_1613422074.14/0/archive-259-zip/StringCharacterIterator.java

# 1.295 openjdk 1.7.0u65

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## 1.300 datatype 1.3.04

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2000-05-05

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## 1.303 quartz 2.3.0

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```
* /opt/cola/permits/1150985854_1617740653.75/0/quartz-2-3-0-sources-4-
jar/org/quartz/utills/CircularLossyQueue.java
* /opt/cola/permits/1150985854_1617740653.75/0/quartz-2-3-0-sources-4-
jar/org/quartz/utills/counter/sampled/SampledRateCounter.java
*
/opt/cola/permits/1150985854_1617740653.75/0/quartz-2-3-0-sources-4-
jar/org/quartz/utills/counter/CounterManager.java
* /opt/cola/permits/1150985854_1617740653.75/0/quartz-2-3-0-sources-4-
jar/org/quartz/utills/counter/sampled/SampledCounter.java
* /opt/cola/permits/1150985854_1617740653.75/0/quartz-2-3-0-sources-4-
jar/org/quartz/utills/counter/CounterManagerImpl.java
* /opt/cola/permits/1150985854_1617740653.75/0/quartz-2-3-0-sources-4-
jar/org/quartz/utills/counter/sampled/SampledRateCounterConfig.java
* /opt/cola/permits/1150985854_1617740653.75/0/quartz-2-3-0-sources-4-
jar/org/quartz/utills/counter/sampled/SampledRateCounterImpl.java
* /opt/cola/permits/1150985854_1617740653.75/0/quartz-2-3-0-sources-4-
jar/org/quartz/utills/counter/CounterImpl.java
* /opt/cola/permits/1150985854_1617740653.75/0/quartz-2-3-0-sources-4-jar/org/quartz/utills/counter/Counter.java
```

```
* /opt/cola/permits/1150985854_1617740653.75/0/quartz-2-3-0-sources-4-
jar/org/quartz/utlils/counter/sampled/TimeStampedCounterValue.java
*
/opt/cola/permits/1150985854_1617740653.75/0/quartz-2-3-0-sources-4-
jar/org/quartz/utlils/counter/sampled/SampledCounterConfig.java
* /opt/cola/permits/1150985854_1617740653.75/0/quartz-2-3-0-sources-4-
jar/org/quartz/utlils/counter/CounterConfig.java
* /opt/cola/permits/1150985854_1617740653.75/0/quartz-2-3-0-sources-4-
jar/org/quartz/utlils/counter/sampled/SampledCounterImpl.java
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```
* /opt/cola/permits/1150985854_1617740653.75/0/quartz-2-3-0-sources-4-jar/org/quartz/ScheduleBuilder.java
* /opt/cola/permits/1150985854_1617740653.75/0/quartz-2-3-0-sources-4-
jar/org/quartz/impl/matchers/GroupMatcher.java
* /opt/cola/permits/1150985854_1617740653.75/0/quartz-2-3-0-sources-4-
jar/org/quartz/impl/jdbcjobstore/DailyTimeIntervalTriggerPersistenceDelegate.java
*
/opt/cola/permits/1150985854_1617740653.75/0/quartz-2-3-0-sources-4-jar/org/quartz/CronExpression.java
* /opt/cola/permits/1150985854_1617740653.75/0/quartz-2-3-0-sources-4-
jar/org/quartz/DisallowConcurrentExecution.java
* /opt/cola/permits/1150985854_1617740653.75/0/quartz-2-3-0-sources-4-jar/org/quartz/CronTrigger.java
* /opt/cola/permits/1150985854_1617740653.75/0/quartz-2-3-0-sources-4-
jar/org/quartz/impl/matchers/NotMatcher.java
* /opt/cola/permits/1150985854_1617740653.75/0/quartz-2-3-0-sources-4-jar/org/quartz/Matcher.java
* /opt/cola/permits/1150985854_1617740653.75/0/quartz-2-3-0-sources-4-
jar/org/quartz/CalendarIntervalTrigger.java
* /opt/cola/permits/1150985854_1617740653.75/0/quartz-2-3-0-sources-4-jar/org/quartz/SimpleTrigger.java
* /opt/cola/permits/1150985854_1617740653.75/0/quartz-2-3-0-sources-4-
jar/org/quartz/impl/matchers/AndMatcher.java
*
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/opt/cola/permits/1150985854\_1617740653.75/0/quartz-2-3-0-sources-4-jar/org/quartz/spi/MutableTrigger.java  
\* /opt/cola/permits/1150985854\_1617740653.75/0/quartz-2-3-0-sources-4-jar/org/quartz/JobBuilder.java  
\* /opt/cola/permits/1150985854\_1617740653.75/0/quartz-2-3-0-sources-4-jar/org/quartz/TriggerKey.java  
\* /opt/cola/permits/1150985854\_1617740653.75/0/quartz-2-3-0-sources-4-jar/org/quartz/DailyTimeIntervalScheduleBuilder.java  
\* /opt/cola/permits/1150985854\_1617740653.75/0/quartz-2-3-0-sources-4-jar/org/quartz/JobExecutionException.java  
\* /opt/cola/permits/1150985854\_1617740653.75/0/quartz-2-3-0-sources-4-jar/org/quartz/JobKey.java  
\* /opt/cola/permits/1150985854\_1617740653.75/0/quartz-2-3-0-sources-4-jar/org/quartz/impl/matchers/EverythingMatcher.java  
\* /opt/cola/permits/1150985854\_1617740653.75/0/quartz-2-3-0-sources-4-jar/org/quartz/JobDetail.java  
\* /opt/cola/permits/1150985854\_1617740653.75/0/quartz-2-3-0-sources-4-jar/org/quartz/impl/triggers/CalendarIntervalTriggerImpl.java  
\*  
/opt/cola/permits/1150985854\_1617740653.75/0/quartz-2-3-0-sources-4-jar/org/quartz/DateBuilder.java  
\* /opt/cola/permits/1150985854\_1617740653.75/0/quartz-2-3-0-sources-4-jar/org/quartz/ListenerManager.java  
\* /opt/cola/permits/1150985854\_1617740653.75/0/quartz-2-3-0-sources-4-jar/org/quartz/JobExecutionContext.java  
\* /opt/cola/permits/1150985854\_1617740653.75/0/quartz-2-3-0-sources-4-jar/org/quartz/CronScheduleBuilder.java  
\* /opt/cola/permits/1150985854\_1617740653.75/0/quartz-2-3-0-sources-4-jar/org/quartz/impl/matchers/OrMatcher.java  
\* /opt/cola/permits/1150985854\_1617740653.75/0/quartz-2-3-0-sources-4-jar/org/quartz/TriggerBuilder.java  
\* /opt/cola/permits/1150985854\_1617740653.75/0/quartz-2-3-0-sources-4-jar/org/quartz/SimpleScheduleBuilder.java  
\* /opt/cola/permits/1150985854\_1617740653.75/0/quartz-2-3-0-sources-4-jar/org/quartz/ExecuteInJTATransaction.java  
\* /opt/cola/permits/1150985854\_1617740653.75/0/quartz-2-3-0-sources-4-jar/org/quartz/TimeOfDay.java  
\* /opt/cola/permits/1150985854\_1617740653.75/0/quartz-2-3-0-sources-4-jar/org/quartz/DailyTimeIntervalTrigger.java  
\*  
/opt/cola/permits/1150985854\_1617740653.75/0/quartz-2-3-0-sources-4-jar/org/quartz/PersistJobDataAfterExecution.java  
\* /opt/cola/permits/1150985854\_1617740653.75/0/quartz-2-3-0-sources-4-jar/org/quartz/CalendarIntervalScheduleBuilder.java  
\* /opt/cola/permits/1150985854\_1617740653.75/0/quartz-2-3-0-sources-4-jar/org/quartz/impl/matchers/KeyMatcher.java  
\* /opt/cola/permits/1150985854\_1617740653.75/0/quartz-2-3-0-sources-4-jar/org/quartz/SchedulerConfigException.java  
\* /opt/cola/permits/1150985854\_1617740653.75/0/quartz-2-3-0-sources-4-jar/org/quartz/impl/triggers/CoreTrigger.java  
\* /opt/cola/permits/1150985854\_1617740653.75/0/quartz-2-3-0-sources-4-jar/org/quartz/impl/matchers/NameMatcher.java  
\* /opt/cola/permits/1150985854\_1617740653.75/0/quartz-2-3-0-sources-4-jar/org/quartz/impl/matchers/StringMatcher.java  
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\* /opt/cola/permits/1150985854\_1617740653.75/0/quartz-2-3-0-sources-4-  
jar/org/terracotta/quartz/wrappers/JobWrapper.java  
\* /opt/cola/permits/1150985854\_1617740653.75/0/quartz-2-3-0-sources-4-  
jar/org/terracotta/quartz/ClusteredJobStore.java  
\*  
/opt/cola/permits/1150985854\_1617740653.75/0/quartz-2-3-0-sources-4-  
jar/org/terracotta/quartz/wrappers/WrapperFactory.java  
\* /opt/cola/permits/1150985854\_1617740653.75/0/quartz-2-3-0-sources-4-  
jar/org/terracotta/quartz/wrappers/DefaultWrapperFactory.java  
\* /opt/cola/permits/1150985854\_1617740653.75/0/quartz-2-3-0-sources-4-  
jar/org/terracotta/quartz/collections/TimeTriggerSet.java  
\* /opt/cola/permits/1150985854\_1617740653.75/0/quartz-2-3-0-sources-4-  
jar/org/terracotta/quartz/TerracottaJobStoreExtensions.java  
\* /opt/cola/permits/1150985854\_1617740653.75/0/quartz-2-3-0-sources-4-  
jar/org/terracotta/quartz/wrappers/TriggerWrapper.java  
\* /opt/cola/permits/1150985854\_1617740653.75/0/quartz-2-3-0-sources-4-  
jar/org/quartz/utils/FindbugsSuppressWarnings.java  
\* /opt/cola/permits/1150985854\_1617740653.75/0/quartz-2-3-0-sources-4-  
jar/org/terracotta/quartz/wrappers/FiredTrigger.java  
\* /opt/cola/permits/1150985854\_1617740653.75/0/quartz-2-3-0-sources-4-  
jar/org/quartz/commonj/WorkManagerThreadExecutor.java

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jar/org/quartz/plugins/interrupt/JobInterruptMonitorPlugin.java  
\* /opt/cola/permits/1150985854\_1617740653.75/0/quartz-2-3-0-sources-4-  
jar/org/quartz/listeners/BroadcastTriggerListener.java  
\*

/opt/cola/permits/1150985854\_1617740653.75/0/quartz-2-3-0-sources-4-  
jar/org/quartz/listeners/BroadcastJobListener.java  
\* /opt/cola/permits/1150985854\_1617740653.75/0/quartz-2-3-0-sources-4-  
jar/org/quartz/impl/jdbcjobstore/UpdateLockRowSemaphore.java  
\* /opt/cola/permits/1150985854\_1617740653.75/0/quartz-2-3-0-sources-4-  
jar/org/quartz/listeners/JobChainingJobListener.java

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jar/org/quartz/management/ManagementServer.java  
\* /opt/cola/permits/1150985854\_1617740653.75/0/quartz-2-3-0-sources-4-  
jar/org/quartz/management/ManagementRESTServiceConfiguration.java

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jar/org/terracotta/quartz/TerracottaJobStore.java  
\* /opt/cola/permits/1150985854\_1617740653.75/0/quartz-2-3-0-sources-4-  
jar/org/terracotta/quartz/TerracottaToolkitBuilder.java  
\* /opt/cola/permits/1150985854\_1617740653.75/0/quartz-2-3-0-sources-4-  
jar/org/terracotta/quartz/AbstractTerracottaJobStore.java  
\*  
/opt/cola/permits/1150985854\_1617740653.75/0/quartz-2-3-0-sources-4-  
jar/org/terracotta/quartz/PlainTerracottaJobStore.java  
\* /opt/cola/permits/1150985854\_1617740653.75/0/quartz-2-3-0-sources-4-  
jar/org/terracotta/quartz/collections/ToolkitDSHolder.java  
\* /opt/cola/permits/1150985854\_1617740653.75/0/quartz-2-3-0-sources-4-  
jar/org/terracotta/quartz/wrappers/JobFacade.java  
\* /opt/cola/permits/1150985854\_1617740653.75/0/quartz-2-3-0-sources-4-  
jar/org/terracotta/quartz/wrappers/TriggerFacade.java

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\* /opt/cola/permits/1150985854\_1617740653.75/0/quartz-2-3-0-sources-4-jar/org/quartz/ee/servlet/QuartzInitializerListener.java  
\* /opt/cola/permits/1150985854\_1617740653.75/0/quartz-2-3-0-sources-4-jar/org/quartz/impl/DirectSchedulerFactory.java  
\*  
/opt/cola/permits/1150985854\_1617740653.75/0/quartz-2-3-0-sources-4-jar/org/quartz/Utils/DirtyFlagMap.java  
\* /opt/cola/permits/1150985854\_1617740653.75/0/quartz-2-3-0-sources-4-jar/org/quartz/impl/StdSchedulerFactory.java  
\* /opt/cola/permits/1150985854\_1617740653.75/0/quartz-2-3-0-sources-4-jar/org/quartz/impl/calendar/MonthlyCalendar.java  
\* /opt/cola/permits/1150985854\_1617740653.75/0/quartz-2-3-0-sources-4-jar/org/quartz/core/JobRunShell.java  
\* /opt/cola/permits/1150985854\_1617740653.75/0/quartz-2-3-0-sources-4-jar/org/quartz/impl/calendar/BaseCalendar.java  
\* /opt/cola/permits/1150985854\_1617740653.75/0/quartz-2-3-0-sources-4-jar/org/quartz/ee/servlet/QuartzInitializerServlet.java  
\* /opt/cola/permits/1150985854\_1617740653.75/0/quartz-2-3-0-sources-4-jar/org/quartz/spi/JobStore.java  
\* /opt/cola/permits/1150985854\_1617740653.75/0/quartz-2-3-0-sources-4-jar/org/quartz/core/QuartzSchedulerThread.java  
\*  
/opt/cola/permits/1150985854\_1617740653.75/0/quartz-2-3-0-sources-4-jar/org/quartz/spi/ThreadPool.java  
\* /opt/cola/permits/1150985854\_1617740653.75/0/quartz-2-3-0-sources-4-jar/org/quartz/impl/calendar/WeeklyCalendar.java  
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Manifest-Version: 1.0  
BuildInfo-Revision: unknown  
Terracotta-ProjectStatus: Supported  
BuildInfo-URL: unknown  
BuildInfo-Host: tc-eng-002  
BuildInfo-User: jenkins-slave  
Terracotta-Description: Enterprise Job Scheduler  
BuildInfo-Timestamp: 20170419-154134  
Terracotta-Name: quartz  
License: Apache Software License, Version 2.0

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\* /opt/cola/permits/1150985854\_1617740653.75/0/quartz-2-3-0-sources-4-jar/org/quartz/impl/jdbcjobstore/SimplePropertiesTriggerProperties.java

\* /opt/cola/permits/1150985854\_1617740653.75/0/quartz-2-3-0-sources-4-jar/org/quartz/utils/ClassUtils.java

\* /opt/cola/permits/1150985854\_1617740653.75/0/quartz-2-3-0-sources-4-jar/org/quartz/impl/DefaultThreadExecutor.java

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*
/opt/cola/permits/1150985854_1617740653.75/0/quartz-2-3-0-sources-4-
jar/org/quartz/impl/jdbcjobstore/CronTriggerPersistenceDelegate.java
* /opt/cola/permits/1150985854_1617740653.75/0/quartz-2-3-0-sources-4-
jar/org/quartz/impl/jdbcjobstore/SimplePropertiesTriggerPersistenceDelegateSupport.java
* /opt/cola/permits/1150985854_1617740653.75/0/quartz-2-3-0-sources-4-
jar/org/quartz/impl/jdbcjobstore/SimpleTriggerPersistenceDelegate.java
* /opt/cola/permits/1150985854_1617740653.75/0/quartz-2-3-0-sources-4-
jar/org/quartz/impl/jdbcjobstore/CalendarIntervalTriggerPersistenceDelegate.java
* /opt/cola/permits/1150985854_1617740653.75/0/quartz-2-3-0-sources-4-
jar/org/quartz/impl/SchedulerDetailsSetter.java
* /opt/cola/permits/1150985854_1617740653.75/0/quartz-2-3-0-sources-4-
jar/org/quartz/impl/jdbcjobstore/TriggerPersistenceDelegate.java
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* /opt/cola/permits/1150985854_1617740653.75/0/quartz-2-3-0-sources-4-
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jar/org/quartz/impl/JobExecutionContextImpl.java
*
/opt/cola/permits/1150985854_1617740653.75/0/quartz-2-3-0-sources-4-
jar/org/quartz/impl/jdbcjobstore/InvalidConfigurationException.java
* /opt/cola/permits/1150985854_1617740653.75/0/quartz-2-3-0-sources-4-
jar/org/quartz/ee/jta/UserTransactionHelper.java
* /opt/cola/permits/1150985854_1617740653.75/0/quartz-2-3-0-sources-4-jar/org/quartz/spi/SchedulerPlugin.java
* /opt/cola/permits/1150985854_1617740653.75/0/quartz-2-3-0-sources-4-
jar/org/quartz/utills/C3p0PoolingConnectionProvider.java
* /opt/cola/permits/1150985854_1617740653.75/0/quartz-2-3-0-sources-4-jar/org/quartz/TriggerUtils.java
* /opt/cola/permits/1150985854_1617740653.75/0/quartz-2-3-0-sources-4-
jar/org/quartz/UnableToInterruptJobException.java
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\* /opt/cola/permits/1150985854\_1617740653.75/0/quartz-2-3-0-sources-4-jar/org/quartz/Utils/Key.java  
 \* /opt/cola/permits/1150985854\_1617740653.75/0/quartz-2-3-0-sources-4-jar/org/quartz/ee/jta/JTAJobRunShell.java  
 \* /opt/cola/permits/1150985854\_1617740653.75/0/quartz-2-3-0-sources-4-jar/org/quartz/helpers/VersionPrinter.java  
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 /opt/cola/permits/1150985854\_1617740653.75/0/quartz-2-3-0-sources-4-jar/org/quartz/simpl/RAMJobStore.java  
 \* /opt/cola/permits/1150985854\_1617740653.75/0/quartz-2-3-0-sources-4-jar/org/quartz/Calendar.java  
 \* /opt/cola/permits/1150985854\_1617740653.75/0/quartz-2-3-0-sources-4-jar/org/quartz/JobPersistenceException.java  
 \* /opt/cola/permits/1150985854\_1617740653.75/0/quartz-2-3-0-sources-4-jar/org/quartz/impl/JobDetailImpl.java  
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 \* /opt/cola/permits/1150985854\_1617740653.75/0/quartz-2-3-0-sources-4-jar/org/quartz/impl/triggers/DailyTimeIntervalTriggerImpl.java  
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 \* /opt/cola/permits/1150985854\_1617740653.75/0/quartz-2-3-0-sources-4-jar/org/quartz/impl/jdbcjobstore/NoSuchDelegateException.java  
 \* /opt/cola/permits/1150985854\_1617740653.75/0/quartz-2-3-0-sources-4-jar/org/quartz/Utils/PropertiesParser.java  
 \* /opt/cola/permits/1150985854\_1617740653.75/0/quartz-2-3-0-sources-4-jar/org/quartz/ObjectAlreadyExistsException.java  
 \* /opt/cola/permits/1150985854\_1617740653.75/0/quartz-2-3-0-sources-4-jar/org/quartz/xml/ValidationException.java  
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jar/org/quartz/spi/InstanceIdGenerator.java
* /opt/cola/permits/1150985854_1617740653.75/0/quartz-2-3-0-sources-4-
jar/org/quartz/impl/jdbcjobstore/DBSemaphore.java
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jar/org/quartz/impl/jdbcjobstore/JobStoreCMT.java
* /opt/cola/permits/1150985854_1617740653.75/0/quartz-2-3-0-sources-4-
jar/org/quartz/impl/jdbcjobstore/oracle/OracleDelegate.java
* /opt/cola/permits/1150985854_1617740653.75/0/quartz-2-3-0-sources-4-
jar/org/quartz/impl/jdbcjobstore/JobStoreSupport.java
* /opt/cola/permits/1150985854_1617740653.75/0/quartz-2-3-0-sources-4-
jar/org/quartz/impl/calendar/HolidayCalendar.java
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jar/org/quartz/impl/jdbcjobstore/SybaseDelegate.java

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 \* /opt/cola/permits/1150985854\_1617740653.75/0/quartz-2-3-0-sources-4-jar/org/quartz/impl/jdbcjobstore/CacheDelegate.java  
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 \* /opt/cola/permits/1150985854\_1617740653.75/0/quartz-2-3-0-sources-4-jar/org/quartz/SchedulerFactory.java

\* /opt/cola/permits/1150985854\_1617740653.75/0/quartz-2-3-0-sources-4-jar/org/quartz/impl/jdbcjobstore/DB2v8Delegate.java  
\* /opt/cola/permits/1150985854\_1617740653.75/0/quartz-2-3-0-sources-4-jar/org/quartz/impl/jdbcjobstore/TriggerStatus.java  
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\* /opt/cola/permits/1150985854\_1617740653.75/0/quartz-2-3-0-sources-4-jar/org/quartz/spi/SchedulerSignaler.java  
\* /opt/cola/permits/1150985854\_1617740653.75/0/quartz-2-3-0-sources-4-jar/org/quartz/impl/jdbcjobstore/JobStoreTX.java  
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\* /opt/cola/permits/1150985854\_1617740653.75/0/quartz-2-3-0-sources-4-jar/org/quartz/ee/jmx/jboss/QuartzServiceMBean.java  
\* /opt/cola/permits/1150985854\_1617740653.75/0/quartz-2-3-0-sources-4-jar/org/quartz/impl/jdbcjobstore/oracle/weblogic/WebLogicOracleDelegate.java  
\* /opt/cola/permits/1150985854\_1617740653.75/0/quartz-2-3-0-sources-4-jar/org/quartz/plugins/history/LoggingTriggerHistoryPlugin.java  
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\* /opt/cola/permits/1150985854\_1617740653.75/0/quartz-2-3-0-sources-4-jar/org/quartz/impl/jdbcjobstore/PointbaseDelegate.java  
\* /opt/cola/permits/1150985854\_1617740653.75/0/quartz-2-3-0-sources-4-jar/org/quartz/impl/jdbcjobstore/StdRowLockSemaphore.java  
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\* /opt/cola/permits/1150985854\_1617740653.75/0/quartz-2-3-0-sources-4-jar/org/quartz/impl/jdbcjobstore/SimpleSemaphore.java  
\* /opt/cola/permits/1150985854\_1617740653.75/0/quartz-2-3-0-sources-4-jar/org/quartz/ee/jta/JTAAnnotationAwareJobRunShellFactory.java  
\* /opt/cola/permits/1150985854\_1617740653.75/0/quartz-2-3-0-sources-4-jar/org/quartz/SchedulerMetaData.java  
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\* /opt/cola/permits/1150985854\_1617740653.75/0/quartz-2-3-0-sources-4-jar/org/terracotta/quartz/DefaultClusteredJobStore.java

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\* /opt/cola/permits/1150985854\_1617740653.75/0/quartz-2-3-0-sources-4-jar/org/quartz/utills/StringKeyDirtyFlagMap.java

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/opt/cola/permits/1150985854\_1617740653.75/0/quartz-2-3-0-sources-4-jar/org/quartz/listeners/JobListenerSupport.java

\* /opt/cola/permits/1150985854\_1617740653.75/0/quartz-2-3-0-sources-4-jar/org/quartz/impl/jdbcjobstore/TablePrefixAware.java

\* /opt/cola/permits/1150985854\_1617740653.75/0/quartz-2-3-0-sources-4-jar/org/quartz/plugins/SchedulerPluginWithUserTransactionSupport.java

\* /opt/cola/permits/1150985854\_1617740653.75/0/quartz-2-3-0-sources-4-jar/org/quartz/listeners/SchedulerListenerSupport.java

\* /opt/cola/permits/1150985854\_1617740653.75/0/quartz-2-3-0-sources-4-jar/org/quartz/listeners/TriggerListenerSupport.java

\* /opt/cola/permits/1150985854\_1617740653.75/0/quartz-2-3-0-sources-4-

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# 1.305 jaxb-runtime 2.3.0

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\* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-jar/com/sun/xml/bind/unmarshaller/Messages\_ko.properties  
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\* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-jar/com/sun/xml/bind/v2/runtime/property/Messages\_zh\_TW.properties  
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\* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-jar/com/sun/xml/bind/v2/runtime/unmarshaller/Messages\_it.properties  
\* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-jar/com/sun/xml/bind/v2/runtime/property/Messages\_de.properties  
\* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-jar/com/sun/xml/bind/v2/runtime/unmarshaller/Messages\_fr.properties  
\* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-jar/com/sun/xml/bind/unmarshaller/Messages\_fr.properties  
\* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-jar/com/sun/xml/bind/v2/runtime/unmarshaller/Messages\_ko.properties  
\* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-jar/com/sun/xml/bind/v2/model/impl/Messages\_zh\_TW.properties  
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\*/

// NO WARRANTY! This class is in the public domain.

/\*\*

\* Default implementation of the Attributes interface.

\*

\* <blockquote>

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\* See <a href='http://www.saxproject.org'>http://www.saxproject.org</a> for further information.

\* </blockquote>

\*

\* <p>This class provides a default implementation of the SAX2 { @link org.xml.sax.Attributes Attributes } interface, with the addition of manipulators so that the list can be modified or reused.</p>

\*

\* <p>There are two typical uses of this class:</p>

\*

\* <ol>

\* <li>to take a persistent snapshot of an Attributes object in a { @link org.xml.sax.ContentHandler#startElement startElement } event; or</li>

\* <li>to construct or modify an Attributes object in a SAX2 driver or filter.</li>

```

* </ol>
*
* <p>This class replaces the now-deprecated SAX1 { @link
* org.xml.sax.helpers.AttributeListImpl
* AttributeListImpl}
* class; in addition to supporting the updated Attributes
* interface rather than the deprecated { @link org.xml.sax.AttributeList
* AttributeList} interface, it also includes a much more efficient
* implementation using a single array rather than a set of Vectors.</p>
*
* @since JAXB 1.0
* @since SAX 2.0
* @author David Megginson
* @version 2.0.1 (sax2r2)
*/

```

Found in path(s):

```

* /opt/cola/permits/1150996732_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-
jar/com/sun/xml/bind/util/AttributesImpl.java

```

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Found in path(s):

\* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-  
jar/com/sun/xml/bind/v2/model/annotation/XmlElementRefsQuick.java  
\* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-  
jar/com/sun/xml/bind/v2/model/impl/RegistryInfoImpl.java  
\* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-  
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\* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-  
jar/com/sun/xml/bind/v2/runtime/MimeTypedTransducer.java  
\* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-  
jar/com/sun/xml/bind/v2/model/runtime/RuntimeAttributePropertyInfo.java  
\* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-  
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\* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-  
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\* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-  
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\* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-  
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\* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-  
jar/com/sun/xml/bind/AccessorFactory.java  
\* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-  
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jar/com/sun/xml/bind/v2/runtime/unmarshaller/LeafPropertyXsiLoader.java
* /opt/cola/permits/1150996732_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-
jar/com/sun/xml/bind/v2/model/impl/RuntimeAttributePropertyInfoImpl.java
* /opt/cola/permits/1150996732_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-
jar/com/sun/xml/bind/v2/model/impl/TypeInfoSetImpl.java
* /opt/cola/permits/1150996732_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-
jar/com/sun/xml/bind/v2/runtime/reflect/opt/TransducedAccessor_field_Boolean.java
* /opt/cola/permits/1150996732_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-
jar/com/sun/xml/bind/v2/runtime/unmarshaller/Base64Data.java
*
/opt/cola/permits/1150996732_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-
jar/com/sun/xml/bind/v2/schemagen/xmlschema/AttributeType.java
* /opt/cola/permits/1150996732_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-
jar/com/sun/xml/bind/v2/runtime/LifecycleMethods.java
* /opt/cola/permits/1150996732_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-
jar/com/sun/xml/bind/v2/schemagen/xmlschema/ExtensionType.java
* /opt/cola/permits/1150996732_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-
jar/com/sun/xml/bind/v2/schemagen/xmlschema/Annotation.java
* /opt/cola/permits/1150996732_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-
jar/com/sun/xml/bind/v2/schemagen/xmlschema/Occurs.java
* /opt/cola/permits/1150996732_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-
jar/com/sun/xml/bind/v2/runtime/output/XMLStreamWriterOutput.java
* /opt/cola/permits/1150996732_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-
jar/com/sun/xml/bind/v2/model/impl/ERPropertyInfoImpl.java
*
/opt/cola/permits/1150996732_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-
jar/com/sun/xml/bind/v2/runtime/unmarshaller/StAXConnector.java
* /opt/cola/permits/1150996732_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-
jar/com/sun/xml/bind/v2/runtime/unmarshaller/LeafPropertyLoader.java
* /opt/cola/permits/1150996732_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-
jar/com/sun/xml/bind/marshaller/NioEscapeHandler.java
* /opt/cola/permits/1150996732_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-
jar/com/sun/xml/bind/v2/runtime/BinderImpl.java
* /opt/cola/permits/1150996732_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-
jar/com/sun/xml/bind/v2/runtime/unmarshaller/StAXEventConnector.java
* /opt/cola/permits/1150996732_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-
jar/com/sun/xml/bind/v2/runtime/output/DOMOutput.java
* /opt/cola/permits/1150996732_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-
jar/com/sun/xml/bind/v2/runtime/output/UTF8XmlOutput.java
*
/opt/cola/permits/1150996732_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-
jar/com/sun/xml/bind/v2/model/annotation/XmlValueQuick.java
* /opt/cola/permits/1150996732_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-
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* /opt/cola/permits/1150996732_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-
jar/com/sun/xml/bind/v2/runtime/reflect/opt/TransducedAccessor_field_Float.java
* /opt/cola/permits/1150996732_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-
jar/com/sun/xml/bind/v2/model/annotation/XmlRootElementQuick.java

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\* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-jar/com/sun/xml/bind/v2/runtime/reflect/PrimitiveArrayListShort.java

\* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-jar/com/sun/xml/bind/v2/model/annotation/LocatableAnnotation.java

\* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-jar/com/sun/xml/bind/v2/runtime/ContentHandlerAdaptor.java

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/opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-jar/com/sun/xml/bind/v2/model/runtime/RuntimeClassInfo.java

\* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-jar/com/sun/xml/bind/v2/runtime/reflect/opt/TransducedAccessor\_method\_Long.java

\* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-jar/com/sun/xml/bind/v2/runtime/reflect/opt/FieldAccessor\_Ref.java

\* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-jar/com/sun/xml/bind/v2/schemagen/Tree.java

\* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-jar/com/sun/xml/bind/v2/util/FatalAdapter.java

\* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-jar/com/sun/xml/bind/v2/model/impl/AttributePropertyInfoImpl.java

\* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-jar/com/sun/xml/bind/v2/runtime/InlineBinaryTransducer.java

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/opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-jar/com/sun/xml/bind/v2/runtime/unmarshaller/ChildLoader.java

\* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-jar/com/sun/xml/bind/v2/runtime/property/TagAndType.java

\* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-jar/com/sun/xml/bind/v2/runtime/SchemaTypeTransducer.java

\* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-jar/com/sun/xml/bind/v2/schemagen/xmlschema/ComplexTypeModel.java

\* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-jar/com/sun/xml/bind/v2/schemagen/xmlschema/ExplicitGroup.java

\* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-jar/com/sun/xml/bind/v2/runtime/reflect/PrimitiveArrayListLong.java

\* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-jar/com/sun/xml/bind/v2/model/impl/TypeInfoImpl.java

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/opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-jar/com/sun/xml/bind/v2/runtime/InternalBridge.java

\* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-jar/com/sun/xml/bind/v2/model/impl/ModelBuilder.java

\* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-jar/com/sun/xml/bind/v2/runtime/unmarshaller/MTOMDecorator.java

\* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-jar/com/sun/xml/bind/v2/runtime/property/Property.java

\* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-jar/com/sun/xml/bind/v2/runtime/property/ArrayElementLeafProperty.java

\* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-

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jar/com/sun/xml/bind/v2/runtime/reflect/PrimitiveArrayListByte.java
* /opt/cola/permits/1150996732_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-
jar/com/sun/xml/bind/v2/model/impl/MapPropertyInfoImpl.java
* /opt/cola/permits/1150996732_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-
jar/com/sun/xml/bind/v2/runtime/reflect/opt/MethodAccessor_Boolean.java
*
/opt/cola/permits/1150996732_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-
jar/com/sun/xml/bind/v2/model/annotation/FieldLocatable.java
* /opt/cola/permits/1150996732_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-
jar/com/sun/xml/bind/unmarshaller/Patcher.java
* /opt/cola/permits/1150996732_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-
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* /opt/cola/permits/1150996732_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-
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* /opt/cola/permits/1150996732_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-
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* /opt/cola/permits/1150996732_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-
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* /opt/cola/permits/1150996732_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-
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*
/opt/cola/permits/1150996732_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-
jar/com/sun/xml/bind/v2/runtime/property/SingleElementNodeProperty.java
* /opt/cola/permits/1150996732_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-
jar/com/sun/xml/bind/v2/runtime/unmarshaller/Loader.java
* /opt/cola/permits/1150996732_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-
jar/com/sun/xml/bind/v2/runtime/NameList.java
* /opt/cola/permits/1150996732_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-
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* /opt/cola/permits/1150996732_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-
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* /opt/cola/permits/1150996732_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-
jar/com/sun/xml/bind/v2/runtime/reflect/opt/SecureLoader.java
*
/opt/cola/permits/1150996732_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-
jar/com/sun/xml/bind/v2/model/annotation/XmlSchemaQuick.java
* /opt/cola/permits/1150996732_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-
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jar/com/sun/xml/bind/v2/model/impl/RuntimeValuePropertyInfoImpl.java
* /opt/cola/permits/1150996732_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-
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* /opt/cola/permits/1150996732_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-
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* /opt/cola/permits/1150996732_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-
jar/com/sun/xml/bind/v2/runtime/reflect/opt/FieldAccessor_Double.java

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\* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-jar/com/sun/xml/bind/marshaller/NamespacePrefixMapper.java

\* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-jar/com/sun/xml/bind/v2/schemagen/xmlschema/NestedParticle.java

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/opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-jar/com/sun/xml/bind/v2/model/impl/GetterSetterPropertySeed.java

\* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-jar/com/sun/xml/bind/v2/runtime/reflect/opt/MethodAccessor\_Short.java

\* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-jar/com/sun/xml/bind/v2/model/runtime/RuntimeArrayInfo.java

\* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-jar/com/sun/xml/bind/api/Messages.java

\* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-jar/com/sun/xml/bind/v2/runtime/reflect/ListTransducedAccessorImpl.java

\* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-jar/com/sun/xml/bind/v2/runtime/reflect/opt/TransducedAccessor\_field\_Double.java

\* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-jar/com/sun/xml/bind/v2/runtime/output/FastInfosetStreamWriterOutput.java

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/opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-jar/com/sun/xml/bind/v2/runtime/reflect/AdaptedLister.java

\* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-jar/com/sun/xml/bind/v2/model/annotation/AbstractInlineAnnotationReaderImpl.java

\* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-jar/com/sun/xml/bind/v2/schemagen/xmlschema/AttrDecls.java

\* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-jar/com/sun/xml/bind/v2/model/impl/RuntimeBuiltinLeafInfoImpl.java

\* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-jar/com/sun/xml/bind/v2/runtime/reflect/NullSafeAccessor.java

\* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-jar/com/sun/xml/bind/v2/runtime/unmarshaller/ValidatingUnmarshaller.java

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/opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-jar/com/sun/xml/bind/v2/model/annotation/XMLTransientQuick.java

\* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-jar/com/sun/xml/bind/v2/model/impl/RuntimeElementPropertyInfoImpl.java

\* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-jar/com/sun/xml/bind/v2/runtime/property/Messages.java

\* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-jar/com/sun/xml/bind/v2/model/annotation/Messages.java

\* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-jar/com/sun/xml/bind/AnyTypeAdapter.java

\* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-jar/com/sun/xml/bind/v2/model/annotation/MethodLocatable.java

\* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-jar/com/sun/xml/bind/v2/runtime/unmarshaller/StructureLoader.java

\* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-

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/opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-  
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\* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-  
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/opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-  
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jar/com/sun/xml/bind/v2/model/impl/RuntimeEnumLeafInfoImpl.java  
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\* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-  
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\* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-  
jar/com/sun/xml/bind/v2/runtime/property/PropertyImpl.java  
\* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-  
jar/com/sun/xml/bind/v2/runtime/unmarshaller/ProxyLoader.java  
\* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-  
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\* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-  
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\* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-  
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\* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-  
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/opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-jar/com/sun/xml/bind/v2/runtime/Messages.java  
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\* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-jar/com/sun/xml/bind/v2/schemagen/Util.java  
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\* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-jar/com/sun/xml/bind/v2/schemagen/package-info.java  
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\* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-jar/com/sun/xml/bind/v2/schemagen/Form.java  
\*  
/opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-jar/com/sun/xml/bind/v2/model/impl/RuntimeMapPropertyInfoImpl.java  
\* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-jar/com/sun/xml/bind/v2/runtime/unmarshaller/Interceptor.java  
\* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-jar/com/sun/xml/bind/v2/model/runtime/RuntimeLeafInfo.java  
\* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-jar/com/sun/xml/bind/v2/runtime/reflect/opt/Injector.java  
\* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-jar/com/sun/xml/bind/v2/runtime/property/SingleReferenceNodeProperty.java  
\* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-jar/com/sun/xml/bind/v2/runtime/reflect/opt/TransducedAccessor\_method\_Integer.java  
\* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-jar/com/sun/xml/bind/v2/model/impl/RuntimeClassInfoImpl.java  
\*  
/opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-jar/com/sun/xml/bind/v2/runtime/reflect/opt/OptimizedAccessorFactory.java  
\* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-jar/com/sun/xml/bind/v2/runtime/output/Pcdata.java  
\* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-jar/com/sun/xml/bind/api/JAXBRIContext.java  
\* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-jar/com/sun/xml/bind/v2/runtime/unmarshaller/XsiNilLoader.java  
\* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-jar/com/sun/xml/bind/v2/schemagen/xmlschema/SimpleRestrictionModel.java  
\* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-jar/com/sun/xml/bind/v2/runtime/unmarshaller/WildcardLoader.java  
\* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-jar/com/sun/xml/bind/v2/model/impl/Util.java  
\*

/opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-  
 jar/com/sun/xml/bind/api/AccessorException.java  
 \* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-  
 jar/com/sun/xml/bind/v2/schemagen/xmlschema/Particle.java  
 \* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-  
 jar/com/sun/xml/bind/v2/runtime/reflect/opt/MethodAccessor\_Integer.java  
 \* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-  
 jar/com/sun/xml/bind/v2/runtime/reflect/opt/TransducedAccessor\_method\_Short.java  
 \* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-  
 jar/com/sun/xml/bind/v2/schemagen/xmlschema/Union.java  
 \* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-  
 jar/com/sun/xml/bind/v2/model/runtime/package-info.java  
 \* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-  
 jar/com/sun/xml/bind/v2/runtime/reflect/opt/FieldAccessor\_Byte.java  
 \*  
 /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-  
 jar/com/sun/xml/bind/v2/runtime/reflect/PrimitiveArrayListDouble.java  
 \* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-  
 jar/com/sun/xml/bind/v2/runtime/unmarshaller/ValuePropertyLoader.java  
 \* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-  
 jar/com/sun/xml/bind/v2/model/runtime/RuntimeValuePropertyInfo.java  
 \* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-  
 jar/com/sun/xml/bind/v2/model/annotation/XmlTypeQuick.java  
 \* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-  
 jar/com/sun/xml/bind/v2/schemagen/xmlschema/Schema.java  
 \* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-  
 jar/com/sun/xml/bind/v2/runtime/reflect/Accessor.java  
 \* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-  
 jar/com/sun/xml/bind/v2/runtime/reflect/opt/OptimizedTransducedAccessorFactory.java  
 \*  
 /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-  
 jar/com/sun/xml/bind/v2/schemagen/xmlschema/TopLevelElement.java  
 \* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-  
 jar/com/sun/xml/bind/v2/schemagen/xmlschema/SimpleRestriction.java  
 \* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-  
 jar/com/sun/xml/bind/api/TypeReference.java  
 \* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-  
 jar/com/sun/xml/bind/v2/runtime/reflect/opt/FieldAccessor\_Integer.java  
 \* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-  
 jar/com/sun/xml/bind/v2/runtime/reflect/opt/TransducedAccessor\_method\_Double.java  
 \* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-  
 jar/com/sun/xml/bind/v2/schemagen/xmlschema/SimpleType.java  
 \* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-  
 jar/com/sun/xml/bind/v2/schemagen/xmlschema/SimpleContent.java  
 \*  
 /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-  
 jar/com/sun/xml/bind/v2/model/impl/RuntimeElementInfoImpl.java  
 \* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-

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jar/com/sun/xml/bind/v2/model/impl/ValuePropertyInfoImpl.java
* /opt/cola/permits/1150996732_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-
jar/com/sun/xml/bind/v2/runtime/SwaRefAdapter.java
* /opt/cola/permits/1150996732_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-
jar/com/sun/xml/bind/v2/model/impl/RuntimeModelBuilder.java
* /opt/cola/permits/1150996732_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-
jar/com/sun/xml/bind/v2/runtime/IllegalAnnotationsException.java
* /opt/cola/permits/1150996732_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-
jar/com/sun/xml/bind/v2/schemagen/xmlschema/Appinfo.java
* /opt/cola/permits/1150996732_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-
jar/com/sun/xml/bind/v2/runtime/reflect/opt/MethodAccessor_Byte.java
*
/opt/cola/permits/1150996732_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-
jar/com/sun/xml/bind/v2/schemagen/xmlschema/Import.java
* /opt/cola/permits/1150996732_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-
jar/com/sun/xml/bind/unmarshaller/Messages.java
* /opt/cola/permits/1150996732_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-
jar/com/sun/xml/bind/v2/schemagen/xmlschema/LocalElement.java
* /opt/cola/permits/1150996732_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-
jar/com/sun/xml/bind/v2/runtime/unmarshaller/InterningXmlVisitor.java
* /opt/cola/permits/1150996732_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-
jar/com/sun/xml/bind/v2/model/impl/ArrayInfoImpl.java
* /opt/cola/permits/1150996732_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-
jar/com/sun/xml/bind/v2/runtime/unmarshaller/DomLoader.java
* /opt/cola/permits/1150996732_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-
jar/com/sun/xml/bind/v2/schemagen/FoolProofResolver.java
* /opt/cola/permits/1150996732_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-
jar/com/sun/xml/bind/v2/runtime/unmarshaller/AttributesEx.java
*
/opt/cola/permits/1150996732_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-
jar/com/sun/xml/bind/v2/runtime/unmarshaller/XsiTypeLoader.java
* /opt/cola/permits/1150996732_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-
jar/com/sun/xml/bind/v2/model/impl/RuntimeReferencePropertyInfoImpl.java
* /opt/cola/permits/1150996732_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-
jar/com/sun/xml/bind/v2/schemagen/xmlschema/ComplexType.java
* /opt/cola/permits/1150996732_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-
jar/com/sun/xml/bind/v2/schemagen/xmlschema/SimpleExtension.java
* /opt/cola/permits/1150996732_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-
jar/com/sun/xml/bind/v2/bytecode/ClassTailor.java
* /opt/cola/permits/1150996732_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-
jar/com/sun/xml/bind/v2/ContextFactory.java
* /opt/cola/permits/1150996732_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-
jar/com/sun/xml/bind/v2/model/annotation/XmlAttributeQuick.java
*
/opt/cola/permits/1150996732_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-
jar/com/sun/xml/bind/v2/schemagen/xmlschema/NoFixedFacet.java
* /opt/cola/permits/1150996732_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-
jar/com/sun/xml/bind/v2/runtime/UnmarshallerImpl.java

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\* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-jar/com/sun/xml/bind/v2/runtime/ElementBeanInfoImpl.java

\* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-jar/com/sun/xml/bind/v2/runtime/reflect/Lister.java

\* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-jar/com/sun/xml/bind/v2/runtime/reflect/opt/MethodAccessor\_Character.java

\* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-jar/com/sun/xml/bind/v2/runtime/reflect/opt/TransducedAccessor\_method\_Boolean.java

\* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-jar/com/sun/xml/bind/v2/runtime/unmarshaller/FastInfosetConnector.java

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/opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-jar/com/sun/xml/bind/v2/runtime/property/ArrayERProperty.java

\* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-jar/com/sun/xml/bind/v2/runtime/FilterTransducer.java

\* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-jar/com/sun/xml/bind/v2/runtime/unmarshaller/TagName.java

\* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-jar/com/sun/xml/bind/v2/runtime/BridgeAdapter.java

\* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-jar/com/sun/xml/bind/v2/runtime/reflect/opt/AccessorInjector.java

\* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-jar/com/sun/xml/bind/v2/runtime/property/ValueProperty.java

\* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-jar/com/sun/xml/bind/v2/runtime/property/ArrayProperty.java

\*

/opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-jar/com/sun/xml/bind/v2/runtime/BridgeContextImpl.java

\* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-jar/com/sun/xml/bind/v2/runtime/reflect/TransducedAccessor.java

\* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-jar/com/sun/xml/bind/v2/runtime/property/StructureLoaderBuilder.java

\* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-jar/com/sun/xml/bind/v2/runtime/unmarshaller/UnmarshallingContext.java

\* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-jar/com/sun/xml/bind/v2/model/annotation/XmlSchemaTypeQuick.java

\* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-jar/com/sun/xml/bind/v2/runtime/unmarshaller/SecureLoader.java

\* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-jar/com/sun/xml/bind/v2/runtime/unmarshaller/SAXConnector.java

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/opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-jar/com/sun/xml/bind/AccessorFactoryImpl.java

\* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-jar/com/sun/xml/bind/IDResolver.java

\* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-jar/com/sun/xml/bind/util/ValidationEventLocatorExImpl.java

\* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-

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jar/com/sun/xml/bind/api/Bridge.java
* /opt/cola/permits/1150996732_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-
jar/com/sun/xml/bind/v2/runtime/unmarshaller/Scope.java
* /opt/cola/permits/1150996732_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-
jar/com/sun/xml/bind/v2/schemagen/xmlschema/TopLevelAttribute.java
* /opt/cola/permits/1150996732_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-
jar/com/sun/xml/bind/v2/model/impl/RuntimeArrayInfoImpl.java
* /opt/cola/permits/1150996732_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-
jar/com/sun/xml/bind/v2/model/impl/RuntimeTypeRefImpl.java
*
/opt/cola/permits/1150996732_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-
jar/com/sun/xml/bind/v2/util/DataSourceSource.java
* /opt/cola/permits/1150996732_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-
jar/com/sun/xml/bind/v2/model/impl/SecureLoader.java
* /opt/cola/permits/1150996732_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-
jar/com/sun/xml/bind/v2/runtime/property/SingleElementLeafProperty.java
* /opt/cola/permits/1150996732_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-
jar/com/sun/xml/bind/v2/model/annotation/XmlEnumQuick.java
* /opt/cola/permits/1150996732_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-
jar/com/sun/xml/bind/v2/model/annotation/XmlElementRefQuick.java
* /opt/cola/permits/1150996732_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-
jar/com/sun/xml/bind/v2/runtime/output/SecureLoader.java
* /opt/cola/permits/1150996732_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-
jar/com/sun/xml/bind/v2/schemagen/Messages.java
*
/opt/cola/permits/1150996732_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-
jar/com/sun/xml/bind/v2/runtime/output/C14nXmlOutput.java
* /opt/cola/permits/1150996732_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-
jar/com/sun/xml/bind/v2/runtime/BridgeImpl.java
* /opt/cola/permits/1150996732_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-
jar/com/sun/xml/bind/v2/runtime/reflect/PrimitiveArrayListCharacter.java
* /opt/cola/permits/1150996732_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-
jar/com/sun/xml/bind/v2/runtime/unmarshaller/LocatorExWrapper.java
* /opt/cola/permits/1150996732_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-
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* /opt/cola/permits/1150996732_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-
jar/com/sun/xml/bind/v2/model/runtime/RuntimeMapPropertyInfo.java
* /opt/cola/permits/1150996732_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-
jar/com/sun/xml/bind/v2/model/runtime/RuntimeTypeInfoSet.java
* /opt/cola/permits/1150996732_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-
jar/com/sun/xml/bind/v2/runtime/reflect/opt/TransducedAccessor_field_Integer.java
*
/opt/cola/permits/1150996732_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-
jar/com/sun/xml/bind/v2/runtime/unmarshaller/StAXExConnector.java
* /opt/cola/permits/1150996732_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-
jar/com/sun/xml/bind/v2/model/impl/RuntimeEnumConstantImpl.java
* /opt/cola/permits/1150996732_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-
jar/com/sun/xml/bind/v2/model/impl/DummyPropertyInfo.java

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\* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-  
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 \* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-  
 jar/com/sun/xml/bind/v2/model/runtime/RuntimeBuiltinLeafInfo.java  
 \* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-  
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 \* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-  
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 \*  
 /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-  
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 \* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-  
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 \* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-  
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 \* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-  
 jar/com/sun/xml/bind/v2/util/CollisionCheckStack.java  
 \*  
 /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-  
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 \* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-  
 jar/com/sun/xml/bind/v2/runtime/output/XmlOutput.java  
 \* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-  
 jar/com/sun/xml/bind/v2/runtime/reflect/opt/FieldAccessor\_Long.java  
 \* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-  
 jar/com/sun/xml/bind/v2/model/runtime/RuntimeTypeRef.java  
 \* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-  
 jar/com/sun/xml/bind/v2/schemagen/xmlschema/ComplexTypeHost.java  
 \* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-  
 jar/com/sun/xml/bind/v2/model/impl/BuiltinLeafInfoImpl.java  
 \* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-  
 jar/com/sun/xml/bind/v2/model/impl/Messages.java  
 \*  
 /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-  
 jar/com/sun/xml/bind/v2/runtime/reflect/opt/FieldAccessor\_Short.java  
 \* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-  
 jar/com/sun/xml/bind/api/CompositeStructure.java  
 \* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-  
 jar/com/sun/xml/bind/XmlAccessorFactory.java  
 \* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-  
 jar/com/sun/xml/bind/v2/model/impl/ElementInfoImpl.java  
 \* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-

jar/com/sun/xml/bind/v2/bytecode/SecureLoader.java  
\* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-  
jar/com/sun/xml/bind/v2/runtime/output/package-info.java  
\* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-  
jar/com/sun/xml/bind/v2/schemagen/xmlschema/Redefinable.java  
\* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-  
jar/com/sun/xml/bind/v2/runtime/unmarshaller/AttributesExImpl.java  
\*  
/opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-  
jar/com/sun/xml/bind/v2/model/runtime/RuntimeElement.java  
\* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-  
jar/com/sun/xml/bind/v2/schemagen/xmlschema/package-info.java  
\* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-  
jar/com/sun/xml/bind/v2/model/runtime/RuntimeNonElement.java  
\* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-  
jar/com/sun/xml/bind/v2/runtime/reflect/opt/Bean.java  
\* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-  
jar/com/sun/xml/bind/v2/runtime/reflect/opt/FieldAccessor\_Boolean.java  
\* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-  
jar/com/sun/xml/bind/v2/schemagen/xmlschema/Annotated.java  
\* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-  
jar/com/sun/xml/bind/v2/runtime/reflect/opt/FieldAccessor\_Float.java  
\*  
/opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-  
jar/com/sun/xml/bind/v2/runtime/AssociationMap.java  
\* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-  
jar/com/sun/xml/bind/v2/runtime/property/AttributeProperty.java  
\* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-  
jar/com/sun/xml/bind/v2/runtime/unmarshaller/TextLoader.java  
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jar/com/sun/xml/bind/v2/model/impl/Utils.java  
\* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-  
jar/com/sun/xml/bind/v2/runtime/property/Utils.java  
\* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-  
jar/com/sun/xml/bind/api/Utils.java  
\* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-  
jar/com/sun/xml/bind/v2/runtime/reflect/Utils.java  
\* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-  
jar/com/sun/xml/bind/v2/runtime/Utils.java

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jar/com/sun/xml/bind/v2/schemagen/xmlschema/xmlschema-for-jaxb.rng

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- \* holder.
- \*/
- /\*\*
- \* Sets the int[] data to this object.
- \*
- \* <p>
- \* This method doesn't make a copy for a performance reason.
- \* The caller is still free to modify the array it passed to this method,
- \* but he should do so with a care. The unmarshalling code isn't expecting
- \* the value to be changed while it's being routed.
- \*/

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\* /opt/cola/permits/1150996732\_1654022864.9866693/0/jaxb-impl-2-3-0-sources-9-jar/com/sun/xml/bind/v2/runtime/unmarshaller/IntArrayData.java

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/\*\*

\* A Base64 encoder/decoder.

\*

\* <p>

\* This class is used to encode and decode data in Base64 format as described in

\* RFC 1521.

\*

\* <p>

\* Project home page: <a

\* href="<http://www.source-code.biz/base64coder/java/>">www.

\* [source-code.biz/base64coder/java](http://www.source-code.biz/base64coder/java/)</a><br>

\* Author: Christian d'Heureuse, Inventec Informatik AG, Zurich, Switzerland<br>

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\* /opt/cola/permits/1150997427\_1654022970.1301146/0/snakeyaml-1-24-sources-7-jar/org.yaml/snakeyaml/external/biz/base64Coder/Base64Coder.java

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jar/org/yaml/snakeyaml/external/com/google/gdata/util/common/base/UnicodeEscaper.java  
\* /opt/cola/permits/1150997427\_1654022970.1301146/0/snakeyaml-1-24-sources-7-  
jar/org/yaml/snakeyaml/external/com/google/gdata/util/common/base/Escaper.java  
\*  
/opt/cola/permits/1150997427\_1654022970.1301146/0/snakeyaml-1-24-sources-7-  
jar/org/yaml/snakeyaml/external/com/google/gdata/util/common/base/PercentEscaper.java  
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jar/org/yaml/snakeyaml/constructor/ConstructorException.java  
\* /opt/cola/permits/1150997427\_1654022970.1301146/0/snakeyaml-1-24-sources-7-  
jar/org/yaml/snakeyaml/util/ArrayUtils.java  
\* /opt/cola/permits/1150997427\_1654022970.1301146/0/snakeyaml-1-24-sources-7-  
jar/org/yaml/snakeyaml/events/ScalarEvent.java  
\*  
/opt/cola/permits/1150997427\_1654022970.1301146/0/snakeyaml-1-24-sources-7-  
jar/org/yaml/snakeyaml/tokens/TagToken.java  
\* /opt/cola/permits/1150997427\_1654022970.1301146/0/snakeyaml-1-24-sources-7-  
jar/org/yaml/snakeyaml/serializer/AnchorGenerator.java  
\* /opt/cola/permits/1150997427\_1654022970.1301146/0/snakeyaml-1-24-sources-7-  
jar/org/yaml/snakeyaml/emitter/EmitterState.java  
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jar/org/yaml/snakeyaml/tokens/StreamStartToken.java  
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jar/org/yaml/snakeyaml/emitter/EmitterException.java

\* /opt/cola/permits/1150997427\_1654022970.1301146/0/snakeyaml-1-24-sources-7-jar/org/yaml/snakeyaml/tokens/KeyToken.java

\* /opt/cola/permits/1150997427\_1654022970.1301146/0/snakeyaml-1-24-sources-7-jar/org/yaml/snakeyaml/constructor/Construct.java

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\*

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\* /opt/cola/permits/1150997427\_1654022970.1301146/0/snakeyaml-1-24-sources-7-jar/org/yaml/snakeyaml/events/DocumentEndEvent.java

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/opt/cola/permits/1150997427\_1654022970.1301146/0/snakeyaml-1-24-sources-7-jar/org/yaml/snakeyaml/events/Event.java

\* /opt/cola/permits/1150997427\_1654022970.1301146/0/snakeyaml-1-24-sources-7-jar/org/yaml/snakeyaml/tokens/FlowMappingStartToken.java

\* /opt/cola/permits/1150997427\_1654022970.1301146/0/snakeyaml-1-24-sources-7-jar/org/yaml/snakeyaml/parser/Parser.java

\* /opt/cola/permits/1150997427\_1654022970.1301146/0/snakeyaml-1-24-sources-7-jar/org/yaml/snakeyaml/tokens/DocumentStartToken.java

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\* /opt/cola/permits/1150997427\_1654022970.1301146/0/snakeyaml-1-24-sources-7-jar/org/yaml/snakeyaml/events/StreamEndEvent.java

\* /opt/cola/permits/1150997427\_1654022970.1301146/0/snakeyaml-1-24-sources-7-jar/org/yaml/snakeyaml/introspector/MissingProperty.java

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\*

/opt/cola/permits/1150997427\_1654022970.1301146/0/snakeyaml-1-24-sources-7-jar/org/yaml/snakeyaml/tokens/ValueToken.java

\* /opt/cola/permits/1150997427\_1654022970.1301146/0/snakeyaml-1-24-sources-7-jar/org/yaml/snakeyaml/reader/UnicodeReader.java

\* /opt/cola/permits/1150997427\_1654022970.1301146/0/snakeyaml-1-24-sources-7-jar/org/yaml/snakeyaml/scanner/SimpleKey.java

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\* /opt/cola/permits/1150997427\_1654022970.1301146/0/snakeyaml-1-24-sources-7-

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jar/org/yaml/snakeyaml/resolver/ResolverTuple.java
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/opt/cola/permits/1150997427_1654022970.1301146/0/snakeyaml-1-24-sources-7-
jar/org/yaml/snakeyaml/emitter/Emitter.java
* /opt/cola/permits/1150997427_1654022970.1301146/0/snakeyaml-1-24-sources-7-
jar/org/yaml/snakeyaml/events/SequenceStartEvent.java
* /opt/cola/permits/1150997427_1654022970.1301146/0/snakeyaml-1-24-sources-7-
jar/org/yaml/snakeyaml/events/DocumentStartEvent.java

```

\* /opt/cola/permits/1150997427\_1654022970.1301146/0/snakeyaml-1-24-sources-7-  
 jar/org/yaml/snakeyaml/serializer/NumberAnchorGenerator.java  
 \* /opt/cola/permits/1150997427\_1654022970.1301146/0/snakeyaml-1-24-sources-7-  
 jar/org/yaml/snakeyaml/events/NodeEvent.java  
 \* /opt/cola/permits/1150997427\_1654022970.1301146/0/snakeyaml-1-24-sources-7-  
 jar/org/yaml/snakeyaml/parser/ParserImpl.java  
 \* /opt/cola/permits/1150997427\_1654022970.1301146/0/snakeyaml-1-24-sources-7-  
 jar/org/yaml/snakeyaml/util/UriEncoder.java  
 \* /opt/cola/permits/1150997427\_1654022970.1301146/0/snakeyaml-1-24-sources-7-  
 jar/org/yaml/snakeyaml/nodes/Node.java  
 \*  
 /opt/cola/permits/1150997427\_1654022970.1301146/0/snakeyaml-1-24-sources-7-  
 jar/org/yaml/snakeyaml/nodes/Tag.java  
 \* /opt/cola/permits/1150997427\_1654022970.1301146/0/snakeyaml-1-24-sources-7-  
 jar/org/yaml/snakeyaml/introspector/MethodProperty.java  
 \* /opt/cola/permits/1150997427\_1654022970.1301146/0/snakeyaml-1-24-sources-7-  
 jar/org/yaml/snakeyaml/TypeDescription.java  
 \* /opt/cola/permits/1150997427\_1654022970.1301146/0/snakeyaml-1-24-sources-7-  
 jar/org/yaml/snakeyaml/nodes/MappingNode.java  
 \* /opt/cola/permits/1150997427\_1654022970.1301146/0/snakeyaml-1-24-sources-7-  
 jar/org/yaml/snakeyaml/tokens/AnchorToken.java  
 \* /opt/cola/permits/1150997427\_1654022970.1301146/0/snakeyaml-1-24-sources-7-  
 jar/org/yaml/snakeyaml/events/MappingEndEvent.java  
 \* /opt/cola/permits/1150997427\_1654022970.1301146/0/snakeyaml-1-24-sources-7-  
 jar/org/yaml/snakeyaml/representer/Representer.java  
 \* /opt/cola/permits/1150997427\_1654022970.1301146/0/snakeyaml-1-24-sources-7-  
 jar/org/yaml/snakeyaml/tokens/FlowSequenceStartToken.java  
 \*  
 /opt/cola/permits/1150997427\_1654022970.1301146/0/snakeyaml-1-24-sources-7-  
 jar/org/yaml/snakeyaml/tokens/BlockEndToken.java  
 \* /opt/cola/permits/1150997427\_1654022970.1301146/0/snakeyaml-1-24-sources-7-  
 jar/org/yaml/snakeyaml/tokens/CommentToken.java  
 \* /opt/cola/permits/1150997427\_1654022970.1301146/0/snakeyaml-1-24-sources-7-  
 jar/org/yaml/snakeyaml/util/ArrayStack.java  
 \* /opt/cola/permits/1150997427\_1654022970.1301146/0/snakeyaml-1-24-sources-7-  
 jar/org/yaml/snakeyaml/scanner/ScannerException.java  
 \* /opt/cola/permits/1150997427\_1654022970.1301146/0/snakeyaml-1-24-sources-7-  
 jar/org/yaml/snakeyaml/events/CollectionEndEvent.java  
 \* /opt/cola/permits/1150997427\_1654022970.1301146/0/snakeyaml-1-24-sources-7-  
 jar/org/yaml/snakeyaml/constructor/BaseConstructor.java  
 \* /opt/cola/permits/1150997427\_1654022970.1301146/0/snakeyaml-1-24-sources-7-  
 jar/org/yaml/snakeyaml/util/PlatformFeatureDetector.java  
 \* /opt/cola/permits/1150997427\_1654022970.1301146/0/snakeyaml-1-24-sources-7-  
 jar/org/yaml/snakeyaml/parser/Production.java  
 \*  
 /opt/cola/permits/1150997427\_1654022970.1301146/0/snakeyaml-1-24-sources-7-  
 jar/org/yaml/snakeyaml/scanner/Scanner.java  
 \* /opt/cola/permits/1150997427\_1654022970.1301146/0/snakeyaml-1-24-sources-7-

jar/org/yaml/snakeyaml/error/Mark.java  
 \* /opt/cola/permits/1150997427\_1654022970.1301146/0/snakeyaml-1-24-sources-7-  
 jar/org/yaml/snakeyaml/constructor/CustomClassLoaderConstructor.java  
 \* /opt/cola/permits/1150997427\_1654022970.1301146/0/snakeyaml-1-24-sources-7-  
 jar/org/yaml/snakeyaml/serializer/SerializerException.java  
 \* /opt/cola/permits/1150997427\_1654022970.1301146/0/snakeyaml-1-24-sources-7-  
 jar/org/yaml/snakeyaml/serializer/Serializer.java  
 \* /opt/cola/permits/1150997427\_1654022970.1301146/0/snakeyaml-1-24-sources-7-  
 jar/org/yaml/snakeyaml/reader/ReaderException.java  
 \* /opt/cola/permits/1150997427\_1654022970.1301146/0/snakeyaml-1-24-sources-7-  
 jar/org/yaml/snakeyaml/tokens/DirectiveToken.java  
 \* /opt/cola/permits/1150997427\_1654022970.1301146/0/snakeyaml-1-24-sources-7-  
 jar/org/yaml/snakeyaml/representer/SafeRepresenter.java  
 \*  
 /opt/cola/permits/1150997427\_1654022970.1301146/0/snakeyaml-1-24-sources-7-  
 jar/org/yaml/snakeyaml/events/StreamStartEvent.java  
 \* /opt/cola/permits/1150997427\_1654022970.1301146/0/snakeyaml-1-24-sources-7-  
 jar/org/yaml/snakeyaml/events/SequenceEndEvent.java  
 \* /opt/cola/permits/1150997427\_1654022970.1301146/0/snakeyaml-1-24-sources-7-  
 jar/org/yaml/snakeyaml/nodes/NodeTuple.java  
 \* /opt/cola/permits/1150997427\_1654022970.1301146/0/snakeyaml-1-24-sources-7-  
 jar/org/yaml/snakeyaml/events/CollectionStartEvent.java  
 \* /opt/cola/permits/1150997427\_1654022970.1301146/0/snakeyaml-1-24-sources-7-  
 jar/org/yaml/snakeyaml/extensions/compactnotation/CompactConstructor.java  
 \* /opt/cola/permits/1150997427\_1654022970.1301146/0/snakeyaml-1-24-sources-7-  
 jar/org/yaml/snakeyaml/constructor/DuplicateKeyException.java  
 \* /opt/cola/permits/1150997427\_1654022970.1301146/0/snakeyaml-1-24-sources-7-  
 jar/org/yaml/snakeyaml/nodes/ScalarNode.java  
 \*  
 /opt/cola/permits/1150997427\_1654022970.1301146/0/snakeyaml-1-24-sources-7-  
 jar/org/yaml/snakeyaml/nodes/AnchorNode.java  
 \* /opt/cola/permits/1150997427\_1654022970.1301146/0/snakeyaml-1-24-sources-7-  
 jar/org/yaml/snakeyaml/tokens/StreamEndToken.java  
 \* /opt/cola/permits/1150997427\_1654022970.1301146/0/snakeyaml-1-24-sources-7-  
 jar/org/yaml/snakeyaml/nodes/NodeId.java  
 \* /opt/cola/permits/1150997427\_1654022970.1301146/0/snakeyaml-1-24-sources-7-  
 jar/org/yaml/snakeyaml/error/MarkedYAMLException.java  
 \* /opt/cola/permits/1150997427\_1654022970.1301146/0/snakeyaml-1-24-sources-7-  
 jar/org/yaml/snakeyaml/emitter/ScalarAnalysis.java  
 \* /opt/cola/permits/1150997427\_1654022970.1301146/0/snakeyaml-1-24-sources-7-  
 jar/org/yaml/snakeyaml/LoaderOptions.java  
 \* /opt/cola/permits/1150997427\_1654022970.1301146/0/snakeyaml-1-24-sources-7-  
 jar/org/yaml/snakeyaml/nodes/SequenceNode.java  
 \* /opt/cola/permits/1150997427\_1654022970.1301146/0/snakeyaml-1-24-sources-7-  
 jar/org/yaml/snakeyaml/tokens/FlowEntryToken.java  
 \*  
 /opt/cola/permits/1150997427\_1654022970.1301146/0/snakeyaml-1-24-sources-7-  
 jar/org/yaml/snakeyaml/composer/ComposerException.java

```

* /opt/cola/permits/1150997427_1654022970.1301146/0/snakeyaml-1-24-sources-7-
jar/org/yaml/snakeyaml/introspector/PropertySubstitute.java
* /opt/cola/permits/1150997427_1654022970.1301146/0/snakeyaml-1-24-sources-7-
jar/org/yaml/snakeyaml/scanner/ScannerImpl.java
* /opt/cola/permits/1150997427_1654022970.1301146/0/snakeyaml-1-24-sources-7-
jar/org/yaml/snakeyaml/tokens/FlowSequenceEndToken.java
* /opt/cola/permits/1150997427_1654022970.1301146/0/snakeyaml-1-24-sources-7-
jar/org/yaml/snakeyaml/tokens/AliasToken.java
* /opt/cola/permits/1150997427_1654022970.1301146/0/snakeyaml-1-24-sources-7-
jar/org/yaml/snakeyaml/representer/BaseRepresenter.java
* /opt/cola/permits/1150997427_1654022970.1301146/0/snakeyaml-1-24-sources-7-
jar/org/yaml/snakeyaml/introspector/Property.java
* /opt/cola/permits/1150997427_1654022970.1301146/0/snakeyaml-1-24-sources-7-
jar/org/yaml/snakeyaml/extensions/compactnotation/CompactData.java
*
/opt/cola/permits/1150997427_1654022970.1301146/0/snakeyaml-1-24-sources-7-
jar/org/yaml/snakeyaml/extensions/compactnotation/PackageCompactConstructor.java
* /opt/cola/permits/1150997427_1654022970.1301146/0/snakeyaml-1-24-sources-7-
jar/org/yaml/snakeyaml/events/MappingStartEvent.java
* /opt/cola/permits/1150997427_1654022970.1301146/0/snakeyaml-1-24-sources-7-
jar/org/yaml/snakeyaml/tokens/BlockEntryToken.java

```

## 1.307 jackson-mapper-asl 1.0.1

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```

/* Jackson JSON-processor.
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*/

```

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```

* /opt/cola/permits/1151085999_1617779160.19/0/jackson-mapper-asl-1-0-1-sources-1-
jar/org/codehaus/jackson/map/MappingJsonFactory.java

```

# 1.308 trove4j 2.1.0

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# 1.309 mail 1.5.4

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- \* /opt/cola/permits/1151187913\_1617805373.39/0/xmlunit-core-2-3-0-sources-5-jar/org/xmlunit/util/Nodes.java
- \* /opt/cola/permits/1151187913\_1617805373.39/0/xmlunit-core-2-3-0-sources-5-jar/org/xmlunit/validation/Languages.java
- \* /opt/cola/permits/1151187913\_1617805373.39/0/xmlunit-core-2-3-0-sources-5-jar/org/xmlunit/diff/ElementSelector.java
- \*
- /opt/cola/permits/1151187913\_1617805373.39/0/xmlunit-core-2-3-0-sources-5-jar/org/xmlunit/diff/XPathContext.java
- \* /opt/cola/permits/1151187913\_1617805373.39/0/xmlunit-core-2-3-0-sources-5-jar/org/xmlunit/util/Linqy.java
- \* /opt/cola/permits/1151187913\_1617805373.39/0/xmlunit-core-2-3-0-sources-5-jar/org/xmlunit/diff/package-info.java
- \* /opt/cola/permits/1151187913\_1617805373.39/0/xmlunit-core-2-3-0-sources-5-jar/org/xmlunit/diff/ElementSelectors.java
- \* /opt/cola/permits/1151187913\_1617805373.39/0/xmlunit-core-2-3-0-sources-5-jar/org/xmlunit/validation/ParsingValidator.java
- \* /opt/cola/permits/1151187913\_1617805373.39/0/xmlunit-core-2-3-0-sources-5-jar/org/xmlunit/package-info.java
- \* /opt/cola/permits/1151187913\_1617805373.39/0/xmlunit-core-2-3-0-sources-5-jar/org/xmlunit/diff/ComparisonControllers.java
- \* /opt/cola/permits/1151187913\_1617805373.39/0/xmlunit-core-2-3-0-sources-5-jar/org/xmlunit/diff/Diff.java
- \*
- /opt/cola/permits/1151187913\_1617805373.39/0/xmlunit-core-2-3-0-sources-5-jar/org/xmlunit/validation/package-info.java
- \* /opt/cola/permits/1151187913\_1617805373.39/0/xmlunit-core-2-3-0-sources-5-jar/org/xmlunit/diff/NodeFilters.java
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- \* /opt/cola/permits/1151187913\_1617805373.39/0/xmlunit-core-2-3-0-sources-5-jar/org/xmlunit/input/CommentLessSource.java
- \* /opt/cola/permits/1151187913\_1617805373.39/0/xmlunit-core-2-3-0-sources-5-jar/org/xmlunit/diff/ComparisonListenerSupport.java
- \* /opt/cola/permits/1151187913\_1617805373.39/0/xmlunit-core-2-3-0-sources-5-jar/org/xmlunit/builder/AbstractTransformationBuilder.java
- \* /opt/cola/permits/1151187913\_1617805373.39/0/xmlunit-core-2-3-0-sources-5-jar/org/xmlunit/builder/TransformationBuilderInterface.java
- \* /opt/cola/permits/1151187913\_1617805373.39/0/xmlunit-core-2-3-0-sources-5-jar/org/xmlunit/diff/NodeMatcher.java
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- /opt/cola/permits/1151187913\_1617805373.39/0/xmlunit-core-2-3-0-sources-5-jar/org/xmlunit/diff/ChildNodeXPathContextProvider.java
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jar/org/xmlunit/validation/Validator.java
* /opt/cola/permits/1151187913_1617805373.39/0/xmlunit-core-2-3-0-sources-5-
jar/org/xmlunit/diff/RecursiveXPathBuilder.java
* /opt/cola/permits/1151187913_1617805373.39/0/xmlunit-core-2-3-0-sources-5-
jar/org/xmlunit/diff/DefaultNodeMatcher.java
* /opt/cola/permits/1151187913_1617805373.39/0/xmlunit-core-2-3-0-sources-5-jar/org/xmlunit/util/Mapper.java
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jar/org/xmlunit/XMLUnitException.java
* /opt/cola/permits/1151187913_1617805373.39/0/xmlunit-core-2-3-0-sources-5-
jar/org/xmlunit/diff/AbstractDifferenceEngine.java
*
/opt/cola/permits/1151187913_1617805373.39/0/xmlunit-core-2-3-0-sources-5-
jar/org/xmlunit/validation/ValidationResult.java
* /opt/cola/permits/1151187913_1617805373.39/0/xmlunit-core-2-3-0-sources-5-
jar/org/xmlunit/xpath/JAXPXPathEngine.java
* /opt/cola/permits/1151187913_1617805373.39/0/xmlunit-core-2-3-0-sources-5-
jar/org/xmlunit/validation/JAXPValidator.java
* /opt/cola/permits/1151187913_1617805373.39/0/xmlunit-core-2-3-0-sources-5-
jar/org/xmlunit/diff/ComparisonListener.java
* /opt/cola/permits/1151187913_1617805373.39/0/xmlunit-core-2-3-0-sources-5-jar/org/xmlunit/util/package-
info.java
* /opt/cola/permits/1151187913_1617805373.39/0/xmlunit-core-2-3-0-sources-5-
jar/org/xmlunit/transform/Transformation.java
* /opt/cola/permits/1151187913_1617805373.39/0/xmlunit-core-2-3-0-sources-5-jar/org/xmlunit/builder/package-
info.java
* /opt/cola/permits/1151187913_1617805373.39/0/xmlunit-core-2-3-0-sources-5-
jar/org/xmlunit/diff/DifferenceEvaluator.java
*
/opt/cola/permits/1151187913_1617805373.39/0/xmlunit-core-2-3-0-sources-5-
jar/org/xmlunit/diff/DifferenceEngine.java
* /opt/cola/permits/1151187913_1617805373.39/0/xmlunit-core-2-3-0-sources-5-
jar/org/xmlunit/diff/DOMDifferenceEngine.java
* /opt/cola/permits/1151187913_1617805373.39/0/xmlunit-core-2-3-0-sources-5-
jar/org/xmlunit/ConfigurationException.java
* /opt/cola/permits/1151187913_1617805373.39/0/xmlunit-core-2-3-0-sources-5-
jar/org/xmlunit/diff/Comparison.java
* /opt/cola/permits/1151187913_1617805373.39/0/xmlunit-core-2-3-0-sources-5-
jar/org/xmlunit/diff/ComparisonType.java
* /opt/cola/permits/1151187913_1617805373.39/0/xmlunit-core-2-3-0-sources-5-
jar/org/xmlunit/diff/DefaultConditionalSelectorBuilder.java
* /opt/cola/permits/1151187913_1617805373.39/0/xmlunit-core-2-3-0-sources-5-jar/org/xmlunit/util/Convert.java
* /opt/cola/permits/1151187913_1617805373.39/0/xmlunit-core-2-3-0-sources-5-
jar/org/xmlunit/diff/ComparisonResult.java
*
/opt/cola/permits/1151187913_1617805373.39/0/xmlunit-core-2-3-0-sources-5-
jar/org/xmlunit/input/WhitespaceNormalizedSource.java
* /opt/cola/permits/1151187913_1617805373.39/0/xmlunit-core-2-3-0-sources-5-
jar/org/xmlunit/diff/DifferenceEvaluators.java

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\* /opt/cola/permits/1151187913\_1617805373.39/0/xmlunit-core-2-3-0-sources-5-jar/org/xmlunit/validation/ValidationProblem.java

\* /opt/cola/permits/1151187913\_1617805373.39/0/xmlunit-core-2-3-0-sources-5-jar/org/xmlunit/xpath/XPathEngine.java

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\*

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# 1.312 lucene-analyzers-common 6.2.1

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```
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```
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```

```
<signature of Ty Coon>, 1 April 1989  
Ty Coon, President of Vice
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@ignore

@c Set file name and title for man page.

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@settitle GNU General Public License

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gfdl(7), fsf-funding(7).

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@end smallexample

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@c man end

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Version 2.1, February 1999

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Any

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```
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```
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```

```
<signature of Ty Coon>, 1 April 1989
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Version 3.1, 31 March 2009

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This is an attempt to acknowledge early contributions to the garbage collector. Later contributions should instead be mentioned in README.changes.

## HISTORY -

Early versions of this collector were developed as a part of research projects supported in part by the National Science Foundation and the Defense Advance Research Projects Agency.

The garbage collector originated as part of the run-time system for the Russell programming language implementation. The first version of the garbage collector was written primarily by Al Demers. It was then refined and mostly rewritten, primarily by Hans-J. Boehm, at Cornell U., the University of Washington, Rice University (where it was first used for C and assembly code), Xerox PARC, SGI, and HP Labs. However, significant contributions have also been made by many others.

Some other contributors:

More recent contributors are mentioned in the modification history in README.changes. My apologies for any omissions.

The SPARC specific code was originally contributed by Mark Weiser.

The Encore Multimax modifications were supplied by Kevin Kenny (kenny@m.cs.uiuc.edu). The adaptation to the IBM PC/RT is largely due to Vernon Lee, on machines made available to Rice by IBM.

Much of the HP specific code and a number of good suggestions for improving the generic code are due to Walter Underwood.

Robert Brazile (brazile@diamond.bbn.com) originally supplied the ULTRIX code. Al Dosser (dosser@src.dec.com) and Regis Cridlig (Regis.Cridlig@cl.cam.ac.uk) subsequently provided updates and information on variation between ULTRIX systems. Parag Patel (parag@netcom.com) supplied the A/UX code.

Jesper Peterson(jep@mtiame.mtia.oz.au), Michel Schinz, and Martin Tauchmann (martintauchmann@bigfoot.com) supplied the Amiga port.

Thomas Funke (thf@zelator.in-berlin.de(?)) and

Brian D.Carlstrom (bdc@clark.lcs.mit.edu) supplied the NeXT ports.

Douglas Steel (doug@wg.icl.co.uk) provided ICL DRS6000 code.

Bill Janssen (janssen@parc.xerox.com) supplied

the SunOS dynamic loader  
specific code. Manuel Serrano (serrano@cornas.inria.fr) supplied linux and  
Sony News specific code. Al Dosser provided Alpha/OSF/1 code. He and  
Dave Detlefs(detlefs@src.dec.com) also provided several generic bug fixes.  
Alistair G. Crooks(agg@uts.amdahl.com) supplied the NetBSD and 386BSD ports.  
Jeffrey Hsu (hsu@soda.berkeley.edu) provided the FreeBSD port.  
Brent Benson (brent@jade.ssd.csd.harris.com) ported the collector to  
a Motorola 88K processor running CX/UX (Harris NightHawk).  
Ari Huttunen (Ari.Huttunen@hut.fi) generalized the OS/2 port to  
nonIBM development environments (a nontrivial task).  
Patrick Beard (beard@cs.ucdavis.edu) provided the initial MacOS port.  
David Chase, then at Olivetti Research, suggested several improvements.  
Scott Schwartz (schwartz@groucho.cse.psu.edu) supplied some of the  
code to save and print call stacks for leak detection on a SPARC.  
Jesse Hull and John Ellis supplied the C++ interface code.  
Zhong Shao performed much of the  
experimentation that led to the  
current typed allocation facility. (His dynamic type inference code hasn't  
made it into the released version of the collector, yet.)

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@c Set file name and title for man page.

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@c man begin SEEALSO

gfdl(7), fsf-funding(7).

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```
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```

```
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```
@smallexample
```

```
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```

```
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```

```
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```

```
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```

```
under certain conditions; type `show c' for details.
```

```
@end smallexample
```

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@var{signature of Ty Coon}, 1 April 1989

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This program is distributed in the hope that it will be useful,  
but WITHOUT ANY WARRANTY; without even the implied warranty of  
MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE. See the  
GNU General Public License for more details.
```

```
You should have received a copy of the GNU General Public License  
along with this program. If not, see <http://www.gnu.org/licenses/>.
```

Also add information on how to contact you by electronic and paper mail.

If the program does terminal interaction, make it output a short



notice like this when it starts in an interactive mode:

```
<program> Copyright (C) <year> <name of author>
This program comes with ABSOLUTELY NO WARRANTY; for details type `show w'.
This is free software, and you are welcome to redistribute it
under certain conditions; type `show c' for details.
```

The hypothetical commands `show w' and `show c' should show the appropriate parts of the General Public License. Of course, your program's commands might be different; for a GUI interface, you would use an "about box".

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```
@node Library Copying
@appendixsec GNU LESSER GENERAL PUBLIC LICENSE
```

```
@cindex LGPL, Lesser General Public License
@center Version 2.1, February 1999
```

```
@display
Copyright @copyright{} 1991, 1999 Free Software Foundation, Inc.
51 Franklin Street - Fifth Floor, Boston, MA 02110-1301, USA
```

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[This is the first released version of the Lesser GPL. It also counts as the successor of the GNU Library Public License, version 2, hence the version number 2.1.]

```
@end display
```

```
@appendixsubsec Preamble
```

The licenses for most software are designed to take away your freedom to share and change it. By contrast, the GNU General Public Licenses are intended to guarantee your freedom to share and change free software---to make sure the software is free for all its users.

This license, the Lesser General Public License, applies to some specially designated software---typically libraries---of the Free Software Foundation and other authors who decide to use it. You can use it too, but we suggest you first think carefully about whether this license or the ordinary General Public License is the better strategy to use in any particular case, based on the explanations below.

When we speak of free software, we are referring to freedom of use, not price. Our General Public Licenses are designed to make sure that you have the freedom to distribute copies of free software (and charge for this service if you wish); that you receive source code or can get it if you want it; that you can change the software and use pieces of it in new free programs; and that you are informed that you can do these things.

To protect your rights, we need to make restrictions that forbid distributors to deny you these rights or to ask you to surrender these rights. These restrictions translate to certain responsibilities for you if you distribute copies of the library or if you modify it.

For example, if you distribute copies of the library, whether gratis or for a fee, you must give the recipients all the rights that we gave you. You must make sure that they, too, receive or can get the source code. If you link other code with the library, you must provide complete object files to the recipients, so that they can relink them with the library after making changes to the library and recompiling it. And you must show them these terms so they know their rights.

We protect your rights with a two-step method: (1) we copyright the library, and (2) we offer you this license, which gives you legal permission to copy, distribute and/or modify the library.

To protect each distributor, we want to make it very clear that there is no warranty for the free library. Also, if the library is modified by someone else and passed on, the recipients should know that what they have is not the original version, so that the original author's reputation will not be affected by problems that might be introduced by others.

Finally, software patents pose a constant threat to the existence of any free program. We wish to make sure that a company cannot effectively restrict the users of a free program by obtaining a restrictive license from a patent holder. Therefore, we insist that any patent license obtained for a version of the library must be consistent with the full freedom of use specified in this license.

Most GNU software, including some libraries, is covered by the ordinary GNU General Public License. This license, the GNU Lesser General Public License, applies to certain designated libraries, and is quite different from the ordinary General Public License. We use this license for certain libraries in order to permit linking those libraries into non-free programs.

When a program is linked with a library, whether statically or using a shared library, the combination of the two is legally speaking a combined work, a derivative of the original library.

The ordinary General Public License therefore permits such linking only if the entire combination fits its criteria of freedom. The Lesser General Public License permits more lax criteria for linking other code with the library.

We call this license the @dfn{Lesser} General Public License because it does @emph{Less} to protect the user's freedom than the ordinary General Public License. It also provides other free software developers Less of an advantage over competing non-free programs. These disadvantages are the reason we use the ordinary General Public License for many libraries. However, the Lesser license provides advantages in certain special circumstances.

For example, on rare occasions, there may be a special need to encourage the widest possible use of a certain library, so that it becomes a de-facto standard. To achieve this, non-free programs must be allowed to use the library. A more frequent case is that a free library does the same job as widely used non-free libraries. In this case, there is little to gain by limiting the free library to free software only, so we use the Lesser General Public License.

In other cases, permission to use a particular library in non-free programs enables a greater number of people to use a large body of free software. For example, permission to use the GNU C Library in non-free programs enables many more people to use the whole GNU operating system, as well as its variant, the GNU/Linux operating system.

Although the Lesser General Public License is Less protective of the users' freedom, it does ensure that the user of a program that is linked with the Library has the freedom and the wherewithal to run that program using a modified version of the Library.

The precise terms and conditions for copying, distribution and modification follow. Pay close attention to the difference between a

``work based on the library" and a ``work that uses the library". The former contains code derived from the library, whereas the latter must be combined with the library in order to run.

@iftex

@appendixsubsec TERMS AND CONDITIONS FOR COPYING, DISTRIBUTION AND MODIFICATION

@end iftex

@ifinfo

@center GNU LESSER GENERAL PUBLIC LICENSE

@center TERMS AND CONDITIONS FOR COPYING, DISTRIBUTION AND MODIFICATION

@end ifinfo

@enumerate 0

@item

This License Agreement applies to any software library or other program which contains a notice placed by the copyright holder or other authorized party saying it may be distributed under the terms of this Lesser General Public License (also called ``this License"). Each licensee is addressed as ``you".

A ``library" means a collection of software functions and/or data prepared so as to be conveniently linked with application programs (which use some of those functions and data) to form executables.

The ``Library", below, refers to any such software library or work which has been distributed under these terms. A ``work based on the Library" means

either the Library or any derivative work under copyright law: that is to say, a work containing the Library or a portion of it, either verbatim or with modifications and/or translated straightforwardly into another language. (Hereinafter, translation is included without limitation in the term ``modification".)

``Source code" for a work means the preferred form of the work for making modifications to it. For a library, complete source code means all the source code for all modules it contains, plus any associated interface definition files, plus the scripts used to control compilation and installation of the library.

Activities other than copying, distribution and modification are not covered by this License; they are outside its scope. The act of running a program using the Library is not restricted, and output from such a program is covered only if its contents constitute a work based on the Library (independent of the use of the Library in a tool for writing it). Whether

that is true depends on what the Library does and what the program that uses the Library does.

@item

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@item

You may modify your copy or copies of the Library or any portion of it, thus forming a work based on the Library, and copy and distribute such modifications or work under the terms of Section 1 above, provided that you also meet all of these conditions:

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@item

The modified work must itself be a software library.

@item

You must cause the files modified to carry prominent notices stating that you changed the files and the date of any change.

@item

You must cause the whole of the work to be licensed at no charge to all third parties under the terms of this License.

@item

If a facility in the modified Library refers to a function or a table of data to be supplied by an application program that uses the facility, other than as an argument passed when the facility is invoked, then you must make a good faith effort to ensure that, in the event an application does not supply such function or table, the facility still operates, and performs whatever part of its purpose remains meaningful.

(For example, a function in a library to compute square roots has a purpose that is entirely well-defined independent of the application. Therefore, Subsection 2d requires that any application-supplied function or table used by this function must be optional: if the application does not supply it, the square root function must still

compute square roots.)

@end enumerate

These requirements apply to the modified work as a whole. If identifiable sections of that work are not derived from the Library, and can be reasonably considered independent and separate works in themselves, then this License, and its terms, do not apply to those sections when you distribute them as separate works. But when you distribute the same sections as part of a whole which is a work based on the Library, the distribution of the whole must be on the terms of this License, whose permissions for other licensees extend to the entire whole, and thus to each and every part regardless of who wrote it.

Thus, it is not the intent of this section to claim rights or contest your rights to work written entirely by you; rather, the intent is to exercise the right to control the distribution of derivative or collective works based on the Library.

In addition, mere aggregation of another work not based on the Library with the Library (or with a work based on the Library) on a volume of a storage or distribution medium does not bring the other work under the scope of this License.

@item

You may opt to apply the terms of the ordinary GNU General Public License instead of this License to a given copy of the Library. To do this, you must alter all the notices that refer to this License, so that they refer to the ordinary GNU General Public License, version 2, instead of to this License. (If a newer version than version 2 of the ordinary GNU General Public License has appeared, then you can specify that version instead if you wish.) Do not make any other change in these notices.

Once this change is made in a given copy, it is irreversible for that copy, so the ordinary GNU General Public License applies to all subsequent copies and derivative works made from that copy.

This option is useful when you wish to copy part of the code of the Library into a program that is not a library.

@item

You may copy and distribute the Library (or a portion or derivative of it, under Section 2) in object code or executable form under the terms of Sections 1 and 2 above provided that you accompany it with the complete corresponding machine-readable source code, which

must be distributed under the terms of Sections 1 and 2 above on a medium customarily used for software interchange.

If distribution of object code is made by offering access to copy from a designated place, then offering equivalent access to copy the source code from the same place satisfies the requirement to distribute the source code, even though third parties are not compelled to copy the source along with the object code.

@item

A program that contains no derivative of any portion of the Library, but is designed to work with the Library by being compiled or linked with it, is called a "work that uses the Library". Such a work, in isolation, is not a derivative work of the Library, and therefore falls outside the scope of this License.

However,

linking a "work that uses the Library" with the Library creates an executable that is a derivative of the Library (because it contains portions of the Library), rather than a "work that uses the library". The executable is therefore covered by this License. Section 6 states terms for distribution of such executables.

When a "work that uses the Library" uses material from a header file that is part of the Library, the object code for the work may be a derivative work of the Library even though the source code is not. Whether this is true is especially significant if the work can be linked without the Library, or if the work is itself a library. The threshold for this to be true is not precisely defined by law.

If such an object file uses only numerical parameters, data structure layouts and accessors, and small macros and small inline functions (ten lines or less in length), then the use of the object file is unrestricted, regardless of whether it is legally a derivative work.

(Executables containing this object code plus portions of the Library will still fall under Section 6.)

Otherwise, if the work is a derivative of the Library, you may distribute the object code for the work under the terms of Section 6. Any executables containing that work also fall under Section 6, whether or not they are linked directly with the Library itself.

@item

As an exception to the Sections above, you may also combine or link a "work that uses the Library" with the Library to produce a work containing portions of the Library, and distribute that work under terms of your choice, provided that the terms permit

modification of the work for the customer's own use and reverse engineering for debugging such modifications.

You must give prominent notice with each copy of the work that the Library is used in it and that the Library and its use are covered by this License. You must supply a copy of this License. If the work during execution displays copyright notices, you must include the copyright notice for the Library among them, as well as a reference directing the user to the copy of this License. Also, you must do one of these things:

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Accompany the work with the complete corresponding machine-readable source code for the Library including whatever changes were used in the work (which must be distributed under Sections 1 and 2 above); and, if the work is an executable linked with the Library, with the complete machine-readable ``work that uses the Library'', as object code and/or source code, so that the user can modify the Library and then relink to produce a modified executable containing the modified Library. (It is understood that the user who changes the contents of definitions files in the Library will not necessarily be able to recompile the application to use the modified definitions.)

@item

Use a suitable shared library mechanism for linking with the Library. A suitable mechanism is one that (1) uses at run time a copy of the library already present on the user's computer system, rather than copying library functions into the executable, and (2) will operate properly with a modified version of the library, if the user installs one, as long as the modified version is interface-compatible with the version that the work was made with.

@item

Accompany the work with a written offer, valid for at least three years, to give the same user the materials specified in Subsection 6a, above, for a charge no more than the cost of performing this distribution.

@item

If distribution of the work is made by offering access to copy from a designated place, offer equivalent access to copy the above specified materials from the same place.

@item



Verify that the user has already received a copy of these materials or that you have already sent this user a copy.

@end enumerate

For an executable, the required form of the "work that uses the Library" must include any data and utility programs needed for reproducing

the executable from it. However, as a special exception, the materials to be distributed need not include anything that is normally distributed (in either source or binary form) with the major components (compiler, kernel, and so on) of the operating system on which the executable runs, unless that component itself accompanies the executable.

It may happen that this requirement contradicts the license restrictions of other proprietary libraries that do not normally accompany the operating system. Such a contradiction means you cannot use both them and the Library together in an executable that you distribute.

@item

You may place library facilities that are a work based on the Library side-by-side in a single library together with other library facilities not covered by this License, and distribute such a combined library, provided that the separate distribution of the work based on the Library and of the other library facilities is otherwise permitted, and provided that you do these two things:

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Accompany the combined library with a copy of the same work based on the Library, uncombined with any other library facilities. This must be distributed under the terms of the Sections above.

@item

Give prominent notice with the combined library of the fact that part of it is a work based on the Library, and explaining where to find the accompanying uncombined form of the same work.

@end enumerate

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@heading END OF TERMS AND CONDITIONS

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@center END OF TERMS AND CONDITIONS

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@page

@appendixsubsec How to Apply These Terms to Your New Libraries

If you develop a new library, and you want it to be of the greatest possible use to the public, we recommend making it free software that everyone can redistribute and change. You can do so by permitting redistribution under these terms (or, alternatively, under the terms of the ordinary General Public License).

To apply these terms, attach the following notices to the library. It is safest to attach them to the start of each source file to most effectively convey the exclusion of warranty; and each file should have at least the

``copyright" line and a pointer to where the full notice is found.

@smallexample

@var{one line to give the library's name and an idea of what it does.}

Copyright (C) @var{year} @var{name of author}

This library is free software; you can redistribute it and/or modify it under the terms of the GNU Lesser General Public License as published by the Free Software Foundation; either version 2.1 of the License, or (at your option) any later version.

This library is distributed in the hope that it will be useful, but WITHOUT ANY WARRANTY; without even the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE. See the GNU Lesser General Public License for more details.

You should have received a copy of the GNU Lesser General Public License along with this library; if not, write to the Free Software Foundation, Inc., 51 Franklin Street, Fifth Floor, Boston, MA 02110-1301, USA.

@end smallexample

Also add information on how to contact you by electronic and paper mail.

You should also get your employer (if you work as a programmer) or your school, if any, to sign a ``copyright disclaimer" for the library, if necessary. Here is a sample; alter the names:

@smallexample

Yoyodyne, Inc., hereby disclaims all copyright interest in the library `Frob' (a library for tweaking knobs) written by James Random Hacker.

@var{signature of Ty Coon}, 1 April 1990

Ty Coon, President of Vice

@end smallexample

That's all there is to it!

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Version 3, 29 June 2007

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## 0. Additional Definitions.

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"The Library" refers to a covered work governed by this License, other than an Application or a Combined Work as defined below.

An "Application" is any work that makes use of an interface provided by the Library, but which is not otherwise based on the Library. Defining a subclass of a class defined by the Library is deemed a mode of using an interface provided by the Library.

A "Combined Work" is a work produced by combining or linking an Application with the Library. The particular version of the Library with which the Combined Work was made is also called the "Linked Version".

The "Minimal Corresponding Source" for a Combined Work means the Corresponding Source for the Combined Work, excluding any source code for portions of the Combined Work that, considered in isolation, are based on the Application, and not on the Linked Version.

The "Corresponding Application Code" for a Combined Work means the object code and/or source code for the Application, including any data and utility programs needed for reproducing the Combined Work from the Application, but excluding the System Libraries of the Combined Work.

## 1. Exception to Section 3 of the GNU GPL.

You may convey a covered work under sections 3 and 4 of this License without being bound by section 3 of the GNU GPL.

## 2. Conveying Modified Versions.

If you modify a copy of the Library, and, in your modifications, a facility refers to a function or data to be supplied by an Application that uses the facility (other than as an argument passed when the facility is invoked), then you may convey a copy of the modified version:

- a) under this License, provided that you make a good faith effort to ensure that, in the event an Application does not supply the

function or data, the facility still operates, and performs whatever part of its purpose remains meaningful, or

b) under the GNU GPL, with none of the additional permissions of this License applicable to that copy.

### 3. Object Code Incorporating Material from Library Header Files.

The object code form of an Application may incorporate material from a header file that is part of the Library. You may convey such object code under terms of your choice, provided that, if the incorporated material is not limited to numerical parameters, data structure layouts and accessors, or small macros, inline functions and templates (ten or fewer lines in length), you do both of the following:

a) Give prominent notice with each copy of the object code that the Library is used in it and that the Library and its use are covered by this License.

b) Accompany the object code with a copy of the GNU GPL and this license document.

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You may convey a Combined Work under terms of your choice that, taken together, effectively do not restrict modification of the portions of the Library contained in the Combined Work and reverse engineering for debugging such modifications, if you also do each of the following:

a) Give prominent notice with each copy of the Combined Work that the Library is used in it and that the Library and its use are covered by this License.

b) Accompany the Combined Work with a copy of the GNU GPL and this license document.

c) For a Combined Work that displays copyright notices during execution, include the copyright notice for the Library among these notices, as well as a reference directing the user to the copies of the GNU GPL and this license document.

d) Do one of the following:

0) Convey the Minimal Corresponding Source under the terms of this License, and the Corresponding Application Code in a form

suitable for, and under terms that permit, the user to recombine or relink the Application with a modified version of the Linked Version to produce a modified Combined Work, in the manner specified by section 6 of the GNU GPL for conveying Corresponding Source.

1) Use a suitable shared library mechanism for linking with the Library. A suitable mechanism is one that (a) uses at run time a copy of the Library already present on the user's computer system, and (b) will operate properly with a modified version of the Library that is interface-compatible with the Linked Version.

e) Provide Installation Information, but only if you would otherwise be required to provide such information under section 6 of the GNU GPL, and only to the extent that such information is necessary to install and execute a modified version of the Combined Work produced by recombining or relinking the Application with a modified version of the Linked Version. (If you use option 4d0, the Installation Information must accompany the Minimal Corresponding Source and Corresponding Application Code. If you use option 4d1, you must provide the Installation Information in the manner specified by section 6 of the GNU GPL for conveying Corresponding Source.)

## 5. Combined Libraries.

You may place library facilities that are a work based on the Library side by side in a single library together with other library facilities that are not Applications and are not covered by this License, and convey such a combined library under terms of your choice, if you do both of the following:

- a) Accompany the combined library with a copy of the same work based on the Library, uncombined with any other library facilities, conveyed under the terms of this License.
- b) Give prominent notice with the combined library that part of it is a work based on the Library, and explaining where to find the accompanying uncombined form of the same work.

## 6. Revised Versions of the GNU Lesser General Public License.

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## 1.314 tomcat-jasper 8.0.43

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## 1.326 tomcat-i18n-ja 8.0.43

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#### A. HISTORY OF THE SOFTWARE

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contextlib2 is a derivative of the contextlib module distributed by the PSF as part of the Python standard library. According, it is itself redistributed under the PSF license (reproduced in full below). As the contextlib module was added only in Python 2.5, the licenses for earlier Python versions are not applicable and have not been included.

Python was created in the early 1990s by Guido van Rossum at Stichting Mathematisch Centrum (CWI, see <http://www.cwi.nl>) in the Netherlands as a successor of a language called ABC. Guido remains Python's principal author, although it includes many contributions from others.

In 1995, Guido continued his work on Python at the Corporation for National Research Initiatives (CNRI, see <http://www.cnri.reston.va.us>) in Reston, Virginia where he released several versions of the software.



In May 2000, Guido and the Python core development team moved to BeOpen.com to form the BeOpen PythonLabs team.

In October of the same year, the PythonLabs team moved to Digital Creations (now Zope Corporation, see <http://www.zope.com>). In 2001, the Python Software Foundation (PSF, see <http://www.python.org/psf/>) was formed, a non-profit organization created specifically to own Python-related Intellectual Property. Zope Corporation is a sponsoring member of the PSF.

All Python releases are Open Source (see <http://www.opensource.org> for the Open Source Definition). Historically, most, but not all, Python releases have also been GPL-compatible; the table below summarizes the various releases that included the contextlib module.

| Release | Derived from | Year | Owner | GPL-compatible? (1) |
|---------|--------------|------|-------|---------------------|
| 2.5     | 2.4          | 2006 | PSF   | yes                 |
| 2.5.1   | 2.5          | 2007 | PSF   | yes                 |
| 2.5.2   | 2.5.1        | 2008 | PSF   | yes                 |
| 2.5.3   | 2.5.2        | 2008 | PSF   | yes                 |
| 2.6     | 2.5          | 2008 | PSF   | yes                 |
| 2.6.1   | 2.6          | 2008 | PSF   | yes                 |
| 2.6.2   | 2.6.1        | 2009 | PSF   | yes                 |
| 2.6.3   | 2.6.2        | 2009 | PSF   | yes                 |
| 2.6.4   | 2.6.3        | 2009 | PSF   | yes                 |
| 2.6.5   | 2.6.4        | 2010 | PSF   | yes                 |
| 3.0     | 2.6          | 2008 | PSF   | yes                 |
| 3.0.1   | 3.0          | 2009 | PSF   | yes                 |
| 3.1     | 3.0.1        | 2009 | PSF   | yes                 |
| 3.1.1   | 3.1          | 2009 | PSF   | yes                 |
| 3.1.2   | 3.1.1        | 2010 | PSF   | yes                 |
| 3.1.3   | 3.1.2        | 2010 | PSF   | yes                 |
| 3.1.4   | 3.1.3        | 2011 | PSF   | yes                 |
| 3.2     | 3.1          | 2011 | PSF   | yes                 |
| 3.2.1   | 3.2          | 2011 | PSF   | yes                 |
| 3.2.2   | 3.2.1        | 2011 | PSF   | yes                 |
| 3.3     | 3.2          |      |       |                     |
| 2012    | PSF          | yes  |       |                     |

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#### A. HISTORY OF THE SOFTWARE

=====

Python was created in the early 1990s by Guido van Rossum at Stichting Mathematisch Centrum (CWI, see <http://www.cwi.nl>) in the Netherlands as a successor of a language called ABC. Guido remains Python's principal author, although it includes many contributions from others.

In 1995, Guido continued his work on Python at the Corporation for National Research Initiatives (CNRI, see <http://www.cnri.reston.va.us>) in Reston, Virginia where he released several versions of the software.

In May 2000, Guido and the Python core development team moved to BeOpen.com to form the BeOpen PythonLabs team. In October of the same year, the PythonLabs team moved to Digital Creations (now Zope Corporation, see <http://www.zope.com>). In 2001, the Python Software Foundation (PSF, see <http://www.python.org/psf/>) was formed, a non-profit organization created specifically to own Python-related Intellectual Property. Zope Corporation is a sponsoring member of the PSF.

All Python releases are Open Source (see <http://www.opensource.org> for the Open Source Definition). Historically, most, but not all, Python releases have also been GPL-compatible; the table below summarizes the various releases.

| Release        | Derived from | Year      | Owner      | GPL-compatible? (1) |
|----------------|--------------|-----------|------------|---------------------|
| 0.9.0 thru 1.2 |              | 1991-1995 | CWI        | yes                 |
| 1.3 thru 1.5.2 | 1.2          | 1995-1999 | CNRI       | yes                 |
| 1.6            | 1.5.2        | 2000      | CNRI       | no                  |
| 2.0            | 1.6          | 2000      | BeOpen.com | no                  |
| 1.6.1          | 1.6          | 2001      | CNRI       | yes (2)             |
| 2.1            | 2.0+1.6.1    | 2001      | PSF        | no                  |
| 2.0.1          | 2.0+1.6.1    | 2001      | PSF        | yes                 |
| 2.1.1          | 2.1+2.0.1    | 2001      | PSF        | yes                 |
| 2.2            | 2.1.1        | 2001      | PSF        | yes                 |
| 2.1.2          | 2.1.1        | 2002      | PSF        | yes                 |
| 2.1.3          |              |           |            |                     |
| 2.1.2          | 2002         | PSF       | yes        |                     |
| 2.2.1          | 2.2          | 2002      | PSF        | yes                 |
| 2.2.2          | 2.2.1        | 2002      | PSF        | yes                 |
| 2.2.3          | 2.2.2        | 2003      | PSF        | yes                 |
| 2.3            | 2.2.2        | 2002-2003 | PSF        | yes                 |
| 2.3.1          | 2.3          | 2002-2003 | PSF        | yes                 |
| 2.3.2          | 2.3.1        | 2002-2003 | PSF        | yes                 |
| 2.3.3          | 2.3.2        | 2002-2003 | PSF        | yes                 |
| 2.3.4          | 2.3.3        | 2004      | PSF        | yes                 |
| 2.3.5          | 2.3.4        | 2005      | PSF        | yes                 |
| 2.4            | 2.3          | 2004      | PSF        | yes                 |
| 2.4.1          | 2.4          | 2005      | PSF        | yes                 |
| 2.4.2          | 2.4.1        | 2005      | PSF        | yes                 |
| 2.4.3          | 2.4.2        | 2006      | PSF        | yes                 |
| 2.4.4          | 2.4.3        | 2006      | PSF        | yes                 |
| 2.5            | 2.4          | 2006      | PSF        | yes                 |
| 2.5.1          | 2.5          | 2007      | PSF        | yes                 |
| 2.5.2          | 2.5.1        | 2008      | PSF        | yes                 |
| 2.5.3          | 2.5.2        | 2008      | PSF        | yes                 |
| 2.6            | 2.5          | 2008      | PSF        | yes                 |
| 2.6.1          | 2.6          | 2008      | PSF        | yes                 |
| 2.6.2          | 2.6.1        | 2009      | PSF        | yes                 |
| 2.6.3          | 2.6.2        | 2009      | PSF        | yes                 |
| 2.6.4          | 2.6.3        | 2009      | PSF        | yes                 |
| 2.6.5          | 2.6.4        | 2010      | PSF        | yes                 |
| 2.7            | 2.6          | 2010      | PSF        | yes                 |

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Python was created in the early 1990s by Guido van Rossum at Stichting Mathematisch Centrum (CWI, see <http://www.cwi.nl>) in the Netherlands as a successor of a language called ABC. Guido remains Python's principal author, although it includes many contributions from others.

In 1995, Guido continued his work on Python at the Corporation for National Research Initiatives (CNRI, see <http://www.cnri.reston.va.us>) in Reston, Virginia where he released several versions of the software.

In May 2000, Guido and the Python core development team moved to BeOpen.com to form the BeOpen PythonLabs team. In October of the same year, the PythonLabs team moved to Digital Creations (now Zope Corporation, see <http://www.zope.com>). In 2001, the Python Software Foundation (PSF, see <http://www.python.org/psf/>) was formed, a non-profit organization created specifically to own Python-related Intellectual Property. Zope Corporation is a sponsoring member of the PSF.

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| 1.6            | 1.5.2        | 2000      | CNRI       | no                  |
| 2.0            | 1.6          | 2000      | BeOpen.com | no                  |
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| 2.1            | 2.0+1.6.1    | 2001      | PSF        | no                  |
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| 2.3.5 | 2.3.4 | 2005 | PSF | yes |
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| 2.4.1 | 2.4   | 2005 | PSF | yes |
| 2.4.2 | 2.4.1 | 2005 | PSF | yes |
| 2.4.3 | 2.4.2 | 2006 | PSF | yes |
| 2.4.4 | 2.4.3 | 2006 | PSF | yes |
| 2.5   | 2.4   | 2006 | PSF | yes |
| 2.5.1 | 2.5   | 2007 | PSF | yes |
| 2.5.2 | 2.5.1 | 2008 | PSF | yes |
| 2.5.3 | 2.5.2 | 2008 | PSF | yes |
| 2.6   | 2.5   | 2008 | PSF | yes |
| 2.6.1 | 2.6   | 2008 | PSF | yes |
| 2.6.2 | 2.6.1 | 2009 | PSF | yes |
| 2.6.3 | 2.6.2 | 2009 | PSF | yes |
| 2.6.4 | 2.6.3 | 2009 | PSF | yes |
| 2.6.5 | 2.6.4 | 2010 | PSF | yes |
| 3.0   | 2.6   | 2008 | PSF | yes |
| 3.0.1 | 3.0   | 2009 | PSF | yes |
| 3.1   | 3.0.1 | 2009 | PSF | yes |
| 3.1.1 | 3.1   | 2009 | PSF | yes |
| 3.1.2 | 3.1   | 2010 | PSF | yes |
| 3.2   | 3.1   | 2010 | PSF | yes |

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Certificate data from Mozilla as of: Thu Nov 3 19:04:19 2011#

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<http://mxr.mozilla.org/mozilla/source/security/nss/lib/ckfw/builtins/certdata.txt?raw=1#>

It contains the certificates in PEM format and therefore can be directly used with curl / libcurl / php\_curl, or with an Apache+mod\_ssl webserver for SSL client authentication.

Just configure this file as the SSLCACertificateFile.#

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/* "grpc_tools/_protoc_compiler.pyx":1
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*/
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* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
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1.21.1/grpc\_tools/\_protoc\_compiler.cpp

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*
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1.21.1/grpc_root/include/grpcpp/impl/codegen/intercepted_channel.h
* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
1.21.1/grpc_root/include/grpc++/impl/codegen/create_auth_context.h
* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
1.21.1/grpc_root/include/grpcpp/opencensus.h
* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
1.21.1/grpc_root/include/grpc++/impl/codegen/core_codegen.h
* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
1.21.1/grpc_root/include/grpc++/support/stream.h
* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
1.21.1/grpc_root/include/grpc++/impl/codegen/status_code_enum.h
* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
1.21.1/grpc_root/include/grpcpp/impl/codegen/proto_buffer_writer.h
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/opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
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* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
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* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
1.21.1/grpc_root/include/grpc++/impl/codegen/stub_options.h
* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
1.21.1/grpc_root/include/grpcpp/alarm.h
* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
1.21.1/grpc_root/include/grpcpp/impl/codegen/call_op_set.h
* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-

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1.21.1/grpc\_root/include/grpc++/impl/codegen/sync\_stream.h

\* /opt/cola/permits/1167821499\_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-1.21.1/grpc\_root/include/grpc++/impl/codegen/rpc\_method.h

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/opt/cola/permits/1167821499\_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-1.21.1/grpc\_root/include/grpc++/impl/codegen/core\_codegen\_interface.h

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\* /opt/cola/permits/1167821499\_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-1.21.1/grpc\_root/include/grpcpp/impl/codegen/client\_callback.h

\* /opt/cola/permits/1167821499\_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-1.21.1/grpc\_root/include/grpc++/impl/codegen/status.h

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\* /opt/cola/permits/1167821499\_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-1.21.1/grpc\_root/include/grpc++/impl/codegen/proto\_utils.h

\* /opt/cola/permits/1167821499\_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-1.21.1/grpc\_root/include/grpc++/support/status\_code\_enum.h

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\* /opt/cola/permits/1167821499\_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-1.21.1/grpc\_root/include/grpc++/support/stub\_options.h

\* /opt/cola/permits/1167821499\_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-1.21.1/grpc\_root/include/grpc/support/thd\_id.h

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\* /opt/cola/permits/1167821499\_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-1.21.1/grpc\_root/include/grpcpp/impl/codegen/interceptor.h

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\* /opt/cola/permits/1167821499\_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-1.21.1/grpc\_root/include/grpcpp/ext/server\_load\_reporting\_impl.h

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* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-1.21.1/grpc_root/include/grpc++/impl/call.h
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* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-1.21.1/grpc_root/include/grpc++/support/channel_arguments.h
* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-1.21.1/grpc_root/include/grpcpp/ext/channelz_service_plugin.h
* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-1.21.1/grpc_root/include/grpc++/impl/codegen/config.h
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* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-1.21.1/grpc_root/include/grpcpp/impl/codegen/call.h
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\*  
\*/  
/\*\* Signal that the call is cacheable. GRPC is free to use GET verb \*/

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\* /opt/cola/permits/1167821499\_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-1.21.1/grpc\_root/include/grpc/support/sync\_custom.h  
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\* /opt/cola/permits/1167821499\_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-1.21.1/grpc\_root/include/grpcpp/impl/channel\_argument\_option.h  
\* /opt/cola/permits/1167821499\_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-1.21.1/grpc\_root/include/grpcpp/test/mock\_stream.h

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1.21.1/grpc\_root/include/grpcpp/impl/codegen/rpc\_service\_method.h  
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* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
1.21.1/third_party/protobuf/src/google/protobuf/compiler/java/java_string_field_lite.h
* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
1.21.1/third_party/protobuf/src/google/protobuf/compiler/csharp/csharp_reflection_class.h
* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
1.21.1/third_party/protobuf/src/google/protobuf/map_type_handler.h
* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
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*
/opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
1.21.1/grpc_tools/_proto/google/protobuf/wrappers.proto
* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
1.21.1/third_party/protobuf/src/google/protobuf/map_test_util_impl.h
* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
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* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
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* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
1.21.1/third_party/protobuf/src/google/protobuf/no_field_presence_test.cc
* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
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*
/opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
1.21.1/third_party/protobuf/src/google/protobuf/util/internal/testdata/wrappers.proto

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* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
1.21.1/third_party/protobuf/src/google/protobuf/compiler/cpp/cpp_primitive_field.h
* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
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* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
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* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
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* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
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*
/opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
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* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
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* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
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* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
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* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
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* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
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/opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
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* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
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* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
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* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
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* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
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* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
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* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
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* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
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* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-

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1.21.1/third\_party/protobuf/src/google/protobuf/compiler/php/php\_generator.cc  
 \* /opt/cola/permits/1167821499\_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-1.21.1/third\_party/protobuf/src/google/protobuf/unitest\_no\_generic\_services.proto  
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 \* /opt/cola/permits/1167821499\_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-1.21.1/third\_party/protobuf/src/google/protobuf/compiler/java/java\_enum\_field\_lite.cc  
 \* /opt/cola/permits/1167821499\_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-1.21.1/third\_party/protobuf/src/google/protobuf/stubs/common\_unittest.cc  
 \* /opt/cola/permits/1167821499\_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-1.21.1/third\_party/protobuf/src/google/protobuf/compiler/cpp/cpp\_plugin\_unittest.cc  
 \* /opt/cola/permits/1167821499\_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-1.21.1/third\_party/protobuf/src/google/protobuf/unitest\_mset\_wire\_format.proto  
 \* /opt/cola/permits/1167821499\_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-1.21.1/third\_party/protobuf/src/google/protobuf/compiler/parser.cc  
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 \* /opt/cola/permits/1167821499\_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-1.21.1/third\_party/protobuf/src/google/protobuf/compiler/js/well\_known\_types\_embed.cc  
 \* /opt/cola/permits/1167821499\_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-1.21.1/third\_party/protobuf/src/google/protobuf/util/json\_util\_test.cc  
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 \* /opt/cola/permits/1167821499\_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-1.21.1/third\_party/protobuf/src/google/protobuf/test\_util2.h  
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 /opt/cola/permits/1167821499\_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-1.21.1/third\_party/protobuf/src/google/protobuf/compiler/java/java\_doc\_comment.h  
 \* /opt/cola/permits/1167821499\_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-1.21.1/third\_party/protobuf/src/google/protobuf/compiler/java/java\_primitive\_field.cc  
 \* /opt/cola/permits/1167821499\_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-1.21.1/third\_party/protobuf/src/google/protobuf/util/package\_info.h  
 \* /opt/cola/permits/1167821499\_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-1.21.1/third\_party/protobuf/src/google/protobuf/compiler/objectivec/objectivec\_enum.h  
 \* /opt/cola/permits/1167821499\_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-1.21.1/third\_party/protobuf/src/google/protobuf/compiler/cpp/cpp\_unittest.h  
 \* /opt/cola/permits/1167821499\_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-1.21.1/third\_party/protobuf/src/google/protobuf/reflection\_ops.cc  
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 /opt/cola/permits/1167821499\_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-1.21.1/third\_party/protobuf/src/google/protobuf/util/json\_util.h  
 \* /opt/cola/permits/1167821499\_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-1.21.1/third\_party/protobuf/src/google/protobuf/compiler/objectivec/objectivec\_helpers.h  
 \* /opt/cola/permits/1167821499\_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-1.21.1/third\_party/protobuf/src/google/protobuf/util/internal/testdata/default\_value\_test.proto  
 \* /opt/cola/permits/1167821499\_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-1.21.1/third\_party/protobuf/src/google/protobuf/util/internal/protostream\_objectwriter.h  
 \* /opt/cola/permits/1167821499\_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-1.21.1/third\_party/protobuf/src/google/protobuf/compiler/code\_generator.cc  
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 \* /opt/cola/permits/1167821499\_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-1.21.1/third\_party/protobuf/src/google/protobuf/compiler/java/java\_enum.cc  
 \* /opt/cola/permits/1167821499\_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-1.21.1/third\_party/protobuf/src/google/protobuf/arena.cc  
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 \* /opt/cola/permits/1167821499\_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-

1.21.1/third\_party/protobuf/src/google/protobuf/stubs/hash.h

\* /opt/cola/permits/1167821499\_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-1.21.1/third\_party/protobuf/src/google/protobuf/io/tokenizer\_unittest.cc

\* /opt/cola/permits/1167821499\_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-1.21.1/third\_party/protobuf/src/google/protobuf/compiler/cpp/cpp\_bootstrap\_unittest.cc

\* /opt/cola/permits/1167821499\_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-1.21.1/third\_party/protobuf/src/google/protobuf/util/internal/object\_location\_tracker.h

\* /opt/cola/permits/1167821499\_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-1.21.1/third\_party/protobuf/src/google/protobuf/compiler/java/java\_enum\_lite.cc

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/opt/cola/permits/1167821499\_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-1.21.1/third\_party/protobuf/src/google/protobuf/compiler/csharp/csharp\_options.h

\* /opt/cola/permits/1167821499\_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-1.21.1/third\_party/protobuf/src/google/protobuf/compiler/cpp/cpp\_field.cc

\* /opt/cola/permits/1167821499\_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-1.21.1/third\_party/protobuf/src/google/protobuf/unittest\_no\_arena\_lite.proto

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\* /opt/cola/permits/1167821499\_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-1.21.1/third\_party/protobuf/src/google/protobuf/util/internal/testdata/default\_value.proto

\* /opt/cola/permits/1167821499\_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-1.21.1/third\_party/protobuf/src/google/protobuf/compiler/java/java\_message\_field.cc

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/opt/cola/permits/1167821499\_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-1.21.1/third\_party/protobuf/src/google/protobuf/util/internal/utility.h

\* /opt/cola/permits/1167821499\_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-1.21.1/third\_party/protobuf/src/google/protobuf/stubs/io\_win32.cc

\* /opt/cola/permits/1167821499\_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-1.21.1/third\_party/protobuf/src/google/protobuf/compiler/java/java\_extension\_lite.cc

\* /opt/cola/permits/1167821499\_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-1.21.1/third\_party/protobuf/src/google/protobuf/util/json\_format.proto

\* /opt/cola/permits/1167821499\_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-1.21.1/grpc\_tools/\_proto/google/protobuf/api.proto

\* /opt/cola/permits/1167821499\_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-1.21.1/third\_party/protobuf/src/google/protobuf/any.cc

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/opt/cola/permits/1167821499\_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-1.21.1/third\_party/protobuf/src/google/protobuf/test\_util.cc

\* /opt/cola/permits/1167821499\_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-1.21.1/third\_party/protobuf/src/google/protobuf/stubs/bytestream.cc

\* /opt/cola/permits/1167821499\_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-1.21.1/third\_party/protobuf/src/google/protobuf/compiler/cpp/cpp\_move\_unittest.cc

\* /opt/cola/permits/1167821499\_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-1.21.1/third\_party/protobuf/src/google/protobuf/compiler/csharp/csharp\_source\_generator\_base.cc

\* /opt/cola/permits/1167821499\_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-1.21.1/third\_party/protobuf/src/google/protobuf/reflection\_internal.h

\* /opt/cola/permits/1167821499\_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-1.21.1/third\_party/protobuf/src/google/protobuf/compiler/cpp/cpp\_service.cc

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* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
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* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
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* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
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* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
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* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
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* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
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* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
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*
/opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
1.21.1/third_party/protobuf/src/google/protobuf/compiler/plugin.cc
* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
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* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
1.21.1/third_party/protobuf/src/google/protobuf/descriptor_database.h

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* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
1.21.1/third_party/protobuf/src/google/protobuf/compiler/python/python_generator.h
* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
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* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
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1.21.1/third_party/protobuf/src/google/protobuf/compiler/java/java_field.cc
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1.21.1/third_party/protobuf/src/google/protobuf/compiler/java/java_shared_code_generator.cc
* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
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* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
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* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
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/opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
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* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
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* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
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* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
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* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
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* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
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* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
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* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
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* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
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* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
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* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
1.21.1/third_party/protobuf/src/google/protobuf/io/zero_copy_stream_impl_lite.h
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/opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
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* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
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* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
1.21.1/third_party/protobuf/src/google/protobuf/stubs/io_win32.h
* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
1.21.1/third_party/protobuf/src/google/protobuf/dynamic_message.cc
* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
1.21.1/third_party/protobuf/src/google/protobuf/compiler/subprocess.h
* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
1.21.1/third_party/protobuf/src/google/protobuf/compiler/objectivec/objectivec_message_field.h
*
/opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
1.21.1/third_party/protobuf/src/google/protobuf/drop_unknown_fields_test.cc
* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
1.21.1/third_party/protobuf/src/google/protobuf/unittest_preserve_unknown_enum2.proto
* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
1.21.1/third_party/protobuf/src/google/protobuf/proto3_arena_lite_unittest.cc
* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-

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1.21.1/third\_party/protobuf/src/google/protobuf/map\_test\_util.cc  
 \* /opt/cola/permits/1167821499\_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-1.21.1/third\_party/protobuf/src/google/protobuf/util/internal/json\_stream\_parser\_test.cc  
 \*  
 /opt/cola/permits/1167821499\_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-1.21.1/third\_party/protobuf/src/google/protobuf/unittest\_empty.proto  
 \* /opt/cola/permits/1167821499\_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-1.21.1/third\_party/protobuf/src/google/protobuf/compiler/cpp/cpp\_message.h  
 \* /opt/cola/permits/1167821499\_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-1.21.1/third\_party/protobuf/src/google/protobuf/implicit\_weak\_message.h  
 \* /opt/cola/permits/1167821499\_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-1.21.1/third\_party/protobuf/src/google/protobuf/port\_def.inc  
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 \* /opt/cola/permits/1167821499\_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-1.21.1/third\_party/protobuf/src/google/protobuf/compiler/importer.h  
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 \* /opt/cola/permits/1167821499\_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-1.21.1/third\_party/protobuf/src/google/protobuf/compiler/cpp/cpp\_message\_field.h  
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1.21.1/third\_party/protobuf/src/google/protobuf/stubs/bytestream.h  
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 \* /opt/cola/permits/1167821499\_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-1.21.1/third\_party/protobuf/src/google/protobuf/struct.proto  
 \* /opt/cola/permits/1167821499\_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-1.21.1/third\_party/protobuf/src/google/protobuf/stubs/mathutil.h  
 \* /opt/cola/permits/1167821499\_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-1.21.1/third\_party/protobuf/src/google/protobuf/testing/file.cc  
 \*  
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 \* /opt/cola/permits/1167821499\_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-1.21.1/third\_party/protobuf/src/google/protobuf/util/json\_format\_proto3.proto  
 \* /opt/cola/permits/1167821499\_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-1.21.1/third\_party/protobuf/src/google/protobuf/util/internal/type\_info\_test\_helper.cc  
 \* /opt/cola/permits/1167821499\_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-1.21.1/third\_party/protobuf/src/google/protobuf/compiler/java/java\_enum\_field.h  
 \* /opt/cola/permits/1167821499\_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-1.21.1/third\_party/protobuf/src/google/protobuf/compiler/cpp/cpp\_enum.h

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*
/opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
1.21.1/third_party/protobuf/src/google/protobuf/compiler/csharp/csharp_map_field.h
* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
1.21.1/third_party/protobuf/src/google/protobuf/compiler/objectivec/objectivec_enum_field.cc
* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
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* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
1.21.1/third_party/protobuf/src/google/protobuf/compiler/zip_writer.cc
* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
1.21.1/third_party/protobuf/src/google/protobuf/util/internal/protostream_objectsource_test.cc
* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
1.21.1/third_party/protobuf/src/google/protobuf/stubs/macros.h
*
/opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
1.21.1/third_party/protobuf/src/google/protobuf/compiler/ruby/ruby_generator.h
* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
1.21.1/third_party/protobuf/src/google/protobuf/stubs/port.h
* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
1.21.1/third_party/protobuf/src/google/protobuf/stubs/statusor.h
* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
1.21.1/third_party/protobuf/src/google/protobuf/unittest_import_lite.proto
* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
1.21.1/third_party/protobuf/src/google/protobuf/compiler/csharp/csharp_enum_field.h
* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
1.21.1/third_party/protobuf/src/google/protobuf/compiler/csharp/csharp_generator.h
*
/opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
1.21.1/third_party/protobuf/src/google/protobuf/unittest_proto3_arena.proto
* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
1.21.1/third_party/protobuf/src/google/protobuf/io/tokenizer.cc
* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
1.21.1/grpc_tools/_proto/google/protobuf/descriptor.proto
* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
1.21.1/third_party/protobuf/src/google/protobuf/util/internal/protostream_objectwriter.cc
* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
1.21.1/third_party/protobuf/src/google/protobuf/stubs/once.h
* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
1.21.1/third_party/protobuf/src/google/protobuf/unittest_lazy_dependencies_enum.proto
* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
1.21.1/third_party/protobuf/src/google/protobuf/compiler/java/java_map_field_lite.cc
*
/opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
1.21.1/third_party/protobuf/src/google/protobuf/test_util_lite.h
* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
1.21.1/third_party/protobuf/src/google/protobuf/compiler/php/php_generator.h
* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
1.21.1/third_party/protobuf/src/google/protobuf/field_mask.proto

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* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
1.21.1/third_party/protobuf/src/google/protobuf/util/internal/testdata/field_mask.proto
* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
1.21.1/third_party/protobuf/src/google/protobuf/map_lite_unittest.proto
* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
1.21.1/third_party/protobuf/src/google/protobuf/compiler/csharp/csharp_helpers.cc
*
/opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
1.21.1/third_party/protobuf/src/google/protobuf/compiler/objectivec/objectivec_enum_field.h
* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
1.21.1/third_party/protobuf/src/google/protobuf/compiler/java/java_service.cc
* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
1.21.1/third_party/protobuf/src/google/protobuf/io/strtod.cc
* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
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* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
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* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
1.21.1/third_party/protobuf/src/google/protobuf/compiler/cpp/cpp_generator.cc
* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
1.21.1/third_party/protobuf/src/google/protobuf/wrappers.proto
* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
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* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
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* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
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*
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1.21.1/third_party/protobuf/src/google/protobuf/util/message_differencer.cc
* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
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* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
1.21.1/third_party/protobuf/src/google/protobuf/arena.h
* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
1.21.1/third_party/protobuf/src/google/protobuf/compiler/java/java_message_field.h
* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
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* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
1.21.1/third_party/protobuf/src/google/protobuf/unittest_no_arena_import.proto
*
/opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
1.21.1/third_party/protobuf/src/google/protobuf/unittest_optimize_for.proto

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\* /opt/cola/permits/1167821499\_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-1.21.1/third\_party/protobuf/src/google/protobuf/util/message\_differencer\_unittest.proto

\* /opt/cola/permits/1167821499\_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-1.21.1/third\_party/protobuf/src/google/protobuf/testing/file.h

\* /opt/cola/permits/1167821499\_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-1.21.1/third\_party/protobuf/src/google/protobuf/compiler/js/js\_generator.cc

\* /opt/cola/permits/1167821499\_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-1.21.1/third\_party/protobuf/src/google/protobuf/compiler/java/java\_file.h

\* /opt/cola/permits/1167821499\_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-1.21.1/third\_party/protobuf/src/google/protobuf/unittest\_import.proto

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 /opt/cola/permits/1167821499\_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-  
 1.21.1/third\_party/protobuf/src/google/protobuf/util/internal/testdata/oneofs.proto  
 \* /opt/cola/permits/1167821499\_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-  
 1.21.1/third\_party/protobuf/src/google/protobuf/io/package\_info.h  
 \* /opt/cola/permits/1167821499\_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-  
 1.21.1/third\_party/protobuf/src/google/protobuf/compiler/csharp/csharp\_reflection\_class.cc  
 No license file was found, but licenses were detected in source scan.

Metadata-Version: 1.1  
 Name: grpcio-tools  
 Version: 1.21.1  
 Summary: Protobuf code generator for gRPC  
 Home-page: <https://grpc.io>  
 Author: The gRPC Authors  
 Author-email: [grpc-io@googlegroups.com](mailto:grpc-io@googlegroups.com)  
 License: Apache License 2.0  
 Description: gRPC Python Tools

=====



Package for gRPC Python tools.

#### Supported Python Versions

-----

Python >= 3.5

#### Deprecated Python Versions

-----

Python == 2.7. Python 2.7 support will be removed on January 1, 2020.

#### Installation

-----

The gRPC Python tools package is available for Linux, Mac OS X, and Windows running Python 2.7.

#### Installing From PyPI

~~~~~

If you are installing locally...

::

```
$ pip install grpcio-tools
```

Else system wide (on Ubuntu)...

::

```
$ sudo pip install grpcio-tools
```

If you're on Windows make sure that you installed the `pip.exe` component when you installed Python (if not go back and install it!) then invoke:

::

```
$ pip.exe install grpcio-tools
```

Windows users may need to invoke `pip.exe` from a command line ran as administrator.

n.b. On Windows and on Mac OS X one *must* have a recent release of `pip` to retrieve the proper wheel from PyPI. Be sure to upgrade to the latest version!

You might also need to install Cython to handle installation via the source distribution if gRPC Python's system coverage with wheels does not happen to

include your system.

## Installing From Source

~~~~~

Building from source requires that you have the Python headers (usually a package named `:code:`python-dev``) and Cython installed. It further requires a GCC-like compiler to go smoothly; you can probably get it to work without GCC-like stuff, but you may end up having a bad time.

::

```
$ export REPO_ROOT=grpc # REPO_ROOT can be any directory of your choice
$ git clone -b $(curl -L https://grpc.io/release) https://github.com/grpc/grpc $REPO_ROOT
$ cd $REPO_ROOT
$ git submodule update --init

$ cd tools/distrib/python/grpcio_tools
$ python ../make_grpcio_tools.py

# For the next command do `sudo pip install` if you get permission-denied errors
$ GRPC_PYTHON_BUILD_WITH_CYTHON=1 pip install .
```

You cannot currently install Python from source on Windows. Things might work out for you in MSYS2 (follow the Linux instructions), but it isn't officially supported at the moment.

## Troubleshooting

~~~~~

Help, I ...

```
* **... see a** :code:`pkg_resources.VersionConflict` **when I try to install
grpc**
```

This is likely because `:code:`pip`` doesn't own the offending dependency, which in turn is likely because your operating system's package manager owns it. You'll need to force the installation of the dependency:

```
:code:`pip install --ignore-installed $OFFENDING_DEPENDENCY`
```

For example, if you get an error like the following:

::

```
Traceback (most recent call last):
File "<string>", line 17, in <module>
```

```
...
File "/usr/lib/python2.7/dist-packages/pkg_resources.py", line 509, in find
    raise VersionConflict(dist, req)
pkg_resources.VersionConflict: (six 1.8.0 (/usr/lib/python2.7/dist-packages),
Requirement.parse('six>=1.10'))
```

You can fix it by doing:

::

```
sudo pip install --ignore-installed six
```

**\*\*... see compiler errors on some platforms when either installing from source or from the source distribution\*\***

If you see

::

```
/tmp/pip-build-U8pSsr/cython/Cython/Plex/Scanners.c:4:20: fatal error: Python.h: No such file or directory
#include "Python.h"
      ^
compilation terminated.
```

You can fix it by installing `python-dev` package. i.e

::

```
sudo apt-get install python-dev
```

If you see something similar to:

::

```
third_party/protobuf/src/google/protobuf/stubs/mathlimits.h:173:31: note: in expansion of macro
'SIGNED_INT_MAX'
    static const Type kPosMax = SIGNED_INT_MAX(Type); \\
                                ^
```

And your toolchain is GCC (at the time of this writing, up through at least GCC 6.0), this is probably a bug where GCC chokes on constant expressions when the `-fwrapv` flag is specified. You should consider setting your environment with `CFLAGS=-fno-wrapv` or using clang (`CC=clang`).

Usage

-----

Given protobuf include directories `$INCLUDE`, an output directory `$OUTPUT`, and proto files `$PROTO_FILES`, invoke as:

::

```
$ python -m grpc.tools.protoc -I$INCLUDE --python_out=$OUTPUT --grpc_python_out=$OUTPUT $PROTO_FILES
```

To use as a build step in distutils-based projects, you may use the provided command class in your `setup.py`:

::

```
setuptools.setup(
    # ...
    cmdclass={
        'build_proto_modules':
grpc.tools.command.BuildPackageProtos,
    }
    # ...
)
```

Invocation of the command will walk the project tree and transpile every `.proto` file into a `*_pb2.py` file in the same directory.

Note that this particular approach requires `grpcio-tools` to be installed on the machine before the setup script is invoked (i.e. no combination of `setup_requires` or `install_requires` will provide access to `grpc.tools.command.BuildPackageProtos` if it isn't already installed). One way to work around this can be found in our `grpcio-health-checking` package <<https://pypi.python.org/pypi/grpcio-health-checking>>:

::

```
class BuildPackageProtos(setuptools.Command):
    """Command to generate project *_pb2.py modules from proto files."""
    # ...
    def run(self):

from grpc.tools import command
    command.build_package_protos(self.distribution.package_dir[""])
```

Now including `grpcio-tools` in `setup_requires` will provide the command on-setup as desired.

For more information on command classes, consult `distutils` and `setuptools` documentation.

Platform: UNKNOWN  
Classifier: Development Status :: 5 - Production/Stable  
Classifier: Programming Language :: Python  
Classifier: Programming Language :: Python :: 2  
Classifier: Programming Language :: Python :: 2.7  
Classifier: Programming Language :: Python :: 3  
Classifier: Programming Language :: Python :: 3.4  
Classifier: Programming Language :: Python :: 3.5  
Classifier: Programming Language :: Python :: 3.6  
Classifier: License :: OSI Approved :: Apache Software License

Found in path(s):

\* /opt/cola/permits/1167821499\_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-1.21.1/grpcio\_tools.egg-info/PKG-INFO

\*

/opt/cola/permits/1167821499\_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-1.21.1/PKG-INFO

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\* /opt/cola/permits/1167821499\_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-1.21.1/grpc\_tools/main.cc

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\*

\*/

/// If set, grpc is free to use the HTTP GET verb for sending the request,

Found in path(s):

\* /opt/cola/permits/1167821499\_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-1.21.1/grpc\_root/include/grpcpp/impl/codegen/client\_context.h

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\* /opt/cola/permits/1167821499\_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-1.21.1/third\_party/protobuf/src/google/protobuf/testing/zcgzip.cc

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Found in path(s):

\* /opt/cola/permits/1167821499\_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-1.21.1/grpc\_tools/\_\_init\_\_.py

\* /opt/cola/permits/1167821499\_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-1.21.1/grpc\_tools/\_protoc\_compiler.pyx

\* /opt/cola/permits/1167821499\_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-1.21.1/grpc\_version.py

\* /opt/cola/permits/1167821499\_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-1.21.1/protoc\_lib\_deps.py

\* /opt/cola/permits/1167821499\_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-1.21.1/grpc\_tools/command.py

\* /opt/cola/permits/1167821499\_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-1.21.1/\_parallel\_compile\_patch.py

\*

/opt/cola/permits/1167821499\_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-1.21.1/setup.py

\* /opt/cola/permits/1167821499\_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-1.21.1/grpc\_tools/protoc.py

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1.21.1/third_party/protobuf/src/google/protobuf/compiler/csharp/csharp_map_field.cc  
* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-  
1.21.1/third_party/protobuf/src/google/protobuf/compiler/objectivec/objectivec_map_field.cc  
*  
/opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-  
1.21.1/third_party/protobuf/src/google/protobuf/compiler/objectivec/objectivec_map_field.h  
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1.21.1/third_party/protobuf/src/google/protobuf/stubs/structurally_valid_unittest.cc  
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1.21.1/third_party/protobuf/src/google/protobuf/compiler/python/python_generator.cc
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```
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*
*/
```

Found in path(s):

```
* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
1.21.1/grpc_root/include/grpcpp/impl/method_handler_impl.h
* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
1.21.1/grpc_root/include/grpc/support/atm_windows.h
* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
1.21.1/grpc_root/include/grpcpp/security/auth_metadata_processor_impl.h
*
* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
1.21.1/grpc_root/include/grpc/impl/codegen/atm_gcc_atomic.h
* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
1.21.1/grpc_root/include/grpcpp/support/status_code_enum.h
* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
1.21.1/grpc_root/include/grpcpp/support/config.h
* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
1.21.1/grpc_root/include/grpc/impl/codegen/atm.h
* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
1.21.1/grpc_root/include/grpcpp/grpcpp.h
* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
1.21.1/grpc_root/include/grpcpp/impl/codegen/security/auth_context.h
* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
```



```

1.21.1/grpc_root/src/compiler/objective_c_generator_helpers.h
*
/opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
1.21.1/grpc_root/include/grpcpp/impl/codegen/config_protobuf.h
* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
1.21.1/grpc_root/src/compiler/ruby_plugin.cc
* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
1.21.1/grpc_root/include/grpcpp/impl/server_builder_option_impl.h
* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
1.21.1/grpc_root/include/grpcpp/impl/codegen/rpc_method.h
* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
1.21.1/grpc_root/include/grpc/support/alloc.h
* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
1.21.1/grpc_root/include/grpc/support/sync_generic.h
*
/opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
1.21.1/grpc_root/include/grpcpp/impl/codegen/proto_utils.h
* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
1.21.1/grpc_root/include/grpcpp/impl/codegen/core_codegen_interface.h
* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
1.21.1/grpc_root/include/grpcpp/impl/rpc_method.h
* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
1.21.1/grpc_root/include/grpc/impl/codegen/sync_posix.h
* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
1.21.1/grpc_root/include/grpc/support/sync_posix.h
* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
1.21.1/grpc_root/include/grpcpp/impl/client_unary_call.h
* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
1.21.1/grpc_root/include/grpcpp/support/async_stream.h
*
/opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
1.21.1/grpc_root/include/grpc/support/atm.h
* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
1.21.1/grpc_root/include/grpcpp/server_context.h
* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
1.21.1/grpc_root/src/compiler/objective_c_generator.cc
* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
1.21.1/grpc_root/include/grpcpp/support/string_ref.h
* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
1.21.1/grpc_root/src/compiler/ruby_generator_string-inl.h
* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
1.21.1/grpc_root/include/grpcpp/impl/codegen/sync_stream.h
* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
1.21.1/grpc_root/include/grpcpp/impl/codegen/method_handler_impl.h
*
/opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
1.21.1/grpc_root/src/compiler/objective_c_plugin.cc
* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-

```

1.21.1/grpc\_root/src/compiler/node\_plugin.cc  
 \* /opt/cola/permits/1167821499\_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-1.21.1/grpc\_root/src/compiler/config.h  
 \* /opt/cola/permits/1167821499\_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-1.21.1/grpc\_root/include/grpcpp/impl/codegen/serialization\_traits.h  
 \* /opt/cola/permits/1167821499\_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-1.21.1/grpc\_root/include/grpcpp/support/async\_unary\_call.h  
 \* /opt/cola/permits/1167821499\_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-1.21.1/grpc\_root/include/grpcpp/support/stream.h  
 \* /opt/cola/permits/1167821499\_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-1.21.1/grpc\_root/include/grpcpp/server\_impl.h  
 \* /opt/cola/permits/1167821499\_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-1.21.1/grpc\_root/src/compiler/schema\_interface.h  
 \*  
 /opt/cola/permits/1167821499\_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-1.21.1/grpc\_root/include/grpc/impl/codegen/log.h  
 \* /opt/cola/permits/1167821499\_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-1.21.1/grpc\_root/include/grpc/compression.h  
 \* /opt/cola/permits/1167821499\_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-1.21.1/grpc\_root/src/compiler/cpp\_generator\_helpers.h  
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1.21.1/grpc\_root/include/grpcpp/generic/generic\_stub.h  
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\* /opt/cola/permits/1167821499\_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-1.21.1/grpc\_root/include/grpcpp/create\_channel\_posix.h  
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* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
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* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
1.21.1/grpc_root/include/grpcpp/ext/proto_server_reflection_plugin.h
* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
1.21.1/grpc_root/include/grpcpp/impl/server_initializer.h
* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
1.21.1/grpc_root/include/grpcpp/health_check_service_interface.h
* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
1.21.1/grpc_root/include/grpcpp/resource_quota.h
No license file was found, but licenses were detected in source scan.
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Found in path(s):

```
* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
1.21.1/third_party/protobuf/src/google/protobuf/io/zip_stream_unittest.sh
* /opt/cola/permits/1167821499_1621866885.4/0/grpcio-tools-1-21-1-1-tar-gz/grpcio-tools-
1.21.1/third_party/protobuf/src/google/protobuf/compiler/zip_output_unittest.sh
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# 1.336 grpcio 1.21.1

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## 1.342 glib-networking 2.60.3\_1

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# \$FreeBSD: releng/11.1/libexec/atrun/LEGAL 50476 1999-08-28 00:22:10Z peter \$

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The FreeBSD team does have my permission to use at, version 2.9, under the BSD license.

You'll find it on sunsite.unc.edu's Incoming, hopefully; the md5 checksum is

3ba2ca3c0e87e1a04feae2c6c1376b0d at-2.9.tgz

Best regards

Thomas

- - -

Thomas Koenig, Thomas.Koenig@ciw.uni-karlsruhe.de, ig25@dkauni2.bitnet.

The joy of engineering is to find a straight line on a double logarithmic diagram.

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Version: 2.6.2i

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@c Local Variables:

@c ispell-local-pdict: "ispell-dict"

@c End:

Upstream source <http://invisible-island.net/dialog/dialog.html>

Current dialog upstream maintainer: Thomas Dickey <[dickey@invisible-island.net](mailto:dickey@invisible-island.net)>

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This script is compatible with the BSD install script, but was written  
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However, linking a "work that uses the Library" with the Library creates an executable that is a derivative of the Library (because it contains portions of the Library), rather than a "work that uses the library". The executable is therefore covered by this License.

Section 6 states terms for distribution of such executables.

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Any executables

containing that work also fall under Section 6,

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=====

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David Gibson <david@gibson.dropbear.id.au>

(principal original author of dtc and libfdt)

2 November 2007

Redistribution terms

Automated Testing Framework

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- \* `configure.ac`, `Makefile.am`: The original versions were derived from the ones in the XML Catalog Manager project, version 2.2.

Author: Julio Merino <jmmv@users.sourceforge.net>

\* atf-c/ui.c: The format\_paragraph and format\_text functions were derived from the ones in the Monotone project, revision 3a0982da308228d796df35f98d787c5cff2bb5b6.

Author: Julio Merino <jmmv@NetBSD.org>

\* atf-c++/detail/io.hpp, atf-c++/detail/io.cpp, atf-c++/detail/io\_test.cpp: These files were derived from the file\_handle, systembuf, pipe and pistream classes and tests found in the Boost.Process library.

Author: Julio Merino <jmmv84@gmail.com>

\* admin/check-style.sh,  
admin/check-style-common.awk,  
admin/check-style-cpp.awk, admin/check-style-shell.awk: These files, except the first one, were first implemented in the Buildtool project. They were later adapted to be part of Boost.Process and, during that process, the shell script was created.

Author: Julio Merino <jmmv84@gmail.com>

=====  
vim: filetype=text:textwidth=75:expandtab:shiftwidth=2:softtabstop=2  
Upstream source <http://invisible-island.net/byacc/byacc.html>

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robert.corbett@eng.Sun.COM

Include a small example if possible. Please include the banner string from skeleton.c with the bug report. Do not expect rapid responses.

-----  
Files: alocal.m4

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Calling this script install-sh is preferred over install.sh, to prevent `make` implicit rules from creating a file called install from it when there is no Makefile.

This script is compatible with the BSD install script, but was written from scratch. It can only install one file at a time, a restriction shared with many OS's install programs.

Files: debian/\*

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```
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```
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```
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type `show w'.
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@end smallexample
```

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@example

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@var{signature of Ty Coon}, 1 April 1989

Ty Coon, President of Vice

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Any

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```
-- vile:txtmode fc=72
-- $Id: COPYING,v 1.2 2014/01/18 23:59:29 tom Exp $
# @(#)bsd.README 8.2 (Berkeley) 4/2/94
# $FreeBSD: releng/11.1/share/mk/bsd.README 318165 2017-05-10 23:14:09Z jhb $
```

This is the README file for the "include" files for the FreeBSD source tree. The files are installed in /usr/share/mk, and are by convention, named with the suffix ".mk". These files store several build options and should be handled with caution.

Note, this file is not intended to replace reading through the .mk files for anything tricky.

There are two main types of make include files. One type is the generally usable make include files, such as `bsd.prog.mk` and `bsd.lib.mk`. The other is the internal make include files, such as `bsd.files.mk` and `bsd.man.mk`, which can not/should not be used directly but are used by the other make include files. In most cases it is only interesting to include `bsd.prog.mk` or `bsd.lib.mk`.

`bsd.arch.inc.mk` - includes arch-specific Makefile.\$arch  
`bsd.compiler.mk` - defined based on current compiler  
`bsd.conf.mk` - install of configuration

files

bsd.cpu.mk - sets CPU/arch-related variables (included from sys.mk)  
bsd.crunchgen.mk - building crunched binaries using crunchgen(1)  
bsd.dep.mk - handle Makefile dependencies  
bsd.doc.mk - building troff system documents  
bsd.endian.mk - TARGET\_ENDIAN=1234(little) or 4321 (big) for target  
bsd.files.mk - install of general purpose files  
bsd.incs.mk - install of include files  
bsd.info.mk - building GNU Info hypertext system (deprecated)  
bsd.init.mk - initialization for the make include files  
bsd.kmod.mk - building loadable kernel modules  
bsd.lib.mk - support for building libraries  
bsd.libnames.mk - define library names  
bsd.links.mk - install of links (sym/hard)  
bsd.man.mk - install of manual pages and their links  
bsd.nls.mk - build and install of NLS catalogs  
bsd.obj.mk - creating 'obj' directories and cleaning up  
bsd.own.mk - define common variables  
bsd.port.mk - building ports  
bsd.port.post.mk - building ports  
bsd.port.pre.mk - building ports  
bsd.port.subdir.mk -  
targets for building subdirectories for ports  
bsd.prog.mk - building programs from source files  
bsd.progs.mk - build multiple programs from sources  
bsd.snmpmod.mk - building modules for the SNMP daemon bsnmpd  
bsd.subdir.mk - targets for building subdirectories  
bsd.sys.mk - common settings used for building FreeBSD sources  
bsd.test.mk - building test programs from source files  
sys.mk - default rules for all makes

This file does not document bsd.port\*.mk. They are documented in ports(7).

See also make(1), mkdep(1), style.Makefile(5) and `PMake - A Tutorial', located in /usr/share/doc/psd/12.make.

-----

Random things worth knowing about this document:

If appropriate when documenting the variables the default value is indicated using square brackets e.g. [gzip].

In some cases the default value depend on other values (e.g. system architecture). In these cases the most common value is indicated.

This document

contains some simple examples of the usage of the BSD make include files. For more examples look at the makefiles in the FreeBSD

source tree.

-----

#### RANDOM THINGS WORTH KNOWING:

The files are like C-style #include files, and pretty much behave like you'd expect. The syntax is slightly different in that a single '.' is used instead of the hash mark, i.e. ".include <bsd.prog.mk>".

One difference that will save you lots of debugging time is that inclusion of the file is normally done at the \*end\* of the Makefile. The reason for this is because .mk files often modify variables and behavior based on the values of variables set in the Makefile. To make this work, remember that the FIRST target found is the target that is used, i.e. if the Makefile has:

```
a:
  echo a
a:
  echo a number two
```

the command "make a" will echo "a". To make things confusing, the SECOND variable assignment is the overriding one, i.e. if the Makefile has:

```
a= foo
a= bar

b:
  echo ${a}
```

the command "make b" will echo "bar". This is for compatibility with the way the V7 make behaved.

It's fairly difficult to make the BSD .mk files work when you're building multiple programs in a single directory. It's a lot easier to split up the programs than to deal with the problem. Most of the agony comes from making the "obj" directory stuff work right, not because we switch to a new version of make. So, don't get mad at us, figure out a better way to handle multiple architectures so we can quit using the symbolic link stuff. (Imake doesn't count.)

The file .depend in the source directory is expected to contain dependencies for the source files. This file is read automatically by make after reading the Makefile.

The variable DESTDIR works as before. It's not set anywhere but will change the tree where the file gets installed.

The profiled libraries are no longer built in a different directory than the regular libraries.

A new suffix, ".po", is used to denote a profiled object, and ".pico" denotes a position-independent relocatable object.

-----

The following variables are common:

**AFLAGS.\${SRC}**

Flags dependent on source file name.

**ACFLAGS.\${SRC}**

Flags dependent on source file name.

**CFLAGS.\${SRC}**

Flags dependent on source file name.

**CFLAGS.\${COMPILER\_TYPE}**

Flags dependent on compiler added to CFLAGS.

**CFLAGS.\${MACHINE\_ARCH}**

Architectural flags added to CFLAGS.

**CFLAGS\_NO\_SIMD** Add this to CFLAGS for programs that don't want any SIMD instructions generated. It is setup in `bsd.cpu.mk` to an appropriate value for the compiler and target.

**CXXFLAGS.\${COMPILER\_TYPE}**

Flags dependent on compiler added to CXXFLAGS.

**CXXFLAGS.\${MACHINE\_ARCH}**

Architectural flags added to CXXFLAGS.

**CXXFLAGS.\${SRC}**

Flags dependent on source file name.

**COMPILER\_FEATURES**

A list of features that the compiler supports. Zero or more of:

    c++11 Supports

full C++ 11 standard.

**COMPILER\_TYPE** Type of compiler, either clang or gcc, though other values are possible. Don't assume `!= clang == gcc`.

**COMPILER\_VERSION**

A numeric constant equal to:

    major \* 10000 + minor \* 100 + tiny

for the compiler's self-reported version.

-----

The include file `<sys.mk>` has the default rules for all makes, in the BSD environment or otherwise. You probably don't want to touch this file.

-----  
The include file <bsd.arch.inc.mk> includes other Makefiles for specific architectures, if they exist. It will include the first of the following files that it finds: Makefile.\${MACHINE}, Makefile.\${MACHINE\_ARCH}, Makefile.\${MACHINE\_CPUARCH}

-----  
The include file <bsd.man.mk> handles installing manual pages and their links.

It has three targets:

all-man:  
  build  
  manual pages.  
maninstall:  
  install the manual pages and their links.  
manlint:  
  verify the validity of manual pages.

It sets/uses the following variables:

MAN The manual pages to be installed (use a .1 - .9 suffix).

MANDIR Base path for manual installation.

MANGRP Manual group.

MANMODE Manual mode.

MANOWN Manual owner.

MANSUBDIR Subdirectory under the manual page section, i.e. "/vax" or "/tahoe" for machine specific manual pages.

MLINKS List of manual page links (using a .1 - .9 suffix). The linked-to file must come first, the linked file second, and there may be multiple pairs. The files are hard-linked.

The include file <bsd.man.mk> includes a file named "../Makefile.inc" if it exists.

-----  
The include file <bsd.own.mk> contains the owners, groups, etc. for both manual pages and binaries.



It has no targets.

It sets/uses the following variables:

BINGRP Binary group.

BINMODE Binary mode.

BINOWN Binary owner.

MANDIR Base path for manual installation.

MANGRP Manual group.

MANMODE Manual mode.

MANOWN Manual owner.

This file is generally useful when building your own Makefiles so that they use the same default owners etc. as the rest of the tree.

-----

The include file <bsd.prog.mk> handles building programs from one or more source files, along with their manual pages. It has a limited number of suffixes, consistent with the current needs of the BSD tree.

It has seven targets:

all:

build the program and its manual page

clean:

remove the program and any object files.

cleandir:

remove all of the files removed by the target clean, as well as .depend, tags, and any manual pages.

depend:

make the dependencies for the source files, and store them in the file .depend.

install:

install the program and its manual pages; if the Makefile does not itself define

the target install, the targets

beforeinstall and afterinstall may also be used to cause actions immediately before and after the install target is executed.

lint:

run lint on the source files

tags:

create a tags file for the source files.

It sets/uses the following variables:

**ACFLAGS** Flags to the compiler when preprocessing and assembling .S files.

**AFLAGS** Flags to the assembler when assembling .s files.

**BINGRP** Binary group.

**BINMODE** Binary mode.

**BINOWN** Binary owner.

**CFLAGS** Flags to the compiler when creating C objects.

**CLEANDIRS** Additional files (**CLEANFILES**) and directories (**CLEANDIRS**) to **CLEANFILES** remove during clean and cleandir targets. "rm -rf" and "rm -f" are used, respectively.

**DPADD** Additional dependencies for the program. Usually used for libraries. For example, to depend on the compatibility and utility libraries use:

```
DPADD=${LIBCOMPAT} ${LIBUTIL}
```

There is a predefined identifier for each (non-profiled, non-shared) library and object. Library file names are transformed to identifiers by removing the extension and converting to upper case.

There are no special identifiers for profiled or shared libraries or objects. The identifiers for the standard libraries are used in **DPADD**. This works correctly iff all the libraries are built at the same time. Unfortunately, it causes unnecessary relinks to shared libraries when only the static libraries have changed. Dependencies on shared libraries should be only on the library version numbers.

**FILES** A list of non-executable files.

The installation is controlled by the **FILESNAME**, **FILESOWN**, **FILESGRP**, **FILESMODE**, **FILESDIR** variables that can be

further specialized by FILES<VAR>\_<file>.

**LDADD** Additional loader objects. Usually used for libraries.

For example, to load with the compatibility and utility libraries, use:

```
LDADD=-lutil -lcompat
```

**LDFLAGS** Additional loader flags. Passed to the loader via CC,

since that's used to link

programs as well, so loader

specific flags need to be prefixed with -Wl, to work.

**LIBADD** Additional libraries. This is for base system libraries

and is only valid inside of the /usr/src tree.

Use LIBADD=name instead of LDADD=-lname.

**LINKS** The list of binary links; should be full pathnames, the

linked-to file coming first, followed by the linked

file. The files are hard-linked. For example, to link

/bin/test and /bin/, use:

```
LINKS= /bin/test /bin/
```

**MAN** Manual pages. If no MAN variable is defined,

"MAN=\${PROG}.1" is assumed. See `bsd.man.mk` for more details.

**PROG** The name of the program to build. If not supplied, nothing

is built.

**PROGRAMNAME** The name that the above program will be installed as, if

different from \${PROG}.

**PROG\_CXX** If defined, the name of the program to build. Also

causes `<bsd.prog.mk>` to link the program with the

standard C++ library. **PROG\_CXX** overrides the value

of **PROG** if **PROG** is also set.

**PROGS** When used with `<bsd.progs.mk>`,

allow building multiple

**PROGS\_CXX** **PROG** and **PROG\_CXX** in one Makefile. To define

individual variables for each program the VAR.prog

syntax should be used. For example:

```
PROGS= foo bar
```

```
SRCS.foo= foo_src.c
```

```
LDADD.foo= -lutil
```

```
SRCS.bar= bar_src.c
```

The supported variables are:

- BINDIR
- BINGRP
- BINMODE
- BINOWN
- CFLAGS
- CXXFLAGS
- DEBUG\_FLAGS
- DPADD
- DPSRCS
- INTERNALPROG (no installation)
- LDADD
- LDFLAGS
- LIBADD
- LINKS
- MAN
- MLINKS
- NO\_WERROR
- PROGNAME
- SRCS
- STRIP
- WARNS

**SCRIPTS** A list of interpreter scripts [file.{sh,csh,pl,awk,...}].

The installation is controlled by the **SCRIPTSNAME**, **SCRIPTSOWN**, **SCRIPTSGRP**, **SCRIPTSMODE**, **SCRIPTSDIR** variables that can be further specialized by **SCRIPTS<VAR>\_<script>**.

**SRCS** List of source files to build the program. If **SRCS** is not defined, it's assumed to be **\${PROG}.c** or, if **PROG\_CXX** is defined, **\${PROG\_CXX}.cc**.

**STRIP** The flag passed to the install program to cause the binary to be stripped. This is to be used when building your own install script so that the entire system can be made stripped/not-stripped using a single nob.

**SUBDIR** A list of subdirectories that should be built as well. Each of the targets will execute the same target in the subdirectories.

The include file **<bsd.prog.mk>** includes the file named **"../Makefile.inc"** if it exists, as well as the include file **<bsd.man.mk>**.

Some simple examples:

To build foo from foo.c with a manual page foo.1, use:

```
PROG= foo
```

```
.include <bsd.prog.mk>
```

To build foo from foo.c with a manual page foo.2, add the line:

```
MAN= foo.2
```

If foo does not have a manual page at all, add the line:

```
MAN=
```

If foo has multiple source files, add the line:

```
SRCS= a.c b.c c.c d.c
```

-----

The include file, <bsd.snmpmod.mk>, handles building MIB modules for bsnmpd from one or more source files, along with their manual pages. It has a limited

number of suffixes, consistent with the current needs of the BSD tree.

bsd.snmpmod.mk leverages bsd.lib.mk for building MIB modules and bsd.files.mk for installing MIB description and definition files.

It implements the following additional targets:

smilint:

execute smilint on the MIBs defined by BMIBS.

The net-mgmt/libsmi package must be installed before executing this target. The net-mgmt/net-snmp package should be installed as well to reduce false positives from smilint.

It sets/uses the following variables:

**BMIBS** The MIB definitions to install.

**BMIBSDIR** The directory where the MIB definitions are installed.  
This defaults to `\${SHAREDIR}/snmp/mibs`.

**DEFS** The MIB description files to install.

DEFSDIR The directory where MIB description files are installed.

This defaults to `\${SHAREDIR}/snmp/defs`.

EXTRAMIBDEFS Extra MIB description files to use as input when generating `${MOD}_oid.h` and `${MOD}_tree.[ch]`.

EXTRAMIBSYMS Extra MIB definition files used only for extracting symbols.

EXTRAMIBSYMS are useful when resolving inter-module dependencies and are useful with files containing only enum-definitions.

See `${MOD}_oid.h` for more details.

LOCALBASE The package root where `smilint` and the `net-snmp` definitions can be found

MOD The `bsnmpd` module name.

SMILINT `smilint` binary to use with the `smilint` make target.

SMILINT\_FLAGS flags to pass to `smilint`.

SMIPATH A colon-separated directory path where MIBs definitions can be found. See "SMIPATH" in `smi_config` for more details.

XSVM MIB names to extract symbols for. See `${MOD}_oid.h` for more details.

It generates the following files:

`${MOD}_tree.c` A source file and header which programmatically describes

`${MOD}_tree.h` the MIB (type, OID name, ACCESS attributes, etc).

The files are generated via "`gensnmptree -p`".

See `gensnmptree(1)` for more details.

`${MOD}_oid.h` A header which programmatically describes the MIB root and MIB tables.

The files are generated via

"`gensnmptree -e`".

See `gensnmptree(1)` for more details.

-----  
The include file <bsd.subdir.mk> contains the default targets for building subdirectories. It has the same seven targets as <bsd.prog.mk>: all, clean, cleandir, depend, install, lint, and tags. For all of the directories listed in the variable SUBDIRS, the specified directory will be visited and the target made. There is also a default target which allows the command "make subdir" where subdir is any directory listed in the variable SUBDIRS.

-----  
The include file <bsd.lib.mk> has support for building libraries. It has the same seven targets as <bsd.prog.mk>: all, clean, cleandir, depend, install, lint, and tags. It has a limited number of suffixes, consistent with the current needs of the BSD tree.

It sets/uses the following variables:

LDADD Additional loader objects.

LIB The name of the library to build. Both a shared and static library will be built. NO\_PIC can be set to only build a static library.

LIBADD Additional libraries. This is for base system libraries and is only valid inside of the /usr/src tree.  
Use LIBADD=name instead of LDADD=-lname.

LIBDIR Target directory for libraries.

LIBGRP Library group.

LIBMODE Library mode.

LIBOWN Library owner.

LIBRARIES\_ONLY Do not build or install files other than the library.

LIB\_CXX The name of the library to build. It also causes <bsd.lib.mk> to link the library with the standard C++ library. LIB\_CXX overrides the value of LIB if LIB is also set. Both a shared and static library will be built. NO\_PIC can be set to only build a static library.

LINTLIBDIR Target directory for lint libraries.

MAN The manual pages to be installed. See `bsd.man.mk` for more details.

SHLIB Like LIB but only builds a shared library.

SHLIB\_CXX Like LIB\_CXX but only builds a shared library.

SHLIB\_LDSCRIPT Template file to generate shared library linker script. If not defined, a simple symlink is created to the real shared object.

SRCs List of source files to build the library. Suffix types `.s`, `.c`, and `.f` are supported. Note, `.s` files are preferred to `.c` files of the same name. (This is not the default for versions of `make`.)

The include file `<bsd.lib.mk>` includes the file named `"../Makefile.inc"` if it exists, as well as the include file `<bsd.man.mk>`.

It has rules for building profiled objects; profiled libraries are built by default.

Libraries are `ranlib`'d before installation.

-----

The include file `<bsd.test.mk>` handles building one or more test programs intended to be used in the FreeBSD Test Suite under `/usr/tests/`.

It has seven targets:

- all:  
build the test programs.
- check:  
runs the test programs from CHECKDIR with `kyua test`.

The `beforecheck` and `aftercheck` targets will be invoked, if defined, to execute commands before and after the `realcheck` target has been executed, respectively.

The `devel/kyua` package must be installed before invoking this target.

See CHECKDIR for more details.



clean:

remove the test programs and any object files.

cleandir:

remove all of the files removed by the target clean, as well as .depend and tags.

depend:

make the dependencies for the source files, and store them in the file .depend.

install:

install the test programs and their data files; if the Makefile does not itself define the target install, the targets beforeinstall and afterinstall may also be used to cause actions immediately before and after the install target is executed.

lint:

run lint on the source files.

tags:

create a tags file for the source files.

It sets/uses the following variables, among many others:

**ATF\_TESTS\_C** The names of the ATF C test programs to build.

**ATF\_TESTS\_CXX** The names of the ATF C++ test programs to build.

**ATF\_TESTS\_SH** The names of the ATF sh test programs to build.

**CHECKDIR** The directory that 'make check' executes tests from.

The value of CHECKDIR defaults to .OBJDIR.

**KYUAFILE** If 'auto' (the default), generate a Kyuafile out of the test programs defined in the Makefile. If 'yes', then a manually-crafted Kyuafile must be supplied with the sources. If 'no', no Kyuafile is installed (useful for subdirectories providing helper programs or data files only).

**LOCALBASE** The --prefix for the kyua package.

The value of LOCALBASE defaults to /usr/local .

**NOT\_FOR\_TEST\_SUITE**

If defined, none of the built test programs get installed under /usr/tests/ and no Kyuafile is automatically generated. Should not be used within the FreeBSD source tree but is provided for the benefit of

third-parties.

PLAIN\_TESTS\_C The names of the plain (legacy) programs to build.

PLAIN\_TESTS\_CXX The names of the plain (legacy) test programs to build.

PLAIN\_TESTS\_SH The names of the plain (legacy) test programs to build.

TAP\_PERL\_INTERPRETER

Path to the Perl interpreter to be used for TAP-compliant test programs that are written in Perl. Refer to TAP\_TESTS\_PERL for details.

TAP\_TESTS\_C The names of the TAP-compliant C test programs to build.

TAP\_TESTS\_CXX The names of the TAP-compliant C++ test programs to build.

TAP\_TESTS\_PERL The names of the TAP-compliant Perl test programs to build. The corresponding source files should end with the .pl extension; the test program is marked as requiring Perl; and TAP\_PERL\_INTERPRETER is used in the built scripts as the interpreter of choice.

TAP\_TESTS\_SH The names of the TAP-compliant sh test programs to build.

TESTSBASE Installation prefix for tests. Defaults to /usr/tests

TESTSDIR Path to the installed tests. Must be a subdirectory of TESTSBASE and the subpath should match the relative location of the tests within the src tree.

The value of TESTSDIR defaults to `${TESTSBASE}/${RELDIR:H}` , e.g. /usr/tests/bin/lis when included from bin/lis/tests .

TESTS\_SUBDIRS List of subdirectories containing tests into which to recurse. Differs from SUBDIR in that these directories get registered into the automatically-generated Kyuafile (if any).

The actual building of the test programs is performed by <bsd.prog.mk>. Please see the documentation above for this other file for additional details on the behavior of <bsd.test.mk>.

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```

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```
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```

```
<signature of Ty Coon>, 1 April 1989
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DIRDEPS = \

.include <dirdeps.mk>

.if \${DEP\_RELDIR} == \${\_DEP\_RELDIR}  
# local dependencies - needed for -jN in clean tree  
.endif  
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# Autogenerated - do NOT edit!

DIRDEPS = \

.include <dirdeps.mk>

.if \${DEP\_RELDIR} == \${\_DEP\_RELDIR}  
# local dependencies - needed for -jN in clean tree  
.endif

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You can contact the author at :

- LZ4 homepage : <http://fastcompression.blogspot.com/p/lz4.html>

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Julian Seward, [jseward@bzip.org](mailto:jseward@bzip.org)

bzip2/libbzip2 version 1.0.6 of 6 September 2010

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include/apr\_strings.h:

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@item KCM credential cache.

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Fortuna in libhcrypto

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@heading Vincent Rijmen, Antoon Bosselaers, Paulo Barreto

AES in libcrypto

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rijndael-alg-fst.c

@version

3.0 (December 2000)

Optimised ANSI C code for the Rijndael cipher (now AES)

@author Vincent Rijmen <vincent.rijmen@esat.kuleuven.ac.be>

@author Antoon Bosselaers <antoon.bosselaers@esat.kuleuven.ac.be>

@author Paulo Barreto <paulo.barreto@terra.com.br>

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kdc/announce.c

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DES core in libhcrypto

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D3DES (V5.09) -

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Written with Symantec's THINK (Lightspeed) C by Richard Outerbridge.

Thanks to: Dan Hoey for his excellent Initial and Inverse permutation code; Jim Gillogly & Phil Karn for the DES key schedule code; Dennis Ferguson, Eric Young and Dana How for comparing notes; and Ray Lau, for humouring me on.

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lib/hcrypto/test\_dh.c

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Best regards  
Thomas

---

Thomas Koenig, Thomas.Koenig@ciw.uni-karlsruhe.de, ig25@dkauni2.bitnet.  
The joy of engineering is to find a straight line on a double logarithmic diagram.

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  57. [61]Loganaden Velvindron <loganaden@gmail.com> Sandboxing (libseccomp) support
  58. [62]Paul A Vixie <vixie@vix.com> TrueTime GPS driver, generic TrueTime clock driver
  59. [63]Ulrich Windl <Ulrich.Windl@rz.uni-regensburg.de> corrected and validated HTML documents according to the HTML DTD
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## References

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\* Optimised ANSI C code for the Rijndael cipher (now AES)

\*

\* @author Vincent Rijmen <vincent.rijmen@esat.kuleuven.ac.be>

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Dean Elsner wrote the original gas for vax. [more details?]

Jay Fenlason maintained gas for a while, adding support for gdb-specific debug information and the 68k series machines, most of the preprocessing pass, and extensive changes in messages.c, input-file.c, write.c.

K. Richard Pixley maintained gas for a while, adding various enhancements and many bug fixes, including merging support for several processors, breaking gas up to handle multiple object file format

backends (including heavy rewrite, testing, an integration of the coff and b.out backends), adding configuration including heavy testing and verification of cross assemblers and file splits and renaming, converted gas to strictly ansi C including full prototypes, added support for m680[34]0 & cpu32, considerable work on i960 including a coff port (including considerable amounts of reverse engineering), a sparc opcode file rewrite, decstation, rs6000, and hp300hpux host ports, updated "know" assertions and made them work, much other reorganization, cleanup, and lint.

Ken Raeburn wrote the high-level BFD interface code to replace most of the code in format-specific I/O modules.

The original Vax-VMS support was contributed by David L. Kashtan. Eric Youngdale and Pat Rankin have done much work with it since.

The Intel 80386 machine description was written by Eliot Dresselhaus.

Minh Tran-Le at IntelliCorp contributed some AIX 386 support.

The Motorola 88k machine description was contributed by Devon Bowen of Buffalo University and Torbjorn Granlund of the Swedish Institute of Computer Science.

Keith

Knowles at the Open Software Foundation wrote the original MIPS back end (tc-mips.c, tc-mips.h), and contributed Rose format support that hasn't been merged in yet. Ralph Campbell worked with the MIPS code to support a.out format.

Support for the Zilog Z8k and Hitachi H8/300, H8/500 and SH processors (tc-z8k, tc-h8300, tc-h8500, tc-sh), and IEEE 695 object file format (obj-ieee), was written by Steve Chamberlain of Cygnus Solutions. Steve also modified the COFF back end (obj-coffbfd) to use BFD for some low-level operations, for use with the Hitachi, 29k and Zilog targets.

John Gilmore built the AMD 29000 support, added .include support, and simplified the configuration of which versions accept which pseudo-ops. He updated the 68k machine description so that Motorola's opcodes always produced fixed-size instructions (e.g. jsr), while synthetic instructions remained shrinkable (jbsr). John fixed many bugs, including true tested cross-compilation support, and one bug in relaxation that took a week and required the proverbial one-bit fix.

Ian Lance Taylor of Cygnus Solutions merged the Motorola and MIT

syntaxes for the 68k, completed support for some COFF targets (68k, i386 SVR3, and SCO Unix), wrote the ECOFF support based on Michael Meissner's mips-tfile program, wrote the PowerPC and RS/6000 support, and made a few other minor patches. He handled the binutils releases for versions 2.7 through 2.9.

David Edelsohn contributed fixes for the PowerPC and AIX support.

Steve Chamberlain made gas able to generate listings.

Support for the HP9000/300 was contributed by Glenn Engel of HP.

Support for ELF format files has been worked on by Mark Eichin of Cygnus Solutions (original, incomplete implementation), Pete Hoogenboom at the University of Utah (HPPA mainly), Michael Meissner of the Open Software Foundation (i386 mainly), and Ken Raeburn of Cygnus Solutions (sparc, initial 64-bit support).

Several engineers at Cygnus Solutions have also provided many small bug fixes and configuration enhancements.

The initial Alpha support was contributed by Carnegie-Mellon University. Additional work was done by Ken Raeburn of Cygnus Solutions. Richard Henderson then rewrote much of the Alpha support.

Ian Dall updated the support code for the National Semiconductor 32000 series, and added support for Mach 3 and NetBSD running on the PC532.

Klaus Kaempf ported the assembler and the binutils to openVMS/Alpha.

Steve Haworth contributed the support for the Texas Instruction c30 (tms320c30).

H.J. Lu has contributed many patches and much testing.

Alan Modra reworked much of the i386 backend, improving the error checking, updating the code, and improving the 16 bit support, using patches from the work of Martynas Kunigelis and H.J. Lu.

Many others have contributed large or small bugfixes and enhancements. If you've contributed significant work and are not mentioned on this list, and want to be, let us know. Some of the history has been lost; we aren't intentionally leaving anyone out.

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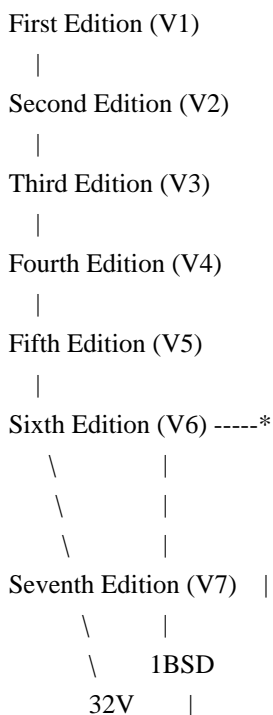
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\ 2BSD-----*
\ /      |
\ /      |
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3BSD     |
|        |
4.0BSD   2.79BSD
|        |
4.1BSD -----> 2.8BSD
|        |
4.1aBSD -----\ |
|         \ |
4.1bBSD         \ |

|         \|
*----- 4.1cBSD -----> 2.9BSD
/        |        |
Eighth Edition |        2.9BSD-Seismo
|        |        |
+----<--- 4.2BSD   2.9.1BSD
|        |        |
+----<--- 4.3BSD -----> 2.10BSD
|        |        / |
Ninth Edition |        / 2.10.1BSD
|        4.3BSD Tahoe-----+ |
|        |        \ |
|        |        \ |
v        |        2.11BSD
Tenth Edition |        |
|        2.11BSD rev #430
4.3BSD NET/1 |        |
|        v
4.3BSD Reno
|
*----- 4.3BSD NET/2 -----+-----*
|        |        |        |
386BSD 0.0 |        |
|        BSD/386 ALPHA
|        |        |        |
386BSD 0.1 ----->+ |        BSD/386 0.3.[13]
| \        |        4.4BSD Alpha |
| 386BSD 1.0 |        |        BSD/386 0.9.[34]
|        |        4.4BSD | |
|        |        /|        |
|        | 4.4BSD-Encumbered |        |
|        -NetBSD 0.8 |        BSD/386 1.0
|        / |        |        |
FreeBSD 1.0 <-----' NetBSD 0.9 |        BSD/386 1.1

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|          |          .----- 4.4BSD Lite |
FreeBSD 1.1 |          / / | \ |
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FreeBSD 1.1.5 .---|-----' / | \ |
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FreeBSD 1.1.5.1 / | / | \ |
|          / NetBSD 1.0 <-' | \ |
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FreeBSD 2.0 <--' | | BSD/OS 2.0
|          \ | |
FreeBSD 2.0.5 \ | | BSD/OS 2.0.1
|          .-----\----- 4.4BSD Lite2 |
|          | \ | | | | |
|          | .-----|-----Rhapsody | | | |
|          || | NetBSD 1.3 | | |
|          || | OpenBSD 2.3 | |
|          || | BSD/OS 3.0 |
FreeBSD 2.1 || | |
| | || NetBSD 1.1 -----, BSD/OS 2.1
| FreeBSD 2.1.5 || | \ |
| | || NetBSD 1.2 \ BSD/OS 3.0
| FreeBSD 2.1.6 || | \ OpenBSD 2.0 | | |
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| FreeBSD 2.1.6.1 || | \ | |
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| FreeBSD 2.1.7 || | | |
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*-FreeBSD 2.2 || | | |
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| FreeBSD 2.2.1 || | | |
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| FreeBSD 2.2.2 || | OpenBSD 2.1 |
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| FreeBSD 2.2.5 || | | |
| | || | OpenBSD 2.2 |
| | || NetBSD 1.3 | |
| FreeBSD 2.2.6 || | | |
| | || | NetBSD 1.3.1 | BSD/OS 3.1
| | || | OpenBSD 2.3 | |
| | || | NetBSD 1.3.2 | |
| FreeBSD 2.2.7 || | | |
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| FreeBSD 2.2.8 || | | |

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| FreeBSD 2.2.9 | | | | |
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FreeBSD 3.0 <-----* | | v | | |
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| NetBSD 1.3.3 | | | |
*---FreeBSD 3.1 | | | | |
| | | | | | BSD/OS 4.0.1
| FreeBSD 3.2----* | NetBSD 1.4 OpenBSD 2.5 | | | | |
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| FreeBSD 3.3 | | | | NetBSD 1.4.1 | |
| | | | | | OpenBSD 2.6 |
| FreeBSD 3.4 | | | | | |
| | | | | | | BSD/OS 4.1
FreeBSD 4.0 | | | | | NetBSD 1.4.2 | |
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| FreeBSD 3.5 | | | | | OpenBSD 2.7 |
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| | Mac OS X | | OpenBSD 2.8 BSD/OS 4.2
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FreeBSD 12 -current | NetBSD -current OpenBSD -current DragonFly -current
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#### Time

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Time tolerance +/- 6 months, depending on which book/article you read; if it was the announcement in Usenet or if it was available as tape.

- [44B] McKusick, Marshall Kirk, Keith Bostic, Michael J Karels, and John Quarterman. The Design and Implementation of the 4.4BSD Operating System.
- [APL] Apple website [<http://www.apple.com/macosex/>]
- [BSDI] Berkeley Software Design, Inc.
- [DFB] DragonFlyBSD Project, The.
- [DOC] README, COPYRIGHT on tape.
- [FBD] FreeBSD Project, The.
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- [NBD] NetBSD Project, The.
- [OBD] OpenBSD Project, The.
- [QCU] Salus, Peter H. A quarter century of UNIX.
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- [TUHS] The Unix Historical Society. [http://minnie.tuhs.org/Unix\\_History/](http://minnie.tuhs.org/Unix_History/).
- [USE] Usenet announcement.
- [WRS] Wind

River Systems, Inc.  
[dmr] Dennis Ritchie, via E-Mail

Multics            1965  
UNIX                Summer 1969  
    DEC PDP-7  
First Edition      1971-11-03 [QCU]  
    DEC PDP-11/20, Assembler  
Second Edition    1972-06-12 [QCU]  
    10 UNIX installations  
Third Edition     1973-02-xx [QCU]  
    Pipes, 16 installations  
Fourth Edition    1973-11-xx [QCU]  
    rewriting in C effected,  
                    above 30 installations  
Fifth Edition     1974-06-xx [QCU]  
    above 50 installations  
Sixth Edition     1975-05-xx [QCU]  
    port to DEC Vax  
Seventh Edition   1979-01-xx [QCU]  
    first portable UNIX  
Eighth Edition    1985-02-xx [QCU]  
    VAX 11/750, VAX 11/780 [dmr]  
    descended from 4.1c BSD [dmr]  
    descended from 4.1 BSD [44B]  
    scooping-out and replacement of the character-device  
    and networking part by the streams mechanism  
  
Ninth Edition     1986-09-xx [QCU]  
Tenth Edition    1989-10-xx [QCU]

#### 1BSD

    late 1977  
    1978-03-09 [QCU]  
    PDP-11, Pascal, ex(1)  
    30 free copies of 1BSD sent out  
    35 tapes sold for 50 USD [QCU]  
2BSD                mid 1978 [QCU] 1979-05-10 [TUHS]  
    75 2BSD tapes shipped  
2.79BSD 1980-04-xx [TUHS]  
2.8BSD 1981-07-xx [KSJ]  
  
2.8.1BSD 1982-01-xx [QCU]  
    set of performance improvements  
2.9BSD 1983-07-xx [KSJ]  
2.9.1BSD            1983-11-xx [TUHS]  
2.9BSD-Seismo 1985-08-xx [SMS]  
2.10BSD 1987-04-xx [KKK]

2.10.1BSD 1989-01-xx [SMS]  
2.11BSD 1992-02-xx [SMS]  
2.11BSD rev #430 1999-12-13 [SMS]

32V 1978-1[01]-xx [QCU]  
3BSD late 1979 [QCU] March 1980 [TUHS]  
virtual memory, page replacement,  
demand paging

4.0BSD 1980-10-xx  
4.1BSD 1981-07-08 [DOC]  
4.1aBSD 1982-04-xx  
alpha release, 100 sites, networking [44B]  
4.1bBSD internal release, fast filesystem [44B]  
4.1cBSD late 1982  
beta release, IPC [44B]  
4.2BSD  
1983-09-xx [QCU]  
1983-08-03 [DOC]  
4.3BSD 1986-06-xx [QCU]  
1986-04-05 [KB], [DOC]  
4.3BSD Tahoe 1988-06-15 [QCU], [DOC]  
4.3BSD NET/1 1988-11-xx [QCU]  
1989-01-01 [DOC]  
4.3BSD Reno 1990-06-29 [QCU], [DOC]  
4.3BSD NET/2 1991-06-28 [QCU], [DOC]

BSD/386 ALPHA 1991-12-xx [BSDI]  
first code released to people outside BSDI  
386BSD 0.0 1992-02-xx [DOC]  
BSD/386 0.3.1 1992-04-xx [BSDI] first ext. beta; B customers  
BSD/386 0.3.3 1992-06-xx [BSDI] first CDROM version  
386BSD 0.1 1992-07-28 [DOC]  
4.4BSD Alpha 1992-07-07  
BSD/386 0.9.3 1992-10-xx [BSDI]  
first external gamma; G customers  
BSD/386 0.9.4 1992-12-xx [BSDI]  
would have been 1.0 except for request  
for preliminary injunction  
BSD/386 1.0 1993-03-xx [BSDI]  
injunction denied; first official release  
NetBSD 0.8 1993-04-20 [NBD]  
4.4BSD  
1993-06-01 [USE]  
NetBSD 0.9 1993-08-23 [NBD]  
FreeBSD 1.0 1993-11-01 [FBD]  
FreeBSD 1.0.2 1993-11-14 [FBD]  
supersedes 1.0 13 days after release.  
BSD/386 1.1 1994-02-xx [BSDI]

4.4BSD Lite 1994-03-01 [USE]  
 FreeBSD 1.1 1994-05-07 [FBD]  
 FreeBSD 1.1.5 1994-06-30 [FBD]  
 FreeBSD 1.1.5.1 1994-07-05 [FBD]  
     supersedes 1.1.5 5 days after release.  
 NetBSD 1.0 1994-10-26 [NBD]  
 386BSD 1.0 1994-11-12 [USE]  
 FreeBSD 2.0 1994-11-23 [FBD]  
 BSD/OS 2.0 1995-01-xx [BSDI] 4.4 lite based  
 FreeBSD 2.0.5 1995-06-10 [FBD]  
 BSD/OS 2.0.1 1995-06-xx [BSDI]  
 4.4BSD Lite Release 2 1995-06-xx [44B]  
     the true final distribution from the CSRG  
 FreeBSD 2.1.0 1995-11-19 [FBD]  
 NetBSD 1.1 1995-11-26 [NBD]  
 BSD/OS 2.1 1996-01-xx [BSDI]  
 FreeBSD 2.1.5 1996-07-14 [FBD]  
 NetBSD 1.2 1996-10-04 [NBD]  
 OpenBSD 2.0 1996-10-18 [OBD]  
 FreeBSD 2.1.6 1996-11-16 [FBD]  
 FreeBSD 2.1.6.1 1996-11-25 [FBD] (sendmail security release)  
 Rhapsody 1997-xx-xx  
 FreeBSD  
     2.1.7 1997-02-20 [FBD]  
 BSD/OS 3.0 1997-02-xx [BSDI] 4.4 lite2 based  
 FreeBSD 2.2.0 1997-03-16 [FBD]  
 FreeBSD 2.2.1 1997-03-25 [FBD]  
 FreeBSD 2.2.2 1997-05-16 [FBD]  
 NetBSD 1.2.1 1997-05-20 [NBD] (patch release)  
 OpenBSD 2.1 1997-06-01 [OBD]  
 FreeBSD 2.2.5 1997-10-22 [FBD]  
 OpenBSD 2.2 1997-12-01 [OBD]  
 NetBSD 1.3 1998-01-04 [NBD]  
 FreeBSD 2.2.6 1998-03-25 [FBD]  
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 BSD/OS 3.1 1998-03-xx [BSDI]  
 OpenBSD 2.3 1998-05-19 [OBD]  
 NetBSD 1.3.2 1998-05-29 [NBD] (patch release)  
 FreeBSD 2.2.7 1998-07-22 [FBD]  
 BSD/OS 4.0 1998-08-xx [BSDI]  
     2-lock MP support, ELF executables  
 FreeBSD 3.0 1998-10-16 [FBD]  
     FreeBSD-3.0 is a snapshot from -current,  
     while 3.1 and 3.2 are from 3.x-stable which  
     was branched quite some time after 3.0-release  
 FreeBSD 2.2.8 1998-11-29 [FBD]  
 OpenBSD 2.4 1998-12-01 [OBD]  
 NetBSD 1.3.3

1998-12-23 [NBD] (patch release)  
FreeBSD 3.1 1999-02-15 [FBD]  
BSD/OS 4.0.1 1999-03-xx [BSDI]  
NetBSD 1.4 1999-05-12 [NBD]  
FreeBSD 3.2 1999-05-17 [FBD]  
OpenBSD 2.5 1999-05-19 [OBD]  
NetBSD 1.4.1 1999-08-26 [NBD] (patch release)  
FreeBSD 3.3 1999-09-17 [FBD]  
OpenBSD 2.6 1999-12-01 [OBD]  
FreeBSD 3.4 1999-12-20 [FBD]  
BSD/OS 4.1 1999-12-xx [BSDI]  
FreeBSD 4.0 2000-03-13 [FBD]  
NetBSD 1.4.2 2000-03-19 [NBD] (patch release)  
OpenBSD 2.7 2000-06-15 [OBD]  
FreeBSD 3.5 2000-06-24 [FBD]  
FreeBSD 4.1 2000-07-27 [FBD]  
FreeBSD 3.5.1 2000-07-28 [FBD]  
FreeBSD 4.1.1 2000-09-25 [FBD] (a network-only patch release)  
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-current, similar to 3.0.  
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UNIX history  
URL: <http://www.levenez.com/unix/>

James Howard: The BSD Family

Tree

URL: [http://ezine.daemonnews.org/200104/bsd\\_family.html](http://ezine.daemonnews.org/200104/bsd_family.html)

("what are the differences between FreeBSD, NetBSD, and OpenBSD?")

## Acknowledgments

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URL: <http://svnweb.freebsd.org/base/head/share/misc/bsd-family-tree>

\$FreeBSD: releng/11.1/share/misc/bsd-family-tree 313208 2017-02-04 15:53:34Z sevan \$

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[This is the first released version of the library GPL. It is numbered 2 because it goes with version 2 of the ordinary GPL.]

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treats it as such.

Because of this blurred distinction, using the ordinary General Public License for libraries did not effectively promote software sharing, because most developers did not use the libraries. We concluded that weaker conditions might promote sharing better.

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(For example, a function in a library to compute square roots has a purpose that is entirely well-defined independent of the application. Therefore, Subsection 2d requires that any application-supplied function or table used by this function must be optional: if the application does not supply it, the square root function must still compute square roots.)

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This option is useful when you wish to copy part of the code of the



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Ty Coon, President of Vice
```

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# Autogenerated - do NOT edit!

DIRDEPS = \

.include <dirdeps.mk>

.if \${DEP\_RELDIR} == \${\_DEP\_RELDIR}

# local dependencies - needed for -jN in clean tree

.endif

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Version: 2.6.3i

Charset: noconv

iQCVAwUBOxo3X9yA8qbVMny5AQHT8wP9FZOtWxEM4SMj4Sj9QezMERz31n5fd0pC  
jUDnyzmosOudM/iFlv6YfyR820aNvNNI+AdtgWYRPVHocVNOOrZcmu7IADO8hIU//  
v8BeBE0bdjeVmOQYRQfXgt3J2q0b8x8Q5a/LCLVLh8k6DFGg8AfEbLDQWhi1JiXC  
0JsaB8crR3M=

=0AMW

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# Autogenerated - do NOT edit!

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.include <dirdeps.mk>

.if \${DEP\_RELDIR} == \${\_DEP\_RELDIR}

# local dependencies - needed for -jN in clean tree

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```

The hypothetical commands

```
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```
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```

```
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```

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```
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```

-----

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## 1.346 smartmontools 5.40

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```

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## 1.349 pycurl 7.43.0-3.ph2

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```
* /opt/cola/permits/1184455681_1627567242.79/0/hikaricp-java6-2-3-13-sources-5-
jar/com/zaxxer/hikari/metrics/CodahaleHealthChecker.java
* /opt/cola/permits/1184455681_1627567242.79/0/hikaricp-java6-2-3-13-sources-5-
jar/com/zaxxer/hikari/pool/PoolBagEntry.java
* /opt/cola/permits/1184455681_1627567242.79/0/hikaricp-java6-2-3-13-sources-5-
jar/com/zaxxer/hikari/util/ICurrentBagEntry.java
```

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\* /opt/cola/permits/1184455681\_1627567242.79/0/hikaricp-java6-2-3-13-sources-5-jar/com/zaxxer/hikari/proxy/ClosedConnection.java  
\* /opt/cola/permits/1184455681\_1627567242.79/0/hikaricp-java6-2-3-13-sources-5-jar/com/zaxxer/hikari/pool/HikariPoolMXBean.java  
\*  
/opt/cola/permits/1184455681\_1627567242.79/0/hikaricp-java6-2-3-13-sources-5-jar/com/zaxxer/hikari/hibernate/HikariConfigurationUtil.java  
\* /opt/cola/permits/1184455681\_1627567242.79/0/hikaricp-java6-2-3-13-sources-5-jar/com/zaxxer/hikari/IConnectionCustomizer.java  
\* /opt/cola/permits/1184455681\_1627567242.79/0/hikaricp-java6-2-3-13-sources-5-jar/com/zaxxer/hikari/HikariDataSource.java  
\* /opt/cola/permits/1184455681\_1627567242.79/0/hikaricp-java6-2-3-13-sources-5-jar/com/zaxxer/hikari/pool/HikariMBeanElf.java  
\* /opt/cola/permits/1184455681\_1627567242.79/0/hikaricp-java6-2-3-13-sources-5-jar/com/zaxxer/hikari/HikariConfigMXBean.java  
\* /opt/cola/permits/1184455681\_1627567242.79/0/hikaricp-java6-2-3-13-sources-5-jar/com/zaxxer/hikari/hibernate/HikariConnectionProvider.java  
\* /opt/cola/permits/1184455681\_1627567242.79/0/hikaricp-java6-2-3-13-sources-5-jar/com/zaxxer/hikari/proxy/PreparedStatementProxy.java  
\* /opt/cola/permits/1184455681\_1627567242.79/0/hikaricp-java6-2-3-13-sources-5-jar/com/zaxxer/hikari/util/PropertyBeanSetter.java  
\*  
/opt/cola/permits/1184455681\_1627567242.79/0/hikaricp-java6-2-3-13-sources-5-jar/com/zaxxer/hikari/proxy/CallableStatementProxy.java  
\* /opt/cola/permits/1184455681\_1627567242.79/0/hikaricp-java6-2-3-13-sources-5-jar/com/zaxxer/hikari/util/UtilityElf.java  
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\* /opt/cola/permits/1184455681\_1627567242.79/0/hikaricp-java6-2-3-13-sources-5-

```
jar/com/zaxxer/hikari/HikariJNDIFactory.java
* /opt/cola/permits/1184455681_1627567242.79/0/hikaricp-java6-2-3-13-sources-5-
jar/com/zaxxer/hikari/pool/BaseHikariPool.java
* /opt/cola/permits/1184455681_1627567242.79/0/hikaricp-java6-2-3-13-sources-5-
jar/com/zaxxer/hikari/metrics/CodaHaleMetricsTracker.java
*
/opt/cola/permits/1184455681_1627567242.79/0/hikaricp-java6-2-3-13-sources-5-
jar/com/zaxxer/hikari/pool/HikariPool.java
* /opt/cola/permits/1184455681_1627567242.79/0/hikaricp-java6-2-3-13-sources-5-
jar/com/zaxxer/hikari/metrics/MetricsTracker.java
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jar/com/zaxxer/hikari/util/FastList.java
* /opt/cola/permits/1184455681_1627567242.79/0/hikaricp-java6-2-3-13-sources-5-
jar/com/zaxxer/hikari/util/Java6ConcurrentBag.java
* /opt/cola/permits/1184455681_1627567242.79/0/hikaricp-java6-2-3-13-sources-5-
jar/com/zaxxer/hikari/util/DriverDataSource.java
*
/opt/cola/permits/1184455681_1627567242.79/0/hikaricp-java6-2-3-13-sources-5-
jar/com/zaxxer/hikari/util/JavassistProxyFactory.java
* /opt/cola/permits/1184455681_1627567242.79/0/hikaricp-java6-2-3-13-sources-5-
jar/com/zaxxer/hikari/util/ConcurrentBag.java
* /opt/cola/permits/1184455681_1627567242.79/0/hikaricp-java6-2-3-13-sources-5-
jar/com/zaxxer/hikari/util/ClassLoaderUtils.java
* /opt/cola/permits/1184455681_1627567242.79/0/hikaricp-java6-2-3-13-sources-5-
jar/com/zaxxer/hikari/proxy/ConnectionProxy.java
* /opt/cola/permits/1184455681_1627567242.79/0/hikaricp-java6-2-3-13-sources-5-
jar/com/zaxxer/hikari/proxy/ResultSetProxy.java
* /opt/cola/permits/1184455681_1627567242.79/0/hikaricp-java6-2-3-13-sources-5-
jar/com/zaxxer/hikari/proxy/IHikariConnectionProxy.java
```

```
* /opt/cola/permits/1184455681_1627567242.79/0/hikaricp-java6-2-3-13-sources-5-
jar/com/zaxxer/hikari/util/IBagStateListener.java
* /opt/cola/permits/1184455681_1627567242.79/0/hikaricp-java6-2-3-13-sources-5-
jar/com/zaxxer/hikari/pool/GlobalPoolLock.java
*
/opt/cola/permits/1184455681_1627567242.79/0/hikaricp-java6-2-3-13-sources-5-
jar/com/zaxxer/hikari/proxy/ProxyFactory.java
* /opt/cola/permits/1184455681_1627567242.79/0/hikaricp-java6-2-3-13-sources-5-
jar/com/zaxxer/hikari/pool/LeakTask.java
* /opt/cola/permits/1184455681_1627567242.79/0/hikaricp-java6-2-3-13-sources-5-
jar/com/zaxxer/hikari/AbstractHikariConfig.java
* /opt/cola/permits/1184455681_1627567242.79/0/hikaricp-java6-2-3-13-sources-5-
jar/com/zaxxer/hikari/HikariConfig.java
* /opt/cola/permits/1184455681_1627567242.79/0/hikaricp-java6-2-3-13-sources-5-
jar/com/zaxxer/hikari/util/DefaultThreadFactory.java
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* /opt/cola/permits/1184455681_1627567242.79/0/hikaricp-java6-2-3-13-sources-5-
jar/com/zaxxer/hikari/pool/PoolInitializationException.java
```

## 1.351 slf4j-log4j 2.0.0-alpha1

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\* /opt/cola/permits/1194526235\_1629464333.26/0/slf4j-log4j12-2-0-0-alpha1-sources-5-  
 jar/org/slf4j/log4j12/Log4jMDCAdapter.java  
 \* /opt/cola/permits/1194526235\_1629464333.26/0/slf4j-log4j12-2-0-0-alpha1-sources-5-  
 jar/org/slf4j/log4j12/Log4jLoggerAdapter.java  
 \* /opt/cola/permits/1194526235\_1629464333.26/0/slf4j-log4j12-2-0-0-alpha1-sources-5-  
 jar/org/slf4j/log4j12/Log4jLoggerFactory.java

# 1.352 berkeley-db 4.7.25-20.el6\_7

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<pre>
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Ty Coon, President of Vice
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```
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## xwd v1.0.7  
  
### xwd utility  
<pre>
```

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</pre>
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```
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# This file contains a list of people who've made non-trivial
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# who commit code to the project are encouraged to add their names
# here. Please keep the list sorted by first names.
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include/GL/wglxext.h :

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jar/org/apache/xerces/impl/msg/XMLSerializerMessages.properties
* /opt/cola/permits/1217727294_1635408911.57/0/xercesimpl-2-12-0-sources-
jar/org/apache/xerces/impl/xpath/regex/message_ja.properties
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jar/org/apache/xerces/impl/msg/XPointerMessages.properties
*
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/opt/cola/permits/1217727294\_1635408911.57/0/xercesimpl-2-12-0-sources-jar/org/apache/xerces/impl/msg/XMLSchemaMessages.properties  
\* /opt/cola/permits/1217727294\_1635408911.57/0/xercesimpl-2-12-0-sources-jar/org/apache/xerces/impl/msg/DatatypeMessages.properties  
\* /opt/cola/permits/1217727294\_1635408911.57/0/xercesimpl-2-12-0-sources-jar/org/apache/xerces/impl/msg/DOMessages.properties  
\* /opt/cola/permits/1217727294\_1635408911.57/0/xercesimpl-2-12-0-sources-jar/org/apache/xerces/impl/xpath/regex/message.properties  
\* /opt/cola/permits/1217727294\_1635408911.57/0/xercesimpl-2-12-0-sources-jar/org/apache/xerces/impl/msg/XIncludeMessages.properties  
\* /opt/cola/permits/1217727294\_1635408911.57/0/xercesimpl-2-12-0-sources-jar/org/apache/xerces/impl/msg/SAXMessages.properties  
\* /opt/cola/permits/1217727294\_1635408911.57/0/xercesimpl-2-12-0-sources-jar/org/apache/xerces/impl/msg/XMLMessages.properties

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\* /opt/cola/permits/1217727294\_1635408911.57/0/xercesimpl-2-12-0-sources-jar/org/apache/xerces/impl/xs/XSModelGroupImpl.java  
\*  
/opt/cola/permits/1217727294\_1635408911.57/0/xercesimpl-2-12-0-sources-jar/org/apache/xerces/impl/xs/traversers/XSDHandler.java  
\* /opt/cola/permits/1217727294\_1635408911.57/0/xercesimpl-2-12-0-sources-jar/org/apache/xerces/impl/dv/xs/DateDV.java  
\* /opt/cola/permits/1217727294\_1635408911.57/0/xercesimpl-2-12-0-sources-jar/org/apache/xerces/impl/xs/XMLSchemaValidator.java  
\* /opt/cola/permits/1217727294\_1635408911.57/0/xercesimpl-2-12-0-sources-jar/org/apache/xerces/impl/dv/xs/XSSimpleTypeDecl.java  
\* /opt/cola/permits/1217727294\_1635408911.57/0/xercesimpl-2-12-0-sources-jar/org/apache/xerces/impl/dv/xs/DateTimeDV.java  
\* /opt/cola/permits/1217727294\_1635408911.57/0/xercesimpl-2-12-0-sources-

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jar/org/apache/xerces/impl/xs/traversers/XSDUniqueOrKeyTraverser.java
* /opt/cola/permits/1217727294_1635408911.57/0/xercesimpl-2-12-0-sources-
jar/org/apache/xerces/impl/dv/xs/MonthDayDV.java
* /opt/cola/permits/1217727294_1635408911.57/0/xercesimpl-2-12-0-sources-
jar/org/apache/xerces/impl/dv/xs/YearMonthDV.java
*
/opt/cola/permits/1217727294_1635408911.57/0/xercesimpl-2-12-0-sources-
jar/org/apache/xerces/impl/xs/traversers/XSDKeyrefTraverser.java
* /opt/cola/permits/1217727294_1635408911.57/0/xercesimpl-2-12-0-sources-
jar/org/apache/xerces/impl/dv/xs/DayDV.java
* /opt/cola/permits/1217727294_1635408911.57/0/xercesimpl-2-12-0-sources-
jar/org/apache/xerces/impl/dv/xs/MonthDV.java
* /opt/cola/permits/1217727294_1635408911.57/0/xercesimpl-2-12-0-sources-
jar/org/apache/xerces/impl/xs/traversers/XSAttributeChecker.java
* /opt/cola/permits/1217727294_1635408911.57/0/xercesimpl-2-12-0-sources-
jar/org/apache/xerces/impl/dv/xs/AbstractDateTimeDV.java
* /opt/cola/permits/1217727294_1635408911.57/0/xercesimpl-2-12-0-sources-
jar/org/apache/xerces/impl/dv/xs/YearDV.java
* /opt/cola/permits/1217727294_1635408911.57/0/xercesimpl-2-12-0-sources-
jar/org/apache/xerces/impl/dv/xs/DurationDV.java
* /opt/cola/permits/1217727294_1635408911.57/0/xercesimpl-2-12-0-sources-
jar/org/apache/xerces/impl/dv/xs/TimeDV.java
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jar/org/apache/xerces/impl/xs/models/XSDFACM.java
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\*/  
/\*\*

\* used to check the 3 constraints against each complex type  
\* (should be each model group):  
\* Unique Particle

Attribution, Particle Derivation (Restriction),

\* Element Declarations Consistent.  
\*/

Found in path(s):

\* /opt/cola/permits/1217727294\_1635408911.57/0/xercesimpl-2-12-0-sources-  
jar/org/apache/xerces/impl/xs/XSConstraints.java

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\* /opt/cola/permits/1217727294\_1635408911.57/0/xercesimpl-2-12-0-sources-  
jar/org/apache/xerces/dom/DeferredDocumentTypeImpl.java

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/opt/cola/permits/1217727294\_1635408911.57/0/xercesimpl-2-12-0-sources-  
jar/org/apache/xerces/xs/XSException.java

\* /opt/cola/permits/1217727294\_1635408911.57/0/xercesimpl-2-12-0-sources-  
jar/org/apache/wml/dom/WMLInputElementImpl.java

\* /opt/cola/permits/1217727294\_1635408911.57/0/xercesimpl-2-12-0-sources-  
 jar/org/apache/xerces/impl/xs/models/XSCMLLeaf.java  
 \* /opt/cola/permits/1217727294\_1635408911.57/0/xercesimpl-2-12-0-sources-  
 jar/org/apache/xerces/impl/XMLNamespaceBinder.java  
 \* /opt/cola/permits/1217727294\_1635408911.57/0/xercesimpl-2-12-0-sources-  
 jar/org/apache/xerces/xs/XSModel.java  
 \* /opt/cola/permits/1217727294\_1635408911.57/0/xercesimpl-2-12-0-sources-  
 jar/org/apache/wml/WMLAnchorElement.java  
 \* /opt/cola/permits/1217727294\_1635408911.57/0/xercesimpl-2-12-0-sources-  
 jar/org/apache/xerces/dom/events/EventImpl.java  
 \* /opt/cola/permits/1217727294\_1635408911.57/0/xercesimpl-2-12-0-sources-  
 jar/org/apache/xerces/xs/XSComplexTypeDefinition.java  
 \* /opt/cola/permits/1217727294\_1635408911.57/0/xercesimpl-2-12-0-sources-  
 jar/org/apache/wml/dom/WMLFieldsetElementImpl.java  
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 jar/org/apache/xerces/impl/dv/xs/FullDVFactory.java  
 \* /opt/cola/permits/1217727294\_1635408911.57/0/xercesimpl-2-12-0-sources-  
 jar/org/apache/xerces/dom/DeferredCommentImpl.java  
 \* /opt/cola/permits/1217727294\_1635408911.57/0/xercesimpl-2-12-0-sources-  
 jar/org/apache/xerces/xs/XSObjectList.java  
 \* /opt/cola/permits/1217727294\_1635408911.57/0/xercesimpl-2-12-0-sources-  
 jar/org/apache/html/dom/HTMLLegendElementImpl.java  
 \* /opt/cola/permits/1217727294\_1635408911.57/0/xercesimpl-2-12-0-sources-  
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 \* /opt/cola/permits/1217727294\_1635408911.57/0/xercesimpl-2-12-0-sources-  
 jar/org/apache/wml/dom/WMLRefreshElementImpl.java  
 \* /opt/cola/permits/1217727294\_1635408911.57/0/xercesimpl-2-12-0-sources-  
 jar/org/apache/xml/serialize/DOMSerializer.java  
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 jar/org/apache/xerces/impl/dtd/models/MixedContentModel.java  
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 \* /opt/cola/permits/1217727294\_1635408911.57/0/xercesimpl-2-12-0-sources-  
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 jar/org/apache/xerces/jaxp/validation/SoftReferenceGrammarPool.java  
 \* /opt/cola/permits/1217727294\_1635408911.57/0/xercesimpl-2-12-0-sources-  
 jar/org/apache/xerces/jaxp/SchemaValidatorConfiguration.java  
 \* /opt/cola/permits/1217727294\_1635408911.57/0/xercesimpl-2-12-0-sources-  
 jar/org/apache/xerces/dom/PSVIDOMImplementationImpl.java  
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 \* /opt/cola/permits/1217727294\_1635408911.57/0/xercesimpl-2-12-0-sources-  
 jar/org/apache/wml/WMLOptionElement.java  
 \* /opt/cola/permits/1217727294\_1635408911.57/0/xercesimpl-2-12-0-sources-  
 jar/org/apache/xerces/jaxp/DocumentBuilderFactoryImpl.java  
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 jar/org/apache/xerces/util/AttributesProxy.java  
 \* /opt/cola/permits/1217727294\_1635408911.57/0/xercesimpl-2-12-0-sources-  
 jar/org/apache/wml/WMLStrongElement.java  
 \* /opt/cola/permits/1217727294\_1635408911.57/0/xercesimpl-2-12-0-sources-  
 jar/org/apache/xerces/dom/DOMOutputImpl.java  
 \* /opt/cola/permits/1217727294\_1635408911.57/0/xercesimpl-2-12-0-sources-  
 jar/org/apache/xerces/impl/xs/XSNotationDecl.java  
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 jar/org/apache/xerces/xs/PSVIProvider.java  
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 jar/org/apache/xerces/util/SoftReferenceSymbolTable.java  
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 \* /opt/cola/permits/1217727294\_1635408911.57/0/xercesimpl-2-12-0-sources-  
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 \* /opt/cola/permits/1217727294\_1635408911.57/0/xercesimpl-2-12-0-sources-  
 jar/org/apache/xerces/impl/dv/DVFactoryException.java  
 \* /opt/cola/permits/1217727294\_1635408911.57/0/xercesimpl-2-12-0-sources-  
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 \* /opt/cola/permits/1217727294\_1635408911.57/0/xercesimpl-2-12-0-sources-  
 jar/org/apache/xerces/xni/parser/XMLDocumentFilter.java



\* /opt/cola/permits/1217727294\_1635408911.57/0/xercesimpl-2-12-0-sources-jar/org/apache/xml/serialize/OutputFormat.java

\* /opt/cola/permits/1217727294\_1635408911.57/0/xercesimpl-2-12-0-sources-jar/org/apache/xerces/xni/NamespaceContext.java

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/opt/cola/permits/1217727294\_1635408911.57/0/xercesimpl-2-12-0-sources-jar/org/apache/wml/dom/WMLDocumentImpl.java

\* /opt/cola/permits/1217727294\_1635408911.57/0/xercesimpl-2-12-0-sources-jar/org/apache/xerces/stax/events/CharactersImpl.java

\* /opt/cola/permits/1217727294\_1635408911.57/0/xercesimpl-2-12-0-sources-jar/org/apache/xerces/dom/ElementDefinitionImpl.java

\* /opt/cola/permits/1217727294\_1635408911.57/0/xercesimpl-2-12-0-sources-jar/org/apache/html/dom/HTMLElementImpl.java

\* /opt/cola/permits/1217727294\_1635408911.57/0/xercesimpl-2-12-0-sources-jar/org/apache/xerces/xni/XMLDTDHandler.java

\* /opt/cola/permits/1217727294\_1635408911.57/0/xercesimpl-2-12-0-sources-jar/org/apache/xerces/xs/XSAttributeGroupDefinition.java

\* /opt/cola/permits/1217727294\_1635408911.57/0/xercesimpl-2-12-0-sources-jar/org/apache/xerces/impl/io/ASCIIReader.java

\* /opt/cola/permits/1217727294\_1635408911.57/0/xercesimpl-2-12-0-sources-jar/org/apache/html/dom/HTMLBaseElementImpl.java

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/opt/cola/permits/1217727294\_1635408911.57/0/xercesimpl-2-12-0-sources-jar/org/apache/xerces/impl/xs/models/XSCMRepeatingLeaf.java

\* /opt/cola/permits/1217727294\_1635408911.57/0/xercesimpl-2-12-0-sources-jar/org/apache/xerces/impl/dv/xs/BooleanDV.java

\* /opt/cola/permits/1217727294\_1635408911.57/0/xercesimpl-2-12-0-sources-jar/org/apache/html/dom/HTMLDirectoryElementImpl.java

\* /opt/cola/permits/1217727294\_1635408911.57/0/xercesimpl-2-12-0-sources-jar/org/apache/xml/serialize/HTMLdtd.java

\* /opt/cola/permits/1217727294\_1635408911.57/0/xercesimpl-2-12-0-sources-jar/org/apache/xerces/dom/NotationImpl.java

\* /opt/cola/permits/1217727294\_1635408911.57/0/xercesimpl-2-12-0-sources-jar/org/apache/html/dom/HTMLAreaElementImpl.java

\* /opt/cola/permits/1217727294\_1635408911.57/0/xercesimpl-2-12-0-sources-jar/org/apache/xerces/xs/XSImplementation.java

\* /opt/cola/permits/1217727294\_1635408911.57/0/xercesimpl-2-12-0-sources-jar/org/apache/xerces/parsers/XIncludeParserConfiguration.java

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/opt/cola/permits/1217727294\_1635408911.57/0/xercesimpl-2-12-0-sources-jar/org/apache/xerces/impl/xs/XSLoaderImpl.java

\* /opt/cola/permits/1217727294\_1635408911.57/0/xercesimpl-2-12-0-sources-jar/org/apache/xml/serialize/BaseMarkupSerializer.java

\* /opt/cola/permits/1217727294\_1635408911.57/0/xercesimpl-2-12-0-sources-jar/org/apache/xerces/impl/xs/models/XSCMUniOp.java

\* /opt/cola/permits/1217727294\_1635408911.57/0/xercesimpl-2-12-0-sources-jar/org/apache/xerces/xni/XNIException.java

\* /opt/cola/permits/1217727294\_1635408911.57/0/xercesimpl-2-12-0-sources-

jar/org/apache/xerces/impl/XMLEntityManager.java  
 \* /opt/cola/permits/1217727294\_1635408911.57/0/xercesimpl-2-12-0-sources-  
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 jar/org/apache/xerces/jaxp/DefaultValidationErrorHandler.java  
 \* /opt/cola/permits/1217727294\_1635408911.57/0/xercesimpl-2-12-0-sources-  
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 \* /opt/cola/permits/1217727294\_1635408911.57/0/xercesimpl-2-12-0-sources-  
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 \* /opt/cola/permits/1217727294\_1635408911.57/0/xercesimpl-2-12-0-sources-  
 jar/org/apache/xerces/xpointer/XPointerPart.java  
 \* /opt/cola/permits/1217727294\_1635408911.57/0/xercesimpl-2-12-0-sources-  
 jar/org/apache/xerces/dom/DeferredCDATASectionImpl.java  
 \* /opt/cola/permits/1217727294\_1635408911.57/0/xercesimpl-2-12-0-sources-  
 jar/org/apache/wml/WMLHeadElement.java  
 \* /opt/cola/permits/1217727294\_1635408911.57/0/xercesimpl-2-12-0-sources-  
 jar/org/apache/xerces/dom/DeferredElementDefinitionImpl.java  
 \* /opt/cola/permits/1217727294\_1635408911.57/0/xercesimpl-2-12-0-sources-  
 jar/org/apache/html/dom/HTMLImageElementImpl.java  
 \*  
 /opt/cola/permits/1217727294\_1635408911.57/0/xercesimpl-2-12-0-sources-  
 jar/org/apache/xerces/xs/XSNamespaceItem.java  
 \* /opt/cola/permits/1217727294\_1635408911.57/0/xercesimpl-2-12-0-sources-

jar/org/apache/xerces/dom/ProcessingInstructionImpl.java  
\* /opt/cola/permits/1217727294\_1635408911.57/0/xercesimpl-2-12-0-sources-  
jar/org/apache/xerces/jaxp/validation/Util.java  
\* /opt/cola/permits/1217727294\_1635408911.57/0/xercesimpl-2-12-0-sources-  
jar/org/apache/wml/dom/WMLWmlElementImpl.java  
\* /opt/cola/permits/1217727294\_1635408911.57/0/xercesimpl-2-12-0-sources-  
jar/org/apache/xerces/impl/xpath/XPath.java  
\* /opt/cola/permits/1217727294\_1635408911.57/0/xercesimpl-2-12-0-sources-  
jar/org/apache/html/dom/HTMLScriptElementImpl.java  
\* /opt/cola/permits/1217727294\_1635408911.57/0/xercesimpl-2-12-0-sources-  
jar/org/apache/xerces/xs/StringList.java  
\* /opt/cola/permits/1217727294\_1635408911.57/0/xercesimpl-2-12-0-sources-  
jar/org/apache/xerces/xni/XMLLocator.java  
\* /opt/cola/permits/1217727294\_1635408911.57/0/xercesimpl-2-12-0-sources-  
jar/org/apache/xerces/util/MessageFormatter.java  
\*  
/opt/cola/permits/1217727294\_1635408911.57/0/xercesimpl-2-12-0-sources-  
jar/org/apache/xerces/jaxp/validation/XMLSchema.java  
\* /opt/cola/permits/1217727294\_1635408911.57/0/xercesimpl-2-12-0-sources-  
jar/org/apache/xerces/dom/DocumentFragmentImpl.java  
\* /opt/cola/permits/1217727294\_1635408911.57/0/xercesimpl-2-12-0-sources-  
jar/org/apache/wml/dom/WMLCardElementImpl.java  
\* /opt/cola/permits/1217727294\_1635408911.57/0/xercesimpl-2-12-0-sources-  
jar/org/apache/xerces/util/PrimeNumberSequenceGenerator.java  
\* /opt/cola/permits/1217727294\_1635408911.57/0/xercesimpl-2-12-0-sources-  
jar/org/apache/xerces/impl/xs/SchemaSymbols.java  
\* /opt/cola/permits/1217727294\_1635408911.57/0/xercesimpl-2-12-0-sources-  
jar/org/apache/xerces/dom/CharacterDataImpl.java  
\* /opt/cola/permits/1217727294\_1635408911.57/0/xercesimpl-2-12-0-sources-  
jar/org/apache/xerces/impl/dtd/DTDGrammar.java  
\* /opt/cola/permits/1217727294\_1635408911.57/0/xercesimpl-2-12-0-sources-  
jar/org/apache/xerces/impl/dv/xs/UnionDV.java  
\*  
/opt/cola/permits/1217727294\_1635408911.57/0/xercesimpl-2-12-0-sources-  
jar/org/apache/html/dom/HTMLSelectElementImpl.java  
\* /opt/cola/permits/1217727294\_1635408911.57/0/xercesimpl-2-12-0-sources-  
jar/org/apache/xerces/parsers/SecuritySupport.java  
\* /opt/cola/permits/1217727294\_1635408911.57/0/xercesimpl-2-12-0-sources-  
jar/org/apache/xerces/xinclude/XIncludeTextReader.java  
\* /opt/cola/permits/1217727294\_1635408911.57/0/xercesimpl-2-12-0-sources-  
jar/org/apache/xerces/impl/dv/dtd/NMTOKENDatatypeValidator.java  
\* /opt/cola/permits/1217727294\_1635408911.57/0/xercesimpl-2-12-0-sources-  
jar/org/apache/xerces/dom/RangeImpl.java  
\* /opt/cola/permits/1217727294\_1635408911.57/0/xercesimpl-2-12-0-sources-  
jar/org/apache/xerces/parsers/CachingParserPool.java  
\* /opt/cola/permits/1217727294\_1635408911.57/0/xercesimpl-2-12-0-sources-  
jar/org/apache/xerces/dom/NodeListCache.java  
\* /opt/cola/permits/1217727294\_1635408911.57/0/xercesimpl-2-12-0-sources-

jar/org/apache/wml/WMLTdElement.java  
\*  
/opt/cola/permits/1217727294\_1635408911.57/0/xercesimpl-2-12-0-sources-  
jar/org/apache/xerces/jaxp/validation/JAXPValidationMessageFormatter.java  
\* /opt/cola/permits/1217727294\_1635408911.57/0/xercesimpl-2-12-0-sources-  
jar/org/apache/xerces/impl/xs/opti/SchemaDOM.java  
\* /opt/cola/permits/1217727294\_1635408911.57/0/xercesimpl-2-12-0-sources-  
jar/org/apache/html/dom/HTMLIsIndexElementImpl.java  
\* /opt/cola/permits/1217727294\_1635408911.57/0/xercesimpl-2-12-0-sources-  
jar/org/apache/xerces/impl/xs/identity/FieldActivator.java  
\* /opt/cola/permits/1217727294\_1635408911.57/0/xercesimpl-2-12-0-sources-  
jar/org/apache/xerces/dom/EntityImpl.java  
\* /opt/cola/permits/1217727294\_1635408911.57/0/xercesimpl-2-12-0-sources-  
jar/org/apache/xerces/impl/dv/xs/HexBinaryDV.java  
\* /opt/cola/permits/1217727294\_1635408911.57/0/xercesimpl-2-12-0-sources-  
jar/org/apache/xerces/util/ParserConfigurationSettings.java  
\* /opt/cola/permits/1217727294\_1635408911.57/0/xercesimpl-2-12-0-sources-  
jar/org/apache/xerces/xni/XMLString.java  
\*  
/opt/cola/permits/1217727294\_1635408911.57/0/xercesimpl-2-12-0-sources-  
jar/org/apache/xerces/impl/xs/util/XSNamedMap4Types.java  
\* /opt/cola/permits/1217727294\_1635408911.57/0/xercesimpl-2-12-0-sources-  
jar/org/apache/xerces/dom/PSVIDocumentImpl.java  
\* /opt/cola/permits/1217727294\_1635408911.57/0/xercesimpl-2-12-0-sources-  
jar/org/apache/xerces/impl/xs/traversers/XSDAttributeGroupTraverser.java  
\* /opt/cola/permits/1217727294\_1635408911.57/0/xercesimpl-2-12-0-sources-  
jar/org/apache/xerces/impl/xs/AttributePSVImpl.java  
\* /opt/cola/permits/1217727294\_1635408911.57/0/xercesimpl-2-12-0-sources-  
jar/org/apache/xerces/stax/events/StartElementImpl.java  
\* /opt/cola/permits/1217727294\_1635408911.57/0/xercesimpl-2-12-0-sources-  
jar/org/apache/xerces/parsers/DOMParserImpl.java  
\* /opt/cola/permits/1217727294\_1635408911.57/0/xercesimpl-2-12-0-sources-  
jar/org/apache/xerces/impl/xs/traversers/StAXSchemaParser.java  
\* /opt/cola/permits/1217727294\_1635408911.57/0/xercesimpl-2-12-0-sources-  
jar/org/apache/html/dom/HTMLCollectionImpl.java  
\*  
/opt/cola/permits/1217727294\_1635408911.57/0/xercesimpl-2-12-0-sources-  
jar/org/apache/xerces/impl/xs/opti/ElementImpl.java  
\* /opt/cola/permits/1217727294\_1635408911.57/0/xercesimpl-2-12-0-sources-  
jar/org/apache/xerces/parsers/NonValidatingConfiguration.java  
\* /opt/cola/permits/1217727294\_1635408911.57/0/xercesimpl-2-12-0-sources-  
jar/org/apache/wml/dom/WMLStrongElementImpl.java  
\* /opt/cola/permits/1217727294\_1635408911.57/0/xercesimpl-2-12-0-sources-  
jar/org/apache/xerces/util/JAXPNamespaceContextWrapper.java  
\* /opt/cola/permits/1217727294\_1635408911.57/0/xercesimpl-2-12-0-sources-  
jar/org/apache/xerces/impl/dv/util/Base64.java  
\* /opt/cola/permits/1217727294\_1635408911.57/0/xercesimpl-2-12-0-sources-  
jar/org/apache/xerces/impl/dv/xs/DoubleDV.java

```
* /opt/cola/permits/1217727294_1635408911.57/0/xercesimpl-2-12-0-sources-
jar/org/apache/xerces/dom/DOMNormalizer.java
* /opt/cola/permits/1217727294_1635408911.57/0/xercesimpl-2-12-0-sources-
jar/org/apache/xerces/jaxp/validation/XMLSchemaFactory.java
*
/opt/cola/permits/1217727294_1635408911.57/0/xercesimpl-2-12-0-sources-
jar/org/apache/xerces/dom/ElementNSImpl.java
* /opt/cola/permits/1217727294_1635408911.57/0/xercesimpl-2-12-0-sources-
jar/org/apache/xerces/jaxp/datatype/DurationImpl.java
* /opt/cola/permits/1217727294_1635408911.57/0/xercesimpl-2-12-0-sources-
jar/org/apache/xerces/impl/dtd/models/DFACContentModel.java
* /opt/cola/permits/1217727294_1635408911.57/0/xercesimpl-2-12-0-sources-
jar/org/apache/xerces/impl/xs/opti/NodeImpl.java
* /opt/cola/permits/1217727294_1635408911.57/0/xercesimpl-2-12-0-sources-
jar/org/apache/wml/dom/WMLSetvarElementImpl.java
* /opt/cola/permits/1217727294_1635408911.57/0/xercesimpl-2-12-0-sources-
jar/org/apache/xerces/dom/DeferredTextImpl.java
* /opt/cola/permits/1217727294_1635408911.57/0/xercesimpl-2-12-0-sources-
jar/org/apache/xerces/parsers/XMLParser.java
* /opt/cola/permits/1217727294_1635408911.57/0/xercesimpl-2-12-0-sources-
jar/org/apache/xerces/impl/dtd/models/CMBinOp.java
*
/opt/cola/permits/1217727294_1635408911.57/0/xercesimpl-2-12-0-sources-
jar/org/apache/xerces/xs/datatypes/ByteList.java
```

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```
/*
```

```
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```

Found in path(s):

```
* /opt/cola/permits/1217727294_1635408911.57/0/xercesimpl-2-12-0-sources-
jar/org/apache/xerces/dom3/as/ASNotationDeclaration.java
* /opt/cola/permits/1217727294_1635408911.57/0/xercesimpl-2-12-0-sources-
jar/org/apache/xerces/dom3/as/ASModel.java
* /opt/cola/permits/1217727294_1635408911.57/0/xercesimpl-2-12-0-sources-
jar/org/apache/xerces/dom3/as/ASElementDeclaration.java
*
/opt/cola/permits/1217727294_1635408911.57/0/xercesimpl-2-12-0-sources-
jar/org/apache/xerces/dom3/as/DocumentEditAS.java
```

\* /opt/cola/permits/1217727294\_1635408911.57/0/xercesimpl-2-12-0-sources-jar/org/apache/xerces/dom3/as/CharacterDataEditAS.java  
\* /opt/cola/permits/1217727294\_1635408911.57/0/xercesimpl-2-12-0-sources-jar/org/apache/xerces/dom3/as/ASNamedObjectMap.java  
\* /opt/cola/permits/1217727294\_1635408911.57/0/xercesimpl-2-12-0-sources-jar/org/apache/xerces/dom3/as/ASObjectList.java  
\* /opt/cola/permits/1217727294\_1635408911.57/0/xercesimpl-2-12-0-sources-jar/org/apache/xerces/dom3/as/DOMASWriter.java  
\* /opt/cola/permits/1217727294\_1635408911.57/0/xercesimpl-2-12-0-sources-jar/org/apache/xerces/dom3/as/ASDataType.java  
\* /opt/cola/permits/1217727294\_1635408911.57/0/xercesimpl-2-12-0-sources-jar/org/apache/xerces/dom3/as/ASObject.java  
\* /opt/cola/permits/1217727294\_1635408911.57/0/xercesimpl-2-12-0-sources-jar/org/apache/xerces/dom3/as/DocumentAS.java  
\* /opt/cola/permits/1217727294\_1635408911.57/0/xercesimpl-2-12-0-sources-jar/org/apache/xerces/dom3/as/ASContentModel.java  
\*

/opt/cola/permits/1217727294\_1635408911.57/0/xercesimpl-2-12-0-sources-jar/org/apache/xerces/dom3/as/DOMImplementationAS.java  
\* /opt/cola/permits/1217727294\_1635408911.57/0/xercesimpl-2-12-0-sources-jar/org/apache/xerces/dom3/as/ASAttributeDeclaration.java  
\* /opt/cola/permits/1217727294\_1635408911.57/0/xercesimpl-2-12-0-sources-jar/org/apache/xerces/dom3/as/NodeEditAS.java  
\* /opt/cola/permits/1217727294\_1635408911.57/0/xercesimpl-2-12-0-sources-jar/org/apache/xerces/dom3/as/ElementEditAS.java  
\* /opt/cola/permits/1217727294\_1635408911.57/0/xercesimpl-2-12-0-sources-jar/org/apache/xerces/dom3/as/DOMASException.java  
\* /opt/cola/permits/1217727294\_1635408911.57/0/xercesimpl-2-12-0-sources-jar/org/apache/xerces/dom3/as/DOMASBuilder.java  
\* /opt/cola/permits/1217727294\_1635408911.57/0/xercesimpl-2-12-0-sources-jar/org/apache/xerces/dom3/as/ASEntityDeclaration.java

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```
*/
/**
 * Checks if this content model has had its min/maxOccurs values reduced for
 * purposes of speeding up UPA. If
so, this content model should not be used
 * for any purpose other than checking unique particle attribution
 *
 * @return a boolean that says whether this content has been compacted for UPA
 */
```

Found in path(s):

```
* /opt/cola/permits/1217727294_1635408911.57/0/xercesimpl-2-12-0-sources-
jar/org/apache/xerces/impl/xs/models/XSCMValidator.java
```

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 */
```

```
/**
 * DOM Level 3 LS CR - Experimental.
 * Create a new LSParser. The newly constructed parser may
 *
then be configured by means of its DOMConfiguration
 * object, and used to parse documents by means of its parse
 * method.
 * @param mode The mode argument is either
 * MODE_SYNCHRONOUS or MODE_ASYNCHRONOUS, if
 * mode is MODE_SYNCHRONOUS then the
 * LSParser that is created will operate in synchronous
 * mode, if it's MODE_ASYNCHRONOUS then the
 * LSParser that is created will operate in asynchronous
 * mode.
 * @param schemaType An absolute URI representing the type of the schema
 * language used during the load of a Document using the
 * newly created LSParser. Note that no lexical checking
```

- \* is done on the absolute URI. In order to create a
- \* `LSParser` for any kind of schema types (i.e. the
- \* `LSParser` will be free to use any schema

found), use the value

- \* `null`.
- \* `<p><b>Note:</b> For W3C XML Schema [XML Schema Part 1</a>\]`
- \* , applications must use the value
- \* `"http://www.w3.org/2001/XMLSchema"`. For XML DTD [[XML 1.0</a>\],](http://www.w3.org/TR/2000/REC-xml-20001006/)
- \* applications must use the value
- \* `"http://www.w3.org/TR/REC-xml"`. Other Schema languages
- \* are outside the scope of the W3C and therefore should recommend an
- \* absolute URI in order to use this method.
- \* `@return` The newly created `LSParser` object. This
- \* `LSParser` is either synchronous or asynchronous
- \* depending on the value of the `mode` argument.
- \* `<p><b>Note:</b> By default, the newly created LSParser`
- \* does not contain a `DOMErrorHandler`, i.e. the value of
- \* the "[parameter-error-handler](http://www.w3.org/TR/2003/WD-DOM-Level-3-Core-20030609/core.html#parameter-error-handler)"
- \* `error-handler` configuration parameter is `null`. However, implementations
- \* may provide a default error handler at creation time. In that case,
- \* the initial value of the `"error-handler"` configuration
- \* parameter on the new created `LSParser` contains a
- \* reference to the default error handler.
- \* `@exception DOMException`
- \* `NOT_SUPPORTED_ERR`: Raised if the requested mode or schema type is
- \* not supported.
- \*/

Found in path(s):

- \* /opt/cola/permits/1217727294\_1635408911.57/0/xercesimpl-2-12-0-sources-jar/org/apache/xerces/dom/CoreDOMImplementationImpl.java

# 1.360 golang 1.13.15

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# The agreement for individuals can be filled out on the web.
#
# Names should be added to this file like so:
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# that the other addresses should be recognized  
# as the  
# same person when interacting with Gerrit.

# Please keep the list sorted.

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## 1.361 nginx 1.12.1

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To do so, attach the following notices to the program. It is safest to attach them to the start of each source file to most effectively convey the exclusion of warranty; and each file should have at least the "copyright" line and a pointer to where the full notice is found.

```
<one line to give the program's name and a brief idea of what it does.>  
Copyright (C) 19yy <name of author>
```

```
This program is free software; you can redistribute it and/or modify  
it under the terms of the GNU  
General Public License as published by  
the Free Software Foundation; either version 2 of the License, or
```

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Also add information on how to contact you by electronic and paper mail.

If the program is interactive, make it output a short notice like this  
when it starts in an interactive mode:

```
Gnomovision version 69, Copyright (C) 19yy name of author  
Gnomovision comes with ABSOLUTELY NO WARRANTY; for details type `show w'.  
This is free software, and you are welcome to redistribute it  
under certain conditions; type `show c' for details.
```

The hypothetical commands `show w' and `show c' should show the appropriate  
parts of the General Public License. Of course, the commands you use may  
be called something other than `show w' and `show c'; they could even be  
mouse-clicks or menu items--whatever suits your program.

You should also get your employer (if you work as a programmer) or your  
school, if any, to sign a "copyright disclaimer" for the program, if  
necessary. Here is a sample; alter the names:

```
Yoyodyne, Inc., hereby disclaims all copyright interest in the program  
'Gnomovision' (which makes passes at compilers) written by James Hacker.
```

```
<signature of Ty Coon>, 1 April 1989  
Ty Coon, President of Vice
```

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consider it more useful to permit linking proprietary applications with the  
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to do, use the GNU Library General  
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## 1.372 rsa 3.3

## 1.372.1 Available under license :

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## 1.373 pycrypto 3.9.6

### 1.373.1 Available under license :

Copyright and licensing of the Python Cryptography Toolkit ("PyCrypto"):

~~~~~  
Previously, the copyright and/or licensing status of the Python  
Cryptography Toolkit ("PyCrypto") had been somewhat ambiguous. The  
original intention of Andrew M. Kuchling and other contributors has  
been to dedicate PyCrypto to the public domain, but that intention was  
not necessarily made clear in the original disclaimer (see  
LEGAL/copy/LICENSE.orig).

Additionally, some files within PyCrypto had specified their own  
licenses that differed from the PyCrypto license itself. For example,  
the original RIPEMD.c module simply had a copyright statement and  
warranty disclaimer, without clearly specifying any license terms.  
(An updated version on the author's website came with a license that  
contained a GPL-incompatible advertising clause.)

To rectify this situation for PyCrypto 2.1, the following steps have  
been taken:

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from the original contributors to  
dedicate their contributions to the public domain if they have not  
already done so. (See the "LEGAL/copy/stmts" directory for  
contributors' statements.)
2. Replacing some modules with clearly-licensed code from other  
sources (e.g. the DES and DES3 modules were replaced with new ones  
based on Tom St. Denis's public-domain LibTomCrypt library.)

3. Replacing some modules with code written from scratch (e.g. the RIPEMD and Blowfish modules were re-implemented from their respective algorithm specifications without reference to the old implementations).
4. Removing some modules altogether without replacing them.

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## 1.374 chardet 3.0.4

### 1.374.1 Available under license :

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Version 2.1, February 1999

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the version number 2.1.]

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"Source code" for a work means the preferred form of the work for making modifications to it. For a library, complete source code means all the source code for all modules it contains, plus any associated interface definition files, plus the scripts used to control compilation and installation of the library.

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## 1.375 javax-annotation-api 1.3.2

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/opt/cola/permits/1278352604\_1654022869.4097037/0/jaxb-api-2-2-11-sources-jar/javax/xml/bind/annotation/XmlValue.java  
\* /opt/cola/permits/1278352604\_1654022869.4097037/0/jaxb-api-2-2-11-sources-jar/javax/xml/bind/annotation/XmlRegistry.java  
\* /opt/cola/permits/1278352604\_1654022869.4097037/0/jaxb-api-2-2-11-sources-jar/javax/xml/bind/PropertyException.java  
\* /opt/cola/permits/1278352604\_1654022869.4097037/0/jaxb-api-2-2-11-sources-jar/javax/xml/bind/annotation/XmlAttribute.java  
\* /opt/cola/permits/1278352604\_1654022869.4097037/0/jaxb-api-2-2-11-sources-jar/javax/xml/bind/annotation/adapters/NormalizedStringAdapter.java  
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\* /opt/cola/permits/1278352604\_1654022869.4097037/0/jaxb-api-2-2-11-sources-jar/javax/xml/bind/DatatypeConverterInterface.java

\* /opt/cola/permits/1278352604\_1654022869.4097037/0/jaxb-api-2-2-11-sources-jar/javax/xml/bind/ValidationEvent.java

\* /opt/cola/permits/1278352604\_1654022869.4097037/0/jaxb-api-2-2-11-sources-jar/javax/xml/bind/util/JAXBSource.java

\* /opt/cola/permits/1278352604\_1654022869.4097037/0/jaxb-api-2-2-11-sources-jar/javax/xml/bind/Unmarshaller.java

\* /opt/cola/permits/1278352604\_1654022869.4097037/0/jaxb-api-2-2-11-sources-jar/javax/xml/bind/TypeConstraintException.java

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/opt/cola/permits/1278352604\_1654022869.4097037/0/jaxb-api-2-2-11-sources-jar/javax/xml/bind/helpers/ParseConversionEventImpl.java

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jar/javax/xml/bind/NotIdentifiableEvent.java  
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jar/javax/xml/bind/util/ValidationEventCollector.java  
\* /opt/cola/permits/1278352604\_1654022869.4097037/0/jaxb-api-2-2-11-sources-  
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jar/javax/xml/bind/helpers/ValidationEventLocatorImpl.java  
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jar/javax/xml/bind/helpers/AbstractUnmarshallerImpl.java  
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jar/javax/xml/bind/helpers/ValidationEventImpl.java  
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jar/javax/xml/bind/JAXBException.java  
\* /opt/cola/permits/1278352604\_1654022869.4097037/0/jaxb-api-2-2-11-sources-  
jar/javax/xml/bind/helpers/PrintConversionEventImpl.java  
\* /opt/cola/permits/1278352604\_1654022869.4097037/0/jaxb-api-2-2-11-sources-  
jar/javax/xml/bind/helpers/DefaultValidationEventHandler.java

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\* /opt/cola/permits/1278352604\_1654022869.4097037/0/jaxb-api-2-2-11-sources-jar/javax/xml/bind/annotation/XmlAccessType.java  
\* /opt/cola/permits/1278352604\_1654022869.4097037/0/jaxb-api-2-2-11-sources-jar/javax/xml/bind/annotation/XmlAnyAttribute.java  
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\* /opt/cola/permits/1278352604\_1654022869.4097037/0/jaxb-api-2-2-11-sources-jar/javax/xml/bind/annotation/XmlSchemaTypes.java  
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\* /opt/cola/permits/1278352604\_1654022869.4097037/0/jaxb-api-2-2-11-sources-jar/javax/xml/bind/attachment/AttachmentMarshaller.java  
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\* /opt/cola/permits/1278352604\_1654022869.4097037/0/jaxb-api-2-2-11-sources-jar/javax/xml/bind/annotation/XmlAccessorType.java  
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\* /opt/cola/permits/1278352604\_1654022869.4097037/0/jaxb-api-2-2-11-sources-  
jar/javax/xml/bind/annotation/XmlSeeAlso.java  
\* /opt/cola/permits/1278352604\_1654022869.4097037/0/jaxb-api-2-2-11-sources-  
jar/javax/xml/bind/DataBindingException.java  
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* /opt/cola/permits/1278352604_1654022869.4097037/0/jaxb-api-2-2-11-sources-
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jar/javax/xml/bind/WhiteSpaceProcessor.java

\* /opt/cola/permits/1278352604\_1654022869.4097037/0/jaxb-api-2-2-11-sources-

jar/javax/xml/bind/DatatypeConverterImpl.java

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It was originally written by Tatu Saloranta ([tatu.saloranta@iki.fi](mailto:tatu.saloranta@iki.fi)), and has been in development since 2007.

It is currently developed by a community of developers, as well as supported commercially by FasterXML.com.

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# 1.386 jetty 9.4.16.v20190411

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- \* org.eclipse.jetty.orbit:org.eclipse.jdt.core

The following artifacts are EPL and ASL2.

- \* org.eclipse.jetty.orbit:javax.security.auth.message

The following artifacts are EPL and CDDL 1.0.

- \* org.eclipse.jetty.orbit:javax.mail.glassfish

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#### Oracle

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<https://glassfish.dev.java.net/nonav/public/CDDL+GPL.html>

- \* javax.servlet:javax.servlet-api
- \* javax.annotation:javax.annotation-api
- \* javax.transaction:javax.transaction-api
- \* javax.websocket:javax.websocket-api

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#### Oracle OpenJDK

If ALPN is used to negotiate HTTP/2 connections, then the following artifacts may be included in the distribution or downloaded when ALPN module is selected.

- \* java.sun.security.ssl

These artifacts replace/modify OpenJDK classes. The modifications are hosted at github and both modified and original are under GPL v2 with classpath exceptions.

<http://openjdk.java.net/legal/gplv2+ce.html>

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#### OW2

The following artifacts are licensed by the OW2 Foundation according to the terms of <http://asm.ow2.org/license.html>

org.ow2.asm:asm-commons

org.ow2.asm:asm

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Apache

The following artifacts are ASL2 licensed.

org.apache.taglibs:taglibs-standard-spec

org.apache.taglibs:taglibs-standard-impl

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MortBay

The following artifacts are ASL2 licensed. Based on selected classes from following Apache Tomcat jars, all ASL2 licensed.

org.mortbay.jasper:apache-jsp

org.apache.tomcat:tomcat-jasper

org.apache.tomcat:tomcat-juli

org.apache.tomcat:tomcat-jsp-api

org.apache.tomcat:tomcat-el-api

org.apache.tomcat:tomcat-jasper-el

org.apache.tomcat:tomcat-api

org.apache.tomcat:tomcat-util-scan

org.apache.tomcat:tomcat-util

org.mortbay.jasper:apache-el

org.apache.tomcat:tomcat-jasper-el

org.apache.tomcat:tomcat-el-api

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<https://glassfish.dev.java.net/nonav/public/CDDL+GPL.html>

org.eclipse.jetty.toolchain:jetty-schemas

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Assorted

The UnixCrypt.java code implements the one way cryptography used by Unix systems for simple password protection. Copyright 1996 Aki Yoshida, modified April 2001 by Iris Van den Broeke, Daniel Deville. Permission to use, copy, modify and distribute UnixCrypt for non-commercial or commercial purposes and without fee is granted provided that the copyright notice appears in all copies.

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\* org.eclipse.jetty.orbit:org.eclipse.jdt.core

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\* org.eclipse.jetty.orbit:javax.security.auth.message

The following artifacts are EPL and CDDL 1.0.  
\* org.eclipse.jetty.orbit:javax.mail.glassfish

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## Oracle

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<https://glassfish.dev.java.net/nonav/public/CDDL+GPL.html>

- \* javax.servlet:javax.servlet-api
- \* javax.annotation:javax.annotation-api
- \* javax.transaction:javax.transaction-api
- \* javax.websocket:javax.websocket-api

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## Oracle OpenJDK

If ALPN is used to negotiate HTTP/2 connections, then the following artifacts may be included in the distribution or downloaded when ALPN module is selected.

- \* java.sun.security.ssl

These artifacts replace/modify OpenJDK classes. The modifications are hosted at github and both modified and original are under GPL v2 with classpath exceptions.

<http://openjdk.java.net/legal/gplv2+ce.html>

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## OW2

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- org.ow2.asm:asm-commons
- org.ow2.asm:asm

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## Apache

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- org.apache.taglibs:taglibs-standard-spec
- org.apache.taglibs:taglibs-standard-impl

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## MortBay



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org.mortbay.jasper:apache-jsp  
org.apache.tomcat:tomcat-jasper  
org.apache.tomcat:tomcat-juli  
org.apache.tomcat:tomcat-jsp-api  
org.apache.tomcat:tomcat-el-api  
org.apache.tomcat:tomcat-jasper-el  
org.apache.tomcat:tomcat-api  
org.apache.tomcat:tomcat-util-scan  
org.apache.tomcat:tomcat-util

org.mortbay.jasper:apache-el  
org.apache.tomcat:tomcat-jasper-el  
org.apache.tomcat:tomcat-el-api

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Mortbay

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<https://glassfish.dev.java.net/nonav/public/CDDL+GPL.html>

org.eclipse.jetty.toolchain:jetty-schemas

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Assorted

The UnixCrypt.java code implements the one way cryptography used by Unix systems for simple password protection. Copyright 1996 Aki Yoshida, modified April 2001 by Iris Van den Broeke, Daniel Deville.

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# 1.388 jetty-servlets 9.4.16.v20190411

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Eclipse

The following artifacts are EPL.  
\* org.eclipse.jetty.orbit:org.eclipse.jdt.core

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\* org.eclipse.jetty.orbit:javafx.security.auth.message

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\* org.eclipse.jetty.orbit:javafx.mail.glassfish

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Oracle

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<https://glassfish.dev.java.net/nonav/public/CDDL+GPL.html>

\* javax.servlet:javax.servlet-api  
\* javax.annotation:javax.annotation-api  
\* javax.transaction:javax.transaction-api  
\* javax.websocket:javax.websocket-api

-----  
Oracle OpenJDK

If ALPN is used to negotiate HTTP/2 connections, then the following artifacts may be included in the distribution or downloaded when ALPN

module is selected.

\* java.sun.security.ssl

These artifacts replace/modify OpenJDK classes. The modifications are hosted at github and both modified and original are under GPL v2 with classpath exceptions.

<http://openjdk.java.net/legal/gplv2+ce.html>

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OW2

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org.ow2.asm:asm-commons  
org.ow2.asm:asm

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Apache

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org.apache.taglibs:taglibs-standard-spec  
org.apache.taglibs:taglibs-standard-impl

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org.mortbay.jasper:apache-jsp  
org.apache.tomcat:tomcat-jasper  
org.apache.tomcat:tomcat-juli  
org.apache.tomcat:tomcat-jsp-api  
org.apache.tomcat:tomcat-el-api  
org.apache.tomcat:tomcat-jasper-el  
org.apache.tomcat:tomcat-api  
org.apache.tomcat:tomcat-util-scan  
org.apache.tomcat:tomcat-util

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org.apache.tomcat:tomcat-el-api

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org.eclipse.jetty.toolchain:jetty-schemas

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Assorted

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Found in path(s):

```
* /opt/cola/permits/1320330290_1651524963.22/0/stateless4j-2-5-0-sources-7-
jar/com/github/oxo42/stateless4j/delegates/FuncBoolean.java
* /opt/cola/permits/1320330290_1651524963.22/0/stateless4j-2-5-0-sources-7-
jar/com/github/oxo42/stateless4j/OutVar.java
```

## 1.393 servlet-api 3.1.0

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<http://www.w3.org/TR/2004/REC-DOM-Level-3-Core-20040407/java-binding.html>

The specification of DOM Level 3's various parts is at:  
<http://www.w3.org/TR/2004/REC-DOM-Level-3-Core-20040407/>

<http://www.w3.org/TR/2004/REC-DOM-Level-3-LS-20040407/>  
<http://www.w3.org/TR/2004/NOTE-DOM-Level-3-XPath-20040226/>

The specification of DOM Level 2's various parts is at:

<http://www.w3.org/TR/2000/REC-DOM-Level-2-Events-20001113/>  
<http://www.w3.org/TR/2000/REC-DOM-Level-2-Style-20001113/>  
<http://www.w3.org/TR/2000/REC-DOM-Level-2-Traversal-Range-20001113/>  
<http://www.w3.org/TR/2000/REC-DOM-Level-2-Views-20001113/>

The specification of DOM Level 1's various parts is at:

<http://www.w3.org/TR/1998/REC-DOM-Level-1-19981001/level-one-html.html>

Links to all available W3C DOM Java Bindings can be found at:

<http://www.w3.org/DOM/DOMTR>

The actual classes of The Simple API for CSS (SAC) came from:

<http://www.w3.org/Style/CSS/SAC/>  
<http://www.w3.org/2002/06/sacjava-1.3.zip>

The actual DOM Java Language Binding  
classes for SMIL came from:

<http://dev.w3.org/cvsweb/java/classes/org/w3c/dom/smil/>  
(both `ElementTimeControl.java` and `TimeEvent.java` were taken at revision 1.1)

The actual DOM Java Language Binding classes for SVG 1.1 came from:

<http://www.w3.org/TR/SVG11/java.html>  
xml-commons/java/external/README.sax.txt \$Id: README.sax.txt 225954 2002-01-31 23:26:48Z curcuru \$

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\* /opt/cola/permits/1334904536\_1653676449.1070127/0/jaxb-core-2-3-0-sources-10-jar/com/sun/xml/bind/v2/Messages\_de.properties  
\* /opt/cola/permits/1334904536\_1653676449.1070127/0/jaxb-core-2-3-0-sources-10-jar/com/sun/xml/bind/marshaller/Messages\_pt\_BR.properties  
\* /opt/cola/permits/1334904536\_1653676449.1070127/0/jaxb-core-2-3-0-sources-10-jar/com/sun/xml/bind/marshaller/Messages\_zh\_CN.properties  
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jar/com/sun/xml/bind/marshaller/Messages\_fr.properties

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\* /opt/cola/permits/1334904536\_1653676449.1070127/0/jaxb-core-2-3-0-sources-10-jar/com/sun/xml/bind/v2/model/nav/GenericArrayTypeImpl.java

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\* /opt/cola/permits/1334904536\_1653676449.1070127/0/jaxb-core-2-3-0-sources-10-jar/com/sun/xml/bind/v2/model/nav/ReflectionNavigator.java

\* /opt/cola/permits/1334904536\_1653676449.1070127/0/jaxb-core-2-3-0-sources-10-jar/com/sun/xml/bind/v2/model/nav/TypeVisitor.java

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\* /opt/cola/permits/1334904536\_1653676449.1070127/0/jaxb-core-2-3-0-sources-10-jar/com/sun/xml/bind/v2/model/core/Element.java

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\* /opt/cola/permits/1334904536\_1653676449.1070127/0/jaxb-core-2-3-0-sources-10-jar/com/sun/xml/bind/v2/schemagen/episode/package-info.java  
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Found in path(s):

\* /opt/cola/permits/1334904685\_1653676440.7415743/0/istack-commons-runtime-3-0-5-jar/META-INF/maven/com.sun.istack/istack-commons-runtime/pom.xml

No license file was found, but licenses were detected in source scan.

Manifest-Version: 1.0

Bundle-Description: istack common utility code

Implementation-Title: istack common utility code runtime

Bundle-License: [https://glassfish.java.net/public/CDDL+GPL\\_1\\_1.html](https://glassfish.java.net/public/CDDL+GPL_1_1.html), [https://glassfish.java.net/public/CDDL+GPL\\_1\\_1.html](https://glassfish.java.net/public/CDDL+GPL_1_1.html)

Bundle-SymbolicName: com.sun.istack.commons-runtime

Implementation-Version: 3.0.5

Built-By: build

Bnd-LastModified: 1486772850426

Bundle-ManifestVersion: 2

Implementation-Vendor-Id: com.sun.istack

Bundle-DocURL: <http://www.oracle.com/>

Bundle-Vendor: Oracle Corporation

Import-Package: javax.activation,javax.xml.namespace,javax.xml.stream,org.xml.sax,org.xml.sax.helpers

Require-Capability: osgi.ee;filter="(&(osgi.ee=JavaSE)(version=1.7))"

Tool: Bnd-3.2.0.201605172007

Implementation-Vendor: Oracle Corporation

Export-Package: com.sun.istack;uses="javax.activation,javax.xml.stream,org.xml.sax,org.xml.sax.helpers";version="3.0.5",com.sun.istack.logging;version="3.0.5",com.sun.istack.localization;version="3.0.5"

Bundle-Name:

istack common utility code runtime

Bundle-Version: 3.0.5

Implementation-Build-Id: tags/istack-commons-3.0.5-321, 2017-02-11T01:

27:24+0100

Created-By: Apache Maven Bundle Plugin

Build-Jdk: 1.8.0\_112

Found in path(s):

\* /opt/cola/permits/1334904685\_1653676440.7415743/0/istack-commons-runtime-3-0-5-jar/META-INF/MANIFEST.MF

## 1.397 libxml 2.9.4

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## 1.413 glib 2.28.8-5.el6

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Version 3, 29 June 2007

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Julian Seward, jseward@bzip.org  
bzip2/libbzip2 version 1.0.5 of 10 December 2007

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## 1.420 zlib 1.2.3-29.el6

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```
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@end enumerate

@heading END OF TERMS AND CONDITIONS

@heading How to Apply These Terms to Your New Programs

If you develop a new program, and you want it to be of the greatest possible use to the public, the best way to achieve this is to make it free software which everyone can redistribute and change under these terms.

To do so, attach the following notices to the program. It is safest to attach them to the start of each source file to most effectively state the exclusion of warranty; and each file should have at least the ``copyright" line and a pointer to where the full notice is found.

@smallexample

@var{one line to give the program's name and a brief idea of what it does.}

Copyright

(C) @var{year} @var{name of author}

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@end smallexample

Also add information on how to contact you by electronic and paper mail.

If the program does terminal interaction, make it output a short notice like this when it starts in an interactive mode:

```
@smallexample
@var{program} Copyright (C) @var{year} @var{name of author}
This program comes with ABSOLUTELY NO WARRANTY;
for details type @samp{show w}.
This is free software, and you are welcome to redistribute it
under certain conditions; type @samp{show c} for details.
@end smallexample
```

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But

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# 1.425 libgpg-error 1.7-4.el6

## 1.425.1 Available under license :

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Version 2, June 1991

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4. You may copy and distribute the Library (or a portion or derivative of it, under Section 2) in object code or executable form under the terms of Sections 1 and 2 above provided that you accompany it with the complete corresponding machine-readable source code, which must be distributed under the terms of Sections 1 and 2 above on a medium customarily used for software interchange.

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5. A program that contains no derivative of any portion of the Library, but is designed to work with the Library by being compiled or linked with it, is called a "work that uses the Library". Such a work, in isolation, is not a derivative work of the Library, and therefore falls outside the scope of this License.

However, linking a "work that uses the Library" with the Library creates an executable that is a derivative of the Library (because it

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If such an object file uses only numerical parameters, data structure layouts and accessors, and small macros and small inline functions (ten lines or less in length), then the use of the object file is unrestricted, regardless of whether it is legally a derivative work. (Executables containing this object code plus portions of the Library will still fall under Section 6.)

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6. As an exception to the Sections above, you may also combine or link a "work that uses the Library" with the Library to produce a work containing portions of the Library, and distribute that work under terms of your choice, provided that the terms permit modification of the work for the customer's own use and reverse engineering for debugging such modifications.

You must give prominent notice with each copy of the work that the Library is used in it and that the Library and its use are covered by this License. You must supply a copy of this License. If the work during execution displays copyright notices, you must include the copyright notice for the Library among them, as well as a reference directing the user to the copy of this License. Also, you must do one of these things:

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For an executable, the required form of the "work that uses the Library" must include any data and utility programs needed for reproducing the executable from it. However, as a special exception, the materials to be distributed need not include anything that is normally distributed (in either source or binary form) with the major components (compiler, kernel, and so on) of the operating system on which the executable runs, unless that component itself accompanies the executable.

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cmd/krb5/kproplog/kproplog.c
cmd/krb5/slave/kpropd_rpc.c
lib/gss_mechs/mech_krb5/et/kdb5_err.c
lib/gss_mechs/mech_spnego/mech/gssapiP_spnego.h
lib/gss_mechs/mech_spnego/mech/spnego_mech.c
lib/krb5/kadm5/kadm_host_srv_names.c
lib/krb5/kdb/kdb_convert.c
lib/krb5/kdb/kdb_hdr.h
lib/krb5/kdb/kdb_log.c
lib/krb5/kdb/kdb_log.h
lib/libgss/g_accept_sec_context.c
lib/libgss/g_acquire_cred.c
lib/libgss/g_canon_name.c
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lib/libgss/g\_inquire\_names.c  
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lib/libgss/g\_rel\_buffer.c  
lib/libgss/g\_rel\_cred.c  
lib/libgss/g\_rel\_name.c  
lib/libgss/g\_rel\_oid\_set.c  
lib/libgss/g\_seal.c  
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lib/libgss/g\_unseal.c  
lib/libgss/g\_userok.c  
lib/libgss/g\_utils.c  
lib/libgss/g\_verify.c  
lib/libgss/gssd\_pname\_to\_uid.c  
uts/common/gssapi/include/gssapi\_err\_generic.h  
uts/common/gssapi/include/mechglueP.h

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lib/gssapi/mechglue/g\_accept\_sec\_context.c  
lib/gssapi/mechglue/g\_acquire\_cred.c  
lib/gssapi/mechglue/g\_canon\_name.c  
lib/gssapi/mechglue/g\_compare\_name.c  
lib/gssapi/mechglue/g\_context\_time.c  
lib/gssapi/mechglue/g\_delete\_sec\_context.c  
lib/gssapi/mechglue/g\_dsp\_name.c  
lib/gssapi/mechglue/g\_dsp\_status.c  
lib/gssapi/mechglue/g\_dup\_name.c  
lib/gssapi/mechglue/g\_exp\_sec\_context.c  
lib/gssapi/mechglue/g\_export\_name.c  
lib/gssapi/mechglue/g\_glue.c  
lib/gssapi/mechglue/g\_imp\_name.c  
lib/gssapi/mechglue/g\_imp\_sec\_context.c  
lib/gssapi/mechglue/g\_init\_sec\_context.c  
lib/gssapi/mechglue/g\_initialize.c  
lib/gssapi/mechglue/g\_inquire\_context.c  
lib/gssapi/mechglue/g\_inquire\_cred.c  
lib/gssapi/mechglue/g\_inquire\_names.c  
lib/gssapi/mechglue/g\_process\_context.c  
lib/gssapi/mechglue/g\_rel\_buffer.c  
lib/gssapi/mechglue/g\_rel\_cred.c  
lib/gssapi/mechglue/g\_rel\_name.c  
lib/gssapi/mechglue/g\_rel\_oid\_set.c  
lib/gssapi/mechglue/g\_seal.c

lib/gssapi/mechglue/g\_sign.c  
lib/gssapi/mechglue/g\_store\_cred.c  
lib/gssapi/mechglue/g\_unseal.c  
lib/gssapi/mechglue/g\_userok.c  
lib/gssapi/mechglue/g\_utils.c  
lib/gssapi/mechglue/g\_verify.c  
lib/gssapi/mechglue/gssd\_pname\_to\_uid.c  
lib/gssapi/mechglue/mglueP.h  
lib/gssapi/mechglue/oid\_ops.c  
lib/gssapi/spnego/gssapiP\_spnego.h  
lib/gssapi/spnego/spnego\_mech.c  
@end  
smallexample

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@smallexample  
include/iprop\_hdr.h  
kadmin/server/ipropd\_svc.c  
lib/kdb/iprop.x  
lib/kdb/kdb\_convert.c  
lib/kdb/kdb\_log.c  
lib/kdb/kdb\_log.h  
lib/krb5/error\_tables/kdb5\_err.et  
slave/kpropd\_rpc.c  
slave/kproplog.c  
@end smallexample

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@pagealignmacro

@endgroup

@end iftex

\input texinfo

@settitle Copyright and Other Legal Notices

@paragraphindent 0

@exampleindent 2

@documentencoding UTF-8

@node Top, , (dir), (dir)

@comment node-name, next, previous, up

@include definitions.texinfo

@include copyright.texinfo

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- lib/gssapi/mechglue/g\_accept\_sec\_context.c
- lib/gssapi/mechglue/g\_acquire\_cred.c
- lib/gssapi/mechglue/g\_canon\_name.c
- lib/gssapi/mechglue/g\_compare\_name.c
- lib/gssapi/mechglue/g\_context\_time.c
- lib/gssapi/mechglue/g\_delete\_sec\_context.c
- lib/gssapi/mechglue/g\_dsp\_name.c
- lib/gssapi/mechglue/g\_dsp\_status.c
- lib/gssapi/mechglue/g\_dup\_name.c
- lib/gssapi/mechglue/g\_exp\_sec\_context.c
- lib/gssapi/mechglue/g\_export\_name.c
- lib/gssapi/mechglue/g\_glue.c
- lib/gssapi/mechglue/g\_imp\_name.c
- lib/gssapi/mechglue/g\_imp\_sec\_context.c
- lib/gssapi/mechglue/g\_init\_sec\_context.c
- lib/gssapi/mechglue/g\_initialize.c
- lib/gssapi/mechglue/g\_inquire\_context.c
- lib/gssapi/mechglue/g\_inquire\_cred.c

lib/gssapi/mechglue/g\_inquire\_names.c  
lib/gssapi/mechglue/g\_process\_context.c  
lib/gssapi/mechglue/g\_rel\_buffer.c  
lib/gssapi/mechglue/g\_rel\_cred.c  
lib/gssapi/mechglue/g\_rel\_name.c  
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lib/gssapi/mechglue/g\_sign.c  
lib/gssapi/mechglue/g\_store\_cred.c  
lib/gssapi/mechglue/g\_unseal.c  
lib/gssapi/mechglue/g\_userok.c  
lib/gssapi/mechglue/g\_utils.c  
lib/gssapi/mechglue/g\_verify.c  
lib/gssapi/mechglue/gssd\_pname\_to\_uid.c  
lib/gssapi/mechglue/mglueP.h  
lib/gssapi/mechglue/oid\_ops.c  
lib/gssapi/spnego/gssapiP\_spnego.h  
lib/gssapi/spnego/spnego\_mech.c

and the initial implementation of incremental propagation, including the following new or changed files:

include/ipropr\_hdr.h  
kadmin/server/ipropr\_svc.c  
lib/kdb/ipropr.x  
lib/kdb/kdb\_convert.c  
lib/kdb/kdb\_log.c  
lib/kdb/kdb\_log.h  
lib/krb5/error\_tables/kdb5\_err.et  
slave/kpropd\_rpc.c  
slave/kproplog.c

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```

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```

The hypothetical commands

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```
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```

```
<signature of Ty Coon>, 1 April 1989
Ty Coon, President of Vice
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# 1.429 ncurses 5.7-4.20090207.el6

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-- \$Id: READ.ME,v 0.7 2006/04/22 23:13:05 tom Exp \$  
-----

This is a clone of the form library that is available with typical  
System V curses implementations (ETI).

It is modelled after the documentation that comes for this library with  
a 386 based SVR4 implementation (ESIX).

The development environment was and is an ELF based Linux system.

For things that still need doing, see the TO-DO file in the top-level  
directory.

Juergen Pfeifer

Found in path(s):

\* /opt/cola/permits/1600019816\_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-  
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\* @Id: curs\_insch.3x,v 1.10 2006/12/02 17:01:50 tom Exp @  
-->

Found in path(s):  
\* /opt/cola/permits/1600019816\_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-  
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-  
5.7/doc/html/man/curs\_insch.3x.html  
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archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/ncurses/base/keyok.c

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\* @Id: curs\_delch.3x,v 1.8 2006/02/25 21:42:57 tom Exp @

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archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-

5.7/doc/html/man/curs\_delch.3x.html

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*****/

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/*****

```

```

* Author: Zeyd M. Ben-Halim <zmbenhal@netcom.com> 1992,1995
* and: Eric S. Raymond <esr@snark.thyrsus.com>
*****/

```

```

/*

```

```

* unctrl.h
*
* Display a printable version of a control character.
* Control characters are displayed in caret notation (^x), DELETE is displayed
* as ^?. Printable characters are displayed as is.
*/

```

```

/* $Id: unctrl.h.in,v 1.10 2001/03/24 21:53:25 tom Exp $ */

```

```

#ifndef NCURSES_UNCTRL_H_incl
#define NCURSES_UNCTRL_H_incl 1

#undef NCURSES_VERSION
#define NCURSES_VERSION "@NCURSES_MAJOR@.@NCURSES_MINOR@"

#ifdef __cplusplus
extern "C" {
#endif

```



```
#include <curses.h>
```

```
#undef unctrl
```

```
NCURSES_EXPORT(NCURSES_CONST  
char *) unctrl (chtype);
```

```
#ifdef __cplusplus
```

```
}
```

```
#endif
```

```
#endif /* NCURSES_UNCTRL_H_incl */
```

Found in path(s):

```
* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-  
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/include/unctrl.h.in
```

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```
# $Id: modules,v 1.13 2006/12/24 00:53:21 tom Exp $
```

```
# Program modules (some are in ncurses lib!)
```

```
#####
```

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#####

#  
# Author: Thomas E. Dickey 1995-on  
#

@ base  
clear progs \$(srcdir) \$(HEADER\_DEPS)  
tic progs \$(srcdir) \$(HEADER\_DEPS) transform.h \$(srcdir)/dump\_entry.h  
toe progs \$(srcdir) \$(HEADER\_DEPS) \$(srcdir)/dump\_entry.h  
dump\_entry progs \$(srcdir) \$(HEADER\_DEPS) \$(srcdir)/dump\_entry.h ../include/parametrized.h  
\$(INCDIR)/capdefaults.c termsort.c  
infocmp progs \$(srcdir) \$(HEADER\_DEPS) \$(srcdir)/dump\_entry.h  
tput progs \$(srcdir) \$(HEADER\_DEPS) transform.h termsort.c  
tset progs \$(srcdir) \$(HEADER\_DEPS) transform.h \$(srcdir)/dump\_entry.h ../include/termcap.h

# vile:makemode

Found in path(s):

\* /opt/cola/permits/1600019816\_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-  
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/progs/modules  
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*****
* @Id: menu_items.3x,v 1.7 2006/11/04 18:35:31 tom Exp @
-->
```

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```
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archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-
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*****
* @Id: form_field_attributes.3x,v 1.10 2006/11/04 18:51:26 tom Exp @
-->
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archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-  
5.7/doc/html/man/form\_field\_attributes.3x.html

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\* @Id: curs\_getch.3x,v 1.30 2006/12/02 17:02:53 tom Exp @

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archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-  
5.7/doc/html/man/curs\_getch.3x.html

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*****
* @Id: curs_bkgd.3x,v 1.19 2003/12/27 18:50:40 tom Exp @
-->

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archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-
5.7/doc/html/man/curs_bkgd.3x.html

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-----
-- $Id: README,v 1.2 2006/04/22 22:24:12 tom Exp $
-----

```

The intention of the demo at this point in time is not to demonstrate all the features of (n)curses and its subsystems, but to give some sample sources how to use the binding at all.

Ideally in the future we can combine both goals.

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archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/Ada95/samples/README
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archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/test/ins\_wide.c  
\* /opt/cola/permits/1600019816\_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-  
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/test/inserts.c  
\* /opt/cola/permits/1600019816\_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-  
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/ncurses/widechar/lib\_vid\_attr.c  
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archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/ncurses/tinfo/alloc\_ttype.c

\* /opt/cola/permits/1600019816\_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-  
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/ncurses/tinfo/init\_keytry.c

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\* @Id: form\_cursor.3x,v 1.6 2006/11/04 18:50:24 tom Exp @

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archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/doc/html/man/form\_cursor.3x.html

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\* @Id: curs\_addch.3x,v 1.27 2007/06/02 20:40:07 tom Exp @

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* @Id: menu_attributes.3x,v 1.10 2008/08/23 18:24:23 tom Exp @
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archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-
5.7/doc/html/man/menu_attributes.3x.html

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*****
* Author: Thomas E. Dickey
* @Id: legacy_coding.3x,v 1.3 2006/12/24 15:12:55 tom Exp @
-->

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archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-
5.7/doc/html/man/legacy_coding.3x.html

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\* @Id: form\_win.3x,v 1.10 2006/11/04 17:12:00 tom Exp @

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\* @Id: menu\_hook.3x,v 1.9 2007/02/24 17:34:08 tom Exp @

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 archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/ncurses/tinfo/read\_termcap.c  
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* @Id: menu_cursor.3x,v 1.6 2006/11/04 17:13:57 tom Exp @
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#
# Author: Thomas Dickey
# and: Ilya Zakharevich
#
# $Id: Caps.keys,v 1.3 2006/05/27 15:33:04 tom Exp $
```



```

#
# This is an adaptation of ncurses' termcap/terminfo capability table, which
# is illustrates an experimental extension to describe alt-, shift- and
# control-modifiers applied to function and normal keys, as done on IBM pc's.
#
# This table is used to generate initializers for tables that drive tic,
# infocmp, and the library compilation code used to support the termcap
# compatibility hack. It is also used to generate the tabular portion of the
# terminfo(5) man page; lines beginning with `#%' are passed through to become
# the terminfo table.
#
# This file has three major sections; a standard-capabilities table, two
# extension-capability tables, and a section of aliases declarations.
#
# The first two have the same format, as follows:
#
# FILE FORMAT
#
# Column 1: terminfo variable name
# Column 2: terminfo capability name
# Column 3: capability type (boolean, numeric, or string)
# Column 4: termcap capability name
# Column 5: KEY_XXX name, if any, '-' otherwise
# Column 6: value for KEY_XXX name, if any, '-' otherwise
# Column 7: Lead with `Y' if capability should be emitted in termcap
#           translations, '-' otherwise
# Column 8: capability description
#
# The codes following [Y-] in column 7 describe the versions of termcap which
# use the given capability. This information is not used by the curses library
# proper; rather, it's there to help the terminfo maintainer avoid emitting
# termcap entry translations that are more than 1023 bytes long (and tank a
# lot of old termcap-using programs). The codes read as follows:
# B = mentioned in the BSD man page for 4.4BSD curses
# C = used by the 4.4BSD curses library
# G = mentioned in the documentation
#   for GNU termcap
# E = used by GNU Emacs
# K = remove this terminfo capability when translating to standard format
# The important codes are C and E. A cap with C or E should be preserved in
# translation if possible. The problem is that preserving all such caps may
# lead to some termcap translations being too long. The termcap maintainer
# has a bit of a juggling act to do...potential problem cases are marked with
# an asterisk (*).
#
# The aliases section has the following format:
#
# Column 1: either `capalias' or `infoalias'

```

```
# Column 2: name to be aliased
# Column 3: what name it should translate to. The name IGNORE means it
# should be discarded with a warning message.
# Column 4: name of the extension set (used for compiler warning messages)
# Column 5: capability description (usually an associated terminfo variable)
#
# HANDLING TERMCP AND TERMINFO EXTENSIONS
#
# There are basically five different ways to handle termcap and terminfo
# extensions:
#
# 1. Don't
# list the capname here, or list it but comment it out (the latter
# is preferable; someone might want to handle it in the future). If you do
# this, the capability will be treated as unknown and raise a warning from
# the compiler.
#
# 2. Alias it. This is appropriate if the capability has the same meaning
# as an already-supported one. The compiler will handle aliasing, emitting
# an appropriate informational message whenever an alias fires.
#
# 3. List it in the standard table. You almost certainly do *not* want
# to do this -- the capabilities in that one, and their order, have been
# carefully chosen to be SVr4-binary-compatible when they're written out
# as a terminfo object, and breaking this would be bad. It's up to the ncurses
# library what to do with the terminfo data after it's read in.
#
# 4. List it in the aliases table with an IGNORE target field. If you
# do this, the capability will be ignored on input (though the user will
# get a warning message about it).
#
# 5. List
# it in the extensions table. If you do this, the compiler will
# silently accept the capability, but the curses library proper will never
# see it (because it won't be written out as part of the terminfo object
# format). It's up to you what you have the compiler do with it.
#
# There are two opposite reasons to choose option 5. One is when you want
# to eat the capability silently and discard it when doing translations
# to terminfo with tic -I. Some very old obsolete BSD caps like :kn: are
# in this class. Nothing will ever use them again.
#
# More usually, you want the compiler to try to deduce something from the
# capability value that it can use to translate it into your output format.
# You'll need to write custom code, probably in postprocess_termcap() or
# postprocess_terminfo(), to handle the translation.
#
# CONTROLLING ENTRY LENGTH
```

```

#
# Notes on specific elisions made to fit translations within 1023 bytes:
#
# Machines with IBM PC-like keyboards want to be able to define
the following
# keys: key_npage, key_ppage, key_home, key_ll (which is used for in termcap-
# only environments for End or Home-Down), key_dc, and key_ic. This is also
# the set of keys the `joe' editor will be upset if it can't see. So don't
# trim those out of the set to be translated to termcap, or various users of
# the termcap file will become irate.
#
# It might look tempting to leave those long init strings out of translations.
# We can't do it (yet); 4.4BSD tput and tset use them.
#
# We retain the sgr capability in translation in spite of the fact that neither
# 4.4BSD nor GNU Emacs uses it, because (a) some entry naming distinctions are
# hard to understand without it, and (b) the entries in which it is long tend
# to be older types that don't use up a lot of string space on function keys.
# The tic(1) translation code will complain and elide it if it makes a critical
# difference (there is special code in tic to recognize this situation).
#
# Yes, BSD tset(1) uses hpa.
We elide hpa/vpa anyway because the motion
# optimizer in BSD curses didn't use them. This omission seems to be the
# single most effective one, it shortened the resolved length of all thirteen
# problem entries in the 9.9.0 version of the terminfo master below critical.
#
# It would be nice to keep f11 and f12 for Emacs use, but a couple of termcap
# translations go back over critical if we do this. As 4.4BSD curses fades
# into history and GNU termcap's application base shrinks towards being GNU
# Emacs only, we'll probably elide out some BSD-only capabilities in order
# to buy space for non-essentials Emacs is still using. Capabilities high
# on that hit list: rc, sc, uc.
#
#####
#
# STANDARD CAPABILITIES
#
#%The following is a complete table of the capabilities included in a
#%terminfo description block and available to terminfo-using code. In each
#%line of the table,
#%
#%The \fBvariable\fR is the name
by which the programmer (at the terminfo level)
#%accesses the capability.
#%
#%The \fBcapname\fR is the short name used in the text of the database,
#%and is used by a person updating the database.

```

```

%% Whenever possible, capnames are chosen to be the same as or similar to
%% the ANSI X3.64-1979 standard (now superseded by ECMA-48, which uses
%% identical or very similar names). Semantics are also intended to match
%% those of the specification.
%%
%% The termcap code is the old
%% .B termcap
%% capability name (some capabilities are new, and have names which termcap
%% did not originate).
%% .P
%% Capability names have no hard length limit, but an informal limit of 5
%% characters has been adopted to keep them short and to allow the tabs in
%% the source file
%% .B Caps
%% to line up nicely.
%%
%% Finally, the description field attempts to convey the semantics of the
%% capability. You may find some codes in the description field:
%% .TP
%% (P)
%% indicates that padding may be specified
%% .TP
%% #[1-9]
%% in
    the description field indicates that the string is passed through tparm with
%% parms as given (#\fI\fP).
%% .TP
%% (P*)
%% indicates that padding may vary in proportion to the number of
%% lines affected
%% .TP
%% (#\d\fI\fP\u)
%% indicates the \fI\fP\uth\d parameter.
%%
%% .PP
%% These are the boolean capabilities:
%%
%% .na
%% .TS H
%% center expand;
%% c l l c
%% c l l c
%% lw25 lw6 lw2 lw20.
%% \fBVariable Cap- TCap Description\fR
%% \fBBooleans name Code\fR
auto_left_margin  bw bool bw - - YB-G- cub1 wraps from column 0 to last column
auto_right_margin am bool am - - YBCGE terminal has automatic margins
no_esc_ctlc  xsb bool xb - - YBCG- beehive (f1=escape, f2=ctrl C)

```

```

ceol_standout_glitch xhp bool xs - - YBCGE standout not erased by overwriting (hp)
eat_newline_glitch xenl bool xn - - YBCGE newline ignored after 80 cols (concept)
erase_overstrike eo bool eo - - YBCG- can erase overstrikes with a blank
generic_type gn bool gn - - YB-G- generic line type
hard_copy hc bool hc - - YBCG- hardcopy
terminal
has_meta_key km bool km - - YB-GE Has a meta key (i.e., sets 8th-bit)
has_status_line hs bool hs - - YB-G- has extra status line
insert_null_glitch in bool in - - YBCGE insert mode distinguishes nulls
memory_above da bool da - - YBCG- display may be retained above the screen
memory_below db bool db - - YB-GE display may be retained below the screen
move_insert_mode mir bool mi - - YBCGE safe to move while in insert mode
move_standout_mode msgr bool ms - - YBCGE safe to move while in standout mode
over_strike os bool os - - YBCG- terminal can overstrike
status_line_esc_ok eslok bool es - - YB-G- escape can be used on the status line
dest_tabs_magic_smo xt bool xt - - YBCGE tabs destructive, magic so char (t1061)
tilde_glitch hz bool hz - - YB-GE can't print ~'s (hazeltine)
transparent_underline ul bool ul - - YBCGE underline character overstrikes
xon_xoff xon bool xo - - YB--- terminal uses xon/xoff handshaking
needs_xon_xoff nxon bool nx - - ----- padding
won't work, xon/xoff required
ptr_silent me5i bool 5i - - ----- printer won't echo on screen
hard_cursor chts bool HC - - ----- cursor is hard to see
non_rev_rmcup nrrmc bool NR - - ----- smcup does not reverse rmcup
no_pad_char npc bool NP - - ----- pad character does not exist
non_dest_scroll_region ndscr bool ND - - ----- scrolling region is non-destructive
can_change ccc bool cc - - ----- terminal can re-define existing colors
back_color_erase bce bool ut - - ----- screen erased with background color
hue_lightness_saturation hls bool hl - - ----- terminal uses only HLS color notation (Tektronix)
col_addr_glitch xhpa bool YA - - ----- only positive motion for hpa/mhpa caps
cr_cancels_micro_mode crxm bool YB - - ----- using cr turns off micro mode
has_print_wheel daisy bool YC - - ----- printer needs operator to change character set
row_addr_glitch xvpa bool YD - - ----- only positive motion for vpa/mvpa caps
semi_auto_right_margin sam bool YE - - ----- printing
in last column causes cr
cpi_changes_res cpix bool YF - - ----- changing character pitch changes resolution
lpi_changes_res lpix bool YG - - ----- changing line pitch changes resolution
%%.TE
%%.ad
%%
%%These are the numeric capabilities:
%%
%%.na
%%.TS H
%%center expand;
%%c l l c
%%c l l c
%%lw25 lw6 lw2 lw20.

```

```

%%\fBVariable Cap- TCap Description\fR
%%\fBNumeric name Code\fR
columns cols num co - - YBCGE number of columns in a line
init_tabs it num it - - YB-G- tabs initially every # spaces
lines lines num li - - YBCGE number of lines on screen or page
lines_of_memory lm num lm - - YB-G- lines of memory if > line. 0 means varies
magic_cookie_glitch xmc num sg - - YBCGE number of blank characters left by smso or rmso
padding_baud_rate pb num pb - - YB-GE lowest baud rate where padding needed
virtual_terminal vt num vt - - YB--- virtual terminal number (CB/unix)
width_status_line wsl num ws - - YB-G- number of columns in status line
num_labels nlab num NI - - ----- number
of labels on screen
label_height lh num lh - - ----- rows in each label
label_width lw num lw - - ----- columns in each label
max_attributes ma num ma - - YBC-- maximum combined attributes terminal can handle
maximum_windows wnum num MW - - ----- maximum number of defineable windows
# These came in with SVr4's color support
max_colors colors num Co - - ----- maximum number of colors on screen
max_pairs pairs num pa - - ----- maximum number of color-pairs on the screen
no_color_video ncv num NC - - ----- video attributes that can't be used with colors
%%.TE
%%.ad
%%
%% The following numeric capabilities are present in the SVr4.0 term structure,
%% but are not yet documented in the man page. They came in with SVr4's
%% printer support.
%%
%%.na
%%.TS H
%%center expand;
%%c 1 l c
%%c 1 l c
%%lw25 lw6 lw2 lw20.
%%\fBVariable Cap- TCap Description\fR
%%\fBNumeric name Code\fR
buffer_capacity bufsz num Ya - - ----- numbers of bytes buffered before printing
dot_vert_spacing spinv num Yb - - ----- spacing
of pins vertically in pins per inch
dot_horz_spacing spinh num Yc - - ----- spacing of dots horizontally in dots per inch
max_micro_address maddr num Yd - - ----- maximum value in micro_..._address
max_micro_jump mjump num Ye - - ----- maximum value in parm_..._micro
micro_col_size mcs num Yf - - ----- character step size when in micro mode
micro_line_size mls num Yg - - ----- line step size when in micro mode
number_of_pins npins num Yh - - ----- numbers of pins in print-head
output_res_char orc num Yi - - ----- horizontal resolution in units per line
output_res_line orl num Yj - - ----- vertical resolution in units per line
output_res_horz_inch orhi num Yk - - ----- horizontal resolution in units per inch
output_res_vert_inch orvi num Yl - - ----- vertical resolution in units per inch

```

```

print_rate cps num Ym - - ----- print rate in characters per second
wide_char_size widcs num Yn - - ----- character step size when
in double wide mode
buttons btns num BT - - ----- number of buttons on mouse
bit_image_entwining bitwin num Yo - - ----- number of passes for each bit-image row
bit_image_type bitype num Yp - - ----- type of bit-image device
%%.TE
%%.ad
%%
%% These are the string capabilities:
%%
%%.na
%%.TS H
%%center expand;
%%c l l c
%%c l l c
%%lw25 lw6 lw2 lw20.
%%\fBVariable Cap- TCap Description\fR
%%\fBString name Code\fR
back_tab cbt str bt - - YBCGE back tab (P)
bell bel str bl - - YB-GE audible signal (bell) (P)
carriage_return cr str cr - - YBCGE carriage return (P*) (P*)
change_scroll_region csr str cs - - YBCGE change region to line #1 to line #2 (P)
clear_all_tabs tbc str ct - - YB-G- clear all tab stops (P)
clear_screen clear str cl - - YBCGE clear screen and home cursor (P*)
clr_eol el str ce - - YBCGE clear to end of line (P)
clr_eos ed str cd - - YBCGE clear to end of screen (P*)
column_address hpa str ch - - B-GE* horizontal position #1, absolute
(P)
command_character cmdch str CC - - YB-G- terminal settable cmd character in prototype !?
cursor_address cup str cm - - YBCGE move to row #1 columns #2
cursor_down cudl str do - - YBCGE down one line
cursor_home home str ho - - YBCGE home cursor (if no cup)
cursor_invisible civis str vi - - YB-G- make cursor invisible
cursor_left cubl str le - - YBCGE move left one space
cursor_mem_address mrcup str CM - - YB-G- memory relative cursor addressing, move to row #1 columns #2
cursor_normal cnorm str ve - - YBCGE make cursor appear normal (undo civis/cvvis)
cursor_right cuf1 str nd - - YBCGE non-destructive space (move right one space)
cursor_to_ll ll str ll - - YBCGE last line, first column (if no cup)
cursor_up cuu1 str up - - YBCGE up one line
cursor_visible cvvis str vs - - YBCGE make cursor very visible
delete_character dch1 str dc - - YBCGE delete character (P*)
delete_line dl1 str dl - - YBCGE delete line (P*)
dis_status_line dsl str ds - - YB-G- disable
status line
down_half_line hd str hd - - YB-G- half a line down
enter_alt_charset_mode smacs str as - - YB-G- start alternate character set (P)
enter_blink_mode blink str mb - - YB-G- turn on blinking

```

enter\_bold\_mode bold str md - - YB-G- turn on bold (extra bright) mode  
 enter\_ca\_mode smcup str ti - - YBCGE string to start programs using cup  
 enter\_delete\_mode smdc str dm - - YBCGE enter delete mode  
 enter\_dim\_mode dim str mh - - YB-G- turn on half-bright mode  
 enter\_insert\_mode smir str im - - YBCGE enter insert mode  
 enter\_secure\_mode invis str mk - - -B-G-\* turn on blank mode (characters invisible)  
 enter\_protected\_mode prot str mp - - -B-G-\* turn on protected mode  
 enter\_reverse\_mode rev str mr - - YB-G- turn on reverse video mode  
 enter\_standout\_mode smso str so - - YBCGE begin standout mode  
 enter\_underline\_mode smul str us - - YBCGE begin underline mode  
 erase\_chars ech str ec - - YB-G- erase #1 characters (P)  
 exit\_alt\_charset\_mode rmacs str ae - - YB-G- end  
 alternate character set (P)  
 exit\_attribute\_mode sgr0 str me - - YB-GE turn off all attributes  
 exit\_ca\_mode rmcup str te - - YBCGE strings to end programs using cup  
 exit\_delete\_mode rmdc str ed - - YBCGE end delete mode  
 exit\_insert\_mode rmir str ei - - YBCGE exit insert mode  
 exit\_standout\_mode rmso str se - - YBCGE exit standout mode  
 exit\_underline\_mode rmul str ue - - YBCGE exit underline mode  
 flash\_screen flash str vb - - YBCGE visible bell (may not move cursor)  
 form\_feed ff str ff - - YB-G- hardcopy terminal page eject (P\*)  
 from\_status\_line fsl str fs - - YB-G- return from status line  
 init\_1string is1 str i1 - - YB-G- initialization string  
 init\_2string is2 str is - - YB-G- initialization string  
 init\_3string is3 str i3 - - YB-G- initialization string  
 init\_file if str if - - YB-G- name of initialization file  
 insert\_character ich1 str ic - - YBCGE insert character (P)  
 insert\_line il1 str al - - YBCGE insert line (P\*)  
 insert\_padding ip str ip - - YBCGE insert  
 padding after inserted character  
 key\_backspace kbs str kb KEY\_BACKSPACE 0407 YB-G- backspace key  
 key\_catab ktbc str ka KEY\_CATAB 0526 -B-G-\* clear-all-tabs key  
 key\_clear kclr str kC KEY\_CLEAR 0515 -B-G-\* clear-screen or erase key  
 key\_ctab kctab str kt KEY\_CTAB 0525 -B-G-\* clear-tab key  
 key\_dc kdch1 str kD KEY\_DC 0512 YB-G- delete-character key  
 key\_dl kdl1 str kL KEY\_DL 0510 -B-G-\* delete-line key  
 key\_down kcuD1 str kD KEY\_DOWN 0402 YBCGE down-arrow key  
 key\_eic krmir str kM KEY\_EIC 0514 -B-G-\* sent by rmir or smir in insert mode  
 key\_eol kel str kE KEY\_EOL 0517 -B-G-\* clear-to-end-of-line key  
 key\_eos ked str kS KEY\_EOS 0516 -B-G-\* clear-to-end-of-screen key  
 key\_f0 kf0 str k0 KEY\_F(0) 0410 YBCGE F0 function key  
 key\_f1 kf1 str k1 KEY\_F(1) - YBCGE F1 function key  
 key\_f10 kf10 str k; KEY\_F(10) - ----E F10 function key  
 key\_f2 kf2 str k2 KEY\_F(2) - YBCGE F2 function key  
 key\_f3 kf3 str k3 KEY\_F(3) - YBCGE F3 function  
 key  
 key\_f4 kf4 str k4 KEY\_F(4) - YBCGE F4 function key  
 key\_f5 kf5 str k5 KEY\_F(5) - YBCGE F5 function key



key\_f6 kf6 str k6 KEY\_F(6) - YBCGE F6 function key  
key\_f7 kf7 str k7 KEY\_F(7) - YBCGE F7 function key  
key\_f8 kf8 str k8 KEY\_F(8) - YBCGE F8 function key  
key\_f9 kf9 str k9 KEY\_F(9) - YBCGE F9 function key  
key\_home khome str kh KEY\_HOME 0406 YBCGE home key  
key\_ic kich1 str kl KEY\_IC 0513 YB-GE insert-character key  
key\_il kil1 str kA KEY\_IL 0511 -B-G-\* insert-line key  
key\_left kcub1 str kl KEY\_LEFT 0404 YBCGE left-arrow key  
key\_ll kll str kH KEY\_LL 0533 YB-G- lower-left key (home down)  
key\_npage knp str kN KEY\_NPAGE 0522 YB-GE next-page key  
key\_ppage kpp str kP KEY\_PPAGE 0523 YB-GE previous-page key  
key\_right kcufl1 str kr KEY\_RIGHT 0405 YBCGE right-arrow key  
key\_sf kind str kF KEY\_SF 0520 -B-G-\* scroll-forward key  
key\_sr kri str kR KEY\_SR 0521 -B-G-\* scroll-backward key  
key\_stab khts str kT KEY\_STAB 0524 -B-G-\* set-tab key  
key\_up kcuu1 str ku KEY\_UP 0403 YBCGE up-arrow  
key  
keypad\_local rmkx str ke - - YBCGE leave 'keyboard\_transmit' mode  
keypad\_xmit smkx str ks - - YBCGE enter 'keyboard\_transmit' mode  
lab\_f0 lf0 str l0 - - -B-G-\* label on function key f0 if not f0  
lab\_f1 lf1 str l1 - - -B-G-\* label on function key f1 if not f1  
lab\_f10 lf10 str la - - - label on function key f10 if not f10  
lab\_f2 lf2 str l2 - - -B-G-\* label on function key f2 if not f2  
lab\_f3 lf3 str l3 - - -B-G-\* label on function key f3 if not f3  
lab\_f4 lf4 str l4 - - -B-G-\* label on function key f4 if not f4  
lab\_f5 lf5 str l5 - - -B-G-\* label on function key f5 if not f5  
lab\_f6 lf6 str l6 - - -B-G-\* label on function key f6 if not f6  
lab\_f7 lf7 str l7 - - -B-G-\* label on function key f7 if not f7  
lab\_f8 lf8 str l8 - - -B-G-\* label on function key f8 if not f8  
lab\_f9 lf9 str l9 - - -B-G-\* label on function key f9 if not f9  
meta\_off rmm str mo - - YB-G-\* turn off meta mode  
meta\_on smm str mm - - YB-G-\* turn  
on meta mode (8th-bit on)  
newline nel str nw - - YB-G-\* newline (behave like cr followed by lf)  
pad\_char pad str pc - - YBCGE padding char (instead of null)  
parm\_dch dch str DC - - YB-GE delete #1 characters (P\*)  
parm\_delete\_line dl str DL - - YBCGE delete #1 lines (P\*)  
parm\_down\_cursor cud str DO - - YBCGE down #1 lines (P\*)  
parm\_ich ich str IC - - YB-GE insert #1 characters (P\*)  
parm\_index indn str SF - - YBCG- scroll forward #1 lines (P)  
parm\_insert\_line il str AL - - YBCGE insert #1 lines (P\*)  
parm\_left\_cursor cub str LE - - YBCGE move #1 characters to the left (P)  
parm\_right\_cursor cuf str RI - - YBCGE move #1 characters to the right (P\*)  
parm\_rindex rin str SR - - YBCG- scroll back #1 lines (P)  
parm\_up\_cursor cuu str UP - - YBCGE up #1 lines (P\*)  
pkey\_key pfkey str pk - - -B--- program function key #1 to type string #2  
pkey\_local pfloc str pl - - -B--- program function key #1 to execute string #2  
pkey\_xmit pfx str px - - -B--- program

function key #1 to transmit string #2

print\_screen mc0 str ps - -B-G-\* print contents of screen

prtr\_off mc4 str pf - -B-G-\* turn off printer

prtr\_on mc5 str po - -B-G-\* turn on printer

repeat\_char rep str rp - -YB-GE repeat char #1 #2 times (P\*)

reset\_1string rs1 str r1 - -B--- reset string

reset\_2string rs2 str r2 - -B--- reset string

reset\_3string rs3 str r3 - -B--- reset string

reset\_file rf str rf - -B--- name of reset file

restore\_cursor rc str rc - -YBCG- restore cursor to position of last save\_cursor

row\_address vpa str cv - -B-GE\* vertical position #1 absolute (P)

save\_cursor sc str sc - -YBCG- save current cursor position (P)

scroll\_forward ind str sf - -YBCGE scroll text up (P)

scroll\_reverse ri str sr - -YBCGE scroll text down (P)

set\_attributes sgr str sa - -YB-G- define video attributes #1-#9 (PG9)

set\_tab hts str st - -YB-G- set a tab in every row, current columns

set\_window wind str wi - -B-GE current  
window is lines #1-#2 cols #3-#4

tab ht str ta - -YBCGE tab to next 8-space hardware tab stop

to\_status\_line tsl str ts - -YB-G- move to status line, column #1

underline\_char uc str uc - -YBCG- underline char and move past it

up\_half\_line hu str hu - -YB-G- half a line up

init\_prog iprog str iP - -B--- path name of program for initialization

key\_a1 ka1 str K1 KEY\_A1 0534 YB-GE upper left of keypad

key\_a3 ka3 str K3 KEY\_A3 0535 YB-GE upper right of keypad

key\_b2 kb2 str K2 KEY\_B2 0536 YB-GE center of keypad

key\_c1 kc1 str K4 KEY\_C1 0537 YB-GE lower left of keypad

key\_c3 kc3 str K5 KEY\_C3 0540 YB-GE lower right of keypad

prtr\_non mc5p str pO - -B-G-\* turn on printer for #1 bytes

#

# SVr1 capabilities stop here. IBM's version of terminfo is the same as  
# SVr4 up to this point, but has a different set afterwards.

#

char\_padding rmp str rP - ------ like ip but when in insert mode

acs\_chars acsc str ac - ------ graphics  
charset pairs, based on vt100

plab\_norm pln str pn - ------ program label #1 to show string #2

key\_btab kcbt str kB KEY\_BTAB 0541 ----- back-tab key

enter\_xon\_mode smxon str SX - ------ turn on xon/xoff handshaking

exit\_xon\_mode rmxon str RX - ------ turn off xon/xoff handshaking

enter\_am\_mode smam str SA - ------ turn on automatic margins

exit\_am\_mode rmam str RA - ------ turn off automatic margins

xon\_character xonc str XN - ------ XON character

xoff\_character xoffc str XF - ------ XOFF character

ena\_acs enacs str eA - ------ enable alternate char set

label\_on smln str LO - ------ turn on soft labels

label\_off rmln str LF - ------ turn off soft labels

key\_beg kbeg str @1 KEY\_BEG 0542 ----- begin key

key\_cancel kcan str @2 KEY\_CANCEL 0543 ----- cancel key  
key\_close kclo str @3 KEY\_CLOSE 0544 ----- close key  
key\_command kcmd str @4 KEY\_COMMAND 0545 ----- command key  
key\_copy kcpy str @5 KEY\_COPY 0546 ----- copy key  
key\_create kcrt str @6 KEY\_CREATE 0547 ----- create  
key  
key\_end kend str @7 KEY\_END 0550 ----- end key  
key\_enter kent str @8 KEY\_ENTER 0527 ----- enter/send key  
key\_exit kext str @9 KEY\_EXIT 0551 ----- exit key  
key\_find kfnd str @0 KEY\_FIND 0552 ----- find key  
key\_help khlp str %1 KEY\_HELP 0553 ----- help key  
key\_mark kmrk str %2 KEY\_MARK 0554 ----- mark key  
key\_message kmsg str %3 KEY\_MESSAGE 0555 ----- message key  
key\_move kmov str %4 KEY\_MOVE 0556 ----- move key  
key\_next knxt str %5 KEY\_NEXT 0557 ----- next key  
key\_open kopn str %6 KEY\_OPEN 0560 ----- open key  
key\_options kopt str %7 KEY\_OPTIONS 0561 ----- options key  
key\_previous kprv str %8 KEY\_PREVIOUS 0562 ----- previous key  
key\_print kpri str %9 KEY\_PRINT 0532 ----- print key  
key\_redo krdo str %0 KEY\_REDO 0563 ----- redo key  
key\_reference kref str &1 KEY\_REFERENCE 0564 ----- reference key  
key\_refresh krfr str &2 KEY\_REFRESH 0565 ----- refresh key  
key\_replace krpl str &3 KEY\_REPLACE 0566 ----- replace  
key  
key\_restart krst str &4 KEY\_RESTART 0567 ----- restart key  
key\_resume kres str &5 KEY\_RESUME 0570 ----- resume key  
key\_save ksav str &6 KEY\_SAVE 0571 ----- save key  
key\_suspend kspd str &7 KEY\_SUSPEND 0627 ----- suspend key  
key\_undo kund str &8 KEY\_UNDO 0630 ----- undo key  
key\_sbeg kBEG str &9 KEY\_SBEG 0572 ----- shifted begin key  
key\_scancel kCAN str &0 KEY\_SCANCEL 0573 ----- shifted cancel key  
key\_scommand kCMD str \*1 KEY\_SCOMMAND 0574 ----- shifted command key  
key\_scopy kCPY str \*2 KEY\_SCOPY 0575 ----- shifted copy key  
key\_screate kCRT str \*3 KEY\_SCREATE 0576 ----- shifted create key  
key\_sdc kDC str \*4 KEY\_SDC 0577 ----- shifted delete-character key  
key\_sdl kDL str \*5 KEY\_SDL 0600 ----- shifted delete-line key  
key\_select kslt str \*6 KEY\_SELECT 0601 ----- select key  
key\_send kEND str \*7 KEY\_SEND 0602 ----- shifted end key  
key\_seol kEOL str \*8 KEY\_SEOL 0603 ----- shifted clear-to-end-of-line key  
key\_sexit kEXT str \*9 KEY\_SEXIT 0604 ----- shifted  
exit key  
key\_sfnd kFND str \*0 KEY\_SFIND 0605 ----- shifted find key  
key\_shelp kHLP str #1 KEY\_SHELP 0606 ----- shifted help key  
key\_shome kHOM str #2 KEY\_SHOME 0607 ----- shifted home key  
key\_sic kIC str #3 KEY\_SIC 0610 ----- shifted insert-character key  
key\_sleft kLFT str #4 KEY\_SLEFT 0611 ----- shifted left-arrow key  
key\_smessage kMSG str %a KEY\_SMESSAGE 0612 ----- shifted message key  
key\_smove kMOV str %b KEY\_SMOVE 0613 ----- shifted move key

key\_snext kNXT str %c KEY\_SNEXT 0614 ----- shifted next key  
key\_soptions kOPT str %d KEY\_SOPTIONS 0615 ----- shifted options key  
key\_sprevious kPRV str %e KEY\_SPREVIOUS 0616 ----- shifted previous key  
key\_sprint kPRT str %f KEY\_SPRINT 0617 ----- shifted print key  
key\_sredo kRDO str %g KEY\_SREDO 0620 ----- shifted redo key  
key\_sreplace kRPL str %h KEY\_SREPLACE 0621 ----- shifted replace key  
key\_sright kRIT str %i KEY\_SRIGHT 0622 ----- shifted right-arrow key  
key\_sresume kRES str %j KEY\_SRSUME 0623 ----- shifted  
resume key  
key\_ssave kSAV str !1 KEY\_SSAVE 0624 ----- shifted save key  
key\_ssuspend kSPD str !2 KEY\_SSUSPEND 0625 ----- shifted suspend key  
key\_sundo kUND str !3 KEY\_SUNDO 0626 ----- shifted undo key  
req\_for\_input rfi str RF - - ----- send next input char (for ptys)  
key\_f11 kf11 str F1 KEY\_F(11) - ----E F11 function key  
key\_f12 kf12 str F2 KEY\_F(12) - ----E F12 function key  
key\_f13 kf13 str F3 KEY\_F(13) - ----E F13 function key  
key\_f14 kf14 str F4 KEY\_F(14) - ----E F14 function key  
key\_f15 kf15 str F5 KEY\_F(15) - ----E F15 function key  
key\_f16 kf16 str F6 KEY\_F(16) - ----E F16 function key  
key\_f17 kf17 str F7 KEY\_F(17) - ----E F17 function key  
key\_f18 kf18 str F8 KEY\_F(18) - ----E F18 function key  
key\_f19 kf19 str F9 KEY\_F(19) - ----E F19 function key  
key\_f20 kf20 str FA KEY\_F(20) - ----E F20 function key  
key\_f21 kf21 str FB KEY\_F(21) - ----E F21 function key  
key\_f22 kf22 str FC KEY\_F(22) - ----E F22 function key  
key\_f23 kf23 str FD KEY\_F(23) - ----E F23  
function key  
key\_f24 kf24 str FE KEY\_F(24) - ----E F24 function key  
key\_f25 kf25 str FF KEY\_F(25) - ----E F25 function key  
key\_f26 kf26 str FG KEY\_F(26) - ----E F26 function key  
key\_f27 kf27 str FH KEY\_F(27) - ----E F27 function key  
key\_f28 kf28 str FI KEY\_F(28) - ----E F28 function key  
key\_f29 kf29 str FJ KEY\_F(29) - ----E F29 function key  
key\_f30 kf30 str FK KEY\_F(30) - ----E F30 function key  
key\_f31 kf31 str FL KEY\_F(31) - ----E F31 function key  
key\_f32 kf32 str FM KEY\_F(32) - ----E F32 function key  
key\_f33 kf33 str FN KEY\_F(33) - ----E F33 function key  
key\_f34 kf34 str FO KEY\_F(34) - ----E F34 function key  
key\_f35 kf35 str FP KEY\_F(35) - ----E F35 function key  
key\_f36 kf36 str FQ KEY\_F(36) - ----E F36 function key  
key\_f37 kf37 str FR KEY\_F(37) - ----E F37 function key  
key\_f38 kf38 str FS KEY\_F(38) - ----E F38 function key  
key\_f39 kf39 str FT KEY\_F(39) - ----E F39 function key  
key\_f40 kf40 str FU KEY\_F(40) - ----E F40  
function key  
key\_f41 kf41 str FV KEY\_F(41) - ----E F41 function key  
key\_f42 kf42 str FW KEY\_F(42) - ----E F42 function key  
key\_f43 kf43 str FX KEY\_F(43) - ----E F43 function key

key\_f44 kf44 str FY KEY\_F(44) - ----E F44 function key  
key\_f45 kf45 str FZ KEY\_F(45) - ----E F45 function key  
key\_f46 kf46 str Fa KEY\_F(46) - ----E F46 function key  
key\_f47 kf47 str Fb KEY\_F(47) - ----E F47 function key  
key\_f48 kf48 str Fc KEY\_F(48) - ----E F48 function key  
key\_f49 kf49 str Fd KEY\_F(49) - ----E F49 function key  
key\_f50 kf50 str Fe KEY\_F(50) - ----E F50 function key  
key\_f51 kf51 str Ff KEY\_F(51) - ----E F51 function key  
key\_f52 kf52 str Fg KEY\_F(52) - ----E F52 function key  
key\_f53 kf53 str Fh KEY\_F(53) - ----E F53 function key  
key\_f54 kf54 str Fi KEY\_F(54) - ----E F54 function key  
key\_f55 kf55 str Fj KEY\_F(55) - ----E F55 function key  
key\_f56 kf56 str Fk KEY\_F(56) - ----E F56 function key  
key\_f57 kf57 str Fl KEY\_F(57) - ----E F57 function  
key  
key\_f58 kf58 str Fm KEY\_F(58) - ----E F58 function key  
key\_f59 kf59 str Fn KEY\_F(59) - ----E F59 function key  
key\_f60 kf60 str Fo KEY\_F(60) - ----E F60 function key  
key\_f61 kf61 str Fp KEY\_F(61) - ----E F61 function key  
key\_f62 kf62 str Fq KEY\_F(62) - ----E F62 function key  
key\_f63 kf63 str Fr KEY\_F(63) - ----E F63 function key  
clr\_bol e11 str cb - - - - - Clear to beginning of line  
clear\_margins mgc str MC - - - - - clear right and left soft margins  
set\_left\_margin smgl str ML - - - - - set left soft margin at current column. See smgl. (ML is not in BSD termcap).  
set\_right\_margin smgr str MR - - - - - set right soft margin at current column  
label\_format fln str Lf - - - - - label format  
set\_clock sclk str SC - - - - - set clock, #1 hrs #2 mins #3 secs  
display\_clock dclk str DK - - - - - display clock  
remove\_clock rmclk str RC - - - - - remove clock  
create\_window cwin str CW - - - - - define a window #1 from #2,#3 to #4,#5  
goto\_window wingo str WG - - - - - go  
to window #1  
hangup hup str HU - - - - - hang-up phone  
dial\_phone dial str DI - - - - - dial number #1  
quick\_dial qdial str QD - - - - - dial number #1 without checking  
tone tone str TO - - - - - select touch tone dialing  
pulse pulse str PU - - - - - select pulse dialing  
flash\_hook hook str fh - - - - - flash switch hook  
fixed\_pause pause str PA - - - - - pause for 2-3 seconds  
wait\_tone wait str WA - - - - - wait for dial-tone  
user0 u0 str u0 - - - - - User string #0  
user1 u1 str u1 - - - - - User string #1  
user2 u2 str u2 - - - - - User string #2  
user3 u3 str u3 - - - - - User string #3  
user4 u4 str u4 - - - - - User string #4  
user5 u5 str u5 - - - - - User string #5  
user6 u6 str u6 - - - - - User string #6  
user7 u7 str u7 - - - - - User string #7

```

user8  u8 str u8 - - ----- User string #8
user9  u9 str u9 - - ----- User string #9
#
# NCurses extensions for keys accessible on most PC consoles
#
key_sup  kUP str !5 KEY_SUP + ----- shifted
up-arrow key
key_sdown  kDOWN str !6 KEY_SDOWN + ----- shifted down-arrow key
key_sbackspace  kBS str !7 KEY_SBACKSPACE + ----- shifted backspace key
key_c_delete  kcdelete str !8 KEY_C_DELETE + ----- control- delete-character key
key_c_end  kcend str !9 KEY_C_END + ----- control- end key
key_c_home  kchom str !0 KEY_C_HOME + ----- control- home key
key_c_insert  kcinsert str !_ KEY_C_INSERT + ----- control- insert-character key
key_c_left  kclft str %k KEY_C_LEFT + ----- control- left-arrow key
key_c_next  kcnxt str %l KEY_C_NEXT + ----- control- next key
key_c_previous  kcpvr str %m KEY_C_PREVIOUS + ----- control- previous key
key_c_print  kcpvt str %n KEY_C_PRINT + ----- control- print key
key_c_right  kcrit str %o KEY_C_RIGHT + ----- control- right-arrow key
key_c_backspace  kcbs str %p KEY_C_BACKSPACE + ----- control- backspace key
key_c_up  kcup str %q KEY_C_UP + ----- control- up-arrow key
key_c_down  kcdown str %r KEY_C_DOWN + ----- control-
down-arrow key
key_a_delete  kadelete str %s KEY_A_DELETE + ----- alt- delete-character key
key_a_end  kaend str %t KEY_A_END + ----- alt- end key
key_a_home  kahom str %u KEY_A_HOME + ----- alt- home key
key_a_insert  kainsert str %v KEY_A_INSERT + ----- alt- insert-character key
key_a_left  kalft str %w KEY_A_LEFT + ----- alt- left-arrow key
key_a_next  kanxt str %x KEY_A_NEXT + ----- alt- next key
key_a_previous  kaprv str %y KEY_A_PREVIOUS + ----- alt- previous key
key_a_print  kaprt str %z KEY_A_PRINT + ----- alt- print key
key_a_right  karit str %! KEY_A_RIGHT + ----- alt- right-arrow key
key_a_backspace  kabs str %@ KEY_A_BACKSPACE + ----- alt- backspace key
key_a_up  kaup str %# KEY_A_UP + ----- alt- up-arrow key
key_a_down  kadown str %$ KEY_A_DOWN + ----- alt- down-arrow key
key_a_a  kaa str $a KEY_A_A + ----- alt- a key
key_a_b  kab str $b KEY_A_B + ----- alt- b key
key_a_c  kac str $c KEY_A_C + ----- alt- c key
key_a_d  kad str $d KEY_A_D + ----- alt-
d key
key_a_e  kae str $e KEY_A_E + ----- alt- e key
key_a_f  kaf str $f KEY_A_F + ----- alt- f key
key_a_g  kag str $g KEY_A_G + ----- alt- g key
key_a_h  kah str $h KEY_A_H + ----- alt- h key
key_a_i  kai str $i KEY_A_I + ----- alt- i key
key_a_j  kaj str $j KEY_A_J + ----- alt- j key
key_a_k  kak str $k KEY_A_K + ----- alt- k key
key_a_l  kal str $l KEY_A_L + ----- alt- l key
key_a_m  kam str $m KEY_A_M + ----- alt- m key

```

key\_a\_n kan str \$n KEY\_A\_N + ----- alt- n key  
key\_a\_o kao str \$o KEY\_A\_O + ----- alt- o key  
key\_a\_p kap str \$p KEY\_A\_P + ----- alt- p key  
key\_a\_q kaq str \$q KEY\_A\_Q + ----- alt- q key  
key\_a\_r kar str \$r KEY\_A\_R + ----- alt- r key  
key\_a\_s kas str \$s KEY\_A\_S + ----- alt- s key  
key\_a\_t kat str \$t KEY\_A\_T + ----- alt- t key  
key\_a\_u kau str \$u KEY\_A\_U + ----- alt- u key  
key\_a\_v kav str \$v KEY\_A\_V + ----- alt- v key  
key\_a\_w kaw str \$w KEY\_A\_W + ----- alt- w key  
key\_a\_x kax str \$x KEY\_A\_X + ----- alt-  
x key  
key\_a\_y kay str \$y KEY\_A\_Y + ----- alt- y key  
key\_a\_z kaz str \$z KEY\_A\_Z + ----- alt- z key  
key\_a\_0 ka\_0 str \$0 KEY\_A\_0 + ----- alt- 0 key  
key\_a\_1 ka\_1 str \$1 KEY\_A\_1 + ----- alt- 1 key  
key\_a\_2 ka\_2 str \$2 KEY\_A\_2 + ----- alt- 2 key  
key\_a\_3 ka\_3 str \$3 KEY\_A\_3 + ----- alt- 3 key  
key\_a\_4 ka\_4 str \$4 KEY\_A\_4 + ----- alt- 4 key  
key\_a\_5 ka\_5 str \$5 KEY\_A\_5 + ----- alt- 5 key  
key\_a\_6 ka\_6 str \$6 KEY\_A\_6 + ----- alt- 6 key  
key\_a\_7 ka\_7 str \$7 KEY\_A\_7 + ----- alt- 7 key  
key\_a\_8 ka\_8 str \$8 KEY\_A\_8 + ----- alt- 8 key  
key\_a\_9 ka\_9 str \$9 KEY\_A\_9 + ----- alt- 9 key  
key\_a\_backtick ka\_bt str `\$ KEY\_A\_BACKTICK + ----- alt- ` key  
key\_a\_under ka\_und str \$\_ KEY\_A\_UNDER + ----- alt- \_ key  
key\_a\_equals ka\_eq str \$= KEY\_A\_EQUALS + ----- alt- = key  
key\_a\_bar ka\_bsl str \$| KEY\_A\_BAR + ----- alt- | key  
key\_a\_lbracket ka\_lbr str \${ KEY\_A\_LBRACKET + ----- alt- [ key  
key\_a\_rbracket ka\_rbr str \$} KEY\_A\_RBRACKET + ----- alt-  
] key  
key\_a\_semi ka\_semi str \$; KEY\_A\_SEMI + ----- alt- ; key  
key\_a\_tick ka\_tick str \$(' KEY\_A\_TICK + ----- alt- ' key  
key\_a\_comma ka\_com str \$, KEY\_A\_COMMA + ----- alt- , key  
key\_a\_dot ka\_dot str \$. KEY\_A\_DOT + ----- alt- . key  
key\_a\_question ka\_sla str \$? KEY\_A\_QUESTION + ----- alt- ? key  
key\_a\_divide ka\_div str \$/ KEY\_A\_DIVIDE + ----- alt- keypad / key  
key\_a\_multiply ka\_mul str \$\* KEY\_A\_MULTIPLY + ----- alt- keypad \* key  
key\_a\_add ka\_add str \$+ KEY\_A\_ADD + ----- alt- keypad + key  
key\_a\_subtract ka\_sub str \$- KEY\_A\_SUBTRACT + ----- alt- keypad - key  
key\_a\_kenter ka\_kent str \$< KEY\_A\_KENTER + ----- alt- keypad enter key  
key\_a\_enter ka\_ent str \$> KEY\_A\_ENTER + ----- alt- enter key  
key\_c\_at kcat str %% KEY\_C\_AT + ----- control- @ key  
key\_c\_divide kcdiv str %/ KEY\_C\_DIVIDE + ----- control- keypad / key  
key\_c\_multiply kcmul str %\* KEY\_C\_MULTIPLY + ----- control- keypad \* key  
key\_c\_add kcadd str %+ KEY\_C\_ADD + ----- control- keypad + key  
key\_c\_subtract kcsub str %- KEY\_C\_SUBTRACT + ----- control-

```

keypad - key
#
# SVr4 added these capabilities to support color
#
orig_pair  op str op - - ---- Set default pair to its original value
orig_colors oc str oc - - ---- Set all color pairs to the original ones
initialize_color  initc str Ic - - ---- initialize color #1 to (#2,#3,#4)
initialize_pair  initp str Ip - - ---- Initialize color pair #1 to fg=(#2,#3,#4), bg=(#5,#6,#7)
set_color_pair  scp str sp - - ---- Set current color pair to #1
set_foreground setf str Sf - - ---- Set foreground color #1
set_background setb str Sb - - ---- Set background color #1
#
# SVr4 added these capabilities to support printers
#
change_char_pitch cpi str ZA - - ---- Change number of characters per inch to #1
change_line_pitch lpi str ZB - - ---- Change number of lines per inch to #1
change_res_horz  chr str ZC - - ---- Change horizontal resolution to #1
change_res_vert  cvr str ZD - - ---- Change vertical resolution to #1
define_char  defc str ZE - - ---- Define
a character #1, #2 dots wide, descender #3
enter_doublewide_mode  swidm str ZF - - ---- Enter double-wide mode
enter_draft_quality  sdrfq str ZG - - ---- Enter draft-quality mode
enter_italics_mode  sitm str ZH - - ---- Enter italic mode
enter_leftward_mode  slm str ZI - - ---- Start leftward carriage motion
enter_micro_mode  smicm str ZJ - - ---- Start micro-motion mode
enter_near_letter_quality  snlq str ZK - - ---- Enter NLQ mode
enter_normal_quality  snrmq str ZL - - ---- Enter normal-quality mode
enter_shadow_mode  sshm str ZM - - ---- Enter shadow-print mode
enter_subscript_mode  ssubm str ZN - - ---- Enter subscript mode
enter_superscript_mode  ssupm str ZO - - ---- Enter superscript mode
enter_upward_mode  sum str ZP - - ---- Start upward carriage motion
exit_doublewide_mode  rwidm str ZQ - - ---- End double-wide mode
exit_italics_mode  ritm str ZR - - ---- End italic mode
exit_leftward_mode  rlm str ZS - - ---- End
left-motion mode
exit_micro_mode  rmicm str ZT - - ---- End micro-motion mode
exit_shadow_mode  rshm str ZU - - ---- End shadow-print mode
exit_subscript_mode  rsubm str ZV - - ---- End subscript mode
exit_superscript_mode  rsupm str ZW - - ---- End superscript mode
exit_upward_mode  rum str ZX - - ---- End reverse character motion
micro_column_address  mhpa str ZY - - ---- Like column_address in micro mode
micro_down  mcud1 str ZZ - - ---- Like cursor_down in micro mode
micro_left  mcub1 str Za - - ---- Like cursor_left in micro mode
micro_right  mcuf1 str Zb - - ---- Like cursor_right in micro mode
micro_row_address  mypa str Zc - - ---- Like row_address #1 in micro mode
micro_up  mcu1 str Zd - - ---- Like cursor_up in micro mode
order_of_pins  porder str Ze - - ---- Match software bits to print-head pins
parm_down_micro  mcud str Zf - - ---- Like parm_down_cursor in micro mode

```



parm\_left\_micro mcub str Zg - - - - - Like parm\_left\_cursor in  
 micro mode  
 parm\_right\_micro mcuf str Zh - - - - - Like parm\_right\_cursor in micro mode  
 parm\_up\_micro mcuu str Zi - - - - - Like parm\_up\_cursor in micro mode  
 select\_char\_set scs str Zj - - - - - Select character set, #1  
 set\_bottom\_margin smgb str Zk - - - - - Set bottom margin at current line  
 set\_bottom\_margin\_parm smgbp str Zl - - - - - Set bottom margin at line #1 or (if smgtp is not given) #2 lines from  
 bottom  
 set\_left\_margin\_parm smglp str Zm - - - - - Set left (right) margin at column #1  
 set\_right\_margin\_parm smgrp str Zn - - - - - Set right margin at column #1  
 set\_top\_margin smgt str Zo - - - - - Set top margin at current line  
 set\_top\_margin\_parm smgtp str Zp - - - - - Set top (bottom) margin at row #1  
 start\_bit\_image sbim str Zq - - - - - Start printing bit image graphics  
 start\_char\_set\_def scsd str Zr - - - - - Start character set definition #1, with #2 characters in the set  
 stop\_bit\_image rbim str Zs - - - - - Stop printing bit image graphics  
 stop\_char\_set\_def rcsd str Zt - - - - - End  
 definition of character set #1  
 subscript\_characters subcs str Zu - - - - - List of subscriptable characters  
 superscript\_characters supcs str Zv - - - - - List of superscriptable characters  
 these\_cause\_cr dochr str Zw - - - - - Printing any of these characters causes CR  
 zero\_motion zerom str Zx - - - - - No motion for subsequent character  
 #%.TE  
 #%.ad  
 #%  
 #%The following string capabilities are present in the SVr4.0 term structure,  
 #%but were originally not documented in the man page.  
 #%  
 #%.na  
 #%.TS H  
 #%center expand;  
 #%c 1 l c  
 #%c 1 l c  
 #%lw25 lw6 lw2 lw18.  
 #%\fBVariable Cap- TCap Description\fR  
 #%\fBString name Code\fR  
 char\_set\_names csnm str Zy - - - - - Produce #1'th item from list of character set names  
 key\_mouse kmous str Km KEY\_MOUSE 0631 - - - - - Mouse event has occurred  
 mouse\_info minfo str Mi - - - - - Mouse status information  
 req\_mouse\_pos reqmp str RQ - - - - - Request mouse position  
 get\_mouse getm str Gm - - - - - Curses  
 should get button events, parameter #1 not documented.  
 set\_a\_foreground setaf str AF - - - - - Set foreground color to #1, using ANSI escape  
 set\_a\_background setab str AB - - - - - Set background color to #1, using ANSI escape  
 pkey\_plab pfxl str xl - - - - - Program function key #1 to type string #2 and show string #3  
 device\_type devt str dv - - - - - Indicate language/codeset support  
 code\_set\_init csin str ci - - - - - Init sequence for multiple codesets  
 set0\_des\_seq s0ds str s0 - - - - - Shift to codeset 0 (EUC set 0, ASCII)  
 set1\_des\_seq s1ds str s1 - - - - - Shift to codeset 1

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set2_des_seq s2ds str s2 - - ---- Shift to codeset 2
set3_des_seq s3ds str s3 - - ---- Shift to codeset 3
set_lr_margin smglr str ML - - ---- Set both left and right margins to #1, #2. (ML is not in BSD termcap).
set_tb_margin smgtb str MT - - ---- Sets both top and bottom margins to #1, #2
bit_image_repeat birep str Xy - - ---- Repeat bit image cell #1 #2 times
bit_image_newline binel str Zz - - ---- Move
to next row of the bit image
bit_image_carriage_return bicr str Yv - - ---- Move to beginning of same row
color_names colorm str Yw - - ---- Give name for color #1
define_bit_image_region defbi str Yx - - ---- Define rectangular bit image region
end_bit_image_region endbi str Yy - - ---- End a bit-image region
set_color_band setcolor str Yz - - ---- Change to ribbon color #1
set_page_length slines str YZ - - ---- Set page length to #1 lines
#
# SVr4 added these capabilities for direct PC-clone support
#
display_pc_char dispc str S1 - - ---- Display PC character #1
enter_pc_charset_mode smpch str S2 - - ---- Enter PC character display mode
exit_pc_charset_mode rmpch str S3 - - ---- Exit PC character display mode
enter_scancode_mode smsc str S4 - - ---- Enter PC scancode mode
exit_scancode_mode rmsc str S5 - - ---- Exit PC scancode mode
pc_term_options pctrm str S6 - - ---- PC terminal options
scancode_escape scesc str S7 - - ---- Escape
for scancode emulation
alt_scancode_esc scesa str S8 - - ---- Alternate escape for scancode emulation
#%.TE
#%.ad
#%
#%.in .8i
#% The XSI Curses standard added these. They are some post-4.1
#% versions of System V curses, e.g., Solaris 2.5 and IRIX 6.x.
#% The \fBncurses\fR termcap names for them are invented; according to the
#% XSI Curses standard, they have no termcap names. If your compiled terminfo
#% entries use these, they may not be binary-compatible with System V terminfo
#% entries after SVr4.1; beware!
#%
#%.na
#%.TS H
#%center expand;
#%c 1 l c
#%c 1 l c
#%lw25 lw6 lw2 lw20.
#%\fBVariable Cap- TCap Description\fR
#%\fBString name Code\fR
enter_horizontal_hl_mode ehhl str Xh - - ---- Enter horizontal highlight mode
enter_left_hl_mode elhl str Xl - - ---- Enter left highlight mode
enter_low_hl_mode eloh str Xo - - ---- Enter low highlight mode
enter_right_hl_mode erhl str Xr - - ---- Enter right highlight mode

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enter_top_hl_mode ethlm str Xt - - ---- Enter
top highlight mode
enter_vertical_hl_mode evhlm str Xv - - ---- Enter vertical highlight mode
set_a_attributes sgr1 str sA - - ---- Define second set of video attributes #1-#6
set_pglen_inch slength str sL - - ---- YI Set page length to #1 hundredth of an inch
#%.TE
#%.ad
#
# The magic token below tells the tic compiler-generator code that all the caps
# past it should be ignored (not written out) when dumping terminfo objects. It
# also tells the man page table generator not to pass through following lines
# This means we can have obsolete capabilities and pseudo-capabilities that are
# recognized for termcap or terminfo compilation, but not output.
#
# %%-STOP-HERE-%%
#
# Don't move this casually! In fact, don't move it at all unless you're
# either doing it to add System V or XPG4 extensions, or have decided you
# don't care about SVr4 binary compatibility.
#
#####
#
#
TERMCAP EXTENSION CAPABILITIES
#
# The capabilities below are either obsolete or extensions on certain systems.
# They are not used by SVR4 terminfo. Some are used by captinfo to translate
# termcap sources; the rest are listed for completeness, and in case somebody
# cares about them enough to hack in code that will translate them into
# terminfo capabilities.
#
# The first part of the list is from Ross Ridge's `mytinfo' package
# (comp.sources.unix, volume 26); the variable names and terminfo names (as
# well as the termcap codes) match his list.
#
# This group of codes is not marked obsolete in 4.4BSD, but have no direct
# terminfo equivalents. The rs capability is specially translated to terminfo
# r2, and vice versa, if an entry does not already have an r2. Similarly,
# i2 is translated to r3 if there is no r3 (because SV terminfo maps is to i2).
# The ug capability is thrown away, but assumed to be whatever sg is if the
# latter is nonzero and we're dumping in termcap format.
#
termcap_init2 OTi2 str i2 - - YB--- secondary
initialization string
termcap_reset OTrs str rs - - YB-G- terminal reset string
magic_cookie_glitch_ul OTug num ug - - YBCGE number of blanks left by ul
#
# Obsolete termcap capabilities. Some are used for termcap translation. The

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# code uses the 'OT' prefix we put on obsolete capabilities to suppress
# printing them in terminfo source dumps of compiled entries.
#
backspaces_with_bs OTbs bool bs - - YBCGE uses ^H to move left
crt_no_scrolling OTns bool ns - - YBCG- crt cannot scroll
no_correctly_working_cr OTnc bool nc - - YBCG- no way to go to start of line
carriage_return_delay OTdC num dC - - YB-G- pad needed for CR
new_line_delay OTdN num dN - - YB-G- pad needed for LF
linefeed_if_not_lf OTnl str nl - - YBCGE use to move down
backspace_if_not_bs OTbc str bc - - YBCGE move left, if not ^H
#
# GNU termcap library extensions. The GNU termcap file distributed with
# Emacs no longer uses these, but MT showed
# up in pre-9.0 versions of the
# BSD termcap file. The name clash with terminfo MT is resolved by type
# info; MT is converted to km.
#
gnu_has_meta_key OTMT bool MT - - ---E has meta key
# gnu_tab_width OTtw num tw - - ---E tab width in spaces
#
# GNU termcap *does* include the following extended capability, Only the
# now-obsolete Ann Arbor terminals used it.
#
# gnu_change_scroll_region OTcS str cS - - ---GE alternate set scrolling region
#
# The following comments describe capnames so ancient that I believe no
# software uses them any longer. Some of these have to go because they
# clash with terminfo names in ways that cannot be resolved by type
# information.
#
# These mytinfo codes are not used in the 4.4BSD curses code. They are
# marked obsolete in the 4.4BSD manual pages.
#
# There is one conflict with terminfo; ma is in both. This conflict is
# resolved by type information.
#
# The `ko' capability is translated by special code. It should contain a
# comma-separated
# list of capabilities for which there are corresponding keys.
# The `kn' code is accepted but ignored.
#
# The `ma' capability seems to have been designed to map between the rogue(2)
# motion keys (including jkhl) and characters emitted by arrow keys on some
# primitive pre-ANSI terminals. It's so obsolete it's fossilized...
#
# Here is a description of memory_lock_above and memory_unlock:
# "You can 'freeze' data on the screen by turning on Memory Lock in a line of
# text. All lines above the cursor's current line become locked in place on

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# the screen. Then enter data normally. When the screen fills up, any
# further data entered forces the first line of unfrozen line text to scroll
# under the frozen data. Lines scrolled off the screen are inserted into
# memory immediately preceding the first frozen line." (from the HP 700/96
# User's manual). VT100/ANSI memory lock set is \E[>2h, reset is \E[>2l.
#
# Applications that use terminfo are supposed to behave as though xr is
#
always true.
#
linefeed_is_newline OTNL bool NL - - YB--- move down with \n
# even_parity OTEP bool EP - - -B--- terminal requires even parity
# odd_parity OTOP bool OP - - -B--- terminal requires odd parity
# half_duplex OTHD bool HD - - -B--- terminal is half-duplex
# lower_case_only OTLC bool LC - - -B--- terminal has only lower case
# upper_case_only OTUC bool UC - - -B--- terminal has only upper case
backspace_delay OTdB num dB - - YB-G- padding required for ^H
# form_feed_delay OTdF num dF - - -B-G- padding required for ^L
horizontal_tab_delay OTdT num dT - - YB-G- padding required for ^I
# vertical_tab_delay OTdV num dV - - -B--- padding required for ^V
number_of_function_keys OTkn num kn - - -B-G- count of function keys
other_non_function_keys OTko str ko - - -B-G- list of self-mapped keycaps
arrow_key_map OTma str ma - - YBC-- map arrow keys rogue(1) motion keys
# memory_lock_above OTml str ml - - -B--- lock visible screen memory above the current
line
# memory_unlock OTmu str mu - - -B--- unlock visible screen memory above the current line
has_hardware_tabs OTpt bool pt - - YB--- has 8-char tabs invoked with ^I
return_does_clr_eol OTxr bool xr - - YB--- return clears the line
# tek_4025_insert_line OTxx bool xx - - -BC-- Tektronix 4025 insert-line glitch
#
# mytinfo described this as a termcap capability, but it's not listed in the
# 4.4BSD man pages, and not found in the 4.4BSD termcap file. The ncurses
# package, like System V, behaves as though it is always true.
#
# rind_only_at_top OTxq bool xq - - ----- reverse index only works from top line
#
# University of Waterloo termcap extensions (as described in mytinfo).
# The `xl' termcap file clashes with a terminfo name; this ambiguity cannot
# be resolved by a type check. The descriptions are guesses from what was
# in the mytinfo tables.
#
# key_interrupt_char OTki str ki - - ----- string set by interrupt key (?)
# key_kill_char OTkk str kk - - ----- string
set by kill key (?)
# key_suspend_char OTkz str kz - - ----- string set by suspend key (?)
# initialization_messy OTxc bool xc - - ----- initialization leaves garbage on the screen (?)
# ind_at_bottom_does_cr OTxl bool xl - - ----- index does a carriage return
#

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# Nonstandard capabilities unique to Ross Ridge's `mytinfo' package.
# SR clashes with a terminfo name; this ambiguity cannot be resolved by a type
# check.
#
# scroll_left OTsl1 str Sl - - ---- scroll screen leftward
# scroll_right OTsr1 str Sr - - ---- scroll screen rightward
# parm_scroll_left OTsl str SL - - ---- scroll screen leftward #1 characters
# parm_scroll_right OTsr str SR - - ---- scroll screen rightward #1 characters
#
# The mytinfo capabilities end here.
#
# XENIX extensions:
#
# Xenix defined its own set of forms-drawing capabilities:
#
# cap IBM ASCII description      ACS      ASCII
# --- -----
# G1 191 \277 M-? single upper
right ACS_URCORNER
# G2 218 \332 M-Z single upper left ACS_ULCORNER
# G3 192 \300 M-@ single lower left ACS_LLCORNER
# G4 217 \331 M-Y single lower right ACS_LRCORNER
# G5 187 \273 M-; double upper right
# G6 201 \311 M-I double upper left
# G7 200 \310 M-H double lower left
# G8 188 \274 M-< double lower right
# GC 197 \305 M-E single intersection ACS_PLUS _ _
# GD 194 \302 M-B single down-tick ACS_TTEE |
# GH 196 \304 M-D single horizontal line ACS_HLINE
# GL 180 \264 M-4 single left tick ACS_RTEE -|
# GR 195 \303 M-C single right tick ACS_LTEE |-
# GU 193 \301 M-A single up tick ACS_BTEE _|
# GV 179 \263 M-3 single vertical line ACS_VLINE
# Gc 206 \316 M-N double intersection
# Gd 203 \313 M-K double down tick
# Gh 205 \315 M-M double horizontal line
# Gl 204 \204 M-L double left tick
# Gr 185 \271 M-9 double right tick
# Gu 202 \312 M-J double up tick
# Gv 186 \272 M-: double vertical line
#
# The compiler will translate the single-line caps and discard the others
# (via
IGNORE aliases further down). We don't want to do normal pad
# translation on these, they're often single-character printable ASCII
# strings that happen to be numerics. There's awk code in parametrized.sh
# that detects the acs_ prefix and uses it to suppress pad translation.
# These terminfo names are invented.

```

```

#
acs_ulcorner OTG2 str G2 - - - - - single upper left
acs_llcorner OTG3 str G3 - - - - - single lower left
acs_urcorner OTG1 str G1 - - - - - single upper right
acs_lrcorner OTG4 str G4 - - - - - single lower right
acs_ltee OTGR str GR - - - - - tee pointing right
acs_rtee OTGL str GL - - - - - tee pointing left
acs_btee OTGU str GU - - - - - tee pointing up
acs_ttee OTGD str GD - - - - - tee pointing down
acs_hline OTGH str GH - - - - - single horizontal line
acs_vline OTGV str GV - - - - - single vertical line
acs_plus OTGC str GC - - - - - single intersection
#
#####
#
#
TERMINFO EXTENSION CAPABILITIES
#
# This section is almost all comments. What it's mainly for is to describe
# what capabilities need to be squeezed out to get down to the XSI Curses
# standard set. They are flagged with K.
#
# HP extensions
#
# These extensions follow ptr_non (replacing everything after it) in HP
# terminfo files. Except for memory_lock and memory_unlock, they are
# functionally identical to SVr4 extensions, but they make the binary format
# different. Grrr....
#
memory_lock meml str ml - - - - -K lock memory above cursor
memory_unlock memu str mu - - - - -K unlock memory
#plab_norm pln str pn - - - - - program label #1 to show string #2
#label_on smln str LO - - - - - turn on soft labels
#label_off rmln str LF - - - - - turn off soft labels
#key_f11 kf11 str F1 - - - - - F11 function key
#key_f12 kf12 str F2 - - - - - F12 function key
#key_f13 kf13 str F3 - - - - - F13 function key
#key_f14 kf14 str F4 - - - - - F14 function key
#key_f15 kf15 str F5 - - - - - F15
function key
#key_f16 kf16 str F6 - - - - - F16 function key
#key_f17 kf17 str F7 - - - - - F17 function key
#key_f18 kf18 str F8 - - - - - F18 function key
#key_f19 kf19 str F9 - - - - - F19 function key
#key_f20 kf20 str FA - - - - - F20 function key
#key_f21 kf21 str FB - - - - - F21 function key
#key_f22 kf22 str FC - - - - - F22 function key
#key_f23 kf23 str FD - - - - - F23 function key

```

```

#key_f24 kf24 str FE - - - - - F24 function key
#key_f25 kf25 str FF - - - - - F25 function key
#key_f26 kf26 str FG - - - - - F26 function key
#key_f27 kf27 str FH - - - - - F27 function key
#key_f28 kf28 str FI - - - - - F28 function key
#key_f29 kf29 str FJ - - - - - F29 function key
#key_f30 kf30 str FK - - - - - F30 function key
#key_f31 kf31 str FL - - - - - F31 function key
#key_f32 kf32 str FM - - - - - F32 function key
#key_f33 kf33 str FN - - - - - F33 function key
#key_f34 kf34 str FO - - - - - F34
function key
#key_f35 kf35 str FP - - - - - F35 function key
#key_f36 kf36 str FQ - - - - - F36 function key
#key_f37 kf37 str FR - - - - - F37 function key
#key_f38 kf38 str FS - - - - - F38 function key
#key_f39 kf39 str FT - - - - - F39 function key
#key_f40 kf40 str FU - - - - - F40 function key
#key_f41 kf41 str FV - - - - - F41 function key
#key_f42 kf42 str FW - - - - - F42 function key
#key_f43 kf43 str FX - - - - - F43 function key
#key_f44 kf44 str FY - - - - - F44 function key
#key_f45 kf45 str FZ - - - - - F45 function key
#key_f46 kf46 str Fa - - - - - F46 function key
#key_f47 kf47 str Fb - - - - - F47 function key
#key_f48 kf48 str Fc - - - - - F48 function key
#key_f49 kf49 str Fd - - - - - F49 function key
#key_f50 kf50 str Fe - - - - - F50 function key
#key_f51 kf51 str Ff - - - - - F51 function key
#key_f52 kf52 str Fg - - - - - F52 function key
#key_f53 kf53 str Fh - - - - - F53 function key
#key_f54 kf54 str Fi - - - - - F54
function key
#key_f55 kf55 str Fj - - - - - F55 function key
#key_f56 kf56 str Fk - - - - - F56 function key
#key_f57 kf57 str Fl - - - - - F57 function key
#key_f58 kf58 str Fm - - - - - F58 function key
#key_f59 kf59 str Fn - - - - - F59 function key
#key_f60 kf60 str Fo - - - - - F60 function key
#key_f61 kf61 str Fp - - - - - F61 function key
#key_f62 kf62 str Fq - - - - - F62 function key
#key_f63 kf63 str Fr - - - - - F63 function key
#
# IBM extensions
#
# These extensions follow ptr_non (replacing everything after it) in IBM
# terminfo files.
#

```



```

# The places in the box[12] capabilities correspond to acsc characters, here is
# the mapping:
#
# box1[0] = ACS_ULCORNER
# box1[1] = ACS_HLINE
# box1[2] = ACS_URCORNER
# box1[3] = ACS_VLINE
# box1[4] = ACS_LRCORNER
# box1[5] = ACS_LLCORNER
# box1[6] = ACS_TTEE
# box1[7] = ACS_RTEE
# box1[8] = ACS_BTEE
# box1[9] = ACS_LTEE
# box1[10] = ACS_PLUS
#
# The box2 characters are the double-line
# versions of these forms graphics.
#
box_chars_1 box1 str bx - - ----K box characters primary set
#box_chars_2 box2 str by - - ----K box characters secondary set
#box_attr_1 batt1 str Bx - - ----K attributes for box1
#box_attr_2 batt2 str By - - ----K attributes for box2
#color_bg_0 colb0 str d0 - - ----K background color 0
#color_bg_1 colb1 str d1 - - ----K background color 1
#color_bg_2 colb2 str d2 - - ----K background color 2
#color_bg_3 colb3 str d3 - - ----K background color 3
#color_bg_4 colb4 str d4 - - ----K background color 4
#color_bg_5 colb5 str d5 - - ----K background color 5
#color_bg_6 colb6 str d6 - - ----K background color 6
#color_bg_7 colb7 str d7 - - ----K background color 7
#color_fg_0 colf0 str c0 - - ----K foreground color 0
#color_fg_1 colf1 str c1 - - ----K foreground color 1
#color_fg_2 colf2 str c2 - - ----K foreground color 2
#color_fg_3 colf3 str c3 - - ----K foreground color 3
#color_fg_4 colf4 str c4 - - ----K foreground
color 4
#color_fg_5 colf5 str c5 - - ----K foreground color 5
#color_fg_6 colf6 str c6 - - ----K foreground color 6
#color_fg_7 colf7 str c7 - - ----K foreground color 7
#font_0 font0 str f0 - - ----- select font 0
#font_1 font1 str f1 - - ----- select font 1
#font_2 font2 str f2 - - ----- select font 2
#font_3 font3 str f3 - - ----- select font 3
#font_4 font4 str f4 - - ----K select font 4
#font_5 font5 str f5 - - ----K select font 5
#font_6 font6 str f6 - - ----K select font 6
#font_7 font7 str f7 - - ----K select font 7
#key_back_tab kbtb str k0 - - ----- backtab key

```

```

#key_do kdo str ki - - ----K do request key
#key_command kcmd str kd - - ----K command-request key
#key_command_pane kcpn str kW - - ----K command-pane key
#key_end kend str kw - - ----- end key
#key_help khlp str kq - - ----- help key
#key_newline knl str nl - - ----K newline key
#key_next_pane knpn str kv - - ----K next-pane
key
#key_prev_cmd kppn str kp - - ----K previous-command key
#key_prev_pane kppn str kV - - ----K previous-pane key
#key_quit kquit str kQ - - ----K quit key
#key_select ksel str kU - - ----- select key
#key_scroll_left kscl str kz - - ----K scroll left
#key_scroll_right kscr str kZ - - ----K scroll right
#key_tab ktab str ko - - ----K tab key
#key_smap_in1 kmpf1 str Kv - - ----K special mapped key 1 input
#key_smap_out1 kmpt1 str KV - - ----K special mapped key 1 output
#key_smap_in2 kmpf2 str Kw - - ----K special mapped key 2 input
#key_smap_out2 kmpt2 str KW - - ----K special mapped key 2 output
#key_smap_in3 kmpf3 str Kx - - ----K special mapped key 3 input
#key_smap_out3 kmpt3 str KX - - ----K special mapped key 3 output
#key_smap_in4 kmpf4 str Ky - - ----K special mapped key 4 input
#key_smap_out4 kmpt4 str KY - - ----K special mapped key 4 output
#key_smap_in5 kmpf5 str Kz - - ----K special mapped key 5 input
#key_smap_out5 kmpt5 str KZ - - ----K special
mapped key 5 output
#appl_defined_str apstr str za - - ----K application-defined string
# The key_smap_in[6789] and key_smap_out[6789] capabilities aren't described in
# the IBM manual pages, so the cap name strings are guesses. The terminfo
# names are almost certainly right, the termcap ones almost certainly wrong.
#key_smap_in6 kmpf6 str k! - - ----K special mapped key 6 input
#key_smap_out6 kmpt6 str K@ - - ----K special mapped key 6 output
#key_smap_in7 kmpf7 str k# - - ----K special mapped key 7 input
#key_smap_out7 kmpt7 str K$ - - ----K special mapped key 7 output
#key_smap_in8 kmpf8 str k% - - ----K special mapped key 8 input
#key_smap_out8 kmpt8 str K^ - - ----K special mapped key 8 output
#key_smap_in9 kmpf9 str k& - - ----K special mapped key 9 input
#key_smap_out9 kmpt9 str K* - - ----K special mapped key 9 output
# Undocumented capabilities end here
#key_sf1 ksf1 str S1 - - ----K special function key 1
#key_sf2 ksf2 str S2 - - ----K special
function key 2
#key_sf3 ksf3 str S3 - - ----K special function key 3
#key_sf4 ksf4 str S4 - - ----K special function key 4
#key_sf5 ksf5 str S5 - - ----K special function key 5
#key_sf6 ksf6 str S6 - - ----K special function key 6
#key_sf7 ksf7 str S7 - - ----K special function key 7
#key_sf8 ksf8 str S8 - - ----K special function key 8

```

```

#key_sf9 ksf9 str S9 - - ----K special function key 9
#key_sf10 ksf10 str SA - - ----K special function key 10
# AIX version 3 documents different codes for F11, F12 and does not mention
# F13-F64. AIX version 4 uses the same naming for F0-F63 as above.
#key_f11 kf11 str k< - - ----- function key 11
#key_f12 kf12 str k> - - ----- function key 12
# Undocumented capabilities end here.
#key_action kact str kJ - - ----K sent by action key
# The IBM docs say these capabilities are for table-drawing, and are
# valid only for aixterm descriptions.
#enter_topline_mode topl str tp - - ----K start top-line
mode
#enter_bottom_mode btml str bm - - ----K start bottom-line mode
#enter_rvert_mode rvert str rv - - ----K start right-vertical mode
#enter_lvert_mode lvert str lv - - ----K start left-vertical mode
#
#####
#
# ALIAS DECLARATIONS
#
# Here we set up aliases for translating extensions into standard terminfo.
#
#----- Termcap aliases -----
#
# BSD aliases:
#
# This is a common error in many termcap files. We'll get notified during
# translation when this (or any other alias) fires.
#
capalias sb sr BSD scroll text down
#
# AT&T extensions:
#
# The old AT&T 5410, 5420, 5425, pc6300plus, 610, and s4 entries used a set of
# nonstandard capabilities. Its signature is the KM capability, used to name
# some sort of keymap file. EE, BO, CI, CV, XS, DS, FL and FE are in this
# set. Comments in the original, and a little cross-checking with other AT&T
# documentation,
# seem to establish the following mappings:
#
capalias BO mr AT&T enter_reverse_mode
capalias CI vi AT&T cursor_invisible
capalias CV ve AT&T cursor_normal
capalias DS mh AT&T enter_dim_mode
#capalias EE me AT&T exit_attribute_mode
capalias FE LF AT&T label_on
capalias FL LO AT&T label_off
capalias XS mk AT&T enter_secure_mode

```

```

#
# We comment out EE because the conflicting XENIX EE is more common in
# old entries.
#
# XENIX extensions:
#
# These are the ones we know how to translate directly:
#
capalias EE mh XENIX exit_attribute_mode
capalias GE ae XENIX exit_alt_charset_mode
capalias GS as XENIX enter_alt_charset_mode
capalias CF vi XENIX cursor_invis
capalias CO ve XENIX cursor_normal
capalias EN @7 XENIX key_end
capalias HM kh XENIX key_home
capalias LD kL XENIX key_dl
capalias PD kN XENIX key_npage
capalias PN po XENIX prtr_off
capalias PS pf XENIX prtr_on
capalias PU kP XENIX key_ppage
capalias RT @8 XENIX kent
capalias UP ku XENIX kcuu1
capalias G6 IGNORE XENIX double-ACS_ULCORNER
capalias G7 IGNORE XENIX double-ACS_LLCORNER
capalias G5 IGNORE XENIX double-ACS_URCORNER
capalias G8 IGNORE XENIX double-ACS_LRCORNER
capalias Gr IGNORE XENIX double-ACS_LTEE
capalias Gr IGNORE XENIX double-ACS_RTEE
capalias Gu IGNORE XENIX double-ACS_BTEE
capalias Gd IGNORE XENIX double
  ACS_TTEE
capalias Gh IGNORE XENIX double-ACS_HLINE
capalias Gv IGNORE XENIX double-ACS_VLINE
capalias Gc IGNORE XENIX double-ACS_PLUS
capalias GG IGNORE XENIX acs-glitch
#
# IBM extensions:
#
capalias kq %1 IBM key_help
#
# Iris extensions:
#
capalias HS mh IRIS enter_dim_mode
#
# Tektronix extensions:
#
capalias KA k; Tek key_f10
capalias KB F1 Tek key_f11

```

```

capalias KC F2 Tek key_f12
capalias KD F3 Tek key_f13
capalias KE F4 Tek key_f14
capalias KF F5 Tek key_f15
capalias BC Sb Tek set_background
capalias FC Sf Tek set_foreground
#
# There are also the following:
#
# XENIX XENIX variable name name clash with terminfo?
# -----
# CL key_char_left
# CR key_char_right
# CW key_change_window
# HP ??
# LF key_linefeed
  label_off
# NU key_next_unlocked_cell
# PL ??
# PR ??
# RC key_recalc remove_clock
# RF key_toggle_ref req_for_input
# WL key_word_left
# WR key_word_right
#
# If you know what any of the question-marked ones mean, please tell us.
#
#----- Terminfo aliases -----
#
# IBM extensions:
#
infoalias font0 s0ds IBM set0_des_seq
infoalias font1 s1ds IBM set1_des_seq
infoalias font2 s2ds IBM set2_des_seq
infoalias font3 s3ds IBM set3_des_seq
infoalias kbtabs kcbt IBM key_backtab
infoalias ksel kslt IBM key_select
#
# Some others are identical to SVr4/XPG4 capabilities, in particular:
# kcmd, kend, khlp, and kf11...kf63.
#
#####
#
# The following sets edit modes for GNU EMACS
# Local Variables:
# case-fold-search:nil
# truncate-lines:t
# End:

```

Found in path(s):

\* /opt/cola/permits/1600019816\_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/include/Caps.keys

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\* @Id: curs\_opaque.3x,v 1.6 2007/09/08 18:49:13 tom Exp @

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5.7/doc/html/man/curs\_opaque.3x.html

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archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/ncurses/trace/lib_tracebits.c
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*
* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-archive-
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* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/ncurses/tinfo/lib_ttyflags.c
* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
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* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-

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archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/ncurses/trace/lib_tracechr.c
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* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
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*
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* @Id: clear.1,v 1.6 2006/12/24 18:07:53 tom Exp @
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* @Id: curs_border_set.3x,v 1.6 2005/05/15 16:17:37 tom Exp @
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\* @Id: curs\_terminfo.3x,v 1.30 2008/08/16 20:53:27 tom Exp @

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-----
```

-- \$Id: READ.ME,v 1.9 2006/04/22 23:13:05 tom Exp \$

This is a clone of the menu library that is available with typical System V curses implementations (ETI).

It is modelled after the documentation that comes for this library with a 386 based SVR4 implementation (ESIX).

The development environment was and is an ELF based Linux system.

For things that still need doing, see the TO-DO file in the top-level directory.

Juergen Pfeifer

Found in path(s):

\* /opt/cola/permits/1600019816\_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/menu/README

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```
# $Id: modules,v 1.15 2006/12/24 00:52:58 tom Exp $
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#####
#
# Author: Thomas E. Dickey 1995-on
#

@ base
# Library objects
f_trace lib $(srcdir) $(FORM_PRIV_H)
```

fld\_arg lib \$(srcdir) \$(FORM\_PRIV\_H)  
fld\_attr lib \$(srcdir) \$(FORM\_PRIV\_H)  
fld\_current lib \$(srcdir) \$(FORM\_PRIV\_H)  
fld\_def lib \$(srcdir) \$(FORM\_PRIV\_H)  
fld\_dup lib \$(srcdir) \$(FORM\_PRIV\_H)  
fld\_ftchoice lib \$(srcdir) \$(FORM\_PRIV\_H)  
fld\_ftlink lib \$(srcdir) \$(FORM\_PRIV\_H)  
fld\_info lib \$(srcdir) \$(FORM\_PRIV\_H)  
fld\_just lib \$(srcdir) \$(FORM\_PRIV\_H)  
fld\_link lib \$(srcdir) \$(FORM\_PRIV\_H)  
fld\_max lib \$(srcdir) \$(FORM\_PRIV\_H)  
fld\_move lib \$(srcdir) \$(FORM\_PRIV\_H)  
fld\_newftyp lib \$(srcdir) \$(FORM\_PRIV\_H)  
fld\_opts lib \$(srcdir) \$(FORM\_PRIV\_H)  
fld\_pad lib \$(srcdir) \$(FORM\_PRIV\_H)  
fld\_page lib \$(srcdir) \$(FORM\_PRIV\_H)  
fld\_stat lib \$(srcdir) \$(FORM\_PRIV\_H)  
fld\_type lib \$(srcdir) \$(FORM\_PRIV\_H)  
fld\_user lib \$(srcdir) \$(FORM\_PRIV\_H)  
frm\_cursor lib \$(srcdir) \$(FORM\_PRIV\_H)  
frm\_data lib \$(srcdir) \$(FORM\_PRIV\_H)  
frm\_def lib \$(srcdir) \$(FORM\_PRIV\_H)  
frm\_driver lib \$(srcdir) \$(FORM\_PRIV\_H)  
frm\_hook lib \$(srcdir) \$(FORM\_PRIV\_H)  
frm\_opts lib \$(srcdir) \$(FORM\_PRIV\_H)  
frm\_page lib \$(srcdir) \$(FORM\_PRIV\_H)  
frm\_post lib \$(srcdir) \$(FORM\_PRIV\_H)  
frm\_req\_name lib \$(srcdir) \$(FORM\_PRIV\_H)  
frm\_scale lib \$(srcdir) \$(FORM\_PRIV\_H)  
frm\_sub lib \$(srcdir) \$(FORM\_PRIV\_H)  
frm\_user lib \$(srcdir) \$(FORM\_PRIV\_H)  
frm\_win lib \$(srcdir) \$(FORM\_PRIV\_H)  
fty\_alnum lib \$(srcdir) \$(FORM\_PRIV\_H)  
fty\_alpha lib \$(srcdir) \$(FORM\_PRIV\_H)  
fty\_enum lib \$(srcdir) \$(FORM\_PRIV\_H)  
fty\_int lib \$(srcdir) \$(FORM\_PRIV\_H)  
fty\_ipv4 lib \$(srcdir) \$(FORM\_PRIV\_H)  
fty\_num lib \$(srcdir) \$(FORM\_PRIV\_H)  
fty\_regex lib \$(srcdir) \$(FORM\_PRIV\_H)

#

vile:makemode

Found in path(s):

\* /opt/cola/permits/1600019816\_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/form/modules

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*****/

```

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archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/ncurses/base/key_defined.c
* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/test/background.c

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```

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*****
* @Id: curs_deleteln.3x,v 1.11 2007/06/02 20:40:07 tom Exp @
-->

```

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```

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archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-
5.7/doc/html/man/curs_deleteln.3x.html

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archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/misc/ncu-indent
* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/misc/jpf-indent

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#####
# $Id: xterm-16color.dat,v 1.2 2006/04/22 21:40:00 tom Exp $
# This illustrates the predefined colors for XFree86 xterm's "xterm-16color".
# If you set $TERM to "xterm-88color" (and have xterm compiled to support the
# 88-color or 256-color feature), you can use the ncurses 'd' screen to
# manipulate the colors shown in the screen. The 'd' screen is limited to
# the first 16 colors, and xterm happens to use the same first 16 colors in
# the extended color models that support initc.
#
# The colors shown are for xterm patch #189.
scale:255
0: 0 0 0 black
1: 205 0 0 red3
2: 0 205 0 green3
3: 205 205 0 yellow3
4: 30 144 255 DodgerBlue1
5: 205 0 205 magenta3
6: 0 205 205 cyan3
7: 229 229 229 gray90
8: 127 127 127 gray50
9: 255 0 0 red
10: 0 255 0 green
11: 255

```

255 0 yellow  
12: 99 184 255 SteelBlue1  
13: 255 0 255 magenta  
14: 0 255 255 cyan  
15: 255 255 255 white

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\* /opt/cola/permits/1600019816\_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/test/xterm-16color.dat  
No license file was found, but licenses were detected in source scan.

-- \*- ada -\*

define(`HTMLNAME',`terminal\_interface-curses-panels\_\_ads.htm')dnl  
include(M4MACRO)dnl

-----  
--  
-- GNAT ncurses Binding --  
--  
-- Terminal\_Interface.Curses.Panels --  
--  
-- S P E C --  
--  
-----

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-----  
-- Author: Juergen Pfeifer, 1996

-- Version Control:

-- \$Revision:

1.19 \$

-- \$Date: 2006/06/25 14:30:22 \$

-- Binding Version 01.00  
-----

with System;

package Terminal\_Interface.Curses.Panels is

pragma Preelaborate (Terminal\_Interface.Curses.Panels);

include(^Panel\_Linker\_Options')dnl

include(^Linker\_Options')

type Panel is private;

-----  
-- Interface constants --  
-----

Null\_Panel : constant Panel;

-----  
-- Exceptions --  
-----

Panel\_Exception : exception;

-- MANPAGE(^panel.3x')

-- ANCHOR(^new\_panel(),^Create')

function Create (Win : Window) return Panel;

-- AKA

pragma Inline (Create);

-- ANCHOR(^new\_panel(),^New\_Panel')

function New\_Panel (Win : Window) return Panel renames Create;

-- AKA

-- pragma Inline (New\_Panel);

-- ANCHOR(^bottom\_panel(),^Bottom')

procedure Bottom (Pan : in Panel);

-- AKA

pragma Inline

(Bottom);

-- ANCHOR(^top\_panel(),^Top')

```

procedure Top (Pan : in Panel);
-- AKA
pragma Inline (Top);

-- ANCHOR(`show_panel()`,`Show`)
procedure Show (Pan : in Panel);
-- AKA
pragma Inline (Show);

-- ANCHOR(`update_panels()`,`Update_Panels`)
procedure Update_Panels;
-- AKA
pragma Import (C, Update_Panels, "update_panels");

-- ANCHOR(`hide_panel()`,`Hide`)
procedure Hide (Pan : in Panel);
-- AKA
pragma Inline (Hide);

-- ANCHOR(`panel_window()`,`Get_Window`)
function Get_Window (Pan : Panel) return Window;
-- AKA
pragma Inline (Get_Window);

-- ANCHOR(`panel_window()`,`Panel_Window`)
function Panel_Window (Pan : Panel) return Window renames Get_Window;
-- pragma Inline (Panel_Window);

-- ANCHOR(`replace_panel()`,`Replace`)
procedure Replace (Pan : in Panel;
                  Win : in Window);
-- AKA
pragma Inline (Replace);

-- ANCHOR(`move_panel()`,`Move`)
procedure Move (Pan
              : in Panel;
                Line   : in Line_Position;
                Column : in Column_Position);
-- AKA
pragma Inline (Move);

-- ANCHOR(`panel_hidden()`,`Is_Hidden`)
function Is_Hidden (Pan : Panel) return Boolean;
-- AKA
pragma Inline (Is_Hidden);

-- ANCHOR(`panel_above()`,`Above`)

```

```

function Above (Pan : Panel) return Panel;
-- AKA
pragma Import (C, Above, "panel_above");

-- ANCHOR(`panel_below()`,`Below`)
function Below (Pan : Panel) return Panel;
-- AKA
pragma Import (C, Below, "panel_below");

-- ANCHOR(`del_panel()`,`Delete`)
procedure Delete (Pan : in out Panel);
-- AKA
pragma Inline (Delete);

```

```
private
```

```

    type Panel is new System.Storage_Elements.Integer_Address;
    Null_Panel : constant Panel := 0;

```

```
end Terminal_Interface.Curses.Panels;
```

Found in path(s):

```

* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/Ada95/gen/terminal_interface-
curses-panels.ads.m4

```

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# $Id: headers,v 1.3 2006/12/24 16:25:45 tom Exp $
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#####
#
# Author: Thomas E. Dickey <dickey@clark.net> 1997
#
$(srcdir)/cursesapp.h
$(srcdir)/cursesf.h
$(srcdir)/cursesm.h
$(srcdir)/cursesp.h
$(srcdir)/cursesw.h
$(srcdir)/cursslk.h
etip.h
# vile:makemode

```

Found in path(s):

```

* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
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*****
* @Id: form_field_validation.3x,v 1.16 2006/12/24 16:08:08 tom Exp @
-->
```

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```
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archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-
5.7/doc/html/man/form_field_validation.3x.html
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*****/
```

```
/******
```



```
* Author: Zeyd M. Ben-Halim <zmbenhal@netcom.com> 1992,1995      *
*   and: Eric S. Raymond <esr@snark.thyrsus.com>                *
*   and: Thomas E. Dickey          1996-on                      *
*****
```

```
/* $Id: curses.h.in,v 1.187 2008/08/30 20:11:29 tom Exp $ */
```

```
#ifndef __NCURSES_H
#define __NCURSES_H
```

```
#define CURSES 1
#define CURSES_H 1
```

```
/* This should be defined for the enhanced functionality to be visible.
* However, some of the wide-character (enhanced) functionality is missing.
* So we do not define it (yet).
#define _XOPEN_CURSES 1
*/
```

```
/* These are defined only in curses.h, and are used for conditional compiles */
#define
  NCURSES_VERSION_MAJOR @NCURSES_MAJOR@
#define NCURSES_VERSION_MINOR @NCURSES_MINOR@
#define NCURSES_VERSION_PATCH @NCURSES_PATCH@
```

```
/* This is defined in more than one ncurses header, for identification */
#undef NCURSES_VERSION
#define NCURSES_VERSION "@NCURSES_MAJOR@.@NCURSES_MINOR@"
```

```
/*
* Identify the mouse encoding version.
*/
#define NCURSES_MOUSE_VERSION @NCURSES_MOUSE_VERSION@
```

```
/*
* Definitions to facilitate DLL's.
*/
#include <ncurses_dll.h>
```

```
/*
* User-definable tweak to disable the include of <stdbool.h>.
*/
#ifndef NCURSES_ENABLE_STDBOOL_H
#define NCURSES_ENABLE_STDBOOL_H @cf_cv_header_stdbool_h@
#endif
```

```
/*
* NCURSES_ATTR_T is used to quiet compiler warnings when building ncurses
```

```

* configured using --disable-macros.
*/
#ifdef NCURSES_NOMACROS
#ifndef NCURSES_ATTR_T
#define NCURSES_ATTR_T attr_t
#endif
#endif /* NCURSES_NOMACROS */

#ifndef NCURSES_ATTR_T
#define NCURSES_ATTR_T int
#endif

/*
* Expands to 'const' if ncurses is configured using --enable-const.
  Note that
* doing so makes it incompatible with other implementations of X/Open Curses.
*/
#undef NCURSES_CONST
#define NCURSES_CONST @NCURSES_CONST@

#undef NCURSES_INLINE
#define NCURSES_INLINE @NCURSES_INLINE@

/*
* The internal type used for color values
*/
#undef NCURSES_COLOR_T
#define NCURSES_COLOR_T short

/*
* Definition used to make WINDOW and similar structs opaque.
*/
#ifndef @cf_cv_enable_opaque@
#define NCURSES_OPAQUE @NCURSES_OPAQUE@
#endif

/*
* The internal type used for window dimensions.
*/
#undef NCURSES_SIZE_T
#define NCURSES_SIZE_T @NCURSES_SIZE_T@

/*
* Control whether tparm() supports varargs or fixed-parameter list.
*/
#undef NCURSES_TPARAM_VARARGS
#define NCURSES_TPARAM_VARARGS @NCURSES_TPARAM_VARARGS@

```

```

/*
 * NCURSES_CH_T is used in building the library, but not used otherwise in
 * this header file, since that would make the normal/wide-character versions
 * of the header incompatible.
 */
#undef NCURSES_CH_T
#define NCURSES_CH_T @NCURSES_CH_T@

#if
    @cf_cv_enable_lp64@ && defined(_LP64)
typedef unsigned chtype;
typedef unsigned mmask_t;
#else
typedef unsigned @cf_cv_typeof_chtype@ chtype;
typedef unsigned @cf_cv_typeof_mmask_t@ mmask_t;
#endif

#include <stdio.h>
#include <unctrl.h>
#include <stdarg.h> /* we need va_list */
#ifdef _XOPEN_SOURCE_EXTENDED
#include <stddef.h> /* we want wchar_t */
#endif /* _XOPEN_SOURCE_EXTENDED */

/* X/Open and SVr4 specify that curses implements 'bool'. However, C++ may also
 * implement it. If so, we must use the C++ compiler's type to avoid conflict
 * with other interfaces.
 *
 * A further complication is that <stdbool.h> may declare 'bool' to be a
 * different type, such as an enum which is not necessarily compatible with
 * C++. If we have <stdbool.h>, make 'bool' a macro, so users may #undef it.
 * Otherwise, let it remain a typedef to avoid conflicts with other #define's.
 * In either case, make a typedef for NCURSES_BOOL which can be used if needed
 * from either C or C++.
 */

#undef
    TRUE
#define TRUE 1

#undef FALSE
#define FALSE 0

typedef @cf_cv_type_of_bool@ NCURSES_BOOL;

#if @USE_CXX_BOOL@ /* __cplusplus, etc. */

/* use the C++ compiler's bool type */

```

```

#define NCURSES_BOOL bool

#else /* c89, c99, etc. */

#if NCURSES_ENABLE_STDBOOL_H
#include <stdbool.h>
/* use whatever the C compiler decides bool really is */
#define NCURSES_BOOL bool
#else
/* there is no predefined bool - use our own */
#undef bool
#define bool NCURSES_BOOL
#endif

#endif /* !__cplusplus, etc. */

#ifdef __cplusplus
extern "C" {
#define NCURSES_CAST(type,value) static_cast<type>(value)
#else
#define NCURSES_CAST(type,value) (type)(value)
#endif

/*
 * X/Open attributes. In the ncurses implementation, they are identical to the
 * A_ attributes.
 */
#define WA_ATTRIBUTES A_ATTRIBUTES
#define WA_NORMAL A_NORMAL
#define WA_STANDOUT A_STANDOUT
#define WA_UNDERLINE A_UNDERLINE
#define WA_REVERSE A_REVERSE
#define WA_BLINK A_BLINK
#define WA_DIM A_DIM
#define WA_BOLD A_BOLD
#define WA_ALTCHARSET A_ALTCHARSET
#define
    WA_INVIS A_INVIS
#define WA_PROTECT A_PROTECT
#define WA_HORIZONTAL A_HORIZONTAL
#define WA_LEFT A_LEFT
#define WA_LOW A_LOW
#define WA_RIGHT A_RIGHT
#define WA_TOP A_TOP
#define WA_VERTICAL A_VERTICAL

/* colors */
#define COLOR_BLACK 0

```

```

#define COLOR_RED 1
#define COLOR_GREEN 2
#define COLOR_YELLOW 3
#define COLOR_BLUE 4
#define COLOR_MAGENTA 5
#define COLOR_CYAN 6
#define COLOR_WHITE 7

/* line graphics */

#if @BROKEN_LINKER@ || @cf_cv_enable_reentrant@
NCURSES_WRAPPED_VAR(chtype*, acs_map);
#define acs_map (_nc_acs_map())
#else
extern NCURSES_EXPORT_VAR(chtype) acs_map[];
#endif

#define NCURSES_ACS(c) (acs_map[NCURSES_CAST(unsigned char,c)])

/* VT100 symbols begin here */
#define ACS_ULCORNER NCURSES_ACS('l') /* upper left corner */
#define ACS_LLCORNER NCURSES_ACS('m') /* lower left corner */
#define ACS_URCORNER NCURSES_ACS('k') /* upper right corner */
#define ACS_LRCORNER NCURSES_ACS('j') /* lower right corner */
#define ACS_LTEE NCURSES_ACS('t')
/* tee pointing right */
#define ACS_RTEE NCURSES_ACS('u') /* tee pointing left */
#define ACS_BTEE NCURSES_ACS('v') /* tee pointing up */
#define ACS_TTEE NCURSES_ACS('w') /* tee pointing down */
#define ACS_HLINE NCURSES_ACS('q') /* horizontal line */
#define ACS_VLINE NCURSES_ACS('x') /* vertical line */
#define ACS_PLUS NCURSES_ACS('n') /* large plus or crossover */
#define ACS_S1 NCURSES_ACS('o') /* scan line 1 */
#define ACS_S9 NCURSES_ACS('s') /* scan line 9 */
#define ACS_DIAMOND NCURSES_ACS('^') /* diamond */
#define ACS_CKBOARD NCURSES_ACS('a') /* checker board (stipple) */
#define ACS_DEGREE NCURSES_ACS('f') /* degree symbol */
#define ACS_PLMINUS NCURSES_ACS('g') /* plus/minus */
#define ACS_BULLET NCURSES_ACS('~') /* bullet */
/* Teletype 5410v1 symbols begin here */
#define ACS_LARROW NCURSES_ACS(',') /* arrow pointing left */
#define ACS_RARROW NCURSES_ACS('+') /* arrow pointing right */
#define ACS_DARROW NCURSES_ACS('.') /* arrow pointing down */
#define ACS_UARROW NCURSES_ACS('-')
/* arrow pointing up */
#define ACS_BOARD NCURSES_ACS('h') /* board of squares */
#define ACS_LANTERN NCURSES_ACS('i') /* lantern symbol */
#define ACS_BLOCK NCURSES_ACS('0') /* solid square block */

```

```

/*
* These aren't documented, but a lot of System Vs have them anyway
* (you can spot pprryzz{||} in a lot of AT&T terminfo strings).
* The ACS_names may not match AT&T's, our source didn't know them.
*/
#define ACS_S3 NCURSES_ACS('p') /* scan line 3 */
#define ACS_S7 NCURSES_ACS('r') /* scan line 7 */
#define ACS_LEQUAL NCURSES_ACS('y') /* less/equal */
#define ACS_GEQUAL NCURSES_ACS('z') /* greater/equal */
#define ACS_PI NCURSES_ACS('{') /* Pi */
#define ACS_NEQUAL NCURSES_ACS('|') /* not equal */
#define ACS_STERLING NCURSES_ACS('}') /* UK pound sign */

/*
* Line drawing ACS names are of the form ACS_trbl, where t is the top, r
* is the right, b is the bottom, and l is the left. t, r, b, and l might
* be B (blank), S (single), D (double), or T (thick).
* The subset defined
* here only uses B and S.
*/
#define ACS_BSSB ACS_ULCORNER
#define ACS_SSBB ACS_LLCORNER
#define ACS_BBSS ACS_URCORNER
#define ACS_SBBS ACS_LRCORNER
#define ACS_SBSS ACS_RTEE
#define ACS_SSSB ACS_LTEE
#define ACS_SSBS ACS_BTEE
#define ACS_BSSS ACS_TTEE
#define ACS_BSBS ACS_HLINE
#define ACS_SBSB ACS_VLINE
#define ACS_SSSS ACS_PLUS

#undef ERR
#define ERR (-1)

#undef OK
#define OK (0)

/* values for the _flags member */
#define _SUBWIN 0x01 /* is this a sub-window? */
#define _ENDLINE 0x02 /* is the window flush right? */
#define _FULLWIN 0x04 /* is the window full-screen? */
#define _SCROLLWIN 0x08 /* bottom edge is at screen bottom? */
#define _ISPAD 0x10 /* is this window a pad? */
#define _HASMOVED 0x20 /* has cursor moved since last refresh? */
#define _WRAPPED 0x40 /* cursor was just wrapped */

/*

```

```

* this value is used in the firstchar and lastchar fields to mark
* unchanged lines
*/
#define _NOCHANGE
    -1

/*
* this value is used in the oldindex field to mark lines created by insertions
* and scrolls.
*/
#define _NEWINDEX -1

typedef struct screen SCREEN;
typedef struct _win_st WINDOW;

typedef chtype attr_t; /* ...must be at least as wide as chtype */

#ifdef _XOPEN_SOURCE_EXTENDED

#if @NCURSES_LIBUTF8@
#ifdef mblen /* libutf8.h defines it w/o undefining first */
#undef mblen
#endif
#include <libutf8.h>
#endif

#if @NEED_WCHAR_H@
#include <wchar.h> /* ...to get mbstate_t, etc. */
#endif

#if @NCURSES_WCHAR_T@
typedef unsigned short wchar_t@NCURSES_OK_WCHAR_T@;
#endif

#if @NCURSES_WINT_T@
typedef unsigned int wint_t@NCURSES_OK_WCHAR_T@;
#endif

#define CCHARW_MAX 5
typedef struct
{
    attr_t attr;
    wchar_t chars[CCHARW_MAX];
#if @NCURSES_EXT_COLORS@
#undef NCURSES_EXT_COLORS
#define NCURSES_EXT_COLORS @NCURSES_PATCH@
    int ext_color; /* color pair, must be more than 16-bits */
#endif
}

```

```

}
cchar_t;

#endif /* _XOPEN_SOURCE_EXTENDED */

#if !NCURSES_OPAQUE
struct
  ldat;

struct _win_st
{
  NCURSES_SIZE_T _cury, _curx; /* current cursor position */

  /* window location and size */
  NCURSES_SIZE_T _maxy, _maxx; /* maximums of x and y, NOT window size */
  NCURSES_SIZE_T _begy, _begx; /* screen coords of upper-left-hand corner */

  short _flags; /* window state flags */

  /* attribute tracking */
  attr_t _attrs; /* current attribute for non-space character */
  chtype _bkgd; /* current background char/attribute pair */

  /* option values set by user */
  bool _notimeout; /* no time out on function-key entry? */
  bool _clear; /* consider all data in the window invalid? */
  bool _leaveok; /* OK to not reset cursor on exit? */
  bool _scroll; /* OK to scroll this window? */
  bool _idlok; /* OK to use insert/delete line? */
  bool _idcok; /* OK to use insert/delete char? */
  bool _immed; /* window in immed mode? (not yet used) */
  bool _sync; /* window in sync mode? */
  bool _use_keypad; /* process function keys into KEY_ symbols? */
  int _delay; /*
  0 = nodelay, <0 = blocking, >0 = delay */

  struct ldat *_line; /* the actual line data */

  /* global screen state */
  NCURSES_SIZE_T _regtop; /* top line of scrolling region */
  NCURSES_SIZE_T _regbottom; /* bottom line of scrolling region */

  /* these are used only if this is a sub-window */
  int _parx; /* x coordinate of this window in parent */
  int _pary; /* y coordinate of this window in parent */
  WINDOW *_parent; /* pointer to parent if a sub-window */

  /* these are used only if this is a pad */

```



```

struct pdat
{
    NCURSES_SIZE_T _pad_y,   _pad_x;
    NCURSES_SIZE_T _pad_top, _pad_left;
    NCURSES_SIZE_T _pad_bottom, _pad_right;
} _pad;

NCURSES_SIZE_T _yoffset; /* real begy is _begy + _yoffset */

#ifdef _XOPEN_SOURCE_EXTENDED
    cchar_t _bkgrnd; /* current background char/attribute pair */
    #if @NCURSES_EXT_COLORS@
        int _color; /* current color-pair for non-space character */
    #endif
    #endif
};
#endif /* NCURSES_OPAQUE */

/*
 * This is an extension to
 * support events...
 */
#if @NCURSES_EXT_FUNCS@
#ifdef NCURSES_WGETCH_EVENTS
#if !defined(__BEOS__) || defined(__HAIKU__)
    /* Fix _nc_timed_wait() on BEOS... */
    # define NCURSES_EVENT_VERSION 1
#endif /* !defined(__BEOS__) */

/*
 * Bits to set in _nc_event.data.flags
 */
# define _NC_EVENT_TIMEOUT_MSEC 1
# define _NC_EVENT_FILE 2
# define _NC_EVENT_FILE_READABLE 2
# if 0 /* Not supported yet... */
# define _NC_EVENT_FILE_WRITABLE 4
# define _NC_EVENT_FILE_EXCEPTION 8
# endif

typedef struct
{
    int type;
    union
    {
        long timeout_msec; /* _NC_EVENT_TIMEOUT_MSEC */
    }
    struct
    {

```

```

    unsigned int flags;
    int fd;
    unsigned int result;
} fev; /* _NC_EVENT_FILE */
} data;
} _nc_event;

typedef struct
{
    int count;
    int result_flags; /* _NC_EVENT_TIMEOUT_MSEC or _NC_EVENT_FILE_READABLE */
    _nc_event *events[1];
} _nc_eventlist;

extern NCURSES_EXPORT(int) wgetch_events(WINDOW *, _nc_eventlist *); /* experimental */
extern NCURSES_EXPORT(int) wgetnstr_events(WINDOW
*,char *,int,_nc_eventlist *);/* experimental */

#endif /* NCURSES_WGETCH_EVENTS */
#endif /* NCURSES_EXT_FUNCS */

/*
 * GCC (and some other compilers) define '__attribute__'; we're using this
 * macro to alert the compiler to flag inconsistencies in printf/scanf-like
 * function calls. Just in case '__attribute__' isn't defined, make a dummy.
 * Old versions of G++ do not accept it anyway, at least not consistently with
 * GCC.
 */
#if !(defined(__GNUC__) || defined(__GNUG__) || defined(__attribute__))
#define __attribute__(p) /* nothing */
#endif

/*
 * We cannot define these in ncurses_cfg.h, since they require parameters to be
 * passed (that is non-portable). If you happen to be using gcc with warnings
 * enabled, define
 * GCC_PRINTF
 * GCC_SCANF
 * to improve checking of calls to printw(), etc.
 */
#ifndef GCC_PRINTFLIKE
#if defined(GCC_PRINTF) && !defined(printf)
#define GCC_PRINTFLIKE(fmt,var) __attribute__((format(printf,fmt,var)))
#else
#define GCC_PRINTFLIKE(fmt,var)
/*nothing*/
#endif
#endif
#endif

```

```

#ifndef GCC_SCANFLIKE
#if defined(GCC_SCANF) && !defined(scanf)
#define GCC_SCANFLIKE(fmt,var) __attribute__((format(scanf,fmt,var)))
#else
#define GCC_SCANFLIKE(fmt,var) /*nothing*/
#endif
#endif

#ifndef GCC_NORETURN
#define GCC_NORETURN /* nothing */
#endif

#ifndef GCC_UNUSED
#define GCC_UNUSED /* nothing */
#endif

/*
 * Function prototypes. This is the complete X/Open Curses list of required
 * functions. Those marked `generated' will have sources generated from the
 * macro definitions later in this file, in order to satisfy XPG4.2
 * requirements.
 */

extern NCURSES_EXPORT(int) addch (const chtype); /* generated */
extern NCURSES_EXPORT(int) addchnstr (const chtype *, int); /* generated */
extern NCURSES_EXPORT(int) addchstr (const chtype *); /* generated */
extern NCURSES_EXPORT(int) addnstr (const char *, int); /* generated */
extern NCURSES_EXPORT(int) addstr (const char *); /* generated */
extern NCURSES_EXPORT(int)
    attroff (NCURSES_ATTR_T); /* generated */
extern NCURSES_EXPORT(int) attron (NCURSES_ATTR_T); /* generated */
extern NCURSES_EXPORT(int) attrset (NCURSES_ATTR_T); /* generated */
extern NCURSES_EXPORT(int) attr_get (attr_t *, short *, void *); /* generated */
extern NCURSES_EXPORT(int) attr_off (attr_t, void *); /* generated */
extern NCURSES_EXPORT(int) attr_on (attr_t, void *); /* generated */
extern NCURSES_EXPORT(int) attr_set (attr_t, short, void *); /* generated */
extern NCURSES_EXPORT(int) baudrate (void); /* implemented */
extern NCURSES_EXPORT(int) beep (void); /* implemented */
extern NCURSES_EXPORT(int) bkgd (chtype); /* generated */
extern NCURSES_EXPORT(void) bkgdset (chtype); /* generated */
extern NCURSES_EXPORT(int) border (chtype, chtype, chtype, chtype, chtype, chtype, chtype, chtype); /* generated */
extern NCURSES_EXPORT(int) box (WINDOW *, chtype, chtype); /* generated */
extern NCURSES_EXPORT(bool) can_change_color (void); /* implemented */
extern
    NCURSES_EXPORT(int) cbreak (void); /* implemented */
extern NCURSES_EXPORT(int) chgat (int, attr_t, short, const void *); /* generated */
extern NCURSES_EXPORT(int) clear (void); /* generated */

```

```

extern NCURSES_EXPORT(int) clearok (WINDOW *,bool); /* implemented */
extern NCURSES_EXPORT(int) clrtoeol (void); /* generated */
extern NCURSES_EXPORT(int) clrtoeol (void); /* generated */
extern NCURSES_EXPORT(int) color_content (short,short*,short*,short*); /* implemented */
extern NCURSES_EXPORT(int) color_set (short,void*); /* generated */
extern NCURSES_EXPORT(int) COLOR_PAIR (int); /* generated */
extern NCURSES_EXPORT(int) copywin (const WINDOW*,WINDOW*,int,int,int,int,int,int,int); /* implemented */
*/
extern NCURSES_EXPORT(int) curs_set (int); /* implemented */
extern NCURSES_EXPORT(int) def_prog_mode (void); /* implemented */
extern NCURSES_EXPORT(int) def_shell_mode (void); /* implemented */
extern NCURSES_EXPORT(int) delay_output (int); /* implemented */
*/
extern NCURSES_EXPORT(int) delch (void); /* generated */
extern NCURSES_EXPORT(void) delscreen (SCREEN *); /* implemented */
extern NCURSES_EXPORT(int) delwin (WINDOW *); /* implemented */
extern NCURSES_EXPORT(int) deleteln (void); /* generated */
extern NCURSES_EXPORT(WINDOW *) derwin (WINDOW *,int,int,int,int); /* implemented */
extern NCURSES_EXPORT(int) douupdate (void); /* implemented */
extern NCURSES_EXPORT(WINDOW *) dupwin (WINDOW *); /* implemented */
extern NCURSES_EXPORT(int) echo (void); /* implemented */
extern NCURSES_EXPORT(int) echochar (const chtype); /* generated */
extern NCURSES_EXPORT(int) erase (void); /* generated */
extern NCURSES_EXPORT(int) endwin (void); /* implemented */
extern NCURSES_EXPORT(char) erasechar (void); /* implemented */
extern NCURSES_EXPORT(void) filter (void); /* implemented */
extern NCURSES_EXPORT(int) flash (void); /* implemented */
extern NCURSES_EXPORT(int) flushinp (void); /* implemented */
extern
NCURSES_EXPORT(chtype) getbkgd (WINDOW *); /* generated */
extern NCURSES_EXPORT(int) getch (void); /* generated */
extern NCURSES_EXPORT(int) getnstr (char *, int); /* generated */
extern NCURSES_EXPORT(int) getstr (char *); /* generated */
extern NCURSES_EXPORT(WINDOW *) getwin (FILE *); /* implemented */
extern NCURSES_EXPORT(int) halfdelay (int); /* implemented */
extern NCURSES_EXPORT(bool) has_colors (void); /* implemented */
extern NCURSES_EXPORT(bool) has_ic (void); /* implemented */
extern NCURSES_EXPORT(bool) has_il (void); /* implemented */
extern NCURSES_EXPORT(int) hline (chtype, int); /* generated */
extern NCURSES_EXPORT(void) idcok (WINDOW *, bool); /* implemented */
extern NCURSES_EXPORT(int) idlok (WINDOW *, bool); /* implemented */
extern NCURSES_EXPORT(void) immedok (WINDOW *, bool); /* implemented */
extern NCURSES_EXPORT(chtype) inch (void); /* generated */
extern NCURSES_EXPORT(int) inchnstr (chtype *, int); /* generated */
*/
extern NCURSES_EXPORT(int) inchstr (chtype *); /* generated */
extern NCURSES_EXPORT(WINDOW *) initscr (void); /* implemented */
extern NCURSES_EXPORT(int) init_color (short,short,short,short); /* implemented */

```

```

extern NCURSES_EXPORT(int) init_pair (short,short,short); /* implemented */
extern NCURSES_EXPORT(int) innstr (char *, int); /* generated */
extern NCURSES_EXPORT(int) insch (chtype); /* generated */
extern NCURSES_EXPORT(int) insdelln (int); /* generated */
extern NCURSES_EXPORT(int) insertln (void); /* generated */
extern NCURSES_EXPORT(int) insnstr (const char *, int); /* generated */
extern NCURSES_EXPORT(int) insstr (const char *); /* generated */
extern NCURSES_EXPORT(int) instr (char *); /* generated */
extern NCURSES_EXPORT(int) intrflush (WINDOW *,bool); /* implemented */
extern NCURSES_EXPORT(bool) isendwin (void); /* implemented */
extern NCURSES_EXPORT(bool) is_linetouched (WINDOW *,int); /* implemented */
extern NCURSES_EXPORT(bool)
is_wintouched (WINDOW *); /* implemented */
extern NCURSES_EXPORT(NCURSES_CONST char *) keyname (int); /* implemented */
extern NCURSES_EXPORT(int) keypad (WINDOW *,bool); /* implemented */
extern NCURSES_EXPORT(char) killchar (void); /* implemented */
extern NCURSES_EXPORT(int) leaveok (WINDOW *,bool); /* implemented */
extern NCURSES_EXPORT(char *) longname (void); /* implemented */
extern NCURSES_EXPORT(int) meta (WINDOW *,bool); /* implemented */
extern NCURSES_EXPORT(int) move (int, int); /* generated */
extern NCURSES_EXPORT(int) mvaddch (int, int, const chtype); /* generated */
extern NCURSES_EXPORT(int) mvaddchnstr (int, int, const chtype *, int); /* generated */
extern NCURSES_EXPORT(int) mvaddchstr (int, int, const chtype *); /* generated */
extern NCURSES_EXPORT(int) mvaddnstr (int, int, const char *, int); /* generated */
extern NCURSES_EXPORT(int) mvaddstr (int, int, const char *); /* generated */
extern NCURSES_EXPORT(int) mvchgat (int, int, int,
attr_t, short, const void *); /* generated */
extern NCURSES_EXPORT(int) mvcur (int,int,int,int); /* implemented */
extern NCURSES_EXPORT(int) mvdelch (int, int); /* generated */
extern NCURSES_EXPORT(int) mvderwin (WINDOW *, int, int); /* implemented */
extern NCURSES_EXPORT(int) mvgetch (int, int); /* generated */
extern NCURSES_EXPORT(int) mvgetnstr (int, int, char *, int); /* generated */
extern NCURSES_EXPORT(int) mvgetstr (int, int, char *); /* generated */
extern NCURSES_EXPORT(int) mvhline (int, int, chtype, int); /* generated */
extern NCURSES_EXPORT(chtype) mvinch (int, int); /* generated */
extern NCURSES_EXPORT(int) mvinchnstr (int, int, chtype *, int); /* generated */
extern NCURSES_EXPORT(int) mvinchstr (int, int, chtype *); /* generated */
extern NCURSES_EXPORT(int) mvinnstr (int, int, char *, int); /* generated */
extern NCURSES_EXPORT(int) mvinsch (int, int, chtype); /* generated */
extern NCURSES_EXPORT(int) mvinsnstr (int, int, const char *, int); /*
generated */
extern NCURSES_EXPORT(int) mvinsstr (int, int, const char *); /* generated */
extern NCURSES_EXPORT(int) mvinstr (int, int, char *); /* generated */
extern NCURSES_EXPORT(int) mvprintw (int,int, const char *,...) /* implemented */
GCC_PRINTFLIKE(3,4);
extern NCURSES_EXPORT(int) mvscanw (int,int, NCURSES_CONST char *,...) /* implemented */
GCC_SCANFLIKE(3,4);
extern NCURSES_EXPORT(int) mvvline (int, int, chtype, int); /* generated */

```

```

extern NCURSES_EXPORT(int) mvwaddch (WINDOW *, int, int, const chtype); /* generated */
extern NCURSES_EXPORT(int) mvwaddchnstr (WINDOW *, int, int, const chtype *, int); /* generated */
extern NCURSES_EXPORT(int) mvwaddchstr (WINDOW *, int, int, const chtype *); /* generated */
extern NCURSES_EXPORT(int) mvwaddnstr (WINDOW *, int, int, const char *, int); /* generated */
extern NCURSES_EXPORT(int) mvwaddstr (WINDOW *, int, int, const char *); /* generated */
extern NCURSES_EXPORT(int) mvwchgat (WINDOW *, int, int, int, attr_t, short,
const void *); /* generated */
extern NCURSES_EXPORT(int) mvwdelch (WINDOW *, int, int); /* generated */
extern NCURSES_EXPORT(int) mvwgetch (WINDOW *, int, int); /* generated */
extern NCURSES_EXPORT(int) mvwgetnstr (WINDOW *, int, int, char *, int); /* generated */
extern NCURSES_EXPORT(int) mvwgetstr (WINDOW *, int, int, char *); /* generated */
extern NCURSES_EXPORT(int) mvwhline (WINDOW *, int, int, chtype, int); /* generated */
extern NCURSES_EXPORT(int) mvwin (WINDOW *,int,int); /* implemented */
extern NCURSES_EXPORT(chtype) mvwinch (WINDOW *, int, int); /* generated */
extern NCURSES_EXPORT(int) mvwinchnstr (WINDOW *, int, int, chtype *, int); /* generated */
extern NCURSES_EXPORT(int) mvwinchstr (WINDOW *, int, int, chtype *); /* generated */
extern NCURSES_EXPORT(int) mvwinnstr (WINDOW *, int, int, char *, int); /* generated */
extern NCURSES_EXPORT(int) mvwinsch (WINDOW *, int, int, chtype); /* generated */
extern NCURSES_EXPORT(int) mvwinsnstr (WINDOW *, int, int,
const char *, int); /* generated */
extern NCURSES_EXPORT(int) mvwinsstr (WINDOW *, int, int, const char *); /* generated */
extern NCURSES_EXPORT(int) mvwinstr (WINDOW *, int, int, char *); /* generated */
extern NCURSES_EXPORT(int) mvwprintw (WINDOW*,int,int, const char *,...) /* implemented */
GCC_PRINTFLIKE(4,5);
extern NCURSES_EXPORT(int) mvwscanw (WINDOW *,int,int, NCURSES_CONST char *,...) /* implemented */
GCC_SCANFLIKE(4,5);
extern NCURSES_EXPORT(int) mvwvline (WINDOW *,int, int, chtype, int); /* generated */
extern NCURSES_EXPORT(int) napms (int); /* implemented */
extern NCURSES_EXPORT(WINDOW *) newpad (int,int); /* implemented */
extern NCURSES_EXPORT(SCREEN *) newterm (NCURSES_CONST char *,FILE *,FILE *); /* implemented */
extern NCURSES_EXPORT(WINDOW *) newwin (int,int,int,int); /* implemented */
extern NCURSES_EXPORT(int) nl (void); /* implemented */
extern NCURSES_EXPORT(int) nocbreak (void); /* implemented */
extern NCURSES_EXPORT(int) nodelay
(WINDOW *,bool); /* implemented */
extern NCURSES_EXPORT(int) noecho (void); /* implemented */
extern NCURSES_EXPORT(int) nonl (void); /* implemented */
extern NCURSES_EXPORT(void) noqiflush (void); /* implemented */
extern NCURSES_EXPORT(int) noraw (void); /* implemented */
extern NCURSES_EXPORT(int) notimeout (WINDOW *,bool); /* implemented */
extern NCURSES_EXPORT(int) overlay (const WINDOW*,WINDOW *); /* implemented */
extern NCURSES_EXPORT(int) overwrite (const WINDOW*,WINDOW *); /* implemented */
extern NCURSES_EXPORT(int) pair_content (short,short*,short*); /* implemented */
extern NCURSES_EXPORT(int) PAIR_NUMBER (int); /* generated */
extern NCURSES_EXPORT(int) pechochar (WINDOW *, const chtype); /* implemented */
extern NCURSES_EXPORT(int) pnoutrefresh (WINDOW*,int,int,int,int,int,int); /* implemented */
extern NCURSES_EXPORT(int) prefresh (WINDOW *,int,int,int,int,int,int); /* implemented */
extern NCURSES_EXPORT(int) printw (const char *,...) /* implemented

```

```

*/
GCC_PRINTFLIKE(1,2);
extern NCURSES_EXPORT(int) putwin (WINDOW *, FILE *); /* implemented */
extern NCURSES_EXPORT(void) qiflush (void); /* implemented */
extern NCURSES_EXPORT(int) raw (void); /* implemented */
extern NCURSES_EXPORT(int) redrawwin (WINDOW *); /* generated */
extern NCURSES_EXPORT(int) refresh (void); /* generated */
extern NCURSES_EXPORT(int) resetty (void); /* implemented */
extern NCURSES_EXPORT(int) reset_prog_mode (void); /* implemented */
extern NCURSES_EXPORT(int) reset_shell_mode (void); /* implemented */
extern NCURSES_EXPORT(int) ripoffline (int, int (*)(WINDOW *, int)); /* implemented */
extern NCURSES_EXPORT(int) savetty (void); /* implemented */
extern NCURSES_EXPORT(int) scanw (NCURSES_CONST char *,...) /* implemented */
GCC_SCANFLIKE(1,2);
extern NCURSES_EXPORT(int) scr_dump (const char *); /* implemented */
extern NCURSES_EXPORT(int) scr_init (const char *); /* implemented */
extern NCURSES_EXPORT(int) scr1 (int); /*
generated */
extern NCURSES_EXPORT(int) scroll (WINDOW *); /* generated */
extern NCURSES_EXPORT(int) scrollok (WINDOW *,bool); /* implemented */
extern NCURSES_EXPORT(int) scr_restore (const char *); /* implemented */
extern NCURSES_EXPORT(int) scr_set (const char *); /* implemented */
extern NCURSES_EXPORT(int) setscreg (int,int); /* generated */
extern NCURSES_EXPORT(SCREEN *) set_term (SCREEN *); /* implemented */
extern NCURSES_EXPORT(int) slk_atroff (const chtype); /* implemented */
extern NCURSES_EXPORT(int) slk_attr_off (const attr_t, void *); /* generated:WIDEC */
extern NCURSES_EXPORT(int) slk_attron (const chtype); /* implemented */
extern NCURSES_EXPORT(int) slk_attr_on (attr_t,void*); /* generated:WIDEC */
extern NCURSES_EXPORT(int) slk_attrset (const chtype); /* implemented */
extern NCURSES_EXPORT(attr_t) slk_attr (void); /* implemented */
extern NCURSES_EXPORT(int) slk_attr_set (const attr_t,short,void*); /* implemented */
extern
NCURSES_EXPORT(int) slk_clear (void); /* implemented */
extern NCURSES_EXPORT(int) slk_color (short); /* implemented */
extern NCURSES_EXPORT(int) slk_init (int); /* implemented */
extern NCURSES_EXPORT(char *) slk_label (int); /* implemented */
extern NCURSES_EXPORT(int) slk_noutrefresh (void); /* implemented */
extern NCURSES_EXPORT(int) slk_refresh (void); /* implemented */
extern NCURSES_EXPORT(int) slk_restore (void); /* implemented */
extern NCURSES_EXPORT(int) slk_set (int,const char *,int); /* implemented */
extern NCURSES_EXPORT(int) slk_touch (void); /* implemented */
extern NCURSES_EXPORT(int) standout (void); /* generated */
extern NCURSES_EXPORT(int) standend (void); /* generated */
extern NCURSES_EXPORT(int) start_color (void); /* implemented */
extern NCURSES_EXPORT(WINDOW *) subpad (WINDOW *, int, int, int, int); /* implemented */
extern NCURSES_EXPORT(WINDOW *) subwin (WINDOW *, int, int, int, int); /* implemented */
extern NCURSES_EXPORT(int)

```

```

syncok (WINDOW *, bool); /* implemented */
extern NCURSES_EXPORT(ctype) termattrs (void); /* implemented */
extern NCURSES_EXPORT(char *) termname (void); /* implemented */
extern NCURSES_EXPORT(void) timeout (int); /* generated */
extern NCURSES_EXPORT(int) touchline (WINDOW *, int, int); /* generated */
extern NCURSES_EXPORT(int) touchwin (WINDOW *); /* generated */
extern NCURSES_EXPORT(int) typeahead (int); /* implemented */
extern NCURSES_EXPORT(int) ungetch (int); /* implemented */
extern NCURSES_EXPORT(int) untouchwin (WINDOW *); /* generated */
extern NCURSES_EXPORT(void) use_env (bool); /* implemented */
extern NCURSES_EXPORT(int) vidattr (ctype); /* implemented */
extern NCURSES_EXPORT(int) vidputs (ctype, int (*)(int)); /* implemented */
extern NCURSES_EXPORT(int) vline (ctype, int); /* generated */
extern NCURSES_EXPORT(int) vwprintw (WINDOW *, const char *,va_list); /* implemented */
extern NCURSES_EXPORT(int) vw_printw (WINDOW
*, const char *,va_list); /* generated */
extern NCURSES_EXPORT(int) vwscanw (WINDOW *, NCURSES_CONST char *,va_list); /* implemented */
extern NCURSES_EXPORT(int) vw_scanw (WINDOW *, NCURSES_CONST char *,va_list); /* generated */
extern NCURSES_EXPORT(int) waddch (WINDOW *, const ctype); /* implemented */
extern NCURSES_EXPORT(int) waddchnstr (WINDOW *,const ctype *,int); /* implemented */
extern NCURSES_EXPORT(int) waddchstr (WINDOW *,const ctype *); /* generated */
extern NCURSES_EXPORT(int) waddnstr (WINDOW *,const char *,int); /* implemented */
extern NCURSES_EXPORT(int) waddstr (WINDOW *,const char *); /* generated */
extern NCURSES_EXPORT(int) wattron (WINDOW *, int); /* generated */
extern NCURSES_EXPORT(int) wattroff (WINDOW *, int); /* generated */
extern NCURSES_EXPORT(int) wattrset (WINDOW *, int); /* generated */
extern NCURSES_EXPORT(int) wattr_get (WINDOW *, attr_t *, short *, void *); /* generated */
extern NCURSES_EXPORT(int) wattr_on (WINDOW *, attr_t, void
*); /* implemented */
extern NCURSES_EXPORT(int) wattr_off (WINDOW *, attr_t, void *); /* implemented */
extern NCURSES_EXPORT(int) wattr_set (WINDOW *, attr_t, short, void *); /* generated */
extern NCURSES_EXPORT(int) wbkgd (WINDOW *, ctype); /* implemented */
extern NCURSES_EXPORT(void) wbkgdset (WINDOW *,ctype); /* implemented */
extern NCURSES_EXPORT(int) wborder (WINDOW *,ctype,ctype,ctype,ctype,ctype,ctype,ctype);
/* implemented */
extern NCURSES_EXPORT(int) wchgat (WINDOW *, int, attr_t, short, const void *); /* implemented */
extern NCURSES_EXPORT(int) wclear (WINDOW *); /* implemented */
extern NCURSES_EXPORT(int) wclrtoebot (WINDOW *); /* implemented */
extern NCURSES_EXPORT(int) wclrtoeol (WINDOW *); /* implemented */
extern NCURSES_EXPORT(int) wcolor_set (WINDOW*,short,void*); /* implemented */
extern NCURSES_EXPORT(void) wcuryncup (WINDOW *); /* implemented */
extern NCURSES_EXPORT(int) wdelch (WINDOW *); /* implemented */
extern NCURSES_EXPORT(int)
wdeleteln (WINDOW *); /* generated */
extern NCURSES_EXPORT(int) wechochar (WINDOW *, const ctype); /* implemented */
extern NCURSES_EXPORT(int) werase (WINDOW *); /* implemented */
extern NCURSES_EXPORT(int) wgetch (WINDOW *); /* implemented */
extern NCURSES_EXPORT(int) wgetnstr (WINDOW *,char *,int); /* implemented */

```



```

extern NCURSES_EXPORT(int) wgetstr (WINDOW *, char *); /* generated */
extern NCURSES_EXPORT(int) whline (WINDOW *, chtype, int); /* implemented */
extern NCURSES_EXPORT(chtype) winch (WINDOW *); /* implemented */
extern NCURSES_EXPORT(int) winchnstr (WINDOW *, chtype *, int); /* implemented */
extern NCURSES_EXPORT(int) winchstr (WINDOW *, chtype *); /* generated */
extern NCURSES_EXPORT(int) winnstr (WINDOW *, char *, int); /* implemented */
extern NCURSES_EXPORT(int) winsch (WINDOW *, chtype); /* implemented */
extern NCURSES_EXPORT(int) winsdelln (WINDOW *,int); /* implemented */
extern NCURSES_EXPORT(int) winsertln (WINDOW *); /*
generated */
extern NCURSES_EXPORT(int) winsnstr (WINDOW *, const char *,int); /* implemented */
extern NCURSES_EXPORT(int) winsstr (WINDOW *, const char *); /* generated */
extern NCURSES_EXPORT(int) winstr (WINDOW *, char *); /* generated */
extern NCURSES_EXPORT(int) wmove (WINDOW *,int,int); /* implemented */
extern NCURSES_EXPORT(int) wnoutrefresh (WINDOW *); /* implemented */
extern NCURSES_EXPORT(int) wprintw (WINDOW *, const char *,...) /* implemented */
GCC_PRINTFLIKE(2,3);
extern NCURSES_EXPORT(int) wredrawln (WINDOW *,int,int); /* implemented */
extern NCURSES_EXPORT(int) wrefresh (WINDOW *); /* implemented */
extern NCURSES_EXPORT(int) wscanw (WINDOW *, NCURSES_CONST char *,...) /* implemented */
GCC_SCANFLIKE(2,3);
extern NCURSES_EXPORT(int) wscr1 (WINDOW *,int); /* implemented */
extern NCURSES_EXPORT(int) wsetscrreg (WINDOW *,int,int); /* implemented */
extern NCURSES_EXPORT(int) wstandout (WINDOW *); /* generated */
extern NCURSES_EXPORT(int) wstandend
(WINDOW *); /* generated */
extern NCURSES_EXPORT(void) wsyncdown (WINDOW *); /* implemented */
extern NCURSES_EXPORT(void) wsyncup (WINDOW *); /* implemented */
extern NCURSES_EXPORT(void) wtimeout (WINDOW *,int); /* implemented */
extern NCURSES_EXPORT(int) wtouchln (WINDOW *,int,int,int); /* implemented */
extern NCURSES_EXPORT(int) wvline (WINDOW *,chtype,int); /* implemented */

/*
* These are also declared in <term.h>:
*/
extern NCURSES_EXPORT(int) tigetflag (NCURSES_CONST char *); /* implemented */
extern NCURSES_EXPORT(int) tigetnum (NCURSES_CONST char *); /* implemented */
extern NCURSES_EXPORT(char *) tigetstr (NCURSES_CONST char *); /* implemented */
extern NCURSES_EXPORT(int) putp (const char *); /* implemented */

#if NCURSES_TPARAM_VARARGS
extern NCURSES_EXPORT(char *) tparm (NCURSES_CONST char *, ...); /* special */
#else
extern NCURSES_EXPORT(char *) tparm (NCURSES_CONST char *,
long,long,long,long,long,long,long,long,long); /* special */
extern
NCURSES_EXPORT(char *) tparm_varargs (NCURSES_CONST char *, ...); /* special */
#endif

```

```

/*
 * These functions are not in X/Open, but we use them in macro definitions:
 */
extern NCURSES_EXPORT(int) getattrs (const WINDOW *); /* generated */
extern NCURSES_EXPORT(int) getcurx (const WINDOW *); /* generated */
extern NCURSES_EXPORT(int) getcury (const WINDOW *); /* generated */
extern NCURSES_EXPORT(int) getbegx (const WINDOW *); /* generated */
extern NCURSES_EXPORT(int) getbegy (const WINDOW *); /* generated */
extern NCURSES_EXPORT(int) getmaxx (const WINDOW *); /* generated */
extern NCURSES_EXPORT(int) getmaxy (const WINDOW *); /* generated */
extern NCURSES_EXPORT(int) getparx (const WINDOW *); /* generated */
extern NCURSES_EXPORT(int) getpary (const WINDOW *); /* generated */

/*
 * vid_attr() was implemented originally based on a draft of X/Open curses.
 */
#ifndef _XOPEN_SOURCE_EXTENDED
#define vid_attr(a,pair,opts) vidattr(a)
#endif

/*
 * These functions
 * are extensions - not in X/Open Curses.
 */
#if @NCURSES_EXT_FUNCS@
#undef NCURSES_EXT_FUNCS
#define NCURSES_EXT_FUNCS @NCURSES_PATCH@
typedef int (*NCURSES_WINDOW_CB)(WINDOW *, void *);
typedef int (*NCURSES_SCREEN_CB)(SCREEN *, void *);
extern NCURSES_EXPORT(bool) is_term_resized (int, int);
extern NCURSES_EXPORT(char *) keybound (int, int);
extern NCURSES_EXPORT(const char *) curses_version (void);
extern NCURSES_EXPORT(int) assume_default_colors (int, int);
extern NCURSES_EXPORT(int) define_key (const char *, int);
extern NCURSES_EXPORT(int) key_defined (const char *);
extern NCURSES_EXPORT(int) keyok (int, bool);
extern NCURSES_EXPORT(int) resize_term (int, int);
extern NCURSES_EXPORT(int) resizeterm (int, int);
extern NCURSES_EXPORT(int) set_escdelay (int);
extern NCURSES_EXPORT(int) set_tabsize (int);
extern NCURSES_EXPORT(int) use_default_colors (void);
extern NCURSES_EXPORT(int) use_extended_names (bool);
extern NCURSES_EXPORT(int) use_legacy_coding (int);
extern NCURSES_EXPORT(int)
    use_screen (SCREEN *, NCURSES_SCREEN_CB, void *);
extern NCURSES_EXPORT(int) use_window (WINDOW *, NCURSES_WINDOW_CB, void *);
extern NCURSES_EXPORT(int) wresize (WINDOW *, int, int);

```

```

extern NCURSES_EXPORT(void) nofilter(void);

/*
 * These extensions provide access to information stored in the WINDOW even
 * when NCURSES_OPAQUE is set:
 */
extern NCURSES_EXPORT(WINDOW *) wgetparent (const WINDOW *); /* generated */
extern NCURSES_EXPORT(bool) is_cleared (const WINDOW *); /* generated */
extern NCURSES_EXPORT(bool) is_idcok (const WINDOW *); /* generated */
extern NCURSES_EXPORT(bool) is_idlok (const WINDOW *); /* generated */
extern NCURSES_EXPORT(bool) is_immedok (const WINDOW *); /* generated */
extern NCURSES_EXPORT(bool) is_keypad (const WINDOW *); /* generated */
extern NCURSES_EXPORT(bool) is_leaveok (const WINDOW *); /* generated */
extern NCURSES_EXPORT(bool) is_nodelay (const WINDOW *); /* generated */
extern NCURSES_EXPORT(bool) is_notimeout (const WINDOW *); /* generated */
/*
extern NCURSES_EXPORT(bool) is_scrollok (const WINDOW *); /* generated */
extern NCURSES_EXPORT(bool) is_syncok (const WINDOW *); /* generated */
extern NCURSES_EXPORT(int) wgetscrreg (const WINDOW *, int *, int *); /* generated */

#else
#define curses_version() NCURSES_VERSION
#endif

/* attributes */

#define NCURSES_ATTR_SHIFT 8
#define NCURSES_BITS(mask,shift) ((mask) << ((shift) + NCURSES_ATTR_SHIFT))

#define A_NORMAL (@cf_cv_1UL@ - @cf_cv_1UL@)
#define A_ATTRIBUTES NCURSES_BITS(~(@cf_cv_1UL@ - @cf_cv_1UL@),0)
#define A_CHARTEXT NCURSES_BITS(@cf_cv_1UL@,0) - @cf_cv_1UL@
#define A_COLOR NCURSES_BITS(((@cf_cv_1UL@) << 8) - @cf_cv_1UL@,0)
#define A_STANDOUT NCURSES_BITS(@cf_cv_1UL@,8)
#define A_UNDERLINE NCURSES_BITS(@cf_cv_1UL@,9)
#define A_REVERSE NCURSES_BITS(@cf_cv_1UL@,10)
#define A_BLINK NCURSES_BITS(@cf_cv_1UL@,11)
#define A_DIM NCURSES_BITS(@cf_cv_1UL@,12)
#define A_BOLD NCURSES_BITS(@cf_cv_1UL@,13)
#define A_ALTCHARSET NCURSES_BITS(@cf_cv_1UL@,14)
#define
A_INVIS NCURSES_BITS(@cf_cv_1UL@,15)
#define A_PROTECT NCURSES_BITS(@cf_cv_1UL@,16)
#define A_HORIZONTAL NCURSES_BITS(@cf_cv_1UL@,17)
#define A_LEFT NCURSES_BITS(@cf_cv_1UL@,18)
#define A_LOW NCURSES_BITS(@cf_cv_1UL@,19)
#define A_RIGHT NCURSES_BITS(@cf_cv_1UL@,20)
#define A_TOP NCURSES_BITS(@cf_cv_1UL@,21)

```

```

#define A_VERTICAL NCURSES_BITS(@cf_cv_1UL@,22)

/*
 * Most of the pseudo functions are macros that either provide compatibility
 * with older versions of curses, or provide inline functionality to improve
 * performance.
 */

/*
 * These pseudo functions are always implemented as macros:
 */

#define getyx(win,y,x) (y = getcury(win), x = getcurx(win))
#define getbegyx(win,y,x) (y = getbegy(win), x = getbegx(win))
#define getmaxyx(win,y,x) (y = getmaxy(win), x = getmaxx(win))
#define getparyx(win,y,x) (y = getpary(win), x = getparx(win))

#define getsyx(y,x) do { if (newscr) { \
    if (is_leaveok(newscr)) \
    (y) = (x) = -1; \
    else \
    getyx(newscr,(y), \
    (x)); \
} \
} while(0)

#define setsyx(y,x) do { if (newscr) { \
    if ((y) == -1 && (x) == -1) \
    leaveok(newscr, TRUE); \
    else { \
    leaveok(newscr, FALSE); \
    wmove(newscr, (y), (x)); \
    } \
} \
} while(0)

#ifndef NCURSES_NOMACROS

/*
 * These miscellaneous pseudo functions are provided for compatibility:
 */

#define wgetstr(w, s) wgetnstr(w, s, -1)
#define getnstr(s, n) wgetnstr(stdscr, s, n)

#define setterm(term) setupterm(term, 1, (int *)0)

#define fixterm() reset_prog_mode()

```

```

#define resetterm() reset_shell_mode()
#define saveterm() def_prog_mode()
#define crmode() cbreak()
#define nocrmode() nocbreak()
#define gettmode()

/* It seems older SYSV curses versions define these */
#if !NCURSES_OPAQUE
#define getattrs(win) ((win) ? (win)->_attrs : A_NORMAL)
#define getcurx(win) ((win) ? (win)->_curx : ERR)
#define getcury(win) ((win) ? (win)->_cury : ERR)
#define getbegx(win) ((win) ? (win)->_begx : ERR)
#define getbegy(win) ((win)
? (win)->_begy : ERR)
#define getmaxx(win) ((win) ? ((win)->_maxx + 1) : ERR)
#define getmaxy(win) ((win) ? ((win)->_maxy + 1) : ERR)
#define getparx(win) ((win) ? (win)->_parx : ERR)
#define getpary(win) ((win) ? (win)->_pary : ERR)
#endif /* NCURSES_OPAQUE */

#define wstandout(win) (wattrset(win,A_STANDOUT))
#define wstandend(win) (wattrset(win,A_NORMAL))

#define wattron(win,at) wattr_on(win, NCURSES_CAST(attr_t, at), NULL)
#define wattroff(win,at) wattr_off(win, NCURSES_CAST(attr_t, at), NULL)

#if !NCURSES_OPAQUE
#if defined(_XOPEN_SOURCE_EXTENDED) && @NCURSES_EXT_COLORS@
#define wattrset(win,at) ((win)->_color = PAIR_NUMBER(at), \
(win)->_attrs = (at))
#else
#define wattrset(win,at) ((win)->_attrs = (at))
#endif
#endif /* NCURSES_OPAQUE */

#define scroll(win) wscrl(win,1)

#define touchwin(win) wtouchln((win), 0, getmaxy(win), 1)
#define touchline(win, s, c) wtouchln((win), s, c, 1)
#define untouchwin(win) wtouchln((win), 0, getmaxy(win), 0)

#define
box(win, v, h) wborder(win, v, v, h, h, 0, 0, 0, 0)
#define border(ls, rs, ts, bs, tl, tr, bl, br) wborder(stdscr, ls, rs, ts, bs, tl, tr, bl, br)
#define hline(ch, n) whline(stdscr, ch, n)
#define vline(ch, n) wvline(stdscr, ch, n)

#define winstr(w, s) winnstr(w, s, -1)

```

```

#define winchstr(w, s) winchnstr(w, s, -1)
#define winsstr(w, s) winsnstr(w, s, -1)

#if !NCURSES_OPAQUE
#define redrawwin(win) wredrawln(win, 0, (win)->_maxy+1)
#endif /* NCURSES_OPAQUE */

#define waddstr(win,str) waddnstr(win,str,-1)
#define waddchstr(win,str) waddchnstr(win,str,-1)

/*
 * These apply to the first 256 color pairs.
 */
#define COLOR_PAIR(n) NCURSES_BITS(n, 0)
#define PAIR_NUMBER(a) (NCURSES_CAST(int,(((a) & A_COLOR) >> NCURSES_ATTR_SHIFT)))

/*
 * pseudo functions for standard screen
 */

#define addch(ch) waddch(stdscr,ch)
#define addchnstr(str,n) waddchnstr(stdscr,str,n)
#define addchstr(str) waddchstr(stdscr,str)
#define addnstr(str,n) waddnstr(stdscr,str,n)
#define addstr(str) waddnstr(stdscr,str,-1)
#define
  attroff(at) wattroff(stdscr,at)
#define attron(at) wattron(stdscr,at)
#define attrset(at) wattrset(stdscr,at)
#define attr_get(ap,cp,o) wattr_get(stdscr,ap,cp,o)
#define attr_off(a,o) wattr_off(stdscr,a,o)
#define attr_on(a,o) wattr_on(stdscr,a,o)
#define attr_set(a,c,o) wattr_set(stdscr,a,c,o)
#define bkgd(ch) wbkgd(stdscr,ch)
#define bkgdset(ch) wbkgdset(stdscr,ch)
#define chgat(n,a,c,o) wchgat(stdscr,n,a,c,o)
#define clear() wclear(stdscr)
#define clrtoeol() wclrtoeol(stdscr)
#define clrtoeol() wclrtoeol(stdscr)
#define color_set(c,o) wcolor_set(stdscr,c,o)
#define delch() wdelch(stdscr)
#define deleteln() winsdelln(stdscr,-1)
#define echochar(c) wechochar(stdscr,c)
#define erase() werase(stdscr)
#define getch() wgetch(stdscr)
#define getstr(str) wgetstr(stdscr,str)
#define inch() winch(stdscr)
#define inchnstr(s,n) winchnstr(stdscr,s,n)

```

```

#define inchstr(s) winchstr(stdscr,s)
#define innstr(s,n) winnstr(stdscr,s,n)
#define
  insch(c) winsch(stdscr,c)
#define insdelln(n) winsdelln(stdscr,n)
#define insertln() winsdelln(stdscr,1)
#define insnstr(s,n) winsnstr(stdscr,s,n)
#define insstr(s) winsstr(stdscr,s)
#define instr(s) winstr(stdscr,s)
#define move(y,x) wmove(stdscr,y,x)
#define refresh() wrefresh(stdscr)
#define scl(n) wscl(stdscr,n)
#define setscrreg(t,b) wsetscrreg(stdscr,t,b)
#define standend() wstandend(stdscr)
#define standout() wstandout(stdscr)
#define timeout(delay) wtimeout(stdscr,delay)
#define wdeleteln(win) winsdelln(win,-1)
#define winsertln(win) winsdelln(win,1)

/*
 * mv functions
 */

#define mvwaddch(win,y,x,ch) (wmove(win,y,x) == ERR ? ERR : waddch(win,ch))
#define mvwaddchnstr(win,y,x,str,n) (wmove(win,y,x) == ERR ? ERR : waddchnstr(win,str,n))
#define mvwaddchstr(win,y,x,str) (wmove(win,y,x) == ERR ? ERR : waddchnstr(win,str,-1))
#define mvwaddnstr(win,y,x,str,n) (wmove(win,y,x) == ERR ? ERR : waddnstr(win,str,n))
#define mvwaddstr(win,y,x,str) (wmove(win,y,x) ==
  ERR ? ERR : waddnstr(win,str,-1))
#define mvwdelch(win,y,x) (wmove(win,y,x) == ERR ? ERR : wdelch(win))
#define mvwchgat(win,y,x,n,a,c,o) (wmove(win,y,x) == ERR ? ERR : wchgat(win,n,a,c,o))
#define mvwgetch(win,y,x) (wmove(win,y,x) == ERR ? ERR : wgetch(win))
#define mvwgetnstr(win,y,x,str,n) (wmove(win,y,x) == ERR ? ERR : wgetnstr(win,str,n))
#define mvwgetstr(win,y,x,str) (wmove(win,y,x) == ERR ? ERR : wgetstr(win,str))
#define mvwhline(win,y,x,c,n) (wmove(win,y,x) == ERR ? ERR : whline(win,c,n))
#define mvwinch(win,y,x) (wmove(win,y,x) == ERR ? NCURSES_CAST(chtype, ERR) : winch(win))
#define mvwinchnstr(win,y,x,s,n) (wmove(win,y,x) == ERR ? ERR : winchnstr(win,s,n))
#define mvwinchstr(win,y,x,s) (wmove(win,y,x) == ERR ? ERR : winchstr(win,s))
#define mvwinnstr(win,y,x,s,n) (wmove(win,y,x) == ERR ? ERR : winnstr(win,s,n))
#define mvwinsch(win,y,x,c) (wmove(win,y,x) == ERR ? ERR : winsch(win,c))
#define mvwinsnstr(win,y,x,s,n) (wmove(win,y,x) == ERR ? ERR : winsnstr(win,s,n))
#define
  mvwinsstr(win,y,x,s) (wmove(win,y,x) == ERR ? ERR : winsstr(win,s))
#define mvwinstr(win,y,x,s) (wmove(win,y,x) == ERR ? ERR : winstr(win,s))
#define mvwvline(win,y,x,c,n) (wmove(win,y,x) == ERR ? ERR : wvline(win,c,n))

#define mvaddch(y,x,ch) mvwaddch(stdscr,y,x,ch)
#define mvaddchnstr(y,x,str,n) mvwaddchnstr(stdscr,y,x,str,n)

```

```

#define mvaddchstr(y,x,str) mvwaddchstr(stdscr,y,x,str)
#define mvaddnstr(y,x,str,n) mvwaddnstr(stdscr,y,x,str,n)
#define mvaddstr(y,x,str) mvwaddstr(stdscr,y,x,str)
#define mvchgat(y,x,n,a,c,o) mvwchgat(stdscr,y,x,n,a,c,o)
#define mvdelch(y,x) mvwdelch(stdscr,y,x)
#define mvgetch(y,x) mvwgetch(stdscr,y,x)
#define mvgetnstr(y,x,str,n) mvwgetnstr(stdscr,y,x,str,n)
#define mvgetstr(y,x,str) mvwgetstr(stdscr,y,x,str)
#define mvhline(y,x,c,n) mvwhline(stdscr,y,x,c,n)
#define mvinch(y,x) mvwinch(stdscr,y,x)
#define mvinchnstr(y,x,s,n) mvwinchnstr(stdscr,y,x,s,n)
#define mvinchstr(y,x,s) mvwinchstr(stdscr,y,x,s)
#define mvinnstr(y,x,s,n) mvwinnstr(stdscr,y,x,s,n)
#define
    mvinsch(y,x,c) mvwinsch(stdscr,y,x,c)
#define mvinsnstr(y,x,s,n) mvwinsnstr(stdscr,y,x,s,n)
#define mvinsstr(y,x,s) mvwinsstr(stdscr,y,x,s)
#define mvinstr(y,x,s) mvwinstr(stdscr,y,x,s)
#define mvvline(y,x,c,n) mvwvline(stdscr,y,x,c,n)

/*
 * Some wide-character functions can be implemented without the extensions.
 */
#if !NCURSES_OPAQUE
#define getbkgd(win) ((win)->_bkgd)
#endif /* NCURSES_OPAQUE */

#define slk_attr_off(a,v) ((v) ? ERR : slk_attroff(a))
#define slk_attr_on(a,v) ((v) ? ERR : slk_attron(a))

#if !NCURSES_OPAQUE
#if defined(_XOPEN_SOURCE_EXTENDED) && @NCURSES_EXT_COLORS@
#define wattr_set(win,a,p,opts) ((win)->_attrs = ((a) & ~A_COLOR), \
    (win)->_color = (p), \
    OK)
#define wattr_get(win,a,p,opts) ((void)((a) != (void *)0 && (*(a) = (win)->_attrs)), \
    (void)((p) != (void *)0 && (*(p) = (win)->_color)), \
    OK)
#else
#define wattr_set(win,a,p,opts) ((win)->_attrs = (((a) & ~A_COLOR) \
    | COLOR_PAIR(p)), OK)
#define wattr_get(win,a,p,opts) ((void)((a) != (void *)0 && (*(a) = (win)->_attrs)), \
    (void)((p) != (void *)0 && (*(p) = PAIR_NUMBER((win)->_attrs))), \
    OK)
#endif
#endif
#endif /* NCURSES_OPAQUE */

/*

```



```

* X/Open curses deprecates SVr4 vwprintw/vwscanw, which are supposed to use
* varargs.h. It adds new calls vw_printw/vw_scanw, which are supposed to
* use POSIX stdarg.h. The ncurses versions of vwprintw/vwscanw already
* use stdarg.h, so...
*/
#define vw_printw  vwprintw
#define vw_scanw  vwscanw

/*
* Export fallback function for use in C++ binding.
*/
#if !@HAVE_VSSCANF@
#define vsscanf(a,b,c) _nc_vsscanf(a,b,c)
NCURSES_EXPORT(int) vsscanf(const char *, const char *, va_list);
#endif

/*
* These macros are extensions - not in X/Open Curses.
*/
#if @NCURSES_EXT_FUNCS@
#if !NCURSES_OPAQUE
#define is_cleared(win) ((win)->_clear)
#define is_idcok(win) ((win)->_idcok)
#define is_idlok(win) ((win)->_idlok)
#define is_immedok(win) ((win)->_immed)
#define
is_keypad(win) ((win)->_use_keypad)
#define is_leaveok(win) ((win)->_leaveok)
#define is_nodelay(win) ((win)->_delay == 0)
#define is_notimeout(win) ((win)->_notimeout)
#define is_scrollok(win) ((win)->_scroll)
#define is_syncok(win) ((win)->_sync)
#define wgetparent(win) ((win) ? (win)->_parent : 0)
#define wgetscrreg(win,t,b) ((win) ? (*(t) = (win)->_regtop, *(b) = (win)->_regbottom, OK) : ERR)
#endif
#endif

#endif /* NCURSES_NOMACROS */

/*
* Public variables.
*
* Notes:
* a. ESCDELAY was an undocumented feature under AIX curses.
* It gives the ESC expire time in milliseconds.
* b. ttytype is needed for backward compatibility
*/
#if @cf_cv_enable_reentrant@

```

```

NCURSES_WRAPPED_VAR(WINDOW *, curscr);
NCURSES_WRAPPED_VAR(WINDOW *, newscr);
NCURSES_WRAPPED_VAR(WINDOW *, stdscr);
NCURSES_WRAPPED_VAR(char *, ttytype);
NCURSES_WRAPPED_VAR(int, COLORS);
NCURSES_WRAPPED_VAR(int, COLOR_PAIRS);
NCURSES_WRAPPED_VAR(int, COLS);
NCURSES_WRAPPED_VAR(int, ESCDELAY);
NCURSES_WRAPPED_VAR(int,
    LINES);
NCURSES_WRAPPED_VAR(int, TABSIZE);

#define curscr    NCURSES_PUBLIC_VAR(curscr())
#define newscr    NCURSES_PUBLIC_VAR(newscr())
#define stdscr    NCURSES_PUBLIC_VAR(stdscr())
#define ttytype   NCURSES_PUBLIC_VAR(ttytype())
#define COLORS    NCURSES_PUBLIC_VAR(COLORS())
#define COLOR_PAIRS NCURSES_PUBLIC_VAR(COLOR_PAIRS())
#define COLS      NCURSES_PUBLIC_VAR(COLS())
#define ESCDELAY  NCURSES_PUBLIC_VAR(ESCDELAY())
#define LINES     NCURSES_PUBLIC_VAR(LINES())
#define TABSIZE   NCURSES_PUBLIC_VAR(TABSIZE())

#else

extern NCURSES_EXPORT_VAR(WINDOW *) curscr;
extern NCURSES_EXPORT_VAR(WINDOW *) newscr;
extern NCURSES_EXPORT_VAR(WINDOW *) stdscr;
extern NCURSES_EXPORT_VAR(char) ttytype[];
extern NCURSES_EXPORT_VAR(int) COLORS;
extern NCURSES_EXPORT_VAR(int) COLOR_PAIRS;
extern NCURSES_EXPORT_VAR(int) COLS;
extern NCURSES_EXPORT_VAR(int) ESCDELAY;
extern NCURSES_EXPORT_VAR(int) LINES;
extern NCURSES_EXPORT_VAR(int) TABSIZE;

#endif

/*
 * Pseudo-character
 * tokens outside ASCII range. The curses wgetch() function
 * will return any given one of these only if the corresponding k- capability
 * is defined in your terminal's terminfo entry.
 *
 * Some keys (KEY_A1, etc) are arranged like this:
 * a1  up  a3
 * left b2  right

```

```

* c1 down c3
*
* A few key codes do not depend upon the terminfo entry.
*/
#define KEY_CODE_YES 0400 /* A wchar_t contains a key code */
#define KEY_MIN 0401 /* Minimum curses key */
#define KEY_BREAK 0401 /* Break key (unreliable) */
#define KEY_SRESET 0530 /* Soft (partial) reset (unreliable) */
#define KEY_RESET 0531 /* Reset or hard reset (unreliable) */

```

Found in path(s):

```

* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/include/curses.h.in
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archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/test/configure.in
* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/configure.in
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archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/ncurses/widechar/lib\_ins\_wch.c  
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\* @Id: curs\_scroll.3x,v 1.13 2006/02/25 21:49:19 tom Exp @

-->

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#####
#
# Author: Thomas Dickey
#
# $Id: Caps.uwin,v 1.4 2006/05/27 15:33:04 tom Exp $
#
# This is an adaptation of ncurses' termcap/terminfo capability table, which
# is designed to align with U/Win's terminfo.
#
# This table is used to generate initializers for tables that drive tic,
# infocmp, and the library compilation code used to support the termcap
# compatibility hack. It is also used to generate the tabular portion of the
# terminfo(5) man page; lines beginning with `#%' are passed through to become
# the terminfo table.
#
# This file has three major sections; a standard-capabilities table, two
# extension-capability tables, and a section of aliases declarations.
# The first two have the same format, as follows:
#
# FILE FORMAT
#
# Column 1: terminfo variable name
# Column 2: terminfo

```

```

capability name
# Column 3: capability type (boolean, numeric, or string)
# Column 4: termcap capability name
# Column 5: KEY_xxx name, if any, '-' otherwise
# Column 6: value for KEY_xxx name, if any, '-' otherwise
# Column 7: Lead with 'Y' if capability should be emitted in termcap
#      translations, '-' otherwise
# Column 8: capability description
#
# The codes following [Y-] in column 7 describe the versions of termcap which
# use the given capability. This information is not used by the curses library
# proper; rather, it's there to help the terminfo maintainer avoid emitting
# termcap entry translations that are more than 1023 bytes long (and tank a
# lot of old termcap-using programs). The codes read as follows:
# B = mentioned in the BSD man page for 4.4BSD curses
# C = used by the 4.4BSD curses library
# G = mentioned in the documentation for GNU termcap
# E = used by GNU Emacs
# K = remove this terminfo capability when translating to standard format
# The important
# codes are C and E. A cap with C or E should be preserved in
# translation if possible. The problem is that preserving all such caps may
# lead to some termcap translations being too long. The termcap maintainer
# has a bit of a juggling act to do...potential problem cases are marked with
# an asterisk (*).
#
# The aliases section has the following format:
#
# Column 1: either `capalias' or `infoalias'
# Column 2: name to be aliased
# Column 3: what name it should translate to. The name IGNORE means it
#      should be discarded with a warning message.
# Column 4: name of the extension set (used for compiler warning messages)
# Column 5: capability description (usually an associated terminfo variable)
#
# HANDLING TERMCAP AND TERMINFO EXTENSIONS
#
# There are basically five different ways to handle termcap and terminfo
# extensions:
#
# 1. Don't list the capname here, or list it but comment it out (the latter
# is preferable; someone might want to handle it in the future).
# If you do
# this, the capability will be treated as unknown and raise a warning from
# the compiler.
#
# 2. Alias it. This is appropriate if the capability has the same meaning
# as an already-supported one. The compiler will handle aliasing, emitting

```

```
# an appropriate informational message whenever an alias fires.
#
# 3. List it in the standard table. You almost certainly do *not* want
# to do this -- the capabilities in that one, and their order, have been
# carefully chosen to be SVr4-binary-compatible when they're written out
# as a terminfo object, and breaking this would be bad. It's up to the ncurses
# library what to do with the terminfo data after it's read in.
#
# 4. List it in the aliases table with an IGNORE target field. If you
# do this, the capability will be ignored on input (though the user will
# get a warning message about it).
#
# 5. List it in the extensions table. If you do this, the compiler will
# silently accept the capability, but the curses library proper will
never
# see it (because it won't be written out as part of the terminfo object
# format). It's up to you what you have the compiler do with it.
#
# There are two opposite reasons to choose option 5. One is when you want
# to eat the capability silently and discard it when doing translations
# to terminfo with tic -I. Some very old obsolete BSD caps like :kn: are
# in this class. Nothing will ever use them again.
#
# More usually, you want the compiler to try to deduce something from the
# capability value that it can use to translate it into your output format.
# You'll need to write custom code, probably in postprocess_termcap() or
# postprocess_terminfo(), to handle the translation.
#
# CONTROLLING ENTRY LENGTH
#
# Notes on specific elisions made to fit translations within 1023 bytes:
#
# Machines with IBM PC-like keyboards want to be able to define the following
# keys: key_npage, key_ppage, key_home, key_ll (which is used for in termcap-
# only environments for End or Home-Down),
key_dc, and key_ic. This is also
# the set of keys the `joe' editor will be upset if it can't see. So don't
# trim those out of the set to be translated to termcap, or various users of
# the termcap file will become irate.
#
# It might look tempting to leave those long init strings out of translations.
# We can't do it (yet); 4.4BSD tput and tset use them.
#
# We retain the sgr capability in translation in spite of the fact that neither
# 4.4BSD nor GNU Emacs uses it, because (a) some entry naming distinctions are
# hard to understand without it, and (b) the entries in which it is long tend
# to be older types that don't use up a lot of string space on function keys.
# The tic(1) translation code will complain and elide it if it makes a critical
```



```

# difference (there is special code in tic to recognize this situation).
#
# Yes, BSD tset(1) uses hpa. We elide hpa/vpa anyway because the motion
# optimizer in BSD curses didn't use them. This omission seems to be the
# single most
# effective one, it shortened the resolved length of all thirteen
# problem entries in the 9.9.0 version of the terminfo master below critical.
#
# It would be nice to keep f11 and f12 for Emacs use, but a couple of termcap
# translations go back over critical if we do this. As 4.4BSD curses fades
# into history and GNU termcap's application base shrinks towards being GNU
# Emacs only, we'll probably elide out some BSD-only capabilities in order
# to buy space for non-essentials Emacs is still using. Capabilities high
# on that hit list: rc, sc, uc.
#
#####
#
# STANDARD CAPABILITIES
#
##% The following is a complete table of the capabilities included in a
##% terminfo description block and available to terminfo-using code. In each
##% line of the table,
##%
##% The \fBvariable\fR is the name by which the programmer (at the terminfo level)
##% accesses the capability.
##%
##% The \fBcapname\fR is the short name used in the text
##% of the database,
##% and is used by a person updating the database.
##% Whenever possible, capnames are chosen to be the same as or similar to
##% the ANSI X3.64-1979 standard (now superseded by ECMA-48, which uses
##% identical or very similar names). Semantics are also intended to match
##% those of the specification.
##%
##% The termcap code is the old
##%.B termcap
##% capability name (some capabilities are new, and have names which termcap
##% did not originate).
##%.P
##% Capability names have no hard length limit, but an informal limit of 5
##% characters has been adopted to keep them short and to allow the tabs in
##% the source file
##%.B Caps
##% to line up nicely.
##%
##% Finally, the description field attempts to convey the semantics of the
##% capability. You may find some codes in the description field:
##%.TP

```

```

%%(P)
%%indicates that padding may be specified
%%.TP
%%#[1-9]
%%in the description field indicates that the string is passed through tparm with
%%parms as given (#\fI\fP).
%%.TP
%%(P*)
%%indicates
    that padding may vary in proportion to the number of
%%lines affected
%%.TP
%%(#\d\fI\fP\u)
%%indicates the \fI\fP\uth\d parameter.
%%
%%.PP
%% These are the boolean capabilities:
%%
%%.na
%%.TS H
%%center expand;
%%c l l c
%%c l l c
%%lw25 lw6 lw2 lw20.
%%\fBVariable Cap- TCap Description\fR
%%\fBBooleans name Code\fR
auto_left_margin  bw bool bw - - YB-G- cub1 wraps from column 0 to last column
auto_right_margin am bool am - - YBCGE terminal has automatic margins
no_esc_ctlc  xsb bool xb - - YBCG- beehive (f1=escape, f2=ctrl C)
ceol_standout_glitch  xhp bool xs - - YBCGE standout not erased by overwriting (hp)
eat_newline_glitch  xenl bool xn - - YBCGE newline ignored after 80 cols (concept)
erase_overstrike  eo bool eo - - YBCG- can erase overstrikes with a blank
generic_type  gn bool gn - - YB-G- generic line type
hard_copy  hc bool hc - - YBCG- hardcopy terminal
has_meta_key  km bool km - - YB-GE Has a meta key (i.e., sets 8th-bit)
has_status_line  hs bool hs - - YB-G- has
    extra status line
insert_null_glitch  in bool in - - YBCGE insert mode distinguishes nulls
memory_above  da bool da - - YBCG- display may be retained above the screen
memory_below  db bool db - - YB-GE display may be retained below the screen
move_insert_mode  mir bool mi - - YBCGE safe to move while in insert mode
move_standout_mode  msgr bool ms - - YBCGE safe to move while in standout mode
over_strike  os bool os - - YBCG- terminal can overstrike
status_line_esc_ok  eslok bool es - - YB-G- escape can be used on the status line
dest_tabs_magic_sms0  xt bool xt - - YBCGE tabs destructive, magic so char (t1061)
tilde_glitch  hz bool hz - - YB-GE cannot print ~'s (hazeltine)
transparent_underline  ul bool ul - - YBCGE underline character overstrikes
xon_xoff  xon bool xo - - YB--- terminal uses xon/xoff handshaking

```

```

needs_xon_xoff  nxon bool nx - - ----- padding will not work, xon/xoff required
ptrr_silent  mc5i bool 5i - - ----- printer will not echo on screen
hard_cursor  chts bool HC - - ----- cursor
is hard to see
non_rev_rmcup  nrrmc bool NR - - ----- smcup does not reverse rmcup
no_pad_char  npc bool NP - - ----- pad character does not exist
non_dest_scroll_region  ndscr bool ND - - ----- scrolling region is non-destructive
back_color_erase  bce bool ut - - ----- screen erased with background color
can_change  ccc bool cc - - ----- terminal can re-define existing colors
hue_lightness_saturation  hls bool hl - - ----- terminal uses only HLS color notation (Tektronix)
#%.TE
#%.ad
#%
#% These are the numeric capabilities:
#%
#%.na
#%.TS H
#%center expand;
#%c 11 c
#%c 11 c
#%lw25 lw6 lw2 lw20.
#%\fBVariable Cap- TCap Description\fR
#%\fBNumeric name Code\fR
columns  cols num co - - YBCGE number of columns in a line
init_tabs  it num it - - YB-G- tabs initially every # spaces
lines  lines num li - - YBCGE number of lines on screen or page
lines_of_memory  lm num lm - - YB-G- lines of memory if > line. 0 means varies
magic_cookie_glitch  xmc num sg - - YBCGE number
of blank characters left by smso or rmso
padding_baud_rate  pb num pb - - YB-GE lowest baud rate where padding needed
virtual_terminal  vt num vt - - YB--- virtual terminal number (CB/unix)
width_status_line  wsl num ws - - YB-G- number of columns in status line
num_labels  nlab num NI - - ----- number of labels on screen
label_height  lh num lh - - ----- rows in each label
label_width  lw num lw - - ----- columns in each label
buttons  btns num BT - - ----- number of buttons on mouse
#max_attributes  ma num ma - - YBC-- maximum combined attributes terminal can handle
#maximum_windows  wnum num MW - - ----- maximum number of defineable windows
# These came in with SVr4's color support
max_colors  colors num Co - - ----- maximum number of colors on screen
max_pairs  pairs num pa - - ----- maximum number of color-pairs on the screen
no_color_video  ncv num NC - - ----- video attributes that cannot be used with colors
#%.TE
#%.ad
#%
#% The following numeric
capabilities are present in the SVr4.0 term structure,
#%but are not yet documented in the man page. They came in with SVr4's

```

```

%%printer support.
%%
%%.na
%%
%% These are the string capabilities:
%%
%%.na
%%.TS H
%%center expand;
%%c l l c
%%c l l c
%%lw25 lw6 lw2 lw20.
%%\fBVariable Cap- TCap Description\fR
%%\fBString name Code\fR
back_tab cbt str bt - - YBCGE back tab (P)
bell bel str bl - - YB-GE audible signal (bell) (P)
carriage_return cr str cr - - YBCGE carriage return (P*) (P*)
change_scroll_region csr str cs - - YBCGE change region to line #1 to line #2 (P)
clear_all_tabs tbc str ct - - YB-G- clear all tab stops (P)
clear_screen clear str cl - - YBCGE clear screen and home cursor (P*)
clr_eol el str ce - - YBCGE clear to end of line (P)
clr_eos ed str cd - - YBCGE clear to end of screen (P*)
column_address hpa str ch - - B-GE* horizontal position #1, absolute (P)
command_character cmdch str CC - - YB-G- terminal settable cmd character in prototype
! ?
cursor_address cup str cm - - YBCGE move to row #1 columns #2
cursor_down cudl str do - - YBCGE down one line
cursor_home home str ho - - YBCGE home cursor (if no cup)
cursor_invisible civis str vi - - YB-G- make cursor invisible
cursor_left cubl str le - - YBCGE move left one space
cursor_mem_address mrcup str CM - - YB-G- memory relative cursor addressing, move to row #1 columns #2
cursor_normal cnorm str ve - - YBCGE make cursor appear normal (undo civis/cvvis)
cursor_right cuf1 str nd - - YBCGE non-destructive space (move right one space)
cursor_to_ll ll str ll - - YBCGE last line, first column (if no cup)
cursor_up cuu1 str up - - YBCGE up one line
cursor_visible cvvis str vs - - YBCGE make cursor very visible
delete_character dch1 str dc - - YBCGE delete character (P*)
delete_line dl1 str dl - - YBCGE delete line (P*)
dis_status_line dsl str ds - - YB-G- disable status line
down_half_line hd str hd - - YB-G- half a line down
enter_alt_charset_mode smacs str as - - YB-G- start
alternate character set (P)
enter_blink_mode blink str mb - - YB-G- turn on blinking
enter_bold_mode bold str md - - YB-G- turn on bold (extra bright) mode
enter_ca_mode smcup str ti - - YBCGE string to start programs using cup
enter_delete_mode smdc str dm - - YBCGE enter delete mode
enter_dim_mode dim str mh - - YB-G- turn on half-bright mode
enter_insert_mode smir str im - - YBCGE enter insert mode

```

enter\_secure\_mode invis str mk - -B-G-\* turn on blank mode (characters invisible)  
 enter\_protected\_mode prot str mp - -B-G-\* turn on protected mode  
 enter\_reverse\_mode rev str mr - -YB-G- turn on reverse video mode  
 enter\_standout\_mode smso str so - -YBCGE begin standout mode  
 enter\_underline\_mode smul str us - -YBCGE begin underline mode  
 erase\_chars ech str ec - -YB-G- erase #1 characters (P)  
 exit\_alt\_charset\_mode rmacs str ae - -YB-G- end alternate character set (P)  
 exit\_attribute\_mode sgr0 str me - -YB-GE turn  
 off all attributes  
 exit\_ca\_mode rmcup str te - -YBCGE strings to end programs using cup  
 exit\_delete\_mode rmdc str ed - -YBCGE end delete mode  
 exit\_insert\_mode rmir str ei - -YBCGE exit insert mode  
 exit\_standout\_mode rmso str se - -YBCGE exit standout mode  
 exit\_underline\_mode rmul str ue - -YBCGE exit underline mode  
 flash\_screen flash str vb - -YBCGE visible bell (may not move cursor)  
 form\_feed ff str ff - -YB-G- hardcopy terminal page eject (P\*)  
 from\_status\_line fsl str fs - -YB-G- return from status line  
 init\_1string is1 str i1 - -YB-G- initialization string  
 init\_2string is2 str is - -YB-G- initialization string  
 init\_3string is3 str i3 - -YB-G- initialization string  
 init\_file if str if - -YB-G- name of initialization file  
 insert\_character ich1 str ic - -YBCGE insert character (P)  
 insert\_line il1 str al - -YBCGE insert line (P\*)  
 insert\_padding ip str ip - -YBCGE insert padding after inserted character  
 key\_backspace kbs str kb KEY\_BACKSPACE 0407 YB-G- backspace  
 key  
 key\_catab ktbc str ka KEY\_CATAB 0526 -B-G-\* clear-all-tabs key  
 key\_clear kclr str kC KEY\_CLEAR 0515 -B-G-\* clear-screen or erase key  
 key\_ctab kctab str kt KEY\_CTAB 0525 -B-G-\* clear-tab key  
 key\_dc kdch1 str kD KEY\_DC 0512 YB-G- delete-character key  
 key\_dl kdl1 str kL KEY\_DL 0510 -B-G-\* delete-line key  
 key\_down kcuD1 str kd KEY\_DOWN 0402 YBCGE down-arrow key  
 key\_eic krmir str kM KEY\_EIC 0514 -B-G-\* sent by rmir or smir in insert mode  
 key\_eol kel str kE KEY\_EOL 0517 -B-G-\* clear-to-end-of-line key  
 key\_eos ked str kS KEY\_EOS 0516 -B-G-\* clear-to-end-of-screen key  
 key\_f0 kf0 str k0 KEY\_F(0) 0410 YBCGE F0 function key  
 key\_f1 kf1 str k1 KEY\_F(1) - YBCGE F1 function key  
 key\_f10 kf10 str k; KEY\_F(10) - ----E F10 function key  
 key\_f2 kf2 str k2 KEY\_F(2) - YBCGE F2 function key  
 key\_f3 kf3 str k3 KEY\_F(3) - YBCGE F3 function key  
 key\_f4 kf4 str k4 KEY\_F(4) - YBCGE F4 function key  
 key\_f5 kf5 str k5 KEY\_F(5) - YBCGE F5  
 function key  
 key\_f6 kf6 str k6 KEY\_F(6) - YBCGE F6 function key  
 key\_f7 kf7 str k7 KEY\_F(7) - YBCGE F7 function key  
 key\_f8 kf8 str k8 KEY\_F(8) - YBCGE F8 function key  
 key\_f9 kf9 str k9 KEY\_F(9) - YBCGE F9 function key  
 key\_home khome str kh KEY\_HOME 0406 YBCGE home key

key\_ic kich1 str kI KEY\_IC 0513 YB-GE insert-character key  
key\_il kil1 str kA KEY\_IL 0511 -B-G-\* insert-line key  
key\_left kcub1 str kI KEY\_LEFT 0404 YBCGE left-arrow key  
key\_ll kll str kH KEY\_LL 0533 YB-G- lower-left key (home down)  
key\_npage knp str kN KEY\_NPAGE 0522 YB-GE next-page key  
key\_ppage kpp str kP KEY\_PPAGE 0523 YB-GE previous-page key  
key\_right kcufl str kr KEY\_RIGHT 0405 YBCGE right-arrow key  
key\_sf kind str kF KEY\_SF 0520 -B-G-\* scroll-forward key  
key\_sr kri str kR KEY\_SR 0521 -B-G-\* scroll-backward key  
key\_stab khts str kT KEY\_STAB 0524 -B-G-\* set-tab key  
key\_up kcuu1 str ku KEY\_UP 0403 YBCGE up-arrow key  
keypad\_local rmkx str ke - - YBCGE leave  
'keyboard\_transmit' mode  
keypad\_xmit smkx str ks - - YBCGE enter 'keyboard\_transmit' mode  
lab\_f0 lf0 str l0 - - -B-G-\* label on function key f0 if not f0  
lab\_f1 lf1 str l1 - - -B-G-\* label on function key f1 if not f1  
lab\_f10 lf10 str la - - ---- label on function key f10 if not f10  
lab\_f2 lf2 str l2 - - -B-G-\* label on function key f2 if not f2  
lab\_f3 lf3 str l3 - - -B-G-\* label on function key f3 if not f3  
lab\_f4 lf4 str l4 - - -B-G-\* label on function key f4 if not f4  
lab\_f5 lf5 str l5 - - -B-G-\* label on function key f5 if not f5  
lab\_f6 lf6 str l6 - - -B-G-\* label on function key f6 if not f6  
lab\_f7 lf7 str l7 - - -B-G-\* label on function key f7 if not f7  
lab\_f8 lf8 str l8 - - -B-G-\* label on function key f8 if not f8  
lab\_f9 lf9 str l9 - - -B-G-\* label on function key f9 if not f9  
meta\_off rmm str mo - - YB-G-\* turn off meta mode  
meta\_on smm str mm - - YB-G-\* turn on meta mode (8th-bit on)  
newline nel str nw - - YB-G-\* newline  
(behave like cr followed by lf)  
pad\_char pad str pc - - YBCGE padding char (instead of null)  
parm\_dch dch str DC - - YB-GE delete #1 characters (P\*)  
parm\_delete\_line dl str DL - - YBCGE delete #1 lines (P\*)  
parm\_down\_cursor cud str DO - - YBCGE down #1 lines (P\*)  
parm\_ich ich str IC - - YB-GE insert #1 characters (P\*)  
parm\_index indn str SF - - YBCG- scroll forward #1 lines (P)  
parm\_insert\_line il str AL - - YBCGE insert #1 lines (P\*)  
parm\_left\_cursor cub str LE - - YBCGE move #1 characters to the left (P)  
parm\_right\_cursor cuf str RI - - YBCGE move #1 characters to the right (P\*)  
parm\_rindex rin str SR - - YBCG- scroll back #1 lines (P)  
parm\_up\_cursor cuu str UP - - YBCGE up #1 lines (P\*)  
pkey\_key pfkey str pk - - -B--- program function key #1 to type string #2  
pkey\_local pfloc str pl - - -B--- program function key #1 to execute string #2  
pkey\_xmit pfx str px - - -B--- program function key #1 to transmit string #2  
print\_screen mc0 str ps - - -B-G-\* print  
contents of screen  
prtr\_off mc4 str pf - - -B-G-\* turn off printer  
prtr\_on mc5 str po - - -B-G-\* turn on printer  
repeat\_char rep str rp - - YB-GE repeat char #1 #2 times (P\*)

```

reset_1string  rs1 str r1 - -B--- reset string
reset_2string  rs2 str r2 - -B--- reset string
reset_3string  rs3 str r3 - -B--- reset string
reset_file    rf str rf - -B--- name of reset file
restore_cursor rc str rc - -YBCG- restore cursor to position of last save_cursor
row_address   vpa str cv - -B-GE* vertical position #1 absolute (P)
save_cursor   sc str sc - -YBCG- save current cursor position (P)
scroll_forward ind str sf - -YBCGE scroll text up (P)
scroll_reverse ri str sr - -YBCGE scroll text down (P)
set_attributes sgr str sa - -YB-G- define video attributes #1-#9 (PG9)
set_tab       hts str st - -YB-G- set a tab in every row, current columns
set_window    wind str wi - -B-GE current window is lines #1-#2 cols #3-#4
tab          ht str ta - -YBCGE tab
            to next 8-space hardware tab stop
to_status_line tsl str ts - -YB-G- move to status line, column #1
underline_char uc str uc - -YBCG- underline char and move past it
up_half_line  hu str hu - -YB-G- half a line up
init_prog     iprog str iP - -B--- path name of program for initialization
key_a1       ka1 str K1 KEY_A1 0534 YB-GE upper left of keypad
key_a3       ka3 str K3 KEY_A3 0535 YB-GE upper right of keypad
key_b2       kb2 str K2 KEY_B2 0536 YB-GE center of keypad
key_c1       kc1 str K4 KEY_C1 0537 YB-GE lower left of keypad
key_c3       kc3 str K5 KEY_C3 0540 YB-GE lower right of keypad
prtr_non     mc5p str pO - -B-G-* turn on printer for #1 bytes
#
# SVr1 capabilities stop here. IBM's version of terminfo is the same as
# SVr4 up to this point, but has a different set afterwards.
#
char_padding  rmp str rP - ------ like ip but when in insert mode
acs_chars    acsc str ac - ------ graphics charset pairs, based on vt100
plab_norm    pln str pn - ------ program label
            #1 to show string #2
key_btab     kcbt str kB KEY_BTAB 0541 ----- back-tab key
enter_xon_mode smxon str SX - ------ turn on xon/xoff handshaking
exit_xon_mode  rmxon str RX - ------ turn off xon/xoff handshaking
enter_am_mode  smam str SA - ------ turn on automatic margins
exit_am_mode   rmam str RA - ------ turn off automatic margins
xon_character  xonc str XN - ------ XON character
xoff_character xoffc str XF - ------ XOFF character
ena_acs       enacs str eA - ------ enable alternate char set
label_on      smln str LO - ------ turn on soft labels
label_off     rmln str LF - ------ turn off soft labels
key_beg       kbeg str @1 KEY_BEG 0542 ----- begin key
key_cancel    kcan str @2 KEY_CANCEL 0543 ----- cancel key
key_close     kclo str @3 KEY_CLOSE 0544 ----- close key
key_command   kcmd str @4 KEY_COMMAND 0545 ----- command key
key_copy      kcpy str @5 KEY_COPY 0546 ----- copy key
key_create    kcert str @6 KEY_CREATE 0547 ----- create key

```

key\_end kend str @7 KEY\_END 0550 ----- end  
key  
key\_enter kent str @8 KEY\_ENTER 0527 ----- enter/send key  
key\_exit kext str @9 KEY\_EXIT 0551 ----- exit key  
key\_find kfnd str @0 KEY\_FIND 0552 ----- find key  
key\_help khlp str %1 KEY\_HELP 0553 ----- help key  
key\_mark kmrk str %2 KEY\_MARK 0554 ----- mark key  
key\_message kmsg str %3 KEY\_MESSAGE 0555 ----- message key  
key\_move kmov str %4 KEY\_MOVE 0556 ----- move key  
key\_next knxt str %5 KEY\_NEXT 0557 ----- next key  
key\_open kopn str %6 KEY\_OPEN 0560 ----- open key  
key\_options kopt str %7 KEY\_OPTIONS 0561 ----- options key  
key\_previous kprv str %8 KEY\_PREVIOUS 0562 ----- previous key  
key\_print kpri str %9 KEY\_PRINT 0532 ----- print key  
key\_redo krdo str %0 KEY\_REDO 0563 ----- redo key  
key\_reference kref str &1 KEY\_REFERENCE 0564 ----- reference key  
key\_refresh krfr str &2 KEY\_REFRESH 0565 ----- refresh key  
key\_replace krpl str &3 KEY\_REPLACE 0566 ----- replace key  
key\_restart krst str &4 KEY\_RESTART 0567 ----- restart key  
key\_resume kres str &5 KEY\_RESUME 0570 ----- resume  
key  
key\_save ksav str &6 KEY\_SAVE 0571 ----- save key  
key\_suspend kspd str &7 KEY\_SUSPEND 0627 ----- suspend key  
key\_undo kund str &8 KEY\_UNDO 0630 ----- undo key  
key\_sbeg kBEG str &9 KEY\_SBEG 0572 ----- shifted begin key  
key\_scancel kCAN str &0 KEY\_SCANCEL 0573 ----- shifted cancel key  
key\_scommand kCMD str \*1 KEY\_SCOMMAND 0574 ----- shifted command key  
key\_scopy kCPY str \*2 KEY\_SCOPY 0575 ----- shifted copy key  
key\_screate kCRT str \*3 KEY\_SCREATE 0576 ----- shifted create key  
key\_sdc kDC str \*4 KEY\_SDC 0577 ----- shifted delete-character key  
key\_sdl kDL str \*5 KEY\_SDL 0600 ----- shifted delete-line key  
key\_select kslt str \*6 KEY\_SELECT 0601 ----- select key  
key\_send kEND str \*7 KEY\_SEND 0602 ----- shifted end key  
key\_seol kEOL str \*8 KEY\_SEOL 0603 ----- shifted clear-to-end-of-line key  
key\_sexit kEXT str \*9 KEY\_SEXIT 0604 ----- shifted exit key  
key\_sfnd kFND str \*0 KEY\_SFIND 0605 ----- shifted find key  
key\_shelp kHLP str #1 KEY\_SHELP 0606 ----- shifted  
help key  
key\_shome kHOM str #2 KEY\_SHOME 0607 ----- shifted home key  
key\_sic kIC str #3 KEY\_SIC 0610 ----- shifted insert-character key  
key\_sleft kLFT str #4 KEY\_SLEFT 0611 ----- shifted left-arrow key  
key\_smessage kMSG str %a KEY\_SMESSAGE 0612 ----- shifted message key  
key\_smove kMOV str %b KEY\_SMOVE 0613 ----- shifted move key  
key\_snext kNXT str %c KEY\_SNEXT 0614 ----- shifted next key  
key\_soptions kOPT str %d KEY\_SOPTIONS 0615 ----- shifted options key  
key\_sprevious kPRV str %e KEY\_SPREVIOUS 0616 ----- shifted previous key  
key\_sprint kPRT str %f KEY\_SPRINT 0617 ----- shifted print key  
key\_sredo kRDO str %g KEY\_SREDO 0620 ----- shifted redo key



key\_sreplace kRPL str %h KEY\_SREPLACE 0621 ----- shifted replace key  
key\_sright kRIT str %i KEY\_SRIGHT 0622 ----- shifted right-arrow key  
key\_srsume kRES str %j KEY\_SRSUME 0623 ----- shifted resume key  
key\_ssav kSAV str !1 KEY\_SSAVE 0624 ----- shifted save key  
key\_ssuspend kSPD str !2 KEY\_SSUSPEND 0625 ----- shifted  
suspend key  
key\_sundo kUND str !3 KEY\_SUNDO 0626 ----- shifted undo key  
req\_for\_input rfi str RF - - - - - send next input char (for ptys)  
key\_f11 kf11 str F1 KEY\_F(11) - ----E F11 function key  
key\_f12 kf12 str F2 KEY\_F(12) - ----E F12 function key  
key\_f13 kf13 str F3 KEY\_F(13) - ----E F13 function key  
key\_f14 kf14 str F4 KEY\_F(14) - ----E F14 function key  
key\_f15 kf15 str F5 KEY\_F(15) - ----E F15 function key  
key\_f16 kf16 str F6 KEY\_F(16) - ----E F16 function key  
key\_f17 kf17 str F7 KEY\_F(17) - ----E F17 function key  
key\_f18 kf18 str F8 KEY\_F(18) - ----E F18 function key  
key\_f19 kf19 str F9 KEY\_F(19) - ----E F19 function key  
key\_f20 kf20 str FA KEY\_F(20) - ----E F20 function key  
key\_f21 kf21 str FB KEY\_F(21) - ----E F21 function key  
key\_f22 kf22 str FC KEY\_F(22) - ----E F22 function key  
key\_f23 kf23 str FD KEY\_F(23) - ----E F23 function key  
key\_f24 kf24 str FE KEY\_F(24) - ----E F24 function  
key  
key\_f25 kf25 str FF KEY\_F(25) - ----E F25 function key  
key\_f26 kf26 str FG KEY\_F(26) - ----E F26 function key  
key\_f27 kf27 str FH KEY\_F(27) - ----E F27 function key  
key\_f28 kf28 str FI KEY\_F(28) - ----E F28 function key  
key\_f29 kf29 str FJ KEY\_F(29) - ----E F29 function key  
key\_f30 kf30 str FK KEY\_F(30) - ----E F30 function key  
key\_f31 kf31 str FL KEY\_F(31) - ----E F31 function key  
key\_f32 kf32 str FM KEY\_F(32) - ----E F32 function key  
key\_f33 kf33 str FN KEY\_F(33) - ----E F33 function key  
key\_f34 kf34 str FO KEY\_F(34) - ----E F34 function key  
key\_f35 kf35 str FP KEY\_F(35) - ----E F35 function key  
key\_f36 kf36 str FQ KEY\_F(36) - ----E F36 function key  
key\_f37 kf37 str FR KEY\_F(37) - ----E F37 function key  
key\_f38 kf38 str FS KEY\_F(38) - ----E F38 function key  
key\_f39 kf39 str FT KEY\_F(39) - ----E F39 function key  
key\_f40 kf40 str FU KEY\_F(40) - ----E F40 function key  
key\_f41 kf41 str FV KEY\_F(41) - ----E F41 function key  
key\_f42 kf42 str FW KEY\_F(42) - ----E F42  
function key  
key\_f43 kf43 str FX KEY\_F(43) - ----E F43 function key  
key\_f44 kf44 str FY KEY\_F(44) - ----E F44 function key  
key\_f45 kf45 str FZ KEY\_F(45) - ----E F45 function key  
key\_f46 kf46 str Fa KEY\_F(46) - ----E F46 function key  
key\_f47 kf47 str Fb KEY\_F(47) - ----E F47 function key  
key\_f48 kf48 str Fc KEY\_F(48) - ----E F48 function key

key\_f49 kf49 str Fd KEY\_F(49) - ----E F49 function key  
key\_f50 kf50 str Fe KEY\_F(50) - ----E F50 function key  
key\_f51 kf51 str Ff KEY\_F(51) - ----E F51 function key  
key\_f52 kf52 str Fg KEY\_F(52) - ----E F52 function key  
key\_f53 kf53 str Fh KEY\_F(53) - ----E F53 function key  
key\_f54 kf54 str Fi KEY\_F(54) - ----E F54 function key  
key\_f55 kf55 str Fj KEY\_F(55) - ----E F55 function key  
key\_f56 kf56 str Fk KEY\_F(56) - ----E F56 function key  
key\_f57 kf57 str Fl KEY\_F(57) - ----E F57 function key  
key\_f58 kf58 str Fm KEY\_F(58) - ----E F58 function key  
key\_f59 kf59 str Fn KEY\_F(59) - ----E F59  
function key  
key\_f60 kf60 str Fo KEY\_F(60) - ----E F60 function key  
key\_f61 kf61 str Fp KEY\_F(61) - ----E F61 function key  
key\_f62 kf62 str Fq KEY\_F(62) - ----E F62 function key  
key\_f63 kf63 str Fr KEY\_F(63) - ----E F63 function key  
clr\_bol el1 str cb - - ----- Clear to beginning of line  
clear\_margins mgc str MC - - ----- clear right and left soft margins  
set\_left\_margin smgl str ML - - ----- set left soft margin at current column. See smgl. (ML is not in BSD termcap).  
set\_right\_margin smgr str MR - - ----- set right soft margin at current column  
device\_type devt str dv - - ----- Indicate language/codeset support  
code\_set\_init csin str ci - - ----- Init sequence for multiple codesets  
set0\_des\_seq s0ds str s0 - - ----- Shift to codeset 0 (EUC set 0, ASCII)  
set1\_des\_seq s1ds str s1 - - ----- Shift to codeset 1  
set2\_des\_seq s2ds str s2 - - ----- Shift to codeset 2  
set3\_des\_seq s3ds str s3 - - ----- Shift to codeset 3  
key\_mouse kmous str Km KEY\_MOUSE 0631 ----- Mouse  
event has occurred  
mouse\_info minfo str Mi - - ----- Mouse status information  
req\_mouse\_pos reqmp str RQ - - ----- Request mouse position  
get\_mouse getm str Gm - - ----- Curses should get button events, parameter #1 not documented.  
release\_mouse relm str Rm - - ----- Curses should release the mouse \*/  
color\_names colorm str Yw - - ----- Give name for color #1  
initialize\_color initc str Ic - - ----- initialize color #1 to (#2,#3,#4)  
initialize\_pair initp str Ip - - ----- Initialize color pair #1 to fg=(#2,#3,#4), bg=(#5,#6,#7)  
orig\_colors oc str oc - - ----- Set all color pairs to the original ones  
orig\_pair op str op - - ----- Set default pair to its original value  
set\_a\_background setab str AB - - ----- Set background color to #1, using ANSI escape  
set\_a\_foreground setaf str AF - - ----- Set foreground color to #1, using ANSI escape  
set\_background setb str Sb - - ----- Set background color #1  
set\_color\_pair scp str sp - - ----- Set  
current color pair to #1  
set\_foreground setf str Sf - - ----- Set foreground color #1  
#%.TE  
#%.ad  
#%  
# The magic token below tells the tic compiler-generator code that all the caps  
# past it should be ignored (not written out) when dumping terminfo objects. It

```

# also tells the man page table generator not to pass through following lines
# This means we can have obsolete capabilities and pseudo-capabilities that are
# recognized for termcap or terminfo compilation, but not output.
#
# %%-STOP-HERE-%%
#
# Don't move this casually! In fact, don't move it at all unless you're
# either doing it to add System V or XPG4 extensions, or have decided you
# don't care about SVr4 binary compatibility.
#
#####
#
# TERMCAP EXTENSION CAPABILITIES
#
# The capabilities below are either obsolete or extensions on certain systems.
# They are not used by SVR4 terminfo. Some are used by captinfo to translate
#
# termcap sources; the rest are listed for completeness, and in case somebody
# cares about them enough to hack in code that will translate them into
# terminfo capabilities.
#
# The first part of the list is from Ross Ridge's `mytinfo' package
# (comp.sources.unix, volume 26); the variable names and terminfo names (as
# well as the termcap codes) match his list.
#
# This group of codes is not marked obsolete in 4.4BSD, but have no direct
# terminfo equivalents. The rs capability is specially translated to terminfo
# r2, and vice versa, if an entry does not already have an r2. Similarly,
# i2 is translated to r3 if there is no r3 (because SV terminfo maps i2 to r3).
# The ug capability is thrown away, but assumed to be whatever sg is if the
# latter is nonzero and we're dumping in termcap format.
#
termcap_init2 OTi2 str i2 - - YB--- secondary initialization string
termcap_reset OTrs str rs - - YB-G- terminal reset string
magic_cookie_glitch_ul OTug num ug - - YBCGE number
of blanks left by ul
#
# Obsolete termcap capabilities. Some are used for termcap translation. The
# code uses the 'OT' prefix we put on obsolete capabilities to suppress
# printing them in terminfo source dumps of compiled entries.
#
backspaces_with_bs OTbs bool bs - - YBCGE uses ^H to move left
crt_no_scrolling OTns bool ns - - YBCG- crt cannot scroll
no_correctly_working_cr OTnc bool nc - - YBCG- no way to go to start of line
carriage_return_delay OTdC num dC - - YB-G- pad needed for CR
new_line_delay OTdN num dN - - YB-G- pad needed for LF
linefeed_if_not_lf OTnl str nl - - YBCGE use to move down
backspace_if_not_bs OTbc str bc - - YBCGE move left, if not ^H

```

```

#
# GNU termcap library extensions. The GNU termcap file distributed with
# Emacs no longer uses these, but MT showed up in pre-9.0 versions of the
# BSD termcap file. The name clash with terminfo MT is resolved by type
# info; MT is converted to km.
#
gnu_has_meta_key OTMT bool MT - - ---E has meta key
#
gnu_tab_width OTtw num tw - - ---E tab width in spaces
#
# GNU termcap *does* include the following extended capability, Only the
# now-obsolete Ann Arbor terminals used it.
#
# gnu_change_scroll_region OTcS str cS - - ---GE alternate set scrolling region
#
# The following comments describe capnames so ancient that I believe no
# software uses them any longer. Some of these have to go because they
# clash with terminfo names in ways that cannot be resolved by type
# information.
#
# These mytinfo codes are not used in the 4.4BSD curses code. They are
# marked obsolete in the 4.4BSD manual pages.
#
# There is one conflict with terminfo; ma is in both. This conflict is
# resolved by type information.
#
# The `ko' capability is translated by special code. It should contain a
# comma-separated list of capabilities for which there are corresponding keys.
# The `kn' code is accepted but ignored.
#
# The `ma' capability seems to have been designed to map between the rogue(2)
#
# motion keys (including jkhl) and characters emitted by arrow keys on some
# primitive pre-ANSI terminals. It's so obsolete it's fossilized...
#
# Here is a description of memory_lock_above and memory_unlock:
# "You can 'freeze' data on the screen by turning on Memory Lock in a line of
# text. All lines above the cursor's current line become locked in place on
# the screen. Then enter data normally. When the screen fills up, any
# further data entered forces the first line of unfrozen line text to scroll
# under the frozen data. Lines scrolled off the screen are inserted into
# memory immediately preceding the first frozen line." (from the HP 700/96
# User's manual). VT100/ANSI memory lock set is \E[>2h, reset is \E[>2l.
#
# Applications that use terminfo are supposed to behave as though xr is
# always true.
#
linefeed_is_newline OTNL bool NL - - YB--- move down with \n

```

```

# even_parity OTEP bool EP - -B--- terminal requires even parity
# odd_parity OTOP bool OP - -B--- terminal
  requires odd parity
# half_duplex OTHD bool HD - -B--- terminal is half-duplex
# lower_case_only OTLC bool LC - -B--- terminal has only lower case
# upper_case_only OTUC bool UC - -B--- terminal has only upper case
backspace_delay OTdB num dB - -YB-G- padding required for ^H
# form_feed_delay OTdF num dF - -B-G- padding required for ^L
horizontal_tab_delay OTdT num dT - -YB-G- padding required for ^I
# vertical_tab_delay OTdV num dV - -B--- padding required for ^V
number_of_function_keys OTkn num kn - -B-G- count of function keys
other_non_function_keys OTko str ko - -B-G- list of self-mapped keycaps
arrow_key_map OTma str ma - -YBC-- map arrow keys rogue(1) motion keys
# memory_lock_above OTml str ml - -B--- lock visible screen memory above the current line
# memory_unlock OTmu str mu - -B--- unlock visible screen memory above the current line
has_hardware_tabs OTpt bool pt - -YB--- has 8-char tabs invoked with ^I
return_does_clr_eol OTxr bool xr - -YB--- return
  clears the line
# tek_4025_insert_line OTxx bool xx - -BC-- Tektronix 4025 insert-line glitch
#
# mytinfo described this as a termcap capability, but it's not listed in the
# 4.4BSD man pages, and not found in the 4.4BSD termcap file. The ncurses
# package, like System V, behaves as though it is always true.
#
# rind_only_at_top OTxq bool xq - ------ reverse index only works from top line
#
# University of Waterloo termcap extensions (as described in mytinfo).
# The `xl' termcap file clashes with a terminfo name; this ambiguity cannot
# be resolved by a type check. The descriptions are guesses from what was
# in the mytinfo tables.
#
# key_interrupt_char OTki str ki - ------ string set by interrupt key (?)
# key_kill_char OTkk str kk - ------ string set by kill key (?)
# key_suspend_char OTkz str kz - ------ string set by suspend key (?)
# initialization_messy OTxc bool xc - ------ initialization leaves garbage on the screen
(?)
# ind_at_bottom_does_cr OTxl bool xl - ------ index does a carriage return
#
# Nonstandard capabilities unique to Ross Ridge's `mytinfo' package.
# SR clashes with a terminfo name; this ambiguity cannot be resolved by a type
# check.
#
# scroll_left OTsll str Sl - ------ scroll screen leftward
# scroll_right OTsr1 str Sr - ------ scroll screen rightward
# parm_scroll_left OTsl str SL - ------ scroll screen leftward #1 characters
# parm_scroll_right OTsr str SR - ------ scroll screen rightward #1 characters
#
# The mytinfo capabilities end here.

```

```

#
# XENIX extensions:
#
# Xenix defined its own set of forms-drawing capabilities:
#
# cap IBM ASCII description      ACS      ASCII
# -----
# G1 191 \277 M-? single upper right ACS_URCORNER
# G2 218 \332 M-Z single upper left ACS_ULCORNER
# G3 192 \300 M-@ single lower left ACS_LLCORNER
# G4 217 \331 M-Y single lower right ACS_LRCORNER
# G5 187 \273 M-; double
  upper right
# G6 201 \311 M-I double upper left
# G7 200 \310 M-H double lower left
# G8 188 \274 M-< double lower right
# GC 197 \305 M-E single intersection ACS_PLUS _ _
# GD 194 \302 M-B single down-tick ACS_TTEE |
# GH 196 \304 M-D single horizontal line ACS_HLINE
# GL 180 \264 M-4 single left tick ACS_RTEE -|
# GR 195 \303 M-C single right tick ACS_LTEE |-
# GU 193 \301 M-A single up tick ACS_BTEE _|
# GV 179 \263 M-3 single vertical line ACS_VLINE
# Gc 206 \316 M-N double intersection
# Gd 203 \313 M-K double down tick
# Gh 205 \315 M-M double horizontal line
# Gl 204 \204 M-L double left tick
# Gr 185 \271 M-9 double right tick
# Gu 202 \312 M-J double up tick
# Gv 186 \272 M-: double vertical line
#
# The compiler will translate the single-line caps and discard the others
# (via IGNORE aliases further down). We don't want to do normal pad
# translation on these, they're often single-character printable ASCII
# strings that happen to be numerics. There's awk code in
  parametrized.sh
# that detects the acs_ prefix and uses it to suppress pad translation.
# These terminfo names are invented.
#
acs_ulcorner  OTG2 str G2 - - - - - single upper left
acs_llcorner  OTG3 str G3 - - - - - single lower left
acs_urcorner  OTG1 str G1 - - - - - single upper right
acs_lrcorner  OTG4 str G4 - - - - - single lower right
acs_ltee      OTGR str GR - - - - - tee pointing right
acs_rtee      OTGL str GL - - - - - tee pointing left
acs_btee      OTGU str GU - - - - - tee pointing up
acs_ttee      OTGD str GD - - - - - tee pointing down
acs_hline     OTGH str GH - - - - - single horizontal line

```

```

acs_vline  OTGV str GV - - ---- single vertical line
acs_plus   OTGC str GC - - ---- single intersection
#
#####
#
# TERMINFO EXTENSION CAPABILITIES
#
# This section is almost all comments. What it's mainly for is to describe
# what capabilities need to be squeezed out to get down to the XSI Curses
#
# standard set. They are flagged with K.
#
# HP extensions
#
# These extensions follow ptr_non (replacing everything after it) in HP
# terminfo files. Except for memory_lock and memory_unlock, they are
# functionally identical to SVr4 extensions, but they make the binary format
# different. Grrr....
#
memory_lock  meml str ml - - ----K lock memory above cursor
memory_unlock  memu str mu - - ----K unlock memory
#plab_norm   pln str pn - - ---- program label #1 to show string #2
#label_on    smln str LO - - ---- turn on soft labels
#label_off   rmln str LF - - ---- turn off soft labels
#key_f11     kf11 str F1 - - ---- F11 function key
#key_f12     kf12 str F2 - - ---- F12 function key
#key_f13     kf13 str F3 - - ---- F13 function key
#key_f14     kf14 str F4 - - ---- F14 function key
#key_f15     kf15 str F5 - - ---- F15 function key
#key_f16     kf16 str F6 - - ---- F16 function key
#key_f17     kf17 str F7 - - ---- F17 function key
#key_f18     kf18 str F8 - - ---- F18 function
key
#key_f19     kf19 str F9 - - ---- F19 function key
#key_f20     kf20 str FA - - ---- F20 function key
#key_f21     kf21 str FB - - ---- F21 function key
#key_f22     kf22 str FC - - ---- F22 function key
#key_f23     kf23 str FD - - ---- F23 function key
#key_f24     kf24 str FE - - ---- F24 function key
#key_f25     kf25 str FF - - ---- F25 function key
#key_f26     kf26 str FG - - ---- F26 function key
#key_f27     kf27 str FH - - ---- F27 function key
#key_f28     kf28 str FI - - ---- F28 function key
#key_f29     kf29 str FJ - - ---- F29 function key
#key_f30     kf30 str FK - - ---- F30 function key
#key_f31     kf31 str FL - - ---- F31 function key
#key_f32     kf32 str FM - - ---- F32 function key
#key_f33     kf33 str FN - - ---- F33 function key

```

```

#key_f34 kf34 str FO - - ----- F34 function key
#key_f35 kf35 str FP - - ----- F35 function key
#key_f36 kf36 str FQ - - ----- F36 function key
#key_f37 kf37 str FR - - ----- F37 function key
#key_f38 kf38 str FS - - ----- F38
function key
#key_f39 kf39 str FT - - ----- F39 function key
#key_f40 kf40 str FU - - ----- F40 function key
#key_f41 kf41 str FV - - ----- F41 function key
#key_f42 kf42 str FW - - ----- F42 function key
#key_f43 kf43 str FX - - ----- F43 function key
#key_f44 kf44 str FY - - ----- F44 function key
#key_f45 kf45 str FZ - - ----- F45 function key
#key_f46 kf46 str Fa - - ----- F46 function key
#key_f47 kf47 str Fb - - ----- F47 function key
#key_f48 kf48 str Fc - - ----- F48 function key
#key_f49 kf49 str Fd - - ----- F49 function key
#key_f50 kf50 str Fe - - ----- F50 function key
#key_f51 kf51 str Ff - - ----- F51 function key
#key_f52 kf52 str Fg - - ----- F52 function key
#key_f53 kf53 str Fh - - ----- F53 function key
#key_f54 kf54 str Fi - - ----- F54 function key
#key_f55 kf55 str Fj - - ----- F55 function key
#key_f56 kf56 str Fk - - ----- F56 function key
#key_f57 kf57 str Fl - - ----- F57 function key
#key_f58 kf58 str Fm - - ----- F58
function key
#key_f59 kf59 str Fn - - ----- F59 function key
#key_f60 kf60 str Fo - - ----- F60 function key
#key_f61 kf61 str Fp - - ----- F61 function key
#key_f62 kf62 str Fq - - ----- F62 function key
#key_f63 kf63 str Fr - - ----- F63 function key
#
# IBM extensions
#
# These extensions follow ptr_non (replacing everything after it) in IBM
# terminfo files.
#
# The places in the box[12] capabilities correspond to acsc characters, here is
# the mapping:
#
# box1[0] = ACS_ULCORNER
# box1[1] = ACS_HLINE
# box1[2] = ACS_URCORNER
# box1[3] = ACS_VLINE
# box1[4] = ACS_LRCORNER
# box1[5] = ACS_LLCORNER
# box1[6] = ACS_TTEE

```



```

# box1[7] = ACS_RTEE
# box1[8] = ACS_BTEE
# box1[9] = ACS_LTEE
# box1[10] = ACS_PLUS
#
# The box2 characters are the double-line versions of these forms graphics.
#
box_chars_1 box1 str bx - - ----K box characters primary set
#box_chars_2 box2 str by - - ----K box characters secondary set
#box_attr_1 batt1 str Bx - - ----K attributes
for box1
#box_attr_2 batt2 str By - - ----K attributes for box2
#color_bg_0 colb0 str d0 - - ----K background color 0
#color_bg_1 colb1 str d1 - - ----K background color 1
#color_bg_2 colb2 str d2 - - ----K background color 2
#color_bg_3 colb3 str d3 - - ----K background color 3
#color_bg_4 colb4 str d4 - - ----K background color 4
#color_bg_5 colb5 str d5 - - ----K background color 5
#color_bg_6 colb6 str d6 - - ----K background color 6
#color_bg_7 colb7 str d7 - - ----K background color 7
#color_fg_0 colf0 str c0 - - ----K foreground color 0
#color_fg_1 colf1 str c1 - - ----K foreground color 1
#color_fg_2 colf2 str c2 - - ----K foreground color 2
#color_fg_3 colf3 str c3 - - ----K foreground color 3
#color_fg_4 colf4 str c4 - - ----K foreground color 4
#color_fg_5 colf5 str c5 - - ----K foreground color 5
#color_fg_6 colf6 str c6 - - ----K foreground color 6
#color_fg_7 colf7 str c7 - - ----K foreground
color 7
#font_0 font0 str f0 - - ----- select font 0
#font_1 font1 str f1 - - ----- select font 1
#font_2 font2 str f2 - - ----- select font 2
#font_3 font3 str f3 - - ----- select font 3
#font_4 font4 str f4 - - ----K select font 4
#font_5 font5 str f5 - - ----K select font 5
#font_6 font6 str f6 - - ----K select font 6
#font_7 font7 str f7 - - ----K select font 7
#key_back_tab kbtb str k0 - - ----- backtab key
#key_do kdo str ki - - ----K do request key
#key_command kcmd str kd - - ----K command-request key
#key_command_pane kcpn str kW - - ----K command-pane key
#key_end kend str kw - - ----- end key
#key_help khlp str kq - - ----- help key
#key_newline knl str nl - - ----K newline key
#key_next_pane knpn str kv - - ----K next-pane key
#key_prev_cmd kppn str kp - - ----K previous-command key
#key_prev_pane kppn str kV - - ----K previous-pane key
#key_quit kquit str kQ - - ----K quit key

```

```

#key_select ksel str kU - - ---- select
key
#key_scroll_left kscl str kz - - ----K scroll left
#key_scroll_right kscr str kZ - - ----K scroll right
#key_tab ktab str ko - - ----K tab key
#key_smap_in1 kmpf1 str Kv - - ----K special mapped key 1 input
#key_smap_out1 kmpt1 str KV - - ----K special mapped key 1 output
#key_smap_in2 kmpf2 str Kw - - ----K special mapped key 2 input
#key_smap_out2 kmpt2 str KW - - ----K special mapped key 2 output
#key_smap_in3 kmpf3 str Kx - - ----K special mapped key 3 input
#key_smap_out3 kmpt3 str KX - - ----K special mapped key 3 output
#key_smap_in4 kmpf4 str Ky - - ----K special mapped key 4 input
#key_smap_out4 kmpt4 str KY - - ----K special mapped key 4 output
#key_smap_in5 kmpf5 str Kz - - ----K special mapped key 5 input
#key_smap_out5 kmpt5 str KZ - - ----K special mapped key 5 output
#appl_defined_str apstr str za - - ----K application-defined string
# The key_smap_in[6789] and key_smap_out[6789] capabilities aren't described
in
# the IBM manual pages, so the cap name strings are guesses. The terminfo
# names are almost certainly right, the termcap ones almost certainly wrong.
#key_smap_in6 kmpf6 str k! - - ----K special mapped key 6 input
#key_smap_out6 kmpt6 str K@ - - ----K special mapped key 6 output
#key_smap_in7 kmpf7 str k# - - ----K special mapped key 7 input
#key_smap_out7 kmpt7 str K$ - - ----K special mapped key 7 output
#key_smap_in8 kmpf8 str k% - - ----K special mapped key 8 input
#key_smap_out8 kmpt8 str K^ - - ----K special mapped key 8 output
#key_smap_in9 kmpf9 str k& - - ----K special mapped key 9 input
#key_smap_out9 kmpt9 str K* - - ----K special mapped key 9 output
# Undocumented capabilities end here
#key_sf1 ksf1 str S1 - - ----K special function key 1
#key_sf2 ksf2 str S2 - - ----K special function key 2
#key_sf3 ksf3 str S3 - - ----K special function key 3
#key_sf4 ksf4 str S4 - - ----K special function key 4
#key_sf5 ksf5 str S5 - - ----K special
function key 5
#key_sf6 ksf6 str S6 - - ----K special function key 6
#key_sf7 ksf7 str S7 - - ----K special function key 7
#key_sf8 ksf8 str S8 - - ----K special function key 8
#key_sf9 ksf9 str S9 - - ----K special function key 9
#key_sf10 ksf10 str SA - - ----K special function key 10
# AIX version 3 documents different codes for F11, F12 and does not mention
# F13-F64. AIX version 4 uses the same naming for F0-F63 as above.
#key_f11 kf11 str k< - - ---- function key 11
#key_f12 kf12 str k> - - ---- function key 12
# Undocumented capabilities end here.
#key_action kact str kJ - - ----K sent by action key
# The IBM docs say these capabilities are for table-drawing, and are
# valid only for aixterm descriptions.

```

```

#enter_topline_mode topl str tp - - ----K start top-line mode
#enter_bottom_mode btml str bm - - ----K start bottom-line mode
#enter_rvert_mode rvert str rv - - ----K start right-vertical mode
#enter_lvert_mode lvert str lv - - ----K start
left-vertical mode
#
#####
#
# ALIAS DECLARATIONS
#
# Here we set up aliases for translating extensions into standard terminfo.
#
#----- Termcap aliases -----
#
# BSD aliases:
#
# This is a common error in many termcap files. We'll get notified during
# translation when this (or any other alias) fires.
#
capalias sb sr BSD scroll text down
#
# AT&T extensions:
#
# The old AT&T 5410, 5420, 5425, pc6300plus, 610, and s4 entries used a set of
# nonstandard capabilities. Its signature is the KM capability, used to name
# some sort of keymap file. EE, BO, CI, CV, XS, DS, FL and FE are in this
# set. Comments in the original, and a little cross-checking with other AT&T
# documentation, seem to establish the following mappings:
#
capalias BO mr AT&T enter_reverse_mode
capalias CI vi AT&T cursor_invisible
capalias CV ve AT&T cursor_normal
capalias DS mh AT&T enter_dim_mode
#capalias EE me AT&T exit_attribute_mode
capalias FE LF AT&T label_on
capalias FL LO AT&T label_off
capalias XS mk AT&T enter_secure_mode
#
#
We comment out EE because the conflicting XENIX EE is more common in
# old entries.
#
# XENIX extensions:
#
# These are the ones we know how to translate directly:
#
capalias EE mh XENIX exit_attribute_mode
capalias GE ae XENIX exit_alt_charset_mode

```

```
capalias GS as XENIX enter_alt_charset_mode
capalias CF vi XENIX cursor_invis
capalias CO ve XENIX cursor_normal
capalias EN @7 XENIX key_end
capalias HM kh XENIX key_home
capalias LD kL XENIX key_dl
capalias PD kN XENIX key_npage
capalias PN po XENIX prtr_off
capalias PS pf XENIX prtr_on
capalias PU kP XENIX key_ppage
capalias RT @8 XENIX kent
capalias UP ku XENIX kcuu1
capalias G6 IGNORE XENIX double-ACS_ULCORNER
capalias G7 IGNORE XENIX double-ACS_LLCORNER
capalias G5 IGNORE XENIX double-ACS_URCORNER
capalias G8 IGNORE XENIX double-ACS_LRCORNER
capalias Gr IGNORE XENIX double-ACS_LTEE
capalias Gr IGNORE XENIX double-ACS_RTEE
capalias Gu IGNORE XENIX double-ACS_BTEE
capalias Gd IGNORE XENIX double
  ACS_TTEE
capalias Gh IGNORE XENIX double-ACS_HLINE
capalias Gv IGNORE XENIX double-ACS_VLINE
capalias Gc IGNORE XENIX double-ACS_PLUS
capalias GG IGNORE XENIX acs-glitch
#
# IBM extensions:
#
capalias kq %1 IBM key_help
#
# Iris extensions:
#
capalias HS mh IRIS enter_dim_mode
#
# Tektronix extensions:
#
capalias KA k; Tek key_f10
capalias KB F1 Tek key_f11
capalias KC F2 Tek key_f12
capalias KD F3 Tek key_f13
capalias KE F4 Tek key_f14
capalias KF F5 Tek key_f15
capalias BC Sb Tek set_background
capalias FC Sf Tek set_foreground
#
# There are also the following:
#
# XENIX XENIX variable name name clash with terminfo?
```

```

# -----
# CL key_char_left
# CR key_char_right
# CW key_change_window
# HP ??
# LF key_linefeed label_off
# NU key_next_unlocked_cell
# PL ??
# PR ??
# RC key_recalc remove_clock
# RF key_toggle_ref req_for_input
# WL key_word_left
# WR key_word_right
#
#
If you know what any of the question-marked ones mean, please tell us.
#
#----- Terminfo aliases -----
#
# IBM extensions:
#
infoalias font0 s0ds IBM set0_des_seq
infoalias font1 s1ds IBM set1_des_seq
infoalias font2 s2ds IBM set2_des_seq
infoalias font3 s3ds IBM set3_des_seq
infoalias kbtabs kcbt IBM key_backtab
infoalias ksel kslt IBM key_select
#
# Some others are identical to SVr4/XPG4 capabilities, in particular:
# kcmd, kend, khlp, and kf11...kf63.
#
#####
#
# The following sets edit modes for GNU EMACS
# Local Variables:
# case-fold-search:nil
# truncate-lines:t
# End:

Found in path(s):
* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/include/Caps.uwin
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archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/ncurses/tinfo/setbuf.c
* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/menu/menu.h
* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/ncurses/base/safe_sprintf.c
* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/c++/cursesmain.cc
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archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/ncurses/tinfo/strings.c
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archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/ncurses/tty/hashmap.c  
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-----  
-- \$Id: TODO,v 1.5 2006/04/22 22:23:21 tom Exp \$  
-----

-- Intensive testing  
Perhaps the delivery of the Beta will help a bit.

-- Documentation  
Like most WEB pages: under continuous construction



- Style cleanup
- Alternate functions for procedures with out params  
Comfort purpose
- Sample program  
Under continuous construction (and it's not a WEB page!!!)
- Make the binding objects a shared library  
They are rather large, so it would make sense, otherwise Ada95 would look too large, although the generated code is as compact as C or C++. I'll wait a bit until the GNAT people provide some better support to construct shared libraries.
- Think  
about more inlining
- Check for memory leaks.  
Oh I would like it so much if the GNAT guys would put an optional GC into their system.

Found in path(s):

```
* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/Ada95/TODO
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*****
* @Id: form_field_just.3x,v 1.9 2006/11/04 17:12:00 tom Exp @
-->

```

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archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-
5.7/doc/html/man/form_field_just.3x.html

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```

```
#
# Author: Thomas E. Dickey <dickey@clark.net> 1996
#
$(srcdir)/form.h
# vile:makemode
```

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```
* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/form/headers
```

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* @Id: define_key.3x,v 1.12 2006/02/25 21:49:19 tom Exp @
```

```
-->
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archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-
```

5.7/doc/html/man/define\_key.3x.html

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```
/*
 * $Id: cleantic.cmd,v 1.4 2006/04/22 23:14:50 tom Exp $
 *
 * Author: Juan Jose Garcia Ripoll <worm@arrakis.es>.
 * Webpage: http://www.arrakis.es/~worm/
 */
parse arg dir

pause
dir = translate(dir,'\','/');
letters = '0 1 2 3 4 5 6 7 8 9 a b c d e f g h i j k l m n o p q r s t u v w x y z'

if dir = " then
    dir = '.'
'echo Cleaning 'dir
```

```
'for %%1 in ('letters') do @if not exist 'dir"%1\*' (echo Cleaning ...%1 & rd %%1 2>NUL)'
```

Found in path(s):

```
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archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/misc/cleantic.cmd  
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* @Id: form_field_userptr.3x,v 1.8 2006/11/04 18:04:37 tom Exp @
```

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-->
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archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-  
5.7/doc/html/man/form_field_userptr.3x.html
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* Author: Thomas E. Dickey      1997,2002,2005      *
*****/

/* LINTLIBRARY */

/* ./panel.c */

#include "panel.priv.h"

#undef _nc_retrace_panel
PANEL *_nc_retrace_panel(
    PANEL *pan)
{ return(*(PANEL **)0); }

#undef _nc_my_visbuf
const char *_nc_my_visbuf(
    const void *ptr)
{ return(*(const char **)0); }

```

```

#undef _nc_dPanel
void _nc_dPanel(
    const char *text,
    const PANEL *pan)
    { /* void */ }

#undef _nc_dStack
void _nc_dStack(
    const char *fmt,
    int num,
    const PANEL *pan)
    { /* void */ }

#undef _nc_Wnoutrefresh
void _nc_Wnoutrefresh(
    const PANEL *pan)
    { /* void */ }

#undef _nc_Touchpan
void _nc_Touchpan(
    const
    PANEL *pan)
    { /* void */ }

#undef _nc_Touchline
void _nc_Touchline(
    const PANEL *pan,
    int start,
    int count)
    { /* void */ }

/* ./p_above.c */

#undef panel_above
PANEL *panel_above(
    const PANEL *pan)
    { return(*(PANEL **)0); }

/* ./p_below.c */

#undef panel_below
PANEL *panel_below(
    const PANEL *pan)
    { return(*(PANEL **)0); }

/* ./p_bottom.c */

#undef bottom_panel

```

```
int bottom_panel(
    PANEL *pan)
    { return(*(int *)0); }

/* ./p_delete.c */

#undef del_panel
int del_panel(
    PANEL *pan)
    { return(*(int *)0); }

/* ./p_hide.c */

#undef hide_panel
int hide_panel(
    PANEL *pan)
    { return(*(int *)0); }

/* ./p_hidden.c */

#undef panel_hidden
int panel_hidden(
    const PANEL *pan)
    { return(*(int *)0); }

/* ./p_move.c */

#undef move_panel
int move_panel(
    PANEL *pan,
    int starty,
    int startx)
    { return(*(int *)0); }

/* ./p_new.c */

#undef new_panel
PANEL *new_panel(
    WINDOW *win)
    { return(*(PANEL **)0); }

/* ./p_replace.c */

#undef replace_panel
int replace_panel(
    PANEL *pan,

    WINDOW *win)
```



```

    { return(*(int *)0); }

/* ./p_show.c */

#undef show_panel
int show_panel(
    PANEL *pan)
    { return(*(int *)0); }

/* ./p_top.c */

#undef top_panel
int top_panel(
    PANEL *pan)
    { return(*(int *)0); }

/* ./p_update.c */

#undef update_panels
void update_panels(void)
    { /* void */ }

/* ./p_user.c */

#undef set_panel_userptr
int set_panel_userptr(
    PANEL *pan,
    void *uptr)
    { return(*(int *)0); }

#undef panel_userptr
void *panel_userptr(
    const PANEL *pan)
    { return(*(void **)0); }

/* ./p_win.c */

#undef panel_window
WINDOW *panel_window(
    const PANEL *pan)
    { return(*(WINDOW **)0); }

```

Found in path(s):

\* /opt/cola/permits/1600019816\_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/panel/lib-lpanel

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```

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```

This is a log of changes that ncurses has gone through since Zeyd started working with Pavel Curtis' original work, pcurses, in 1992.

Changes through 1.9.9e are recorded by Zeyd M Ben-Halim.  
Changes since 1.9.9e are recorded by Thomas E Dickey.

Contributors include those who have provided patches (even small ones), as well as those who provide useful information (bug reports, analyses). Changes with no cited author are the work of Thomas E Dickey (TD).

A few contributors are given in this file by their initials.  
They each account for one percent or more of the changes since 1.9.9e.  
See the AUTHORS file for the corresponding full names.

Changes through 1.9.9e did not credit all contributions;  
it is not possible to add this information.

20081102 5.7 release for upload to ftp.gnu.org

20081025

- + add a manpage to discuss memory leaks.
- + add support for shared libraries for QNX (other than libtool, which does not work well on that platform).
- + build-fix for QNX C++ binding.

20081018

- + build-fixes for OS/2 EMX.
- + modify form library to accept control characters such as newline in set\_field\_buffer(), which is compatible with Solaris (report by Nit Khair).
- + modify configure script to assume --without-hashed-db when --disable-database is used.
- + add "-e" option in ncurses/Makefile.in when generating source-files to force earlier exit if the build environment fails unexpectedly (prompted by patch by Adrian Bunk).
- + change configure script to use CF\_UTF8\_LIB, improved variant of CF\_LIBUTF8.

20081012

- + add teraterm4.59 terminfo entry, use that as primary teraterm entry, rename original to teraterm2.3 -TD
- + update "gnome" terminfo to 2.22.3 -TD
- + update "konsole" terminfo to 1.6.6, needs today's fix for tic -TD
- + add "aterm" terminfo -TD
- + add "linux2.6.26" terminfo -TD
- + add logic to tic for cancelling strings in user-defined capabilities, overlooked til now.

20081011

- + update html documentation.
- + add -m and -s options to test/keynames.c and test/key\_names.c to test the meta() function with keyname() or key\_name(), respectively.
- + correct return value of key\_name() on error; it is null.
- + document some unresolved issues for rpath and pthreads in TO-DO.
- + fix a missing prototype for ioctl() on OpenBSD in tset.c
- + add configure option --disable-tic-depends to make explicit whether tic library depends on ncurses/ncursesw library, amends change from 20080823 (prompted by Debian #501421).

20081004

- + some build-fixes for configure --disable-ext-funcs (incomplete, but works for C/C++ parts).
- + improve configure-check for awks unable to handle

large strings, e.g.

AIX 5.1 whose awk silently gives up on large printf's.

20080927

- + fix build for --with-dmalloc by workaround for redefinition of strndup between string.h and dmalloc.h
- + fix build for --disable-sigwinch
- + add environment variable NCURSES\_GPM\_TERMS to allow override to use GPM on terminals other than "linux", etc.
- + disable GPM mouse support when \$TERM does not happen to contain "linux", since Gpm\_Open() no longer limits its assertion to terminals that it might handle, e.g., within "screen" in xterm.
- + reset mouse file-descriptor when unloading GPM library (report by Miroslav Lichvar).
- + fix build for --disable-leaks --enable-widec --with-termplib
- > patch by Juergen Pfeifer:
- + use improved initialization for soft-label keys in Ada95 sample code.
- + discard internal symbol \_nc\_slk\_format (unused since 20080112).
- + move call of slk\_paint\_info() from \_nc\_slk\_initialize() to slk\_intern\_refresh(), improving initialization.

20080925

- +  
fix bug in mouse code for GPM from 20080920 changes (reported in Debian #500103, also Miroslav Lichvar).

20080920

- + fix shared-library rules for cygwin with tic- and tinfo-libraries.
- + fix a memory leak when failure to connect to GPM.
- + correct check for notimeout() in wgetch() (report on linux.redhat newsgroup by FurtiveBertie).
- + add an example warning-suppression file for valgrind, misc/ncurses.supp (based on example from Reuben Thomas)

20080913

- + change shared-library configuration for OpenBSD, make rpath work.
- + build-fixes for using libutf8, e.g., on OpenBSD 3.7

20080907

- + corrected fix for --enable-weak-symbols (report by Frederic L W Meunier).

20080906

- + corrected gcc options for building shared libraries on IRIX64.
- + add configure check for awk programs unable to handle big-strings, use that to improve the default for --enable-big-strings option.
- + makefile-fixes for --enable-weak-symbols (report by Frederic L W Meunier).

- + update test/configure script.
- + adapt ifdef's from library to make test/view.c build when mbrtowc() is unavailable, e.g., with HPUX 10.20.
- + add configure check for wcsrtombs, mbsrtowcs, which are used in test/ncurses.c, and use wcstombs, mbstowcs instead if available, fixing build of ncursesw for HPUX 11.00

20080830

- + fixes to make Ada95 demo\_panels() example work.
- + modify Ada95 'rain' test program to accept keyboard commands like the C-version.
- + modify BeOS-specific ifdef's to build on Haiku (patch by Scott McCreary).
- + add configure-check to see if the std namespace is legal for cerr and endl, to fix a build issue with Tru64.
- + consistently use NCURSES\_BOOL in lib\_gen.c
- + filter #line's from lib\_gen.c
- + change delimiter in MKlib\_gen.sh from '%' to '@', to avoid substitution by IBM xlc to '#' as part of its extensions to digraphs.
- + update config.guess, config.sub from <http://savannah.gnu.org/projects/config> (caveat - its maintainer removed support for older Linux systems).

20080823

- + modify configure check for pthread library to work with OSF/1 5.1, which uses #define's to associate its header and library.
- + use pthread\_mutexattr\_init() for initializing pthread\_mutexattr\_t, makes threaded code work on HPUX 11.23
- + fix a bug in demo\_menus in freeing menus (cf: 20080804).
- + modify configure script for the case where tic library is used (and possibly renamed) to remove its dependency upon ncurses/ncursesw library (patch by Dr Werner Fink).
- + correct manpage for menu\_fore() which gave wrong default for the attribute used to display a selected entry (report by Mike Gran).
- + add Eterm-256color, Eterm-88color and rxvt-88color (prompted by Debian #495815) -TD

20080816

- + add configure option --enable-weak-symbols to turn on new feature.
  - + add configure-check for availability of weak symbols.
  - + modify linkage with pthread library to use weak symbols so that applications not linked to that library will not use the mutexes,
- etc. This relies on gcc, and may be platform-specific (patch by Dr Werner Fink).
- + add note to INSTALL to document limitation of renaming of tic library

- using the --with-ticlib configure option (report by Dr Werner Fink).
- + document (in manpage) why tputs does not detect I/O errors (prompted by comments by Samuel Thibault).
- + fix remaining warnings from Klocwork report.

20080804

- + modify \_nc\_panelhook() data to account for a permanent memory leak.
- + fix memory leaks in test/demo\_menus
- + fix most warnings from Klocwork tool (report by Larry Zhou).
- + modify configure script CF\_XOPEN\_SOURCE macro to add case for "dragonfly" from xterm #236 changes.
- + modify configure script --with-hashed-db to let \$LIBS override the search for the db library (prompted by report by Samson Pierre).

20080726

- + build-fixes for gcc 4.3.1 (changes to gnat "warnings", and C inlining thresholds).

20080713

- + build-fix (reports by Christian Ebert, Funda Wang).

20080712

- + compiler-warning  
fixes for Solaris.

20080705

- + use NCURSES\_MOUSE\_MASK() in definition of BUTTON\_RELEASE(), etc., to make those work properly with the "--enable-ext-mouse" configuration (cf: 20050205).
- + improve documentation of build-cc options in INSTALL.
- + work-around a bug in gcc 4.2.4 on AIX, which does not pass the -static/-dynamic flags properly to linker, causing test/bs to not link.

20080628

- + correct some ifdef's needed for the broken-linker configuration.
- + make debugging library's \$BAUDRATE feature work for termcap interface.
- + make \$NCURSES\_NO\_PADDING feature work for termcap interface (prompted by comment on FreeBSD mailing list).
- + add screen.mlterm terminfo entry -TD
- + improve mlterm and mlterm+pcfkeys terminfo entries -TD

20080621

- + regenerated html documentation.
- + expand manpage description of parameters for form\_driver() and menu\_driver() (prompted by discussion with Adam Spragg).
- + add null-pointer checks for cur\_term in baudrate() and

def\_shell\_mode(),  
def\_prog\_mode()  
+ fix some memory leaks in delscreen() and wide acs.

20080614

+ modify test/ditto.c to illustrate multi-threaded use\_screen().  
+ change CC\_SHARED\_OPTS from -KPIC to -xcode=pic32 for Solaris.  
+ add "-shared" option to MK\_SHARED\_LIB for gcc on Solaris (report by Poor Yorick).

20080607

+ finish changes to wgetch(), making it switch as needed to the window's actual screen when calling wrefresh() and wgetnstr(). That allows wgetch() to get used concurrently in different threads with some minor restrictions, e.g., the application should not delete a window which is being used in a wgetch().  
+ simplify mutex's, combining the window- and screen-mutex's.

20080531

+ modify wgetch() to use the screen which corresponds to its window parameter rather than relying on SP; some dependent functions still use SP internally.  
+ factor out most use of SP in lib\_mouse.c, using parameter.  
+ add internal \_nc\_keyname(), replacing keyname() to associate with a particular SCREEN rather than the global SP.  
+ add internal \_nc\_unctrl(), replacing unctrl() to associate with a particular SCREEN rather than the global SP.  
+ add internal \_nc\_tracemouse(), replacing \_tracemouse() to eliminate its associated global buffer \_nc\_globals.tracemse\_buf now in SCREEN.  
+ add internal \_nc\_tracechar(), replacing \_tracechar() to use SCREEN in preference to the global \_nc\_globals.tracechr\_buf buffer.

20080524

+ modify \_nc\_keypad() to make it switch temporarily as needed to the screen which must be updated.  
+ wrap cur\_term variable to help make \_nc\_keymap() thread-safe, and always set the screen's copy of this variable in set\_curterm().  
+ restore curs\_set() state after endwin()/refresh() (report/patch Miroslav Lichvar)

20080517

+ modify configure script to note that --enable-ext-colors and --enable-ext-mouse are not experimental, but extensions from the ncurses ABI 5.  
+ corrected manpage description of setcchar() (discussion with Emanuele Giaquinta).

- + fix for adding a non-spacing character at the beginning of a line (report/patch by Miroslav Lichvar).

20080503

- + modify screen.\* terminfo entries using new screen+fkeys to fix overridden keys in screen.rxvt (Debian #478094) -TD
- + modify internal interfaces to reduce wgetch()'s dependency on the global SP.
- + simplify some loops with macros each\_screen(), each\_window() and each\_ripoff().

20080426

- + continue modifying test/ditto.c toward making it demonstrate multithreaded use\_screen(), using fifos to pass data between screens.
- + fix typo in form.3x (report by Mike Gran).

20080419

- + add screen.rxvt terminfo entry -TD
- + modify tic -f option to format spaces as \s to prevent them from being lost when that is read back in unformatted strings.
- + improve test/ditto.c, using a "talk"-style layout.

20080412

- + change test/ditto.c to use openpty() and xterm.
- + add locks for copywin(), dupwin(), overlap(), overlay() on their window parameters.
- + add locks for initscr() and newterm() on updates to the SCREEN pointer.
- + finish table in curs\_thread.3x manpage.

20080405

- + begin table in curs\_thread.3x manpage describing the scope of data used by each function (or symbol) for threading analysis.
- + add null-pointer checks to setsyx() and getsyx() (prompted by discussion by Martin v. Lowis and Jeroen Ruigrok van der Werven on python-dev2 mailing list).

20080329

- + add null-pointer checks in set\_term() and delscreen().
- + move \_nc\_windows into \_nc\_globals, since windows can be pads, which are not associated with a particular screen.
- + change use\_screen() to pass the SCREEN\* parameter rather than stdscr to the callback function.
- + force libtool to use tag for 'CC' in case it does not detect this, e.g., on aix when using CC=powerpc-ibm-aix5.3.0.0-gcc (report/patch by Michael Haubenwallner).
- + override OBJEXT to "lo" when building with libtool, to work on



platforms such as AIX  
where libtool may use a different suffix for  
the object files than ".o" (report/patch by Michael Haubenwallner).  
+ add configure --with-pthread option, for building with the POSIX  
thread library.

20080322

+ fill in extended-color pair two more places in wbkgrndset() and  
waddch\_nosync() (prompted by Sedeno's patch).  
+ fill in extended-color pair in \_nc\_build\_wch() to make colors work  
for wide-characters using extended-colors (patch by Alejandro R  
Sedeno).  
+ add x/X toggles to ncurses.c C color test to test/demo  
wide-characters with extended-colors.  
+ add a/A toggles to ncurses.c c/C color tests.  
+ modify test/ditto.c to use use\_screen().  
+ finish modifying test/rain.c to demonstrate threads.

20080308

+ start modifying test/rain.c for threading demo.  
+ modify test/ncurses.c to make 'f' test accept the f/F/b/F/</> toggles  
that the 'F' accepts.  
+ modify test/worm.c to show trail in reverse-video when other threads  
are working concurrently.  
+ fix a deadlock  
from improper nesting of mutexes for windowlist and  
window.

20080301

+ fixes from 20080223 resolved issue with mutexes; change to use  
recursive mutexes to fix memory leak in delwin() as called from  
\_nc\_free\_and\_exit().

20080223

+ fix a size-difference in \_nc\_globals which caused hanging of mutex  
lock/unlock when termLib was built separately.

20080216

+ avoid using nanosleep() in threaded configuration since that often  
is implemented to suspend the entire process.

20080209

+ update test programs to build/work with various UNIX curses for  
comparisons. This was to reinvestigate statement in X/Open curses  
that insnstr and winsnstr perform wrapping. None of the Unix-branded  
implementations do this, as noted in manpage (cf: 20040228).

20080203

+ modify `_nc_setupscreen()` to set the legacy-coding value the same for both narrow/wide models. It had been set only for wide model, but is needed to make `unctrl()` work with locale in the narrow model.

+

improve `waddch()` and `winsch()` handling of EILSEQ from `mbrtowc()` by using `unctrl()` to display illegal bytes rather than trying to append further bytes to make up a valid sequence (reported by Andrey A Chernov).

+ modify `unctrl()` to check codes in 128-255 range versus `isprint()`. If they are not printable, and locale was set, use a "M-" or "~" sequence.

20080126

+ improve threading in `test/worm.c` (wrap refresh calls, and `KEY_RESIZE` handling). Now it hangs in `napms()`, no matter whether `nanosleep()` or `poll()` or `select()` are used on Linux.

20080119

+ fixes to build with `--disable-ext-funcs`  
+ add manpage for `use_window` and `use_screen`.  
+ add `set_tabsize()` and `set_escdelay()` functions.

20080112

+ remove recursive-mutex definitions, finish threading demo for `worm.c`  
+ remove a redundant adjustment of lines in `resizeterm.c`'s `adjust_window()` which caused occasional misadjustment of `stdscr` when softkeys were used.

20080105

+ several improvements to terminfo entries based on `xterm #230 -TD`  
+ modify `MKlib_gen.sh` to handle `keyname/key_name` prototypes, so the "link\_test" builds properly.  
+ fix for toe command-line options `-u/-U` to ensure filename is given.  
+ fix allocation-size for command-line parsing in `infocmp` from 20070728 (report by Miroslav Lichvar)  
+ improve `resizeterm()` by moving ripped-off lines, and repainting the soft-keys (report by Katarina Machalkova)  
+ add clarification in `wclear`'s manpage noting that the screen will be cleared even if a subwindow is cleared (prompted by Christer Enfors question).  
+ change `test/ncurses.c` soft-key tests to work with `KEY_RESIZE`.

20071222

+ continue implementing support for threading demo by adding mutex for `delwin()`.

20071215

- + add several functions to C++ binding which wrap C functions that pass a WINDOW\* parameter (request by Chris Lee).

20071201

- + add note about configure options needed for Berkeley database to the INSTALL file.
- + improve checks for version of Berkeley database libraries.
- + amend fix for rpath to not modify LDFLAGS if the platform has no applicable transformation (report by Christian Ebert, cf: 20071124).

20071124

- + modify configure option --with-hashed-db to accept a parameter which is the install-prefix of a given Berkeley Database (prompted by pierre4d2 comments).
- + rewrite wrapper for wcrctomb(), making it work on Solaris. This is used in the form library to determine the length of the buffer needed by field\_buffer (report by Alfred Fung).
- + remove unneeded window-parameter from C++ binding for wresize (report by Chris Lee).

20071117

- + modify the support for filesystems which do not support mixed-case to generate 2-character (hexadecimal) codes for the lower-level of the filesystem terminfo database (request by Michail Vidiassov).
- + add configure option --enable-mixed-case, to allow overriding the configure script's check if the filesystem supports mixed-case filenames.
- + add wresize() to C++ binding (request by Chris Lee).
- + define NCURSES\_EXT\_FUNCS and NCURSES\_EXT\_COLORS in curses.h to make it simpler to tell if the extended functions and/or colors are declared.

20071103

- + update memory-leak checks for changes to names.c and codes.c
- + correct asc strings in h19, z100 (patch by Benjamin C W Sittler).

20071020

- + continue implementing support for threading demo by adding mutex for use\_window().
- + add mrxyt terminfo entry, add/fix xterm building blocks for modified cursor keys -TD
- + compile with FreeBSD "contemporary" TTY interface (patch by Rong-En Fan).

20071013

- + modify makefile rules to allow clear, tput and tset to be built

without libtic. The other programs (infocmp, tic and toe) rely on that library.

- + add/modify null-pointer checks in several functions for SP and/or the WINDOW\* parameter (report by Thorben Krueger).
- + fixes for field\_buffer() in formw library (see Redhat Bugzilla #310071, patches by Miroslav Lichvar).
- + improve performance of NCURSES\_CHAR\_EQ code (patch by Miroslav Lichvar).
- + update/improve mlterm and rxvt terminfo entries, e.g., for the modified cursor- and keypad-keys -TD

20071006

- + add code to curses.priv.h ifdef'd with NCURSES\_CHAR\_EQ, which changes the CharEq() macro to an inline function to allow comparing cchar\_t struct's without comparing gaps in a possibly unpacked memory layout (report by Miroslav Lichvar).

20070929

- + add new functions to lib\_trace.c to setup mutex's for the \_tracef() calls within the ncurses library.
- + for the reentrant model, move \_nc\_tputs\_trace and \_nc\_outchars into the SCREEN.
- + start modifying test/worm.c to provide threading demo (incomplete).
- + separated ifdef's for some BSD-related symbols in tset.c, to make it compile on LynxOS (report by Greg Gemmer).

20070915

- + modify Ada95/gen/Makefile to use shlib script, to simplify building shared-library configuration on platforms lacking rpath support.
- + build-fix for Ada95/src/Makefile to reflect changed dependency for the terminal-interface-curses-aux.adb file which is now generated.
- + restructuring test/worm.c, for use\_window() example.

20070908

- + add use\_window() and use\_screen() functions, to develop into support for threaded library (incomplete).
- + fix typos in man/curs\_opaque.3x which kept the install script from creating symbolic links to two aliases created in 20070818 (report by Rong-En Fan).

20070901

- + remove a spurious newline from output of html.m4, which caused links for Ada95 html to be incorrect for the files generated using m4.
- + start investigating mutex's for SCREEN manipulation (incomplete).
- + minor cleanup of codes.c/names.c for --enable-const
- + expand/revise "Routine and Argument Names" section of ncurses manpage to address report by David Givens in newsgroup discussion.

- + fix interaction between --without-progs/--with-termcap configure options (report by Michail Vidiassov).
- + fix typo in "--disable-relink" option (report by Michail Vidiassov).

20070825

- + fix a sign-extension bug in infocmp's repair\_acsc() function (cf: 971004).
- + fix old configure script bug which prevented "--disable-warnings" option from working (patch by Mike Frysinger).

20070818

- + add 9term terminal description (request by Juhapekka Tolvanen) -TD
- + modify comp\_hash.c's string output to avoid misinterpreting a null "\0" followed by a digit.
- + modify MKnames.awk and MKcodes.awk to support big-strings. This only applies to the cases (broken linker, reentrant) where the corresponding arrays are accessed via wrapper functions.
- + split MKnames.awk into two scripts, eliminating the shell redirection which complicated the make process and also the bogus timestamp file which was introduced to fix "make -j".
- + add test/test\_opaque.c, test/test\_arrays.c
- + add wgetscrreg() and wgetparent() for applications that may need it when NCURSES\_OPAQUE is defined (prompted by Bryan Christ).

20070812

- + amend treatment of infocmp "-r" option to retain the 1023-byte limit unless "-T" is given (cf: 981017).
- + modify comp\_captab.c generation to use big-strings.
- + make \_nc\_capalias\_table and \_nc\_infoalias\_table private accessed via \_nc\_get\_alias\_table() since the tables are used only within the tic library.
- + modify configure script to skip Intel compiler in CF\_C\_INLINE.
- + make \_nc\_info\_hash\_table and \_nc\_cap\_hash\_table private accessed via \_nc\_get\_hash\_table() since the tables are used only within the tic library.

20070728

- + make \_nc\_capalias\_table and \_nc\_infoalias\_table private, accessed via \_nc\_get\_alias\_table() since they are used only by parse\_entry.c
- + make \_nc\_key\_names private since it is used only by lib\_keyname.c
- + add --disable-big-strings configure option to control whether unctrl.c is generated using the big-string optimization - which may use strings longer than supported by a given compiler.
- + reduce relocation tables for tic, infocmp by changing type of internal hash tables to short, and make those private symbols.

+ eliminate large fixed arrays from progs/infocmp.c

20070721

+ change winnstr() to stop at the end of the line (cf: 970315).  
+ add test/test\_get\_wstr.c  
+ add test/test\_getstr.c  
+ add test/test\_inwstr.c  
+ add test/test\_instr.c

20070716

+ restore a call to obtain screen-size in \_nc\_setupterm(), which is used in tput and other non-screen applications via setupterm() (Debian #433357, reported by Florent Bayle, Christian Ohm, cf: 20070310).

20070714

+ add test/savescreen.c test-program  
+ add check to trace-file open, if the given name is a directory, add ".log" to the name and try again.  
+ add konsole-256color entry -TD  
+ add extra gcc warning options from xterm.  
+ minor fixes for ncurses/hashmap test-program.  
+ modify configure script to quiet c++ build with libtool when the --disable-echo option is used.  
+ modify configure script to disable ada95 if libtool is selected,  
writing a warning message (addresses FreeBSD ports/114493).  
+ update config.guess, config.sub

20070707

+ add continuous-move "M" to demo\_panels to help test refresh changes.  
+ improve fix for refresh of window on top of multi-column characters, taking into account some split characters on left/right window boundaries.

20070630

+ add "widec" row to \_tracedump() output to help diagnose remaining problems with multi-column characters.  
+ partial fix for refresh of window on top of multi-column characters which are partly overwritten (report by Sadrul H Chowdhury).  
+ ignore A\_CHARTEXT bits in vidattr() and vid\_attr(), in case multi-column extension bits are passed there.  
+ add setlocale() call to demo\_panels.c, needed for wide-characters.  
+ add some output flags to \_nc\_trace\_tty mode to help diagnose a bug report by Larry Virden, i.e., ONLCR, OCRNL, ONOCR and ONLRET,

20070623

+ add test/demo\_panels.c

+ implement opaque version of setsyx() and getsyx().

20070612

+

corrected xterm+pcf2 terminfo modifiers for F1-F4, to match xterm  
#226 -TD

+ split-out key\_name() from MKkeyname.awk since it now depends upon  
wunctrl() which is not in libtinfo (report by Rong-En Fan).

20070609

+ add test/key\_name.c

+ add stdscr cases to test/inchs.c and test/inch\_wide.c

+ update test/configure

+ correct formatting of DEL (0x7f) in \_nc\_vischar().

+ null-terminate result of wunctrl().

+ add null-pointer check in key\_name() (report by Andreas Krennmair,  
cf: 20020901).

20070602

+ adapt mouse-handling code from menu library in form-library  
(discussion with Clive Nicolson).

+ add a modification of test/dots.c, i.e., test/dots\_mvcur.c to  
illustrate how to use mvcur().

+ modify wide-character flavor of SetAttr() to preserve the  
WidecExt() value stored in the .attr field, e.g., in case it  
is overwritten by chgat (report by Aleksi Torhamo).

+ correct buffer-size for \_nc\_viswbuf2n() (report by Aleksi Torhamo).

+ build-fixes

for Solaris 2.6 and 2.7 (patch by Peter O'Gorman).

20070526

+ modify keyname() to use "^X" form only if meta() has been called, or  
if keyname() is called without initializing curses, e.g., via  
initscr() or newterm() (prompted by LinuxBase #1604).

+ document some portability issues in man/curs\_util.3x

+ add a shadow copy of TTY buffer to \_nc\_prescreen to fix applications  
broken by moving that data into SCREEN (cf: 20061230).

20070512

+ add 'O' (wide-character panel test) in ncurses.c to demonstrate a  
problem reported by Sadrul H Chowdhury with repainting parts of  
a fullwidth cell.

+ modify slk\_init() so that if there are preceding calls to  
riporffline(), those affect the available lines for soft-keys (adapted  
from patch by Clive Nicolson).

+ document some portability issues in man/curs\_getyx.3x

20070505

- + fix a bug in Ada95/samples/ncurses which caused a variable to become uninitialized in the "b" test.
- + fix Ada95/gen/Makefile.in adahtml rule to account for recent movement of files, fix a few incorrect manpage references in the generated html.
- + add Ada95 binding to \_nc\_freall() as Curses\_Free\_All to help with memory-checking.
- + correct some functions in Ada95 binding which were using return value from C where none was returned: idcok(), immedok() and wtimeout().
- + amend recent changes for Ada95 binding to make it build with Cygwin's linker, e.g., with configure options --enable-broken-linker --with-ticlib

20070428

- + add a configure check for gcc's options for inlining, use that to quiet a warning message where gcc's default behavior changed from 3.x to 4.x.
- + improve warning message when checking if GPM is linked to curses library by not warning if its use of "wgetch" is via a weak symbol.
- + add loader options when building with static libraries to ensure that an installed shared library for ncurses does not conflict. This is reported as problem with Tru64, but could affect other platforms

(report Martin Mokrajs, analysis by Tim Mooney).

- + fix build on cygwin after recent ticlib/termlib changes, i.e.,
  - + adjust TINFO\_SUFFIX value to work with cygwin's dll naming
  - + revert a change from 20070303 which commented out dependency of SHLIB\_LIST in form/menu/panel/c++ libraries.
- + fix initialization of ripoff stack pointer (cf: 20070421).

20070421

- + move most static variables into structures \_nc\_globals and \_nc\_prescreen, to simplify storage.
- + add/use configure script macro CF\_SIG\_ATOMIC\_T, use the corresponding type for data manipulated by signal handlers (prompted by comments in mailing.openbsd.bugs newsgroup).
- + modify CF\_WITH\_LIBTOOL to allow one to pass options such as -static to the libtool create- and link-operations.

20070414

- + fix whitespace in curs\_opaque.3x which caused a spurious ';' in the installed aliases (report by Peter Santoro).
- + fix configure script to not try to generate adacurses-config when Ada95 tree is not built.

20070407

+



- add man/curs\_legacy.3x, man/curs\_opaque.3x
- + fix acs\_map binding for Ada95 when --enable-reentrant is used.
- + add adacurses-config to the Ada95 install, based on version from FreeBSD port, in turn by Juergen Pfeifer in 2000 (prompted by comment on comp.lang.ada newsgroup).
- + fix includes in c++ binding to build with Intel compiler (cf: 20061209).
- + update install rule in Ada95 to use mkdirs.sh
- > other fixes prompted by inspection for Coverity report:
- + modify ifdef's for c++ binding to use try/catch/throw statements
- + add a null-pointer check in tack/ansi.c request\_cfss()
- + fix a memory leak in ncurses/base/wresize.c
- + corrected check for valid memu/meml capabilities in progs/dump\_entry.c when handling V\_HPUX case.
- > fixes based on Coverity report:
- + remove dead code in test/bs.c
- + remove dead code in test/demo\_defkey.c
- + remove an unused assignment in progs/infocmp.c
- + fix a limit check in tack/ansi.c tools\_charset()
- + fix tack/ansi.c tools\_status()
- to perform the VT320/VT420 tests in request\_cfss(). The function had exited too soon.
- + fix a memory leak in tic.c's make\_namelist()
- + fix a couple of places in tack/output.c which did not check for EOF.
- + fix a loop-condition in test/bs.c
- + add index checks in lib\_color.c for color palettes
- + add index checks in progs/dump\_entry.c for version\_filter() handling of V\_BSD case.
- + fix a possible null-pointer dereference in copywin()
- + fix a possible null-pointer dereference in waddchnstr()
- + add a null-pointer check in \_nc\_expand\_try()
- + add a null-pointer check in tic.c's make\_namelist()
- + add a null-pointer check in \_nc\_expand\_try()
- + add null-pointer checks in test/cardfile.c
- + fix a double-free in ncurses/tinfo/trim\_sgr0.c
- + fix a double-free in ncurses/base/wresize.c
- + add try/catch block to c++/cursesmain.cc

20070331

- + modify Ada95 binding to build with --enable-reentrant by wrapping global variables (bug: acs\_map does not yet work).
- + modify Ada95 binding to use the new access-functions, allowing it to build/run when NCURSES\_OPAQUE is set.
- + add access-functions and macros to return properties of the WINDOW structure, e.g., when NCURSES\_OPAQUE is set.
- + improved install-sh's quoting.
- + use mkdirs.sh rather than mkinstalldirs, e.g., to use fixes from

other programs.

20070324

- + eliminate part of the direct use of WINDOW data from Ada95 interface.
- + fix substitutions for term lib filename to make configure option --enable-reentrant work with --with-term lib.
- + change a constructor for NCursesWindow to allow compiling with NCURSES\_OPAQUE set, since we cannot pass a reference to an opaque pointer.

20070317

- + ignore --with-ctype=unsigned since unsigned is always added to the type in curses.h; do the same for --with-mm mask-t.
- + change warning regarding --enable-ext-colors and wide-character in the configure script to an error.
- + tweak error message in CF\_WITH\_LIBTOOL to distinguish other programs such as Darwin's libtool program (report by Michail Vidiassov)
- + modify edit\_man.sh to allow for multiple substitutions per line.
- + set locale in misc/ncurses-config.in since it uses a range
- + change permissions libncurses++.a install (report by Michail Vidiassov).
- + corrected length of temporary buffer in wide-character version of set\_field\_buffer() (related to report by Bryan Christ).

20070311

- + fix mk-1st.awk script install\_shlib() function, broken in 20070224 changes for cygwin (report by Michail Vidiassov).

20070310

- + increase size of array in \_nc\_visbuf2n() to make "tic -v" work properly in its similar\_sgr() function (report/analysis by Peter Santoro).
- + add --enable-reentrant configure option for ongoing changes to implement a reentrant version of ncurses:
  - + libraries are suffixed with "t"
  - + wrap several global variables (curscr, newscr, stdscr, ttytype, COLORS, COLOR\_PAIRS, COLS, ESCDELAY, LINES and TABSIZE) as functions returning values stored in SCREEN or cur\_term.
  - + move some initialization (LINES, COLS) from lib\_setup.c, i.e., setupterm() to \_nc\_setupscreen(), i.e., newterm().

20070303

- + regenerated html documentation.
- + add NCURSES\_OPAQUE symbol to curses.h, will use to make structs opaque in selected configurations.
- + move the chunk in lib\_acs.c which resets acs capabilities when

- running on a terminal whose locale interferes with those into `_nc_setuptscreen()`, so the `libtinfo/libtinfow` files can be made identical (requested by Miroslav Lichvar).
- + do not use configure variable `SHLIB_LIBS` for building libraries outside the `ncurses` directory, since that symbol is customized only for that directory, and using it introduces an unneeded dependency on `libdl` (requested by Miroslav Lichvar).
  - + modify `mk-1st.awk` so the generated makefile rules for linking or installing shared libraries do not first remove the library, in case it is in use, e.g., `libncurses.so` by `/bin/sh` (report by Jeff Chua).
  - + revised section "Using NCURSES under XTERM" in `ncurses-intro.html` (prompted by newsgroup comment by Nick Guenther).

20070224

- + change internal return codes of `_nc_wgetch()` to check for cases where `KEY_CODE_YES` should be returned, e.g., if a `KEY_RESIZE` was ungetch'd, and read by `wget_wch()`.
- + fix static-library build broken in 20070217 changes to remove `"-ldl"` (report by Miroslav Lichvar).
- + change makefile/scripts for `cygwin` to allow building `term.lib`.
- + use `Form_Hook` in `manpages` to match `form.h`
- + use `Menu_Hook` in `manpages`, as well as a few places in `menu.h`
- + correct `form-` and `menu-`manpages to use specific `Field_Options`, `Menu_Options` and `Item_Options` types.
- + correct prototype for `_tracechar()` in `manpage` (cf: 20011229).
- + correct prototype for `wunctrl()` in `manpage`.

20070217

- + fixes for `$(TICS_LIST)` in `ncurses/Makefile` (report by Miroslav Lichvar).
- + modify relinking of shared libraries to apply only when `rpath` is enabled, and add `--disable-relink` option which can be used to disable the feature altogether (reports by Michail Vidiassov, Adam J Richter).
- + fix `--with-term.lib` option for wide-character configuration, stripping the `"w"` suffix in one place (report by Miroslav Lichvar).
- + remove `"-ldl"` from some library lists to reduce dependencies in programs (report by Miroslav Lichvar).
- + correct description of `--enable-signed-char` in `configure --help` (report by Michail Vidiassov).
- + add pattern for GNU/kFreeBSD configuration to `CF_XOPEN_SOURCE`, which matches an earlier change to `CF_SHARED_OPTS`, from `xterm #224` fixes.
- + remove `"${DESTDIR}"` from `-install_name` option used for linking shared libraries on Darwin (report by Michail Vidiassov).

20070210

- + add test/inchs.c, test/inch\_wide.c, to test win\_wchnstr().
- + remove libdl from library list for term lib (report by Miroslav Lichvar).
- + fix configure.in to allow --without-progs --with-term lib (patch by Miroslav Lichvar).
- + modify win\_wchnstr()  
to ensure that only a base cell is returned  
for each multi-column character (prompted by report by Wei Kong  
regarding change in mvwin\_wch() cf: 20041023).

20070203

- + modify fix\_wchnstr() in form library to strip attributes (and color) from the cchar\_t array (field cells) read from a field's window. Otherwise, when copying the field cells back to the window, the associated color overrides the field's background color (report by Ricardo Cantu).
- + improve tracing for form library, showing created forms, fields, etc.
- + ignore --enable-rpath configure option if --with-shared was omitted.
- + add \_nc\_leaks\_tinfo(), \_nc\_free\_tic(), \_nc\_free\_tinfo() entrypoints to allow leak-checking when both tic- and tinfo-libraries are built.
- + drop CF\_CPP\_VSCAN\_FUNC macro from configure script, since C++ binding no longer relies on it.
- + disallow combining configure script options --with-ticlib and --enable-termcap (report by Rong-En Fan).
- + remove tack from ncurses tree.

20070128

- + fix typo in configure script that broke --with-term lib option (report by Rong-En Fan).

20070127

- + improve fix for FreeBSD gnu/98975, to allow for null pointer passed to tgetent() (report by Rong-en Fan).
- + update tack/HISTORY and tack/README to tell how to build it after it is removed from the ncurses tree.
- + fix configure check for libtool's version to trim blank lines (report by sci-fi@hush.ai).
- + review/eliminate other original-file artifacts in cursesw.cc, making its license consistent with ncurses.
- + use ncurses vw\_scanw() rather than reading into a fixed buffer in the c++ binding for scanw() methods (prompted by report by Nuno Dias).
- + eliminate fixed-buffer vsprintf() calls in c++ binding.

20070120

- + add \_nc\_leaks\_tic() to separate leak-checking of tic library from

term/ncurses libraries, and thereby eliminate a library dependency.  
+ fix test/mk-test.awk to ignore blank lines.  
+ correct paths in include/headers, for --srcdir (patch  
by Miroslav  
Lichvar).

20070113

+ add a break-statement in misc/shlib to ensure that it exits on the  
\_first\_ matched directory (report by Paul Novak).  
+ add tack/configure, which can be used to build tack outside the  
ncurses build-tree.  
+ add --with-ticlib option, to build/install the tic-support functions  
in a separate library (suggested by Miroslav Lichvar).

20070106

+ change MKunctrl.awk to reduce relocation table for unctrl.o  
+ change MKkeyname.awk to reduce relocation table for keyname.o  
(patch by Miroslav Lichvar).

20061230

+ modify configure check for libtool's version to trim blank lines  
(report by sci-fi@hush.ai).  
+ modify some modules to allow them to be reentrant if \_REENTRANT is  
defined: lib\_baudrate.c, resizeterm.c (local data only)  
+ eliminate static data from some modules: add\_tries.c, hardscroll.c,  
lib\_ttyflags.c, lib\_twait.c  
+ improve manpage install to add aliases for the transformed program  
names, e.g., from --program-prefix.  
+  
used linklint to verify links in the HTML documentation, made fixes  
to manpages as needed.  
+ fix a typo in curs\_mouse.3x (report by William McBrine).  
+ fix install-rule for ncurses5-config to make the bin-directory.

20061223

+ modify configure script to omit the tic (terminfo compiler) support  
from ncurses library if --without-progs option is given.  
+ modify install rule for ncurses5-config to do this via "install.libs"  
+ modify shared-library rules to allow FreeBSD 3.x to use rpath.  
+ update config.guess, config.sub

20061217 5.6 release for upload to ftp.gnu.org

20061217

+ add ifdef's for <wctype.h> for HPUX, which has the corresponding  
definitions in <wchar.h>.  
+ revert the va\_copy() change from 20061202, since it was neither  
correct nor portable.

- + add \$(LOCAL\_LIBS) definition to progs/Makefile.in, needed for rpath on Solaris.
- + ignore wide-acs line-drawing characters that wwidth() claims are not one-column. This is a workaround for Solaris' broken locale support.

20061216

- + modify configure --with-gpm option to allow it to accept a parameter, i.e., the name of the dynamic GPM library to load via dlopen() (requested by Bryan Henderson).
- + add configure option --with-valgrind, changes from vile.
- + modify configure script AC\_TRY\_RUN and AC\_TRY\_LINK checks to use 'return' in preference to 'exit()'.

20061209

- + change default for --with-develop back to "no".
- + add XTABS to tracing of TTY bits.
- + updated autoconf patch to ifdef-out the misfeature which declares exit() for configure tests. This fixes a redefinition warning on Solaris.
- + use \${CC} rather than \${LD} in shared library rules for IRIX64, Solaris to help ensure that initialization sections are provided for extra linkage requirements, e.g., of C++ applications (prompted by comment by Casper Dik in newsgroup).
- + rename "\$target" in CF\_MAN\_PAGES to make it easier to distinguish from the autoconf predefined symbol. There was no conflict,

since "\$target" was used only in the generated edit\_man.sh file, but SuSE's rpm package contains a patch.

20061202

- + update man/term.5 to reflect extended terminfo support and hashed database configuration.
- + updates for test/configure script.
- + adapted from SuSE rpm package:
  - + remove long-obsolete workaround for broken-linker which declared cur\_term in tic.c
  - + improve error recovery in PUTC() macro when wcrctomb() does not return usable results for an 8-bit character.
- + patches from rpm package (SuSE):
  - + use va\_copy() in extra varargs manipulation for tracing version of printw, etc.
  - + use a va\_list rather than a null in \_nc\_freall()'s call to \_nc\_printf\_string().
- + add some see-also references in manpages to show related wide-character functions (suggested by Claus Fischer).

20061125

- + add a check in lib\_color.c to ensure caller does not increase COLORS above max\_colors, which is used as an array index (discussion with Simon Sasburg).
- + add ifdef's allowing ncurses to be built with tparm() using either varargs (the existing status), or using a fixed-parameter list (to match X/Open).

20061104

- + fix redrawing of windows other than stdscr using wredrawln() by touching the corresponding rows in curscr (discussion with Dan Gookin).
- + add test/redraw.c
- + add test/echochar.c
- + review/cleanup manpage descriptions of error-returns for form- and menu-libraries (prompted by FreeBSD docs/46196).

20061028

- + add AUTHORS file -TD
- + omit the -D options from output of the new config script --cflags option (suggested by Ralf S Engelschall).
- + make NCURSES\_INLINE unconditionally defined in curses.h

20061021

- + revert change to accommodate bash 3.2, since that breaks other platforms, e.g., Solaris.
- + minor fixes to NEWS file to simplify scripting to obtain list of contributors.
- + improve some shared-library configure scripting for Linux, FreeBSD and NetBSD to make "--with-shlib-version" work.
- + change configure-script rules for FreeBSD shared libraries to allow for rpath support in versions past 3.
- + use \$(DESTDIR) in makefile rules for installing/uninstalling the package config script (reports/patches by Christian Wiese, Ralf S Engelschall).
- + fix a warning in the configure script for NetBSD 2.0, working around spurious blanks embedded in its \${MAKEFLAGS} symbol.
- + change test/Makefile to simplify installing test programs in a different directory when --enable-rpath is used.

20061014

- + work around bug in bash 3.2 by adding extra quotes (Jim Gifford).
- + add/install a package config script, e.g., "ncurses5-config" or "ncursesw5-config", according to configuration options.

20061007

- + add several GNU Screen terminfo variations with 16- and 256-colors, and status line (Alain Bench).
- + change the way shared libraries (other than libtool) are installed. Rather than copying the build-tree's libraries, link the shared objects into the install directory. This makes the --with-rpath option work except with \$(DESTDIR) (cf: 20000930).

20060930

- + fix ifdef in c++/internal.h for QNX 6.1
- + test-compiled with (old) egcs-1.1.2, modified configure script to not unset the \$CXX and related variables which would prevent this.
- + fix a few terminfo.src typos exposed by improvements to "-f" option.
- + improve infocmp/tic "-f" option formatting.

20060923

- + make --disable-largefile option work (report by Thomas M Ott).
- + updated html documentation.
- + add ka2, kb1, kb3, kc2 to vt220-keypad as an extension -TD
- + minor improvements to rxvt+pcfkeys -TD

20060916

- + move static data from lib\_mouse.c into SCREEN struct.
- + improve ifdef's for \_POSIX\_VDISABLE in tset to work with Mac OS X (report by Michail Vidiassov).
- + modify CF\_PATH\_SYNTAX to ensure it uses the result from --prefix option (from lynx changes) -TD
- + adapt AC\_PROG\_EGREP check, noting that this is likely to be another place aggravated by POSIXLY\_CORRECT.
- +  
modify configure check for awk to ensure that it is found (prompted by report by Christopher Parker).
- + update config.sub

20060909

- + add kon, kon2 and jfbterm terminfo entry (request by Till Maas) -TD
- + remove invis capability from kclone+sgr, mainly used by linux entry, since it does not really do this -TD

20060903

- + correct logic in wadd\_wch() and wecho\_wch(), which did not guard against passing the multi-column attribute into a call on waddch(), e.g., using data returned by win\_wch() (cf: 20041023) (report by Sadrul H Chowdhury).

20060902

- + fix kterm's acsc string -TD
- + fix for change to tic/infocmp in 20060819 to ensure no blank is



embedded into a termcap description.  
+ workaround for 20050806 ifdef's change to allow visbuf.c to compile when using --with-termlib --with-trace options.  
+ improve tgetstr() by making the return value point into the user's buffer, if provided (patch by Miroslav Lichvar (see Redhat Bugzilla #202480)).  
+ correct  
libraries needed for foldkeys (report by Stanislav Ievlev)

20060826

+ add terminfo entries for xfce terminal (xfce) and multi gnome terminal (mgt) -TD  
+ add test/foldkeys.c

20060819

+ modify tic and infocmp to avoid writing trailing blanks on terminfo source output (Debian #378783).  
+ modify configure script to ensure that if the C compiler is used rather than the loader in making shared libraries, the \$(CFLAGS) variable is also used (Redhat Bugzilla #199369).  
+ port hashed-db code to db2 and db3.  
+ fix a bug in tgetent() from 20060625 and 20060715 changes (patch/analysis by Miroslav Lichvar (see Redhat Bugzilla #202480)).

20060805

+ updated xterm function-keys terminfo to match xterm #216 -TD  
+ add configure --with-hashed-db option (tested only with FreeBSD 6.0, e.g., the db 1.8.5 interface).

20060729

+ modify toe to access termcap data, e.g., via cgetent() functions, or as a text file if those are not available.  
+ use \_nc\_basename() in tset to improve \$SHELL check for csh/sh.  
+ modify \_nc\_read\_entry() and \_nc\_read\_termcap\_entry() so infocmp, can access termcap data when the terminfo database is disabled.

20060722

+ widen the test for xterm kmous a little to allow for other strings than \E[M, e.g., for xterm-sco functionality in xterm.  
+ update xterm-related terminfo entries to match xterm patch #216 -TD  
+ update config.guess, config.sub

20060715

+ fix for install-rule in Ada95 to add terminal\_interface.ads and terminal\_interface.ali (anonymous posting in comp.lang.ada).  
+ correction to manpage for getcchar() (report by William McBrine).  
+ add test/chgat.c

- + modify wchgat() to mark updated cells as changed so a refresh will repaint those cells (comments by Sadrul H Chowdhury and William McBrine).
- + split up dependency of names.c and codes.c in ncurses/Makefile to work with parallel make (report/analysis by Joseph S Myers).
- + suppress a warning message (which is ignored) for systems without an ldconfig program (patch by Justin Hibbits).
- + modify configure script --disable-symlinks option to allow one to disable symlink() in tic even when link() does not work (report by Nigel Horne).
- + modify MKfallback.sh to use tic -x when constructing fallback tables to allow extended capabilities to be retrieved from a fallback entry.
- + improve leak-checking logic in tgetent() from 20060625 to ensure that it does not free the current screen (report by Miroslav Lichvar).

20060708

- + add a check for \_POSIX\_VDISABLE in tset (NetBSD #33916).
- + correct \_nc\_free\_entries() and related functions used for memory leak checking of tic.

20060701

- + revert a minor change for magic-cookie support from 20060513, which caused unexpected reset of attributes, e.g., when resizing test/view in color mode.
- + note in clear manpage that the program ignores command-line parameters (prompted by Debian #371855).
- + fixes to make lib\_gen.c build properly with changes to the configure --disable-macros option and NCURSES\_NOMACROS (cf: 20060527)
- + update/correct several terminfo entries -TD
- + add some notes regarding copyright to terminfo.src -TD

20060625

- + fixes to build Ada95 binding with gnat-4.1.0
- + modify read\_termtype() so the term\_names data is always allocated as part of the str\_table, a better fix for a memory leak (cf: 20030809).
- + reduce memory leaks in repeated calls to tgetent() by remembering the last TERMINAL\* value allocated to hold the corresponding data and freeing that if the tgetent() result buffer is the same as the previous call (report by "Matt" for FreeBSD gnu/98975).
- + modify tack to test extended capability function-key strings.
- + improved gnome terminfo entry (GenToo #122566).
- + improved xterm-256color terminfo entry (patch by Alain Bench).

20060617

- + fix two small memory leaks related to repeated tgetent() calls with TERM=screen (report by "Matt" for FreeBSD gnu/98975).

- + add --enable-signed-char to simplify Debian package.
- + reduce name-pollution in term.h by removing #define's for HAVE\_XXX symbols.
- + correct typo in curs\_terminfo.3x (Debian #369168).

20060603

- + enable the mouse in test/movewindow.c
- + improve a limit-check in frm\_def.c (John Heasley).
- + minor copyright fixes.
- + change configure script to produce test/Makefile from data file.

20060527

- + add a configure option --enable-wgetch-events to enable NCURSES\_WGETCH\_EVENTS, and correct the associated loop-logic in lib\_twait.c (report by Bernd Jendrissek).
- + remove include/nomacros.h from build, since the ifdef for NCURSES\_NOMACROS makes that obsolete.
- + add entrypoints for some functions which were only provided as macros to make NCURSES\_NOMACROS ifdef work properly: getcurx(), getcury(), getbegx(), getbegy(), getmaxx(), getmaxy(), getparx() and getpary(), wgetbkgrnd().
- + provide ifdef for NCURSES\_NOMACROS which suppresses most macro definitions from curses.h, i.e., where a macro is defined to override

a function to improve performance. Allowing a developer to suppress these definitions can simplify some application (discussion with Stanislav Ievlev).

- + improve description of memu/meml in terminfo manpage.

20060520

- + if msg\_r is false, reset video attributes when doing an automargin wrap to the next line. This makes the ncurses 'k' test work properly for hpterm.
- + correct caching of keyname(), which was using only half of its table.
- + minor fixes to memory-leak checking.
- + make SCREEN.\_acs\_map and SCREEN.\_screen\_acs\_map pointers rather than arrays, making ACS\_LEN less visible to applications (suggested by Stanislav Ievlev).
- + move chunk in SCREEN ifdef'd for USE\_WIDEC\_SUPPORT to the end, so \_screen\_acs\_map will have the same offset in both ncurses/ncursesw, making the corresponding tinfo/tinow libraries binary-compatible (cf: 20041016, report by Stanislav Ievlev).

20060513

- + improve debug-tracing for EmitRange().
- + change default for --with-develop

to "yes". Add NCURSES\_NO\_HARD\_TABS  
and NCURSES\_NO\_MAGIC\_COOKIE environment variables to allow runtime  
suppression of the related hard-tabs and xmc-glitch features.  
+ add ncurses version number to top-level manpages, e.g., ncurses, tic,  
infocmp, terminfo as well as form, menu, panel.  
+ update config.guess, config.sub  
+ modify ncurses.c to work around a bug in NetBSD 3.0 curses  
(field\_buffer returning null for a valid field). The 'r' test  
appears to not work with that configuration since the new\_fieldtype()  
function is broken in that implementation.

20060506

+ add hpterm-color terminfo entry -TD  
+ fixes to compile test-programs with HPUX 11.23

20060422

+ add copyright notices to files other than those that are generated,  
data or adapted from pdcurses (reports by William McBrine, David  
Taylor).  
+ improve rendering on hpterm by not resetting attributes at the end  
of doupdate() if the terminal has the magic-cookie feature (report  
by Bernd  
Rieke).  
+ add 256color variants of terminfo entries for programs which are  
reported to implement this feature -TD

20060416

+ fix typo in change to NewChar() macro from 20060311 changes, which  
broke tab-expansion (report by Frederic L W Meunier).

20060415

+ document -U option of tic and infocmp.  
+ modify tic/infocmp to suppress smacs/rmacs when acsc is suppressed  
due to size limit, e.g., converting to termcap format. Also  
suppress them if the output format does not contain acsc and it  
was not VT100-like, i.e., a one-one mapping (Novell #163715).  
+ add configure check to ensure that SIGWINCH is defined on platforms  
such as OS X which exclude that when \_XOPEN\_SOURCE, etc., are  
defined (report by Nicholas Cole)

20060408

+ modify write\_object() to not write coincidental extensions of an  
entry made due to it being referenced in a use= clause (report by  
Alain Bench).  
+ another fix for infocmp -i option, which did not ensure that some  
escape sequences had  
comparable prefixes (report by Alain Bench).

20060401

- + improve discussion of init/reset in terminfo and tput manpages (report by Alain Bench).
- + use is3 string for a fallback of rs3 in the reset program; it was using is2 (report by Alain Bench).
- + correct logic for infocmp -i option, which did not account for multiple digits in a parameter (cf: 20040828) (report by Alain Bench).
- + move \_nc\_handle\_sigwinch() to lib\_setup.c to make --with-termplib option work after 20060114 changes (report by Arkadiusz Miskiewicz).
- + add copyright notices to test-programs as needed (report by William McBrine).

20060318

- + modify ncurses.c 'F' test to combine the wide-characters with color and/or video attributes.
- + modify test/ncurses to use CTL/Q or ESC consistently for exiting a test-screen (some commands used 'x' or 'q').

20060312

- + fix an off-by-one in the scrolling-region change (cf\_ 20060311).

20060311

- + add checks in waddchnstr() and wadd\_wchnstr() to stop copying when a null character is found (report by Igor Bogomazov).
- + modify progs/Makefile.in to make "tput init" work properly with cygwin, i.e., do not pass a ".exe" in the reference string used in check\_aliases (report by Samuel Thibault).
- + add some checks to ensure current position is within scrolling region before scrolling on a new line (report by Dan Gookin).
- + change some NewChar() usage to static variables to work around stack garbage introduced when cchar\_t is not packed (Redhat #182024).

20060225

- + workarounds to build test/movewindow with PDCurses 2.7.
- + fix for nsterm-16color entry (patch by Alain Bench).
- + correct a typo in infocmp manpage (Debian #354281).

20060218

- + add nsterm-16color entry -TD
- + updated mlterm terminfo entry -TD
- + remove 970913 feature for copying subwindows as they are moved in mvwin() (discussion with Bryan Christ).
- + modify test/demo\_menus.c to demonstrate moving a menu (both the window and subwindow) using shifted cursor-keys.
- +

start implementing recursive mvwin() in movewindow.c (incomplete).  
+ add a fallback definition for GCC\_PRINTFLIKE() in test.priv.h,  
for movewindow.c (report by William McBrine).  
+ add help-message to test/movewindow.c

20060211

+ add test/movewindow.c, to test mvderwin().  
+ fix ncurses soft-key test so color changes are shown immediately  
rather than delayed.  
+ modify ncurses soft-key test to hide the keys when exiting the test  
screen.  
+ fixes to build test programs with PDCurses 2.7, e.g., its headers  
rely on autoconf symbols, and it declares stubs for nonfunctional  
terminfo and termcap entrypoints.

20060204

+ improved test/configure to build test/ncurses on HPUX 11 using the  
vendor curses.  
+ documented ALTERNATE CONFIGURATIONS in the ncurses manpage, for the  
benefit of developers who do not read INSTALL.

20060128

+ correct form library Window\_To\_Buffer() change (cf: 20040516), which  
should ignore the video attributes (report by Ricardo  
Cantu).

20060121

+ minor fixes to xmc-glitch experimental code:  
+ suppress line-drawing  
+ implement max\_attributes  
tested with xterm.  
+ minor fixes for the database iterator.  
+ fix some buffer limits in c++ demo (comment by Falk Hueffner in  
Debian #348117).

20060114

+ add toe -a option, to show all databases. This uses new private  
interfaces in the ncurses library for iterating through the list of  
databases.  
+ fix toe from 20000909 changes which made it not look at  
\$HOME/.terminfo  
+ make toe's -v option parameter optional as per manpage.  
+ improve SIGWINCH handling by postponing its effect during newterm(),  
etc., when allocating screens.

20060111

+ modify wgetnstr() to return KEY\_RESIZE if a sigwinch occurs. Use  
this in test/filter.c

- + fix an error in filter() modification which caused some applications to fail.

20060107

- + check if filter() was called when getting the screensize. Keep it at 1 if so (based on Redhat #174498).
- + add extension nofilter().
- + refined the workaround for ACS mapping.
- + make ifdef's consistent in curses.h for the extended colors so the header file can be used for the normal curses library. The header file installed for extended colors is a variation of the wide-character configuration (report by Frederic L W Meunier).

20051231

- + add a workaround to ACS mapping to allow applications such as test/blue.c to use the "PC ROM" characters by masking them with A\_ALTCHARSET. This worked up til 5.5, but was lost in the revision of legacy coding (report by Michael Deutschmann).
- + add a null-pointer check in the wide-character version of calculate\_actual\_width() (report by Victor Julien).
- + improve test/ncurses 'd' (color-edit) test by allowing the RGB values to be set independently (patch by William McBride).
- + modify test/configure script to allow building test programs with PDCurses/X11.
- + modified test programs to allow some to work with NetBSD curses. Several do not because NetBSD curses implements a subset of X/Open curses, and also lacks much of SVr4 additions. But it's enough for comparison.
- + update config.guess and config.sub

20051224

- + use BSD-specific fix for return-value from cgetent() from CVS where an unknown terminal type would be reported as "database not found".
- + make tgetent() return code more readable using new symbols TGETENT\_YES, etc.
- + remove references to non-existent "tctest" program.
- + remove TESTPROGS from progs/Makefile.in (it was referring to code that was never built in that directory).
- + typos in curs\_addchstr.3x, some doc files (noticed in OpenBSD CVS).

20051217

- + add use\_legacy\_coding() function to support lynx's font-switching feature.
- + fix formatting in curs\_termcap.3x (report by Mike Frysinger).
- + modify MKlib\_gen.sh to change preprocessor-expanded \_Bool back to bool.

20051210

- + extend test/ncurses.c 's' (overlay window) test to exercise overlay(), overwrite() and copywin() with different combinations of colors and attributes (including background color) to make it easy to see the effect of the different functions.
- + corrections to menu/m\_global.c for wide-characters (report by Victor Julien).

20051203

- + add configure option --without-dlsym, allowing developers to configure GPM support without using dlsym() (discussion with Michael Setzer).
- + fix wins\_nwstr(), which did not handle single-column non-8bit codes (Debian #341661).

20051126

- + move prototypes for wide-character trace functions from curses.tail to curses.wide to avoid accidental reference to those if `_XOPEN_SOURCE_EXTENDED` is defined without ensuring that `<wchar.h>` is included.
- + add/use `NCURSES_INLINE` definition.
- + change some internal functions to use int/unsigned rather than the short equivalents.

20051119

- + remove a redundant check in lib\_color.c (Debian #335655).
- + use ld's `-search_paths_first` option on Darwin to work around odd search rules on that platform (report by Christian Gennerat, analysis by Andrea Govoni).
- + remove special case for Darwin in `CF_XOPEN_SOURCE` configure macro.
- + ignore `EINTR` in `tcgetattr/tcsetattr` calls (Debian #339518).
- + fix several bugs in test/bs.c (patch by Stephen Lindholm).

20051112

- + other minor fixes to cygwin based on tack -TD
- + correct smacs in cygwin (Debian #338234, report by Baurzhan Ismagulov, who noted that it was fixed in Cygwin).

20051029

- + add shifted up/down arrow codes to xterm-new as kind/kri strings -TD
- + modify `wbkgnd()` to avoid clearing the `A_CHARTEXT` attribute bits since those record the state of multicolumn characters (Debian #316663).
- + modify `werase` to clear multicolumn characters that extend into a derived window (Debian #316663).



20051022

- + move assignment from environment variable ESCDELAY from initscr() down to newterm() so the environment variable affects timeouts for terminals opened with newterm() as well.
- + fix a memory leak in keyname().
- + add test/demo\_altkeys.c
- + modify test/demo\_defkey.c to exit from loop via 'q' to allow leak-checking, as well as fix a buffer size in winnstr() call.

20051015

- + correct order of use-clauses in rxvt-basic entry which made codes for f1-f4 vt100-style rather than vt220-style (report by Gabor Z Papp).
- + suppress configure check for gnatmake if Ada95/Makefile.in is not found.
- + correct a typo in configure --with-bool option for the case where --without-cxx is used (report by Daniel Jacobowitz).
- + add a note to INSTALL's discussion of --with-normal, pointing out that one may wish to use --without-gpm to ensure a completely static link (prompted by report by Felix von Leitner).

20051010 5.5 release for upload to ftp.gnu.org

20051008

- + document in demo\_forms.c some portability issues.

20051001

- + document side-effect of werase() which sets the cursor position.
- + save/restore the current position in form field editing to make overlay mode work.

20050924

- + correct header dependencies in progs, allowing parallel make (report by Daniel Jacobowitz).
- + modify CF\_BUILD\_CC to ensure that pre-setting \$BUILD\_CC overrides the configure check for --with-build-cc (report by Daniel Jacobowitz).
- + modify CF\_CFG\_DEFAULTS to not use /usr as the default prefix for NetBSD.
- + update config.guess and config.sub from <http://subversions.gnu.org/cgi-bin/viewcvs/config/config/>

20050917

- + modify sed expression which computes path for /usr/lib/terminfo symbolic link in install to ensure that it does not change unexpected levels of the path (Gentoo #42336).
- + modify default for --disable-lp64 configure option to reduce impact

on existing 64-bit builds. Enabling the `_LP64` option may change the size of `chtype` and `mmask_t`. However, for ABI 6, it is enabled by default (report by Mike Frysinger).

- + add configure script check for `--enable-ext-mouse`, bump ABI to 6 by default if it is used.
- + improve configure script logic for bumping ABI to omit this if the `--with-abi-version` option was used.
- + update address for Free Software Foundation in `tack`'s source.
- + correct `wins_wch()`, which was not marking the filler-cells of multi-column characters (cf: 20041023).

20050910

- + modify mouse initialization to ensure that `Gpm_Open()` is called only once. Otherwise GPM gets confused in its initialization of signal handlers (Debian #326709).

20050903

- + modify logic for backspacing in a multiline form field to ensure that it works even when the preceding line is full (report by Frank van Vugt).
- + remove comment about BUGS section of `ncurses` manpage (Debian #325481)

20050827

- + document some workarounds for shared and `libtool` library configurations in `INSTALL` (see `--with-shared` and `--with-libtool`).
- + modify `CF_GCC_VERSION` and `CF_GXX_VERSION` macros to accommodate cross-compilers which emit the platform name in their version message, e.g.,  
`arm-sa1100-linux-gnu-g++ (GCC) 4.0.1`  
(report by Frank van Vugt).

20050820

- + start updating documentation for upcoming 5.5 release.
- + fix to make `libtool` and `libtinfo` work together again (cf: 20050122).
- + fixes to allow building traces into `libtinfo`
- + add debug trace to `tic` that shows if/how `ncurses` will write to the lower corner of a terminal's screen.
- + update `llib-1*` files.

20050813

- + modify initializers in `c++` binding to build with old versions of `g++`.
- + improve special case for 20050115 repainting fix, ensuring that if the first changed cell is not a character that the range to be repainted is adjusted to start at a character's beginning (Debian #316663).

20050806

- + fixes to build on QNX 6.1
- + improve configure script checks for Intel 9.0 compiler.
- + remove #include's for libc.h (obsolete).
- + adjust ifdef's in curses.priv.h so that when cross-compiling to produce comp\_hash and make\_keys, no dependency on wchar.h is needed. That simplifies the build-cppflags (report by Frank van Vugt).
- +  
move modules related to key-binding into libtinfo to fix linkage problem caused by 20050430 changes to MKkeyname.sh (report by Konstantin Andreev).

20050723

- + updates/fixes for configure script macros from vile -TD
- + make prism9's sgr string agree with the rest of the terminfo -TD
- + make vt220's sgr0 string consistent with sgr string, do this for several related cases -TD
- + improve translation to termcap by filtering the 'me' (sgr0) strings as in the runtime call to tgetent() (prompted by a discussion with Thomas Klausner).
- + improve tic check for sgr0 versus sgr(0), to help ensure that sgr0 resets line-drawing.

20050716

- + fix special cases for trimming sgr0 for hurd and vt220 (Debian #318621).
- + split-out \_nc\_trim\_sgr0() from modifications made to tgetent(), to allow it to be used by tic to provide information about the runtime changes that would be made to sgr0 for termcap applications.
- + modify make\_sed.sh to make the group-name in the NAME section of  
form/menu library manpage agree with the TITLE string when renaming is done for Debian (Debian #78866).

20050702

- + modify parameter type in c++ binding for insch() and mvwinsch() to be consistent with underlying ncurses library (was char, is chtype).
- + modify treatment of Intel compiler to allow \_GNU\_SOURCE to be defined on Linux.
- + improve configure check for nanosleep(), checking that it works since some older systems such as AIX 4.3 have a nonworking version.

20050625

- + update config.guess and config.sub from  
<http://subversions.gnu.org/cgi-bin/viewcvs/config/config/>
- + modify misc/shlib to work in test-directory.
- + suppress \$suffix in misc/run\_tic.sh when cross-compiling. This allows cross-compiles to use the host's tic program to handle the

- "make install.data" step.
- + improve description of \$LINES and \$COLUMNS variables in manpages (prompted by report by Dave Ulrick).
- + improve description of cross-compiling in INSTALL
- + add NCURSES-Programming-HOWTO.html by Pradeep Padala (see <http://tldp.org/HOWTO/NCURSES-Programming-HOWTO/>).
- + modify configure script to obtain soname for GPM library (discussion with Daniel Jacobowitz).
- + modify configure script so that --with-ctype option will still compute the unsigned literals suffix for constants in curses.h (report by Daniel Jacobowitz:
- + patches from Daniel Jacobowitz:
  - + the man\_db.renames entry for tack.1 was backwards.
  - + tack.1 had some 1m's that should have been 1M's.
  - + the section for curs\_inwstr.3 was wrong.

20050619

- + correction to --with-ctype option (report by Daniel Jacobowitz).

20050618

- + move build-time edit\_man.sh and edit\_man.sed scripts to top directory to simplify reusing them for renaming tack's manpage (prompted by a review of Debian package).
- + revert minor optimization from 20041030 (Debian #313609).
- + libtool-specific fixes, tested with libtool 1.4.3, 1.5.0, 1.5.6, 1.5.10 and 1.5.18 (all work except as noted previously for the c++ install using libtool 1.5.0):
  - + modify the clean-rule in c++/Makefile.in to work with IRIX64 make program.
  - + use \$(LIBTOOL\_UNINSTALL) symbol, overlooked in 20030830
- + add configure options --with-ctype and --with-mmask-t, to allow overriding of the non-LP64 model's use of the corresponding types.
- + revise test for size of ctype (and mmask\_t), which always returned "long" due to an uninitialized variable (report by Daniel Jacobowitz).

20050611

- + change \_tracef's that used "%p" format for va\_list values to ignore that, since on some platforms those are not pointers.
- + fixes for long-formats in printf's due to largefile support.

20050604

- + fixes for termcap support:
  - + reset pointer to \_nc\_curr\_token.tk\_name when the input stream is closed, which could point to free memory (cf: 20030215).
  - + delink TERMTYPE data which is used by the termcap reader, so that extended names data will be freed consistently.

- + free pointer to TERMTYPE data in `_nc_free_termtype()` rather than its callers.
- + add some entrypoints for freeing permanently allocated data via `_nc_freeall()` when `NO_LEAKS` is defined.
- + amend 20041030 change to `_nc_do_color` to ensure that optimization is applied only when the terminal supports `back_color_erase` (bce).

20050528

- + add sun-color terminfo entry -TD
- + correct a missing assignment in c++ binding's method `NCursesPanel::UserPointer()` from 20050409 changes.
- + improve configure check for large-files, adding check for `dirent64` from vile -TD
- + minor change to configure script to improve linker options for the Ada95 tree.

20050515

- + document error conditions for ncurses library functions (report by Stanislav Ievlev).
- + regenerated html documentation for ada binding.  
see <ftp://invisible-island.net/ncurses/patches/gnathtml>

20050507

- + regenerated html documentation for manpages.
- + add `$(BUILD_EXEEXT)` suffix to invocation of `make_keys` in `ncurses/Makefile` (Gentoo #89772).
- + modify `c++/demo.cc` to build with `g++ -fno-implicit-templates` option (patch by Mike Frysinger).
- + modify `tic` to filter out long extended names when translating to termcap format. Only two characters are permissible for termcap capability names.

20050430

- + modify terminfo entries `xterm-new` and `rxvt` to add strings for `shift-`, `control-cursor` keys.
- + workaround to allow c++ binding to compile with `g++ 2.95.3`, which has a broken implementation of `static_cast<>` (patch by Jeff Chua).
- + modify initialization of key lookup table so that if an extended capability (`tic -x`) string is defined, and its name begins with 'k', it will automatically be treated as a key.
- + modify `test/keynames.c` to allow for the possibility of extended key names, e.g., via `define_key()`, or via `"tic -x"`.
- + add `test/demo_termcap.c` to show the contents of given entry via the termcap interface.

20050423

- + minor fixes for vt100/vt52 entries -TD
- + add configure option --enable-largefile
- +  
corrected libraries used to build Ada95/gen/gen, found in testing gcc 4.0.0.

20050416

- + update config.guess, config.sub
- + modify configure script check for \_XOPEN\_SOURCE, disable that on Darwin whose header files have problems (patch by Chris Zubrzycki).
- + modify form library Is\_Printable\_String() to use iswprint() rather than wwidth() for determining if a character is printable. The latter caused it to reject menu items containing non-spacing characters.
- + modify ncurses test program's F-test to handle non-spacing characters by combining them with a reverse-video blank.
- + review/fix several gcc -Wconversion warnings.

20050409

- + correct an off-by-one error in m\_driver() for mouse-clicks used to position the mouse to a particular item.
- + implement test/demo\_menus.c
- + add some checks in lib\_mouse to ensure SP is set.
- + modify C++ binding to make 20050403 changes work with the configure --enable-const option.

20050403

- + modify start\_color() to return ERR if it cannot allocate memory.
- + address g++ compiler warnings in C++ binding by adding explicit member initialization, assignment operators and copy constructors. Most of the changes simply preserve the existing semantics of the binding, which can leak memory, etc., but by making these features visible, it provides a framework for improving the binding.
- + improve C++ binding using static\_cast, etc.
- + modify configure script --enable-warnings to add options to g++ to correspond to the gcc --enable-warnings.
- + modify C++ binding to use some C internal functions to make it compile properly on Solaris (and other platforms).

20050327

- + amend change from 20050320 to limit it to configurations with a valid locale.
- + fix a bug introduced in 20050320 which broke the translation of nonprinting characters to uparrow form (report by Takahashi Tamotsu).

20050326

- + add ifdef's for \_LP64 in curses.h to avoid using wasteful 64-bits for

chtype and mmask\_t,  
but add configure option --disable-lp64 in case  
anyone used that configuration.  
+ update misc/shlib script to account for Mac OS X (report by Michail  
Vidiassov).  
+ correct comparison for wrapping multibyte characters in  
waddch\_literal() (report by Takahashi Tamotsu).

20050320

+ add -c and -w options to tset to allow user to suppress ncurses'  
resizing of the terminal emulator window in the special case where it  
is not able to detect the true size (report by Win Delvaux, Debian  
#300419).  
+ modify waddch\_nosync() to account for locale zn\_CH.GBK, which uses  
codes 128-159 as part of multibyte characters (report by Wang  
WenRui, Debian #300512).

20050319

+ modify ncurses.c 'd' test to make it work with 88-color  
configuration, i.e., by implementing scrolling.  
+ improve scrolling in ncurses.c 'c' and 'C' tests, e.g., for 88-color  
configuration.

20050312

+ change tracemunch to use strict checking.  
+ modify ncurses.c 'p' test to test line-drawing within  
a pad.  
+ implement environment variable NCURSES\_NO\_UTF8\_ACS to support  
miscellaneous terminal emulators which ignore alternate character  
set escape sequences when in UTF-8 mode.

20050305

+ change NCursesWindow::err\_handler() to a virtual function (request by  
Steve Beal).  
+ modify fty\_int.c and fty\_num.c to handle wide characters (report by  
Wolfgang Gutjahr).  
+ adapt fix for fty\_alpha.c to fty\_alnum.c, which also handled normal  
and wide characters inconsistently (report by Wolfgang Gutjahr).  
+ update llib-\* files to reflect internal interface additions/changes.

20050226

+ improve test/configure script, adding tests for \_XOPEN\_SOURCE, etc.,  
from lynx.  
+ add aixterm-16color terminfo entry -TD  
+ modified xterm-new terminfo entry to work with tgetent() changes -TD  
+ extended changes in tgetent() from 20040710 to allow the substring of  
sgr0 which matches rmacs to be at the beginning of the sgr0 string  
(request by Thomas Wolff). Wolff says the visual

effect in

- combination with pre-20040710 ncurses is improved.
- + fix off-by-one in `winnstr()` call which caused form field validation of multibyte characters to ignore the last character in a field.
- + correct logic in `winsch()` for inserting multibyte strings; the code would clear cells after the insertion rather than push them to the right (cf: 20040228).
- + fix an inconsistency in `Check_Alpha_Field()` between normal and wide character logic (report by Wolfgang Gutjahr).

20050219

- + fix a bug in editing wide-characters in form library: deleting a nonwide character modified the previous wide-character.
- + update manpage to describe `NCURSES_MOUSE_VERSION 2`.
- + correct manpage description of `mouseinterval()` (Debian #280687).
- + add a note to `default_colors.3x` explaining why this extension was added (Debian #295083).
- + add traces to panel library.

20050212

- + improve editing of wide-characters in form library: left/right cursor movement, and single-character deletions work properly.
- + disable GPM mouse support when `$TERM` happens to be prefixed with "xterm". `Gpm_Open()` would otherwise assert that it can deal with mouse events in this case.
- + modify GPM mouse support so it closes the server connection when the caller disables the mouse (report by Stanislav Ievlev).

20050205

- + add traces for callback functions in form library.
- + add experimental configure option `--enable-ext-mouse`, which defines `NCURSES_MOUSE_VERSION 2`, and modifies the encoding of mouse events to support wheel mice, which may transmit buttons 4 and 5. This works with xterm and similar X terminal emulators (prompted by question by Andreas Henningsson, this is also related to Debian #230990).
- + improve configure macros `CF_XOPEN_SOURCE` and `CF_POSIX_C_SOURCE` to avoid redefinition warnings on cygwin.

20050129

- + merge remaining development changes for extended colors (mostly complete, does not appear to break other configurations).
- + add `xterm-88color.dat` (part of extended colors testing).
- + improve `_tracedump()` handling of color pairs past 96.
- + modify return-value from `start_color()` to return OK if colors have already been started.
- + modify `curs_color.3x` list error conditions for `init_pair()`,



- pair\_content() and color\_content().
- + modify pair\_content() to return -1 for consistency with init\_pair() if it corresponds to the default-color.
- + change internal representation of default-color to allow application to use color number 255. This does not affect the total number of color pairs which are allowed.
- + add a top-level tags rule.

20050122

- + add a null-pointer check in wgetch() in case it is called without first calling initscr().
- + add some null-pointer checks for SP, which is not set by libtinfo.
- + modify misc/shlib to ensure that absolute pathnames are used.
- + modify test/Makefile.in, etc., to link test programs only against the libraries needed, e.g., omit form/menu/panel library for the ones that are curses-specific.
- + change SP->\_current\_attr to a pointer, adjust ifdef's to ensure that libtinfo.so and libtinfow.so have the same ABI. The reason for this is that the corresponding data which belongs to the upper-level ncurses library has a different size in each model (report by Stanislav Ievlev).

20050115

- + minor fixes to allow test-compiles with g++.
- + correct column value shown in tic's warnings, which did not account for leading whitespace.
- + add a check in \_nc\_trans\_string() for improperly ended strings, i.e., where a following line begins in column 1.
- + modify \_nc\_save\_str() to return a null pointer on buffer overflow.
- + improve repainting while scrolling wide-character data (Eungkyu Song).

20050108

- + merge some development changes to extend color capabilities.

20050101

- + merge some development changes to extend color capabilities.
- + fix manpage typo (FreeBSD report docs/75544).
- + update config.guess, config.sub
- > patches for configure script (Albert Chin-A-Young):
- + improved fix to make mbstate\_t recognized on HP-UX 11i (cf: 20030705), making vsscanf() prototype visible on IRIX64. Tested for on HP-UX 11i, Solaris 7, 8, 9, AIX 4.3.3, 5.2, Tru64 UNIX 4.0D, 5.1, IRIX64 6.5, Redhat Linux 7.1, 9, and RHEL 2.1, 3.0.
- + print the result of the --disable-home-terminfo option.
- + use -rpath when compiling with SGI C compiler.

20041225

- + add trace calls to remaining public functions in form and menu libraries.
- + fix check for numeric digits in test/ncurses.c 'b' and 'B' tests.
- + fix typo in test/ncurses.c 'c' test from 20041218.

20041218

- + revise test/ncurses.c 'c' color test to improve use for xterm-88color and xterm-256color, added 'C' test using the wide-character color\_set and attr\_set functions.

20041211

- + modify configure script to work with Intel compiler.
- + fix an limit-check in wadd\_wchnstr() which caused labels in the forms-demo to be one character short.
- + fix typo in curs\_addchstr.3x (Jared Yanovich).
- + add trace calls to most functions in form and menu libraries.
- + update working-position for adding wide-characters when window is scrolled (prompted by related report by Eungkyu Song).

20041204

- + replace some references on Linux to wctomb() which use it to obtain the length of a multibyte string with \_nc\_wctomb, since wctomb() is broken in glibc (see Debian #284260).
- + corrected length-computation in wide-character support for field\_buffer().
- + some fixes to frm\_driver.c to allow it to accept multibyte input.
- + modify configure script to work with Intel 8.0 compiler.

20041127

- + amend change to setupterm() in 20030405 which would reuse the value of cur\_term if the same output was selected. This now reuses it only when setupterm() is called from tgetent(), which has no notion of separate SCREENs. Note that tgetent() must be called after initscr() or newterm() to use this feature (Redhat Bugzilla #140326).
- + add a check in CF\_BUILD\_CC macro to ensure that developer has given the --with-build-cc option when cross-compiling (report by Alexandre Campo).
- + improved configure script checks for \_XOPEN\_SOURCE and \_POSIX\_C\_SOURCE (fix for IRIX 5.3 from Georg Schwarz, \_POSIX\_C\_SOURCE updates from lynx).
- + cosmetic fix to test/gdc.c to recolor the bottom edge of the box for consistency (comment by Dan Nelson).

20041120

- + update wsvt25 terminfo entry -TD

- + modify test/ins\_wide.c to test all flavors of ins\_wstr().
- + ignore filler-cells in wadd\_wchnstr() when adding a cchar\_t array which consists of multi-column characters, since this function constructs them (cf: 20041023).
- + modify winnstr() to return multibyte character strings for the wide-character configuration.

#### 20041106

- + fixes to make slk\_set() and slk\_wset() accept and store multibyte or multicolumn characters.

#### 20041030

- + improve color optimization a little by making \_nc\_do\_color() check if the old/new pairs are equivalent to the default pair 0.
- + modify assume\_default\_colors() to not require that use\_default\_colors() be called first.

#### 20041023

- + modify term\_attrs() to use termattrs(), add the extended attributes such as enter\_horizontal\_hl\_mode for WA\_HORIZONTAL to term\_attrs().
- + add logic in waddch\_literal() to clear orphaned cells when one multi-column character partly overwrites another.
- + improved logic for clearing cells when a multi-column character must be wrapped to a new line.
- + revise storage of cells for multi-column characters to correct a problem with repainting. In the old scheme, it was possible for doupdate() to decide that only part of a multi-column character should be repainted since the filler cells stored only an attribute to denote them as fillers, rather than the character value and the attribute.

#### 20041016

- + minor fixes for traces.
- + add SP->\_screen\_acs\_map[], used to ensure that mapping of missing line-drawing characters is handled properly.  
For example, ACS\_DARROW is absent from xterm-new, and it was coincidentally displayed the same as ACS\_BTEE.

#### 20041009

- + amend 20021221 workaround for broken acs to reset the sgr, rmacs and smacs strings as well. Also modify the check for screen's limitations in that area to allow the multi-character shift-in and shift-out which seem to work.
- + change GPM initialization, using dl library to load it dynamically at runtime (Debian #110586).

20041002

- + correct logic for color pair in setcchar() and getcchar() (patch by Marcin 'Qrczak' Kowalczyk).
- + add t/T commands to ncurses b/B tests to allow a different color to be tested for the attrset part of the test than is used in the background color.

20040925

- + fix to make setcchar() to work when its wchar\_t\* parameter is pointing to a string which contains more data than can be converted.
- + modify wget\_wstr() and example in ncurses.c to work if wchar\_t and wint\_t are different sizes (report by Marcin 'Qrczak' Kowalczyk).

20040918

- + remove check in wget\_wch() added to fix an infinite loop, appears to have been working around a transitory glibc bug, and interferes with normal operation (report by Marcin 'Qrczak' Kowalczyk).
- + correct wadd\_wch() and wecho\_wch(), which did not pass the rendition information (report by Marcin 'Qrczak' Kowalczyk).
- + fix aclocal.m4 so that the wide-character version of ncurses gets compiled as libncursesw.5.dylib, instead of libncurses.5w.dylib (adapted from patch by James J Ramsey).
- + change configure script for --with-caps option to indicate that it is no longer experimental.
- + change configure script to reflect the fact that --enable-widec has not been "experimental" since 5.3 (report by Bruno Lustosa).

20040911

- + add 'B' test to ncurses.c, to exercise some wide-character functions.

20040828

- + modify infocmp -i option to match 8-bit controls against its table entries, e.g., so it can analyze the xterm-8bit entry.
- + add morphos terminfo entry, improve amiga-8bit entry (Pavel Fedin).
- + correct translation of "%%" in terminfo format to termcap, e.g., using "tic -C" (Redhat Bugzilla #130921).
- + modified configure script CF\_XOPEN\_SOURCE macro to ensure that if it defines \_POSIX\_C\_SOURCE, that it defines it to a specific value (comp.os.stratus newsgroup comment).

20040821

- + fixes to build with Ada95 binding with gnat 3.4 (all warnings are fatal, and gnat does not follow the guidelines for pragmas). However that did find a coding error in Assume\_Default\_Colors().
- + modify several terminfo entries to ensure xterm mouse and cursor visibility are reset in rs2 string: hurd, putty, gnome,

konsole-base, mlterm, Eterm, screen (Debian #265784, #55637). The xterm entries are left alone - old ones for compatibility, and the new ones do not require this change. -TD

20040814

- + fake a SIGWINCH in newterm() to accommodate buggy terminal emulators and window managers (Debian #265631).
- > terminfo updates -TD
- + remove dch/dch1 from rxvt because they are implemented inconsistently with the common usage of bce/ech
- + remove khome from vt220 (vt220's have no home key)
- + add rxvt+pcfkeys

20040807

- + modify test/ncurses.c 'b' test, adding v/V toggles to cycle through combinations of video attributes so that for instance bold and underline can be tested. This made the legend too crowded, added a help window as well.
- + modify test/ncurses.c 'b' test to cycle through default colors if the -d option is set.
- + update putty terminfo entry (Robert de Bath).

20040731

- + modify test/cardfile.c to allow it to read more data than can be displayed.
- + correct logic in resizeterm.c which kept it from processing all levels of window hierarchy (reports by Folkert van Heusden, Chris Share).

20040724

- + modify "tic -cv" to ignore delays when comparing strings. Also modify it to ignore a canceled sgr string, e.g., for terminals which cannot properly combine attributes in one control sequence.
- + corrections for gnome and konsole entries (Redhat Bugzilla #122815, patch by Hans de Goede)
- > terminfo updates -TD
- + make ncsa-m rmacs/smacs consistent with sgr
- + add sgr, rc/sc and ech to syscons entries
- + add function-keys to decansi
- + add sgr to mterm-ansi
- + add sgr, civis, cnorm to emu
- + correct/simplify cup in addrinfo

20040717

- > terminfo updates -TD
- + add xterm-pc-fkeys

- + review/update gnome and gnome-rh90 entries (prompted by Redhat Bugzilla #122815).
- + review/update konsole entries
- + add sgr, correct sgr0 for kterm and mlterm
- + correct tsl string in kterm

20040711

- + add configure option --without-xterm-new

20040710

- + add check in wget\_wch() for printable bytes that are not part of a multibyte character.
- + modify wadd\_wchnstr() to render text using window's background attributes.
- + improve tic's check to compare sgr and sgr0.
- + fix c++ directory's .cc.i rule.
- + modify logic in tgetent() which adjusts the termcap "me" string to work with ISO-2022 string used in xterm-new (cf: 20010908).
- + modify tic's check for conflicting function keys to omit that if converting termcap to termcap format.
- + add -U option to tic and infocmp.
- + add rmam/smam to linux terminfo entry (Trevor Van Bremen)
- > terminfo updates -TD
- + minor fixes for emu
- + add emu-220
- + change wyse asc strings to use 'i' map rather than 'I'
- + fixes for avatar0
- + fixes for vp3a+

20040703

- + use tic -x to install terminfo database -TD
- + add -x to infocmp's usage message.
- + correct field used for comparing O\_ROWMAJOR in set\_menu\_format() (report/patch by Tony Li).
- + fix a missing nul check in set\_field\_buffer() from 20040508 changes.
- > terminfo updates -TD
- + make xterm-xf86-v43 derived from xterm-xf86-v40 rather than xterm-basic -TD
- + align with xterm patch #192's use of xterm-new -TD
- + update xterm-new and xterm-8bit for cvvis/cnorm strings -TD
- + make xterm-new the default "xterm" entry -TD

20040626

- + correct BUILD\_CPPFLAGS substitution in ncurses/Makefile.in, to allow cross-compiling from a separate directory tree (report/patch by Dan Engel).

- + modify `is_term_resized()` to ensure that window sizes are nonzero, as documented in the manpage (report by Ian Collier).
- + modify `CF_XOPEN_SOURCE` configure macro to make Hurd port build (Debian #249214, report/patch by Jeff Bailey).
- + configure-script mods from xterm, e.g., updates to `CF_ADD_CFLAGS`
- + update `config.guess`, `config.sub`
- > terminfo updates -TD
  - + add `mlterm`
  - + add `xterm-xf86-v44`
  - + modify `xterm-new` aka `xterm-xfree86` to accommodate `luit`, which relies on G1 being used via an ISO-2022 escape sequence (report by Juliusz Chroboczek)
  - + add 'hurd' entry

20040619

- + reconsidered `winsnstr()`, decided after comparing other implementations that wrapping is an X/Open documentation error.
- + modify `test/inserts.c` to test all flavors of `insstr()`.

20040605

- + add `setlocale()` calls to a few test programs which may require it: `demo_forms.c`, `filter.c`, `ins_wide.c`, `inserts.c`
- + correct a few misspelled function names in `ncurses-intro.html` (report by Tony Li).
- + correct internal name of `key_defined()` manpage, which conflicted with `define_key()`.

20040529

- + correct size of internal pad used for holding wide-character `field_buffer()` results.
- + modify `data_ahead()` to work with wide-characters.

20040522

- + improve description of terminfo if-then-else expressions (suggested by Arne Thomassen).
- + improve `test/ncurses.c` 'd' test, allow it to use external file for initial palette (added `xterm-16color.dat` and `linux-color.dat`), and reset colors to the initial palette when starting/ending the test.
- + change `limit-check` in `init_color()` to allow `r/g/b` component to reach 1000 (cf: 20020928).

20040516

- + modify form library to use `cchar_t`'s rather than `char`'s in the wide-character configuration for storing data for field buffers.
- + correct logic of `win_wchnstr()`, which did not work for more than one cell.

20040508

- + replace memset/memcpy usage in form library with for-loops to simplify changing the datatype of FIELD.buf, part of wide-character changes.
- + fix some inconsistent use of #if/#ifdef (report by Alain Guibert).

20040501

- + modify menu library to account for actual number of columns used by multibyte character strings, in the wide-character configuration (adapted from patch by Philipp Tomsich).
- + add "-x" option to infocmp like tic's "-x", for use in "-F" comparisons. This modifies infocmp to only report extended capabilities if the -x option is given, making this more consistent with tic. Some scripts may break, since infocmp previous gave this information without an option.
- + modify termcap-parsing to retain 2-character aliases at the beginning of an entry if the "-x" option is used in tic.

20040424

- + minor compiler-warning and test-program fixes.

20040417

- + modify tic's missing-sgr warning to apply to terminfo only.
- + free some memory leaks in tic.
- + remove check in post\_menu() that prevented menus from extending beyond the screen (request by Max J. Werner).
- + remove check in newwin() that prevents allocating windows that extend beyond the screen. Solaris curses does this.
- + add ifdef in test/color\_set.c to allow it to compile with older curses.
- + add napms() calls to test/dots.c to make it not be a CPU hog.

20040403

- + modify unctrl() to return null if its parameter does not correspond to an unsigned char.
- + add some limit-checks to guard isprint(), etc., from being used on values that do not fit into an unsigned char (report by Sami Farin).

20040328

- + fix a typo in the \_nc\_get\_locale() change.

20040327

- + modify \_nc\_get\_locale() to use setlocale() to query the program's current locale rather than using getenv(). This fixes a case in tin which relies on legacy treatment of 8-bit characters when the locale is not initialized



(reported by Urs Jansen).

- + add sgr string to screen's and rxvt's terminfo entries -TD.
- + add a check in tic for terminfo entries having an sgr0 but no sgr string. This confuses Tru64 and HPUX curses when combined with color, e.g., making them leave line-drawing characters in odd places.
- + correct casts used in ABSENT\_BOOLEAN, CANCELLED\_BOOLEAN, matches the original definitions used in Debian package to fix PowerPC bug before 20030802 (Debian #237629).

20040320

- + modify PutAttrChar() and PUTC() macro to improve use of A\_ALTCHARSET attribute to prevent line-drawing characters from being lost in situations where the locale would otherwise treat the raw data as nonprintable (Debian #227879).

20040313

- + fix a redefinition of CTRL() macro in test/view.c for AIX 5.2 (report by Jim Idle).
- + remove ".PP" after ".SH NAME" in a few manpages; this confuses some apropos script (Debian #237831).

20040306

- + modify ncurses.c 'r' test so editing commands, like inserted text, set the field background, and the state of insert/overlay editing mode is shown in that test.
- + change syntax of dummy targets in Ada95 makefiles to work with pmake.
- + correct logic in test/ncurses.c 'b' for noncolor terminals which did not recognize a quit-command (cf: 20030419).

20040228

- + modify \_nc\_insert\_ch() to allow for its input to be part of a multibyte string.
- + split out lib\_insnstr.c, to prepare to rewrite it. X/Open states that this function performs wrapping, unlike all of the other insert-functions. Currently it does not wrap.
- + check for nl\_langinfo(CODESET), use it if available (report by Stanislav Ievlev).
- + split-out CF\_BUILD\_CC macro, actually did this for lynx first.
- + fixes for configure script CF\_WITH\_DBMALLOC and CF\_WITH\_DMALLOC, which happened to work with bash, but not with Bourne shell (report by Marco d'Itri via tin-dev).

20040221

- + some changes to adapt the form library to wide characters, incomplete

(request by Mike Aubury).

- + add symbol to curses.h which can be used to suppress include of

```
stdbool.h, e.g.,
#define NCURSES_ENABLE_STDBOOL_H 0
#include <curses.h>
(discussion on XFree86 mailing list).
```

20040214

- + modify configure --with-terminfo option to accept a value which sets the name of the terminfo library. This would allow a packager to build libtinfow.so renamed to coincide with libtinfo.so (discussion with Stanislav Ievlev).
- + improve documentation of --with-install-prefix, --prefix and \$(DESTDIR) in INSTALL (prompted by discussion with Paul Lew).
- + add configure check if the compiler can use -c -o options to rename its output file, use that to omit the 'cd' command which was used to ensure object files are created in a separate staging directory (prompted by comments by Johnny Wezel, Martin Mokrajs).

20040208 5.4 release for upload to ftp.gnu.org

- + update TO-DO.

20040207 pre-release

- + minor fixes to \_nc\_tparm\_analyze(), i.e., do not count %i as a param, and do not count %d if it follows a %p.
- + correct an inconsistency between handling of codes in the 128-255 range, e.g., as illustrated by test/ncurses.c f/F tests. In POSIX locale, the latter did not show printable results, while the former did.
- + modify MKlib\_gen.sh to compensate for broken C preprocessor on Mac OS X, which alters "%%" to "% %" (report by Robert Simms, fix verified by Scott Corscadden).

20040131 pre-release

- + modify SCREEN struct to align it between normal/wide curses flavors to simplify future changes to build a single version of libtinfo (patch by Stanislav Ievlev).
- + document handling of carriage return by addch() in manpage.
- + document special features of unctrl() in manpage.
- + documented interface changes in INSTALL.
- + corrected control-char test in lib\_addch.c to account for locale (Debian #230335, cf: 971206).
- + updated test/configure.in to use AC\_EXEEXT and AC\_OBJEXT.
- + fixes to compile Ada95 binding with Debian gnat 3.15p-4 package.
- + minor configure-script fixes for older ports, e.g., BeOS R4.5.

20040125 pre-release

- + amend change to PutAttrChar() from 20030614 which computed the number

of cells for a possibly multi-cell character. The 20030614 change forced the cell to a blank if the result from `wcwidth()` was not greater than zero. However, `wcwidth()` called for parameters in the range 128-255 can give this return value. The logic now simply ensures that the number of cells is greater than zero without modifying the displayed value.

20040124 pre-release

- + looked good for 5.4 release for upload to `ftp.gnu.org` (but see above)
- + modify configure script check for `ranlib` to use `AC_CHECK_TOOL`, since that works better for cross-compiling.

20040117 pre-release

- + modify `lib_get_wch.c` to prefer `mblen/mbtowc` over `mbrlen/mbrtowc` to work around core dump in Solaris 8's locale support, e.g., for `zh_CN.GB18030` (report by Saravanan Bellan).
- + add includes for `<stdarg.h>` and `<stdio.h>` in configure script macro to make `<wchar.h>` check work with Tru64 4.0d.
- + add terminfo entry for U/Win -TD
- + add terminfo entries for SFU aka Interix aka OpenNT (Federico Bianchi).
- + modify `tput`'s error messages to prefix them with the program name (report by Vincent Lefevre, patch by Daniel Jacobowitz (see Debian #227586)).
- + correct a place in `tack` where `exit_standout_mode` was used instead of `exit_attribute_mode` (patch by Jochen Voss (see Debian #224443)).
- + modify `c++/cursesf.h` to use `const` in the `Enumeration_Field` method.
- + remove an ambiguous (actually redundant) method from `c++/cursesf.h`
- + make `$HOME/.terminfo` update optional (suggested by Stanislav Ievlev).
- + improve `sed` script which extracts `libtool`'s version in the `CF_WITH_LIBTOOL` macro.
- + add `ifdef'd` call to `AC_PROG_LIBTOOL` to `CF_WITH_LIBTOOL` macro (to simplify local patch for Albert Chin-A-Young)..
- + add `$(CXXFLAGS)` to link command in `c++/Makefile.in` (adapted from patch by Albert Chin-A-Young)..
- + fix a missing substitution in `configure.in` for `"$target"` needed for HPUX `.so/.sl` case.
- + resync `CF_XOPEN_SOURCE` configure macro with `lynx`; fixes IRIX64 and NetBSD 1.6 conflicts with `_XOPEN_SOURCE`.
- + make check for `stdbool.h` more specific, to ensure that including it will actually define/declare `bool` for the configured compiler.
- + rewrite `ifdef's` in `curses.h` relating `NCURSES_BOOL` and `bool`. The intention of that is to `#define NCURSES_BOOL` as `bool` when the compiler declares `bool`, and to `#define bool` as `NCURSES_BOOL` when it does not (reported by Jim Gifford, Sam Varshavchik, cf: 20031213).

20040110 pre-release

- + change minor version to 4, i.e., ncurses 5.4
- + revised/improved terminfo entries for tvi912b, tvi920b (Benjamin C W Sittler).
- + simplified ncurses/base/version.c by defining the result from the configure script rather than using sprintf (suggested by Stanislav Ievlev).
- + remove obsolete casts from c++/cursesw.h (reported by Stanislav Ievlev).
- + modify configure script so that when configuring for termlib, programs such as tic are not linked with the upper-level ncurses library (suggested by Stanislav Ievlev).
- + move version.c from ncurses/base to ncurses/tinfo to allow linking of tic, etc., using libtinfo (suggested by Stanislav Ievlev).

20040103

- + adjust -D's to build ncursesw on OpenBSD.
- + modify CF\_PROG\_EXT to make OS/2 build with EXEEXT.
- + add pecho\_wchar().
- + remove <wctype.h> include from lib\_slk\_wset.c which is not needed (or available) on older platforms.

20031227

- + add -D's to build ncursesw on FreeBSD 5.1.
- + modify shared library configuration for FreeBSD 4.x/5.x to add the soname information (request by Marc Glisse).
- + modify \_nc\_read\_tic\_entry() to not use MAX\_ALIAS, but PATH\_MAX only for limiting the length of a filename in the terminfo database.
- + modify termname() to return the terminal name used by setupterm() rather than \$TERM, without truncating to 14 characters as documented by X/Open (report by Stanislav Ievlev, cf: 970719).
- + re-add definition for \_BSD\_TYPES, lost in merge (cf: 20031206).

20031220

- + add configure option --with-manpage-format=catalog to address behavior of BSDI, allow install of man+cat files on NetBSD, whose behavior has diverged by requiring both to be present.
- + remove leading blanks from comment-lines in manlinks.sed script to work with Tru64 4.0d.
- + add screen.linux terminfo entry (discussion on mutt-users mailing list).

20031213

- + add a check for tic to flag missing backslashes for termcap continuation lines. ncurses reads the whole entry, but termcap applications do not.

- + add configure option "--with-manpage-aliases" extending "--with-manpage-aliases" to provide the option of generating ".so" files rather than symbolic links for manpage aliases.
- + add bool definition in include/curses.h.in for configurations with no usable C++ compiler (cf: 20030607).
- +  
fix pathname of SigAction.h for building with --srcdir (reported by Mike Castle).

#### 20031206

- + folded ncurses/base/sigaction.c into includes of ncurses/SigAction.h, since that header is used only within ncurses/tty/lib\_tstp.c, for non-POSIX systems (discussion with Stanislav Ievlev).
- + remove obsolete \_nc\_outstr() function (report by Stanislav Ievlev <inger@altlinux.org>).
- + add test/background.c and test/color\_set.c
- + modify color\_set() function to work with color pair 0 (report by George Andreou <gbandreo@tem.uoc.gr>).
- + add configure option --with-trace, since defining TRACE seems too awkward for some cases.
- + remove a call to \_nc\_free\_termtype() from read\_termtype(), since the corresponding buffer contents were already zeroed by a memset (cf: 20000101).
- + improve configure check for \_XOPEN\_SOURCE and related definitions, adding special cases for Solaris' \_\_EXTENSIONS\_\_ and FreeBSD's \_\_BSD\_TYPES (reports by Marc Glisse <marc.glisse@normalesup.org>).
- +  
small fixes to compile on Solaris and IRIX64 using cc.
- + correct typo in check for pre-POSIX sort options in MKkey\_defs.sh (cf: 20031101).

#### 20031129

- + modify \_nc\_gettime() to avoid a problem with arithmetic on unsigned values (Philippe Blain).
- + improve the nanosleep() logic in napms() by checking for EINTR and restarting (Philippe Blain).
- + correct expression for "%D" in lib\_tgoto.c (Juha Jarvi <mooz@welho.com>).

#### 20031122

- + add linux-vt terminfo entry (Andrey V Lukyanov <land@long.yar.ru>).
- + allow "\\|" escape in terminfo; tic should not warn about this.
- + save the full pathname of the trace-file the first time it is opened, to avoid creating it in different directories if the application opens and closes it while changing its working directory.
- + modify configure script to provide a non-empty default for \$BROKEN\_LINKER

20031108

- + add DJGPP to special case of DOS-style drive letters potentially appearing in TERMCAP environment variable.
- +  
fix some spelling in comments (reports by Jason McIntyre, Jonathon Gray).
- + update config.guess, config.sub

20031101

- + fix a memory leak in error-return from setupterm() (report by Stanislav Ievlev <inger@altlinux.org>).
- + use EXEEXT and OBJEXT consistently in makefiles.
- + amend fixes for cross-compiling to use separate executable-suffix BUILD\_EXEEXT (cf: 20031018).
- + modify MKkey\_defs.sh to check for sort utility that does not recognize key options, e.g., busybox (report by Peter S Mazinger <ps.m@gmx.net>).
- + fix potential out-of-bounds indexing in \_nc\_infotocap() (found by David Krause using some of the new malloc debugging features under OpenBSD, patch by Ted Unangst).
- + modify CF\_LIB\_SUFFIX for Itanium releases of HP-UX, which use a ".so" suffix (patch by Jonathan Ward <Jonathan.Ward@hp.com>).

20031025

- + update terminfo for xterm-xfree86 -TD
- + add check for multiple "tc=" clauses in a termcap to tic.
- + check for missing op/oc in tic.
- + correct  
\_nc\_resolve\_uses() and \_nc\_merge\_entry() to allow infocmp and tic to show cancelled capabilities. These functions were ignoring the state of the target entry, which should be untouched if cancelled.
- + correct comment in tack/output.c (Debian #215806).
- + add some null-pointer checks to lib\_options.c (report by Michael Bienia).
- + regenerated html documentation.
- + correction to tar-copy.sh, remove a trap command that resulted in leaving temporary files (cf: 20030510).
- + remove contact/maintainer addresses for Juergen Pfeifer (his request).

20031018

- + updated test/configure to reflect changes for libtool (cf: 20030830).
- + fix several places in tack/pad.c which tested and used the parameter- and parameterless strings inconsistently, i.e., in pad\_rin(), pad\_il(), pad\_indn() and pad\_dl() (Debian #215805).
- + minor fixes for configure script and makefiles to cleanup executables generated when cross-compiling for DJGPP.
- + modify infocmp to omit check for \$TERM for

operations that do not

require it, e.g., "infocmp -e" used to build fallback list (report by Koblinger Egmont).

20031004

- + add terminfo entries for DJGPP.
- + updated note about maintainer in ncurses-intro.html

20030927

- + update terminfo entries for gnome terminal.
- + modify tack to reset colors after each color test, correct a place where exit\_standout\_mode was used instead of exit\_attribute\_mode.
- + improve tack's bce test by making it set colors other than black on white.
- + plug a potential recursion between napms() and \_nc\_timed\_wait() (report by Philippe Blain).

20030920

- + add --with-rel-version option to allow workaround to allow making libtool on Darwin generate the "same" library names as with the --with-shared option. The Darwin ld program does not work well with a zero as the minor-version value (request by Chris Zubrzycki).
- + modify CF\_MIXEDCASE\_FILENAMES macro to work with cross-compiling.
- + modify tack to allow it to run from fallback terminfo data.
- > patch by Philippe Blain:
- + improve PutRange() by adjusting call to EmitRange() and corresponding return-value to not emit unchanged characters on the end of the range.
- + improve a check for changed-attribute by exiting a loop when the change is found.
- + improve logic in TransformLine(), eliminating a duplicated comparison in the clr\_bol logic.

20030913

- > patch by Philippe Blain:
- + in ncurses/tty/lib\_mvcur.c,
  - move the label 'nonlocal' just before the second gettimeofday() to be able to compute the diff time when 'goto nonlocal' used.
  - Rename 'msec' to 'microsec' in the debug-message.
- + in ncurses/tty/lib\_mvcur.c,
  - Use \_nc\_outch() in carriage return/newline movement instead of putchar() which goes to stdout. Move test for xold>0 out of loop.
- + in ncurses/tinfo/setbuf.c,
  - Set the flag SP->\_buffered at the end of operations when all has been successful (typeMalloc can fail).
- + simplify NC\_BUFFERED macro by moving check inside \_nc\_setbuf().

20030906

+

modify configure script to avoid using "head -1", which does not work if POSIXLY\_CORRECT (sic) is set.

+ modify run\_tic.in to avoid using wrong shared libraries when cross-compiling (Dan Kegel).

20030830

+ alter configure script help message to make it clearer that --with-build-cc does not specify a cross-compiler (suggested by Dan Kegel <dank@kegel.com>).

+ modify configure script to accommodate libtool 1.5, as well as add an parameter to the "--with-libtool" option which can specify the pathname of libtool (report by Chris Zubrzycki). We note that libtool 1.5 has more than one bug in its C++ support, so it is not able to install libncurses++, for instance, if \$DESTDIR or the option --with-install-prefix is used.

20030823

> patch by Philippe Blain:

+ move assignments to SP->\_cursrow, SP->\_curscol into online\_mvcur().

+ make baudrate computation in delay\_output() consistent with the assumption in \_nc\_mvcur\_init(), i.e., a byte is 9 bits.

20030816

+ modify logic in waddch\_literal() to take into account zh\_TW.Big5 whose multibyte sequences may contain "printable" characters, e.g., a "g" in the sequence "\247g" (Debian #204889, cf: 20030621).

+ improve storage used by \_nc\_safe\_strcpy() by ensuring that the size is reset based on the initialization call, in case it were called after other strcpy/strcat calls (report by Philippe Blain).

> patch by Philippe Blain:

+ remove an unused ifdef for REAL\_ATTR & WANT\_CHAR

+ correct a place where \_cup\_cost was used rather than \_cuu\_cost

20030809

+ fix a small memory leak in \_nc\_free\_ttype().

+ close trace-file if trace() is called with a zero parameter.

+ free memory allocated for soft-key strings, in delscreen().

+ fix an allocation size in safe\_sprintf.c for the "\*" format code.

+ correct safe\_sprintf.c to not return a null pointer if the format happens to be an empty string. This applies to the "configure --enable-safe-sprintf" option (Redhat #101486).

20030802

+ modify casts used for ABSENT\_BOOLEAN and CANCELLED\_BOOLEAN (report by



Daniel Jacobowitz).  
> patch by Philippe Blain:  
+ change padding for change\_scroll\_region to not be proportional to  
the size of the scroll-region.  
+ correct error-return in \_nc\_safe\_strcat().

20030726

+ correct limit-checks in \_nc\_scroll\_window() (report and test-case by  
Thomas Graf <graf@dms.at> cf: 20011020).  
+ re-order configure checks for \_XOPEN\_SOURCE to avoid conflict with  
\_GNU\_SOURCE check.

20030719

+ use clr\_eol in preference to blanks for bce terminals, so select and  
paste will have fewer trailing blanks, e.g., when using xterm  
(request by Vincent Lefevre).  
+ correct prototype for wunctrl() in manpage.  
+ add configure --with-abi-version option (discussion with Charles  
Wilson).  
> cygwin changes from Charles Wilson:  
+ alocal.m4: on cygwin, use autodetected prefix for import  
and static lib, but use "cyg" for DLL.  
+ include/ncurses\_dll.h: correct

the comments to reflect current

status of cygwin/mingw port. Fix compiler warning.

+ misc/run\_tic.in: ensure that tic.exe can find the uninstalled  
DLL, by adding the lib-directory to the PATH variable.

+ misc/terminfo.src (nxterm|xterm-color): make xterm-color  
primary instead of nxterm, to match XFree86's xterm.terminfo  
usage and to prevent circular links.

(rxvt): add additional codes from rxvt.org.

(rxvt-color): new alias

(rxvt-xpm): new alias

(rxvt-cygwin): like rxvt, but with special acsc codes.

(rxvt-cygwin-native): ditto. rxvt may be run under XWindows, or  
with a "native" MSWin GUI. Each takes different acsc codes,  
which are both different from the "normal" rxvt's acsc.

(cygwin): cygwin-in-cmd.exe window. Lots of fixes.

(cygwinDBG): ditto.

+ mk-1st.awk: use "cyg" for the DLL prefix, but "lib" for import  
and static libs.

20030712

+ update config.guess, config.sub

+ add triples for configuring

shared libraries with the Debian

GNU/FreeBSD packages (patch by Robert Millan <zeratul2@wanadoo.es>).

20030705

- + modify `CF_GCC_WARNINGS` so it only applies to gcc, not g++. Some platforms have installed g++ along with the native C compiler, which would not accept gcc warning options.
- + add `-D_XOPEN_SOURCE=500` when configuring with `--enable-widex`, to get `mbstate_t` declaration on HPUX 11.11 (report by David Ellement).
- + add `_nc_pathlast()` to get rid of casts in `_nc_basename()` calls.
- + correct a sign-extension in `wadd_wch()` and `wecho_wchar()` from 20030628 (report by Tomohiro Kubota).
- + work around omission of `btowc()` and `wctob()` from wide-character support (sic) in NetBSD 1.6 using `mbtowc()` and `wctomb()` (report by Gabor Z Papp).
- + add portability note to `curs_get_wstr.3x` (Debian #199957).

20030628

- + rewrite `wadd_wch()` and `wecho_wchar()` to call `waddch()` and `wechochar()` respectively, to avoid calling `waddch_noecho()` with wide-character data, since that function assumes its input is 8-bit data.  
Similarly, modify `waddnwstr()` to call `wadd_wch()`.
- + remove logic from `waddnstr()` which transformed multibyte character strings into wide-characters. Rewrite of `waddch_literal()` from 20030621 assumes its input is raw multibyte data rather than wide characters (report by Tomohiro Kubota).

20030621

- + write `getyx()` and related 2-return macros in terms of `getcury()`, `getcurx()`, etc.
- + modify `waddch_literal()` in case an application passes bytes of a multibyte character directly to `waddch()`. In this case, `waddch()` must reassemble the bytes into a wide-character (report by Tomohiro Kubota <kubota@debian.org>).

20030614

- + modify `waddch_literal()` in case a multibyte value occupies more than two cells.
- + modify `PutAttrChar()` to compute the number of character cells that are used in multibyte values. This fixes a problem displaying double-width characters (report/test by Mitsuru Chinen <mchinen@yamato.ibm.com>).
- +  
add a null-pointer check for result of `keyname()` in `_tracechar()`
- + modify `_tracechar()` to work around glibc `sprintf` bug.

20030607

- + add a call to `setlocale()` in `cursesmain.cc`, making demo display properly in a UTF-8 locale.
- + add a fallback definition in `curses.priv.h` for `MB_LEN_MAX` (prompted

- by discussion with Gabor Z Papp).
- + use macros NCURSES\_ACS() and NCURSES\_WACS() to hide cast needed to appease -Wchar-subscript with g++ 3.3 (Debian #195732).
  - + fix a redefinition of \$RANLIB in the configure script when libtool is used, which broke configure on Mac OS X (report by Chris Zubrzycki <berem@mac.com>).
  - + simplify ifdef for bool declaration in curses.h.in (suggested by Albert Chin-A-Young).
  - + remove configure script check to allow -Wconversion for older versions of gcc (suggested by Albert Chin-A-Young).

20030531

- + regenerated html manpages.
- + modify ifdefs in curses.h.in that disabled use of \_\_attribute\_\_() for g++, since recent versions implement the cases which ncurses uses (Debian #195230).
- + modify \_nc\_get\_token() to handle a case where an entry has no description, and capabilities begin on the same line as the entry name.
- + fix a typo in ncurses\_dll.h reported by gcc 3.3.
- + add an entry for key\_defined.3x to man\_db.renames.

20030524

- + modify setcchar() to allow converting control characters to complex characters (report/test by Mitsuru Chinen <mchinen@yamato.ibm.com>).
- + add tkterm entry -TD
- + modify parse\_entry.c to allow a terminfo entry with a leading 2-character name (report by Don Libes).
- + corrected acsc in screen.teraterm, which requires a PC-style mapping.
- + fix trace statements in read\_entry.c to use lseek() rather than tell().
- + fix signed/unsigned warnings from Sun's compiler (gcc should give these warnings, but it is unpredictable).
- + modify configure script to omit -Winline for gcc 3.3, since that feature is broken.
- + modify manlinks.sed to add a few functions that were overlooked since they return function pointers: field\_init, field\_term, form\_init, form\_term, item\_init, item\_term, menu\_init and menu\_term.

20030517

- + prevent recursion in wgetch() via wgetnstr() if the connection cannot be switched between cooked/raw modes because it is not a TTY (report by Wolfgang Gutjahr <gutw@knapp.com>).
- + change parameter of define\_key() and key\_defined() to const (prompted by Debian #192860).
- + add a check in test/configure for ncurses extensions, since there

are some older versions, etc., which would not compile with the current test programs.

- + corrected demo in test/ncurses.c of wgetn\_wstr(), which did not convert wchar\_t string to multibyte form before printing it.
- + corrections to lib\_get\_wstr.c:
  - + null-terminate buffer passed to setcchar(), which occasionally failed.
  - + map special characters such as erase- and kill-characters into key-codes so those will work as expected even if they are not mentioned in the terminfo.
- + modify PUTC() and Charable() macros to make wide-character line drawing work for POSIX locale on Linux console (cf: 20021221).

20030510

- + make typography for program options in manpages consistent (report by Miloslav Trmac <mitr@volny.cz>).
- + correct dependencies in Ada95/src/Makefile.in, so the builds with "--srcdir" work (report by Warren L Dodge).
- + correct missing definition of \$(CC) in Ada95/gen/Makefile.in (reported by Warren L Dodge <warrend@mdhost.cse.tek.com>).
- + fix typos and whitespace in manpages (patch by Jason McIntyre <jmc@prioris.mini.pw.edu.pl>).

20030503

- + fix form\_driver() cases for REQ\_CLR\_EOF, REQ\_CLR\_EOL, REQ\_DEL\_CHAR, REQ\_DEL\_PREV and REQ\_NEW\_LINE, which did not ensure the cursor was at the editing position before making modifications.
- + add test/demo\_forms and associated test/edit\_field.c demos.
- + modify test/configure.in to use test/modules for the list of objects to compile rather than using the list of programs.

20030419

- + modify logic of acsc to use the original character if no mapping is defined, noting that Solaris does this.
- + modify ncurses 'b' test to avoid using the acs\_map[] array since 20021231 changes it to no longer contain information from the acsc string.
- + modify makefile rules in c++, progs, tack and test to ensure that the compiler flags (e.g., \$CFLAGS or \$CCFLAGS) are used in the link command (report by Jose Luis Rico Botella <informatica@serpis.com>).
- + modify soft-key initialization to use A\_REVERSE if A\_STANDOUT would not be shown when colors are used, i.e., if ncv#1 is set in the terminfo as is done in "screen".

20030412

- + add a test for slk\_color(), in ncurses.c

- + fix some issues reported by valgrind in the `slk_set()` and `slk_wset()` code, from recent rewrite.
- + modify ncurses 'E' test to use show previous label via `slk_label()`, as in 'e' test.
- + modify wide-character versions of `NewChar()`, `NewChar2()` macros to ensure that the whole struct is initialized.

20030405

- + modify `setupterm()` to check if the terminfo and terminal-modes have already been read. This ensures that it does not reinvoke `def_prog_mode()` when an application calls more than one function, such as `tgetent()` and `initscr()` (report by Olaf Buddenhagen).

20030329

- + add 'E' test to `ncurses.c`, to exercise `slk_wset()`.
- + correct handling of carriage-return in `wgetn_wstr()`, used in demo of `slk_wset()`.
- + first draft of `slk_wset()` function.

20030322

- + improved warnings in `tic` when suppressing items to fit in `termcap`'s 1023-byte limit.
- + built a list in `test/README` showing which externals are being used by either programs in the test-directory or via internal library calls.
- + adjust include-options in `CF_ETIP_DEFINES` to avoid missing `ncurses_dll.h`, fixing special definitions that may be needed for `etip.h` (reported by Greg Schafer <gschafer@zip.com.au>).

20030315

- + minor fixes for `cardfile.c`, to make it write the updated fields to a file when `^W` is given.
- + add/use `_nc_trace_bufcat()` to eliminate some fixed buffer limits in trace code.

20030308

- + correct a case in `_nc_remove_string()`, used by `define_key()`, to avoid infinite loop if the given string happens to be a substring of other strings which are assigned to keys (report by John McCutchan).
- + add `key_defined()` function, to tell which keycode a string is bound to (discussion with John McCutchan <ttb@tentacle.dhs.org>).
- + correct `keybound()`, which reported definitions in the wrong table, i.e., the list of definitions which are disabled by `keyok()`.
- + modify `demo_keydef.c` to show the details it changes, and to check for errors.

20030301

- + restructured test/configure script, make it work for libncursesw.
- + add description of link\_fieldtype() to manpage (report by L Dee Holtsclaw <dee@sunbeltsoft.com>).

20030222

- + corrected ifdef's relating to configure check for wchar\_t, etc.
- + if the output is a socket or other non-tty device, use 1 millisecond for the cost in mvcur; previously it was 9 milliseconds because the baudrate was not known.
- + in \_nc\_get\_tty\_mode(), initialize the TTY buffer on error, since glibc copies uninitialized data in that case, as noted by valgrind.
- + modify tput to use the same parameter analysis as tparm() does, to provide for user-defined strings, e.g., for xterm title, a corresponding capability might be title=\E]2;%p1%s^G,
- + modify MKlib\_gen.sh to avoid passing "#" tokens through the C preprocessor. This works around Mac OS X's preprocessor, which insists on adding a blank on each side of the token (report/analysis by Kevin Murphy <murphy@genome.chop.edu>).

20030215

- + add configure check for wchar\_t and wint\_t types, rather than rely on preprocessor definitions. Also work around for gcc fixinclude bug which creates a shadow copy of curses.h if it sees these symbols apparently typedef'd.
- + if database is disabled, do not generate run\_tic.sh
- + minor fixes for memory-leak checking when termcap is read.

20030208

- + add checking in tic for incomplete line-drawing character mapping.
- + update configure script to reflect fix for AC\_PROG\_GCC\_TRADITIONAL, which is broken in autoconf 2.5x for Mac OS X 10.2.3 (report by Gerben Wierda <Sherlock@rna.nl>).
- + make return value from \_nc\_printf\_string() consistent. Before, depending on whether --enable-safe-sprintf was used, it might not be cached for reallocating.

20030201

- + minor fixes for memory-leak checking in lib\_tparm.c, hardscroll.c
- + correct a potentially-uninitialized value if \_read\_termtype() does not read as much data as expected (report by Wolfgang Rohdewald <wr6@uni.de>).
- + correct several places where the aclocal.m4 macros relied on cache variable names which were incompatible (as usual) between autoconf 2.13 and 2.5x, causing the test for broken-linker to give incorrect

results (reports by Gerben Wierda <Sherlock@rma.nl> and Thomas Esser

<te@dbs.uni-hannover.de>).

+ do not try to open gpm mouse driver if standard output is not a tty; the gpm library does not make this check (bug report for dialog by David Oliveira <davidoliveira@develop.prozone.ws>).

20030125

+ modified emx.src to correspond more closely to terminfo.src, added emx-base to the latter -TD

+ add configure option for FreeBSD sysmouse, --with-sysmouse, and implement support for that in lib\_mouse.c, lib\_getch.c

20030118

+ revert 20030105 change to can\_clear\_with(), does not work for the case where the update is made on cells which are blanks with attributes, e.g., reverse.

+ improve ifdef's to guard against redefinition of wchar\_t and wint\_t in curses.h (report by Urs Jansen).

20030111

+ improve mvcur() by checking if it is safe to move when video attributes are set (msgr), and if not, reset/restore attributes within that function rather than doing it separately in the GoTo() function in tty\_update.c (suggested

by Philippe Blain).

+ add a message in run\_tic.in to explain more clearly what does not work when attempting to create a symbolic link for /usr/lib/terminfo on OS/2 and other platforms with no symbolic links (report by John Polterak).

+ change several sed scripts to avoid using "\+" since it is not a BRE (basic regular expression). One instance caused terminfo.5 to be misformatted on FreeBSD (report by Kazuo Horikawa <horikawa@FreeBSD.org> (see FreeBSD docs/46709)).

+ correct misspelled 'wint\_t' in curs\_get\_wch.3x (Michael Elkins).

20030105

+ improve description of terminfo operators, especially static/dynamic variables (comments by Mark I Manning IV <mark4th@earthlink.net>).

+ demonstrate use of FIELDTYPE by modifying test/ncurses 'r' test to use the predefined TYPE\_ALPHA field-type, and by defining a specialized type for the middle initial/name.

+ fix MKterminfo.sh, another workaround for POSIXLY\_CORRECT misfeature of sed 4.0

> patch by Philippe

Blain:

+ optimize can\_clear\_with() a little by testing first if the parameter is indeed a "blank".

- + simplify `ClrBottom()` a little by allowing it to use `clr_eos` to clear sections as small as one line.
- + improve `ClrToEOL()` by checking if `clr_eos` is available before trying to use it.
- + use `tputs()` rather than `putp()` in a few cases in `tty_update.c` since the corresponding delays are proportional to the number of lines affected: `repeat_char`, `clr_eos`, `change_scroll_region`.

20021231

- + rewrite of `lib_acs.c` conflicts with copying of `SCREEN acs_map` to/from global `acs_map[]` array; removed the lines that did the copying.

20021228

- + change some overlooked `tputs()` calls in scrolling code to use `putp()` (report by Philippe Blain).
- + modify `lib_getch.c` to avoid recursion via `wgetnstr()` when the input is not a tty and consequently mode-changes do not work (report by <R.Chamberlin@querix.com>).
- + rewrote `lib_acs.c` to allow `PutAttrChar()` to decide how to render alternate-characters, i.e., to work with Linux console and UTF-8 locale.
- + correct line/column reference in `adjust_window()`, needed to make special windows such as `curscr` track properly when resizing (report by Lucas Gonze <lgonze@panix.com>).
- > patch by Philippe Blain:
- + correct the value used for blank in `ClrBottom()` (broken in 20000708).
- + correct an off-by-one in `GoTo()` parameter in `_nc_scrolln()`.

20021221

- + change several `tputs()` calls in scrolling code to use `putp()`, to enable padding which may be needed for some terminals (patch by Philippe Blain).
- + use `'%'` as sed substitute delimiter in `run_tic` script to avoid problems with pathname delimiters such as `'.'` and `'@'` (report by John Polterak).
- + implement a workaround so that line-drawing works with screen's crippled UTF-8 support (tested with 3.9.13). This only works with the wide-character support (`--enable-widec`); the normal library will simply suppress line-drawing when running in a UTF-8 locale in screen.

20021214

- + allow `BUILD_CC` and related configure script variables to be overridden from the environment.
- + make build-tools variables in `ncurses/Makefile.in` consistent with the configure script variables (report by Maciej W Rozycki).
- + modify `ncurses/modules` to allow



configure --disable-leaks --disable-ext-funcs  
to build (report by Gary Samuelson).  
+ fix a few places in configure.in which lacked quotes (report by  
Gary Samuelson <gary.samuelson@verizon.com>).  
+ correct handling of multibyte characters in waddch\_literal() which  
force wrapping because they are started too late on the line (report  
by Sam Varshavchik).  
+ small fix for CF\_GNAT\_VERSION to ignore the help-message which  
gnatmake adds to its version-message.  
> Maciej W Rozycki <macro@ds2.pg.gda.pl>:  
+ use AC\_CHECK\_TOOL to get proper values for AR and LD for cross  
compiling.  
+ use \$cross\_compiling variable in configure script rather than  
comparing \$host\_alias and \$target alias,  
since "host" is  
traditionally misused in autoconf to refer to the target platform.  
+ change configure --help message to use "build" rather than "host"  
when referring to the --with-build-XXX options.

20021206

+ modify CF\_GNAT\_VERSION to print gnatmake's version, and to allow for  
possible gnat versions such as 3.2 (report by Chris Lingard  
<chris@stockwith.co.uk>).  
+ modify #define's for CKILL and other default control characters in  
tset to use the system's default values if they are defined.  
+ correct interchanged defaults for kill and interrupt characters  
in tset, which caused it to report unnecessarily (Debian #171583).  
+ repair check for missing C++ compiler, which is broken in autoconf  
2.5x by hardcoding it to g++ (report by Martin Mokrejs).  
+ update config.guess, config.sub (2002-11-30)  
+ modify configure script to skip --with-shared, etc., when the  
--with-libtool option is given, since they would be ignored anyway.  
+ fix to allow "configure --with-libtool  
--with-termlib" to build.  
+ modify configure script to show version number of libtool, to help  
with bug reports. libtool still gets confused if the installed  
libraries are old, since it ignores the -L options at some  
point (tested with libtool 1.3.3 and 1.4.3).  
+ reorder configure script's updating of \$CPPFLAGS and \$CFLAGS to  
prevent -I options in the user's environment from introducing  
conflicts with the build -I options (may be related to reports by  
Patrick Ash and George Goffe).  
+ rename test/define\_key.c to test/demo\_defkey.c, test/keyok.c to  
test/demo\_keyok.c to allow building these with libtool.

20021123

+ add example program test/define\_key.c for define\_key().  
+ add example program test/keyok.c for keyok().

- + add example program test/ins\_wide.c for wins\_wch() and wins\_wstr().
- + modify wins\_wch() and wins\_wstr() to interpret tabs by using the winsch() internal function.
- + modify setcchar() to allow for wchar\_t input strings that have more than one spacing character.

20021116

- + fix a boundary check in lib\_insch.c (patch by Philippe Blain).
- + change type for \*printw functions from NCURSES\_CONST to const (prompted by comment by Pedro Palhoto Matos <plpm@mega.ist.utl.pt>, but really from a note on X/Open's website stating that either is acceptable, and the latter will be used in a future revision).
- + add xterm-1002, xterm-1003 terminfo entries to demonstrate changes in lib\_mouse.c (20021026) -TD
- + add screen-bce, screen-s entries from screen 3.9.13 (report by Adam Lazur <zal@debian.org>) -TD
- + add mterm terminfo entries -TD

20021109

- + split-out useful fragments in terminfo for vt100 and vt220 numeric keypad, i.e., vt100+keypad, vt100+pfkeys, vt100+fnkeys and vt220+keypad. The last as embedded in various entries had ka3 and kb2 interchanged (report/discussion with Leonard den Ottolander <leonardjo@hetnet.nl>).
- + add check in tic for keypads consistent with vt100 layout.
- + improve checks in tic for color capabilities

20021102

- + check for missing/empty/illegal terminfo name in \_nc\_read\_entry() (report by Martin Mokejcs, where \$TERM was set to an empty string).
- + rewrote lib\_insch.c, combining it with lib\_insstr.c so both handle tab and other control characters consistently (report by Philippe Blain).
- + remove an #undef for KEY\_EVENT from curses.tail used in the experimental NCURSES\_WGETCH\_EVENTS feature. The #undef confuses dpkg's build script (Debian #165897).
- + fix MKlib\_gen.sh, working around the ironically named POSIXLY\_CORRECT feature of GNU sed 4.0 (reported by Ervin Nemeth <airwin@inf.bme.hu>).

20021026

- + implement logic in lib\_mouse.c to handle position reports which are generated when XFree86 xterm is initialized with private modes 1002 or 1003. These are returned to the application as the REPORT\_MOUSE\_POSITION mask, which was not implemented. Tested both with ncurses 'a' menu (prompted by discussion with Larry

Riedel

- <Larry@Riedel.org>).
- + modify lib\_mouse.c to look for "XM" terminfo string, which allows one to override the escape sequence used to enable/disable mouse mode. In particular this works for XFree86 xterm private modes 1002 and 1003. If "XM" is missing (note that this is an extended name), lib\_mouse uses the conventional private mode 1000.
- + correct NOT\_LOCAL() macro in lib\_mvcur.c to refer to screen\_columns where it used screen\_lines (report by Philippe Blain).
- + correct makefile rules for the case when both --with-libtool and --with-gpm are given (report by Mr E\_T <troll@logi.net.au>).
- + add note to terminfo manpage regarding the differences between setaf/setab and setf/setb capabilities (report by Pavel Roskin).

20021019

- + remove redundant initialization of TABSIZE in newterm(), since it is already done in setupterm() (report by Philippe Blain).
- + add test/inserts.c, to test winnstr() and winsch().
- + replace 'sort' in dist.mk with script that sets locale to POSIX.
- + update URLs in announce.html.in (patch by Frederic L W Meunier).
- + remove glibc add-on files, which are no longer needed (report by Frederic L W Meunier).

20021012 5.3 release for upload to ftp.gnu.org

- + modify ifdef's in etip.h.in to allow the etip.h header to compile with gcc 3.2 (patch by Dimitar Zhekov <jimmy@is-vn.bg>).
- + add logic to setupterm() to make it like initscr() and newterm(), by checking for \$NCURSES\_TRACE environment variable and enabling the debug trace in that case.
- + modify setupterm() to ensure that it initializes the baudrate, for applications such as tput (report by Frank Henigman).
- + modify definition of bits used for command-line and library debug traces to avoid overlap, using new definition TRACE\_SHIFT to relate the two.
- + document tput's interpretation of parameterized strings according to whether parameters are given, etc. (discussion with Robert De Bath).

20021005 pre-release

- + correct winnwstr() to account for non-character cells generated when a double-width character is added (report by Michael Bienia <michael@vorlon.ping.de>).
- + modify \_nc\_viswbuf2n() to provide better results using wctomb().
- + correct logic in \_nc\_varargs() which broke tracing of parameters for formats such as "%.s".
- + correct scale factor in linux-c and linux-c-nc terminfo entries (report Floyd Davidson).

- + change tic -A option to -t, add the same option to infocmp for consistency.
- + correct "%c" implementation in lib\_tparm.c, which did not map a null character to a 128 (cf: 980620) (patch by Frank Henigman <fjhenigman@mud.cgl.uwaterloo.ca>).

#### 20020928 pre-release

- + modify MKkey\_defs.sh to check for POSIX sort -k option, use that if it is found, to accommodate newer utility which dropped the compatibility support for +number options (reported by Andrey A Chernov).
- + modify linux terminfo entry to use color palette feature from linux-c-nc entry (comments by Tomasz Wasiak and Floyd Davidson).
- + restore original color definitions in endwin() if init\_color() was used, and resume those colors on the next douupdate() or refresh() (report by Tomasz Wasiak <tjwasiak@komputom.com.pl>).
- + improve debug-traces by modifying MKlib\_gen.sh to generate calls to returnBool() and returnAttr().
- + add/use \_nc\_visbufn() and \_nc\_viswbufn() to limit the debug trace of waddnstr() and similar functions to match the parameters as used.
- + add/use \_nc\_retrace\_bool() and \_nc\_retrace\_unsigned().
- + correct type used by \_nc\_retrace\_ctype().
- + add debug traces to some functions in lib\_mouse.c
- + modify lib\_addch.c to handle non-spacing characters.
- + correct parameter of RemAttr() in lib\_bkgd.c, which caused the c++ demo's boxes to lose the A\_ALTCHARSET flag (broken in 20020629).
- + correct width computed in \_tracedump(), which did not account for the attributes (broken in 20010602).
- + modify test/tracemunch to replace addresses for windows other than curscr, newscr and stdscr with window0, window1, etc.

#### 20020921 pre-release

- + redid fix for edit\_man.sed path.
  - + workaround for Cygwin bug which makes subprocess writes to stdout result in core dump.
  - + documented getbegx(), etc.
  - + minor fixes to configure script to use '%' consistently as a sed delimiter rather than '@'.
- > patch by Philippe Blain:
- + add check in lib\_overlay.c to ensure that the windows to be merged actually overlap, and in copywin(), limit the area to be touched to the lines given for the destination window.

#### 20020914 pre-release

- + modified curses.h so that if the wide-character version is installed overwriting /usr/include/curses.h, and if it relied on libutf8.h,

then applications that use that header for wide-character support must define HAVE\_LIBUTF8\_H.

- + modify putwin(), getwin() and dupwin() to allow them to operate on pads (request by Philippe Blain).
- + correct attribute-merging in wborder(), broken in 20020216 (report by Tomasz Wasiak <tjwasiak@grubasek.komputom.com.pl>).

> patch by Philippe Blain:

- + corrected pop-counts in tparam\_internal() to '!' and '~' cases.
- + use sizeof(NCURSES\_CH\_T) in one place that used sizeof(chtype).
- + remove some unused variables from mvcur test-driver.

#### 20020907 pre-release

- + change configure script to allow install of widec-character (ncursesw) headers to overwrite normal (ncurses) headers, since the latter is a compatible subset of the former.
- + fix path of edit\_man.sed in configure script, needed to regenerate html manpages on Debian.
- + fix mismatched enums in vsscanf.c, which caused warning on Solaris.
- + update README.emx to reflect current patch used for autoconf.
- + change web- and ftp-site to invisible-island.net

> patch by Philippe Blain:

- + change case for 'P' in tparam\_internal() to indicate that it pops a variable from the stack.
- + correct sense of precision and width in parse\_format(), to avoid confusion.
- + modify lib\_tparm.c, absorb really\_get\_space() into get\_space().
- + modify getwin() and dupwin() to copy the \_notimeout, \_idlok and \_idcok window fields.
- + better fix for \_nc\_set\_type(), using typeMalloc().

#### 20020901 pre-release

- + change minor version to 3, i.e., ncurses 5.3
- + update config.guess, config.sub
- + retest build with each configure option; minor ifdef fixes.
- + make keyname() return a null pointer rather than "UNKNOWN STRING" to match XSI.
- + modify handling of wide line-drawing character functions to use the normal line-drawing characters when not in UTF-8 locale.
- + add check/fix to comp\_parse.c to suppress warning about missing asc string. This happens in configurations where raw termcap information is processed; tic already does this and other checks.
- + modify tic's check for ich/ich1 versus rmir/smir to only warn about ich1, to match xterm patch #70 notes.
- + moved information for ripped-off lines into SCREEN struct to allow use in resizeterm().
- + add experimental wgetch\_events(),

ifdef'd with NCURSES\_WGETCH\_EVENTS

- (adapted from patch by Ilya Zakharevich - see ncurses/README.IZ).
- + amend check in kgetch() from 20020824 to look only for function-keys, otherwise escape sequences are not resolved properly.
- > patch by Philippe Blain:
- + removed redundant assignment to SP->\_checkfd from newterm().
- + check return-value of setupterm() in restartterm().
- + use sizeof(NCURSES\_CH\_T) in a few places that used sizeof(chtype).
- + prevent dupwin() from duplicating a pad.
- + prevent putwin() from writing a pad.
- + use typeRealloc() or typeMalloc() in preference to direct calls on \_nc\_doalloc().

20020824

- + add a check in kgetch() for cooked characters in the fifo to avoid calling fifo\_push() when a KEY\_RESIZE is available (report/analysis by Sam Varshavchik <mrsam@courier-mta.com>).
- + fix an overlooked case for bugzilla #68199 (Philippe Blain).
- + ensure clearerr() is called before using ferror() e.g., in lib\_screen.c (report by Philippe Blain).

20020817

- + modify lib\_screen.c and lib\_newwin.c to maintain the SCREEN-specific pointers for curscr/stdscr/newscr when scr\_save() and scr\_restore() modify the global curscr/stdscr/newscr variables. Fixes Redhat bugzilla #68199 dated 2002-07-07.
- + add checks for null pointer in calls to tparm() and tgoto() based on FreeBSD bug report. If ncurses were built with termcap support, and the first call to tgoto() were a zero-length string, the result would be a null pointer, which was not handled properly.
- + correct a typo in terminfo.head, which gave the octal code for colon rather than comma.
- + remove the "tic -u" option from 20020810, since it did not account for nested "tc=" clauses, and when that was addressed, was still unsatisfactory.

20020810

- + add tic -A option to suppress capabilities which are commented out when translating to termcap.
- + add tic -u option to provide older behavior of "tc=" clauses.
- + modified tic to expand all but the final "tc=" clause in a termcap entry, to accommodate termcap libraries which do not handle multiple tc clauses.
- + correct typo in curs\_inopts.3x regarding CS8/CS7 usage (report by Philippe Blain).
- + remove a couple of redundant uses of A\_ATTRIBUTES in expressions

- using AttrOf(), which already incorporates that mask (report by Philippe Blain).
- + document TABSIZE variable.
- + add NCURSES\_ASSUMED\_COLORS environment variable, to allow users to override compiled-in default black-on-white assumption used in assume\_default\_colors().
- + correct an off-by-one comparison against max\_colors in COLORFGBG logic.
- + correct a use of uninitialized memory found by valgrind (reported by Olaf Buddenhagen <olafBuddenhagen@web.de>).
- + modified wresize() to ensure that a failed realloc will not corrupt the window structure, and to make subwindows fit within the resized window (completes Debian #87678, #101699)

20020803

- + fix an off-by-one in lib\_pad.c check for limits of pad (patch by Philippe Blain).
- + revise logic for BeOS in lib\_twait.c altered in 20011013 to restore logic used by lib\_getch.c's support for GPM or EMX mouse (report by Philippe Blain)
- + remove NCURSES\_CONST from several prototypes in curses.wide, to make the --enable-const --enable-widenc configure options to work together (report by George Goffe <grgoffe@yahoo.com>).

20020727

- + finish no-leak checking in cardfile.c, using this for testing changes to resizeterm().
- + simplify \_nc\_freeall() using delscreen().

20020720

- + check error-return from \_nc\_set\_tty\_mode() in \_nc\_initscr() and reset\_prog\_mode() (report/patch by Philippe Blain).
- + regenerate configure using patch for autoconf 2.52, to address problem with identifying C++ bool type.
- + correct/improve logic to produce an exit status for errors in tput, which did not exit with an error when told to put a string not in the current terminfo entry (report by David Gomez <david@pleyades.net>).
- + modify configure script AC\_OUTPUT() call to work around defect in autoconf 2.52 which adds an ifdef'd include to the generated configure definitions.
- + remove fstat() check from scr\_init(), which also fixes a missing include for <sys/stat.h> from 20020713 (reported by David Ellement, fix suggested by Philippe Blain).
- + update curs\_scanw.3x manpage to note that XSI curses differs from SVr4 curses: return-values are incompatible.
- + correct several prototypes in manpages which used const

- inconsistently with the curses.h file, and removed spurious const's in a few places from curses.h, e.g., for wbkgd() (report by Glenn Maynard <glenn@zewt.org>).
- + change internal type used by tparm() to long, to work with LP64 model.
- + modify nc\_alloc.h to allow building with g++, for testing.

20020713

- + add resize-handling to cardfile.c test program.
- + altered resizeterm() to avoid having it fail when a child window cannot be resized because it would be larger than its parent. (More work must be done on this, but it works well enough to integrate).
- + improve a limit-check in lib\_refresh.c
- + remove check in lib\_screen.c relating dumptime to file's modification times, since that would not necessarily work for remotely mounted filesystems.
- + modify lrtest to simplify debugging changes to resizeterm, e.g., t/T commands to enable/disable tracing.
- + updated status of multibyte support in TO-DO.
- + update contact info in source-files (patch by Juergen Pfeifer).

20020706

- + add Caps.hpux11, as an example.
- + modify version\_filter(), used to implement -R option for tic and infocmp, to use computed array offsets based on the Caps.\* file which is actually configured, rather than constants which correspond to the Caps file.
- + reorganized lib\_raw.c to avoid updating SP and cur\_term state if the functions fail (reported by Philippe Blain).
- + add -Wundef to gcc warnings, adjust a few ifdef's to accommodate gcc.

20020629

- + correct parameters to setcchar() in ncurses.c (cf: 20020406).
- + set locale in most test programs (view.c and ncurses.c were the only ones).
- + add configure option --with-build-cppflags (report by Maksim A Nikulin <M.A.Nikulin@inp.nsk.su>).
- + correct a typo in wide-character logic for lib\_bkgnd.c (Philippe Blain).
- + modify lib\_wacs.c to not cancel the acsc, smacs, rmacs strings when in UTF-8 locale. Wide-character functions use Unicode values, while narrow-character functions use the terminfo data.
- + fix a couple of places in Ada95/samples which did not compile with gnat 3.14
- + modify mkinstalldirs so the DOS-pathname case is locale-independent.
- + fix locale problem in MKlib\_gen.sh by forcing related variables to POSIX (C), using same approach as autoconf (set variables only if



they were set before). Update MKterminfo.sh and MKtermsort.sh to match.

20020622

- + add charset to generated html.
- + add mvterm entry, adapted from a FreeBSD bug-report by Daniel Rudy

<dcrudy@pacbell.net> -TD

- + add rxvt-16color, ibm+16color entries -TD
- + modify check in --disable-overwrite option so that it is used by default unless the --prefix/\$prefix value is not /usr, in attempt to work around packagers, e.g., for Sun's freeware, who do not read the INSTALL notes.

20020615

- + modify wgetch() to allow returning wgetch'd KEY\_RESIZE as a function key code in get\_wch().
- + extended resize-handling in test/ncurses 'a' menu to the entire stack of windows created with 'w' commands.
- + improve \$COLORFGBG feature by interpreting an out-of-range color value as an SGR 39 or 49, for foreground/background respectively.
- + correct a typo in configure --enable-colorfgbg option, and move it to the experimental section (cf: 20011208).

20020601

- + add logic to dump\_entry.c to remove function-key definitions that do not fit into the 1023-byte limit for generated termcaps. This makes hds200 fit.
- + more improvements to tic's warnings, including logic to ignore differences between delay values in sgr strings.
- + move definition of KEY\_RESIZE into MKkeydefs.sh script, to accommodate Caps.osf1r5 which introduced a conflicting definition.

20020525

- + add simple resize-handling in test/ncurses.c 'a' menu.
- + fixes in keyname() and \_tracechar() to handle negative values.
- + make tic's warnings about mismatches in sgr strings easier to follow.
- + correct tic checks for number of parameters in smgpb and smglp.
- + improve scoansi terminfo entry, and add scoansi-new entry -TD
- + add pcvt25-color terminfo entry -TD
- + add kf13-kf48 strings to cons25w terminfo entry (reported by Stephen Hurd <deuce@lordlegacy.org> in newsgroup lucky.freebsd.bugs) -TD
- + add endpoint \_nc\_trace\_ttymode(), use this to distinguish the Ottyb and Nttyb members of terminal (aka cur\_term), for tracing.

20020523

- + correct and simplify logic for lib\_pad.c change in 20020518 (reported

by Mike Castle).

20020518

- + fix lib\_pad.c for case of drawing a double-width character which falls off the left margin of the pad (patch by Kriang Lerdsuwanakij <lerdsuwa@users.sourceforge.net>)
- + modify configure script to work around broken gcc 3.1 "--version" option, which adds unnecessary trash to the requested information.
- + adjust ifdef's in case SIGWINCH is not defined, e.g., with DJGPP (reported by Ben Decker <deckerben@freenet.de>).

20020511

- + implement vid\_puts(), vid\_attr(), term\_attrs() based on the narrow-character versions as well.
- + implement erasewchar(), killwchar() based on erasechar() and killchar().
- + modify erasechar() and killchar() to return ERR if the value was VDISABLE.
- + correct a bug in wresize() in handling subwindows (based on patch by Roger Gammans <rgammans@computer-surgery.co.uk>, report by Scott Beck <scott@gossamer-threads.com>).
- + improve test/tclock.c by making the second-hand update more often if gettimeofday() is available.

20020429

- + workaround for Solaris sed with MKlib\_gen.sh (reported by Andy Tsouladze <andyt@mypoints.com>).

20020427

- + correct return-value from getchchar(), making it consistent with Solaris and Tru64.
- + reorder loops that generate makefile rules for different models vs subsets so configure --with-termplib works again. This was broken by logic added to avoid duplicate rules in changes to accommodate cygwin dll's (reported by George.R.Goffe@seagate.com).
- + update config.guess, config.sub

20020421

- + modify ifdef's in write\_entry.c to allow use of symbolic links on platforms with no hard links, e.g., BeOS.
- + modify a few includes to allow compile with BeOS, which has stdbool.h with a conflicting definition for 'bool' versus its OS.h definition.
- + amend MKlib\_gen.sh to work with gawk, which defines 'func' as an alias for 'function'.

20020420

- + correct form of prototype for ripoffline().
- + modify MKlib\_gen.sh to test that all functions marked as implemented can be linked.

20020413

- + add manpages:  
curs\_get\_wstr.3x, curs\_in\_wchstr.3x
- + implement wgetn\_wstr().
- + implement win\_wchnstr().
- + remove redefinition of unget\_wch() in lib\_gen.c (reported by Jungshik Shin <jshin@jtan.com>).

20020406

- + modified several of the test programs to allow them to compile with vendor curses implementations, e.g., Solaris, AIX -TD

20020323

- + modified test/configure to allow configuring against ncursesw.
- + change WACS\_XXX definition to use address, to work like Tru64 curses.

20020317

- + add 'e' and 'm' toggles to 'a', 'A' tests in ncurses.c to demonstrate effect of echo/noecho and meta modes.
- + add 'A' test to ncurses.c to demonstrate wget\_wch() and related functions.
- + add manpage: curs\_get\_wch.3x
- + implement unget\_wch().
- + implement wget\_wch().

20020310

- + regenerated html manpages.
- + add manpages: curs\_in\_wch.3x, curs\_ins\_wch.3x, curs\_ins\_wstr.3x
- + implement wins\_wch().
- + implement win\_wch().
- + implement wins\_nwstr(), wins\_wstr().

20020309

- + add manpages: curs\_addwstr.3x,  
curs\_winwstr.3x
- + implement winnwstr(), winwstr().

20020223

- + add manpages: curs\_add\_wchstr.3x, curs\_bkgrnd.3x
- + document wunctrl, key\_name.
- + implement key\_name().
- + remove const's in lib\_box.c incorrectly leftover after splitting off lib\_box\_set.c
- + update llib-Incurses, llib-ncursesw, fix configure script related to

these.

20020218

- + remove quotes on "SYNOPSIS" in man/curs\_box\_set.3x, which resulted in spurious symlinks on install.

20020216

- + implement whline\_set(), wvline\_set(), add manpage curs\_border\_set.
- + add substest 'b' to 'F' and 'f' in ncurses.c to demonstrate use of box() and box\_set() functions.
- + add substest 'u' to 'F' in ncurses.c, to demonstrate use of addstr() given UTF-8 string equivalents of WACS\_XXX symbols.
- + minor fixes to several manpages based on groff -ww output.
- + add descriptions of external variables of termcap interface to the manpage (report by Bruce Evans <bde@zeta.org.au>).
- > patches by Bernhard Rosenkraenzer:
  - + correct configure option --with-bool, which was executed as --with-ospeed.
  - + add quotes for parameters of --with-bool and --with-ospeed configure options.
- > patch by Sven Verdoolaege (report by Gerhard Haering <haering\_linux@gmx.de>):
  - + correct typos in definitions of several wide-character macros: waddwstr, wgetbkgrnd, mvaddwstr, mvwadd\_wchnstr, mvwadd\_wchnstr, mvwaddwstr.
  - + pass \$(CPPFLAGS) to MKlib\_gen.sh, thereby fixing a missing definition of \_XOPEN\_SOURCE\_EXTENDED, e.g., on Solaris

20020209

- + implement wide-acs characters for UTF-8 locales. When in UTF-8 locale, ignore narrow version of acs. Add 'F' test to test/ncurses.c to demonstrate.
- + correct prototype in keybound manpage (noted from a Debian mailing list item).

20020202

- + add several cases to the wscanw() example in testcurs.c, showing the format.
- + implement a simple vsscanf() fallback function which uses the %n conversion to help parse the input data (prompted by discussion with Albert Chin-A-Young).
- + modify mk-1st.awk and test/Makefile.in to add \$(LDLFLAGS) when making shared libraries, and to use \$(CFLAGS) when linking test programs (patch by Albert Chin-A-Young).
- + add a call to \_nc\_keypad() in keypad() to accommodate applications such as nvi, which use curses for output but not for input (fixes

Debian #131263, cf: 20011215).

- + add entrypoints to `resizeterm.c` which provide better control over the process: `is_term_resized()` and `resize_term()`. The latter restores the original design of `resizeterm()` before `KEY_RESIZE` was added in 970906. Do this to accommodate 20010922 changes to `view.c`, but allow for programs with their own `sigwinch` handler, such as `lynx` (reported by Russell Ruby <russ@math.orst.edu>).

20020127

- + fix a typo in `change` to `mk-1st.awk`, which broke the shared-library makefile rules (reported by Martin Mokrejs).

20020126

- + update `config.guess`, `config.sub`
- + finish changes needed to build dll's on cygwin.
- +  
fix a typo in `mvwchat()` macro (reported by Cy <yam@homerow.net>).

20020119

- + add case in `lib_baudrate.c` for B921600 (patch by Andrey A Chernov).
- + correct missing sed-editing stage in `manpage` installs which is used to rename manpages, broken in 20010324 fix for Debian #89939 (Debian #78866).
- + remove `-L$(libdir)` from linker flags, probably not needed any more since HPUX is handled properly (reported by Niibe Yutaka <gniibe@m17n.org>).
- + add configure check for `mbstate_t`, needed for wide-character configuration. On some platforms we must include `<wchar.h>` to define this (reported by Daniel Jacobowitz).
- + incorporate some of the changes needed to build dll's on cygwin.

20020112a

- + workaround for `awk` did not work with `mawk`, adjusted shell script.

20020112

- + add `Caps.osf1r5`, as an example.
- + modify behavior of `can_clear_with()` so that if an application is running in a non-bce terminals with default colors enabled, it returns true, allowing the user to select/paste text without picking up extraneous trailing blanks (adapted from patch by Daniel Jacobowitz <dmj+@andrew.cmu.edu>).
- + modify generated `curses.h` to ifdef-out prototypes for extensions if they are disabled, and to define `curses_version()` as a string in that case. This is needed to make the programs such as `tic` build in that configuration.
- + modified generated `headers.sh` to remove a gzip'd version of the target file if it exists, in case non-gzip'd manpages are installed

into a directory where gzip'd ones exist. In that case, the latter would be found.

- + corrected a redundant initialization of signal handlers from 20010922 changes.
- + clarified bug-reporting address in terminfo.src (report by John H DuBois III <spcedt@armory.com>).
- > several fixes from Robert Joop:
  - + do not use "-v" option of awk in MKkey\_defs.sh because it does not work with SunOS nawk.
  - + modify definitions for libutf8 in curses.h to avoid redefinition warnings for mblen
  - + quoted references to compiler in shell command in misc/Makefile, in case it uses multiple tokens.

20011229

- + restore special case from 20010922 changes to omit SA\_RESTART when setting up SIGWINCH handler, which is needed to allow wgetch() to be interrupted by that signal.
- + update configure macro CF\_WITH\_PATHLIST, to omit some double quotes not needed with autoconf 2.52
- + revert configure script to autoconf 2.13 patched with autoconf-2.13-19990117.patch.gz (or later) from <ftp://invisible-island.net/autoconf/> because autoconf 2.52 macro AC\_PROG\_AWK does not work on HP-UX 11.0 (report by David Ellement <ellement@sdd.hp.com>). This also fixes a different problem configuring with Mac OS X (reported by Marc Smith <marc.a.smith@home.com>).

20011222

- + modify include/edit\_cfg.h to eliminate BROKEN\_LINKER symbol from term.h
- + move prototype for \_nc\_vsscanf() into curses.h.in to omit HAVE\_VSSCANF symbol from curses.h, which was dependent upon the ncurses\_cfg.h file which is not installed.
- + use ACS\_LEN rather than SIZEOF(acs\_map) in trace code of lib\_acs.c, to work with broken linker configuration, e.g., cygwin (report by Robert Joop <rj@rainbow.in-berlin.de>).
- + make napms() call \_nc\_timed\_wait() rather than poll() or select(), to work around broken implementations of these on cygwin.

20011218

- + drop configure macro CF\_WIDEC\_SHIFT, since that was rendered obsolete by Sven Verdoolaege's rewrite of wide-character support. This makes libncursesw incompatible again, but makes the header files almost the same as in the narrow-character configuration.

- + simplify definitions that combine wide/narrow versions of bkgd, etc., to eliminate differences between the wide/narrow versions of curses.h
- + correct typo in configure macro CF\_FUNC\_VSSCANF
- + correct location of call to \_nc\_keypad() from 20011215 changes which prevented keypad() from being disabled (reported by Lars Hecking).

#### 20011215

- + rewrote ncurses 'a' test to exercise wgetch() and keypad() functions better, e.g., by adding a 'w' command to create new windows which may have different keypad() settings.
- + corrected logic of keypad() by adding internal screen state to track whether the terminal's keypad-mode has been set. Use this in wgetch() to update the keypad-mode according to whether the associated window's keypad-mode has been set with keypad(). This corrects a related problem restoring terminal state after handling SIGTSTP (reported by Mike Castle).
- + regenerate configure using patch for autoconf 2.52  
autoconf-2.52-patch.gz  
at  
<ftp://invisible-island.net/autoconf/>
- + update config.guess, config.sub from  
<http://subversions.gnu.org/cgi-bin/viewcvs/config/config/>
- + minor changes to quoting in configure script to allow it to work with autoconf 2.52

#### 20011208

- + modify final checks in lib\_setup.c for line and col values, making them independent.
- + modify acs\_map[] if configure --broken-linker is specified, to make it use a function rather than an array (prompted by an incorrect implementation in cygwin package).
- + correct spelling of configure option --enable-colorfgbg, which happened to work if --with-develop was set (noted in cygwin package for ncurses).
- + modify ifdef for genericerror() to compile with SUNWspro Sun WorkShop 6 update 1 C++ 5.2 (patch by Sullivan N Beck <sbeck@cise.ufl.edu>).
- + add configure checks to see if ncurses' fallback vsscanf() will compile either of the special cases for FILE structs, and if not, force it to the case which simply returns an error (report by Sullivan N Beck <sbeck@cise.ufl.edu> indicates that Solaris 8 with 64-bits does not allow access to FILE's fields).
- + modify ifdefs for c++/cursesw.cc to use the fallback vsscanf() in the ncurses library if no better substitute for this can be found in the C++ runtime.
- + modify the build to name dynamic libraries according to the convention

used on OS X and Darwin. Rather than something like libncurses.dylib.5.2, Darwin would name it libncurses.5.dylib. There are a few additional minor fixes, such as setting the library version and compatibility version numbers (patch by Jason Evans <jevans@apple.com>).

- + use 'sh' to run mkinstalldirs, to work around problems with buggy versions of 'make' on OS/2 (report by John Polterak <jp@eyup.org>).
- + correct typo in manpage description of curs\_set() (Debian #121548).
- + replace the configure script existence-check for mkstemp() by one that checks if the function works, needed for older glibc and AmigaOS.

20011201

- + modify script that generates fallbacks.c to compile a temporary copy of the terminfo source in case the host does not contain all of the entries requested for fallbacks (request by Greg Roelofs).
- + modify configure script to accommodate systems such as Mac OS X whose <stdbool.h> header defines a 'bool' type inconsistent with ncurses,

which normally makes 'bool' consistent with C++. Include <stdbool.h> from curses.h to force consistent usage, define a new type NCURSES\_BOOL and related that to the exported 'bool' as either a typedef or definition, according to whether <stdbool.h> is present (based on a bug report for tin 1.5.9 by Aaron Adams <adamsa@mac.com>).

20011124

- + added/updated terminfo entries for M\$ telnet and KDE konsole -TD

20011117

- + updated/expanded Apple\_Terminal and Darwin PowerPC terminfo entries (Benjamin C W Sittler).
- + add putty terminfo entry -TD
- + if configuring for wide-curses, define \_XOPEN\_SOURCE\_EXTENDED, since this may not otherwise be defined to make test/view.c compile.

20011110

- + review/correct several missing/generated items in curses.wide, sorted the lists to make subsequent diff's easier to track.

20011103

- + add manual pages for add\_wch(), echo\_wchar(), getcchar(), mvadd\_wch(), mvwadd\_wch(), setcchar(), wadd\_wch() and wecho\_wchar().
- + implement wecho\_wchar()
- + modify \_tracedump() to handle wide-characters by mapping them to '?' and control-characters to '.', to make the trace file readable. Also dynamically allocate the buffer used by \_tracedump() for formatting the results.



- + modify T\_CALLED/T\_RETURN macros to ease balancing call/return lines in a trace by using curly braces.
- + implement \_nc\_visbuf(), for tracing cchar\_t arrays.
- + correct trace-calls in setcchar() and getcchar() functions, which traced the return values but not the entry to each function.
- + correct usage message in test/view.c, which still mentioned -u flag.

#### 20011027

- + modify configure script to allow building with termcap only, or with fallbacks only. In this case, we do not build tic and toe.
- + add configure --with-termcap option, to override default TERMPATH value of /etc/termcap:/usr/share/misc/termcap.
- + cosmetic change to tack: make menu descriptions agree with menu titles.

#### 20011020

- + rewrote limit-checks in wscrl() and associated \_nc\_scroll\_window(), to ensure that if the parameter of wscrl() is larger than the size of the scrolling region, then the scrolling region will be cleared (report by Ben Kohlen <bckohlen@yahoo.com>).
- + add trace/varargs.c, using this to trace parameters in lib\_printw.c
- + implement \_tracecchar\_t2() and \_tracecchar\_t().
- + split-out trace/visbuf.c
- + correct typo in lib\_printw.c changes from 20010922 (report by Mike Castle).

#### 20011013

- + modify run\_tic.sh to check if the build is a cross-compile. In that case, do not use the build's tic to install the terminfo database (report by Rafael Rodriguez Velilla <rrv@tid.es>).
- + modify mouse click resolution so that mouseinterval(-1) will disable it, e.g., to handle touchscreens via a slow connection (request by Byron Stanoszek <gandalf@winds.org>).
- + correct mouseinterval() default value shown in curs\_mouse.3x
- + remove conflicting definition of mouse\_trafo() (reported by Lars Hecking, using gcc 2.95.3).

#### 20011001

- + simpler fix for signal\_name(), to replace the one overlooked in 20010929 (reported by Larry Virden).

#### 20010929

- + add -i option to view.c, to test ncurses' check for non-default signal handler for SIGINT, etc.
- + add cases for shared-libraries on Darwin/OS X (patch by Rob Braun <bbraun@synack.net>).

- + modify tset to restore original I/O modes if an error is encountered. Also modify to use buffered stderr consistently rather than mixing with write().
- + change signal\_name() function to use if-then-else rather than case statement, since signal-values aren't really integers (reported by Larry Virden).
- + add limit checks in wredrawln(), fixing a problem where lynx was repainting a pad which was much larger than the screen.

#### 20010922

- + fix: PutRange() was counting the second part of a wide character as part of a run, resulting in a cursor position that was one too far (patch by Sven Verdoolaege).
- + modify resizeterm() to not queue a KEY\_RESIZE if there was no SIGWINCH, thereby separating the two styles of SIGWINCH handling in test/view.c
- + simplified lib\_tstp.c, modify it to use SA\_RESTART flag for SIGWINCH.
- + eliminate several static buffers in the terminfo compiler, using allocated buffers.
- + modify MKkeyname.awk so that keyname() does not store its result into a static buffer that is overwritten by the next call.
- + reorganize the output of infocmp -E and -e options to compile cleanly with gcc -Wwrite-strings warnings.
- + remove redefinition of chgat/wchgat/mvwchgat from curses.wide

#### 20010915

- + add label to test/view.c, showing the name of the last key or signal that made the screen repaint, to make it clearer when a sigwinch does this.
- + use ExitProgram() consistently in the test-programs to make it simpler to test leaks with dmalloc, etc.
- + move hashtable static data out of hashmap.c into SCREEN struct.
- + make NO\_LEAK code compile with revised WINDOWLIST structs.

#### 20010908

- + modify tgetent() to check if exit\_attribute\_mode resets the alternate character set, and if so, attempt to adjust the copy of the termcap "me" string which it will return to eliminate that part. In particular, 'screen' would lose track of line-drawing characters (report by Frederic L W Meunier <0@pervalidus.net>, analysis by Michael Schroeder).

#### 20010901

- + specify DOCTYPE in html manpages.
- + add missing macros for several "generated" functions: attr\_get(), attr\_off(), attr\_on(), attr\_set(), chgat(), mvchgat(), mvwchgat() and

- mouse\_trafo()).
- + modify view.c to agree with non-experimental status of ncurses' sigwinch handler:
  - + change the sense of the -r option, making it default to ncurses' sigwinch handler.
  - + add a note explaining what functions are unsafe in a signal handler.
  - + add a -c option, to set color display, for testing.
- + unset \$data variable in MKterminfo.sh script, to address potential infinite loop if shell malfunction (report by Samuel Mikes <smikes@cubane.com>, for bash 2.05.0 on a Linux 2.0.36 system).
- + change kbs in mach terminfo entries to ^? (Marcus Brinkmann <Marcus.Brinkmann@ruhr-uni-bochum.de>).
- + correct logic for COLORFGBG environment variable: if rxvt is compiled with xpm support, the variable has three fields, making it slightly incompatible with itself. In either case, the background color is the last field.

20010825

- + move calls to def\_shell\_mode() and def\_prog\_mode() before loop with callbacks in lib\_set\_term.c, since the c++ demo otherwise initialized the tty modes before saving them (patch by John David Anglin <dave@hiauly1.hia.nrc.ca>).
- + duplicate logic used to initialize trace in newterm(), in initscr() to avoid confusing trace of initscr().
- + simplify allocation of WINDOW and WINDOWLIST structs by making the first a part of the second rather than storing a pointer. This saves a call to malloc for each window (discussion with Philippe Blain).
- + remove unused variable 'used\_ncv' from lib\_vidattr.c (Philippe Blain).
- + modify c++/Makefile.in to accommodate archive programs that are different for C++ than for C, and add cases for vendor's C++ compilers on Solaris and IRIX (report by Albert Chin-A-Young).
- + correct manpage description of criteria for deciding if the terminal supports xterm mouse controls.
- + add several configure script options to aid with cross-compiling: --with-build-cc, --with-build-cflags, --with-build-ldflags, and --with-build-libs (request by Greg Roelofs).
- + change criteria for deciding if configure is cross-compiling from host/build mismatch to host/target mismatch (request by Greg Roelofs <greg.roelofs@philips.com>).
- + correct logic for infocmp -e and -E options which writes the data for the ext\_Names[] array. This is needed if one constructs a fallback table for a terminfo entry which uses extended termcap names, e.g., AX in a color xterm.
- + fix undefined NCURSES\_PATHSEP

when configure --disable-database  
option is given.

20010811

- + fix for VALID\_BOOLEAN() macro when char is not signed.
- + modify 'clean' rule for C++ binding to work with Sun compiler, which caches additional information in a subdirectory of the objects.
- + added llib-ncursesw.

20010804

- + add Caps.keys example for experimental extended function keys (adapted from a patch by Ilya Zakharevich).
- + correct parameter types of vidputs() and vidattr() to agree with header files (report by William P Setzer).
- + fix typos in several man-pages (patch by William P Setzer).
- + remove unneeded ifdef for \_\_GNUG\_\_ in CF\_CPP\_VSCAN\_FUNC configure macro, which made ncurses C++ binding fail to build with other C++ compilers such as HPUX 11.x (report by Albert Chin-A-Young).
- + workaround for bug in HPUX 11.x C compiler: add a blank after NCURSES\_EXPORT macro in form.h (report by Albert Chin-A-Young)
- + ignore blank lines in Caps\* files in MKkey\_defs.sh script (report by Albert Chin-A-Young).
- + correct definition of key\_end in Caps.aix4, which left KEY\_END undefined (report by Albert Chin-A-Young).
- + remove a QNX-specific fallback prototype for vsscanf(), which is obsolete with QNX RTP.
- + review/fix some of the T() and TR() macro calls, having noticed that there was no data for delwin() in a trace of dialog because there was no returnVoid call for wtimeout(). Also, traces in lib\_twait.c are now selected under TRACE\_IEVENT rather than TRACE\_CALLS.

20010728

- + add a \_nc\_access() check before opening files listed via \$TERMPATH.
- + using modified man2html, regenerate some of the html manpages to fix broken HREF's where the link was hyphenated.

20010721

- + add some limit/pointer checks to -S option of tputs.
- + updated/expanded Apple\_Terminal and Darwin PowerPC terminfo entries (Benjamin C W Sittler).
- + add a note in curs\_termcap.3x regarding a defect in the XSI description of tgetent (based on a discussion with Urs Jansen

regarding the HPUX 11.x implementation, whose termcap interface is not compatible with existing termcap programs).

- + modify manhtml rule in dist.mk to preserve copyright notice on the generated files, as well as to address HTML style issues reported by

tidy and weblint. Regenerated/updated corresponding html files.  
+ comment out use of Protected\_Character and related rarely used attributes in ncurses Ada95 test/demo to compile with wide-character configuration.

20010714

+ implement a simple example in C++ demo to test scanw().  
+ corrected stdio function used to implement scanw() in cursesw.cc  
+ correct definition of RemAttr() macro from 20010602 changes, which caused C++ SillyDemo to not show line-drawing characters.  
+ modify C++ binding, adding getKey() which can be overridden by user to substitute functions other than getch() for keyboard processing of forms and menus (patch by Juergen Pfeifer).

20010707

+ fix some of the trace calls which needed modification to work with new wide-character structures.  
+ modify magic-cookie code in tty\_update.c to compile with new wide-character structures (report by <George.R.Goffe@seagate.com>).  
+ ensure that \_XOPEN\_SOURCE\_EXTENDED is defined in curses.priv.h if compiling for wide-character configuration.  
+ make addwnstr() handle non-spacing characters (patch by Sven Verdoolaege).

20010630

+ add configure check to define \_GNU\_SOURCE, needed to prop up glibc header files.  
+ split-out include/curses.wide to solve spurious redefinitions caused by defining \_GNU\_SOURCE, and move includes for <signal.h> before <curses.h> to work around misdefinition of ERR in glibc 2.1.3 header file.  
+ extended ospeed change to NetBSD and OpenBSD -TD  
+ modify logic in lib\_baudrate.c for ospeed, for FreeBSD to make it work properly for termcap applications (patch by Andrey A Chernov).

20010623

+ correct an overlooked CharOf/UChar instance (reports by Eugene Lee <eugene@anime.net>, Sven Verdoolaege).  
+ correct unneeded ifdef for wunctrl() (reported by Sven Verdoolaege)

20010618

+ change overlooked several CharOf/UChar instances.  
> several patches from Sven Verdoolaege:  
+ correct a typo in wunctrl(), which made it appear that botwc() was needed (no such function: use btowc()).  
+ reimplement wide-character demo in test/view.c, using new functions.

- + implement `getcchar()`, `setcchar()`, `wadd_wchnstr()` and related macros.
- + fix a syntax problem with `do/if/while` in `PUTC` macro (`curses.priv.h`).

20010616

- + add parentheses in macros for `malloc` in `test.priv.h`, fixes an expression in `view.c` (report by Wolfgang Gutjahr <gutw@knapp.co.at>).
- + add `Caps.uwin`, as an example.
- + change the way `curses.h` is generated, making the list of function key definitions extracted from the `Caps` file.
- + add `#undef`'s before possible redefinition of `ERR` and `OK` in `curses.h`
- + modify logic in `tic`, `toe`, `tput` and `tset` which checks for `basename` of `argv[0]` to work properly on systems such as `OS/2` which have case-independent filenames and/or program suffixes, e.g., `".ext"`.

20010609

- + add a configure check, if `--enable-widex` is specified, for `putwc()`, which may be in `libutf8`.
- + remove some unnecessary text from `curs_extend.3x` and `default_colors.3x` which caused `man-db` to make incorrect symbolic links (Debian bug report #99550).
- + add configure check if cast for `_IO_va_list` is needed to compile C++ `vscan` code (Debian bug report #97945).
- > several patches from Sven Verdoolaege:
  - + correct code that used non-standard auto-initialization of a struct, which `gcc` allows (report by Larry Virden).
  - + use `putwc()` in `PUTC()` macro.
  - + make `addstr()` work for the special case where the codeset is non-stateful (eg. UTF-8), as well as stateful codesets.

20010603

- + correct loop expression in `NEXT_CHAR` macro for `lib_addstr.c` changes from 20010602 (report by Mike Castle).

20010602

- + modify `mvcur()` to avoid emitting newline characters when `nonl()` mode is set. Normally this is not a problem since the actual terminal mode is set to suppress `nl/crlf` translations, however it is useful to allow the caller to manipulate the terminal mode to avoid staircasing effects after spawning a process which writes messages (for `lynx 2.8.4`) -TD
- > several patches from Sven Verdoolaege <skimo@kotnet.org>:
  - + remove redundant type-conversion in `fifo_push()`
  - + correct definition of `addwstr()` macro in `curses.h.in`
  - + remove `_nc_utf8_outh()`
  - + rename most existing uses of `CharOf()` to `UChar()`, e.g., where it is used to prevent sign-extension in `ctype` macros.

- + change some chtype's to attr\_t's where the corresponding variables are used to manipulate attributes.
- + UpdateAttr() was applied to both attributes (attr\_t) and characters (chtype). Modify macro and calls to it to make these distinct.
- + add CharEq() macro, use in places where wide-character configuration implementation uses a struct for cchar\_t.
- + moved struct ldat into curses.priv.h, to hide implementation details.
- + change CharOf() macro to use it for masking A\_CHARTEXT data from chtype's.
- + add L() macro to curses.priv.h, for long-character literals.
- + replace several assignments from struct ldat entries to chtype or char values with combinations of CharOf() and AttrOf() macros.
- + add/use intermediate ChAttrOf() and ChCharOf() macros where we know we are using chtype data.
- + add/use lowlevel attribute manipulation macros AddAttr(), RemAttr() and SetAttr().
- + add/use SetChar() macro, to change a cchar\_t based on a character and attributes.
- + convert most internal use of chtype to NCURSES\_CH\_T, to simplify use of cchar\_t for wide-character configuration. Similarly, use ARG\_CH\_T where a pointer would be more useful.
- + add stubs for tracing cchar\_t values.
- + add/use macro ISBLANK()
- + add/use constructors for cchar\_t's: NewChar(), NewChar2().
- + add/use macros CHREF(), CHDEREF(), AttrOfD(), CharOfD() to facilitate passing cchar\_t's by address.
- + add/use PUTC\_DATA, PUTC() macros.
- + for wide-character configuration, move the window background data to the end of the WINDOW struct so that whether \_XOPEN\_SOURCE\_EXTENDED is defined or not, the offsets in the struct will not change.
- + modify addch() to work with wide-characters.
- + mark several wide-character functions as generated in curses.h.in
- + implement wunctrl(), wadd\_wch(), wbkgndset(), wbkgnd(), wborder\_set() and waddnwstr().

20010526

- + add experimental --with-caps=XXX option to customize to similar terminfo database formats such as AIX 4.x
- + add Caps.aix4 as an example.
- + modify Caps to add columns for the the KEY\_XXX symbols.
- + modify configure --with-widex to suppress overwrite of libcurses.so and curses.h
- + add checks to toe.c to avoid being confused by files and directories where we would expect the reverse, e.g., source-files in the top-level terminfo levels as is the case for AIX.

20010519

+ add

top-level 'depend' rule for the C sources, assuming that the makedepend program is available. As a side-effect, this makes the generated sources, as in "make sources" (prompted by a report by Mike Castle that "make -j" fails because the resulting parallel processes race to generate ncurses/ncurses.c).

+ modify configure script so that --disable-overwrite option's action to add a symbolic link for libncurses applies to the static library as well as the shared library when both are configured (report by Felix Natter <f.natter@ndh.net>).

+ add ELKS terminfo entries (Federico Bianchi <bianchi@www.arte.unipi.it>)

+ add u6 (CSR) to Eterm (Michael Jennings).

20010512

+ modify test/ncurses.c to work with xterm-256color, which has fewer color pairs than colors\*colors (report by David Ellement <ellement@sdd.hp.com>).

20010505

+ corrected screen.xterm-xfree86 entry.

+ update comment in Caps regarding IBM (AIX) function-key definitions.

20010421

+ modify c++/Makefile.in

to link with libncurses++w.a when configured for wide-characters (patch by Sven Verdoolaege).

+ add check in \_nc\_trace\_buf() to refrain from freeing a null pointer.

+ improve CF\_PROG\_INSTALL macro using CF\_DIRNAME.

+ update config.guess, config.sub from autoconf 2.49e (alpha).

20010414

+ add secondary check in tic.c, similar\_sgr() to see if the reason for mismatch was that the individual capabilities used a time-delay while sgr did not. Used this to cleanup mismatches, e.g., in vt100, and remove time-delay from Apple\_Terminal entries.

+ add Apple\_Terminal terminfo entries (Benjamin C W Sittler <bsittler@iname.com>).

+ correct definitions of shifted editing keys for xterm-xfree86 -TD

+ fix a bug in test/bs.c from 20010407 (patch by Erik Sigra).

+ prevent relative\_move() from doing an overwrite if it detects 8-bit characters when configured for UTF-8 (reported by Sven Verdoolaege <skimo@kotnet.org>).

20010407

+ add configure checks for strstream.h



vscan function, and similar

stdio-based function which may be used in C++ binding for gcc 3.0 (reports by George Goffe, Lars Hecking, Mike Castle).

+ rewrite parts of configure.in which used changequote(). That feature is broken in the latest autoconf alphas (e.g., 2.49d).

+ add a missing pathname for ncurses\_dll.h, needed when building in a directory outside the source tree (patch by Sven Verdoolaege <skimo@kotnet.org>).

> fix 2 bugs in test/bs.c Erik Sigra <sigra@home.se>:

+ no ships were ever placed in the last row or in the last column.

This made the game very easy to win, because you never had to waste any shots there, but the computer did.

+ the squares around a sunken ship that belonged to the player were not displayed as already hit by the computer, like it does for the player.

20010331

+ add some examples of customizing screen's terminfo:

screen.xterm-xfree86, screen.xterm-r6, screen.teraterm -TD

+ modify screen's terminfo entry to

match the khome/kend in screen

3.09.08 (Debian bug report #92215).

+ correct a memory leak in forms library (report by Stefan Vogtner <stefan@vogtner.de>) (patch by Juergen Pfeifer).

20010324

+ change symbols used to guard against repeated includes to begin consistently with "NCURSES\_" rather than a leading underscore. There are other symbols defined in the header files which begin with a leading underscore, but they are part of the legacy interface.

+ reorder includes in c++ binding so that rcs identifiers can be compiled-in.

+ add .cc.ii rule to c++ makefile, to get preprocessor output for debugging.

+ correct configure script handling of @keyword@ substitutions when the --with-manpage-renames option is given (cf: 20000715, fixes Debian bug #89939).

+ report stack underflow/overflow in tparm() when tic -cv option is given.

+ remove spurious "%|" operator from xterm-xfree86 terminfo entry, (reported by Adam Costello <amc@cs.berkeley.edu>, Debian bug #89222).

20010310

+ cleanup of newdemo.c, fixing some ambiguous expressions noted by gcc 2.95.2, and correcting some conflicting color pair initializations.

+ add missing copyright notice for cursesw.h

+ review, make minor fixes for use of '::' for referring to C-language

- interface from C++ binding.
- + modify configure check for g++ library slightly to accommodate nonstandard version number, e.g., <vendor>-2.7 (report by Ronald Ho <rho@mipos2.intel.com>).
- + add configure check for c++ <sstream> header, replace hardcoded ifdef.
- + workaround for pre-release of gcc 3.0 libstdc++, which has dropped vscan from strstreambuf to follow standard, use wrapper for C vscanf instead (report by George Goffe <grgoffe@excite.com> and Matt Taggart <taggart@carmen.fc.hp.com>, fixes Debian .

20010303

- + modify interface of \_nc\_get\_token() to pass 'silent' parameter to it, to make quieter loading of /etc/termcap (patch by Todd C Miller).
- + correct a few typos in curs\_slk.3x and curs\_outopts.3x manpages (patch by Todd C Miller).

20010224

- + compiler-warning fixes (reported by Nelson Beebe).

20010210

- + modify screen terminfo entry to use new 3.9.8 feature allowing xterm mouse controls -TD

20010203

- + broaden patterns used to match OS/2 EMX in configure script to cover variant used in newer config.guess/config.sub
- + remove changequote() calls from configure script, since this feature is broken in the autoconf 2.49c alpha, maintainers decline to fix.
- + remove macro callPutChar() from tty\_update.c, since this is no longer needed (reported by Philippe Blain).
- + add a null-pointer check in tic.c to handle the case when the input file is really empty. Modify the next\_char() function in comp\_scan.c to allow arbitrarily long lines, and incidentally supply a newline to files that do not end in a newline. These changes improve tic's recovery from attempts to read binary files, e.g., its output from the terminfo database (reported by Bernhard Rosenkraenzer).

20010127

- + revert change to c++/demo.cc from 20001209, which changed definition of main() apparently to accommodate cygwin linker, but broke the demo program.
- + workaround for broken egcs 2.91.66 which calls member functions (i.e., lines() and colors()) of NCursesWindow before calling its constructor. Add calls to initialize() in a few constructors which did not do this already.

- + use the GNAT preprocessor to make the necessary switch between TRACE and NO\_TRACE configurations (patch by Juergen Pfeifer).
- > patches by Bernhard Rosenkraenzer:
- + modify kterm terminfo entry to use SCS sequence to support alternate character set (it does not work with SI/SO).
- + --with-ospeed=something didn't work. configure.in checked for a \$enableval where it should check for \$withval. Also, ncurses/l-lib-ncurses still had a hardcoded short.

20010114

- + correction to my merge of Tom Riddle's patch that broke tic in some conditions (reported by Enoch Wexler <enoch@wexler.co.il>) -TD

20010113

- + modify view.c to test halfdelay(). Like other tests, this recognizes the 's' and space commands for stopping/starting polled input, shows a freerunning clock in the header. If given a parameter to 's', that makes view.c use halfdelay() with that parameter rather than nodelay().
- + fix to allow compile with the experimental configure option --disable-hashmap.
- + modify postprocess\_termcap() to avoid overwriting key\_backspace, key\_left, key\_down when processing a non-base entry (report/patch by Tom Riddle).
- + modify \_nc\_wrap\_entry(), adding option to reallocate the string table, needed in \_nc\_merge\_entry() when merging termcap entries. (adapted from report/patch by Tom Riddle <ftr@oracom.com>).
- + modify a few configure script macros to keep \$CFLAGS used only for compiler options, preprocessor options in \$CPPFLAGS.

20001230

- + correct marker positions in lrtest.c after receiving a sigwinch.
- + fix ifdef's in ncurses.c to build against pre-5.2 for testing.
- + fixes to tclock for resizing behavior, redundant computation (report and patch by A M Kuchling <akuchlin@mems-exchange.org>).

20001216

- + improved scoansi terminfo entry -TD
- + modify configure script and makefile in Ada95/src to compile a stub for the trace functions when ncurses does not provide those.

20001209

- + add ncurses\_dll.h and related definitions to support generating DLL's with cygwin (adapted from a patch by Charles Wilson <cwilson@ece.gatech.edu>, changed NCURSES\_EXPORT macro to make it work with 'indent') -TD

20001202

- + correct prototypes for some functions in `curs_termcap.3x`, matching `termcap.h`, which matches X/Open.
- > patch by Juergen Pfeifer:
- + a revised version of the Ada enhancements sent in by "H. Nanosecond", aka Eugene V Melaragno <aldomel@ix.netcom.com>. This patch includes
  - small fixes to the existing ncurses binding
  - addition of some more low-level functions to the binding, including `termcap` and `terminfo` functions
  - An Ada implementation of the "ncurses" test application originally written in C.

20001125

- + modify logic in `lib_setup.c` to allow either lines or columns value from `terminfo` to be used if the screen size cannot be determined dynamically rather than requiring both (patch by Ehud Karni <ehud@unix.simonwiesel.co.il>).
- + add check in `lib_tgoto.c`'s `is_termcap()` function to reject null or empty strings (reported by Valentin Nechayev <netch@netch.kiev.ua> to `freebsd-bugs`).
- + add definition from `configure` script that denotes the path-separator, which is normally a colon. The path-separator is a semicolon on OS/2 EMX and similar systems which may use a colon within pathnames.
- + alter logic to set default for `--disable-overwrite` option to set it to 'yes' if the `--prefix/$prefix` value is not `/usr/local`, thereby accommodating the most common cause of problems: gcc's nonstandard search rules. Other locations such as `/usr/local/ncurses` will default to overwriting (report by Lars Hecking <lhecking@nmrc.ie>).

20001118

- + modify default for `--disable-overwrite` `configure` option to disable if the `--prefix` or `$prefix` value is not `/usr`.
- + add `cygwin` to systems for which `ncurses` is installed by default into `/usr` rather than `/usr/local`.

20001111

- + minor optimization in `comp_error.c` and `lib_termname.c`, using `strncat()` to replace `strncpy()` (patch by Solar Designer).
- + add a `use_terminfo_vars()` check for `$HOME/.termcap`, and check for `geteuid()` to use `use_terminfo_vars()` (patch by Solar Designer <solar@false.com>).
- + improved `cygwin` `terminfo` entry, based on patch by <ernie\_boyd@yahoo.com>.
- + modify `_nc_write_entry()` to allow for the possibility that linking

aliases on a filesystem that ignores case would not succeed because the source and destination differ only by case, e.g., NCR260VT300WPP0 on cygwin (report by Neil Zanella).  
+ fix a typo in  
the curs\_deleteln.3x man page (patch by Bernhard Rosenkraenzer <bero@redhat.de>).

20001104

+ add configure option --with-ospeed to assist packagers in transition to 5.3 change to ospeed type.  
+ add/use CharOf() macro to suppress sign-extension of char type on platforms where this is a problem in ctype macros, e.g., Solaris.  
+ change trace output to binary format.  
+ correct a missing quote adjustment in CF\_PATH\_SYNTAX autoconf macro, for OS/2 EMX configuration.  
+ rearrange a few configure macros, moving preprocessor options to \$CPPFLAGS (a now-obsolete version of autoconf did not consistently use \$CPPFLAGS in both the compile and preprocessor checks).  
+ add a check in relative\_move() to guard against buffer overflow in the overwrite logic.

20001028

+ add message to configure script showing g++ version.  
+ resync config.guess, config.sub  
+ modify lib\_delwin.c, making it return ERR if the window did not exist (suggested by Neil Zanella).  
+ add cases for  
FreeBSD 3.1 to tdlint and makelib scripts, used this  
to test/review ncurses library. (Would use lclint, but it doesn't work).  
+ reorganized knight.c to avoid forward references. Correct screen updates when backtracking, especially to the first cell. Add F/B/a commands.

20001021 5.2 release for upload to ftp.gnu.org

+ update generated html files from manpages.  
+ modify dist.mk to use edit\_man.sh to substitute autoconf'd variables in html manpages.  
+ fix an uninitialized pointer in read\_termcap.c (report by Todd C Miller, from report/patch by Philip Guenther <guenther@gac.edu>).  
+ correct help-message and array limit in knight.c (patch by Brian Raiter <breadbox@muppetlabs.com>).  
> patch by Juergen Pfeifer:  
+ fix to avoid warning by GNAT-3.13p about use of inconsistent casing for some identifiers defined in the standard package.  
+ cosmetic change to forms/fty\_enum.c

20001014

- + correct an off-by-one position in test/railroad.c which could cause wrapping at the right margin.
- + test/repair some issues with libtool configuration. Make --disable-echo force libtool --silent. (Libtool does not work for OS/2 EMX, works partly for SCO - libtool is still very specific to gcc).
- + change default of --with-manpage-tbl to "no", since for most of the platforms which do have tbl installed, the system "man" program understands how to run tbl automatically.
- + minor improvement to force\_bar() in comp\_parse.c (Bernhard Rosenkraenzer <bero@redhat.de>).
- + modify lib\_tparm.c to use get\_space() before writing terminating null character, both for consistency as well as to ensure that if save\_char() was called immediately before, that the allocated memory is enough (patch by Sergei Ivanov).
- + add note about termcap ML capability which is duplicated between two different capabilities: smgl and smglr (reported by Sergei Ivanov <svivanov@pdmi.ras.ru>).
- + correct parameter counts in include/Caps for dcl as well as some printer-specific capabilities: csnm, defc, scs, scsd, smgtp, smglp.
- > patch by Johnny C Lam <lamj@stat.cmu.edu>:
- + add support for building with libtool (apparently version 1.3.5, since old versions do not handle -L../lib), using new configure option --with-libtool.
- + add configure option --with-manpage-tbl, which causes the manpages to be preprocessed by tbl(1) prior to installation,
- + add configure option --without-curses-h, which causes the installation process to install curses.h as ncurses.h and make appropriate changes to headers and manpages.

20001009

- + correct order of options/parameters in run\_tic.in invocation of tic, which did not work with standard getopt() (reported by Ethan Butterfield <primus@veris.org>).
- + correct logic for 'reverse' variable in lib\_vidattr.c, which was setting it true without checking if newmode had A\_REVERSE set, e.g., using \$TERM=ansi on OS/2 EMX (see 20000917).
- > patch by Todd C Miller:
- + add a few missing use\_terminfo\_vars() and fixes up \_nc\_tgetent().  
Previously, \_nc\_cgetset() would still get called on cp so the simplest thing is to set cp to NULL if !use\_terminfo\_vars().
- + added checks for an empty \$HOME environment variable.
- > patches for OS/2 EMX (Ilya Zakharevich):
- + modify convert\_configure.pl to support INSTALL. Change compiler options in that script to use multithreading, needed for the mouse.

- + modify OS/2 mouse support, retrying as a 2-button mouse if code fails to set up a 3-button mouse.
- + improve code for OS/2 mouse support, using `_nc_timed_wait()` to replace `select()` call.

20001007

- + change type of `ospeed` variable back to short to match its use in legacy applications (reported by Andrey A Chernov).
- + add case to configure script for `--enable-rpath` on IRIX (patch by Albert Chin-A-Young).
- + minor fix to `position_check()` function, to ensure it gets the whole cursor report before decoding.
- + add configure option `--disable-assumed-color`, to allow pre-5.1 convention of default colors used for color-pair 0 to be configured (see `assume_default_colors()`).
- + rename configure option `--enable-hashmap` `--disable-hashmap`, and reorder the configure options, splitting the experimental and development
- + add configure option `--disable-root-enviro`, which tells ncurses to disregard `$TERMINFO` and similar environment variables if the current user is root, or running `setuid/setgid` (based on discussion with several people).
- + modified `misc/run_tic.in` to use `tic -o`, to eliminate dependency on `$TERMINFO` variable for installs.
- + add table entry for `plab_norm` to `tput`, so it passes in strings for that capability.
- + modify `parse_format()` in `lib_tparm.c` to ignore precision if it is longer than 10000 (report by Jouko Pynnonen).
- + rewrote limit checks in `lib_mvcur.c` using new functions `_nc_safe_strcat()`, etc. Made other related changes to check lengths used for `strcat/strcpy` (report by Jouko Pynnonen <jouko@solutions.fi>).

20000930

- + modify several descriptions, including those for `setaf`, `setab`, in `include/Caps` to indicate that the entries are parameterized. This information is used to tell which strings are translated when converting to termcap. Fixes a problem where the generated termcap would contain a spurious `"%p1"` for the terminfo `"%p1%d"`.
- + modify `ld -rpath` options (e.g., Linux, and Solaris) to use an absolute pathname for the build tree's lib directory (prompted by discussion with Albert Chin-A-Young).
- + modify `"make install.man"` and `"make uninstall.man"` to include tack's man-page.
- + various fixes for install scripts used to support configure `--srcdir` and `--with-install-prefix` (reported by Matthew Clarke

<Matthew\_Clarke@mindlink.bc.ca>).

- + make configure script checks on variables \$GCC and \$GXX consistently compare against 'yes' rather than test if they are nonnull, since either may be set to the corresponding name of the C or C++ compiler

(report/patch by Albert Chin-A-Young).

20000923

- + modify rs2 capability in xterm-r6 and similar where cursor save/restore bracketed the sequence for resetting video attributes. The cursor restore would undo that (report by John Hawkinson <jhawk@MIT.EDU> (see NetBSD misc/11052)).
- + using parameter check added to tic, corrected 27 typos in terminfo.src -TD
- + modify tic to verify that its inputs are really files, in case someone tries to read a directory (or /dev/zero).
- + add a check for empty buffers returned by fgets() in comp\_scan.c next\_char() function, in case tic is run on a non-text file (fixes a core dump reported by Aaron Campbell <aaron@cs.dal.ca>).
- + add to railroad.c some code exercising tgoto(), providing an alternate form of display if the terminal supports cursor addressing.
- + split-out tgoto() again, this time into new file lib\_tgoto.c, and implement a conventional BSD-style tgoto() which is used if the capability string does not contain terminfo-style padding or parameters (requested by Andrey A Chernov).
- + add check to tic which reports capabilities that do not reference the expected number of parameters.
- + add error checking to infocmp's -v and -m options to ensure that the option value is indeed a number.
- + some cleanup of logic in \_nc\_signal\_handler() to verify if SIGWINCH handler is setup. Separated the old/new sigaction data for SIGTSTP from the other signals.

20000917

- + add S0, E0 extensions to screen's terminfo entry, which is another way to solve the misconfiguration issue -TD
- + completed special case for tgoto from 20000916

20000916

- + update xterm terminfo entries to match XFree86 xterm patch #146 -TD
- + add Matrix Orbital terminfo entries (from Eric Z Ayers <eric@ale.org>).
- + add special case to lib\_tparm.c to allow 'screen' program to use a termcap-style parameter "%" to tgoto() for switching character sets.
- + use LN\_S substitution in run\_tic.in, to work on OS/2 EMX which has no symbolic links.



- + updated notes in README.emx regarding autoconf patches.
- + replace a lookup table in lib\_vidattr.c used to decode no\_color\_video with a logic expression (suggested by Philippe Blain).
- + add a/A toggle to ncurses.c 'b' test, which clears/sets alternate character set attribute from the displayed text.
- + correct inequality in parameter analysis of rewritten lib\_tparm.c which had the effect of ignoring p9 in set\_attributes (sgr), breaking alternate character set (reported by Piotr Majka <charvel@link.pl>).
- + correct ifdef'ing for GCC\_PRINTF, GCC\_SCANF which would not compile with Sun WorkShop compilers since these tokens were empty (cf: 20000902, reported by Albert Chin-A-Young).

20000909

- + correct an uninitialized parameter to open\_tempfile() in tic.c which made "tic -I" give an ambiguous error message about tmpnam.
- + add special case in lib\_vidattr.c to reset underline and standout for devices that have no sgr0 defined  
(patch by Don Lewis <Don.Lewis@tsc.tdk.com>). Note that this will not work for bold mode, since there is no exit-bold-mode capability.
- + improved patch for Make\_Enum\_Type (patch by Juergen Pfeifer).
- + modify tparm to disallow arithmetic on strings, analyze the varargs list to read strings as strings and numbers as numbers.
- + modify tparm's internal function spop() to treat a null pointer as an empty string.
- + modify tput program so it can be renamed or invoked via a link as 'reset' or 'init', producing the same effect as 'tput reset' or 'tput init'.
- + add private entrypoint \_nc\_basename(), use to consolidate related code in progs, as well as accommodating OS/2 EMX pathnames.
- + remove NCURSES\_CONST line from edit\_cfg.sh to compensate for its removal (except via AC\_SUBST) from configure.in, making --enable-const work again (reported by Juergen Pfeifer).
- + regen'd configure to pick up "hpux\*" change from 20000902.

20000902

- + modify tset.c to check for transformed "reset" program name, if any.
- + add a check for null pointer in Make\_Enum\_Type() (reported by Steven W Orr <steveo@world.std.com>).
- + change functions \_nc\_parse\_entry() and postprocess\_termcap() to avoid using strtok(), because it is non-reentrant (reported by Andrey A Chernov <ache@nagual.pp.ru>).
- + remove "hpux10.\*" case from CF\_SHARED\_OPTS configure script macro. This differed from the "hpux\*" case by using reversed symbolic links, which made the 5.1 version not match the configuration of 5.0 shared libraries (reported by Albert Chin-A-Young).
- + correct a dependency in Ada95/src/Makefile.in which prevented

building with configure --srcdir (patch by H Nanosecond <aldomel@ix.netcom.com>).

- + modify ifdef's in curses.h.in to avoid warning if GCC\_PRINTF or GCC\_SCANF was not previously defined (reported by Pavel Roskin <proski@gnu.org>).
- + add MKncurses\_def.sh to generate fallback definitions for ncurses\_cfg.h, to quiet gcc -Wundef warnings, modified ifdef's in code to consistently use "#if" rather than "#ifdef".

20000826

- + add QNX qansi entries to terminfo -TD
- + add os2 entry to misc/emx.src (<jmcoop@webmail.bmi.net>).
- + add configure option --with-database to allow specifying a different terminfo source-file to install. On OS/2 EMX, this defaults to misc/emx.src
- + change misc/run\_tic.sh to derive it from misc/run\_tic.in, to simplify setting .exe extension on OS/2 EMX.
- + add .exe extension in Ada95/gen/Makefile.in, Ada95/samples/Makefile.in, for OS/2 EMX (reported by <jmcoop@webmail.bmi.net>).
- + add configure check for filesystems (such as OS/2 EMX) which do not distinguish between upper/lowercase filenames, use this to fix tags rules in makefiles.
- + initialize fds[] array to 0's in \_nc\_timed\_wait(); apparently poll() only sets the revents members of that array when there is activity corresponding to the related file (report by Glenn Cooper <gcooper@qantas.com.au>, using Purify on Solaris 5.6).
- + change configure script to use AC\_CANONICAL\_SYSTEM rather than AC\_CANONICAL\_HOST, which means that configure --target will set a default program-prefix.
- + add note on cross-compiling to INSTALL (which does not rely on the AC\_CANONICAL\_\* macros).

20000819

- + add cases for EMX OS/2 to config.guess, config.sub
- + new version of config.guess, config.sub from lynx 2.8.4dev.7
- + add definitions via transform.h to allow tic and tput to check for the transformed aliases rather than the original infotocap, etc.
- + simplify transform-expressions in progs/Makefile.in, make the uninstall rule work for transformed program names.
- + change symbol used by --install-prefix configure option from INSTALL\_PREFIX to DESTDIR (the latter has become common usage although the name is misleading).
- + modify programs to use curses\_version() string to report the version of ncurses with which they are compiled rather than the NCURSES\_VERSION string. The function

returns the patch level in  
addition to the major and minor version numbers.

20000812

- + modify CF\_MAN\_PAGES configure macro to make transformed program names a parameter to that macro rather than embedding them in the macro.
  - + newer config.guess, config.sub (reference version used in lynx 2.8.4dev.7).
  - + add configure option --with-default-terminfo-dir=DIR to allow specifying the default terminfo database directory (request by Albert Chin-A-Young).
  - + minor updates for terminfo.src from FreeBSD termcap change-history.
  - + correct notes in README and INSTALL regarding documentation files that were moved from misc directory to doc (report by Rich Kulawiec <rsk@gsp.org>).
  - + change most remaining unquoted parameters of 'test' in configure script to use quotes, for instance fixing a problem in the --disable-database option (reported by Christian Mondrup <scanm@biobase.dk>).
  - + minor adjustments to work around some of the incompatibilities/bugs in autoconf
- 2.29a alpha.
- + add -I/usr/local/include when --with-ncurses option is used in test/configure script.
  - + correct logic in adjust\_cancels(), which did not check both alternatives when reclassifying an extended name between boolean, number and string, causing an infinite loop in tic.

20000730

- + correct a missing backslash in curses.priv.h

20000729

- + change handling of non\_dest\_scroll\_region in tty\_update.c to clear text after it is shifted in rather than before shifting out. Also correct row computation (reported by Ruediger Kuhlmann <uck4@rz.uni-karlsruhe.de>).
- + add/use new trace function to display chtype values from winch() and getbkgd().
- + add trace mask TRACE\_ATTRS, alter several existing \_tracef calls that trace attribute changes under TRACE\_CALLS to use this.
- + modify MKlib\_gen.sh so that functions returning chtype will call returnChar().
- + add returnChar() trace, for functions returning chtype.
- + change indent.pro to line up parenthesis.

20000722

+

fix a heap problem with the c++ binding (report by  
<alexander\_liberson@ninemest.com>, patch by Juergen Pfeifer).  
+ minor adjustment to ClrToEOL() to handle an out-of-bounds parameter.  
+ modify the check for big-core to force a couple of memory accesses,  
which may work as needed for older/less-capable machines (if not,  
there's still the explicit configure option).  
> fixes based on diff's for Amiga and BeOS found at  
<http://www.mathematik.uni-karlsruhe.de/~kuhlmann/cross/ncurses/>  
+ alter definition of NCURSES\_CONST to make it non-empty.  
+ add amiga-vnc terminfo entry.  
+ redefine 'TEXT' in menu.h for AMIGA, since it is reported to have  
an (unspecified) symbol conflict.  
+ replaced case-statement in \_nc\_tracebits() for CSIZE with a table to  
simplify working around implementations that define random  
combinations of the related macros to zero.  
+ modify configure test for tcgetattr() to allow for old  
implementations, e.g., on BeOS, which only defined  
it as a macro.  
> patches by Bruno Haible:  
+ when checking LC\_ALL/LC\_CTYPE/LANG environment variables for UTF-8  
locale, ignore those which are set to an empty value, as per SUSV2.  
+ encode 0xFFFFD in UTF-8 with 3 bytes, not 2.  
+ modify \_nc\_utf8\_outh() to avoid sign-extension when checking for  
out-of-range value.

20000715

+ correct manlinks.sed script to avoid using ERE "\+", which is not  
understood by older versions of sed (patch by Albert Chin-A-Young).  
+ implement configure script options that transform installed program  
names, e.g., --program-prefix, including the manpage names and cross  
references (patch by Albert Chin-A-Young <china@thewrittenword.com>).  
+ correct several mismatches between manpage filename and ".TH"  
directives, renaming dft\_fgbg.3x to default\_colors.3x and  
menu\_attris.3x to menu\_attributes.3x (report by Todd C Miller).  
+ correct missing includes for <string.h> in several places, including  
the C++ binding. This is not noted by gcc  
unless we use the  
-fno-builtin option (reported by Igor Schein <igor@txc.com>).  
+ modified progs/tset.c and tack/sysdep.c to build with sgtyb  
interface if neither termio or termios is available. Tested this  
with FreeBSD 2.1.5 (which does have termios - but the sgtyb does  
work).

20000708 5.1 release for upload to ftp.gnu.org

+ document configure options in INSTALL.  
+ add man-page for ncurses trace functions.  
+ correct return value shown in curs\_touch.3x for is\_linetouched() and  
is\_wintouched(), in curs\_initscr.3x for isendwin(), and in

- curs\_termattr.3x for has\_ic() and has\_il().
- + add prototypes for touchline() and touchwin(), adding them to the list of generated functions.
- + modify fifo\_push() to put ERR into the fifo just like other values to return from wgetch(). It was returning without doing that, making end-of-file condition incorrectly return a 0 (reported by Todd C Miller).
- + uncomment CC\_SHARED\_OPTS for progs and tack (see 971115), since they are needed for SCO OpenServer.
- + move \_nc\_disable\_period from free\_ttype.c to comp\_scan.c to appease dynamic loaders on SCO and IRIX64.
- + add "-a" option to test/ncurses.c to invoke assume\_default\_colors() for testing.
- + correct assignment in assume\_default\_colors() which tells ncurses whether to use default colors, or the assumed ones (reported by Gary Funck <gary@Intrepid.Com>).
- + review/correct logic in mk-1st.awk for making symbolic links for shared libraries, in particular for FreeBSD, etc.
- + regenerate misc/\*.def files for OS/2 EMX dll's.
- + correct quoting of values for CC\_SHARED\_OPTS in aclocal.m4 for cases opensbd2\*, opensbd\*, freebsd\* and netbsd\* (patch by Peter Wemm) (err in 20000610).
- + minor updates to release notes, as well as adding/updating URLs for examples cited in announce.html
- > several fixes from Philippe Blain <philippe.blain2@freesbee.fr>:
- + correct placement of ifdef for NCURSES\_XNAMES in function \_nc\_free\_ttype(), fixes a memory leak.
- + add a call to \_nc\_synchook() to the end of function whline() like that in wvline() (difference was in 1.9.4).
- + make ClearScreen() a little faster by moving two instances of UpdateAttr() out of for-loops.
- + simplify ClrBottom() by eliminating the tstLine data, using for-loops (cf: 960428).

#### 20000701 pre-release

- + change minor version to 1, i.e., ncurses 5.1
- + add experimental configure option --enable-colorfgbg to check for \$COLORTERM variable as set by rxvt/aterm/Eterm.
- + add Eterm terminfo entry (Michael Jennings <mej@valinux.com>).
- + modify manlinks.sed to pick aliases from the SYNOPSIS section, and several manpages so manlinks.sed can find aliases for creating symbolic links.
- + add explanation to run\_tic.sh regarding extended terminal capabilities.
- + change message format for edit\_cfg.sh, since some people interpret it as a warning.

- + correct unescaped '\$' in sysv5uw7\*|unix\_sv\* rule for CF\_SHARED\_OPTS configure macro (report by Thanh Ma <Thanh.Ma@casi-rusco.com>).
- + correct logic in lib\_twait.c as used by lib\_mouse.c for GPM mouse support when poll() is used rather than select() (prompted by discussion with David Allen <DAllen24@aol.com>).

#### 20000624 pre-release

- + modify TransformLine() to check for cells with different color pairs that happen to render the same display colors.
- + apply \$NCURSES\_NO\_PADDING to cost-computation in mvcur().
- + improve cost computation in PutRange() by accounting for the use of parm\_right\_cursor in mvcur().
- + correct cost computation in EmitRange(), which was not using the normalized value for cursor\_address.
- + newer config.guess, config.sub (reference version used in TIN 1.5.6).

#### 20000617

- + update config.guess, config.sub (reference version used in PCRE 3.2).
- + resync changes to gnathtml against version 1.22, regenerated html files under doc/html/ada using this (1.22.1.1).
- + regenerated html files under doc/html/man after correcting top and bottom margin options for man2html in dist.mk
- + minor fixes to test programs ncurses 'i' and testcurs program to make the subwindow's background color cover the subwindow.
- + modify configure script so AC\_MSG\_ERROR is temporarily defined to a warning in AC\_PROG\_CXX to make it recover from a missing C++ compiler without requiring user to add --without-cxx option (adapted from comment by Akim Demaille <akim@epita.fr> to autoconf mailing list).
- + modify headers.sh to avoid creating temporary files in the build directory when installing headers (reported by Sergei Pokrovsky <pok@nbsp.nsk.su>)

#### 20000610

- + regenerated the html files under doc/html/ada/files and doc/html/ada/funcs with a slightly-improved gnathtml.
- + add kmous capability to linux terminfo entry to allow it to use xterm-style events provided by gpm patch by Joerg Schoen.
- + make the configure macro CF\_SHARED\_OPTS a little smarter by testing if -fPIC is supported by gcc rather than -fpic. The former option allows larger symbol tables.
- + update config.guess and config.sub (patches by Kevin Buettner <kev@primenet.com> (for elf64\_ia64), Bernd Kuemmerlen <bkuemmer@mevis.de> (for MacOS X)).
- + add warning for 'tic -cv' about use of '^?' in terminfo source, which is an extension.

20000527

- + modify echo() behavior of getch() to match Solaris curses for carriage return and backspace (reported by Neil Zanella).
- + change \_nc\_flush() to a function.
- + modify delscreen() to check if the output stream has been closed, and if so, free the buffer allocated for setbuf (this provides an ncurses-specific way to avoid a memory leak when repeatedly calling newterm reported by Chipp C <at\_1@zdnetwork.com>).
- + correct typo in curs\_getch.3x manpage regarding noecho (reported by David Malone <dwmalone@maths.tcd.ie>).
- + add a "make libs" rule.
- + make the Ada95 interface build with configure --enable-widex.
- + if the configure --enable-widex option is given, append 'w' to names of the generated libraries (e.g., libncursesw.so) to avoid conflict with existing ncurses libraries.

20000520

- + modify view.c to make a rudimentary viewer of UTF-8 text if ncurses is configured with the experimental wide-character support.
- + add a simple UTF-8 output driver to the experimental wide-character support. If any of the environment variables LC\_ALL, LC\_CTYPE or LANG contain the string "UTF-8", this driver will be used to translate the output to UTF-8. This works with XFree86 xterm.
- + modify configure script to allow building shared libraries on BeOS (from a patch by Valeriy E Ushakov).
- + modify lib\_addch.c to allow repeated update to the lower-right corner, rather than displaying only the first character written until the cursor is moved. Recent versions of SVr4 curses can update the lower-right corner, and behave this way (reported by Neil Zanella).
- + add a limit-check in \_nc\_do\_color(), to avoid using invalid color pair value (report by Brendan O'Dea <bod@compusol.com.au>).

20000513

- + the tack program knows how to use smcup and rmcup but the "show caps that can be tested" feature did not reflect this knowledge. Correct the display in the menu tack/test/edit/c (patch by Daniel Weaver).
- + xterm-16color does allow bold+colors, removed ncv#32 from that terminfo entry.

20000506

- + correct assignment to SP->\_has\_sgr\_39\_49 in lib\_dft\_fgbg.c, which broke check for screen's AX capability (reported by Valeriy E Ushakov <uwe@ptc.spbu.ru>).
- + change man2html rule in dist.mk to workaround bug in some man-programs that ignores locale when rendering hyphenation.

+ change web- and ftp-site to dickey.his.com

20000429

+ move `_nc_curr_token` from `parse_entry.c` to `comp_scan.c`, to work around problem linking tack on MacOS X DP3.

+ include `<sys/time.h>` in `lib_napms.c` to compile on MacOS X DP3 (reported by Gerben Wierda `<wierda@holmes.nl>`).

+ modify `lib_vidattr.c` to check for `ncv` fixes when `pair-0` is not default colors.

+ add `-d` option to `ncurses.c`, to turn on default-colors for testing.

+ add a check to `_nc_makenew()` to ensure that `newwin()` and `newpad()` calls do not silently fail by passing too-large limits.

+ add symbol `NCURSES_SIZE_T` to use rather than explicit 'short' for internal window and pad sizes. Note that since this is visible in the `WINDOW` struct, it would be an ABI change to make this an 'int' (prompted by a question by Bastian Trompetter `<btrompetter@firemail.de>`, who attempted to create a 96000-line pad).

20000422

+ add `mgterm` terminfo entry from NetBSD, minor adjustments to `sun-ss5`, `aixterm` entries -TD

+ modify `tack/ansi.c` to make it more tolerant of bad ANSI replies. An example of an illegal ANSI response can be found using Microsoft's Telnet client. A correct display can be found using a VT-4xx terminal or XFree86 xterm with:

```
XTerm*VT100*decTerminalID: 450
```

(patch by Daniel Weaver).

+ modify `gdc.c` to recognize

'q' for quit, 's' for single-step and ' ' for resume. Add `-n` option to force `gdc`'s standard input to

`/dev/null`, to both illustrate the use of `newterm()` for specifying alternate inputs as well as for testing signal handling.

+ minor fix for configure option `--with-manpage-symlinks`, for target directories that contain a period ('.') (reported by Larry Virden).

20000415

+ minor additions to `beterm` entry (feedback from Rico Tudor) -TD

+ corrections/updates for some IBM terminfo entries -TD

+ modify `_nc_screen_wrap()` so that when exiting curses mode with non-default colors, the last line on the screen will be cleared to the screen's default colors (request by Alexander V Lukyanov).

+ modify `ncurses.c` 'r' example to set `nonl()`, allowing control/M to be read for demonstrating the `REQ_NEW_LINE` operation (prompted by a question by Tony L Keith `<tlkeith@keithconsulting.com>`).

+ modify `ncurses.c` 'r' example of `field_info()` to work on Solaris 2.7, documented extension



of ncurses which allows a zero pointer.

- + modify `fmt_complex()` to avoid buffer overflow in case of excess recursion, and to recognize "%e%" as a synonym for else-if, which means that it will not recur for that special case.
- + add logic to support \$TERMCAP variable in case the USE\_GETCAP symbol is defined (patch by Todd C Miller).
- + modify one of the m4 files used to generate the Ada95 sources, to avoid using the token "symbols" (patch by Juergen Pfeifer).

20000408

- + add terminfo entries `bsdos-pc-m`, `bsdos-pc-mono` (Jeffrey C Honig)
- + correct spelling error in terminfo entry name: `bq300-rv` was given as `bg300-rv` in esr's version.
- + modify `redrawwin()` macro so its parameter is fully parenthesized (fixes Debian bug report #61088).
- + correct formatting error in `dump_entry()` which set incorrect column value when no newline trimming was needed at the end of an entry, before appending "use=" clauses (cf: 960406).

20000401

- + add configure option `--with-manpage-symlinks`
- +  
change `unctrl()` to render C1 characters (128-159) as `~@`, `~A`, etc.
- + change makefiles so `trace()` function is provided only if TRACE is defined, e.g., in the debug library. Modify related calls to `_tracechar()` to use `unctrl()` instead.

20000325

- + add screen's AX capability (for ECMA SGR 39 and 49) to applicable terminfo entries, use presence of this as a check for a small improvement in setting default colors.
- + improve logic in `_nc_do_color()` implementing `assume_default_colors()` by passing in previous color pair info to eliminate redundant call to `set_original_colors()`. (Part of this is from a patch by Alexander V Lukyanov).
- + modify warning in `_nc_trans_string()` about a possibly too-long string to do this once only rather than for each character past the threshold (600). Change interface of `_nc_trans_string()` to allow check for buffer overflow.
- + correct use of `memset` in `_nc_read_entry_source()` to initialize ENTRY struct each time before reading new data into it, rather than once per loop (cf: 990301). This affects multi-entry in-core operations such as "infocmp -Fa".

20000319

- + remove a spurious pointer increment in `_nc_infotocap()` changes from 20000311. Add check for '.' in format of number, since that also

is not permitted in termcap.

+ correct typo in rxvt-basic terminfo from temporary change made while integrating 20000318.

#### 20000318

+ revert part of the vt220 change (request by Todd C Miller).

+ add ansi-\* terminfo entries from ESR's version.

+ add -a option to tic and infocmp, which retains commented-out capabilities during source translation/comparison, e.g., captainfo and infotocap.

+ modify cardfile.c to display an empty card if no input data file is found, fixes a core dump in that case (reported by Bruno Haible).

+ correct bracketing in CF\_MATH\_LIB configure macro, which gave wrong result for OS/2 EMX.

+ supply required parameter for `_nc_resolve_uses()` call

in

`read_termcap.c`, overlooked in 20000311 (reported by Todd C Miller).

> patches by Bruno Haible <haible@ilog.fr>:

+ fix a compiler warning in `fty_enum.c`

+ correct `LIB_PREFIX` expression for `DEPS_CURSES` in progs, tack makefiles, which resulted in redundant linking (cf: 20000122).

#### 20000311

+ make `ifdef's` for `BROKEN_LINKER` consistent (patch by Todd C Miller).

+ improved tack/README (patch by Daniel Weaver).

+ modify `tput.c` to ensure that unspecified parameters are passed to `tparm()` as 0's.

+ add a few checks in `infocmp` to guard against buffer overflow when displaying string capabilities.

+ add check for zero-uses in `infocmp's` `file_comparison()` function before calling `_nc_align_termttype()`. Otherwise one parameter is indexed past the end of the uses-array.

+ add an option `-q` to `infocmp` to specify the less verbose output, keeping the existing format as the default, though not retaining the previous behavior that made the `-F` option compare each entry to

itself.

+ adapted patch by ESR to make `infocmp -F` less verbose `-TD` (the submitted patch was unusable because it did not compile properly)

+ modify `write_entry.c` to ensure that absent or cancelled booleans are written as `FALSE`, for consistency with `infocmp` which now assumes this. Note that for the small-core configuration, `tic` may not produce the same result as before.

+ change some private library interfaces used by `infocmp`, e.g., `_nc_resolve_uses()`.

+ add a check in `_nc_infotocap()` to ensure that cm-style capabilities accept only `%d` codes when converting the format from terminfo to

termcap.  
+ modify ENTRY struct to separate the data in 'parent' into the name and link values (the original idea to merge both into 'parent' was not good).  
+ discard repair\_acsc(tterm);  
> patch by Juergen Pfeifer:  
+ drop support for gnat 3.10  
+ move generated documentation and html files under ./doc directory, adding makefile rules for this  
to dist.mk

20000304

+ correct conflicting use of tparm() in 20000226 change to tic, which made it check only one entry at a time.  
+ fix errors in ncurses-intro.html and hackguide.html shown by Dave Raggett's tidy.  
+ make the example in ncurses-intro.html do something plausible, and corrected misleading comment (reported by Neil Zanella).  
+ modify pnoutrefresh() to set newsr->\_leaveok as wnoutrefresh() does, to fix a case where the cursor position was not updated as in Solaris (patch by David Mosberger <davidm@hpl.hp.com>).  
+ add a limit-check for wresize() to ensure that a subwindow does not address out of bounds.  
+ correct offsets used for subwindows in wresize() (patch by Michael Andres <ma@suse.de>).  
+ regenerate html'ized manual pages with man2html 3.0.1 (patch by Juergen Pfeifer). This generated a file with a space in its name, which I removed.  
+ fix a few spelling errors in tack.  
+ modify tack/Makefile.in to match linker options of progs/Makefile.in;

otherwise it does not build properly for older HPUX shared library configurations.

+ add several terminfo entries from esr's "11.0".

20000226

+ make 'tput flash' work properly for xterm by flushing output in delay\_output() when using napms(), and modifying xterm's terminfo to specify no padding character. Otherwise, xterm's reported baud rate can mislead ncurses into producing too few padding characters (Debian #58530).  
+ add a check to tic for consistency between sgr and the separate capabilities such as smso, use this to check/correct several terminfo entries (Debian #58530).  
+ add a check to tic if cvvis is the same as cnorm, adjusted several terminfo entries to remove the conflict (Debian #58530).  
+ correct prototype shown in attr\_set()/wattr\_set() manpages (fixes Debian #53962).

- + minor clarification for `curs_set()` and `leaveok()` manpages.
- + use `mkstemp()` for creating temporary file for tic's processing of \$TERMCAP contents (fixes Debian #56465).
- + correct two errors from integrating Alexander's changes: did not handle the non-bce case properly in `can_erase_with()` (noted by Alexander), and left `fg/bg` uninitialized in the pair-zero case of `_nc_do_color()` (reported by Dr Werner Fink <werner@suse.de> and Ismael Cordeiro <ismael@cordeiro.com>).

20000219

- + store default-color code consistently as `C_MASK`, even if given as -1 for convenience (adapted from patches by Alexander V Lukyanov).
- > patches by Alexander V Lukyanov:
- + change `can_clear_with()` macro to accommodate logic for `assume_default_colors()`, making most of the `FILL_BCE` logic unnecessary. Made `can_clear_with()` an inline function to make it simpler to read.

20000212

- + corrected form of recent copyright dates.
- + minor corrections to `xterm-xf86-v333` terminfo entry -TD
- > patches by Alexander V Lukyanov:
- + reworded `dft_fgbg.3x` to avoid assuming that the terminal's default colors are white on black.
- + fix initialization of `tstLine` so that it is filled with current blank character in any case. Previously it was possible to have it filled with old blank. The wrong over-optimization was introduced in 991002 patch. (it is not very critical as the only bad effect is not using `clr_eos` for clearing if blank has changed).

20000205

- + minor corrections/updates to several terminfo entries: `rxvt-basic`, `vt520`, `vt525`, `ibm5151`, `xterm-xf86-v40` -TD
- + modify `ifdef's` for `poll()` to allow it to use `<sys/poll.h>`, thereby allowing `poll()` to be used on Linux.
- + add `CF_FUNC_POLL` macro to check if `poll()` is able to select from standard input. If not we will not use it, preferring `select()` (adapted from patch by Michael Pakovic <mpakovic@fdn.com>).
- + update `CF_SHARED_OPTS` macro for SCO Unixware 7.1 to allow building shared libraries (reported/tested by Thanh <thanhma@mediaone.net>).
- + override `$LANGUAGE` in `build` to avoid incorrect ordering of keynames.
- + correct `CF_MATH_LIB` parameter, must be `sin(x)`, not `sqrt(x)`.

20000122

- + resync `CF_CHECK_ERRNO` and `CF_LIB_PREFIX` macros from `tin` and `xterm` -TD

- + modify CF\_MATH\_LIB configure macro to parameterize the test function used, for reuse in dialog and similar packages.
- + correct tests for file-descriptors in OS/2 EMX mouse support. A negative value could be used by FD\_SET, causing the select() call to wait indefinitely.

20000115

- + additional fixes for non-bce terminals (handling of delete\_character) to work when assume\_default\_colors() is not specified.
- + modify warning message from \_nc\_parse\_entry() regarding extended capability names to print only if tic/infocmp/toe have the -v flag set, and not at all in ordinary user applications. Otherwise, this warning would be shown for screen's extended capabilities in programs that use the termcap interface (reported by Todd C Miller).
- + modify use of \_nc\_tracing from programs such as tic so their debug level is not in the same range as values set by trace() function.
- + small panel header cleanup (patch by Juergen Pfeifer).
- + add 'railroad' demo for termcap interface.
- + modify 'tic' to write its usage message to stderr (patch by Todd C Miller).

20000108

- + add prototype for erase() to curses.h.in, needed to make test programs build with c++/g++.
- + add .c.i and .c.h suffix rules to generated makefiles, for debugging.
- + correct install rule for tack.1; it assumed that file was in the current directory (reported by Mike Castle <dalgoda@ix.netcom.com>).
- + modify terminfo/termcap translation to suppress acsc before trying sgr if the entry would be too large (patch by Todd C Miller).
- + document a special case of incompatibility between ncurses 4.2 and 5.0, add a section for this in INSTALL.
- + add TRACE\_DATABASE flag for trace().

20000101

- + update mach, add mach-color terminfo entries based on Debian diffs for ncurses 5.0 -TD
- + add entries for xterm-hp, xterm-vt220, xterm-vt52 and xterm-noapp terminfo entries
- TD
- + change OTrs capabilities to rs2 in terminfo.src -TD
- + add obsolete and extended capabilities to 'screen' terminfo -TD
- + corrected conversion from terminfo rs2 to termcap rs (cf: 980704)
- + make conversion to termcap ug (underline glitch) more consistently applied.
- + fix out-of-scope use of 'personal[]' buffer in 'toe' (this error was in the original pre-1.9.7 version, when \$HOME/.terminfo was introduced).

- + modify 'toe' to ignore terminfo directories to which it has no permissions.
- + modify read\_termtype(), fixing 'toe', which could dump core when it found an incomplete entry such as "dumb" because it did not initialize its buffer for \_nc\_read\_file\_entry().
- + use -fPIC rather than -fpic for shared libraries on Linux, not needed for i386 but some ports (from Debian diffs for 5.0) -TD
- + use explicit VALID\_NUMERIC() checks in a few places that had been overlooked, and add a check to ensure that init\_tabs is nonzero, to avoid divide-by-zero (reported by Todd C Miller).
- + minor fix for CF\_ANSI\_CC\_CHECK configure macro, for HPUX 10.x (from tin) -TD

19991218

- + reorder tests during mouse initialization to allow for gpm to run in xterm, or for xterm to be used under OS/2 EMX. Also drop test for \$DISPLAY in favor of kmous=\E[M or \$TERM containing "xterm" (report by Christian Weisgerber <naddy@mips.rhein-neckar.de>).
- + modify raw() and noraw() to clear/restore IEXTEN flag which affects stty lnext on systems such as FreeBSD (report by Bruce Evans <bde@zeta.org.au>, via Jason Evans <jasone@canonware.com>).
- + fix a potential (but unlikely) buffer overflow in failed() function of tset.c (reported by Todd C Miller).
- + add manual-page for ncurses extensions, documented curses\_version(), use\_extended\_names().

19991211

- + treat as untranslatable to termcap those terminfo strings which contain non-decimal formatting, e.g., hexadecimal or octal.
- + correct commented-out capabilities that cannot be translated to termcap, which did not check if a colon must be escaped.
- + correct termcap translation for "%>" and "%+", which did not check if a colon must be escaped, for instance.
- + use save\_string/save\_char for \_nc\_captainfo() to eliminate fixed buffer (originally for \_nc\_infotocap() in 960301 -TD).
- + correct expression used for terminfo equivalent of termcap %B, adjust regent100 entry which uses this.
- + some cleanup and commenting of ad hoc cases in \_nc\_infotocap().
- + eliminate a fixed-buffer in tic, used for translating comments.
- + add manpage for infotocap

19991204

- + add kvt and gnome terminfo entries -TD
- + correct translation of "%%" by infotocap, which was emitted as "%".
- + add "obsolete" termcap strings to terminfo.src
- + modify infocmp to default to showing obsolete capabilities rather

- than terminfo only.
- + modify write\_entry.c so that if extended names (i.e., configure --enable-tcap-names) are active, then tic will also write "obsolete" capabilities that are present in the terminfo source.
- + modify tic so that when running as captinfo or infotocap, it initializes the output format as in -C and -I options, respectively.
- + improve infocmp and tic -f option by splitting long strings that do not have if-then-else construct, but do have parameters, e.g., the initc for xterm-88color.
- + refine MKtermsort.sh slightly by using bool for the \*\_from\_termcap arrays.

19991127

- + additional fixes for non-bce terminals (handling of clear\_screen, clr\_eol, clr\_eos, scrolling) to work when assume\_default\_colors() is not specified.
- + several small changes to xterm terminfo entries -TD.
- + move logic for \_nc\_windows in lib\_freeall.c inside check for nonnull SP, since it is part of that struct.
- + remove obsolete shlib-versions, which was unintentionally re-added in 970927.
- + modify infocmp -e, -E options to ensure that generated fallback.c type for Booleans agrees with term.h (reported by Eric Norum <eric@cls.usask.ca>).
- + correct configure script's use of \$LIB\_PREFIX, which did not work for installing the c++ directory if \$libdir did not end with "/lib" (reported by Huy Le <huyle@ugcs.caltech.edu>).
- + modify infocmp so -L and -f options work together.
- + modify the initialization of SP->\_color\_table[] in start\_color() so that color\_content() will return usable values for COLORS greater than 8.
- + modify ncurses 'd' test in case COLORS is greater than 16, e.g., for xterm-88color, to limit the displayed/computed colors to 16.
- > patch by Juergen Pfeifer:
- + simplify coding of the panel library according to suggestions by Philippe Blain.
- + improve macro coding for a few macros in curses.priv.h

19991113

- + modify treatment of color pair 0 so that if ncurses is configured to support default colors, and they are not active, then ncurses will set that explicitly, not relying on orig\_colors or orig\_pair.
- + add new extension, assume\_default\_colors() to provide better control

over the use of default colors.

- + modify test programs to use more-specific ifdef's for existence of

- wresize(), resizeterm() and use\_default\_colors().
- + modify configure script to add specific ifdef's for some functions that are included when --enable-ext-funcs is in effect, so their existence can be ifdef'd in the test programs.
- + reorder some configure options, moving those extensions that have evolved from experimental status into a new section.
- + change configure --enable-tcap-names to enable this by default.

19991106

- + install tack's manpage (reported by Robert Weiner <robert@progplus.com>)
- + correct worm.c's handling of KEY\_RESIZE (patch by Frank Heckenbach).
- + modify curses.h.in, undef'ing some symbols to avoid conflict with C++ STL (reported by Matt Gerassimoff <mgeras@ticon.net>)

19991030

- + modify linux terminfo entry to indicate that dim does not mix with color (reported by Klaus Weide <kweide@enteract.com>).
- + correct several typos in terminfo entries related to missing '[' in CSI's -TD
- + fix several compiler warnings in c++ binding (reported by Tim Mooney for alphaev56-dec-osf4.0f)
- + rename parameter of \_nc\_free\_entries() to accommodate lint.
- + correct lint rule for tack, used incorrect list of source files.
- + add case to config.guess, config.sub for Rhapsody.
- + improve configure tests for libg++ and libstdc++ by omitting the math library (which is missing on Rhapsody), and improved test for the math library itself (adapted from path by Nelson H. F. Beebe).
- + explicitly initialize to zero several data items which were implicitly initialized, e.g., cur\_term. If not explicitly initialized, their storage type is C (common), and causes problems linking on Rhapsody 5.5 using gcc 2.7.2.1 (reported by Nelson H. F. Beebe).
- + modify Ada95 binding to not include the linker option for Ada bindings in the Ada headers, but in the Makefiles instead (patch by Juergen Pfeifer).

19991023 5.0 release for

- upload to ftp.gnu.org
- + effective with release of 5.0, change NCURSES\_VERSION\_PATCH to 4-digit year.
- + add function curses\_version(), to return ncurses library version (request by Bob van der Poel).
- + remove rmam, smam from cygwin terminfo entry.
- + modify FreeBSD cons25 terminfo entry to add cnorm and cvvis, as well as update ncv to indicate that 'dim' conflicts with colors.
- + modify configure script to use symbolic links for FreeBSD shared



- libraries by default.
- + correct `ranf()` function in `rain` and `worm` programs to ensure it does not return 1.0
- + hide the cursor in `hanoi.c` if it is running automatically.
- + amend `lrtest.c` to account for optimizations that exploit margin wrapping.
- + add a simple terminfo demo, `dots.c`
- + modify `SIGINT/SIGQUIT` handler to set a flag used in `_nc_outch()` to tell it to use `write()` rather than `putc()`, since the latter is not safe in a signal handler according to POSIX.
- + add/use internal macros `_nc_flush()` and `NC_OUTPUT` to hide details of output-file pointer in `ncurses` library.
- + uncomment `CC_SHARED_OPTS` (see 971115), since they are needed for SCO OpenServer.
- + correct `CC_SHARED_OPTS` for building shared libraries for SCO OpenServer.
- + remove `usleep()` from alternatives in `napms()`, since it may interact with `alarm()`, causing a process to be interrupted by `SIGALRM` (with advice from Bela Lubkin).
- + modify `terminal_interface-curses-forms.ads.m4` to build/work with GNAT 3.10 (patch by Juergen Pfeifer).
- + remove part of `CF_GPP_LIBRARY` configure-script macro, which did not work with `gcc 2.7.2.3`
- + minor fix to `test/tclock.c` to avoid beeping more than once per second
- + add `'s'` and `' '` decoding to `test/rain.c`

#### 991016 pre-release

- + corrected BeOS code for `lib_twait.c`, making `nodelay()` function work.

#### 991009 pre-release

- + correct `ncurses'` value for `cursor-column` in `PutCharLR()`, which was off-by-one in one case (patch by Ilya Zakharevich).
- + fix some minor errors in `position_check()` debugging code, found while using this to validate the `PutCharLR()` patch.
- + modify `firework`, `lrtest`, `worm` examples to be resizable, and to recognize `'q'` for quit, `'s'` for single-step and `' '` for resume.
- + restore reverted change to `terminal_interface-curses-forms.ads.m4`, add a note on building with `gnat 3.10p` to `Ada95/TODO`.
- + add a copy of the standalone configure script for the test-directory to simplify testing on SCO and Solaris.

#### 991002 pre-release

- + minor fixes for `_nc_msec_cost()`, `color_content()`, `pair_content()`, `_nc_freewin()`, `ClrBottom()` and `onscreen_mvcur()` (analysis by Philippe Blain, comments by Alexander V Lukyanov).
- + simplify definition of `PANEL` and eliminate internal functions

`_nc_calculate_obscure()`, `_nc_free_obscure()` and `_nc_override()`,  
(patch by Juergen Pfeifer, analysis by Philippe Blain  
<bledp@voila.fr>)).

- + change renaming of `dft_fgbg.3x` to `use_default_colors.3ncurses` in `man_db.renames`, since Debian is not concerned with 14-character filename limitation (Debian bug report by Josip Rodin <joy@cibalia.gkvk.hr>).
- + corrected `scoansi` terminfo entry by testing with `scoterm` and `console`.
- + revert change from 990614 to `terminal_interface-curses-forms.ads.m4`, since this does not work for `gnat 3.10p`
- + modify `telock` example to be resizable (if `ncurses`' `sigwinch` handler is used), and in color.
- + use `$(CC)` rather than `'gcc'` in `MK_SHARED_LIB` symbols, used for Linux shared library rules.

#### 990925 pre-release

- + add newer NetBSD console terminfo entries
- + add `amiga-8bit` terminfo entry (from Henning 'Faroul' Peters <Faroul@beyond.kn-bremen.de>)
- + remove `-lcurses -ltermcap` from `configure` script's check for the `gpm` library, since they are not really necessary (a properly configured `gpm` library has no dependency on any `curses` library), and if the `curses` library is not installed, this would cause the test to fail.
- + modify `tic`'s `-C` option so that terminfo "use=" clauses are translated to "tc=" clauses even when running it as `captainfo`.
- + modify `CF_STDCPP_LIBRARY` `configure` macro to perform its check only for GNU C++, since that library conflicts with SGI's `libC` on IRIX-6.2
- + modify `CF_SHARED_OPTS` `configure` macro to support build on NetBSD with ELF libraries (patch by Bernd Ernesti <bernd@arresum.inka.de>).
- + correct a problem in `libpanel`, where the `_nc_top_panel` variable was not set properly when `bottom_panel()` is called to hide a panel which is the only one on the stack (report/analysis by Michael Andres <ma@suse.de>, patch by Juergen Pfeifer).

#### 990918 pre-release

- + add `asc` string to HP 70092 terminfo entry (patch by Joerg Wunsch <j@interface-business.de>).
- + add top-level `uninstall.data` and `uninstall.man` makefile rules.
- + correct logic of `CF_LINK_FUNCS` `configure` script, from BeOS changes so that hard-links work on Unix again.
- + change default value of `cf_cv_builtin_bool` to 1 (suggested by Jeremy Buhler), making it less likely that a conflicting declaration of `bool` will be seen when compiling with C++.

#### 990911 pre-release

- + improved configure checks for builtin.h
- + minor changes to C++ binding (remove static initializations, and make configure-test for parameter initializations) for features not allowed by vendor's C++ compilers (reported by Martin Mokrajs, this applies to SGI, though I found SCO has the same characteristics).
- + corrected quoting of ETIP\_xxx definitions which support old versions of g++, e.g., those using -lg++
- + remove 'L' code from safe\_sprintf.c, since 'long double' is not widely portable. safe\_sprintf.c is experimental, however, and exists mainly as a fallback for systems without snprintf (reported by Martin Mokrajs <mmokrajs@natur.cuni.cz>, for IRIX 6.2)
- + modify definition of \_nc\_tinfo\_fkeys in broken-linker configuration so that it is not unnecessarily made extern (Jeffrey C Honig).

#### 990904 pre-release

- + move definition for builtin.h in configure tests to specific check for libg++, since qt uses the same filename incompatibly.
- + correct logic of lib\_termcap.c tgetstr function, which did not copy the result to the buffer parameter. Testing shows Solaris does update this, though of course tgetent's buffer is untouched (reported in Peter Edwards <peter.edwards@ireland.com> in mpc.lists.freebsd.current newsgroup).
- + corrected beterm terminfo entry, which lists some capabilities which are not actually provided by the BeOS Terminal.
- + add special logic to replace select() calls on BeOS, whose select() function works only for sockets.
- + correct missing escape in mkterm.h.awk.in, which caused part of the copyright noticed to be omitted (reported by Peter Wemm <peter@netplex.com.au>).
- > several small changes to make the c++ binding and demo work on OS/2 EMX (related to a clean reinstall of EMX):
- + correct library-prefix for c++ binding; none is needed.
- + add \$x suffix to make\_hash and make\_keys so 'make distclean' works.
- + correct missing \$x suffix for tack, c++ demo executables.
- + split CF\_CXX\_LIBRARY into CF\_GPP\_LIBRARY (for -lg++) and CF\_STDCPP\_LIBRARY (for -lstdc++)

#### 990828 pre-release

- + add cygwin terminfo entry -TD
- + modify CF\_PROG\_EXT configure macro to set .exe extension for cygwin.
- + add configure option --without-cxx-binding, modifying the existing --without-cxx option to check only for the C++ compiler characteristics. Whether or not the C++ binding is needed, the configure script checks for the size/type of bool, to make ncurses match. Otherwise C++ applications cannot use ncurses.

990821 pre-release

- + updated configure macros CF\_MAKEFLAGS, CF\_CHECK\_ERRNO
- + minor corrections to beterm terminfo entry.
- + modify lib\_setup.c to reject values of \$TERM which have a '/' in them.
- + add ifdef's to guard against CS5, CS6, CS7, CS8 being zero, as more than one is on BeOS. That would break a switch statement.
- + add configure macro CF\_LINK\_FUNCS to detect and work around BeOS's nonfunctional link().
- + improved configure macros CF\_BOOL\_DECL and CF\_BOOL\_SIZE to detect BeOS's bool, which is declared as an unsigned char.

990814 pre-release

- + add ms-vt100 terminfo entry -TD
- + minor fixes for misc/emx.src, based on testing with tack.
- + minor fix for test/ncurses.c, test 'a', in case ncvt is not set.

990731 pre-release

- + minor correction for 'screen' terminfo entry.
- + clarify description of errret values for setupterm in manpage.
- + modify tput to allow it to emit capabilities for hardcopy terminals (patch by Goran Uddeborg <goeran@uddeborg.pp.se>).
- + modify the 'o' (panel) test in ncurses.c to show the panels in color or at least in bold, to test Juergen's change to wrefresh().
- > patches by Juergen Pfeifer:
  - + Fixes a problem using wbgdset() with panels. It has actually nothing to do with panels but is a problem in the implementation of wrefresh(). Whenever a window changes its background attribute to something different than newscr's background attribute, the whole window is touched to force a copy to newscr. This is an unwanted side-effect of wrefresh() and it is actually not necessary. A changed background attribute affects only further outputs of background it doesn't mean anything to the current content of the window. So there is no need to force a copy. (reported by Frank Heckenbach <frank@g-n-u.de>).
  - + an upward compatible enhancement of the NCursesPad class in the C++ binding. It allows one to add a "viewport" window to a pad and then to use panning to view the pad through the viewport window.

990724 pre-release

- + suppress a call to def\_prog\_mode() in the SIGTSTP handler if the signal was received while not in curses mode, e.g., endwin() was called in preparation for spawning a shell command (reported by Frank Heckenbach <frank@g-n-u.de>)
- + corrected/enhanced xterm-r5, xterm+sl, xterm+sl-twm terminfo entries.
- + change test for xterm mouse capability: it

now checks only if the

user's \$DISPLAY variable is set in conjunction with the kmous capability being present in the terminfo. Before, it checked if any of "xterm", "rxvt" or "kterm" were substrings of the terminal name. However, some emulators which are incompatible with xterm in other ways do support the xterm mouse capability.

+ reviewed and made minor changes in ncurses to quiet g++ warnings about shadowed or uninitialized variables. g++ incorrectly warns about uninitialized variables because it does not take into account short-circuit expression evaluation.

+ change ncurses 'b' test to start in color pair 0 and to show in the right margin those attributes which are suppressed by no\_color\_video, i.e., "(NCV)".

+ modify ifdef's in curses.h so that \_\_attribute\_\_ is not redefined when compiling with g++, but instead disabled the macros derived for \_\_attribute\_\_ since g++ does not consistently recognize the same keywords as gcc (reported by Stephan

K Zitz <zitz@erf.net>).

+ update dependencies for term.h in ncurses/modules (reported by Ilya Zakharevich).

990710 pre-release

+ modify the form demo in ncurses.c to illustrate how to manipulate the field appearance, e.g. for highlighting or translating the field contents.

+ correct logic in write\_entry from split-out of home\_terminfo in 980919, which prevented update of \$HOME/.terminfo (reported by Philip Spencer <pspencer@fields.utoronto.ca>).

990703 pre-release

+ modify linux terminfo description to make use of kernel 2.2.x mods that support cursor style, e.g., to implement cvvis (patch by Frank Heckenbach <frank@g-n-u.de>)

+ add special-case in setupterm to retain previously-saved terminal settings in cur\_term, which happens when curses and termcap calls are mixed (from report by Bjorn Helgaas <helgaas@dhc.net>).

+ suppress initialization of key-tries in \_nc\_keypad() if we are only disabling keypad mode, e.g., in endwin() called when keypad()

was

not.

+ modify the Ada95 makefile to ensure that always the Ada files from the development tree are used for building and not the eventually installed ones (patch by Juergen Pfeifer).

990626 pre-release

+ use TTY definition in tack/sysdep.c rather than struct termios (reported by Philippe De Muyter).

+ add a fallback for strstr, used in lib\_mvcur.c and tack/edit.c,

not present on sysV68 (reported by Philippe De Muyter).  
+ correct definition in comp\_hash.c to build with configure  
--with-rcs-ids option.

990619 pre-release

+ modified ifdef's for sigaction and sigvec to ensure we do not try to handle SIGTSTP if neither is available (from report by Philippe De Muyter).  
> patch by Philippe De Muyter:  
+ in tic.c, use `unlink' if `remove' is not available.  
+ use only `unsigned' as fallback value for `speed\_t'. Some files used `short' instead.

990616 pre-release

+ fix some compiler warnings in tack.  
+ add a check for predefined bool type in CC, based on report that BeOS predefines a bool type.  
+ correct logic for infocmp -e option, i.e., the configure --with-fallbacks option, which I'd not updated when implementing extended names (cf: 990301). The new implementation adds a "-E" option to infocmp -TD  
> patch by Juergen Pfeifer:  
+ introduce the private type Curses\_Bool in the Ada95 binding implementation. This is to clearly represent the use of "bool" also in the binding. It should have no effect on the generated code.  
+ improve the man page for field\_buffer() to tell the people, that the whole buffer including leading/trailing spaces is returned. This is a common source of confusion, so it's better to document it clearly.

990614 pre-release

> patch by Juergen Pfeifer:  
+ use pragma PreElaborate in several places.  
+ change a few System.Address uses to more specific types.  
+ change interface version-number to 1.0  
+ regenerate Ada95 HTML files.

990612 pre-release

+ modify lib\_endwin.c to avoid calling reset\_shell\_mode(), return ERR if it appears that curses was never initialized, e.g., by initscr(). For instance, this guards against setting the terminal modes to strange values if endwin() is called after setupterm(). In the same context, Solaris curses will dump core.  
+ modify logic that avoids a conflict in lib\_vidattr.c between sgr0 and equivalent values in rmso or rmlu by ensuring we do not modify the data which would be returned by the terminfo or termcap interfaces (reported by Brad Peppers <brad@linuxcanada.com>, cf: 960706).

- + add a null-pointer check for SP in lib\_vidattr.c to logic that checks for magic cookies.
- + improve fallback declaration of 'bool' when the --without-cxx option is given, by using a 'char' on i386 and related hosts (prompted by discussion with Alexander V Lukyanov).

#### 990605 pre-release

- + include time.h in lib\_napms.c if nanosleep is used (patch by R Lindsay Todd <toddr@rpi.edu>).
- + add an "#undef bool" to curses.h, in case someone tries to define it, e.g., perl.
- + add check to tparm to guard against divide by zero (reported by Aaron Campbell <aaron@ug.cs.dal.ca>).

#### 990516 pre-release

- + minor fix to build tack on CLIX (mismatched const).
- > patch by Juergen Pfeifer:
- + change Juergen's old email address with new one in the files where it is referenced. The Ada95 HTML pages are regenerated.
- + update MANIFEST to list the tack files.

#### 990509 pre-release

- + minor fixes to make 'tack' build/link on NeXT (reported by Francisco A. Tomei Torres).

#### 990417 pre-release

- + add 'tack' program (which is GPL'd), updating it to work with the modified TERMTYPE struct and making a fix to support setaf/setab capabilities. Note that the tack program is not part of the ncurses libraries, but an application which can be distributed with ncurses. The configure script will ignore the directory if it is omitted, however.
- + modify gpm mouse support so that buttons 2 and 3 are used for select/paste only when shift key is pressed, making them available for use by an application (patch by Klaus Weide).
- + add complete list of function keys to scoansi terminfo entry - TD

#### 990410 pre-release

- + add a simple test program cardfile.c to illustrate how to read form fields, and showing forms within panels.
- + change shared-library versioning for the Hurd to be like Linux rather than \*BSD (patch by Mark Kettenis <kettenis@wins.uva.nl>).
- + add linux-lat terminfo entry.
- + back-out \_nc\_access check in read\_termcap.c (both incorrect and unnecessary, except to guard against a small window where the file's ownership may change).

990403 pre-release

- + remove conflicting `_nc_free_termtype()` function from test module `lib_freeall.c`
- + use `_nc_access` check in `read_termcap.c` for `termpaths[]` array (noted by Jeremy Buhler, indicating that Alan Cox made a similar patch).
- > patch by Juergen Pfeifer:
- + modify menu creation to not inherit status flag from the default menu
  - which says that the associated marker string has been allocated and should be freed (bug reported by Marek Paliwoda" <paliwoda@kki.net.pl>)

990327 pre-release ([alpha.gnu.org/gnu/ncurses-5.0-beta1.tar.gz](http://alpha.gnu.org/gnu/ncurses-5.0-beta1.tar.gz))

- + minor fixes to `xterm-xfree86` terminfo entry - TD.
- + split up an expression in configure script check for `ldconfig` to workaround limitation of BSD/OS sh (reported by Jeff Haas <jmh@mail.msen.com>).
- + correct a typo in `man/form_hook.3x` (Todd C Miller).

990318 pre-release

- + parenthesize and undef 'index' symbol in c++ binding and demo, to accommodate its definition on NeXT (reported by Francisco A. Tomei Torres).
- + add `sigismember()` to `base/sigaction.c` compatibility to link on NeXT (reported by Francisco A. Tomei Torres).
- + further refinements to inequality in `hashmap.c` to cover a case with `^U` in `nvi` (patch by Alexander V Lukyanov).

990316 pre-release

- + add fallback definition for `getcwd`, to link on NeXT.
- + add a copy of `cur_term` to `tic.c` to make it link properly on NeXT (reported by Francisco A. Tomei Torres).
- + change inequality in `hashmap.c` which checks the distance traveled by a chunk so that `^D` command in `nvi` (scrolls 1/2 screen) will use scrolling logic (patch by Alexander V Lukyanov, reported by Jeffrey C Honig).

990314 pre-release

- + modify `lib_color.c` to handle a special case where the `curscr` attributes have been made obsolete (patch by Alexander V Lukyanov).
- + update BSD/OS console terminfo entries to use `klone+sgr` and `klone+color` (patch by Jeffrey C Honig).
- + update `glibc` addon configure script for extended capabilities.
- + correct a couple of warnings in the `--enable-const` configuration.
- + make `comp_hash` build properly with `_nc_strdup()`, on NeXT (reported by Francisco A. Tomei Torres <francisco.tomei@cwix.com>).



#### 990313 pre-release

- + correct typos in linux-c initc string - TD
- + add 'crt' terminfo entry, update xterm-xfree86 entry - TD
- + remove a spurious argument to tparm()  
in lib\_skrefr.c (patch by  
Alexander V Lukyanov).

#### 990307 pre-release

- + back-out change to wgetch because it causes a problem with ^Z handling in lynx (reported by Kim DeVaughn).

#### 990306 pre-release

- + add -G option to tic and infocmp, to reverse the -g option.
- + recode functions in name\_match.c to avoid use of strncpy, which caused a 4-fold slowdown in tic (cf: 980530).
- + correct a few warnings about sign-extension in recent changes.
- > patch by Juergen Pfeifer:
  - + fixes suggested by Jeff Bradbury <jibradbury@lucent.com>:
    - + improved parameter checking in new\_fieldtype().
    - + fixed a typo in wgetch() timeout handling.
    - + allow slk\_init() to be called per newterm call. The internal SLK state is stored in the SCREEN struct after every newterm() and then reset for the next newterm.
    - + fix the problem that a slk\_refresh() refreshes stdscr if the terminal has true SLKs.
  - + update HTML documentation for Ada binding.

#### 990301 pre-release

- + remove 'bool' casts  
from definitions of TRUE/FALSE so that statements  
such as "#if TRUE" work. This was originally done to allow for a C++ compiler which would warn of implicit conversions between enum and int, but is not needed for g++ (reported by Kim DeVaughn).
- + add use\_extended\_names() function to allow applications to suppress read of the extended capabilities.
- + add configure option --enable-tcap-names to support logic which allows ncurses' tic to define new (i.e., extended) terminal capabilities. This is activated by the tic -x switch. The infocmp program automatically shows or compares extended capabilities.  
Note: This changes the Strings and similar arrays in the TERMTYPE struct so that applications which manipulate it must be recompiled.
- + use macros typeMalloc, typeCalloc and typeRealloc consistently throughout ncurses library.
- + add \_nc\_strdup() to doalloc.c.
- + modify define\_key() to allow multiple strings to be bound to the same keycode.
- + correct

logic error in `_nc_remove_string`, from 990220.

- > patch for Ada95 binding (Juergen Pfeifer):
- + regenerate some of the html documentation
- + minor cleanup in `terminal_interface-curses.adb`

990220 pre-release

- + resolve ambiguity of `kend/kl/kslt` and `khome/kfnd/kich1` strings in `xterm` and `ncsa terminfo` entries by removing the unneeded ones. Note that some entries will return `kend` & `khome` versus `kslt` and `kfnd`, for PC-style keyboards versus strict vt220 compatibility - TD
- + add function `keybound()`, which returns the definition associated with a given keycode.
- + modify `define_key()` to undefine the given string when no keycode is given.
- + modify `keyok()` so it works properly if there is more than one string defined for a keycode.
- + add check to `tic` to warn about terminfo descriptions that contain more than one key assigned to the same string. This is shown only if the verbose (`-v`) option is given. Moved related logic (`tic -v`) from `comp_parse.c` into the `tic` program.
- + add/use `_nc_trace_tries()` to show the function keys that will be recognized.
- + rename `init_acs` to `_nc_init_acs` (request by Alexander V Lukyanov).
- > patch for Ada95 binding (Juergen Pfeifer):
- + remove all the `*_adabind.c` from `ncurses`, `menu` and `form` projects. Those little helper routines have all been implemented in Ada and are no longer required.
- + The option handling routines in `menu` and `form` have been made more save. They now make sure that the unused bits in options are always zero.
- + modify configuration scripts to
  - + use `gnatmake` as default compiler name. This is a safer choice than `gcc`, because some GNAT implementations use other names for the `compilerdriver` to avoid conflicts.
  - + use new default installation locations for the Ada files according to the proposed GNU Ada filesystem standard (for Linux).
- + simplify the Makefiles for the Ada binding
- + rename `ada_include` directory to `src`.

990213

- + enable `sigwinch` handler by default.
- +
- disable logic that allows `setbuf` to be turned off/on, because some implementations will overrun the buffer after it has been disabled once.

990206

- + suppress `sc/rc` capabilities from terminal description if they appear in `smcup/rmcup`. This affects only scrolling optimization, to fix a problem reported by several people with `xterm`'s alternate screen, though the problem is more general.
- > patch for Ada95 binding (Juergen Pfeifer):
- + removed all `pragma Preelaborate()` stuff, because the just released `gnat-3.11p` complains on some constructs.
- + fixed some upper/lower case notations because `gnat-3.11p` found inconsistent use.
- + used a new method to generate the HTML documentation of the Ada95 binding. This invalidates nearly the whole `./Ada95/html` subtree. Nearly all current files in this subtree are removed

990130

- + cache last result from `_nc_baudrate`, for performance (suggested by Alexander V Lukyanov).
- + modify `ClrUpdate()` function to workaround a problem in `nvi`, which uses `redrawwin` in `SIGTSTP` handling. Jeffrey C Honig reported that `ncurses` repainted the screen with nulls before resuming normal operation (patch by Alexander V Lukyanov).
- + generalize `is_xterm()` function a little by letting `xterm/rxvt/kterm` be any substring rather than the prefix.
- + modify `lib_data.c` to initialize `SP`. Some linkers, e.g., IBM's, will not link a module if the only symbols exported from the module are uninitialized ones (patch by Ilya Zakharevich). Ilya says that he has seen messages claiming this behavior conforms to the standard.)
- + move call on `_nc_signal_handler` past `_nc_initscr`, to avoid a small window where `Nttyb` hasn't yet been filled (reported by Klaus Weide).
- + modify `lib_tstp.c` to block `SIGTTOU` when handling `SIGTSTP`, fixes a problem where `ncurses` applications which were run via a shell script would hang when given a `^Z`. Also, check if the terminal's process group is consistent, i.e., a shell has not taken ownership of it, before deciding to save the current terminal settings in the `SIGTSTP` handler (patch by Klaus Weide).
- + correct spelling of `ACS_names` in `curs_border.3x` (reported by Bob van der Poel <bvdpoel@kootenay.com>).
- + correct a couple of typos in the macros supporting the `configure --with-shlib-version` option.

990123

- + modify `fty_regex.c` to compile on `HAVE_REGEXPR_H_FUNCS` machine (patch by Kimio Ishii <ishii@csl.sony.co.jp>).
- + rename `BSDI` console terminfo entries: `bsdos` to `bsdos-pc-nobold`, and `bsdos-bold` to `bsdos-pc` (patch by Jeffrey C Honig).
- + modify `tput` to accept `termcap` names as an alternative to `terminfo` names (patch by Jeffrey C Honig).

- + correct a typo in term.7 (Todd C Miller).
- + add configure --with-shlib-version option to allow installing shared libraries named according to release or ABI versions. This parameterizes some existing logic in the configure script, and is intended for compatibility upgrades on Digital Unix, which used versioned libraries in ncurses 4.2, but no longer does (cf: 980425).
- + resync configure script against autoconf 2.13 + patches
- + minor improvements for teraterm terminfo entry based on the program's source distribution.

990116

- + change default for configure --enable-big-core to assume machines do have enough memory to resolve terminfo.src in-memory.
- + correct name of ncurses library in TEST\_ARGS when configuring with debug library.
- + minor fixes to compile ncurses library with broken-linker with g++.
- + add --enable-broken-linker configure option, default to environment variable \$BROKEN\_LINKER (request by Jeffrey C Honig).
- + change key\_names[] array to static since it is not part of the curses interface (reported by Jeffrey C Honig <jch@bsd.com>).

990110

- + add Tera Term terminfo entry - TD

990109

- + reviewed/corrected macros in curses.h as per XSI document.
- + provide support for termcap PC variable by copying it from terminfo data and using it as the padding character in tputs (reported by Alexander V Lukyanov).
- + corrected iris-ansi and iris-ansi-ap terminfo entries for kent and kf9-kf12 capabilities, as well as adding kcbt.
- + document the mouse handling mechanism in menu\_driver and make a small change in menu\_driver's return codes to provide more consistency (patch by Juergen Pfeifer).
- + add fallback definition for NCURSES\_CONST to termcap.h.in (reported by Uchiyama Yasushi <uch@nop.or.jp>).
- + move lib\_restart.c to ncurses/base, since it uses curses functions directly, and therefore cannot be used in libtinfo.so
- + rename micro\_char\_size to micro\_col\_size, adding #define to retain old name.
- + add set\_a\_attributes and set\_pglen\_inch to terminfo structure, as per XSI and Solaris 2.5.
- + minor makefile files to build ncurses test\_progs
- + update html files in misc directory to reflect changes since 4.2

990102

- + disable scroll hints when hashmap is enabled (patch by Alexander V Lukyanov).
- +  
move logic for tic's verify of -e option versus -I and -C so that the terminfo data is not processed if we cannot handle -e (reported by Steven Schwartz <steves@unitrends.com>).
- + add test-driver traces to terminfo and termcap functions.
- + provide support for termcap ospeed variable by copying it from the internal cur\_term member, and using ospeed as the baudrate reference for the delay\_output and tputs functions. If an application does not set ospeed, the library behaves as before, except that \_nc\_timed\_wait is no longer used, or needed, since ospeed always has a value. But the application can modify ospeed to adjust the output of padding characters (prompted by a bug report for screen 3.7.6 and email from Michael Schroeder <Michael.Schroeder@informatik.uni-erlangen.de>).
- + removed some unused ifdef's as part of Alexander's restructuring.
- + reviewed/updated curses.h, term.h against X/Open Curses Issue 4 Version 2. This includes making some parameters NCURSES\_CONST rather than const, e.g., in termcap.h.
- + change linux terminfo entry to use ncv#2, since underline does not work with color

981226

- + miscellaneous corrections for curses.h to match XSI.
- + change --enable-no-padding configure option to be normally enabled.
- + add section to ncurses manpage for environment variables.
- + investigated Debian bug report that pertains to screen 3.7.4/3.7.6 changes, found no sign of problems on Linux (or on SunOS, Solaris) running screen built with ncurses.
- + check if tmp\_fp is opened in tic.c before closing it (patch by Pavel Roskin <pavel\_roskin@geocities.com>).
- + correct several font specification typos in man-pages.

981220

- + correct default value for BUILD\_CC (reported by Larry Virden).

981219

- + modify \_nc\_set\_writedir() to set a flag in \_nc\_tic\_dir() to prevent it from changing the terminfo directory after chdir'ing to it. Otherwise, a relative path in \$TERMINFO would confuse tic (prompted by a Debian bug report).
- + correct/update ncsa terminfo entry (report by Larry Virden).
- + update xterm-xfree86 terminfo to current (patch 90), smcur/rmcur changes
- + add Mathew Vernon's mach console entries to terminfo.src
- + more changes, moving functions, as part of Alexander's restructuring.

- + modify configure script for GNU/Hurd share-library support, introduce BUILD\_CC variable for cross compiling (patch by Uchiyama Yasushi <uch@nop.or.jp>)

981212

- + add environment variable NCURSES\_NO\_SETBUF to allow disabling the setbuf feature, for testing purposes.
- + correct ifdef's for termcap.h versus term.h that suppress redundant declarations of prototypes (reported by H.J.Lu).
- + modify Makefile.os2 to add linker flags which allow multiple copies of an application to coexist (reported by Ilya Zakharevich).
- + update Makefile.glibc and associated configure script so that ncurses builds as a glibc add-on with the new directory configuration (reported by H.J.Lu).

981205

- + modify gen\_reps() function in gen.c to work properly on SunOS (sparc), which is a left-to-right architecture.
- + modify relative\_move and tputs to avoid an interaction with the BSD-style padding. The relative\_move function could produce a string to replace on the screen which began with a numeric character, which was then interpreted by tputs as padding. Now relative\_move will not generate a string with a leading digit in that case (overwrite). Also, tputs will only interpret padding if the string begins with a digit; as coded it permitted a string to begin with a decimal point or asterisk (reported by Larry Virden).
- > patches by Juergen Pfeifer:
  - + fix a typo in m\_driver.c mouse handling and improves the error handling.
  - + fix broken mouse handling in the Ada95 binding
  - + make the Ada95 sample application menus work with the new menu mouse support
  - + improve the mouse handling introduced by Ilya; it now handles menus with spacing.
  - + repair a minor bug in the menu\_driver code discovered during this rework.
  - + add new function wmouse\_trafo() to hide implementation details of \_yoffset member of WINDOW struct needed for mouse coordinate transformation.

981128

- + modify Ada95/gen/gen.c to avoid using return-value of sprintf, since some older implementations (e.g., SunOS 4.x) return the buffer address rather than its length.
- > patch by Rick Ohnemus:
  - + modify demo.cc to get it to compile with newer versions of egcs.

- + trim a space that appears at the end of the table preprocessor lines (" t). This space prevents some versions of man from displaying the pages - changed to remove all trailing whitespace (TD)
- + finally, 'make clean' does not remove panel objects.
- > patches by Ilya Zakharevich:
  - + allow remapping of OS/2 mouse buttons using environment variable MOUSE\_BUTTONS\_123 with the default value 132.
  - + add mouse support to ncurses menus.

981121

- + modify misc/makedef.cmd to report old-style .def file symbols, and to generate the .def files sorted by increasing names rather than the reverse.
- + add misc/\*.ref which are J.J.G.Ripoll's dll definition files (renamed from misc/\*.old), and updated based on the entrypoint coding he used for an older version of ncurses.
- + add README.emx, to document how to build on OS/2 EMX.
- + updates for config.guess, config.sub from Lynx
- > patches by Ilya Zakharevich:
  - + minor fixes for mouse handling mode:
    - a) Do not initialize mouse if the request is to have no mouse;
    - b) Allow switching of OS/2 VIO mouse on and off.
  - + modify Makefile.os2 to support alternative means of generating configure script, by translating Unix script with Perl.
- > patches by Juergen Pfeifer:
  - + Updates MANIFEST to reflect changes in source structure
  - + Eliminates a problem introduced with my last patch for the C++ binding in the panels code. It removes the update() call done in the panel destructor.
  - + Changes in the Ada95 binding to better support systems where `sizeof(chtype)!=sizeof(int)` (e.g. DEC Alpha).

981114

- + modify install-script for manpages to skip over .orig and .rej files (request by Larry Virden).
- > patches/discussion by Alexander V Lukyanov:
  - + move base-library sources into ncurses/base and tty (serial terminal) sources into ncurses/tty, as part of Alexander V Lukyanov's proposed changes to ncurses library.
  - + copy \_tracemouse() into ncurses.c so that lib\_tracemse.c need not be linked into the normal ncurses library.
  - + move macro winch to a function, to hide details of struct ldat
- > patches by Juergen Pfeifer:
  - + fix a potential compile problem in cursesw.cc
  - + some Ada95 cosmetics
  - + fix a gen.c problem when compiling on 64-Bit machines

- + fix Ada95/gen/Makefile.in "-L" linker switch
- + modify Ada95 makefiles to use the INSTALL\_PREFIX setting.

981107

- + ifdef'd out lib\_freeall.c when not configured.
- + rename \_tracebits() to \_nc\_tracebits().
- + move terminfo-library sources into ncurses/tinfo, and trace-support functions into ncurses/trace as part of Alexander V Lukyanov's proposed changes to ncurses library.
- + modify generated term.h to always specify its own definitions for HAVE\_TERMIOS\_H, etc., to guard against inclusion by programs with broken configure scripts.

981031

- + modify terminfo parsing to accept octal and hexadecimal constants, like Solaris.
- + remove an autoconf 2.10 artifact from the configure script's check for "-g" compiler options. (Though harmless, this confused someone at Debian, who recently issued a patch that results in the opposite effect).
- + add configure option --with-ada-compiler to accommodate installations that do not use gcc as the driver for GNAT (patch by Juergen Pfeifer).

981017

- + ensure ./man exists in configure script, needed when configuring with --srcdir option.
- + modify infocmp "-r" option to remove limit on formatted termcap output, which makes it more like Solaris' version.
- + modify captainfo to treat no-argument case more like Solaris' version, which uses the contents of \$TERMCAP as the entry to format.
- + modify mk-2nd.awk to handle subdirectories, e.g., ncurses/tty (patch by Alexander V Lukyanov).

981010

- + modify --with-terminfo-dirs option so that the default value is the \${datadir} value, unless \$TERMINFO\_DIRS is already set. This gets rid of a hardcoded list of candidate directories in the configure script.
- + add some error-checking to \_nc\_read\_file\_entry() to ensure that strings are properly terminated (Todd C Miller).
- + rename manpage file curs\_scr\_dmp.3x to curs\_scr\_dump.3x, to correspond with contents (reported by Neil Zanella <nzanella@cs.mun.ca>).
- + remove redundant configure check for C++ which did not work when \$CXX was specified with a full pathname (reported by Andreas Jaeger).



+ corrected bcopy/memmove check; the macro was not standalone.

981003

+ remove unnecessary portion of OS/2 EMX mouse change from  
check\_pending()  
(reported by Alexander V Lukyanov).

980926

+ implement mouse support for OS/2 EMX (adapted from patch against  
4.2(?) by Ilya Zakharevich).  
+ add configure-check for bcopy/memmove, for 980919 changes to hashmap.  
+ merge Data General terminfo from Hasufin <hasufin@vidnet.net> - TD  
+ merge AIX 3.2.5 terminfo descriptions for IBM terminals, replaces  
some older entries - TD  
+ modify tic to compile into %'char' form in preference to % {number},  
since that is a little more efficient.  
+ minor correction to infocmp to avoid displaying "difference" between  
two capabilities that are rendered in equivalent forms.  
+ add -g option to tic/infocmp to force character constants to be  
displayed in quoted form. Otherwise their decimal values are shown.  
+ modify setupterm so that cancelled strings are treated the same as  
absent strings, cancelled and absent booleans false (does not affect  
tic, infocmp).  
+ modify tic, infocmp to discard redundant i3, r3 strings when  
output  
to termcap format.  
> patch by Alexander V Lukyanov:  
+ improve performance of tparm, now it takes 19% instead of 25% when  
profiling worm.  
+ rename maxlen/minlen to prec/width for better readability.  
+ use format string for printing strings.  
+ use len argument correctly in save\_text, and pass it to save\_number.

980919

+ make test\_progs compile (but hashmap does not function).  
+ correct NC\_BUFFERED macro, used in lib\_mvcur test-driver, modify  
associated logic to avoid freeing the SP->\_setbuf data.  
+ add modules home\_terminfo and getenv\_num to libtinfo.  
+ move write\_entry to libtinfo, to work with termcap caching.  
+ minor fixes to blue.c to build with atac.  
+ remove softscroll.c module; no longer needed for testing.  
> patches by Todd C Miller:  
+ use strtol(3) instead of atoi(3) when parsing env variables so we can  
detect a bogus (non-numeric) value.  
+ check for terminal names > MAX\_NAME\_SIZE in a few more places when  
dealing with env variables again.  
+

- fix a MAX\_NAME\_SIZE that should be MAX\_NAME\_SIZE+1
- + use sizeof instead of strlen(3) on PRIVATE\_INFO since it is a fixed string #define (compile time vs runtime).
- + when setting errno to ENOMEM, set it right before the return, not before code that could, possibly, set errno to a different value.
- > patches by Alexander V Lukyanov:
  - + use default background in update\_cost\_from\_blank()
  - + disable scroll-hints when hashmap is configured.
  - + improve integration of hashmap scrolling code, by adding oldhash and newhash data to SP struct.
  - + invoke del\_curterm from delscreen.
  - + modify del\_curterm to set cur\_term to null if it matches the function's parameter which is deleted.
  - + modify lib\_douupdate to prefer parm\_ich to the enter\_insert\_mode and exit\_insert\_mode combination, adjusting InsCharCost to check enter\_insert\_mode, exit\_insert\_mode and insert\_padding. Add insert\_padding in insert mode after each char. This adds new costs to the SP struct.

980912

- + modify test-driver in lib\_mvcur.s to use \_nc\_setbuffer, for consistent treatment.
- + modify ncurses to restore output to unbuffered on endwin, and resume buffering in refresh (see lib\_set\_term.c and NC\_BUFFERED macro).
- + corrected HTML version numbers (according to the W3C validator, they never were HTML 2.0-compliant, but are acceptable 3.0).

980905

- + modify MKterminfo.sh to generate terminfo.5 with tables sorted by capability name, as in SVr4.
- + modified term.h, termcap.h headers to avoid redundant declarations.
- + change 'u\_int' type in tset.c to unsigned, making this compile on Sequent PRX 4.1 (reported by Michael Sterrett <msterret@coat.com>).

980829

- + corrections to mailing addresses, and moving the magic line that causes the man program to invoke tbl to the first line of each manpage (patch by Rick Ohnemus <rick@ecomcon.com>).
- + add Makefile.os2 and supporting scripts to generate dll's on OS/2 EMX (from J.J.G.Ripoll, with further integration by TD).
- + correct a typo in icl6404 terminfo entry.
- + add xtermm and xtermc terminfo entries.
- > from esr's terminfo version:
  - + Added Francesco Potorti's tuned Wyse 99 entries.
  - + dtterm enacs (from Alexander V Lukyanov).
  - + Add ncsa-ns, ncsa-m-ns and ncsa-m entries from esr version.

980822

- + document AT&T acs characters in terminfo.5 manpage.
- + use EMX \_scrsz() function if terminfo and environment do not declare the screen size (reported by Ilya Zakharevich <ilya@math.ohio-state.edu>).
- + remove spurious '\ ' characters from eterm and osborne terminfo entries (prompted by an old Debian bug report).
- + correct reversed malloc/realloc calls in \_nc\_doalloc (reported by Hans-Joachim Widmaier <hjwidmai@foxboro.com>).
- + correct misplaced parenthesis which caused file-descriptor from opening termcap to be lost, from 980725 changes (reported by Andreas Jaeger).

980815

- + modify lib\_setup.c to eliminate unneeded include of <sys/ioctl.h> when termios is not used (patch by Todd C Miller).
- + add function \_nc\_doalloc, to ensure that failed realloc calls do not leak memory (reported by Todd C Miller).
- + improved ncsa-telnet terminfo entry.

980809

- + correct missing braces around a trace statement in read\_entry.c, from 980808 (reported by Kim DeVaughn <kimdv@best.com> and Liviu Daia).

980808

- + fix missing include <errno.h> in ditto.c (reported by Bernhard Rosenkraenzer <bero@k5.sucks.eu.org>)
- + add NCSA telnet terminfo entries from Francesco Potorti <F.Potorti@cnuce.cnr.it>, from Debian bug reports.
- + make handling of \$LINES and \$COLUMNS variables more compatible with Solaris by allowing them to individually override the window size as obtained via ioctl.

980801

- + modify lib\_vidattr.c to allow for terminal types (e.g., xterm-color) which may reset all attributes in the 'op' capability, so that colors are set before turning on bold and other attributes, but still after turning attributes off.
- + add 'ditto.c' to test directory to illustrate use of newterm for initializing multiple screens.
- + modify \_nc\_write\_entry() to recover from failed attempt to link alias for a terminfo on a filesystem which does not preserve character case (reported by Peter L Jordan <PJordan@chla.usc.edu>).

980725

- + updated versions of config.guess and config.sub based on automake 1.3
- + change name-comparisons in lib\_termcap to compare no more than 2 characters (gleaned from Debian distribution of 1.9.9g-8.8, verified with Solaris curses).
- + fix typo in curs\_insstr.3x (patch by Todd C Miller)
- + use 'access()' to check if ncurses library should be permitted to open or modify files with fopen/open/link/unlink/remove calls, in case the calling application is running in setuid mode (request by Cristian Gafton <gafton@redhat.com>, responding to Duncan Simpson <dps@io.stargate.co.uk>).
- + arm100 terminfo entries from Dave Millen <dmill@globalnet.co.uk>).
- + qnxt2 and minitel terminfo entries from esr's version.

980718

- + use -R option with ldconfig on FreeBSD because otherwise it resets the search path to /usr/lib (reported by Dan Nelson).
- + add -soname option when building shared libraries on OpenBSD 2.x (request by QingLong).
- + add configure options --with-manpage-format and --with-manpage-renames (request by QingLong).
- + correct conversion of CANCELLED\_NUMERIC in write\_object(), which was omitting the high-order byte, producing a 254 in the compiled terminfo.
- + modify return-values of tgetflag, tgetnum, tgetstr, tigetflag, tigetnum and tigetstr to be compatible with Solaris (gleaned from Debian distribution of 1.9.9g-8.8).
- + modify \_nc\_syserr\_abort to abort only when compiled for debugging, otherwise simply exit with an error.

980711

- + modify Ada95 'gen' program to use appropriate library suffix (e.g., "\_g" for a debug build).
- + update Ada95 'make clean' rule to include generics .ali files
- + add a configure test to ensure that if GNAT is found, that it can compile/link working Ada95 program.
- + flush output in beep and flash functions, fixing a problem with getstr (patch by Alexander V Lukyanov)
- + fix egcs 1.0.2 warning for etip.h (patch by Chris Johns).
- + correct ifdef/brace nesting in lib\_sprintf.c (patch by Bernhard Rosenkraenzer <bero@Pool.Informatik.RWTH-Aachen.DE>).
- + correct typo in wattr\_get macro from 980509 fixes (patch by Dan Nelson).

980704

- + merge changes from current XFree86 xterm terminfo descriptions.

- + add configure option '--without-ada'.
- + add a smart-default for termcap 'ac' to terminfo 'acs\_chars' which corresponds to vt100.
- + change translation for termcap 'rs' to terminfo 'rs2', which is the documented equivalent, rather than 'rs1'.

980627

- + slow 'worm' down a little, for very fast machines.
- + corrected firstchar/lastchar computation in lib\_hline.c
- + simplify some expressions with CHANGED\_CELL, CHANGED\_RANGE and CHANGED\_TO\_EOL macros.
- + modify init\_pair so that if a color-pair is reinitialized, we will repaint the areas of the screen whose color changes, like SVr4 curses (reported by Christian Maurer <maurer@inf.fu-berlin.de>).
- + modify getsyx/setsyx macros to comply with SVr4 man-page which says that leaveok() affects their behavior (report by Darryl Miles, patch by Alexander V Lukyanov).

980620

- + review terminfo.5 against Solaris 2.6 curses version, corrected several minor errors/omissions.
- + implement tparm %l format.
- + implement tparm printf-style width and precision for %s, %d, %x, %o as per XSI.
- + implement tparm dynamic variables (reported by Xiaodan Tang).

980613

- + update man-page for for wattr\_set, wattr\_get (cf: 980509)
- + correct limits in hashtest, which would cause nonprinting characters to be written to large screens.
- + correct configure script, when --without-cxx was specified: the wrong variable was used for cf\_cv\_type\_of\_bool. Compilers up to gcc 2.8 tolerated the missing 'int'.
- + remove the hardcoded name "gcc" for the GNU Ada compiler. The compiler's name might be something like "egcs" (patch by Juergen Pfeifer).
- + correct curs\_addch.3x, which implied that echochar could directly display control characters (patch by Alexander V Lukyanov).
- + fix typos in ncurses-intro.html (patch by Sidik Isani <isani@cfht.hawaii.edu>)

980606

- + add configure test for conflicting use of exception in math.h and other headers.
- + minor optimization to 'hash()' function in hashmap.c, reduces its time by 10%.

- + correct form of LD\_SHARED\_OPTS for HP-UX 10.x (patch by Tim Mooney).
- + fix missing quotes for 'print' in MKunctrl.awk script (reported by Mihai Budiu <mihai@g41.sp.cs.cmu.edu>).
- > patch by Alexander V Lukyanov:
- + correct problem on Solaris (with poll() function) where getch could hang indefinitely even if timeout(x) was called. This turned out to be because milliseconds was not updated before 'goto retry' in \_nc\_timed\_wait.
- + simplified the function \_nc\_timed\_wait and fixed another bug, which was the assumption of !GOOD\_SELECT && HAVE\_GETTIMEOFDAY in \*timeleft assignment.
- + removed the cycle on EINTR, as it seems to be useless.

980530

- + add makefile-rule for test/keynames
- + modify run\_tic.sh and shlib to ensure that user's .profile does not override the \$PATH used to run tic (patch by Tim Mooney).
- + restore LD\_SHARED\_OPTS to \$(LD\_SHARED\_FLAGS) when linking programs, needed for HP-UX shared-library path (recommended by Tim Mooney).
- + remove special case of HP-UX -L options, use +b options to embed \$(libdir) in the shared libraries (recommended by Tim Mooney).
- + add checks for some possible buffer overflows and unchecked malloc/realloc/calloc/strdup return values (patch by Todd C Miller <Todd.Miller@courtesan.com>)

980523

- + correct maxx/maxy expression for num\_columns/num\_lines in derwin (patch by Alexander V Lukyanov).
- + add /usr/share/lib/terminfo and /usr/lib/terminfo as compatibility fallbacks
- to \_nc\_read\_entry(), along with --with-terminfo-dirs configure option (suggested by Mike Hopkirk).
- + modify config.guess to recognize Unixware 2.1 and 7 (patch by Mike Hopkirk <hops@sco.com>).
- + suppress definition of CC\_SHARED\_OPTS in LD\_FLAGS\_SHARED in c++ Makefile.in, since this conflicts when g++ is used with HP-UX compiler (reported by Tim Mooney).
- + parenthesize 'strcpy' calls in c++ binding to workaround redefinition in some C++ implementations (reported by several people running egcs with glibc 2.0.93, analysis by Andreas Jaeger).

980516

- + modify write\_entry.c so that it will not attempt to link aliases with embedded '/', but give only a warning.
- + put -L\$(libdir) first when linking programs, except for HP-UX.
- + modify comp\_scan.c to handle SVr4 terminfo description for att477, which contains a colon in the description field.

- + modify configure script to support SCO osr5.0.5 shared libraries, from comp.unix.sco.programmer newsgroup item (Mike Hopkirk).
- + eliminate extra GoTo call in lib\_douupdate.c (patch by Alexander V. Lukyanov).
- + minor adjustments of const/NCURSES\_CONST from IRIX compile.
- + add updates based on esr's 980509 version of terminfo.src.

#### 980509

- + correct macros for wattr\_set, wattr\_get, separate wattrset macro from these to preserve behavior that allows attributes to be combined with color pair numbers.
- + add configure option --enable-no-padding, to allow environment variable \$NCURSES\_NO\_PADDING to eliminate non-mandatory padding, thereby making terminal emulators (e.g., for vt100) a little more efficient (request by Daniel Eisenbud <eisenbud@cs.swarthmore.edu>).
- + modify configure script to embed ABI in shared libraries for HP-UX 10.x (detailed request by Tim Mooney).
- + add test/example of the 'filter()' function.
- + add nxterm and xterm-color terminfo description (request by Cristian Gafton <gafton@redhat.com>).
- + modify rxvt terminfo description to clear alternate screen before switching back to normal screen, for compatibility with applications which use xterm (reported by Manoj Kasichainula <manojk@io.com>).
- + modify linux terminfo description to reset color palette (reported by Telford Tendys <telford@eng.uts.edu.au>).
- + correction to douupdate, for case where terminal does not support insert/delete character. The logic did not check that there was a difference in alignment of changes to old/new screens before repainting the whole non-blank portion of the line. Modified to fall through into logic that reduces by the portion which does not differ (reported by Daniel Eisenbud <eisenbud@cs.swarthmore.edu>).
- + minor performance improvement to wnoutrefresh by moving some comparisons out of inner loop.

#### 980425

- + modify configure script to substitute NCURSES\_CONST in curses.h
- + updated terminfo entries for xterm-xf86-v40, xterm-16color, xterm-8bit to correspond to XFree86 3.9Ag.
- + remove restriction that forces ncurses to use setaf/setab if the number of colors is greater than 8. (see 970524 for xterm-16color).
- + change order of -L options (so that \$(libdir) is searched first) when linking tic and other programs, to workaround HP's linker. Otherwise, the -L../lib is embedded when linking against shared libraries and the installed program does not run (reported by Ralf Hildebrandt).

+ modify configuration of shared libraries on Digital Unix so that versioning is embedded in the library, rather than implied by links (patch by Tim Mooney).

980418

+ modify etip.h to avoid conflict with math.h on HP-UX 9.03 with gcc 2.8.1 which redefines 'exception' (reported by Ralf Hildebrandt <R.Hildebrandt@tu-bs.de>).

+ correct configure tests in CF\_SHARED\_OPTS which used \$CC value to check for gcc, rather than autoconf's \$GCC value. This did not work properly if the full pathname of the compiler were given (reported by Michael Yount <yount@csf.Colorado.edu>).

+ revise check for compiler options to force ANSI mode since repeating an option such as -Aa causes HP's compiler to fail on its own headers (reported by Clint Olsen <olsenc@ichips.intel.com>).

980411

+ ifdef'd has\_key() and mcprint() as extended functions.

+ modified several prototypes to correspond with 1997 version of X/Open Curses (affects ABI since developers have used attr\_get).

+ remove spurious trailing blanks in glibc addon-scripts (patch by H.J.Lu).

+ insert a few braces at locations where gcc-2.8.x asks to use them to avoid ambiguous else's, use -fpic rather than -fPIC for Linux (patch by Juergen Pfeifer).

980404

+ split SHLIB\_LIST into SHLIB\_DIRS/SHLIB\_LIST to keep -L options before -l to accommodate Solaris' linker (reported by Larry Virden).

980328

+ modify lib\_color.c to eliminate dependency on orig\_colors and orig\_pair, since SVr4 curses does not require these either, but uses them when they are available.

+ add detailed usage-message to infocmp.

+ correct a typo in att6386 entry (a "%?" which was "?").

+ add -f option to infocmp and tic, which formats the terminfo if/then/else/endif so that they are readable (with newlines and tabs).

+ fixes for glibc addon scripts (patch by H.J.Lu).

980321

+ revise configure macro CF\_SPEED\_TYPE so that termcap.h has speed\_t declared (from Adam J Richter <adam@yggdrasil.com>)

+ remove spurious curs\_set() call from leaveok() (J T Conklin).

+ corrected handling leaveok() in douppdate() (patch by Alexander V.



Lukyanov).

- + improved version of wredrawln (patch by Alexander V. Lukyanov).
- + correct c++/Makefile.in so install target do not have embedded ../lib to confuse it (patch by Thomas Graf <graf@essi.fr>).
- + add warning to preinstall rule which checks if the installer would overwrite a curses.h or termcap.h that is not derived from ncurses. (The recommended configuration for developers who need both is to use --disable-overwrite).
- + modify preinstall rule in top-level Makefile to avoid implicit use of 'sh', to accommodate Ultrix 4.4 (reported by Joao Palhoto Matos <jmatos@math.ist.utl.pt>, patch by Thomas Esser <te@informatik.uni-hannover.de>)
- + refine ifdef's for TRACE so that libncurses has fewer dependencies on libtinfo when TRACE is disabled.
- + modify configure script so that if the --with-termplib option is used to generate a separate terminfo library, we chain it to the ncurses library with a "-l" option (reported by Darryl Miles and Ian T. Zimmerman).

980314

- + correct limits and window in wredrawln function (reported/analysis by Alexander V. Lukyanov).
- + correct sed expression in configure script for --with-fallback option (patch by Jesse Thilo).
- + correct some places in configure script where \$enableval was used rather than \$withval (patch by Darryl Miles <dml@g7led.demon.co.uk>).
- + modify some man-pages so no '.' or '..' falls between TH and SH macros, to accommodate man\_db program (reported by Ian T. Zimmerman <itz@rahul.net>).
- + terminfo.src 10.2.1 downloaded from ESR's webpage (ESR).
- > several changes by Juergen Pfeifer:
  - + add copyright notices (and rcs id's) on remaining man-pages.
  - + corrected prototypes for slk\_\* functions, using chtype rather than attr\_t.
  - + implemented the wcolor\_set() and slk\_color() functions
  - + the slk\_attr\_{set,off,on} functions need an additional void\* parameter according to XSI.
  - + fix the C++ and Ada95 binding as well as the man pages to reflect above enhancements.

980307

- + use 'stat()' rather than 'access()' in toe.c to check for the existence of \$HOME/.terminfo, since it may be a file.
- + suppress configure CF\_CXX\_LIBRARY check if we are not using g++ 2.7.x, since this is not needed with g++ 2.8 or egcs (patch by Juergen Pfeifer).

- + turn on hashmap scrolling code by default, intend to remedy defects by 4.3 release.

- + minor corrections to terminfo.src changelog.

980302 4.2 release for upload to prep.ai.mit.edu

- +

- correct Florian's email address in ncurses-intro.html

- + terminfo.src 10.2.0 (ESR).

980228 pre-release

- + add linux-koi8r replace linux-koi8, which is not KOI8 (patch by QingLong <qinglong@Bolizm.ihep.su>).

- + minor documentation fixes (patch by Juergen Pfeifer).

- + add setlocale() call to ncurses.c (reported by Claes G. Lindblad <claesg@algonet.se>).

- + correct sign-extension in lib\_insstr.c (reported by Sotiris Vassilopoulos <svas@leon.nrcps.ariadne-t.gr>)

980221 pre-release

- + regenerated some documentation overlooked in 980214 patch (ncurses-intro.doc, curs\_outopts.3x.html)

- + minor ifdef change to C++ binding to work with gcc 2.8.0 (patch by Juergen Pfeifer).

- + change maintainer's mailing address to florian@gnu.org, change tentative mailing list address to bug-ncurses-request@gnu.org (patch by Florian La Roche).

- + add definition of \$(REL\_VERSION) to c++/Makefile.in (reported by Gran Hasse <gh@raditex.se>).

- + restore version numbers to Ada95 binding, accidentally deleted by copyright patch (patch by Juergen Pfeifer).

980214 pre-release

- + remove ncurses.lsm from MANIFEST so that it won't be used in FSF distributions, though it is retained in development.

- + correct scaling of milliseconds to nanoseconds in lib\_napms.c (patch by Jeremy Buhler).

- + update mailing-list information (bug-ncurses@gnu.org).

- + update announcement for upcoming 4.2 release.

- + modify -lm test to check for 'sin()' rather than 'floor()'

- + remove spurious commas from terminfo.src descriptions.

- + change copyright notices to Free Software Foundation

980207

- + minor fixes for autoconf macros CF\_ERRNO, CF\_HELP\_MESSAGE and CF\_SIZECHANGE

- + modify Makefile.glibc so that \$(objpfx) is defined (H.J.Lu).

- + ifdef-out true-return from \_nc\_mouse\_inline() which depends on

merge of QNX patch (pending 4.2 release).

> patch to split off seldom-used modules in ncurses (J T Conklin):  
This reduces size by up to 2.6kb.

- + move functionality of `_nc_usleep` into `napms`, add configuration case for `nanosleep()`.
- + moved `wchgat()` from `lib_addch.c` to `lib_chgat.c`
- + moved `clearok()`, `immedok()`, `leaveok()`, and `scrollok()` from `lib_options.c` to `lib_clearok.c`, `lib_immedok.c`, `lib_leaveok.c` and `lib_scrollok.c`.
- + moved `napms()` from `lib_kernel.c` to `lib_napms.c`
- + moved `echo()` and `noecho()` from `lib_raw.c` to `lib_echo.c`
- + moved `nl()` and `nonl()` from `lib_raw.c` to `lib_nl.c`

980131

- + corrected conversion in `telock.c` (cf: 971018).
- + updates to `Makefile.glibc` and associated Linux configure script (patch by H.J.Lu).
- + workaround a quoting problem on SunOS with `tar-copy.sh`
- + correct `init_pair()` calls in `worm.c` to work when `use_default_colors()` is not available.
- + include `<sys/types.h>` in `CF_SYS_TIME_SELECT` to work with FreeBSD 2.1.5
- + add `ncv` capability to FreeBSD console (`cons25w`), making reverse work with color.
- + correct sense of `configure-test` for `sys/time.h` inclusion with `sys/select.h`
- + fixes for `Ada95/ada_include/Makefile.in` to work with `--srcdir` option.
- + remove unused/obsolete test-program rules from `progs/Makefile.in` (the rules in `ncurses/Makefile.in` work).
- + remove shared-library loader flags from `test/Makefile.in`, etc.
- + simplify `test/configure.in` using new version of `autoconf` to create `test/ncurses_cfg.h`
- + suppress suffix rules in `test/Makefile.in`, provide explicit dependency to work with `--srcdir` option and less capable 'make' programs.

> adapted from patch for QNX by Xiaodan Tang:

- + initialize `%P` and `%g` variables set/used in `tparam`, and also ensure that empty strings don't return a null result from `tparam_internal`
- + add QNX-specific prototype for `vsscanf()`
- + move initialization of `SP->_keytry` from `init_keytry()` to `newterm()` to avoid resetting it via a `keyok()` call by `mouse_activate()`.
- + reorganized some functions in `lib_mouse()` to use case-statements.
- + remove `sgf` string from `qnx terminfo` entry since it is reported to turn off attributes inconsistently.

980124

- + add f/F/b/B commands to ncurses 'b' test to toggle colors, providing test for no\_color\_video.
- + adjusted emx.src to use no\_color\_video, now works with ncurses 'b' and 'k' tests.
- + implement no\_color\_video attribute, and as a special case, reverse colors when the reverse attribute cannot be combined with color.
- + check for empty string in \$TERM variable (reported by Brett Michaels <brett@xylan.com>).
- > from reports by Fred Fish:
  - + add configure-test for isascii
  - + add configure-test for -lm library.
  - + modify CF\_BOOL\_SIZE to check if C++ bool types are unsigned.
- > patches by J.J.G.Ripoll
  - + add configure/makefile variables to support .exe extension on OS/2 EMX (requires additional autoconf patches).
  - + explicitly initialize variables in lib\_data.c to appease OS/2 linker
- > patches by Fred Fish <fnf@ninemoons.com>
  - + misc/Makefile.in (install.data): Avoid trying to install the CVS directory.
  - + aclocal.m4 (install.includes): Remove files in the include directory

where we are going to install new ones, not the original source files.

- + misc/terminfo.src: Add entry for "beterm", derived from termcap distributed with BeOS PR2 using captinfo.
- + aclocal.m4: Wrap \$cf\_cv\_type\_of\_bool with quotes (contains space)
- + aclocal.m4: Assume bool types are unsigned.
- + progs/infocmp.c: workaround mwcc 32k function data limit

980117

- + correct initialization of color-pair (cf: 970524) in xmas.c, which was using only one color-pair for all colors (reported by J.J.G.Ripoll).
- + add multithread options for objects build on EMX, for compatibility with XFree86.
- + split up an expression in MKlib\_gen.sh to work around a problem on OS/2 EMX, with 'ash' (patch by J.J.G.Ripoll).
- + change terminfo entries xterm (xterm-xf86-v40), xterm-8bit rs1 to use hard reset.
- + rename terminfo entry xterm-xf86-v39t to xterm-xf86-v40
- + remove bold/underline from sun console entries since they're not implemented.
- + correct \_tracef calls in \_tracedump(), which did not separate format from parameters.
- + correct getopt string for tic "-o" option, and add it to man-page synopsis (reported by Darren Hiebert <darren@hmi.com>).

- + correct typo in panel/Makefile.in, reversed if-statement in scrolling optimization (Alexander V. Lukyanov).
- + test for 'remove()', use 'unlink()' if not found (patch by Philippe De Muyter <phdm@macqel.be>).
- > patches by Juergen Pfeifer:
  - + Improve a feature of the forms driver. For invisible fields (O\_VISIBLE off) only the contents but not the attributes are cleared. We now clear both. (Reported by Javier Kohan <jkohan@adan.fceia.unr.edu.ar>)
  - + The man page form\_field\_opts.3x makes now clear, that invisible fields are also always inactive.
  - + adjust ifdef's to compile the C++ binding with the just released gcc-2.8.0 c++ and the corresponding new C++ libraries.

980110

- + correct "?" command in ncurses.c; it was performing non-screen writes while the program was in screen mode. (It "worked" in 1.9.9e because that version sets OPOST and OCRNL incorrectly).
- + return error from functions in lib\_kernel, lib\_raw and lib\_ti if cur\_term is null, or if underlying I/O fails.
- + amend change to tputs() so that it does not return an error if cur\_term is null, since some applications depend on being able to use tputs without initializing the terminal (reported by Christian J. Robinson <infynity@cyberhighway.net>).

980103

- + add a copy of emx.src from J.J.G.Ripoll's OS/2 EMX version of ncurses 1.9.9e, together with fixes/additions for the "ansi" terminal type.
- + add tic check for save/restore cursor if change\_scroll\_region is defined (reference: O'Reilly book).
- + modify read\_termcap.c to handle EMX-style pathnames (reported by J.J.G.Ripoll).
- + modify lib\_raw.c to use EMX's setmode (patch from J.J.G.Ripoll). Ripoll says EMX's curses does this.
- + modify \_nc\_tic\_expand() to generate \0 rather than \200.
- + move/revise 'expand()' from dump\_entry.c to ncurses library as \_nc\_tic\_expand(), for use by tack.
- + decode \a as \007 for terminfo, as per XSI.
- + correct translation of terminfo "^@", to \200, like \0.
- + modify next\_char() to treat <cr><lf> the same as <newline>, for cross-platform compatibility.
- + use new version of autoconf (971230) to work around limited environment on CLIX, due to the way autoconf builds --help message.
- > patch by Juergen Pfeifer:
  - + check that the Ada95 binding runs against the correct version of ncurses.

- + insert constants about the library version into the main spec-file of the Ada95 binding.

#### 971227

- + modify open/fopen calls to use binary mode, needed for EMX.
- + modify configure script to work with autoconf 2.10 mods for OS/2 EMX (from J.J.G.Ripoll).
- + generated ncurses\_cfg.h with patch (971222) to autoconf 2.12 which bypasses limited sed buffer length.
- > several changes from Juan Jose Garcia Ripoll <worm@arrakis.es> (J.J.G.Ripoll) to support OS/2 EMX:
  - + add a `_scrolling` flag to `SP`, to set when we encounter a terminal that simply cannot scroll.
  - + corrected logic in `_nc_add_to_try()`, by ensuring that strings with embedded `\200` characters are matched.
  - + don't assume the host has `'link()'` function, for linking terminfo entries.

#### 971220

- + if there's no `ioctl`'s to support `sigwinch` handler, disable it.
- + add configure option `--disable-ext-funcs` to remove the extended functions from the build.
- + add configure option `--with-terminlib` to generate the terminfo functions as a separate library.
- + add 'sources' rule to facilitate cross-compiling.
- + review/fix order of `mostlyclean/clean/distclean` rules.
- + modify install-rule for headers to first remove old header, in case there was a symbolic link that confuses the install script.
- + corrected substitution for `NCURSES_CONST` in `term.h` (cf: 971108)
- + add null pointer checks in `wnoutrefresh()`, `overlap()` (patch by Xiaodan Tang <xtang@qnx.com>)
- + correct `tputs()`, which could dereference a null `cur_term` if invoked before terminal is initialized (patch by Christopher Seawood <cls@seawood.org>)
- > patch by Juergen Pfeifer:
  - + makes better use of `"pragma Inline"` in the Ada95 binding
  - + resynchronizes the generated html manpages

#### 971213

- + additional fixes for man-pages section-references
- + add (for debugging) a check for `ich/ich1` conflict with `smir/rmir` to `tic`, etc.
- + remove `hpa/vpa` from `rxvt` terminal description because they are not implemented correctly, added `sgr0`.
- + change `ncurses 's'` to use raw mode, so `^Q` works (reported by Rudolf Leitgeb <leitgeb@leland.stanford.edu>)

971206

- + modify protection when installing libraries to (normally) not executable. HP-UX shared libraries are an exception.
- + add configure check for 'tack'.
- + implement script for renaming section-references in man-page install, for Debian configuration.
- + add validity-check for SP in trace code in baudrate() (reported by Daniel Weaver).
- > patch by Alexander V. Lukyanov (fixes to match sol25 curses)
- + modify 'overlay()' so that copy applies target window background to characters.
- + correct 'mvwin()' so that it does not clear the previous locations.
- + correct lib\_acs.c so that 8-bit character is not sign expanded in case of wide characters in chtype.
- + correct control-char test in lib\_addch.c for use with wide chars
- + use attribute in the chtype when adding a control character in lib\_addch.c control char was added with current attribute

971129

- + save/restore errno in \_tracef() function
- + change treatment of initialize\_color to use a range of 0..1000 (recommended by Daniel Weaver).
- + set umask in mkinstalldirs, fixing problems reported by users who have set root's umask to 077.
- + correct bug in tic that caused capabilities to be reprinted at the end of output when they had embedded comments.
- + rewrote wredrawln to correspond to XSI, and split-out since it is not often used (from report by Alexander V. Lukyanov, 970825)
- + rewrote Dan Nelson's change to make it portable, as well as to correct logic for handling backslashes.
- + add code to \_nc\_tgetent() to make it work more like a real tgetent(). It removes all empty fields, and removes all but the first in a group of duplicate caps. The code was pulled from the BSD libtermcap code in termcap.c (patch by Dan Nelson <dnelson@emsphone.com>)
- + don't include --enable-widex in the --with-develop configure option, since it is not binary-compatible with 4.1 (noted by Alexander V. Lukyanov)
- > patch by Juergen Pfeifer:
- + further improvements of the usage of elaboration pragmas in the Ada95 binding
- + enhanced Ada95 sample to use the user\_data mechanism for panels.
- + a fix for the configuration script to make gnat-3.10 the required version.
- + resync of the html version of the manpages

971122

- > fixes/updates for terminfo.src:
- + add vt220-js, pilot, rbcomm, datapoint entries from esr's 27-jun-97 version.
- + add hds200 description  
(Walter Skorski)
- + add EMX 0.9b descriptions
- + correct rmso/sms0 capabilities in wy30-mc and wy50-mc (Daniel Weaver)
- + rename xhpterm back to hpterm.
- > patch by Juergen Pfeifer:
- + Improves the usage of elaboration pragmas for the Ada95 binding.
- + Adds a translation of the test/rain.c into Ada95 to the samples.  
This has been contributed to the project by Laurent Pautet  
(pautet@gnat.com)

971115

- + increase MAX\_NAME\_SIZE to 512 to handle extremely long alias list in HP-UX terminfo.
- + correction & simplification of delay computation in tputs, based on comments from Daniel Weaver.
- + replace test for SCO with more precise header tests.
- + add configure test for unsigned literals, use in NCURSES\_BITS macro.
- + comment-out the -PIC, etc., flags from c++, progs and test makefiles since they probably are not needed, and are less efficient (noted by Juergen Fluk)
- + add -L\$(libdir) to loader options, after -L../lib so that loaders that record this information will tend to do the right thing if the programs are moved around after installing them (suggested by Juergen Fluk).
- + add -R option to loader options for programs for Solaris if the --enable-rpath option is specified for the libraries.

971112

- + correct installed filename for shared libraries on \*BSD (reported by Juergen Fluk).

971108

- + cleanup logic for deciding when tputs() should call delay\_output(), based on comments from Daniel Weaver.
- + modified tputs() to avoid use of float.
- + correct use of trailpad in tputs(), which used the wrong variable in call to delay\_output().
- + correct inverted expression for null-count in delay\_output()  
(analysis by Daniel Weaver).
- + apply --enable-rpath option to Solaris (requested by Larry Virden).
- + correct substitution of EXTRA\_CFLAGS for gcc 2.6.3
- + correct check for error-return by \_nc\_tgetent(), which returns 0



for success.  
+ add configure test for BSD 4.4 cgetent() function, modify read\_termcap.c to use the host's version of that if found, using the terminal database on FreeBSD (reported by Peter Wemm).  
+ add u8, u9 strings to sun-il description for Daniel Weaver.  
+ use NCURSES\_CONST in panel's user-pointer.  
+ modify edit\_cfg.sh and MKterm.h.awk.in to substitute NCURSES\_CONST so that will work on NeXT.  
+ use \_nc\_set\_screen() rather than assignments to SP to fix port to NeXT (reported by Francisco A. Tomei Torres).

971101

+ force mandatory padding in bell and flash\_screen, as specified in XSI.  
+ don't allow padding\_baud\_rate to override mandatory delays (reported by Daniel Weaver).  
+ modify delay\_output() to use \_nc\_timed\_wait() if no baudrate has been defined, or if the cur\_term pointer is not initialized. XSI treats this as unspecified. (requested by Daniel Weaver).  
+ change getcap-cache ifdef's to eliminate unnecessary chdir/mkdir when that feature is not configured.  
+ remove \_nc\_err\_abort() calls when write\_entry.c finds a directory but cannot write to it, e.g., when translating part/all of /etc/termcap (reported by Andreas Jaeger <aj@arthur.rhein-neckar.de>). (this dates back to 951102, in 1.9.7a).  
+ minor ifdef fixes to compile with atac and glibc 2.0.5c  
+ add check for -lgen when configuring regex.h  
+ modify Solaris shared-library option "-d y" to "-dy" to workaround incompatibility of gcc 2.7.2 vs vendor's tools.

971026

+ correct ifdef's for struct winsize vs struct tysize in lib\_setup.c to compile on SCO.  
+ remove dangling backslash in panel/Makefile.in  
+ modify MKkeyname.awk to work with SCO's nawk, which dumps core in the length() function.  
+ correct length of allocation in \_nc\_add\_to\_try(), to allow for trailing null.  
+ correct logic in \_nc\_remove\_key(), which was discarding too many nodes (patch by Alexander V. Lukyanov)

971025

+ add definition for \$(REL\_VERSION) to test/Makefile.in, so \*BSD shared libraries link properly (see 970524).  
+ modify Linux shared-library generation

to include library dependencies (e.g., -lncurses and -lgpm) in the forms, menu and panel libraries (suggested by Juergen Pfeifer).

- + modify configure script to use config.guess and config.sub rather than uname, which is unreliable on some systems.
- + updated Makefile.glibc, test-built with glibc 2.0.5c
- + modify keyname() to return values consistent with SVr4 curses (patch by Juergen Fluk).

> changes requested by Daniel Weaver:

- + modify delay\_output() so that it uses the same output function as tputs() if called from that function.
- + move \_baudrate from SCREEN to TERMINAL so that low-level use of tputs works when SP is not set.

> patch by Juergen Pfeifer:

- + factor lib\_menu and lib\_form into smaller modules
- + clean up the interface between panel and SCREEN
- + minor changes to the Ada95 mouse support implementation
- + minor bugfix in C++ binding to ripoff windows
- + fix a few Ada95 html documentation pages

971018

- + split-out lib\_ungetch.c, make runtime link to resizeterm() to decouple those modules from lib\_restart.c
- + add xterm-xf86-v39t description to terminfo.src
- + reset SP->\_endwin in lib\_tstp.c cleanup() function after calling endwin() to avoid unnecessary repainting if the application has established an atexit function, etc. Encountered this problem in the c++ demo, whose destructors repaint the screen.
- + combine \_nc\_get\_screensize() and resizeterm() calls as new function \_nc\_update\_screensize().
- + minor fixes to allow compile with g++ (suggested by Nelson H. F. Beebe).
- + implement install-rules for Ada95 makefiles.
- + use screen\_lines or MAXLINES as needed where LINES was coded, as well as screen\_columns for COLS, in the ncurses library.

> patch by Alexander V. Lukyanov:

- + modify logic for ripped-off lines to handle several SCREENs.

> patch by Juergen Pfeifer:

- + factors lib\_slk.c into some smaller modules
- + factors panel.c into some smaller modules
- + puts the static information about the current panel stack into the SCREEN structure to allow different panel stacks on different screens.
- + preliminary fix for an error adjusting LINES to account for ripped-off lines.

971011

- + move `_nc_max_click_interval` and other mouse interface items to `SCREEN` struct so that they are associated with a single terminal, and also save memory when the application does not need a mouse (roughly 3k vs 0.5k on Linux).
- + modify `mouseinterval()` so that a negative parameter queries the click-interval without modifying it.
- + modify ncurses 'i' test to work with ncurses' apparent extension from SVr4, i.e., allows `nocbreak+noecho` (analysis by Alexander V. Lukyanov).
- + add configure options `--with-ada-includes` and `--with-ada-objects`, to drive Ada95 binding install (not yet implemented).
- + install C++ binding as `-Incurses++` and associated headers with the other ncurses headers.
- + fix header uninstall if configure `--srcdir` is used.
- > minor interface changes to support 'tack' program
- TD  
(request by Daniel Weaver <danw@znyx.com>).
- + export functions `_nc_trans_string()` and `_nc_msec_cost()`.
- + add variable `_nc_nulls_sent`, to record the number of padding characters output in `delay_output()`.
- + move tests for `generic_type` and `hard_copy` terminals in `setupterm()` to the end of that function so that the library will still be initialized, though not generally useful for curses programs.
- > patches by Alexander V. Lukyanov:
  - + modify `ClrBottom()` to avoid using `clr_eos` if there is only one line to erase.
  - + typo in configure `--help`.
- > patch by J T Conklin (with minor resync against Juergen's changes)
  - + split-out `lib_flash.c` from `lib_bEEP.c`
  - + split-out `lib_hline.c` and `lib_vline.c` from `lib_box.c`
  - + split-out `lib_wattron.c`, `lib_wattroff.c` from `lib_addch.c`

971005

- > patch by Juergen Pfeifer:
  - + correct source/target of `c++/edit_cfg.sh`

971004

- + add color, mouse support to `kterm` terminfo entry.
- + modify `lib_mouse.c` to recognize `rxvt`, `kterm`, `color_xterm` also as providing "xterm"-style mouse.
- + updated `rxvt`'s terminfo description to correspond to 2.21b, with fixes for the `acsc` (the `box1` capability is incorrect, `ech1` does not work).
- + fix logic in `parse_entry.c` that discarded `acsc` when 'synthesizing' an entry from equivalents in XENIX or AIX. This lets ncurses handle the distribution copy of `rxvt`'s terminfo.

- + modify acsc capability for linux and linux-koi8 terminfo descriptions (from Pavel Roskin <pavel@absolute.spb.su>).
- + corrected definition in curses.h for ACS\_LANTERN, which was 'T' rather than 'i' (see 970802).
- + updated terminfo.src with reformatted acsc entries, and repaired the trashed entries with spurious '\ ' characters that this exposed.
- + add logic to dump\_entry.c to reformat acsc entries into canonical form (sorted, unique mapping).
- + add configure script to generate c++/etip.h
- + add configure --with-develop option, to enable by default most of the experimental options (requested by Alexander V. Lukyanov).
- + rename 'deinstall' to 'uninstall', following GNU convention (suggested by Alexander V. Lukyanov).
- > patches by Alexander V. Lukyanov:
  - + modify tactics 2 and 5 in onscreen\_mvcur(), to allow them on the last line of the screen, since carriage return will not cause a newline.
  - + remove clause from PutCharLR() that would try to use eat\_newline\_glitch since that apparently does not work on some terminals (e.g., M\$ telnet).
  - + correct a limit check in scroll\_csr\_backward()
- > patches by Juergen Pfeifer:
  - + adds dummy implementations of methods above() and below() to the NCursesPanel class.
  - + fixes missing returncode in NCursesWindow::ripoffline()
  - + fixes missing returncode in TestApplication::run() in demo.cc
  - + We should at least give a comment in etip.h why it is currently a problem to install the C++ binding somewhere
  - + makes the WINDOW\* argument of wenclose() a const.
  - + modifies several of the routines in lib\_adabind.c to use a const

WINDOW\* argument.

970927

- + add 'deinstall' rules.
- + use explicit assignments in configure --without-progs option to work around autoconf bug which doesn't always set \$withval.
- + check for ldconfig, don't try to run it if not found.
- + implement simple/unoptimized case in lib\_douupdate.c to handle display with magic cookie glitch, tested with ncurses.c program.
- + correct missing \_tracef in getmouse(), to balance the returnCode macro.
- + simplify show\_attr() in ncurses.c using termattrs().
- > patches by Juergen Pfeifer:
  - + provides missing inlines for mvw[hv]line in cursesw.h of the C++ binding
  - + fixes a typo in a comment of frm\_driver.c
  - + Enhances Ada95 Makefiles to fulfill the requirement of GNAT-3.10 that

generics should be compiled. Proper fixes to the configuration scripts are also provided.

970920

- + several modifications to the configure script (requested by Ward Horner):
  - + add configure options --without-progs, to suppress the build of the utility programs, e.g., for cross-compiling.
  - + add \$(HOSTCCFLAGS) and \$(HOSTLDFLAGS) symbols to ncurses Makefile.in, to simplify setup for cross compiling.
  - + add logic in configure script to recognize "--target=vxworks", and generate load/install actions for VxWorks objects.
- + move typedef for sigaction\_t into SigAction.h to work around problem generating lint library.
- + modify fty\_regex.c to reflect renaming of ifdef's for regular expressions.
- + simplify ifdef in lib\_setup.c for TIOCGWINSZ since that symbol may reside in <sys/ioctl.h>.
- + merge testcurs.c with version from PDCurses 2.3, clarifying some of the more obscure tests, which rely upon color.
- + use macros getbegyx() and getmaxyx() in newdemo.c and testcurs.c
- + modify ncurses.c to use getbegyx() and getmaxyx() macros to cover up implementation difference wrt SVr4 curses, allow 's' test to work.
- + add missing endwin() to testscanw.c program (reported by Fausto Saporito <fausap@itb.it>).
- + fixes/updates for Makefile.glibc and related files under sysdeps (patch by H.J.Lu).
- > patches by Juergen Pfeifer:
  - + add checks for null pointers, especially WINDOW's throughout the ncurses library.
  - + solve a problem with wrong calculation of panel overlapping (reported by Ward Horner):
    - + make sure that a panel's window isn't a pad.
    - + do more error checking in module lib\_touch.c
- + missing files for Ada95 binding from the last patch
- + synch. of generated html pages (RCS-Id's were wrong in html files)
- + support for Key\_Resize in Ada binding
- + changed documentation style in ./c++/cursesm.h
- > patches by Alexander V. Lukyanov:
  - + undo attempt to do recursive inlining for PutChar(), noting that it did not improve timing measurably, but inflated the size of lib\_douupdate.o

970913

- + modify rain.c to use color.
- + correct scroll\_csr\_backward() to match scroll\_csr\_forward().

- + minor adjustment to llib-Incurses, to work with Solaris 2.5.1
- + minor fixes to sysdeps/unix/sysv/linux/configure to reflect renaming of configure cache variables in 970906.
- + correct logic involving changes to O\_VISIBLE option in Synchronize\_Options function in frm\_driver.c (Tony Hoffmann <Tony.Hoffmann@hia.nrc.ca>)
- + add \$(HOSTCC) symbol to ncurses Makefile.in, to simplify setup for cross compiling (suggested by Chris Johns).
- + modify ifdef in lib\_setup.c to only include <sys/ioctl.h> if we can use it to support screen-size calculation (reported by Chris Johns).
- + #undef unctrl to avoid symbol conflict in port to RTEMS (reported by Chris Johns <cjohns@plessey.com.au>)
- > patches by Juergen Pfeifer:
  - + simplified, made minor corrections to Ada95 binding to form fieldtype.
  - + The C++ binding has been enhanced:
    - + Improve NCursesWindow class: added additional methods to cover more ncurses functionality. Make refresh() and noutrefresh() virtual members to allow different implementation in the NCursesPanel class.
    - + CAUTION: changed order of parameters in vline() and hline() of NCursesWindow class.
    - + Make refresh() in NCursesPanel non-static, it is now a reimplementaion of refresh() in the base class. Added noutrefresh() to NCursesPanel.
    - + Added NCursesForm and related classes to support libform functionality.
    - + Moved most of configuration related stuff from cursesw.h to etip.h
    - + Added NCursesApplication class to support easy configuration of menu and forms related attributes as well as ripped of title lines and Soft-Label-Keys for an application.
    - + Support of Auto-Cleanup for a menu's fieldlist.
    - + Change of return type for current\_item() and operator[] for menus.
    - + Enhanced demo.
    - + Fixed a bug in form/fld\_def.c: take into account that copyarg and freearg for a fieldtype may be NULL, makearg must not be NULL
    - + Fixed a bug in form/fld\_type.c: in set\_fieldtype\_arg() makearg must not be NULL, copyarg and freearg may be NULL.
    - + Fixed a bug in form/frm\_def.c: Allow Disconnect\_Fields() if it is already disconnected.
    - + Enhance form/frm\_driver.c: Allow growth of dynamic fields also on navigation requests.
    - + Fixed a bug in form/fty\_enum.c: wrong position of postincrement in case-insensitiva comparision routine.
    - + Enhanced form/lib\_adabind.c with function \_nc\_get\_field() to get a

- forms field by index.
- + Enhanced menu/m\_adabind.c with function `_nc_get_item()` to get a menu item by index.
- + Fixed in curses.h.in: make `chtype` argument for `pechochar()` constant. Mark `wbkgdset()` as implemented, remove `wbkgdset` macro, because it was broken (didn't handle colors correctly).
- + Enhanced lib\_mouse.c: added `_nc_has_mouse()` function
- + Added `_nc_has_mouse()` prototype to curses.priv.h
- + Modified lib\_bkgd.c: hopefully correct implementation of `wbkgdset()`; streamlined implementation of `wbkgd()`
- + Modified lib\_mvwin.c: Disable move of a pad. Implement (costly) move of subwindows. Fixed update behavior of movements of regular windows.
- + Fixed lib\_pad.c: make `chtype` argument of `pechochar()` const.
- + Fixed lib\_window.c: `dupwin()` is not(!) in every bit a really clone of the original. Subwindows become regular windows by doing a `dupwin()`.
- + Improved manpage `form_fieldtype.3x`
- > patches by Alexander V. Lukyanov:
  - + simplify the `PutChar()` handling of `exit_am_mode`, because we already know that `auto_right_margin` is true.
  - + add a check in `PutChar()` for ability to insert to the case of shifting character to LR corner.
  - + in terminal initialization by `_nc_screen_resume()`, make sure that terminal right margin mode is known.
  - + move logic that invokes `touchline()`, or does the equivalent, into `_nc_scroll_window()`.
  - + modify scrolling logic use of insert/delete line capability, assuming that they affect the screen contents only within the current scrolling region.
  - + modify `rain.c` to demonstrate `SIGWINCH` handler.
  - + remove logic from `getch()` that would return an `ERR` if the application called `getch()` when the cursor was at the lower-right corner of the physical screen, and the terminal does not have insert-character ability.
  - + change `view.c` so that it breaks out of `getch()` loop if a `KEY_RESIZE` is read, and modify logic in `getch()` so this fix will yield the desired behavior, i.e., the screen is repainted automatically when the terminal window is resized.

970906

- + add configure option `--enable-sigwinch`
- + modify `view.c` to test `KEY_RESIZE` logic, with `-r` option.
- + modify `testcurs.c` to eliminate misleading display wrt cursor type by testing if the terminal supports `cnorm`, `civis`, `cvvis`.
- + several fixes for m68k/NeXT 4.0, to bring `cur_term`, `_nc_curr_line` and

\_nc\_curr\_col variables into linked programs: move these variables, making new modules lib\_cur\_term and trace\_buf (reported by Francisco Alberto Tomei Torres <fatomei@sandburg.unm.edu>).

> patches by Alexander V. Lukyanov:

- + add pseudo-functionkey KEY\_RESIZE which is returned by getch() when the SIGWINCH handler has been called since the last call to doupdate().
- + modify lib\_twait.c to hide EINTR only if HIDE\_EINTR is defined.
- + add SIGWINCH handler to ncurses library which is used if there is no application SIGWINCH handler in effect when the screen is initialized.
- + make linked list of all SCREEN structures.
- + move curses.h include before definition of SCREEN to use types in that structure.
- + correction to ensure that wgetstr uses only a newline to force a scroll (970831).

970831

- + add experimental configure option --enable-safe-sprintf; the normal mode now allocates a buffer as large as the screen for the lib\_printw.c functions.
- + modify wgetch to refresh screen when reading ungetch'd characters, since the application may require this - SVr4 does this.
- + refine treatment of newline in wgetstr to echo only when this would force the screen to scroll.

970830

- + remove override in wgetstr() that forces keypad(), since SVr4 does not do this.
- + correct y-reference for erasure in wgetstr() when a wrap forces a scroll.
- + correct x-position in waddch() after a wrap forces a scroll.
- + echo newline in wgetstr(), making testscanw.c scroll properly when scanw is done.
- + modify vwscanw() to avoid potential buffer overflow.
- + rewrote lib\_printw.c to eliminate fixed-buffer limits.

> patches by Alexander V. Lukyanov:

- + correct an error in handling cooked mode in wgetch(); processing was in the wrong order.
- + simplified logic in wgetch() that handles backspace, etc., by using wechochar().
- + correct wechochar() so that it interprets the output character as in waddch().
- + modify pechochar() to use pefresh() rather than doupdate(), since the latter does not guarantee immediate refresh of the pad.
- + modify pechochar() so that if called with a non-pad WINDOW, will



invoke wechochar() instead.  
+ modify fifo indices to allow fifo to be longer than 127 bytes.

970823

+ add xterm-8bit  
to terminfo.src  
+ moved logic for SP->\_fifohold inside check\_pending() to make it  
work properly when we add calls to that function.  
+ ensure that bool functions return only TRUE or FALSE, and TRUE/FALSE  
are assigned to bool values (patch by H.J.Lu).  
> patches by Alexander V. Lukyanov:  
+ several fixes to getch:  
1. Separate cooked and raw keys in fifo  
2. Fix the case of ungetch'ed KEY\_MOUSE  
3. wrap the code for hiding EINTR with ifdef HIDE\_EINTR  
4. correctly handle input errors (i.e., EINTR) without loss of raw  
keys  
5. recognize ESC KEY\_LEFT and similar  
6. correctly handle the case of reception of KEY\_MOUSE from gpm  
+ correct off-by-one indexing error in \_nc\_mouse\_parse(), that caused  
single mouse events (press/release) to be ignored in favor of  
composed events (click). Improves on a fix from integrating gpm  
support in 961229.  
+ add another call to check\_pending, before scrolling, for  
line-breakout optimization  
+ improve hashmap.c  
by  
1. fixed loop condition in grow\_hunks()  
2. not marking lines with offset 0  
3. fixed condition of 'too far' criteria, thus one-line hunks are  
ignored and two lines interchanged won't pass.  
+ rewrote/simplified \_nc\_scroll\_optimize() by separating into two  
passes, forward/backward, looking for chunks moving only in the given  
direction.  
+ move logic that emits sgr0 when initializing the screen to  
\_nc\_screen\_init(), now invoked from newterm.  
+ move cursor-movement cleanup from endwin() into \_nc\_mvcur\_wrap()  
function and screen cleanup (i.e., color) into \_nc\_screen\_wrap()  
function.  
+ add new functions \_nc\_screen\_init(), \_nc\_screen\_resume() and  
\_nc\_screen\_wrap().  
+ rename \_nc\_mvcur\_scrolln() to \_nc\_scrolln().  
+ add a copy of acs\_map[] to the SCREEN structure, where it can be  
stored/retrieved via set\_term().  
+ move variables \_nc\_idcok, \_nc\_idlok, \_nc\_windows into the SCREEN  
structure.

970816

- + implement experimental `_nc_perform_scroll()`.
- +  
 modify `newterm` (actually `_nc_setupscreen()`) to emit an `sgr0` when initializing the screen, as does SVr4 (reported by Alexander V. Lukyanov).
- + added `test_progs` rule to `ncurses/Makefile`.
- + modify `test/configure.in` to check if `initscr` is already in `$LIBS` before looking for (n)curses library.
- + correct version-number in `configure` script for OSF1 shared-library options (patch by Tim Mooney).
- + add `-DNDEBUG` to `CPPFLAGS` for `--enable-assertions` (as Juergen originally patched) since the c++ demo files do not necessarily include `ncurses_cfg.h`
- + supply default value for `--enable-assertions` option in `configure` script (reported by Kriang Lerdsuwanakij <lerdsuwa@scf-fs.usc.edu>).
- > patches by Alexander V. Lukyanov:
- + correct/simplify logic of `werase()`, `wclrtoeol()` and `wclrbot()`. See example `firstlast.c`
- + optimize `waddch_literal()` and `waddch_nosync()` by factoring out common subexpressions.
- + correct sense of `NDEBUG` `ifdef` for `CHECK_POSITION` macro.
- + corrections to `render_char()`, to make handling of colored blanks match SVr4 curses, as well as to correct a bug that xor'd space against the background character.
- + replaced hash function with a faster one (timed it)
- + rewrote the hashmap algorithm to be one-pass, this avoids multiple `cost_effective()` calls on the same lines.
- + modified `cost_effective()` so it is now slightly more precise.
- > patches for glibc integration (H.J.Lu):
- + add modules `define_key`, `keyok`, `name_match`, `tries`
- + add makefile rules for some of the unit tests in `ncurses` (`mvcur`, `captinfo`, `hardscroll`, `hashmap`).
- + update Linux `configure-script` for wide-character definitions.

970809

- + modify `_tracebits()` to show the character size (e.g., CS8).
- + modify `tparm()` to emit `'\200'` where the generated string would have a null (reported by From: Ian Dall <Ian.Dall@dsto.defence.gov.au> for terminal type `ncr7900`).
- + modify `install` process so that `ldconfig` is not invoked if the package is built with an `install-prefix`.
- +  
 correct test program for `chtype` size (reported by Tim Mooney).
- + add `configure` option `--disable-scroll-hints`, using this to `ifdef` the logic that computes indices for `_nc_scroll_optimize()`.
- + add module `ncurses/softscroll.c`, to perform single-stage computation of scroll indices used in `_nc_scroll_optimize()`. This is faster than

- the existing scrolling algorithm, but tends to make too-small hunks.
- + eliminate fixed buffer size in `_nc_linedump()`.
- + minor fixes to `lib_douupdate.c` to add tradeoff between `clr_eol` (el) and `clr_bol` (el1), refine logic in `ClrUpdate()` and `ClrBottom()` (patch by Alexander V. Lukyanov).
- + add `test/testaddch.c`, from a pending patch by Alexander V. Lukyanov.
- + correct processing of "configure --enable-assertions" option (patch by Juergen Pfeifer).

970802

- + add '-s' (single-step) option to `test/hashtest.c`, correct an error in loop limit for '-f' (footer option), toggle `scrollok()` when writing footer to avoid wrap at lower-right corner.
- + correct behavior of `clrtoeol()` immediately after wrapping cursor, which was not clearing the line at the cursor position (reported by Liviu Daia <daia@stoilow.imar.ro>).
- + corrected mapping for `ACS_LANTERN`, which was 'I' rather than 'i' (reported by Klaus Weide <kweide@tezcat.com>).
- + many corrections to make `progs/capconvert` work, as well as make it reasonably portable and integrated with `ncurses 4.1` (reported by Dave Furstenau <df@ravine.binary.net>).

970726

- + add flag `SP->_fifohold`, corresponding logic to modify the behavior of the line breakout logic so that if the application does not read input, refreshes will not be stopped, but only slowed.
- + generate `slk_attr_off()`, `slk_attr_on()`, `slk_attr_set()`, `vid_attr()`, `ifdef'd` for wide-character support, since `ncurses' WA_xxx` attribute masks are identical with the `A_xxx` masks.
- + modify `MKlib_gen.sh` to generate `ifdef'd` functions to support optional configuration of wide-characters.
- + modify `tset` to behave more like `SVr4's tset`, which does not modify the settings of `intr`, `quit` or `erase` unless they are given as command options (reported by Nelson H. F. Beebe <beebe@math.utah.edu>).
- + modify `tset` to look in `/etc/ttys` or `/etc/ttytype` if the configuration does not have `gettynam()`.
- + extend `baudrate` table in `tset.c` to match `baudrate()` function.
- + add table entries for 230400 and 460800 bd to `baudrate()` function.
- + improve breakout logic by allowing it before the first line updated, which is what `SVr4 curses` does (patch by Alexander V. Lukyanov).
- + correct initialization of `vcost` in `relative_move()`, for cursor-down case (patch by Alexander V. Lukyanov).
- > nits gleaned from Debian distribution of 1.9.9g-3:
  - + install symbolic link for `intotocap`.
  - + reference `libc` directly when making shared libraries.
  - + correct renaming of `curs_scr_dmp.3x` in `man_db.renames`.

+ guard tgetflag() and other termcap functions against null cur\_term pointer.

970719

+ corrected

initial state of software echo (error in 970405, reported by Alexander V. Lukyanov).

+ reviewed/added messages to configure script, so that all non-test options should be accompanied by a message.

+ add configure check for long filenames, using this to determine if it is safe to allow long aliases for terminal descriptions as does SVr4.

+ add configure options for widec (wide character), hashmap (both experimental).

> patch by Alexander V. Lukyanov:

+ hashmap.c - improved by heuristic, so that scroll test works much better when csr is not available.

+ hardscroll.c - patched so that it continues to scroll other chunks after failure to scroll one.

+ lib\_douupdate.c - \_nc\_mvcur\_scrolln extended to handle more cases; csr is avoided as it is relative costly. Fixed wrong coordinates in one case and wrong string in TRACE.

> patch by Juergen Pfeifer:

+ modify C++ binding to compile on AIX 4.x with the IBM C-SET++ compiler.

970712

+ remove alternate character

set from kterm terminfo entry; it uses the shift-out control for a purpose incompatible with curses, i.e., font switching.

+ disentangle 'xterm' terminfo entry from some derived entries that should be based on xterm-r6 instead.

+ add cbt to xterm-xf86-xv32 terminfo entry; I added the emulation for XFree86 3.1.2F, but overlooked its use in terminfo then - T.Dickey.

+ correct logic in lib\_mvcur.c that uses back\_tab.

970706

+ correct change from 970628 to ClrUpdate() in lib\_douupdate.c so that contents of curscr are saved in newsr before clearing the screen.

This is needed to make repainting work with the present logic of TransformLine().

+ use napms() rather than sleep() in tset.c to avoid interrupting I/O.

970705

+ add limit checks to \_nc\_read\_file\_entry() to guard against overflow of buffer when reading incompatible terminfo format, e.g, from OSF/1.

+ correct some loop-variable errors in xmc support in lib\_douupdate.c

- + modify ncurses 'b' test
- to add gaps, specified by user, to allow investigation of interaction with xmc (magic cookie) code.
- + correct typo in 970524 mods to xmas.c, had omitted empty parameter list from has\_colors(), which gcc ignores, but SVr4 does not (reported by Larry Virden).
- + correct rmso capability in wy50-mc description.
- + add configure option "--enable-hard-tabs", renamed TABS\_OK ifdef to USE\_HARD\_TABS.
- > patch by Juergen Pfeifer:
  - + Add bindings for keyok() and define\_key() to the Ada95 packages.
  - + Improve man pages menu\_post.3x and menu\_format.3x
  - + Fix the HTML pages in the Ada95/html directory to reflect the above changes.

#### 970628

- + modify change from 970101 to ClrUpdate() in lib\_doupdate.c so that pending changes to both curscr and newscr are flushed properly. This fixes a case where the first scrolling operation in nvi would cause the screen to be cleared unnecessarily and repainted before doing the indexing, i.e., by repeatedly pressing 'j' (reported by Juergen Pfeifer).
- + correct error in trans\_string() which added embedded newlines in a terminfo description to the stored strings.
- + remove spurious newlines from sgr in wyse50 (and several other) terminfo descriptions.
- + add configure option for experimental xmc (magic cookie) code, "--enable-xmc-glitch". When disabled (the default), attributes that would store a magic cookie are suppressed in vidputs(). The magic cookie code is far from workable at this stage; the configuration option is a stopgap.
- + move \_nc\_initscr() from lib\_initscr.c to lib\_newterm.c
- + correct path for invoking make\_keys (a missing "./").

#### 970621

- + correct sign-extension problem with "infocmp -e", which corrupted asc values computed for linux fallback data.
- + correct dependency on ncurses/names.c (a missing "./").
- + modify configure script to use '&&' even for cd'ing to existing directories to work around broken shell interpreters.
- + correct a loop-limit in \_nc\_hash\_map() (patch by Alexander V. Lukyanov).

#### 970615

- + restore logic in \_nc\_scroll\_optimize() which marks as touched the lines in curscr that are shifted.

- + add new utility 'make\_keys' to compute keys.tries as a table rather than a series of function calls.
- + correct include-dependency for tic.h used by name\_match
- + removed buffer-allocation for name and description from m\_item\_new.c, since this might result in incompatibilities with SVr4. Also fixed the corresponding Ada95 binding module (patch by Juergen Pfeifer, report by Avery Pennarun <apenwarr@foxnet.net>)
- + removed the mechanism to timestamp the generated Ada95 sources. This resulted always in generating patches for the HTML doc, even when nothing really changed (patch by Juergen Pfeifer).
- + improve man page mitem\_new.3x (patch by Juergen Pfeifer).

970614

- + remove ech capability from rxvt description because it does not work.
- + add missing case logic for infocmp -I option (reported by Lorenzo M. Catucci <lorenzo@argon.roma2.infn.it>)
- + correct old bug in pnoutrefresh() unmasked by fix in 970531; this caused glitches in the ncurses 'p' test since the area outside the pad was not compared when setting up indices for \_nc\_scroll\_optimize.
- + rewrote tracebits() to workaround misdefinition of TOSTOP on Ultrix 4.4, as well as to eliminate fixed-size buffer (reported by Chris Tanner <tannerc@aecl.ca>)
- + correct prototype for termattrs() as per XPG4 version 2.
- + add placeholder prototypes for color\_set(), erasewchar(), term\_attrs(), wcolor\_set() as per XPG4 version 2.
- + correct attribution for progs/progs.priv.h and lib\_twait.c
- + improve line-breakout logic by checking based on changed lines rather than total lines (patch by Alexander V. Lukyanov).
- + correct loop limits for table-lookup of enumerated value in form (patch by Juergen Pfeifer).
- + improve threshold computation for determining when to call ClrToEOL (patch by Alexander V. Lukyanov).

970531

- + add configure option --disable-database to force the library to use only the fallback data.
- + add configure option --with-fallbacks, to specify list of fallback terminal descriptions.
- + add a symbolic link for ncurses.h during install; too many programs still assume there's an ncurses.h
- + add new terminfo.src entry for xterm-xf86-v33.
- + restore terminfo.src entry for emu to using setf/setb, since it is not, after all, generating ANSI sequences. Corrected missing comma that caused setf/setb entries to merge.
- + modify mousemask() to use keyok() to enable/disable KEY\_MOUSE, so that applications can disable ncurses' mouse and supply their own

handler.

- + add extensions `keyok()` and `define_key()`. These are designed to allow the user's application better control over the use of function keys, e.g., disabling the ncurses `KEY_MOUSE`. (The `define_key` idea was from a mailing-list thread started by Kenneth Albanowski <kjahds@kjahds.com> Nov'1995).
- + restore original behavior in ncurses 'g' test, i.e., explicitly set the keypad mode rather than use the default, since it confuses people.
- + rewrote the `newdemo` banner so it's readable (reported by Hugh Daniel).
- + tidy up exit from `hashtest` (reported by Hugh Daniel).
- + restore check for `^Q` in ncurses 'g' test broken in 970510 (reported by Hugh Daniel)
- + correct `tput` program, checking return-value of `setupterm` (patch by Florian La Roche).
- + correct logic in `pnoutrefresh()` and `pechochar()` functions (reported by Kriang Lerdsuwanakij <lerdsuwa@scf.usc.edu>). The computation of 'wide' date to eric's #283 (1.9.9), and the `pechochar` bug to the original implementation (1.9.6).
- + correct typo in `vt102-w` `terminfo.src` entry (patch by Robert Wuest <rwuest@sire.vt.com>)
- + move calls of `_nc_background()` out of various loops, as its return value will be the same for the whole window being operated on (patch by J T Conklin).
- + add macros `getcur[xy]` `getbeg[xy]` `getpar[xy]`, which are defined in SVr4 headers (patch by J T Conklin <jtc@NetBSD.ORG>)
- + modify `glibc` `addon-configure` scripts (patch by H.J.Lu).
- + correct a bug in `hashmap.c`: the size used for clearing the hashmap table was incorrect, causing stack corruption for large values of `LINES`, e.g., `>MAXLINES/2` (patch by Alexander V. Lukyanov).
- + eric's `terminfo` 9.13.23 & 9.13.24 changes: replaced `minitel-2` entry, added `MGR`, `ansi-nt` (note: the changes described for 9.13.24 have not been applied).
- > several changes by Juergen Pfeifer:
  - + correct a missing error-return in `form_driver.c` when wrapping of a field is not possible.
  - + correct logic in `form_driver.c` for configurations that do not have `memccpy()` (reported by Sidik Isani <isani@cfht.hawaii.edu>)
  - + change several `c++` binding functions to `inline`.
  - + modify `c++` menu binding to inherit from panels, for proper initialization.
  - + correct freeing of menu items in `c++` binding.
  - + modify `c++` binding to reflect removal of `const` from user data pointer in `forms/menus` libraries.

970524

- + add description of xterm-16color.
- + modify name of shared-library on \*BSD to end with \$(REL\_VERSION) rather than \$(ABI\_VERSION) to match actual convention on FreeBSD (cf: 960713).
- + add OpenBSD to shared-library case, same as NetBSD and FreeBSD (reported by Hugh Daniel <hugh@rat.toad.com>).
- + corrected include-dependency in menu/Makefile so that "make install" works properly w/o first doing "make".
- + add fallback definition for isascii, used in infocmp.
- + modify xmas to use color, and to exit right away when a key is pressed.
- + modify gdc so that the scrolled digits function as described (there was no time delay between the stages, and the digits overwrote the bounding box without tidying up).
- + modify lib\_color.c to use setaf/setab only for the ANSI color codes 0 through 7. Using 16 colors requires setf/setb.
- + modify ncurses 'c' test to work with 16 colors, as well as the normal 8 colors.
- + remove  
const qualifier from user data pointer in forms and menus  
libraries (patch by Juergen Pfeifer).
- + rewrote 'waddchnstr()' to avoid using the \_nc\_waddch\_nosync() function, thereby not interpreting tabs, etc., as per spec (patch by Alexander V. Lukyanov).

970517

- + suppress check for pre-existing ncurses header if the --prefix option is specified.
- + add configure options "--with-system-type" and "--with-system-release" to assist in checking the generated makefiles.
- + add configure option "--enable-rpath" to allow installers to specify that programs linked against shared libraries will have their library path embedded, allowing installs into nonstandard locations.
- + add flags to OSF1 shared-library options to specify version and symbol file (patch by Tim Mooney <mooney@dogbert.cc.ndsu.NoDak.edu>)
- + add missing definition for ABI\_VERSION to c++/Makefile.in (reported by Satoshi Adachi <adachi@wisdom.aa.ap.titech.ac.jp>).
- + modify link flags to accommodate  
HP-UX linker which embeds absolute  
pathnames in executables linked against shared libraries (reported by Jason Evans <jasone@mr.c.uidaho.edu>, solved by Alan Shutko <ats@hubert.wustl.edu>).
- + drop unnecessary check for attribute-change in onscreen\_mvcur() since mvcur() is the only caller within the library, and that check in turn is exercised only from lib\_douupdate.c (patch by Alexander V.



- Lukyanov).
- + add 'blank' parameter to `_nc_scroll_window()` so `_nc_mvcur_scrolln()` can use the background of `stdscr` as a parameter to that function (patch by Alexander V. Lukyanov).
- + moved `_nc_mvcur_scrolln()` from `lib_mvcur.c` to `lib_douupdate.c`, to use the latter's internal functions, as well as to eliminate unnecessary cursor save/restore operations (patch by Alexander V. Lukyanov).
- + omit parameter of `ClrUpdate()`, since it is called only for `newscr`, further optimized/reduced by using `ClearScreen()` and `TransformLine()` to get rid of duplicate code (patch by Alexander V. Lukyanov).
- + modify scrolling algorithm in `_nc_scroll_optimize()` to reject hunks that are smaller than the distance to be moved (patch by Alexander V. Lukyanov).
- + correct a place where the panel library was not `ifdef'd` in `ncurses.c` (Juergen Pfeifer)
- + documentation fixes (Juergen Pfeifer)

970515 4.1 release for upload to prep.ai.mit.edu

- + re-tag changes since 970505 as 4.1 release.

970510

- + modify `ncurses 'g'` test to allow mouse input
- + modify default xterm description to include mouse.
- + modify configure script to add `-Wwrite-strings` if gcc warnings are enabled while configuring `--enable-const` (and fixed related warnings).
- + add toggle, status display for keypad mode to `ncurses 'g'` test to verify that keypad and `scrollok` are not inherited from parent window during a call to `newwin`.
- + correction to `MKexpanded.sh` to make it work when configure `--srcdir` is used (reported by H.J.Lu).
- + revise test for `bool`-type, ensuring that it checks if `builtin.h` is available before including it, adding test for `sizeof(bool)` equal to `sizeof(short)`, and warning user if the size cannot be determined (reported by Alexander V. Lukyanov).
- + add files to support configuration of `ncurses` as an add-on library for GNU `libc` (patch by H.J.Lu <hjl@lucon.org>)

970506

- + correct buffer overrun in `lib_traceatr.c`
- + modify change to `lib_vidattr.c` to avoid redundant `orig_pair`.
- + turn on `'echo()'` in `hanoi.c`, since it is initially off.
- + rename local `'errno'` variable in `etip.h` to avoid conflict with global (H.J.Lu).
- + modify configure script to cache `LD`, `AR`, `AR_OPTS` (patch by H.J.Lu <hjl@lucon.org>)

#### 970505 4.1 pre-release

- + regenerate the misc directory html dumps without the link list, which is not useful.
- + correct dependency in form directory makefile which caused unnecessary recompiles.
- + correct substitution for ABI\_VERSION in test-makefile
- + modify install rules for shared-library targets to remove the target before installing, since some install programs do not properly handle overwrite of symbolic links.
- + change order of top-level targets so that 'include' immediate precedes the 'ncurses' directory, reducing the time between new headers and new libraries (requested by Larry Virden).
- + modify lib\_vidattr.c so that colors are turned off only before modifying other attributes, turned on after others. This makes the hanoi.c program display correctly on FreeBSD console.
- + modify debug code in panel library to print user-data addresses rather than the strings which they (may) point to.
- + add check to ensure that C++ binding and demo are not built with g++ versions below 2.7, since the binding uses templates.
- + modify c++ binding and demo to build and run with SGI's c++ compiler. (It also compiles with the Sun SparcWorks compiler, but the demo does not link, due to a vtbl problem).
- + corrections to demo.cc, to fix out-of-scope variables (Juergen Pfeifer).

#### 970503

- + correct memory leak in \_nc\_trace\_buf().
- + add configure test for regexpr.h, for Unixware 1.x.
- + correct missing "./" prefixing names of generated files in ncurses directory.
- + use single-quotes in configure scripts assignments for MK\_SHARED\_LIB to workaround shell bug on FreeBSD 2.1.5
- + remove tabs from intermediate #define's for GCC\_PRINTF, GCC\_SCANF that caused incorrect result in ncurses\_cfg.h
- + correct initialization in lib\_trace.c, which omitted version info.
- + remove ech, e11 attributes from cons25w description; they appear to malfunction in FreeBSD 2.1.5
- + correct color attributes in terminfo.src and lib\_color.c to match SVr4 behavior by interchanging codes 1,4, 3,6 in the setf/setb capabilities.
- + use curs\_set() rather than checks via tigetstr() for test programs that hide the cursor: firework, rain, worm.
- + ensure that if the terminal lacks change\_scroll\_region, parm\_index and parm\_rindex are used only to scroll the whole screen (patch by

Peter Wemm).

- + correct `curs_set()` logic, which did not return ERR if the requested attributes did not exist, nor did it assume an unknown initial state for the cursor (patch by Alexander V. Lukyanov).
- + combine `IDcTransformLine` and `NoIDcTransformLine` to new `TransformLine` function in `lib_douupdate.c` (patch by Alexander V. Lukyanov).
- + correct `hashmap.c`, which did not update index information (patch by Alexander V. Lukyanov).
- + fixes for C++ binding and demo (see `c++/NEWS`) (Juergen Pfeifer).
- + correct index in `lib_instr.c` (Juergen Pfeifer).
- + correct typo in 970426 patch from Tom's cleanup of `lib_overlay.c` (patch by Juergen Pfeifer).

970426

- + corrected cost computation in `PutRange()`, which was using milliseconds compared to characters by adding two new members to the `SCREEN` struct, `_hpa_ch_cost` and `_cup_ch_cost`.
- + drop `ncurses/lib_unctrl.c`, add `ncurses/MKunctrl.awk` to generate a const array of strings (suggested by Alexander V. Lukyanov). The original suggestion in 970118 used a perl script.
- + rewrote `ncurses 'b'` test to better exercise magic-cookie (`xmc`), as well as noting the attributes that are not supported by a terminal.
- + trace the computation of cost values in `lib_mvcur.c`
- + modify `_nc_visbuf()` to use octal rather than hex, corrected sign extension bug in that function that caused buffer overflow.
- + modify trace in `lib_acs.c` to use `_nc_visbuf()`.
- + suppress trace within `_traceattr2()`.
- + correct logic of `_tracectype2()`, which did not account for repeats or redefinition within an `acsc` string.
- + modify debug-library version `baudrate()` to use environment variable `$BAUDRATE` to override speed computation. This is needed for regression testing.
- + correct problems shown by "weblint -pedantic".
- + update mailing-list information (now `ncurses@bsd.com`).

970419

- + Improve `form_field_validation.3x` manpage to better describe the precision parameter for `TYPE_NUMERIC` and `TYPE_INTEGER`. Provide more precise information how the range checking can be avoided. (patch by Juergen Pfeifer, reported by Bryan Henderson)
- + change type of min/max value of form types `TYPE_INTEGER` to long to match SVr4 documentation.
- + set the form window to `stdscr` in `set_form_win()` so that `form_win()` won't return null (patch by Juergen Pfeifer, reported by Bryan Henderson <bryanh@giraffe.netgate.net>).

970412

- + corrected ifdef'ing of inline (cf: 970321) for TRACE vs C++.
- + corrected toggle\_attr\_off() macro (patch by Andries Brouwer).
- + modify treatment of empty token in \$MANPATH to /usr/man (reported by <Andries.Brouwer@cw.nl>)
- + modify traces that record functions-called so that chtype and attr\_t values are expressed symbolically, to simplify reuse of generated test-scripts on SVr4 regression testing.
- + add new trace functions \_traceattr2() and \_tracechtype2()

970405

- + add configure option --enable-const, to support the use of 'const' where XSI should have, but did not, specify.  
This defines NCURSES\_CONST, which is an empty token otherwise, for strict compatibility.
- + make processing of configure options more verbose by echoing the --enable/--with values.
- + add configure option --enable-big-core
- + set initial state of software echo off as per XSI.
- + check for C++ builtin.h header
- + correct computation of absolute-path for \$INSTALL that dropped "-c" parameter from the expression.
- + rename config.h to ncurses\_cfg.h to avoid naming-conflict when ncurses is integrated into larger systems (adapted from diffs by H.J.Lu for libc).
- + correct inequality in lib\_douupdate.c that caused a single-char to not be updated when the char on the right-margin was not blank, idcok() was true (patch by Alexander V Lukyanov (in 970124), reported by Kriang Lerdsuwanakij <lerdsuwa@scf-fs.usc.edu> in 970329).
- + modify 'clean' rule in include/Makefile so that files created by configure script are removed in 'distclean' rule instead.

970328

- + correct array limit in tparam\_internal(), add case to interpret "%x" (patch by Andreas Schwab)
- + rewrote number-parsing in ncurses.c 'd' test; it did not reset the value properly when non-numeric characters were given (reported by Andreas Schwab <schwab@issan.informatik.uni-dortmund.de>)

970321

- + move definition of \_\_INTERNAL\_CAPS\_VISIBLE before include for progs.priv.h (patch by David MacKenzie).
- + add configuration summary, reordered check for default include directory to better accommodate a case where installer is configuring a second copy of ncurses (reported by Klaus Weide <kweide@tezcat.com>)

- + moved the #define for 'inline' as an empty token from the \$(CFLAGS\_DEBUG) symbol into config.h, to avoid redefinition warning (reported by Ward Horner).
- + modify test for bool builtin type to use 'unsigned' rather than 'unknown' when cross-compiling (reported by Ward Horner).

970315

- + add header dependencies so that "make install.libs" will succeed even if "make all" is not done first.
- + moved some macros from lib\_douupdate.c to curses.priv.h to use in expanded functions with ATAC.
- + correct implementation of lib\_instr.c; both XSI and SVr4 agree that the winnstr functions can return more characters than will fit on one line.

970308

- + modify script that generates lib\_gen.c to support traces of called & return.
- + add new configure option "--disable-macros", for testing calls within lib\_gen.c
- + corrected logic that screens level-checking of called/return traces.

970301

- + use new configure macro NC\_SUBST to replace AC\_PATH\_PROG, better addressing request by Ward Horner.
- + check for cross-compiling before trying to invoke the autoconf AC\_FUNC\_SETVBUF\_REVERSED macro (reported by Ward Horner)
- + correct/simplify loop in \_nc\_visbuf(), 970201 changes omitted a pointer-increment.
- + eliminate obsolete symbol SHARED\_ABI from dist.mk (noted by Florian La Roche).

970215

- + add configure option --enable-expanded, together with code that implements an expanded form of certain complex macros, for testing with ATAC.
- + disable CHECK\_POSITION unless --with-assertions is configured (Alexander V Lukyanov pointed out that this is redundant).
- + use keyname() to show traced chtype values where applicable rather than \_tracechar(), which truncates the value to 8-bits.
- + minor fixes to TRACE\_ICALLS, added T\_CREATE, TRACE\_CCALLS macros.
- + modify makefiles in progs and test directories to avoid using C preprocessor options on link commands (reported by Ward Horner)
- + correct ifdef/include-order for nc\_alloc.h vs lib\_freall.c (reported by Ward Horner)
- + modify ifdef's to use configure-defined symbols consistently

(reported by Ward Horner)  
+ add/use new makefile symbols AR, AR\_OPTS and LD to assist in non-UNIX ports (reported by Ward Horner <whorner@tsi-telsys.com>)  
+ rename struct try to struct tries, to avoid name conflict with C++ (reported by Gary Johnson).  
+ modify worm.c  
to hide cursor while running.  
+ add -Wcast-qual to gcc warnings, fix accordingly.  
+ use PutChar rather than PutAttrChar in ClrToEOL to properly handle wrapping (Alexander V Lukyanov).  
+ correct spurious echoing of input in hanoi.c from eric's #291 & #292 patches (reported by Vernon C. Hoxie <vern@zebra.alphacdc.com>).  
+ extend IRIX configuration to IRIX64  
+ supply missing install.libs rule needed after restructuring test/Makefile.in

970208

+ modify "make mostlyclean" to leave automatically-generated source in the ncurses directory, for use in cross-compiles.  
+ autogenerated object-dependencies for test directory  
+ add configure option --with-rcs-ids  
+ modify configuration scripts to generate major/minor/patch versions (suggested by Alexander V Lukyanov).  
+ supply missing va\_end's in lib\_scanw.c  
+ use stream I/O for trace-output, to eliminate fixed-size buffer  
+ add TRACE\_ICALLS definition/support to lib\_trace.c  
+ modify Ada95 binding to work with GNAT  
3.09 (Juergen Pfeifer).

970201

+ add/modify traces for called/return values to simplify extraction for test scripts.  
+ changed \_nc\_visbuf to quote its result, and to dynamically allocate the returned buffer.  
+ invoke ldconfig after installing shared library  
+ modify install so that overwrite applies to shared library -lcurses in preference to static library (reported by Zeyd M Ben-Halim 960928).  
+ correct missing ';' in 961221 mod to overwrite optional use of \$(LN\_S) symbol.  
+ fixes to allow "make install" to work without first doing a "make all" (suggested by Larry Virden).

970125

+ correct order of #ifdef for TABS\_OK.  
+ instrumented toe.c to test memory-leaks.  
+ correct memory-deallocation in toe.c (patch by Jesse Thilo).  
+ include <sys/types.h> in configuration test for regex.h (patch by Andreas Schwab)

+ make infocmp recognize -I option, for SVr4 compatibility (reported by Andreas Schwab <schwab@issan.informatik.uni-dortmund.de>)

#### 970118

+ add extension

'use\_default\_colors()', modified test applications that use default background (firework, gdc, hanoi, knight, worm) to demonstrate.

+ correct some limit checks in lib\_douupdate.c exposed while running worm.

+ use typeCalloc macro for readability.

+ add/use definition for CONST to accommodate testing with Solaris (SVr4) curses, which doesn't use 'const' in its prototypes.

+ modify ifdef's in test/hashtest.c and test/view.c to compile with Solaris curses.

+ modify \_tracedump() to pad pad colors & attrs lines to match change in 970101 showing first/last changes.

+ corrected location of terminating null on dynamically allocated forms fields (patch by Per Foreby).

#### 970111

+ added headers to make view.c compile on SCO with the resizeterm() code (i.e., struct winsize) - though this compiles, I don't have a suitable test configuration since SIGWINCH doesn't pass my network to that machine - T.Dickey.

+ update test/configure.in to supply some default substitutions.

+ modify configure script to add -lcurses after -lgpm to fix problem linking against static libraries.

+ add a missing noraw() to test/ncurses.c (places noted by Jeremy Buhler)

+ add a missing wclear() to test/testcurs.c (patch by Jeremy Buhler <jbuhler@cs.washington.edu>)

+ modify headers to accommodate compilers that don't allow duplicate "#define" lines for NCURSES\_VERSION (reported by Larry W. Virden <lvirden@cas.org>)

+ fix formatting glitch in curs\_getch.3x (patch by Jesse Thilo).

+ modify lib\_douupdate to make el, e1l and ed optimization use the can\_clear\_with macro, and change EmitRange to allow leaving cursor at the middle of interval, rather than always at the end (patch by Alexander V Lukyanov). This was originally 960929, resync 970106.

#### 970104

+ workaround defect in autoconf 2.12 (which terminates configuration if no C++ compiler is found) by adding an option --without-cxx.

+ modify several man-pages to use tbl, where .nf/.fi

was used (reported

by Jesse Thilo).

- + correct font-codes in some man-pages (patch by Jesse Thilo <Jesse.Thilo@pobox.com>)
- + use configure script's knowledge of existence of g++ library for the c++ Makefile (reported by Paul Jackson).
- + correct misleading description of --datadir configuration option (reported by Paul Jackson <pj@sam.engr.sgi.com>)

#### 970101

- + several corrections to `_nc_mvcur_scrolln()`, prompted by a bug report from Peter Wemm:
  - > the logic for `non_dest_scroll_region` was interchanged between the forward & reverse scrolling cases.
  - > multiple returns from the function allowed certain conditions to do part of an operation before discovering that it couldn't be completed, returning an error without restoring the cursor.
  - > some returns were ERR, where the function had completed the operation, because the insert/delete line logic was improperly tested (this was probably the case Peter saw).
  - > contrary to comments, some scrolling cases were tested after the insert/delete line method.
- + modify `_tracedump()` to show first/last changes.
- + modify param of `ClrUpdate()` in `lib_douupdate.c` to 'newsr', fixes refresh problem (reported by Peter Wemm) that caused nvi to not show result of ":r !ls" until a ^L was typed.

#### 961229 (internal alpha)

- + correct some of the writable-strings warnings (reported by Gary Johnson <gjohnson@season.com>). Note that most of the remaining ones are part of the XSI specification, and can't be "fixed".
- + improve include-dependencies in form, menu, panel directories.
- + correct logic of `delay_output()`, which would return early if there is data on stdin.
- + modify interface & logic of `_nc_timed_wait()` to support 2 file descriptors, needed for GPM.
- + integrate patch by Andrew Kuchling <amk@magnet.com> for GPM (mouse) support, correcting logic in `wgetch()` and `_nc_mouse_parse()` which prevented patch from working properly -TD
- + improve performance of panel algorithm (Juergen Pfeifer 961203).
- + strip RCS id's from generated .html files in Ada95 subtree.
- + resync with generated .html files (Juergen Pfeifer 961223).
- + terminfo.src 10.1.0 (ESR).

#### 961224 4.0 release

- + release as 4.0 to accommodate Linux ld.so.1.8.5
- + correct syntax/spelling, regenerated .doc files from .html using lynx 2.5



+ refined forms/menus makefiles (Juergen Pfeifer 961223).

#### 961221 - snapshot

- + remove logic in read\_entry.c that attempts to refine errno by using 'access()' for the directory (from patch by Florian La Roche).
- + correct configure test/substitution that inhibits generating include-path to /usr/include if gcc is used (reported by Florian La Roche).
- + modify setupterm() to allocate new TERMINAL for each call, just as solaris' curses does (Alexander V Lukyanov 960829).
- + corrected memory leaks in read\_entry.c
- + add configure options --with-dbmalloc, --with-dmalloc, and --disable-leaks, tested by instrumenting infocmp, ncurses programs.
- + move #include's for stdlib.h and string.h to \*.priv.h to accommodate use of dbmalloc.
- + modify use of \$(LN\_S) to follow recommendation in autoconf 2.12, i.e., set current directory before linking.
- + split-out panel.priv.h, improve dependencies for forms, menus (Juergen Pfeifer 961204).
- + modify \_nc\_freewin() to reset globals curscr/newscr/stdscr when freeing the corresponding WINDOW (found using Purify).
- + modify delwin() to return ERR if the window to be deleted has subwindows, needed as a side-effect of resizeterm() (found using Purify). Tested and found that SVr4 curses behaves this way.
- + implement logic for \_nc\_freeall(), bringing stub up to date.

#### 961215

- + modify wbkgd() so that it doesn't set nulls in the rendered text, even if its argument doesn't specify a character (fixes test case by Juergen Pfeifer for bug-report).
- + set window-attributes in wbkgd(), to simplify comparison against Solaris curses, which does this.

#### 961214 - snapshot

- + replace most constants in ncurses 'o' test by expressions, making it work with wider range of screen sizes.
- + add options to ncurses.c to specify 'e' test softkey format, and the number of header/footer lines to rip-off.
- + add ^R (repaint after resize), ^L (refresh) commands to ncurses 'p' test.
- + add shell-out (!) command to ncurses 'p' test to allow test of resize between endwin/refresh.
- + correct line-wrap case in mvcur() by emitting carriage return, overlooked in 960928, but needed due to SVr4 compatibility changes to terminal modes in 960907.
- + correct logic in wresize that causes new lines to be allocated,

broken for the special case of increasing rows only in 960907's fix for subwindows.

- + modify configure script to generate \$(LD\_FLAGS) with -L and -l options in preference to explicit library filenames. (NOTE: this may require further amending, since I vaguely recall a dynamic loader that did not work properly without the full names, but it should be handled as an exception to the rule, since some linkers do bulk inclusion of libraries when given the full name - T.Dickey).
- + modify configure script to allow user-supplied \$CFLAGS to set the debug-option in all libraries (requested by lots of people) -TD
- + use return consistently from main(), rather than exit (reported by Florian La Roche).
- + add --enable-getcap-cache option to configure, normally disabled (requested by Florian La Roche).
- + make configure test for gettimeofday() and possibly -lbsd more efficient (requested by Florian La Roche <florian@knorke.saar.de>)
- + minor adjustments to Ada95 binding (patches by Juergen Pfeifer)
- + correct attributes after emitting orig\_pair in lib\_vidattr.c (patch by Alexander V Lukyanov).

961208

- + corrected README wrt Ada95 (Juergen Pfeifer)

961207 - snapshot

- + integrate resizeterm() into douupdate(), so that if screen size changes between endwin/refresh, ncurses will resize windows to fit (this needs additional testing with pads and softkeys).
- + add, for memory-leak testing, \_nc\_freall() entrypoint to free all data used in ncurses library.
- + initialize \_nc\_idcok, \_nc\_idlok statically to resolve discrepancy between initscr() and newwin() initialization (reported by Alexander V Lukyanov).
- + test built VERSION=4.0, SHARED\_ABI=4 with Linux ld.so.1.8.5 (set beta versions to those values -- NOTE that subsequent pre-4.0 beta may not be interchangeable).
- + modify configure script to work with autoconf 2.12

961130 1.9.9g release

- + add copyright notices to configuration scripts (written by Thomas Dickey).

961127

- > patch, mostly for panel (Juergen Pfeifer):
- + cosmetic improvement for a few routines in the ncurses core library to avoid warning messages.
- + the panel overlap detection was broken

- + the panel\_window() function was not fool-proof.
- + Some inlining...
- + Cosmetic changes (also to avoid warning messages when compiling with -DTRACE).

961126

> patch by Juergen

Pfeifer:

- + eliminates warning messages for the compile of libform.
- + inserts Per Foreby's new field type TYPE\_IPV4 into libform.
- + Updates man page and the Ada95 binding to reflect this.
- + Improves inlining in libmenu and libform.

961120

- + improve the use of the "const" qualifier in the panel library (Juergen Pfeifer)
- + change set\_panel\_userptr() and panel\_userptr() to use void\* (Juergen Pfeifer)

961119

- + change ABI to 3.4
- + package with 961119 version of Ada95 binding (fixes for gnat-3.07). (Juergen Pfeifer)
- + correct initialization of the stdscr pseudo panel in panel library (Juergen Pfeifer)
- + use MODULE\_ID (rcs keywords) in forms and menus libraries (Juergen Pfeifer).
- > patch #324 (ESR):
- + typo in curs\_termcap man page (reported by Hendrik Reichel <106065.2344@compuserve.com>)
- + change default xterm entry to xterm-r6.
- + add entry for color\_xterm

961116 - snapshot

- + lint found several functions that had only #define implementations (e.g., attr\_off), modified curses.h.in to generate them as per XSI Curses requirement that every macro be available as a function.
- + add check in infocmp.c to guard against string compare of CANCELLED\_STRING values.
- + modify firework.c, rain.c to hide cursor while running.
- + correct missing va\_end in lib\_tparm.c
- + modify hanoi.c to work on non-color terminals, and to use timing delays when in autoplay mode.
- + correct 'echochar()' to refresh immediately (reported by Adrian Garside <94ajg2@eng.cam.ac.uk>)
- > patch #322 (ESR):
- + reorganize terminfo.src entries for xterm.

#### 961109 - snapshot

- + corrected error in line-breakout logic (lib\_douupdate.c)
- + modified newdemo to use wgetch(win) rather than getch() to eliminate a spurious clear-screen.
- + corrected ifdef's for 'poll()' configuration.
- + added modules to ncurses, form, menu for Ada95 binding (Juergen Pfeifer).
- + modify set\_field\_buffer() to allow assignment of string longer than the initial buffer length, and to return the complete string rather than only the initial size (Juergen Pfeifer and Per Foreby <perf@efd.lth.se>).

#### 961102 - snapshot

- + configure for 'poll()' in preference to 'select()', since older systems are more likely to have a broken 'select()'.
- + modified render\_char() to avoid OR'ing colors.
- + minor fixes to testcurs.c, newdemo.c test programs: ifdef'd out the resize test, use wbgd and corrected box() parameters.
- + make flushinp() test work in ncurses.c by using napms() instead of sleep().
- + undo ESR's changes to xterm-x11r6 (it no longer matched the X11R6.1 distribution, as stated)
- + terminfo 9.13.18 resync (ESR)
- + check for getenv("HOME") returning null (ESR).
- + change buffer used to decode xterm-mouse commands to unsigned to handle displays wider than 128 chars (Juergen Pfeifer).
- + correct typo curs\_ouptops.3x (Juergen Pfeifer).
- + correct limit-checking in wenclose() (Juergen Pfeifer).
- + correction to Peter Wemm's newwin change (Thomas Fehr <fehr@suse.de>).
- + corrections to logic that combines colors and attributes; they must not be OR'd (Juergen Pfeifer, extending from report/patch by Rick Marshall).

#### 961026 - snapshot

- + reset flags in 'getwin()' that might cause refresh to attempt to manipulate the non-existent parent of a window that is read from a file (lib\_screen.c).
- + restructure \_nc\_timed\_wait() to log more information, and to try to recover from badly-behaved 'select()' calls (still testing this).
- + move define for GOOD\_SELECT into configure script.
- + corrected extra '\' character inserted before ',' in comp\_scan.c
- + corrected expansion of %-format characters in dump\_entry.c; some were rendered as octal constants.
- + modify dump\_entry.c to make terminfo output more readable and like

SVr4, by using "\s" for spaces (leading/trailing only), "\", " for comma, "\^" and "\:" as well.

- + corrected some memory leaks in ncurses.c, and a minor logic error in the top-level command-parser.
- + correction

for label format 4 (PC style with info line), a

- slk\_clear(), slk\_restore() sequence didn't redraw the info line (Juergen Pfeifer).
- + modified the slk window (if simulated) to inherit the background and default character attributes from stdscr (Juergen Pfeifer).
- + corrected limit-check in set\_top\_row (Juergen Pfeifer).

#### 961019 - snapshot

- + correct loop-limit in wnoutrefresh(), bug exposed during pipe-testing had '.lastchar' entry one beyond '.\_maxx'.
- + modify ncurses test-program to work with data piped to it.
- + corrected pathname computation in run\_tic.sh, removing extra "../" (reported by Tim Mooney).
- + modified configure script to use previous install's location for curses.h
- + added NetBSD and FreeBSD to platforms that use --prefix=/usr as a default.

#### 961013

- + revised xterm terminfo descriptions to reflect the several versions that are available.
- + corrected a pointer reference in dump\_entry.c that didn't test if the pointer was -1.

#### 961005 - snapshot

- + correct \_nc\_mvcur\_scrolln for terminals w/o scrolling region.
- + add -x option to hashtest to control whether it allows writes to the lower-right corner.
- + ifdef'd (NCURSES\_TEST) the logic for \_nc\_optimize\_enable to make it simpler to construct tests (for double-check of \_nc\_hash\_map tests).
- + correct ifdef's for c++ in curses.h
- + change default xterm type to xterm-x11r6.
- + correct quoting in configure that made man-pages installed with \$datadir instead of actual terminfo path.
- + correct whitespace in include/Caps, which caused kf11, clr\_eol and clr\_end to be omitted from terminfo.5
- + fix memory leaks in delscreen() (adapted from Alexander V Lukyanov).
- + improve appearance of marker in multi-selection menu (Juergen Pfeifer)
- + fix behavior for forms with all fields inactive (Juergen Pfeifer)
- + document 'field\_index()' (Juergen Pfeifer)

> patch #321 (ESR):

- + add some more XENIX keycap translations to include/Caps.
- + modify newwin to set initial state of each line to 'touched' (from patch by Peter Wemm <peter@spinner.dialix.com>)
- + in SET\_TTY, replace TCSANOW with TCSADRAIN (Alexander V Lukyanov).

960928 - snapshot

- + ifdef'd out \_nc\_hash\_map (still slower)
- + add graphic characters to vt52 description.
- + use PutAttrChar in ClrToEOL to ensure proper background, position.
- + simplify/correct logic in 'mvcur()' that does wrapping; it was updating the position w/o actually moving the cursor, which broke relative moves.
- + ensure that 'doupdate()' sets the .oldindex values back to a sane state; this was causing a spurious refresh in ncurses 'r'.
- + add logic to configure (from vile) to guard against builders who don't remove config.cache & config.status when doing new builds -TD
- + corrected logic for 'repeat\_char' in EmitRange (cf: eric #317), which did not follow the 2-parameter scheme specified in XSI.
- + corrected logic of wrefresh, wnoutrefresh broken in #319, making clearok work properly (report by Michael Elkins).
- + corrected problem with endwin introduced by #314 (removing the scrolling-region reset) that broke ncurses.c tests.
- + corrected order of args in AC\_CHECK\_LIB (from report by Ami Fischman <fischman@math.ucla.edu>).
- + corrected formatting of terminfo.5 tables (Juergen Ehling)
- > patch 320 (ESR):
  - + change ABI to 3.3
  - + emit a carriage-return in 'endwin()' to workaround a kernel bug in BSDI. (requested by Mike Karels <karels@redrock.bsdi.com>)
  - + reverse the default of configure --enable-termcap (consensus).
- > patch 319 (ESR):
  - + modified logic for clearok and related functions (from report by Michael Elkins) - untested
- > patch 318 (ESR):
  - + correction to #317.
- > patch 317 (ESR):
  - + re-add \_nc\_hash\_map
  - + modify EmitRange to maintain position as per original design.
  - + add hashtest.c, program to time the hashmap optimization.
- > patch 316 (ESR):
  - + add logic to deal with magic-cookie (how was this tested?) (lib\_doupdate.c).
  - + add ncurses.c driver for magic-cookie, some fixes to ncurses.c
- > patch 315 (ESR):
  - + merged Alexander V Lukyanov's patch to use ech and rep - untested

- (lib\_doupdate.c).
- + modified handling of interrupted system calls - untested
- (lib\_getch.c, lib\_twait.c).
- + new function \_nc\_mvcur\_resume()
- + fix return value for 'overlay()', 'overwrite()'

#### 960914 - snapshot

- + implement subwindow-logic in wresize, minor fixes to ncurses 'g' test.
- + corrected bracketing of fallback.c (reported/suggested fix by Juergen Ehling <eh@eclipse.aball.de>).
- + update xterm-color to reflect XFree86 3.1.3G release.
- + correct broken dterm description from #314 patch (e.g., spurious newline. The 'pairs' change might work, but no one's tested it either ;-)
- + clarify the documentation for the builtin form fieldtypes (Juergen Pfeifer)
- > patch 314 (ESR):
- + reset scroll region on startup rather than at wrapup time (enhancement suggested by Alexander V Lukyanov).
- + make storage of palette tables and their size counts per-screen for multi-terminal applications (suggested by Alexander V Lukyanov).
- + Improved error reporting for infotocap translation errors.
- + Update terminfo.src to 9.13.14.

#### 960907 - snapshot

- + rewrote wgetstr to make it erase control chars and also fix bogus use of \_nc\_outstr which caused the display to not wrap properly (display problem reported by John M. Flinchbaugh <glynis@netrax.net>)
- + modify ncurses 'f' test to accommodate terminal responses to C1 codes (and split up this screen to accommodate non-ANSI terminals).
- + test enter\_insert\_mode and exit\_insert\_mode in has\_ic().
- + removed bogus logic in mvcur that assumes nl/nonl set output modes (XSI says they are input modes; SVr4 implements this).
- + added macros SET\_TTY, GET\_TTY to term.h
- + correct getstr() logic that altered terminal modes w/o restoring.
- + disable ICRNL, etc., during initialization to match SVr4, removing the corresponding logic from raw, cbreak, etc.
- + disable ONLCR during initialization, to match SVr4 (this is needed for cursor optimization when the cursor-down is a newline).
- + replaced ESR's imitation of wresize with my original (his didn't work).

#### 960831 - snapshot

- + memory leaks (Alexander V. Lukyanov).
- + modified pnoutrefresh() to be more tolerant of too-large screen

- size (reported by Michael Elkins).
- + correct handling of terminfo files with no strings (Philippe De Muyter)
- + correct "tic -s" to take into account -I, -C options.
- + modify ncurses 'f' test to not print codes 80 through 9F, since they are considered control codes by ANSI terminals.

#### 960824 - snapshot

- + correct speed variable-type in 'tgetent()' (reported by Peter Wemm)
- + make "--enable-getcap" configuration-option work (reported by Peter Wemm <peter@spinner.DIALix.COM>)

#### 960820

- + correct err in 960817 that changed return-value of tigetflag() (reported by Alexander V. Lukyanov).
- + modify infocmp to use library default search-path for terminfo directory (Alexander V. Lukyanov).

#### 960817 - snapshot

- + corrected an err in mvcur that broke resizing-behavior.
- + correct fall-thru behavior of \_nc\_read\_entry(), which was not finding descriptions that existed in directories past the first one searched (reported by Alexander V. Lukyanov)
- + corrected typo in dterm description.
- > patch 313 (ESR):
- + add dterm description
- + clarify ncurses 'i' test (drop vscanf subtest)

#### 960810 - snapshot

- + correct nl()/nonl() to work as per SVr4 & XSI.
- + minor fixes to ncurses.c (use 'noraw()', mvscanw return-code)
- + refine configure-test for -g option (Tim Mooney).
- + correct interaction between O\_BLANK and NEW\_LINE request in form library (Juergen Pfeifer)

#### 960804

- + revised fix to tparm; previous fix reversed parameter order.
- > patch 312 (ESR):
- correct terminfo.src corrupted by #310
- > patch 311 (ESR):
- + fix idlok() and idcok() and the default of the idlok switch.

#### 960803 - snapshot

- + corrected tparm to handle capability strings without explicit pop (reported by William P Setzer)
- + add fallback def for GCC\_NORETURN, GCC\_UNUSED for termcap users



(reported by Tim Mooney).  
> patch 310 (ESR):  
+ documentation and prototyping errors for has\_color, immedok and idcok  
(reported by William P Setzer <wsetzer@pams.ncsu.edu>)  
+ updated qnx terminfo entry (by Michael Hunter)

#### 960730

+ eliminate quoted includes in ncurses subdirectory, ensure config.h  
is included first.  
+ newterm initializes terminal settings the same as initscr (reported  
by Tim Mooney).

#### 960727 - snapshot

+ call cbreak() in initscr(), as per XSI & SVr4.  
+ turn off hardware echo in initscr() as per XSI & SVr4  
> patch 309 (ESR):  
+ terminfo changes (9.3.10), from BRL  
+ add more checks to terminfo parser.  
+ add more symbols to infocmp.

#### 960720 - snapshot

+ save previous-attribute in lib\_vidattr.c if SP is null (reported by  
Juergen Fluk <louis@dachau.marco.de>)  
+ corrected calls on \_nc\_render so that background character is set  
as per XSI.  
+  
corrected wbkgdset macro (XSI allows background character to be  
null), and tests that use it.  
+ more corrections to terminfo (xterm & rxvt)  
+ undid change to mcprint prototype (cannot use size\_t in curses.h  
because not all systems declare it in the headers that we can safely  
include therein).  
+ move the ifdefs for errno into curses.priv.h  
> patch 308 (ESR):  
+ terminfo changes (9.3.8)  
+ modified logic of error-reporting in terminfo parser

#### 960713 - snapshot

+ always check for <sys/bsdtypes.h> since ISC needs it to declare  
fd\_set (Juergen Pfeifer)  
+ install shared-libraries on NetBSD/FreeBSD with ABI-version (reported  
by Juergen Pfeifer, Mike Long)  
+ add LOCAL\_LDFLAGS2 symbol (Juergen Pfeifer)  
+ corrected prototype for delay\_output() -- bump ABI to 3.2  
+ terminfo patches #306/307 (ESR).  
+ moved logic that filters out rmul and rmso from setupterm to newterm  
where it is less likely to interfere with termcap applications.

960707

- + rollback ESR's #305 change to terminfo.src (it breaks existing applications, e.g., 'less 290').
- + correct path of edit\_man.sh, and fix typo that made all man-pages preformatted.
- + restore man/menu\_requestname.3x omitted in Zeyd's resync (oops).
- + auto-configure the GCC\_PRINTFLIKE/GCC\_SCANFLIKE macros (reported by Philippe De Muyter).

960706 - snapshot

- + make lib\_vidattr.c more readable using macros.
- + filter out rmul, rmso that conflict with sgr0 when reading terminal descriptions.
- + added sanity-checking of various paired string attributes (ESR).
- + work around autoconf bug, force \$INSTALL to absolute path (reported by Zeyd).
- + modify man-page install for BSDI to install preformatted .0 files (reported by David MacKenzie).
- + add/use gcc \_\_attribute\_\_ for printf and scanf in curses.h
- + added SGR attributes test-case to ncurses
- + revised ncurses 't' logic to show trace-disable effect in the menu.
- + use getopt in ncurses program to process -s and -t options.
- + make ncurses 'p' legend toggle with '?'
- + disable scrollok during the ncurses 'p' test; if it is enabled the stdscr will scroll when putting the box-corners in the lower-right of the screen.

960629 - snapshot

- + check return code of \_nc\_mvcur\_scrolln() in \_nc\_scroll\_optimize() for terminals with no scrolling-support (reported by Nikolay Shadrin <queen@qh.mirea.ac.ru>)
- + added ^S scrollok-toggle to ncurses 'g' test.
- + added ^T trace-toggle to ncurses tests.
- + modified ncurses test program to use ^Q or ESC consistently for terminating tests (rather than ^D), and to use control keys rather than function keys in 'g' test.
- + corrected misplaced wclrtoeol calls in addch to accommodate wrapping (reported by Philippe De Muyter).
- + modify lib\_doupdate.c to use effective costs to tradeoff between delete-character/insert-character vs normal updating (reported by David MacKenzie).
- + compute effective costs for screen update operations (e.g., clr\_eos, delete\_character).
- + corrected error in knight.c exposed by wrap fixes in 960622; the msgwin needed scrollok set.

- + corrected last change to IDcTransformLine logic to avoid conflict between PutRange and InsStr
- + modified run\_tic.sh to not use /usr/tmp (reported by David MacKenzie), and further revised it and alocal.m4 to use \$TMPDIR if set.
- + corrected off-by-one in RoomFor call in read\_entry.c

#### 960622 - snapshot

- + modified logic that wraps cursor in addch to follow the XSI spec, (implemented in SVr4) which states that the cursor position is updated when wrapping. Renamed \_NEED\_WRAP to \_WRAPPED to reflect the actual semantics.
- + added -s option to tic, to provide better diagnostics in run\_tic.sh
- + improved error-recovery for tabset install.
- + change ABI to 3.1 (dropped tparam, corrected getbkgd(), added \_yoffset to WINDOW).
- + modified initialization of SP->\_ofp so that init\_acs() is called with the "right" file pointer (reported by Rick Marshall <rjm@nlc.net.au>)
- + documentation fixes (Juergen Pfeifer).
- + corrected, using new SCREEN and WINDOW members, the behavior of ncurses if one uses ripoffline() to remove a line from the top of the screen (Juergen Pfeifer).
- + modified autoconf scripts to prepare for Ada95 (GNAT) binding to ncurses (Juergen Pfeifer).
- + incorrect buffer-size in \_nc\_read\_entry, reported by ESR.

#### 960617

- + corrected two logic errors in read\_entry.c, write\_entry.c (called by tic, the write/read of terminfo entries used inconsistent rules for locating the entries; the \$TERMINFO\_DIRS code would find only the first entry in a list).
- + refined pathname computation in run\_tic.sh and shlib.
- + corrected initialization of \$IP in misc/run\_tic.sh

#### 960615 - snapshot

- + ifdef'd out \_nc\_hash\_map() call because it does not improve speed.
- + display version of gcc if configure script identifies it.
- + modify configure script to use /usr as Linux's default prefix.
- + modify run\_tic.sh to use shlib script, fixes some problems installing

with a shared-library configuration.

- + adjusted configure script so that it doesn't run tests with the warnings turned on, which makes config.log hard to read.
- + added 'lint' rule to top-level Makefile.
- + added configure option '--with-install-prefix' for use by system builders to install into staging locations (requested by Charles Levert <charles@comm.polymtl.ca>).

- + corrected autoconfigure for Debian man program; it's not installed as "man\_db".
- + set noecho in 'worm'; it was ifdef'd for debug only
- + updated test/configure.in for timing-display in ncurses 'p' test
- + corrected misspelled 'getbkgd()'.
- + corrected wbkgdset to work like observed syvr4 (sets A\_CHARTEXT part to blank if no character given, copies attributes to window's attributes).
- + modified lib\_douupdate.c to use lower-level SP's current\_attr state instead of curscr's state, since it is redundant.
- + correction to IDcTransformLine logic which controls where InsStr is invoked (refined by Alexander V Lukyanov).

> patch 303 (ESR):

- + conditionally include Chris Torek's hash function \_nc\_hash\_map().
- + better fix for nvi refresh-bug (Rick Marshall)
- + fix for bug in handling of interrupted keystroke waits, (Werner Fleck).

#### 960601 - snapshot

- + auto-configure man-page compression-format and renames for Debian.
- + corrected several typos in curses.h.in (i.e., the mvXXXX macros).
- + re-order curses.priv.h for lint.
- + added rules for lintlib, lint
- + corrected ifdef for BROKEN\_LINKER in MKnames.awk.in
- + corrected missing INSTALL\_DATA in misc/Makefile.in
- + flush output when changing cursor-visibility (Rick Marshall)
- + fix a minor bug in the \_nc\_ripoff() routine and improve error checking when creating the label window (Juergen Pfeifer).
- + enhancement to the control over the new PC-style soft key format. allow caller now to select whether or not one wants to have the index-line; see curs\_slk.3x for documentation (Juergen Pfeifer).
- + typos, don't use inline
- with -g (Philippe De Muyter)
- + fixes for menus & wattr-, slk-functions (Juergen Pfeifer)

#### 960526 - snapshot

- + removed --with-ticdir option altogether, maintain compatibility with existing applications via symbolic link in run\_tic.sh
- + patch for termio.h, signal (Philippe De Muyter)
- + auto-configure gcc warning options rather than infer from version.
- + auto-configure \_\_attribute\_\_ for different gcc versions.
- + corrected special use of clearok() in hardscroll.c by resetting flag in wrefresh().
- + include stdlib.h before defs for EXIT\_SUCCESS, for OSF/1.
- + include sys/types.h in case stdlib.h does not declare size\_t.
- + fixes for makefile (Tim Mooney)
- + fixes for menus & forms (Juergen Pfeifer)

#### 960518 - snapshot

- + revised ncurses.c panner test, let pad abut all 4 sides of screen.
- + refined case in lib\_douupdate.c for ClrToEOL().
- + corrected prior change for PutRange (Alexander V Lukyanov <lav@yars.free.net>).
- + autoconf mods (Tim Mooney <mooney@dogbert.cc.ndsu.NoDak.edu>).
- + locale fix for forms (Philippe De Muyter <phdemuyt@ulb.ac.be>)
- + renamed "--with-datadir" option to "--with-ticdir" to avoid confusion, and made this check for the /usr/lib/terminfo pre-existing directory.
- > patches 299-301 (ESR):
- + added hashmap.c
- + mods to tracing, especially for ACS chars.
- + corrected off-by-one in IDCtransform.
- + corrected intermittent mouse bug by using return-value from read().
- + mods to parse\_entry.c, for smarter defaults.

#### 960512

- + use getopt in 'tic'; added -L option and modified -e option to allow list from a file.

#### 960511

- + don't use fixed buffer-size in tparm().
- + modified tic to create terminfo directory if it doesn't exist.
- + added -T options to tic and infocmp (for testing/analysis)
- + refined the length criteria for termcap and terminfo
- + optimize lib\_douupdate with memcpy, PutRange
- > patches 297, 298 (ESR):
- + implement TERMINFO\_DIRS, and -o option of tic
- + added TRACE\_IEVENT
- + removed boolean version of 'getm'
- + added lib\_print.c (for Rick Marshall)
- + added has\_key()
- + added 't' to ncurses.c test.
- + moved delay\_output() to lib\_tputs.c
- + removed tparam() (was added in 1.9.9, but conflicts with emacs and is not part of X/Open Curses).
- + misc cursor & optimization fixes.

#### 960504 - snapshot

- + modified ncurses 'p' test to allow full-screen range for panner size.
- + fixes for locale (Philippe De Muyter <phdm@labauto1.ulb.ac.be>)
- + don't use fixed buffer-size in fmt\_entry().
- + added usage-message to 'infocmp'.
- + modified install.includes rules to prepend subdirectory-name to

"#include" if needed.

960430

- + protect wrefresh, wnoutrefresh from invocation with pad argument.
- + corrected default CCFLAGS in test/Makefile.

960428 - snapshot

- + implemented logic to support terminals with background color erase (e.g., rxvt and the newer color xterm).
- + improved screen update logic (off-by-one logic error; use clr\_eos if possible)

960426 - snapshot

- + change ncurses 'a' test to run in raw mode.
- + make TIOCGWINSZ configure test less stringent, in case user configures via terminal that cannot get screen size.
- > patches 295, 296 (ESR):
- + new "-e" option of tic.
- + fix for "infocmp -e".
- + restore working-directory in read\_termcap.c
- + split lib\_kernel.c, lib\_setup.c and names.c in order to reduce overhead for programs that use only termcap features.

960418 - snapshot

- + use autoconf 2.9
- + fix for AIX 3.2.5 (must define \_POSIX\_SOURCE to get termios struct definitions via <termios.h>, modified macros in lib\_raw.c to avoid K&R-style substitution)
- > patches 293, 294 (ESR):
- + mods to wgetch() in cooked mode
- + corrected askuser() logic in tset
- + correct interaction of endwin() with mouse processing
- + added trace support for TTY flags

960406

- + fixes for NeXT, ISC and HPUX auto-configure
- + autogenerate development header-dependencies (config.h, \*.priv.h)
- + corrected single-column formatting of "use=" (e.g., in tic)
- + modify tic to read full terminfo-names
- +  
corrected divide-by-zero that caused hang (or worse) when redirecting output
- + modify tic to generate directories only as-needed (and corrected instance of use of data from function that had already returned).

### ncurses-1.9.8a -> 1.9.9e

- \* fixed broken wsyncup()/wysncdown(), as a result wnoutrefresh() now has copy-changed-lines behavior.
- \* added and documented wresize() function.
- \* more fixes to LOWER-RIGHT corner handling.
- \* changed the line-breakout optimization code to allow some lines to be emitted before the first check.
- \* added option for tic to use symbolic instead of hard links (for AFS)
- \* fix to restore auto-wrap mode.
- \* trace level can be controlled by environment variable.
- \* better handling of NULs in terminal descriptions.
- \* improved compatibility with observed SVR4 behavior.
- \* the refresh behavior of over-lapping windows is now more efficient and behaves like SVR4.
- \* use autoconf 2.7, which results in a working setup for SCO 5.0.
- \* support for ESCDELAY.
- \*
- small fixes for menu/form code.
- \* the test directory has its own configure.
- \* fixes to pads when optimizing scrolling.
- \* fixed several off-by-one bugs.
- \* fixes for termcap->terminfo translation; less restrictions more correct behavior.

### ncurses-1.9.7 -> 1.9.8a

- \* teach infocmp -i to recognize ECMA highlight sequences
- \* infocmp now dumps all SVr4 termcaps (not just the SVr4 ones) on -C
- \* support infocmp -RBSD.
- \* satisfy XSI Curses requirement that every macro be available as a function.
- \* This represents the last big change to the public interface of ncurses. The ABI\_VERSION has now been set at 3.0 and should stay there barring any great catastrophies or acts of God.
- \* The C++ has been cleaned up in reaction to the changes to satisfy XSI's requirements.
- \* libncurses now gets linked to libcurses to help seamless emulation (replacement) of a vendor's curses. --disable-overwrite turns this behavior off.

### ncurses-1.9.6 -> 1.9.7

- \* corrected return values of setupterm()
- \*
- Fixed some bugs in tput (it does padding now)
- \* fixed a bug in tic that made it do the wrong thing on entries with more than one `use' capability.
- \* corrected the screen-size calculation at startup time to alter the numeric capabilities as per SVr4, not just LINES and COLS.
- \* toe(1) introduced; does what infocmp -T used to.

- \* tic(1) can now translate AIX box1 and font[0123] capabilities.
- \* tic uses much less core, the dotic.sh kluge can go away now.
- \* fix read\_entry() and write\_entry() to pass through cancelled capabilities OK.
- \* Add \$HOME/.terminfo as source/target directory for terminfo entries.
- \* termcap compilation now automatically dumps an entry to \$HOME/.terminfo.
- \* added -h option to toe(1).
- \* added -R option to tic(1) and infocmp(1).
- \* added fallback-entry-list feature.
- \* added -i option to infocmp(1).
- \* do a better job at detecting if we're on SCO.

### ncurses-1.9.5 -> 1.9.6

- \* handling of TERMCAP environment variables now works correctly.
- \* various changes to shorten termcap translations to less than 1024 chars.
- \* tset(1) added
- \* mouse support for xterm.
- \* most data tables are now const and accordingly live in shareable text space.
- \* Obey the XPG4/SVr4 practice that echo() is initially off.
- \* tic is much better at translating XENIX and AIX termcap entries now.
- \* tic can interpret ko capabilities now.
- \* integrated Juergen Pfeifer's forms library.
- \* taught write\_entry() how not to write more than it needs to; this change reduces the size of the terminfo tree by a full 26%!
- \* infocmp -T option added.
- \* better warnings about historical tic quirks from tic.

### ncurses 1.9.4 -> 1.9.5

- \* menus library is now included with documentation.
- \* lib\_mvcur has been carefully profiled and tuned.
- \* Fixed a ^Z-handling bug that was tanking lynx(1).
- \* HJ Lu's patches for ELF shared libraries under Linux
- \* terminfo.src 9.8.2
- \* tweaks for compiling in separate directories.
- \* Thomas Dickey's patches to support NeXT's brain-dead linker
- \* Eric Raymond's patches to fix problems with long termcap entries.
- \* more support for shared libraries under SunOS and IRIX.

### ncurses 1.9.3 -> 1.9.4

- \* fixed an undefined-order-of-evaluation bug in lib\_acs.c
- \* systematically gave non-API public functions and data an \_nc\_ prefix.
- \* integrated Juergen Pfeifer's menu code into the distribution.
- \* totally rewrote the knight test game's interface



### ncurses 1.9.2c -> 1.9.3

- \* fixed the TERMCAP\_FILE Support.
- \* fixed off-by-one errors in scrolling code
- \* added tracemunch to the test tools
- \* took steps to cut the running time of make install.data

### ncurses 1.9.2c -> 1.9.2d

- \* revised 'configure' script to produce libraries for normal, debug, profile and shared object models.

### ncurses 1.9.1 -> 1.9.2

- \* use 'autoconf' to implement 'configure' script.
- \* panels support added
- \* tic now checks for excessively long termcap entries when doing translation
- \* first cut at eliminating namespace pollution.

### ncurses 1.8.9 -> 1.9

- \* cleanup gcc warnings for the following:
  - use size\_t where 'int' is not appropriate, fixed some shadowed variables, change attr\_t to compatible with chtype, use attr\_t in some places where it was confused with 'int'.
- \* use chtype/attr\_t casts as appropriate to ensure portability of masking operations.
- \* added-back waddchnstr() to lib\_addstr.c (it had been deleted).
- \* supplied missing prototypes in curses.h
- \* include <termcap.h> in lib\_termcap.c to ensure that the prototypes are consistent (they weren't).
- \* corrected prototype of tputs in <termcap.h>
- \* rewrote varargs parsing in lib\_tparm.c (to avoid referencing memory that may be out of bounds on the stack) -- Purify found this.
- \* ensure that TRACE is defined in lib\_trace.c (to solve prototype warnings from gcc).
- \* corrected scrolling-region size in 'mvcwr\_wrap()'
- \* more spelling fixes
- \* use 'calloc()' to allocate WINDOW struct in lib\_newwin.c (Purify).
- \* set default value for SP->\_ofp in lib\_set\_term.c (otherwise SunOS dumps core in init\_acs()).
- \* include <errno.h> in write\_entry.c (most "braindead" includes declare errno in that file).

### ncurses 1.8.8 -> 1.8.9

- \* compile (mostly) clean with gcc 2.5.8 -Wall -Wstrict-prototypes

-Wmissing-prototypes -Wconversion and using `__attribute__` to flush out non-portable use of "%x" for pointers, or for ctype data (which is declared as a long).

- \* modified `doupdate` to ensure that `ttyahead` was turned on before attempting select-call (otherwise, some implementations hang).
- \* added trace mask `TRACE_FIFO`, use this in `lib_getch.c` to allow finer resolution of traces.
- \* improved bounds checking on several critical functions.
- \* the data directory has been replaced by the new master terminfo file.
- \* -F file-comparison option added to `infocmp`.
- \* compatibility with XSI Curses is now documented in the man pages.
- \* `wsyncup/wsyncdown` functions are reliable now; subwindow code in general is much less flaky.
- \* capabilities `~msgr`, `tilde_glitch`, `insert_padding`, `generic_type`, `no_pad_char`, `memory_above`, `memory_below`, and `hard_copy` are now used properly.
- \* cursor-movement optimization has been completely rewritten.
- \* vertical-movement optimization now uses hardware scrolling, `il`, `dl`.

### ncurses 1.8.7 -> 1.8.8

- \* `untic` no longer exists, `infocmp` replaces it.
- \* `tic` can understand `termcap` now, especially if it is called `captainfo`.
- \* The Linux Standard Console terminfo entry is called `linux` instead of `console`. It also uses the kernel's new method of changing charsets.
- \* `initscr()` will EXIT upon error (as the docs say) This will mostly happen if you try to run on an undefined terminal.
- \* I can get things running on AIX but `tic` can't compile terminfo. I have to compile entries on another machine. Volunteers to hunt this bug are welcome.
- \* `wbkgd()` and `wbkgdset()` can be used to set a window's background to color. `wclear()/werase()` DO NOT use the current attribute to clear the screen. This is the way SVR4 curses works. PDCurses 2.1 is broken in this respect, though PDCurses 2.2 has been fixed.
- \* cleaned up the `test/` directory.
- \* `test/worm` will segfault after quite a while.
- \* many spelling corrections courtesy of Thomas E. Dickey

### ncurses 1.8.6 -> 1.8.7

- \* cleaned up programs in `test/` directory.
- \* fixed `wbkgdset()` macro.
- \* modified `getstr()` to stop it from advancing cursor in `noecho` mode.
- \* modified `linux` terminfo entry to work with the latest kernel to get the correct alternate character set.
- \* also added a `linux-mono` entry for those running on monochrome screens.
- \* changed `initscr()` so that it behaves like the man page says it does. this fixes the problem with programs in `test/` crashing with `SIGSEV` if a terminal is undefined.
- \* modified `addch()` to avoid using any `term.h` `#define`'s

- \* removed duplicate tgoto() in lib\_tparm.c
- \* modified dump\_entry.c so that infocmp deals correctly with ',' in acsc
- \* modified delwin() to correctly handle deleting subwindows.
- \* fixed Makefile.dist to stop installing an empty curses.h
- \* fixed a couple of out-of-date notes in man pages.

### ### ncurses 1.8.5 -> 1.8.6

- \* Implemented wbkgd(), bkgd(), bkgdset(), and wbkgdset().
- \* The handling of attributes has been improved and now does not turn off color if other attributes are turned off.
- \* scrolling code is improved. Scrolling in subwindows is still broken.
- \* Fixes to several bugs that manifest them on platforms other than Linux.
- \* The default to meta now depends on the status of the terminal when ncurses is started.
- \* The interface to the tracing facility has changed. Instead of the pair of functions traceon() and traceoff(), there is just one function trace() which takes a trace mask argument. The trace masks, defined in curses.h, are as follows:

```
#define TRACE_DISABLE 0x00 /* turn off tracing */
#define TRACE_ORDINARY 0x01 /* ordinary trace mode */
#define TRACE_CHARPUT 0x02 /* also trace all character outputs */
#define TRACE_MAXIMUM 0x0f /* maximum trace level */
```

More trace masks may be added, or these may be changed, in future releases.

- \* The pad code has been improved and the pad test code in test/ncurses.c has been improved.
- \* The prototype ansi entry has been changed to work with a wider variety of emulators.
- \* Fix to the prototype ansi entry that enables it to work with PC emulators that treat trailing ";m" in a highlight sequence as ";0m"; this doesn't break operation with any emulators.
- \* There are now working infocmp, captinfo, tput, and tclear utilities.
- \* tic can now compile entries in termcap syntax.
- \* Core-dump bug in pnoutrefresh fixed.
- \* We now recognize and compile all the nonstandard capabilities in Ross Ridge's mytinfo package (rendering it obsolete).
- \* General cleanup and documentation improvements.
- \* Fixes and additions to the installation-documentation files.
- \* Take cursor to normal mode on endwin.

### ### ncurses 1.8.4 -> 1.8.5

- \* serious bugs in updating screen which caused erratic non-display, fixed.
- \* fixed initialization for getch() related variable which cause

unpredictable results.

- \* fixed another doupdate bug which only appeared if you have parm\_char.
- \* implemented redrawln() and redrawwin().
- \* implemented winsnstr() and related functions.
- \* cleaned up insertln() and deleteln() and implemented (w)insdeln().
- \* changed Makefile.dist so that installation of man pages will take note of the terminfo directory.
- \* fixed Configure (removed the mysterious 'X').
- \* Eric S. Raymond fixed the script.\* files so that they work with stock awk.

#### ncurses 1.8.3 -> 1.8.4 ####

- \* fixed bug in refreshing the screen after return from shell\_mode. There are still problems but they don't manifest themselves on my machine (Linux 0.99.14f).
  - \* added wgetnstr() and modified things accordingly.
  - \* fixed the script.src script.test to work with awk not just gawk.
  - \* Configure can now take an argument of the target system.
  - \* added test/ncurses.c which replaces several other programs and performs more testing.
- [Thanks to Eric S Raymond for the last 4]
- \* more fixes to lib\_overlay.c and added test/over.c to illustrate how it works.
  - \* fixed ungetch() to take int instead of ch.
  - \* fixes to cure wgetch() if flushinp() is called.

One note I forgot to mention in 1.8.3 is that tracing is off by default starting in the version. If you want tracing output, put traceon(); in your code and link with -ldcurses.

#### ncurses 1.8.2 -> ncurses 1.8.3 ####

MAJOR CHANGES:

1) The order of capabilities has been changed in order to achieve binary compatibility with SVR4 terminfo database. This has the unfortunate effect of breaking application currently linked with ncurses. To ensure correct behavior, recompile all such programs. Most programs using color or newer capabilities will break, others will probably continue to work ok.

2) Pavel Curtis has renounced his copyright to the public domain. This means that his original sources (posted to comp.sources.unix, volume 1) are now in the public domain. The current sources are NOT in the public domain, they are copyrighted by me. I'm entertaining ideas on what the new terms ncurses is released under.

3) Eric S. Raymond has supplied a complete set of man pages for ncurses in ?roff format. They will eventually replace most of the current docs. Both sets are included in this release.

Other changes and notes from 1.8.2 include:

- \* SIGSEGV during scrolling no longer occurs.
- \* Other problems with scrolling and use of idl have been corrected.
- \* lib\_getch.c has been re-written and should perform flawlessly. please use test/getch.c and any other programs to test this.
- \* ripoffline() is implemented (Thanks to Eric) and slk\_ functions changed accordingly.
- \* I've added support for terminals that scroll if you write in the bottom-right corner.
- \* fixed more bugs in pads code. If anybody has a program that uses pads I'd love a copy.
- \* correct handling for terminal with back\_color\_erase capability (such as Linux console, and most PC terminals)
- \* ^Z handling apparently didn't work (I should never trust code sent me to me without extensive testing). It now seems to be fixed. Let me know if you have problems.
- \* I've added support for Apollo and NeXT, but it may still be incomplete, especially when dealing with the lack of POSIX features.
- \* scrolling should be more efficient on terminals with idl capabilities. Please see src/lib\_scroll.c for more notes.
- \* The line drawing routines were offset by 1 at both ends. This is now fixed.
- \* added a few missing prototypes and macros (e.g. setterm())
- \* fixed code in src/lib\_overlay.c which used to crash.
- \* added a few more programs in test/ The ones from the PDCurses package are useful, especially if you have SVR4 proper. I'm interested in the results you get on such a systems (Eric? ;-). They already exposed certain bugs in ncurses.
- \* See src/README for porting notes.
- \* The C++ code should really replace ncurses.h instead of working around it. It should avoid name-space clashes with nterm.h (use rows instead of lines, etc.)
- \* The C++ should compile ok. I've added explicit rules to the Makefile because no C++ defaults are documented on the suns.
- \* The docs say that echo() and nocbreak() are mutually exclusive. At the moment ncurses will switch to cbreak() if the case above occurs. Should it continue to do so? How about echo() and noraw()?
- \* PDCurses seem to assume that wclear() will use current attribute when clearing the screen. According to Eric this is not the case with SVR4.
- \* I have discovered, to my chagrin, SunOS 4.x (and probably other systems)

- \* doesn't have vsscanf and God knows what else! I've will do a vsscanf().
- \* I've also found out that the src/script.\* rely on gawk and will not work with stock awk or even with nawk. Any changes are welcome.
- \* Linux is more tolerant of NULL dereferences than most systems. This fact was exposed by hanoi.
- \* ncurses still seems inefficient in drawing the screen on a serial link between Linux and suns. The padding may be the culprit.
- \*

There seems to be one lingering problem with douupdate() after shelling out. Despite the fact the it is sending out the correct information to the terminal, nothing takes effect until you press ^L or another refresh takes place. And yes, output does get flushed.

#### ncurses 1.8.1 -> ncurses 1.8.2 #### Nov 28, 1993 ####

- \* added support for SVR4 and BSDI's BSD/386.
- \* major update and fix to scrolling routine.
- \* MORE fixes to stuff in lib\_getch.c.
- \* cleaned-up configuration options and can now generate Config.\* files through an awk script.
- \* changed setupterm() so it can be called more than once, add added set\_curterm(), del\_curterm().
- \* a few minor cleanups.
- \* added more prototypes in curses.h

#### ncurses 1.8 -> ncurses 1.8.1 #### Nov 4, 1993 ####

- \* added support for NeXTStep 3.0
- \* added termcap emulation (not well tested).
- \* more complete C++ interface to ncurses.
- \* fixed overlay(), overwrite(), and added copywin().
- \* a couple of bug fixes.
- \* a few code cleanups.

####

ncurses 0.7.2/0.7.3 -> ncurses 1.8 #### Aug 31, 1993 ####

- \* The annoying message "can't open file." was due to missing terminfo entry for the used terminal. It has now been replaced by a hopefully more helpful message.
- \* Problems with running on serial lines are now fixed.
- \* Added configuration files for SunOS, Linux, HP/UX, Ultrix, 386bsd/BSDI (if you have others send'em to me)
- \* Cleaner Makefile.
- \* The documentation in manual.doc is now more uptodate.
- \* update optimization and support for hp terminals, and 386bsd console driver(s).
- \* mvcur optimization for terminals without cursor addressing

(doesn't work on Linux)

- \* if cursor moved since last update, getch() will refresh the screen before working.
- \* getch() & alarm() can now live together. in 0.7.3 a signal interrupted getch() (bug or feature?) now the getch is restarted.
- \* scanw() et all were sick, now fixed.
- \* support for 8-bit input (use meta()).
- \* added default screen size to all terminfos.
- \* added c++ Ncursesw class.
- \* several minor bug fixes.

##### ncurses 0.7.2 -> ncurses 0.7.3 ##### May 27, 1993 #####

- \* Config file to cope with different platforms (386BSD, BSDI, Ultrix, SunOS)
- \* more fixes to lib\_getch.c
- \* changes related to Config

##### ncurses 0.7 -> ncurses 0.7.2 ##### May 22, 1993 #####

- \* docs updated slightly (color usage is now documented).
- \* yet another fix for getch(), this one fixes problems with ESC being swallowed if another character is typed before the 1 second timeout.
- \* Hopefully, addstr() and addch() are 8-bit clean.
- \* fixed lib\_tparm.c to use stdarg.h (should run on suns now)
- \* order of capabilities changed to reflect that specified in SYSV this will allow for binary-compatibility with existing terminfo dbs.
- \* added halfdelay()
- \* fixed problems with asc\_init()
- \* added A\_PROTECT and A\_INVIS
- \* cleaned up vidputs()
- \* general cleanup of the code
- \* more attention to portability to other systems
- \* added terminfos for hp70092 (wont work until changes to lib\_update.c are made) and 386BSD pcvt drivers.

Thanks to Hellmuth Michaelis for his help.

optimization code is slated for the next major release, stay tuned!

##### ncurses 0.6/0.61 -> ncurses 0.7 ##### April 1, 1993

Please note that the next release will be called 1.8. If you want to know about the rationale drop me a line.

Included are several test programs in test/.

I've split up the panels library, reversi, tetris, sokoban. They are now available separately from netcom.com:pub/zmbenhal/

- \* color and ACS support is now fully compatible with SYSV at the terminfo level.
- \* Capabilities now includes as many SYSV caps I could find.
- \* tigetflag,tigetnum,tigetstr functions added.
- \* boolnames, boolfnames, boolcodes numnames, numfnames, numcodes, strnames, strfnames, strcodes arrays are now added.
- \* keyname() is added.
- \* All function keys can be defined in terminfo entries.
- \* fixed lin\_tparm.c to behave properly.
- \* terminfo entries for vt\* and xterm are included (improvements are welcome)
- \* more automation in handling caps and keys.
- \* included fixes from 0.6.1
- \* added a few more missing functions.
- \* fixed a couple of minor bugs.
- \* updated docs JUST a little (still miles behind in documenting the newer features).

#### ncurses 0.6 -> ncurses 0.61 ####

- 1) Included the missing data/console.
- 2) allow attributes when drawing boxes.
- 3) corrected usage of win->\_delay value.
- 4) fixed a bug in lib\_getch.c. if it didn't recognize a sequence it would simply return the last character in the sequence. The correct behavior is to return the entire sequence one character at a time.

#### ncurses0.5 -> ncurses0.6 #### March 1, 1993 ####

- \* removed \_numchngd from struct \_win\_st and made appropriate changes.
- \* rewritten kgetch() to remove problems with interaction between alarm and read(). It caused SIGSEGV every now and then.
- \* fixed a bug that miscounted the numbers of columns when updating. (in lib\_doupdate.c(ClrUpdate() -- iterate to columns not columns-1)
- \* fixed a bug that cause the lower-right corner to be incorrect. (in lib\_doupdate.c(putChar() -- check against columns not columns-1)
- \* made resize() and cleanup() static to lib\_newterm.c
- \* added notimeout().
- \* added timeout() define in curses.h
- \* added more function prototypes and fixed napms.
- \* added use\_env().
- \* moved screen size detection to lib\_setup.c.
- \* fixed newterm() to conform to prototype.
- \* removed SIGWINCH support as SYSV does not define its semantics.
- \* cleaned-up lib\_touch.c



- \* added waddnstr() and relatives.
- \* added slk\_\* support.
- \* fixed a bug in wdeleteln().
- \* added PANEL library.
- \* modified Makefile for smoother installation.
- \* terminfo.h is really term.h

##### ncurses 0.4 -> ncurses 0.5 ##### Feb 14, 1993 #####

- \* changed \_win\_st structure to allow support for missing functionality.
- \* Addition of terminfo support for all KEY\_\*.
- \* Support for nodelay(), timeout(), notimeout().
- \* fixed a bug with the keypad char reading that did not return ESC until another key is pressed.
- \* nl mapping no longer occur on output (as should be)
- fixed bug '\n' no causing a LF.
- \* fixed bug that reset terminal colors regardless of whether we use color or not.
- \* Better support for ACS (not quite complete).
- \* fixed bug in wvline().
- \* added curs\_set().
- \* changed from signal() to sigaction().
- \* re-included the contents of important.patch into source.

##### ncurses 0.3 -> ncurses 0.4 ##### Feb 3, 1993 #####

- \* Addition of more KEY\_\* definitions.
- \* Addition of function prototypes.
- \* Addition of several missing functions.
- \* No more crashes if screen size is undefined (use SIGWINCH handler).
- \* added a handler to cleanup after SIGSEGV (hopefully never needed).
- \* changed SRCDIR from /etc/term to /usr/lib/terminfo.
- \* renamed compile/dump to tic/untic.
- \* New scrolling code.
- \* fixed bug that reversed the sense of nl() and nonl().

##### ncurses 0.2 -> ncurses 0.3 ##### Jan 20, 1993 #####

- \* more support for color and graphics see test/ for examples.
- \* fixed various files to allow correct update after shelling out.
- \*
- more fixes for updates.
- \* no more core dumps if you don't have a terminfo entry.
- \* support for LINES and COLUMNS environment variables.
- \* support for SIGWINCH signal.
- \* added a handler for SIGINT for clean exits.

##### ncurses 0.1 -> ncurses 0.2 ##### Aug 14, 1992 #####

- \* support for color.
- \* support for PC graphic characters.

- \* lib\_trace.c updated to use stdarg.h and vprintf routines.
- \* added gdc.c (Great Digital Clock) as an example of using color.

#### ncurses -> ncurses 0.1 #### Jul 31, 1992 ####

- \* replacing sgty stuff by termios stuff.
- \* ANSIfication of some functions.
- \* Disabling cost analysis 'cause it's incorrect.
- \* A quick hack for a terminfo entry.

-- vile:txtmode:

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\* /opt/cola/permits/1600019816\_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/NEWS

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\* Author: Thomas E. Dickey 1996

\* @Id: wresize.3x,v 1.9 2006/02/25 21:47:06 tom Exp @

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-- \$Id: README,v 1.9 2006/04/22 22:19:37 tom Exp \$

For discussion of the package internals, see hackguide.html in the doc/html directory.

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archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/ncurses/base/lib_bkgd.c
* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/ncurses/tinfo/captinfo.c
* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/ncurses/base/lib_getstr.c
* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/test/blue.c
* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/ncurses/tinfo/lib_options.c
*
* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-archive-
fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/test/hanoi.c
* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/ncurses/base/lib_slkrefr.c
* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/progs/dump_entry.h
* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/ncurses/base/lib_addch.c

```

\*  
/opt/cola/permits/1600019816\_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/ncurses/tinfo/comp\_scan.c  
\* /opt/cola/permits/1600019816\_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/test/keynames.c  
\* /opt/cola/permits/1600019816\_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/test/knight.c  
\* /opt/cola/permits/1600019816\_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/ncurses/tinfo/alloc\_entry.c  
\* /opt/cola/permits/1600019816\_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/test/rain.c  
\* /opt/cola/permits/1600019816\_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/form/form.priv.h  
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\* @Id: tset.1,v 1.19 2006/12/24 15:00:30 tom Exp @

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```
* $Id: chkdef.cmd,v 1.3 2006/04/22 23:14:50 tom Exp $
*
* Author: Juan Jose Garcia Ripoll <worm@arrakis.es>.
* Webpage: http://www.arrakis.es/~worm/
*
* chkdef.cmd - checks that a .def file has no conflicts and is properly
* formatted.
*
* returns nonzero if two symbols have the same code or a line has a wrong
* format.
*
* returns 0 otherwise
```

```

*
* the standard output shows conflicts.
*/
parse arg def_file

def_file = translate(def_file, '\, /')

call CleanQueue

/*
* `cmp' is zero when the file is valid
* `codes' associates a name to a code
* `names' associates a code to a name
*/
cmp = 0
codes. = 0
names. = ""

/*
* This sed expression cleans empty lines, comments and special .DEF
* commands, such as LIBRARY..., EXPORTS..., etc
*/
tidy_up = "s/[ ]*/ /g;s/;.*//g;/^[ ]*$/d;/^[a-zA-Z]/d;"

/*
* First we find all public symbols from the original DLL. All this
* information is pushed into a REXX private list with the RXQUEUE
* utility program.
*/
'@echo off'
'type' def_file | sed' tidy_up | sort | rxqueue'

do while queued() > 0
/*
* We retrieve the symbol name (NEW_NAME) and its code (NEW_CODE)
*/
parse pull "" new_name "" '@'new_code rest
select
when (new_code = "") | (new_name = "") then
/* The input was not properly formatted */
do
say 'Error: symbol "'new_name'" has no export code or is empty'
cmp = 1
end
when codes.new_name \= 0 then
/* This symbol was already defined */
if codes.new_name \= new_code then
do

```

```

cmp = 2
say 'Symbol "'new_name'" multiply defined'
end
when names.new_code \= " then
  /* This code was already assigned to a symbol */
  if names.new_code \= new_name then
    do
      cmp
    = 3
    say 'Conflict with "'names.new_code'" & "'new_name'" being @'new_code'
      end
    otherwise
    do
      codes.new_name = new_code
      names.new_code = new_name
    end
  end /* select */
end

```

exit cmp

CleanQueue: procedure

```

do while queued() > 0
  parse pull foo
end
return

```

Found in path(s):

```

* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/misc/chkdef.cmd

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\* Author: Thomas E. Dickey 1999-on  
\* @Id: curs\_extend.3x,v 1.17 2006/12/24 18:01:48 tom Exp @

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5.7/doc/html/man/curs\_extend.3x.html

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\* @Id: panel.3x,v 1.14 2007/05/12 20:45:20 tom Exp @

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\* @Id: curs\_print.3x,v 1.8 2006/02/25 21:49:19 tom Exp @

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\* @Id: curs\_scr\_dump.3x,v 1.7 2006/12/24 16:05:49 tom Exp @

-->

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\* /opt/cola/permits/1600019816\_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-  
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-  
5.7/doc/html/man/curs\_scr\_dump.3x.html

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-- \*- ada -\*

define(HTMLNAME,`terminal\_interface-curses-forms-form\_user\_data\_\_ads.htm')dnl

include(M4MACRO)dnl

-----

--

--

```

--          GNAT ncurses Binding          --
--
--          Terminal_Interface.Curses.Forms.Form_User_Data  --
--
--          S P E C          --
--
-----
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-----
-- Author: Juergen Pfeifer, 1996
-- Version Control:
--
-- $Revision: 1.14 $
-- Binding Version 01.00
-----

```

```

generic
  type User is limited private;
  type User_Access is access User;
package Terminal_Interface.Curses.Forms.Form_User_Data is
  pragma Preelaborate (Terminal_Interface.Curses.Forms.Form_User_Data);

```

```

-- MANPAGE(`form_userptr.3x')

-- ANCHOR(`set_form_userptr',`Set_User_Data')
procedure Set_User_Data (Frm : in Form;
                        Data : in User_Access);

-- AKA
pragma Inline (Set_User_Data);

-- ANCHOR(`form_userptr',`Get_User_Data')
procedure Get_User_Data (Frm : in Form;
                        Data : out User_Access);

-- AKA

-- ANCHOR(`form_userptr',`Get_User_Data')
function Get_User_Data (Frm : in Form) return User_Access;

-- AKA
-- Same as function
pragma Inline (Get_User_Data);

end Terminal_Interface.Curses.Forms.Form_User_Data;

```

Found in path(s):

\* /opt/cola/permits/1600019816\_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/Ada95/gen/terminal\_interface-curses-forms-form\_user\_data.ads.m4

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Found in path(s):

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archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/test/edit\_field.c

\* /opt/cola/permits/1600019816\_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-  
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/test/color\_set.c

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\*\*\*\*\*/

\*\*\*\*\*/

\* Author: Thomas E. Dickey 2008 \*

\*\*\*\*\*/

/\* LINTLIBRARY \*/

/\* ./tty/hardscroll.c \*/

#include <curses.priv.h>

#undef \_nc\_oldnums

int \*\_nc\_oldnums;

#undef \_nc\_scroll\_optimize

void \_nc\_scroll\_optimize(void)

{ /\* void \*/ }

#undef \_nc\_linedump

void \_nc\_linedump(void)

{ /\* void \*/ }

/\* ./tty/hashmap.c \*/

#include <term.h>

#undef \_nc\_hash\_map

void \_nc\_hash\_map(void)

{ /\* void \*/ }

#undef \_nc\_make\_oldhash

void \_nc\_make\_oldhash(

int i)

{ /\* void \*/ }

#undef \_nc\_scroll\_oldhash

void \_nc\_scroll\_oldhash(

int n,

int top,

int bot)

{ /\* void \*/ }

/\* ./base/lib\_addch.c \*/

#include <ctype.h>

#undef \_nc\_render

chtype \_nc\_render(

WINDOW \*win,

chtype ch)

{ return(\*(chtype \*)0); }

```
#undef _nc_waddch_nosync
int _nc_waddch_nosync(
    WINDOW *win,
    const chtype c)
{ return(*(int *)0); }
```

```
#undef waddch
int waddch(
    WINDOW *win,
    const chtype ch)
{ return(*(int *)0); }
```

```
#undef wechochar
int wechochar(
    WINDOW *win,
    const chtype ch)
{ return(*(int *)0); }
```

```
/* ./base/lib_addstr.c */
```

```
#undef waddnstr
int waddnstr(
    WINDOW *win,
    const char *astr,
    int n)
{ return(*(int *)0); }
```

```
#undef waddchnstr
int waddchnstr(
    WINDOW *win,
    const chtype *astr,
    int n)
{ return(*(int *)0); }
```

```
/* ./base/lib_beep.c */
```

```
#undef beep
int beep(void)
{ return(*(int *)0); }
```

```
/* ./base/lib_bkgd.c */
```

```
#undef wbkgdset
void wbkgdset(
    WINDOW *win,
    chtype ch)
{ /* void */ }
```



```
#undef wbkgd
int wbkgd(
    WINDOW *win,
    chtype ch)
{ return(*(int *)0); }
```

```
/* ./base/lib_box.c */
```

```
#undef wborder
int wborder(
    WINDOW *win,
    chtype ls,
    chtype rs,
    chtype ts,
    chtype bs,
    chtype tl,

    chtype tr,
    chtype bl,
    chtype br)
{ return(*(int *)0); }
```

```
/* ./base/lib_chgat.c */
```

```
#undef wchgat
int wchgat(
    WINDOW *win,
    int n,
    attr_t attr,
    short color,
    const void *opts)
{ return(*(int *)0); }
```

```
/* ./base/lib_clear.c */
```

```
#undef wclear
int wclear(
    WINDOW *win)
{ return(*(int *)0); }
```

```
/* ./base/lib_clearok.c */
```

```
#undef clearok
int clearok(
    WINDOW *win,
    NCURSES_BOOL flag)
{ return(*(int *)0); }
```

```

/* ./base/lib_clrbot.c */

#undef wclrtobot
int wclrtobot(
    WINDOW *win)
    { return(*(int *)0); }

/* ./base/lib_clreol.c */

#undef wclrtoeol
int wclrtoeol(
    WINDOW *win)
    { return(*(int *)0); }

/* ./base/lib_color.c */

#include <tic.h>

#undef _nc_COLOR_PAIRS
int _nc_COLOR_PAIRS(void)
    { return(*(int *)0); }

#undef _nc_COLORS
int _nc_COLORS(void)
    { return(*(int *)0); }

#undef _nc_reset_colors
NCURSES_BOOL _nc_reset_colors(void)
    { return*(NCURSES_BOOL *)0; }

#undef start_color
int start_color(void)
    { return(*(int *)0); }

#undef init_pair
int init_pair(
    short pair,

    short f,
    short b)
    { return(*(int *)0); }

#undef init_color
int init_color(
    short color,
    short r,
    short g,

```

```

short b)
{ return(*(int *)0); }

#undef can_change_color
NCURSES_BOOL can_change_color(void)
{ return*(NCURSES_BOOL *)0; }

#undef has_colors
NCURSES_BOOL has_colors(void)
{ return*(NCURSES_BOOL *)0; }

#undef color_content
int color_content(
    short color,
    short *r,
    short *g,
    short *b)
{ return(*(int *)0); }

#undef pair_content
int pair_content(
    short pair,
    short *f,
    short *b)
{ return(*(int *)0); }

#undef _nc_do_color
void _nc_do_color(
    short old_pair,
    short pair,
    NCURSES_BOOL reverse,
    int (*outc)(
    int p1))
{ /* void */ }

/* ./base/lib_colorset.c */

#undef wcolor_set
int wcolor_set(
    WINDOW *win,
    short color_pair_number,
    void *opts)
{ return(*(int *)0); }

/* ./base/lib_delch.c */

#undef wdelch
int wdelch(

```

```
WINDOW *win)
{ return(*(int *)0); }

/* ./base/lib_delwin.c */

#undef
delwin
int delwin(
    WINDOW *win)
{ return(*(int *)0); }

/* ./base/lib_echo.c */

#undef echo
int echo(void)
{ return(*(int *)0); }

#undef noecho
int noecho(void)
{ return(*(int *)0); }

/* ./base/lib_endwin.c */

#undef endwin
int endwin(void)
{ return(*(int *)0); }

/* ./base/lib_erase.c */

#undef werase
int werase(
    WINDOW *win)
{ return(*(int *)0); }

/* ./base/lib_flash.c */

#undef flash
int flash(void)
{ return(*(int *)0); }

/* ./lib_gen.c */

#undef addch
int addch(
    const chtype z)
{ return(*(int *)0); }

#undef addchnstr
```

```
int addchnstr(  
    const chtype *a1,  
    int z)  
    { return(*(int *)0); }
```

```
#undef addchstr  
int addchstr(  
    const chtype *z)  
    { return(*(int *)0); }
```

```
#undef addnstr  
int addnstr(  
    const char *a1,  
    int z)  
    { return(*(int *)0); }
```

```
#undef addstr  
int addstr(  
    const char *z)  
    { return(*(int *)0); }
```

```
#undef attroff  
int attroff(  
    NCURSES_ATTR_T z)  
    { return(*(int *)0); }
```

```
#undef attron  
int attron(  
    NCURSES_ATTR_T z)  
    { return(*(int  
    *)0); }
```

```
#undef attrset  
int attrset(  
    NCURSES_ATTR_T z)  
    { return(*(int *)0); }
```

```
#undef attr_get  
int attr_get(  
    attr_t *a1,  
    short *a2,  
    void *z)  
    { return(*(int *)0); }
```

```
#undef attr_off  
int attr_off(  
    attr_t a1,  
    void *z)
```

```

    { return(*(int *)0); }

#undef attr_on
int attr_on(
    attr_t a1,
    void *z)
    { return(*(int *)0); }

#undef attr_set
int attr_set(
    attr_t a1,
    short a2,
    void *z)
    { return(*(int *)0); }

#undef bkgd
int bkgd(
    chtype z)
    { return(*(int *)0); }

#undef bkgdset
void bkgdset(
    chtype z)
    { /* void */ }

#undef border
int border(
    chtype a1,
    chtype a2,
    chtype a3,
    chtype a4,
    chtype a5,
    chtype a6,
    chtype a7,
    chtype z)
    { return(*(int *)0); }

#undef box
int box(
    WINDOW *a1,
    chtype a2,
    chtype z)
    { return(*(int *)0); }

#undef chgat
int chgat(
    int a1,
    attr_t a2,

```

```
short a3,  
const void *z)  
{ return(*(int *)0); }  
  
#undef clear  
int clear(void)  
{ return(*(int *)0); }  
  
#undef clrrobot  
int clrrobot(void)  
{  
return(*(int *)0); }  
  
#undef clrtoeol  
int clrtoeol(void)  
{ return(*(int *)0); }  
  
#undef color_set  
int color_set(  
short a1,  
void *z)  
{ return(*(int *)0); }  
  
#undef COLOR_PAIR  
int COLOR_PAIR(  
int z)  
{ return(*(int *)0); }  
  
#undef delch  
int delch(void)  
{ return(*(int *)0); }  
  
#undef deleteln  
int deleteln(void)  
{ return(*(int *)0); }  
  
#undef echochar  
int echochar(  
const chtype z)  
{ return(*(int *)0); }  
  
#undef erase  
int erase(void)  
{ return(*(int *)0); }  
  
#undef getbkgd  
chtype getbkgd(  
WINDOW *z)
```

```
{ return(*(ctype *)0); }

#undef getch
int getch(void)
{ return(*(int *)0); }

#undef getnstr
int getnstr(
char *a1,
int z)
{ return(*(int *)0); }

#undef getstr
int getstr(
char *z)
{ return(*(int *)0); }

#undef hline
int hline(
ctype a1,
int z)
{ return(*(int *)0); }

#undef inch
ctype inch(void)
{ return(*(ctype *)0); }

#undef inchnstr
int inchnstr(
ctype *a1,
int z)
{ return(*(int *)0); }

#undef inchstr
int inchstr(
ctype *z)
{
return(*(int *)0); }

#undef innstr
int innstr(
char *a1,
int z)
{ return(*(int *)0); }

#undef insch
int insch(
ctype z)
```



```
{ return(*(int *)0); }

#undef insdelln
int insdelln(
    int z)
    { return(*(int *)0); }

#undef insertln
int insertln(void)
    { return(*(int *)0); }

#undef insnstr
int insnstr(
    const char *a1,
    int z)
    { return(*(int *)0); }

#undef insstr
int insstr(
    const char *z)
    { return(*(int *)0); }

#undef instr
int instr(
    char *z)
    { return(*(int *)0); }

#undef move
int move(
    int a1,
    int z)
    { return(*(int *)0); }

#undef mvaddch
int mvaddch(
    int a1,
    int a2,
    const chtype z)
    { return(*(int *)0); }

#undef mvaddchnstr
int mvaddchnstr(
    int a1,
    int a2,
    const chtype *a3,
    int z)
    { return(*(int *)0); }
```

```
#undef mvaddchstr
int mvaddchstr(
    int a1,
    int a2,
    const chtype *z)
{ return(*(int *)0); }
```

```
#undef mvaddnstr
int mvaddnstr(
    int a1,
    int a2,
    const char *a3,
    int z)
{ return(*(int *)0); }
```

```
#undef mvaddstr
int mvaddstr(
    int a1,

    int a2,
    const char *z)
{ return(*(int *)0); }
```

```
#undef mvchgat
int mvchgat(
    int a1,
    int a2,
    int a3,
    attr_t a4,
    short a5,
    const void *z)
{ return(*(int *)0); }
```

```
#undef mvdelch
int mvdelch(
    int a1,
    int z)
{ return(*(int *)0); }
```

```
#undef mvgetch
int mvgetch(
    int a1,
    int z)
{ return(*(int *)0); }
```

```
#undef mvgetnstr
int mvgetnstr(
    int a1,
```

```
int a2,  
char *a3,  
int z)  
{ return(*(int *)0); }
```

```
#undef mvgetstr  
int mvgetstr(  
int a1,  
int a2,  
char *z)  
{ return(*(int *)0); }
```

```
#undef mvhline  
int mvhline(  
int a1,  
int a2,  
chtype a3,  
int z)  
{ return(*(int *)0); }
```

```
#undef mvinch  
chtype mvinch(  
int a1,  
int z)  
{ return(*(chtype *)0); }
```

```
#undef mvinchnstr  
int mvinchnstr(  
int a1,  
int a2,  
chtype *a3,  
int z)  
{ return(*(int *)0); }
```

```
#undef mvinchstr  
int mvinchstr(  
int a1,  
int a2,  
chtype *z)  
{ return(*(int *)0); }
```

```
#undef mvinnstr  
int mvinnstr(  
int a1,  
int a2,  
char *a3,  
int z)  
{
```

```
return(*(int *)0); }

#undef mvinsch
int mvinsch(
    int a1,
    int a2,
    chtype z)
{ return(*(int *)0); }

#undef mvinsnstr
int mvinsnstr(
    int a1,
    int a2,
    const char *a3,
    int z)
{ return(*(int *)0); }

#undef mvinsstr
int mvinsstr(
    int a1,
    int a2,
    const char *z)
{ return(*(int *)0); }

#undef mvinstr
int mvinstr(
    int a1,
    int a2,
    char *z)
{ return(*(int *)0); }

#undef mvvline
int mvvline(
    int a1,
    int a2,
    chtype a3,
    int z)
{ return(*(int *)0); }

#undef mvwaddch
int mvwaddch(
    WINDOW *a1,
    int a2,
    int a3,
    const chtype z)
{ return(*(int *)0); }

#undef mvwaddchnstr
```

```
int mvwaddchnstr(  
    WINDOW *a1,  
    int a2,  
    int a3,  
    const chtype *a4,  
    int z)  
    { return(*(int *)0); }
```

```
#undef mvwaddchstr  
int mvwaddchstr(  
    WINDOW *a1,  
    int a2,  
    int a3,  
    const chtype *z)  
    { return(*(int *)0); }
```

```
#undef mvwaddnstr  
int mvwaddnstr(  
    WINDOW *a1,  
    int a2,  
    int a3,  
    const char *a4,  
    int z)  
    { return(*(int *)0); }
```

```
#undef mvwaddstr  
int mvwaddstr(  
    WINDOW *a1,  
  
    int a2,  
    int a3,  
    const char *z)  
    { return(*(int *)0); }
```

```
#undef mvwchgat  
int mvwchgat(  
    WINDOW *a1,  
    int a2,  
    int a3,  
    int a4,  
    attr_t a5,  
    short a6,  
    const void *z)  
    { return(*(int *)0); }
```

```
#undef mvwdelch  
int mvwdelch(  
    WINDOW *a1,
```

```
int a2,  
int z)  
{ return(*(int *)0); }
```

```
#undef mvwgetch  
int mvwgetch(  
WINDOW *a1,  
int a2,  
int z)  
{ return(*(int *)0); }
```

```
#undef mvwgetnstr  
int mvwgetnstr(  
WINDOW *a1,  
int a2,  
int a3,  
char *a4,  
int z)  
{ return(*(int *)0); }
```

```
#undef mvwgetstr  
int mvwgetstr(  
WINDOW *a1,  
int a2,  
int a3,  
char *z)  
{ return(*(int *)0); }
```

```
#undef mvwhline  
int mvwhline(  
WINDOW *a1,  
int a2,  
int a3,  
chtype a4,  
int z)  
{ return(*(int *)0); }
```

```
#undef mvwinch  
chtype mvwinch(  
WINDOW *a1,  
int a2,  
int z)  
{ return(*(chtype *)0); }
```

```
#undef mvwinchnstr  
int mvwinchnstr(  
WINDOW *a1,  
int a2,
```

```
int a3,  
ctype *a4,  
int z)  
{ return(*(int *)0); }
```

```
#undef mvwinchstr  
int mvwinchstr(  
WINDOW *a1,  
  
int a2,  
int a3,  
ctype *z)  
{ return(*(int *)0); }
```

```
#undef mvwinstr  
int mvwinstr(  
WINDOW *a1,  
int a2,  
int a3,  
char *a4,  
int z)  
{ return(*(int *)0); }
```

```
#undef mvwinsch  
int mvwinsch(  
WINDOW *a1,  
int a2,  
int a3,  
ctype z)  
{ return(*(int *)0); }
```

```
#undef mvwinsnstr  
int mvwinsnstr(  
WINDOW *a1,  
int a2,  
int a3,  
const char *a4,  
int z)  
{ return(*(int *)0); }
```

```
#undef mvwinsstr  
int mvwinsstr(  
WINDOW *a1,  
int a2,  
int a3,  
const char *z)  
{ return(*(int *)0); }
```

```
#undef mvwinstr
int mvwinstr(
    WINDOW *a1,
    int a2,
    int a3,
    char *z)
{ return(*(int *)0); }

#undef mvwvline
int mvwvline(
    WINDOW *a1,
    int a2,
    int a3,
    chtype a4,
    int z)
{ return(*(int *)0); }

#undef PAIR_NUMBER
int PAIR_NUMBER(
    int z)
{ return(*(int *)0); }

#undef redrawwin
int redrawwin(
    WINDOW *z)
{ return(*(int *)0); }

#undef refresh
int refresh(void)
{ return(*(int *)0); }

#undef scr1
int scr1(
    int z)
{
    return(*(int *)0); }

#undef scroll
int scroll(
    WINDOW *z)
{ return(*(int *)0); }

#undef setscreg
int setscreg(
    int a1,
    int z)
{ return(*(int *)0); }
```



```
#undef standout
int standout(void)
{ return(*(int *)0); }
```

```
#undef standend
int standend(void)
{ return(*(int *)0); }
```

```
#undef timeout
void timeout(
    int z)
{ /* void */ }
```

```
#undef touchline
int touchline(
    WINDOW *a1,
    int a2,
    int z)
{ return(*(int *)0); }
```

```
#undef touchwin
int touchwin(
    WINDOW *z)
{ return(*(int *)0); }
```

```
#undef untouchwin
int untouchwin(
    WINDOW *z)
{ return(*(int *)0); }
```

```
#undef vline
int vline(
    chtype a1,
    int z)
{ return(*(int *)0); }
```

```
#undef vw_printw
int vw_printw(
    WINDOW *a1,
    const char *a2,
    va_list z)
{ return(*(int *)0); }
```

```
#undef vw_scanw
int vw_scanw(
    WINDOW *a1,
    char *a2,
    va_list z)
```

```
{ return(*(int *)0); }

#undef waddchstr
int waddchstr(
    WINDOW *a1,
    const chtype *z)
{ return(*(int *)0); }

#undef waddstr
int waddstr(
    WINDOW *a1,

    const char *z)
{ return(*(int *)0); }

#undef wattron
int wattron(
    WINDOW *a1,
    int z)
{ return(*(int *)0); }

#undef wattroff
int wattroff(
    WINDOW *a1,
    int z)
{ return(*(int *)0); }

#undef wattrset
int wattrset(
    WINDOW *a1,
    int z)
{ return(*(int *)0); }

#undef wattr_get
int wattr_get(
    WINDOW *a1,
    attr_t *a2,
    short *a3,
    void *z)
{ return(*(int *)0); }

#undef wattr_set
int wattr_set(
    WINDOW *a1,
    attr_t a2,
    short a3,
    void *z)
{ return(*(int *)0); }
```

```
#undef wdeleteln
int wdeleteln(
    WINDOW *z)
{ return(*(int *)0); }
```

```
#undef wgetstr
int wgetstr(
    WINDOW *a1,
    char *z)
{ return(*(int *)0); }
```

```
#undef winchstr
int winchstr(
    WINDOW *a1,
    chtype *z)
{ return(*(int *)0); }
```

```
#undef winsertln
int winsertln(
    WINDOW *z)
{ return(*(int *)0); }
```

```
#undef winsstr
int winsstr(
    WINDOW *a1,
    const char *z)
{ return(*(int *)0); }
```

```
#undef winstr
int winstr(
    WINDOW *a1,
    char *z)
{ return(*(int *)0); }
```

```
#undef wstandout
int wstandout(
    WINDOW *z)
{
    return(*(int *)0); }
```

```
#undef wstandend
int wstandend(
    WINDOW *z)
{ return(*(int *)0); }
```

```
#undef getattrs
int getattrs(
```

```
const WINDOW *z)
{ return(*(int *)0); }
```

```
#undef getcurx
int getcurx(
const WINDOW *z)
{ return(*(int *)0); }
```

```
#undef getcury
int getcury(
const WINDOW *z)
{ return(*(int *)0); }
```

```
#undef getbegx
int getbegx(
const WINDOW *z)
{ return(*(int *)0); }
```

```
#undef getbegy
int getbegy(
const WINDOW *z)
{ return(*(int *)0); }
```

```
#undef getmaxx
int getmaxx(
const WINDOW *z)
{ return(*(int *)0); }
```

```
#undef getmaxy
int getmaxy(
const WINDOW *z)
{ return(*(int *)0); }
```

```
#undef getparx
int getparx(
const WINDOW *z)
{ return(*(int *)0); }
```

```
#undef getpary
int getpary(
const WINDOW *z)
{ return(*(int *)0); }
```

```
#undef wgetparent
WINDOW *wgetparent(
const WINDOW *z)
{ return(*(WINDOW **)0); }
```

```
#undef is_cleared
NCURSES_BOOL is_cleared(
    const WINDOW *z)
    { return(*(NCURSES_BOOL *)0); }
```

```
#undef is_idcok
NCURSES_BOOL is_idcok(
    const
    WINDOW *z)
    { return(*(NCURSES_BOOL *)0); }
```

```
#undef is_idlok
NCURSES_BOOL is_idlok(
    const WINDOW *z)
    { return(*(NCURSES_BOOL *)0); }
```

```
#undef is_immedok
NCURSES_BOOL is_immedok(
    const WINDOW *z)
    { return(*(NCURSES_BOOL *)0); }
```

```
#undef is_keypad
NCURSES_BOOL is_keypad(
    const WINDOW *z)
    { return(*(NCURSES_BOOL *)0); }
```

```
#undef is_leaveok
NCURSES_BOOL is_leaveok(
    const WINDOW *z)
    { return(*(NCURSES_BOOL *)0); }
```

```
#undef is_nodelay
NCURSES_BOOL is_nodelay(
    const WINDOW *z)
    { return(*(NCURSES_BOOL *)0); }
```

```
#undef is_notimeout
NCURSES_BOOL is_notimeout(
    const WINDOW *z)
    { return(*(NCURSES_BOOL *)0); }
```

```
#undef is_scrollok
NCURSES_BOOL is_scrollok(
    const WINDOW *z)
    { return(*(NCURSES_BOOL *)0); }
```

```
#undef is_syncok
NCURSES_BOOL is_syncok(
```

```
const WINDOW *z)
{ return(*(NCURSES_BOOL *)0); }
```

```
#undef wgetscrreg
int wgetscrreg(
    const WINDOW *a1,
    int *a2,
    int *z)
{ return(*(int *)0); }
```

```
#undef mouse_trafo
NCURSES_BOOL mouse_trafo(
    int *a1,
    int *a2,

    NCURSES_BOOL z)
{ return(*(NCURSES_BOOL *)0); }
```

```
/* ./base/lib_getch.c */
```

```
#include <fifo_defs.h>
```

```
#undef _nc_ESCDELAY
int _nc_ESCDELAY(void)
{ return(*(int *)0); }
```

```
#undef set_escdelay
int set_escdelay(
    int value)
{ return(*(int *)0); }
```

```
#undef _nc_wgetch
int _nc_wgetch(
    WINDOW *win,
    unsigned long *result,
    int use_meta)
{ return(*(int *)0); }
```

```
#undef wgetch
int wgetch(
    WINDOW *win)
{ return(*(int *)0); }
```

```
/* ./base/lib_getstr.c */
```

```
#undef wgetnstr
int wgetnstr(
    WINDOW *win,
```

```

char *str,
int maxlen)
{ return(*(int *)0); }

/* ./base/lib_hline.c */

#undef whline
int whline(
WINDOW *win,
chtype ch,
int n)
{ return(*(int *)0); }

/* ./base/lib_immedok.c */

#undef immedok
void immedok(
WINDOW *win,
NCURSES_BOOL flag)
{ /* void */ }

/* ./base/lib_inchstr.c */

#undef winchnstr
int winchnstr(
WINDOW *win,
chtype *str,
int n)
{ return(*(int *)0); }

/* ./base/lib_initscr.c */

#undef initscr
WINDOW *initscr(void)
{ return(*(WINDOW
***)0); }

/* ./base/lib_insch.c */

#undef _nc_insert_ch
int _nc_insert_ch(
WINDOW *win,
chtype ch)
{ return(*(int *)0); }

#undef winsch
int winsch(
WINDOW *win,

```

```

ctype c)
{ return(*(int *)0); }

/* ./base/lib_insdel.c */

#undef winsdelln
int winsdelln(
    WINDOW *win,
    int n)
{ return(*(int *)0); }

/* ./base/lib_insnstr.c */

#undef winsnstr
int winsnstr(
    WINDOW *win,
    const char *s,
    int n)
{ return(*(int *)0); }

/* ./base/lib_instr.c */

#undef winnstr
int winnstr(
    WINDOW *win,
    char *str,
    int n)
{ return(*(int *)0); }

/* ./base/lib_isendwin.c */

#undef isendwin
NCURSES_BOOL isendwin(void)
{ return*(NCURSES_BOOL *)0; }

/* ./base/lib_leaveok.c */

#undef leaveok
int leaveok(
    WINDOW *win,
    NCURSES_BOOL flag)
{ return(*(int *)0); }

/* ./base/lib_mouse.c */

#undef getmouse
int getmouse(
    MEVENT *aevent)

```



```

    { return(*(int *)0); }

#undef ungetmouse
int ungetmouse(
    MEVENT *aevent)
    { return(*(int *)0); }

#undef mousemask
mmask_t mousemask(
    mmask_t newmask,

    mmask_t *oldmask)
    { return(*(mmask_t *)0); }

#undef wenclose
NCURSES_BOOL wenclose(
    const WINDOW *win,
    int y,
    int x)
    { return(*(NCURSES_BOOL *)0); }

#undef mouseinterval
int mouseinterval(
    int maxclick)
    { return(*(int *)0); }

#undef _nc_has_mouse
int _nc_has_mouse(void)
    { return(*(int *)0); }

#undef wmouse_trafo
NCURSES_BOOL wmouse_trafo(
    const WINDOW *win,
    int *pY,
    int *pX,
    NCURSES_BOOL to_screen)
    { return(*(NCURSES_BOOL *)0); }

/* ./base/lib_move.c */

#undef wmove
int wmove(
    WINDOW *win,
    int y,
    int x)
    { return(*(int *)0); }

/* ./tty/lib_mvcur.c */

```

```

#undef _nc_msec_cost
int _nc_msec_cost(
    const char *const cap,
    int affcnt)
    { return(*(int *)0); }

#undef _nc_mvcur_resume
void _nc_mvcur_resume(void)
    { /* void */ }

#undef _nc_mvcur_init
void _nc_mvcur_init(void)
    { /* void */ }

#undef _nc_mvcur_wrap
void _nc_mvcur_wrap(void)
    { /* void */ }

#undef mvcur
int mvcur(
    int yold,
    int xold,
    int ynew,

    int xnew)
    { return(*(int *)0); }

#undef _nc_optimize_enable
int _nc_optimize_enable;

/* ./base/lib_mvwin.c */

#undef mvwin
int mvwin(
    WINDOW *win,
    int by,
    int bx)
    { return(*(int *)0); }

/* ./base/lib_newterm.c */

#undef filter
void filter(void)
    { /* void */ }

#undef nofilter
void nofilter(void)

```

```

{ /* void */ }

#undef newterm
SCREEN *newterm(
    char *name,
    FILE *ofp,
    FILE *ifp)
{ return(*(SCREEN **)0); }

/* ./base/lib_newwin.c */

#undef _nc_freewin
int _nc_freewin(
    WINDOW *win)
{ return(*(int *)0); }

#undef newwin
WINDOW *newwin(
    int num_lines,
    int num_columns,
    int begy,
    int begx)
{ return(*(WINDOW **)0); }

#undef derwin
WINDOW *derwin(
    WINDOW *orig,
    int num_lines,
    int num_columns,
    int begy,
    int begx)
{ return(*(WINDOW **)0); }

#undef subwin
WINDOW *subwin(
    WINDOW *w,
    int l,
    int c,
    int y,
    int x)
{ return(*(WINDOW **)0); }

#undef _nc_makenew
WINDOW *_nc_makenew(
    int num_lines,
    int num_columns,

    int begy,

```

```

int begx,
int flags)
{ return(*(WINDOW ***)0); }

#undef _nc_screen_of
SCREEN *_nc_screen_of(
WINDOW *win)
{ return(*(SCREEN ***)0); }

/* ./base/lib_nl.c */

#undef nl
int nl(void)
{ return(*(int *)0); }

#undef nonl
int nonl(void)
{ return(*(int *)0); }

/* ./base/lib_overlay.c */

#undef overlay
int overlay(
const WINDOW *win1,
WINDOW *win2)
{ return(*(int *)0); }

#undef overwrite
int overwrite(
const WINDOW *win1,
WINDOW *win2)
{ return(*(int *)0); }

#undef copywin
int copywin(
const WINDOW *src,
WINDOW *dst,
int sminrow,
int smincol,
int dminrow,
int dmincol,
int dmaxrow,
int dmaxcol,
int over)
{ return(*(int *)0); }

/* ./base/lib_pad.c */

```

```
#undef newpad
WINDOW *newpad(
    int l,
    int c)
{ return(*(WINDOW **)0); }
```

```
#undef subpad
WINDOW *subpad(
    WINDOW *orig,
    int l,
    int c,
    int begy,
    int begx)
{ return(*(WINDOW **)0); }
```

```
#undef prefresh
int prefresh(
    WINDOW *win,
    int pminrow,
    int pmincol,

    int sminrow,
    int smincol,
    int smaxrow,
    int smaxcol)
{ return(*(int *)0); }
```

```
#undef pnoutrefresh
int pnoutrefresh(
    WINDOW *win,
    int pminrow,
    int pmincol,
    int sminrow,
    int smincol,
    int smaxrow,
    int smaxcol)
{ return(*(int *)0); }
```

```
#undef pechochar
int pechochar(
    WINDOW *pad,
    const chtype ch)
{ return(*(int *)0); }
```

```
/* ./base/lib_printw.c */
```

```
#undef printw
int printw(
```

```

const char *fmt,
...)
{ return(*(int *)0); }

#undef wprintw
int wprintw(
    WINDOW *win,
    const char *fmt,
    ...)
{ return(*(int *)0); }

#undef mvprintw
int mvprintw(
    int y,
    int x,
    const char *fmt,
    ...)
{ return(*(int *)0); }

#undef mvwprintw
int mvwprintw(
    WINDOW *win,
    int y,
    int x,
    const char *fmt,
    ...)
{ return(*(int *)0); }

#undef vwprintw
int vwprintw(
    WINDOW *win,
    const char *fmt,
    va_list argp)
{ return(*(int *)0); }

/* ./base/lib_redrawln.c */

#undef wredrawln
int wredrawln(
    WINDOW *win,
    int beg,
    int num)
{
    return(*(int *)0); }

/* ./base/lib_refresh.c */

#undef wrefresh

```

```

int wrefresh(
    WINDOW *win)
    { return(*(int *)0); }

#undef wnoutrefresh
int wnoutrefresh(
    WINDOW *win)
    { return(*(int *)0); }

/* ./base/lib_restart.c */

#undef restartterm
int restartterm(
    char *term,
    int filenum,
    int *errret)
    { return(*(int *)0); }

/* ./base/lib_scanw.c */

#undef vwscanw
int vwscanw(
    WINDOW *win,
    char *fmt,
    va_list argp)
    { return(*(int *)0); }

#undef scanw
int scanw(
    char *fmt,
    ...)
    { return(*(int *)0); }

#undef wscanw
int wscanw(
    WINDOW *win,
    char *fmt,
    ...)
    { return(*(int *)0); }

#undef mvscanw
int mvscanw(
    int y,
    int x,
    char *fmt,
    ...)
    { return(*(int *)0); }

```

```

#undef mvwscanw
int mvwscanw(
    WINDOW *win,
    int y,
    int x,
    char *fmt,
    ...)
{ return(*(int *)0); }

/* ./base/lib_screen.c */

#undef getwin
WINDOW *getwin(
    FILE *filep)
{ return(*(WINDOW **)0); }

#undef putwin
int putwin(
    WINDOW *win,
    FILE *filep)
{
    return(*(int *)0); }

#undef scr_restore
int scr_restore(
    const char *file)
{ return(*(int *)0); }

#undef scr_dump
int scr_dump(
    const char *file)
{ return(*(int *)0); }

#undef scr_init
int scr_init(
    const char *file)
{ return(*(int *)0); }

#undef scr_set
int scr_set(
    const char *file)
{ return(*(int *)0); }

/* ./base/lib_scroll.c */

#undef _nc_scroll_window
void _nc_scroll_window(
    WINDOW *win,

```



```

int const n,
int const top,
int const bottom,
chtype blank)
{ /* void */ }

#undef wscr1
int wscr1(
    WINDOW *win,
    int n)
{ return(*(int *)0); }

/* ./base/lib_scrollok.c */

#undef scrollok
int scrollok(
    WINDOW *win,
    NCURSES_BOOL flag)
{ return(*(int *)0); }

/* ./base/lib_scrreg.c */

#undef wsetscrreg
int wsetscrreg(
    WINDOW *win,
    int top,
    int bottom)
{ return(*(int *)0); }

/* ./base/lib_set_term.c */

#undef set_term
SCREEN *set_term(
    SCREEN *screenp)
{ return(*(SCREEN **)0); }

#undef delscreen
void delscreen(
    SCREEN *sp)
{
/* void */ }

#undef _nc_setupscreen
int _nc_setupscreen(
    int slines,
    int scolumns,
    FILE *output,
    NCURSES_BOOL filtered,

```

```

int slk_format)
{ return(*(int *)0); }

#undef _nc_ripoffline
int _nc_ripoffline(
    int line,
    int (*init)(
        WINDOW *p1,
        int p2))
{ return(*(int *)0); }

#undef ripoffline
int ripoffline(
    int line,
    int (*init)(
        WINDOW *p1,
        int p2))
{ return(*(int *)0); }

/* ./base/lib_slk.c */

#undef _nc_slk_initialize
int _nc_slk_initialize(
    WINDOW *stwin,
    int cols)
{ return(*(int *)0); }

#undef slk_restore
int slk_restore(void)
{ return(*(int *)0); }

/* ./base/lib_slkatr_set.c */

#undef slk_attr_set
int slk_attr_set(
    const attr_t attr,
    short color_pair_number,
    void *opts)
{ return(*(int *)0); }

/* ./base/lib_slkatrof.c */

#undef slk_attroff
int slk_attroff(
    const chtype attr)
{ return(*(int *)0); }

/* ./base/lib_slkatron.c */

```

```

#undef slk_attron
int slk_attron(
    const chtype attr)
    { return(*(int *)0); }

/* ./base/lib_slkatrset.c
*/

#undef slk_attrset
int slk_attrset(
    const chtype attr)
    { return(*(int *)0); }

/* ./base/lib_slkattr.c */

#undef slk_attr
attr_t slk_attr(void)
    { return(*(attr_t *)0); }

/* ./base/lib_slkclear.c */

#undef slk_clear
int slk_clear(void)
    { return(*(int *)0); }

/* ./base/lib_slkcolor.c */

#undef slk_color
int slk_color(
    short color_pair_number)
    { return(*(int *)0); }

/* ./base/lib_slkinit.c */

#undef slk_init
int slk_init(
    int format)
    { return(*(int *)0); }

/* ./base/lib_slklab.c */

#undef slk_label
char *slk_label(
    int n)
    { return(*(char **)0); }

/* ./base/lib_slkrefr.c */

```

```

#undef slk_noutrefresh
int slk_noutrefresh(void)
    { return(*(int *)0); }

#undef slk_refresh
int slk_refresh(void)
    { return(*(int *)0); }

/* ./base/lib_slkset.c */

#undef slk_set
int slk_set(
    int i,
    const char *astr,
    int format)
    { return(*(int *)0); }

/* ./base/lib_slktouch.c */

#undef slk_touch
int slk_touch(void)
    { return(*(int *)0); }

/* ./base/lib_touch.c
*/

#undef is_linetouched
NCURSES_BOOL is_linetouched(
    WINDOW *win,
    int line)
    { return(*(NCURSES_BOOL *)0); }

#undef is_wintouched
NCURSES_BOOL is_wintouched(
    WINDOW *win)
    { return(*(NCURSES_BOOL *)0); }

#undef wtouchln
int wtouchln(
    WINDOW *win,
    int y,
    int n,
    int changed)
    { return(*(int *)0); }

/* ./trace/lib_tracedmp.c */

```

```

#undef _tracedump
void _tracedump(
    const char *name,
    WINDOW *win)
    { /* void */ }

/* ./trace/lib_tracemse.c */

#undef _nc_tracemouse
char *_nc_tracemouse(
    SCREEN *sp,
    MEVENT const *ep)
    { return(*(char **)0); }

#undef _tracemouse
char *_tracemouse(
    MEVENT const *ep)
    { return(*(char **)0); }

/* ./tty/lib_tstp.c */

#include <SigAction.h>

#undef _nc_signal_handler
void _nc_signal_handler(
    NCURSES_BOOL enable)
    { /* void */ }

/* ./base/lib_ungetch.c */

#undef _nc_fifo_dump
void _nc_fifo_dump(
    SCREEN *sp)
    { /* void */ }

#undef _nc_ungetch
int _nc_ungetch(
    SCREEN *sp,
    int ch)
    { return(*(int *)0);
    }

#undef ungetch
int ungetch(
    int ch)
    { return(*(int *)0); }

/* ./tty/lib_vidattr.c */

```

```

#undef vidputs
int vidputs(
    chtype newmode,
    int (*outc)(
        int p1))
    { return(*(int *)0); }

#undef vidattr
int vidattr(
    chtype newmode)
    { return(*(int *)0); }

#undef termattrs
chtype termattrs(void)
    { return(*(chtype *)0); }

/* ./base/lib_vline.c */

#undef wvline
int wvline(
    WINDOW *win,
    chtype ch,
    int n)
    { return(*(int *)0); }

/* ./base/lib_wattroff.c */

#undef wattr_off
int wattr_off(
    WINDOW *win,
    attr_t at,
    void *opts)
    { return(*(int *)0); }

/* ./base/lib_wattron.c */

#undef wattr_on
int wattr_on(
    WINDOW *win,
    attr_t at,
    void *opts)
    { return(*(int *)0); }

/* ./base/lib_winch.c */

#undef winch
chtype winch(

```

```

WINDOW *win)
{ return(*(chtype *)0); }

/* ./base/lib_window.c */

#undef _nc_synchook
void _nc_synchook(
    WINDOW *win)
{ /* void */ }

#undef mvderwin
int mvderwin(
    WINDOW *win,
    int y,
    int x)
{ return(*(int *)0); }

#undef
syncok
int syncok(
    WINDOW *win,
    NCURSES_BOOL bf)
{ return(*(int *)0); }

#undef wsyncup
void wsyncup(
    WINDOW *win)
{ /* void */ }

#undef wsyncdown
void wsyncdown(
    WINDOW *win)
{ /* void */ }

#undef wcursyncup
void wcursyncup(
    WINDOW *win)
{ /* void */ }

#undef dupwin
WINDOW *dupwin(
    WINDOW *win)
{ return(*(WINDOW **)0); }

/* ./base/nc_panel.c */

#undef _nc_panelhook
struct panelhook *_nc_panelhook(void)

```

```
{ return(*(struct panelhook **)0); }
```

```
/* ./base/safe_sprintf.c */
```

```
#undef _nc_printf_string  
char *_nc_printf_string(  
    const char *fmt,  
    va_list ap)  
    { return(*(char **)0); }
```

```
/* ./tty/tty_update.c */
```

```
#include <sys/time.h>  
#include <sys/times.h>
```

```
#undef douupdate  
int douupdate(void)  
    { return(*(int *)0); }
```

```
#undef _nc_scrolln  
int _nc_scrolln(  
    int n,  
    int top,  
    int bot,  
    int maxy)  
    { return(*(int *)0); }
```

```
#undef _nc_screen_resume  
void _nc_screen_resume(void)  
    { /* void */ }
```

```
#undef _nc_screen_init  
void _nc_screen_init(void)  
    { /* void */  
    }
```

```
#undef _nc_screen_wrap  
void _nc_screen_wrap(void)  
    { /* void */ }
```

```
#undef _nc_do_xmc_glitch  
void _nc_do_xmc_glitch(  
    attr_t previous)  
    { /* void */ }
```

```
/* ./trace/varargs.c */
```

```
typedef enum {
```



```
    atUnknown = 0, atInteger, atFloat, atPoint, atString
} ARGTYPE;
```

```
#undef _nc_varargs
char *_nc_varargs(
    const char *fmt,
    va_list ap)
{ return(*(char **)0); }
```

```
/* ./base/memmove.c */
```

```
#undef _nc_memmove
void _nc_memmove(void)
{ /* void */ }
```

```
/* ./base/vsscanf.c */
```

```
#undef _nc_vsscanf
void _nc_vsscanf(void)
{ /* void */ }
```

```
/* ./base/lib_freeall.c */
```

```
#include <term_entry.h>
```

```
#undef _nc_freeall
void _nc_freeall(void)
{ /* void */ }
```

```
#undef _nc_free_and_exit
void _nc_free_and_exit(
    int code)
{ /* void */ }
```

```
/* ./expanded.c */
```

```
#undef _nc_toggle_attr_on
void _nc_toggle_attr_on(
    attr_t *S,
    attr_t at)
{ /* void */ }
```

```
#undef _nc_toggle_attr_off
void _nc_toggle_attr_off(
    attr_t *S,
    attr_t at)
{ /* void */ }
```

```

#undef _nc_DelCharCost
int _nc_DelCharCost(
    int count)
{
    return(*(int *)0); }

#undef _nc_InsCharCost
int _nc_InsCharCost(
    int count)
{ return(*(int *)0); }

#undef _nc_UpdateAttrs
void _nc_UpdateAttrs(
    chtype c)
{ /* void */ }

/* ./base/legacy_coding.c */

#undef use_legacy_coding
int use_legacy_coding(
    int level)
{ return(*(int *)0); }

/* ./base/lib_dft_fgbg.c */

#undef use_default_colors
int use_default_colors(void)
{ return(*(int *)0); }

#undef assume_default_colors
int assume_default_colors(
    int fg,
    int bg)
{ return(*(int *)0); }

/* ./tinfo/lib_print.c */

#undef mcprint
int mcprint(
    char *data,
    int len)
{ return(*(int *)0); }

/* ./base/resizeterm.c */

#undef is_term_resized
NCURSES_BOOL is_term_resized(
    int ToLines,

```

```
int ToCols)
{ return(*(NCURSES_BOOL *)0); }
```

```
#undef resize_term
int resize_term(
    int ToLines,
    int ToCols)
{ return(*(int *)0); }
```

```
#undef resizeterm
int resizeterm(
    int ToLines,
    int ToCols)
{ return(*(int *)0); }
```

```
/* ./trace/trace_xnames.c */
```

```
#undef _nc_trace_xnames
void _nc_trace_xnames(
    TERMTYPE
    *tp)
{ /* void */ }
```

```
/* ./tinfo/use_screen.c */
```

```
#undef use_screen
int use_screen(
    SCREEN *screen,
    NCURSES_SCREEN_CB func,
    void *data)
{ return(*(int *)0); }
```

```
/* ./base/use_window.c */
```

```
#undef use_window
int use_window(
    WINDOW *win,
    NCURSES_WINDOW_CB func,
    void *data)
{ return(*(int *)0); }
```

```
/* ./base/wresize.c */
```

```
#undef wresize
int wresize(
    WINDOW *win,
    int ToLines,
    int ToCols)
```

```

    { return(*(int *)0); }

/* ./tinfo/access.c */

#include <sys/stat.h>
#include <nc_alloc.h>

#undef _nc_rootname
char *_nc_rootname(
    char *path)
    { return(*(char **)0); }

#undef _nc_is_abs_path
NCURSES_BOOL _nc_is_abs_path(
    const char *path)
    { return*(NCURSES_BOOL *)0; }

#undef _nc_pathlast
unsigned _nc_pathlast(
    const char *path)
    { return*(unsigned *)0; }

#undef _nc_basename
char *_nc_basename(
    char *path)
    { return(*(char **)0); }

#undef _nc_access
int _nc_access(
    const char *path,
    int mode)
    { return(*(int *)0); }

#undef
    _nc_is_dir_path
NCURSES_BOOL _nc_is_dir_path(
    const char *path)
    { return*(NCURSES_BOOL *)0; }

#undef _nc_is_file_path
NCURSES_BOOL _nc_is_file_path(
    const char *path)
    { return*(NCURSES_BOOL *)0; }

#undef _nc_env_access
int _nc_env_access(void)
    { return(*(int *)0); }

```

```

/* ./tinfo/add_tries.c */

#undef _nc_add_to_try
int _nc_add_to_try(
    TRIES **tree,
    const char *str,
    unsigned code)
{ return(*(int *)0); }

/* ./tinfo/alloc_ttype.c */

#undef _nc_align_termttype
void _nc_align_termttype(
    TERMTYPE *to,
    TERMTYPE *from)
{ /* void */ }

#undef _nc_copy_termttype
void _nc_copy_termttype(
    TERMTYPE *dst,
    TERMTYPE *src)
{ /* void */ }

/* ./codes.c */

#undef _nc_boolcodes
char *const *_nc_boolcodes(void)
{ return(*(char **)0); }

#undef _nc_numcodes
char *const *_nc_numcodes(void)
{ return(*(char **)0); }

#undef _nc_strcodes
char *const *_nc_strcodes(void)
{ return(*(char **)0); }

/* ./tinfo/comp_error.c */

#undef _nc_suppress_warnings
NCURSES_BOOL
    _nc_suppress_warnings;
#undef _nc_curr_line
int _nc_curr_line;
#undef _nc_curr_col
int _nc_curr_col;

#undef _nc_get_source

```

```
const char *_nc_get_source(void)
{ return(*(const char **)0); }
```

```
#undef _nc_set_source
void _nc_set_source(
    const char *const name)
{ /* void */ }
```

```
#undef _nc_set_type
void _nc_set_type(
    const char *const name)
{ /* void */ }
```

```
#undef _nc_get_type
void _nc_get_type(
    char *name)
{ /* void */ }
```

```
#undef _nc_warning
void _nc_warning(
    const char *const fmt,
    ...)
{ /* void */ }
```

```
#undef _nc_err_abort
void _nc_err_abort(
    const char *const fmt,
    ...)
{ /* void */ }
```

```
#undef _nc_syserr_abort
void _nc_syserr_abort(
    const char *const fmt,
    ...)
{ /* void */ }
```

```
/* ./tinfo/db_iterator.c */
```

```
#undef _nc_tic_dir
const char *_nc_tic_dir(
    const char *path)
{ return(*(const char **)0); }
```

```
#undef _nc_keep_tic_dir
void _nc_keep_tic_dir(
    const char *path)
{ /* void */ }
```

```

#undef _nc_last_db
void _nc_last_db(void)
{ /* void */ }

#undef _nc_next_db
const
char *_nc_next_db(
    DBDIRS *state,
    int *offset)
{ return(*(const char **)0); }

#undef _nc_first_db
void _nc_first_db(
    DBDIRS *state,
    int *offset)
{ /* void */ }

/* ./tinfo/doalloc.c */

#undef _nc_doalloc
void *_nc_doalloc(
    void *oldp,
    size_t amount)
{ return(*(void **)0); }

/* ./tinfo/entries.c */

#undef _nc_head
ENTRY *_nc_head;
#undef _nc_tail
ENTRY *_nc_tail;

#undef _nc_free_entry
void _nc_free_entry(
    ENTRY *headp,
    TERMTYPE *tterm)
{ /* void */ }

#undef _nc_free_entries
void _nc_free_entries(
    ENTRY *headp)
{ /* void */ }

#undef _nc_delink_entry
ENTRY *_nc_delink_entry(
    ENTRY *headp,
    TERMTYPE *tterm)
{ return(*(ENTRY **)0); }

```

```

#undef _nc_leaks_tinfo
void _nc_leaks_tinfo(void)
{ /* void */ }

/* ./fallback.c */

#undef _nc_fallback
const TERMTYPE *_nc_fallback(
    const char *name)
{ return(*(const TERMTYPE **)0); }

/* ./tinfo/free_ttype.c */

#undef _nc_free_termtype
void _nc_free_termtype(
    TERMTYPE *ptr)
{ /* void */
}

#undef _nc_user_definable
NCURSES_BOOL _nc_user_definable;

#undef use_extended_names
int use_extended_names(
    NCURSES_BOOL flag)
{ return(*(int *)0); }

/* ./tinfo/getenv_num.c */

#undef _nc_getenv_num
int _nc_getenv_num(
    const char *name)
{ return(*(int *)0); }

/* ./tinfo/home_terminfo.c */

#undef _nc_home_terminfo
char *_nc_home_terminfo(void)
{ return(*(char **)0); }

/* ./tinfo/init_keytry.c */

#if 0

#include <init_keytry.h>

#undef _nc_tinfo_fkeys

```



```
const struct tinfo_fkeys _nc_tinfo_fkeys[] = {0};
```

```
#endif
```

```
#undef _nc_init_keytry
```

```
void _nc_init_keytry(  
    SCREEN *sp)  
    { /* void */ }
```

```
/* ./tinfo/lib_acs.c */
```

```
#undef _nc_acs_map
```

```
chtype *_nc_acs_map(void)  
    { return(*(chtype **)0); }
```

```
#undef _nc_init_acs
```

```
void _nc_init_acs(void)  
    { /* void */ }
```

```
/* ./tinfo/lib_baudrate.c */
```

```
#include <termcap.h>
```

```
struct speed {  
    int s;  
    int sp;  
};
```

```
#undef _nc_baudrate
```

```
int _nc_baudrate(  
    int OSpeed)  
    { return(*(int *)0); }
```

```
#undef _nc_ospeed
```

```
int _nc_ospeed(  
    int BaudRate)  
    {  
    return(*(int *)0); }
```

```
#undef baudrate
```

```
int baudrate(void)  
    { return(*(int *)0); }
```

```
/* ./tinfo/lib_cur_term.c */
```

```
#undef _nc_cur_term
```

```
TERMINAL *_nc_cur_term(void)  
    { return(*(TERMINAL **)0); }
```

```

#undef set_curterm
TERMINAL *set_curterm(
    TERMINAL *termp)
    { return(*(TERMINAL **)0); }

#undef del_curterm
int del_curterm(
    TERMINAL *termp)
    { return(*(int *)0); }

/* ./tinfo/lib_data.c */

#undef _nc_stdscr
WINDOW *_nc_stdscr(void)
    { return(*(WINDOW **)0); }

#undef _nc_curscr
WINDOW *_nc_curscr(void)
    { return(*(WINDOW **)0); }

#undef _nc_newscr
WINDOW *_nc_newscr(void)
    { return(*(WINDOW **)0); }

#undef _nc_screen_chain
SCREEN *_nc_screen_chain;
#undef SP
SCREEN *SP;
#undef _nc_globals
NCURSES_GLOBALS _nc_globals;
#undef _nc_prescreen
NCURSES_PREScreen _nc_prescreen;

#undef _nc_init_pthreads
void _nc_init_pthreads(void)
    { /* void */ }

#undef _nc_mutex_init
void _nc_mutex_init(
    pthread_mutex_t *obj)
    { /* void */ }

#undef _nc_mutex_lock
int _nc_mutex_lock(
    pthread_mutex_t
    *obj)
    { return(*(int *)0); }

```

```

#undef _nc_mutex_trylock
int _nc_mutex_trylock(
    pthread_mutex_t *obj)
    { return(*(int *)0); }

#undef _nc_mutex_unlock
int _nc_mutex_unlock(
    pthread_mutex_t *obj)
    { return(*(int *)0); }

/* ./tinfo/lib_has_cap.c */

#undef has_ic
NCURSES_BOOL has_ic(void)
    { return*(NCURSES_BOOL *)0; }

#undef has_il
NCURSES_BOOL has_il(void)
    { return*(NCURSES_BOOL *)0; }

/* ./tinfo/lib_kernel.c */

#undef erasechar
char erasechar(void)
    { return*(char *)0; }

#undef killchar
char killchar(void)
    { return*(char *)0; }

#undef flushinp
int flushinp(void)
    { return*(int *)0; }

/* ./lib_keyname.c */

struct kn { short offset; int code; };

#undef _nc_keyname
char *_nc_keyname(
    SCREEN *sp,
    int c)
    { return*(char **)0; }

#undef keyname
char *keyname(
    int c)

```

```

    { return(*(char **)0); }

/* ./tinfo/lib_longname.c */

#undef longname
char *longname(void)
    { return(*(char **)0); }

/* ./tinfo/lib_napms.c */

#undef napms
int napms(
    int ms)
    {
    return(*(int *)0); }

/* ./tinfo/lib_options.c */

#undef idlok
int idlok(
    WINDOW *win,
    NCURSES_BOOL flag)
    { return(*(int *)0); }

#undef idcok
void idcok(
    WINDOW *win,
    NCURSES_BOOL flag)
    { /* void */ }

#undef halfdelay
int halfdelay(
    int t)
    { return(*(int *)0); }

#undef nodelay
int nodelay(
    WINDOW *win,
    NCURSES_BOOL flag)
    { return(*(int *)0); }

#undef notimeout
int notimeout(
    WINDOW *win,
    NCURSES_BOOL f)
    { return(*(int *)0); }

#undef wtimeout

```

```

void wtimeout(
    WINDOW *win,
    int delay)
    { /* void */ }

#undef keypad
int keypad(
    WINDOW *win,
    NCURSES_BOOL flag)
    { return(*(int *)0); }

#undef meta
int meta(
    WINDOW *win,
    NCURSES_BOOL flag)
    { return(*(int *)0); }

#undef curs_set
int curs_set(
    int vis)
    { return(*(int *)0); }

#undef typeahead
int typeahead(
    int fd)
    { return(*(int *)0); }

#undef has_key
int has_key(
    int keycode)
    { return(*(int *)0); }

#undef _nc_keypad
int _nc_keypad(
    SCREEN *sp,
    NCURSES_BOOL flag)
    {
    return(*(int *)0); }

/* ./tinfo/lib_raw.c */

#undef raw
int raw(void)
    { return(*(int *)0); }

#undef cbreak
int cbreak(void)
    { return(*(int *)0); }

```

```

#undef qiflush
void qiflush(void)
    { /* void */ }

#undef noraw
int noraw(void)
    { return(*(int *)0); }

#undef nocbreak
int nocbreak(void)
    { return(*(int *)0); }

#undef noqiflush
void noqiflush(void)
    { /* void */ }

#undef intrflush
int intrflush(
    WINDOW *win,
    NCURSES_BOOL flag)
    { return(*(int *)0); }

/* ./tinfo/lib_setup.c */

#include <locale.h>
#include <sys/ioctl.h>
#include <langinfo.h>

#undef _nc_ttytype
char *_nc_ttytype(void)
    { return(*(char **)0); }

#undef _nc_ptr_Lines
int *_nc_ptr_Lines(void)
    { return(*(int **)0); }

#undef _nc_LINES
int _nc_LINES(void)
    { return(*(int *)0); }

#undef _nc_ptr_Cols
int *_nc_ptr_Cols(void)
    { return(*(int **)0); }

#undef _nc_COLS
int _nc_COLS(void)
    { return(*(int *)0); }

```

```

#undef _nc_TABSIZE
int _nc_TABSIZE(void)
{ return(*(int *)0); }

#undef set_tabsize
int set_tabsize(
    int value)
{
    return(*(int *)0); }

#undef _nc_handle_sigwinch
int _nc_handle_sigwinch(
    SCREEN *sp)
{ return(*(int *)0); }

#undef use_env
void use_env(
    NCURSES_BOOL f)
{ /* void */ }

#undef _nc_get_screensize
void _nc_get_screensize(
    SCREEN *sp,
    int *linep,
    int *colp)
{ /* void */ }

#undef _nc_update_screensize
void _nc_update_screensize(
    SCREEN *sp)
{ /* void */ }

#undef _nc_get_locale
char *_nc_get_locale(void)
{ return(*(char **)0); }

#undef _nc_unicode_locale
int _nc_unicode_locale(void)
{ return(*(int *)0); }

#undef _nc_locale_breaks_acs
int _nc_locale_breaks_acs(
    TERMINAL *termp)
{ return(*(int *)0); }

#undef _nc_setupterm
int _nc_setupterm(

```

```

char *tname,
int Filedes,
int *errret,
NCURSES_BOOL reuse)
{ return(*(int *)0); }

#undef setupterm
int setupterm(
char *tname,
int Filedes,
int *errret)
{ return(*(int *)0); }

/* ./tinfo/lib_termcap.c */

#undef UP
char *UP;
#undef BC
char *BC;

#undef tgetent
int tgetent(
char *bufp,

const char *name)
{ return(*(int *)0); }

#if 0

#include <capdefaults.c>

#endif

#undef tgetflag
int tgetflag(
char *id)
{ return(*(int *)0); }

#undef tgetnum
int tgetnum(
char *id)
{ return(*(int *)0); }

#undef tgetstr
char *tgetstr(
char *id,
char **area)
{ return(*(char **)0); }

```



```
/* ./tinfo/lib_termname.c */
```

```
#undef termname  
char *termname(void)  
{ return(*(char **)0); }
```

```
/* ./tinfo/lib_tgoto.c */
```

```
#undef tgoto  
char *tgoto(  
    const char *string,  
    int x,  
    int y)  
{ return(*(char **)0); }
```

```
/* ./tinfo/lib_ti.c */
```

```
#undef tigetflag  
int tigetflag(  
    char *str)  
{ return(*(int *)0); }
```

```
#undef tigetnum  
int tigetnum(  
    char *str)  
{ return(*(int *)0); }
```

```
#undef tigetstr  
char *tigetstr(  
    char *str)  
{ return(*(char **)0); }
```

```
/* ./tinfo/lib_tparm.c */
```

```
#undef _nc_tparm_err  
int _nc_tparm_err;
```

```
#undef _nc_tparm_analyze  
int _nc_tparm_analyze(  
    const char *string,  
    char *p_is_s[9],  
    int *popcount)  
{ return(*(int *)0); }
```

```
#undef tparm  
char *tparm(  
    char *string,
```

```

...
{ return(*(char **)0); }

/* ./tinfo/lib_tputs.c */

#undef PC
char PC;
#undef ospeed
NCURSES_OSPEED ospeed;
#undef _nc_nulls_sent
int _nc_nulls_sent;

#undef _nc_set_no_padding
void _nc_set_no_padding(
    SCREEN *sp)
{ /* void */ }

#undef delay_output
int delay_output(
    int ms)
{ return(*(int *)0); }

#undef _nc_flush
void _nc_flush(void)
{ /* void */ }

#undef _nc_outch
int _nc_outch(
    int ch)
{ return(*(int *)0); }

#undef putp
int putp(
    const char *string)
{ return(*(int *)0); }

#undef tputs
int tputs(
    const char *string,
    int affcnt,
    int (*outc)(
        int p1))
{ return(*(int *)0); }

/* ./trace/lib_trace.c */

#undef _nc_tracing

```

```

unsigned _nc_tracing;

#undef _nc__nc_tputs_trace
const char *_nc__nc_tputs_trace(void)
{ return(*(const char **)0); }

#undef _nc__nc_outchars
long _nc__nc_outchars(void)
{ return(*(long *)0); }

#undef _nc_set_tputs_trace
void _nc_set_tputs_trace(
    const char *s)
{ /* void */ }

#undef
_nc_count_outchars
void _nc_count_outchars(
    long increment)
{ /* void */ }

#undef trace
void trace(
    const unsigned int tracelevel)
{ /* void */ }

#undef _tracef
void _tracef(
    const char *fmt,
    ...)
{ /* void */ }

#undef _nc_retrace_bool
NCURSES_BOOL _nc_retrace_bool(
    NCURSES_BOOL code)
{ return(*(NCURSES_BOOL *)0); }

#undef _nc_retrace_int
int _nc_retrace_int(
    int code)
{ return(*(int *)0); }

#undef _nc_retrace_unsigned
unsigned _nc_retrace_unsigned(
    unsigned code)
{ return(*(unsigned *)0); }

#undef _nc_retrace_ptr

```

```

char *_nc_retrace_ptr(
    char *code)
    { return(*(char **)0); }

#undef _nc_retrace_cptr
const char *_nc_retrace_cptr(
    const char *code)
    { return(*(const char **)0); }

#undef _nc_retrace_cvoid_ptr
void *_nc_retrace_cvoid_ptr(
    void *code)
    { return(*(void **)0); }

#undef _nc_retrace_void_ptr
void *_nc_retrace_void_ptr(
    void *code)
    { return(*(void **)0); }

#undef _nc_retrace_sp
SCREEN *_nc_retrace_sp(
    SCREEN *code)
    { return(*(SCREEN
***)0); }

#undef _nc_retrace_win
WINDOW *_nc_retrace_win(
    WINDOW *code)
    { return(*(WINDOW **)0); }

#undef _nc_use_tracef
int _nc_use_tracef(
    unsigned mask)
    { return(*(int *)0); }

#undef _nc_locked_tracef
void _nc_locked_tracef(
    const char *fmt,
    ...)
    { /* void */ }

/* ./trace/lib_traceatr.c */

#undef _traceattr2
char *_traceattr2(
    int bufnum,
    chtype newmode)
    { return(*(char **)0); }

```

```

#undef _traceattr
char *_traceattr(
    attr_t newmode)
    { return(*(char **)0); }

#undef _nc_retrace_attr_t
attr_t _nc_retrace_attr_t(
    attr_t code)
    { return(*(attr_t *)0); }

#undef _nc_altcharset_name
const char *_nc_altcharset_name(
    attr_t attr,
    ctype ch)
    { return(*(const char **)0); }

#undef _tracectype2
char *_tracectype2(
    int bufnum,
    ctype ch)
    { return(*(char **)0); }

#undef _tracectype
char *_tracectype(
    ctype ch)
    { return(*(char **)0); }

#undef _nc_retrace_ctype
ctype _nc_retrace_ctype(
    ctype code)
    { return(*(ctype *)0); }

/* ./trace/lib_tracebits.c
*/

typedef struct {
    unsigned int val;
    const char *name;
} BITNAMES;

#undef _nc_trace_tty_mode
char *_nc_trace_tty_mode(
    struct termios *tty)
    { return(*(char **)0); }

#undef _nc_tracebits
char *_nc_tracebits(void)

```

```

    { return(*(char **)0); }

/* ./trace/lib_tracechr.c */

#undef _nc_tracechar
char *_nc_tracechar(
    SCREEN *sp,
    int ch)
    { return(*(char **)0); }

#undef _tracechar
char *_tracechar(
    int ch)
    { return(*(char **)0); }

/* ./tinfo/lib_ttyflags.c */

#undef _nc_get_tty_mode
int _nc_get_tty_mode(
    struct termios *buf)
    { return(*(int *)0); }

#undef _nc_set_tty_mode
int _nc_set_tty_mode(
    struct termios *buf)
    { return(*(int *)0); }

#undef def_shell_mode
int def_shell_mode(void)
    { return(*(int *)0); }

#undef def_prog_mode
int def_prog_mode(void)
    { return(*(int *)0); }

#undef reset_prog_mode
int reset_prog_mode(void)
    { return(*(int *)0); }

#undef reset_shell_mode
int reset_shell_mode(void)
    { return(*(int *)0); }

#undef savetty
int savetty(void)
    {
    return(*(int *)0); }

```

```

#undef resetty
int resetty(void)
{ return(*(int *)0); }

/* ./tty/lib_twait.c */

#undef _nc_timed_wait
int _nc_timed_wait(
    SCREEN *sp,
    int mode,
    int milliseconds,
    int *timeleft)
{ return(*(int *)0); }

/* ./tinfo/name_match.c */

#undef _nc_first_name
char *_nc_first_name(
    const char *const sp)
{ return(*(char **)0); }

#undef _nc_name_match
int _nc_name_match(
    const char *const namelst,
    const char *const name,
    const char *const delim)
{ return(*(int *)0); }

/* ./names.c */

#undef _nc_boolnames
char *const *_nc_boolnames(void)
{ return(*(char **)0); }

#undef _nc_boolfnames
char *const *_nc_boolfnames(void)
{ return(*(char **)0); }

#undef _nc_numnames
char *const *_nc_numnames(void)
{ return(*(char **)0); }

#undef _nc_numfnames
char *const *_nc_numfnames(void)
{ return(*(char **)0); }

#undef _nc_strnames
char *const *_nc_strnames(void)

```

```

    { return(*(char **)0); }

#undef _nc_strfnames
char *const
*_nc_strfnames(void)
{ return(*(char **)0); }

/* ./tinfo/read_entry.c */

#include <hashed_db.h>

#undef _nc_read_termtype
int _nc_read_termtype(
    TERMTYPE *ptr,
    char *buffer,
    int limit)
{ return(*(int *)0); }

#undef _nc_read_file_entry
int _nc_read_file_entry(
    const char *const filename,
    TERMTYPE *ptr)
{ return(*(int *)0); }

#undef _nc_read_entry
int _nc_read_entry(
    const char *const name,
    char *const filename,
    TERMTYPE *const tp)
{ return(*(int *)0); }

/* ./tinfo/read_termcap.c */

#include <sys/types.h>

#undef _nc_read_termcap_entry
int _nc_read_termcap_entry(
    const char *const tn,
    TERMTYPE *const tp)
{ return(*(int *)0); }

/* ./tinfo/setbuf.c */

#undef _nc_set_buffer
void _nc_set_buffer(
    FILE *ofp,
    NCURSES_BOOL buffered)
{ /* void */ }

```



```

/* ./tinfo/strings.c */

#undef _nc_str_init
string_desc *_nc_str_init(
    string_desc *dst,
    char *src,
    size_t len)
{ return(*(string_desc **)0); }

#undef _nc_str_null
string_desc *_nc_str_null(
    string_desc
    *dst,
    size_t len)
{ return(*(string_desc **)0); }

#undef _nc_str_copy
string_desc *_nc_str_copy(
    string_desc *dst,
    string_desc *src)
{ return(*(string_desc **)0); }

#undef _nc_safe_strerror
NCURSES_BOOL _nc_safe_strerror(
    string_desc *dst,
    const char *src)
{ return(*(NCURSES_BOOL *)0); }

#undef _nc_safe_strerror
NCURSES_BOOL _nc_safe_strerror(
    string_desc *dst,
    const char *src)
{ return(*(NCURSES_BOOL *)0); }

/* ./trace/trace_buf.c */

#undef _nc_trace_buf
char *_nc_trace_buf(
    int bufnum,
    size_t want)
{ return(*(char **)0); }

#undef _nc_trace_bufcat
char *_nc_trace_bufcat(
    int bufnum,
    const char *value)
{ return(*(char **)0); }

```

```
/* ./trace/trace_tries.c */
```

```
#undef _nc_trace_tries  
void _nc_trace_tries(  
    TRIES *tree)  
    { /* void */ }
```

```
/* ./base/tries.c */
```

```
#undef _nc_expand_try  
char *_nc_expand_try(  
    TRIES *tree,  
    unsigned code,  
    int *count,  
    size_t len)  
    { return(*(char **)0); }
```

```
#undef _nc_remove_key  
int _nc_remove_key(  
    TRIES **tree,  
  
    unsigned code)  
    { return(*(int *)0); }
```

```
#undef _nc_remove_string  
int _nc_remove_string(  
    TRIES **tree,  
    const char *string)  
    { return(*(int *)0); }
```

```
/* ./tinfo/trim_sgr0.c */
```

```
#undef _nc_trim_sgr0  
char *_nc_trim_sgr0(  
    TERMTYPE *tp)  
    { return(*(char **)0); }
```

```
/* ./unctrl.c */
```

```
#undef _nc_unctrl  
char *_nc_unctrl(  
    SCREEN *sp,  
    ctype ch)  
    { return(*(char **)0); }
```

```
#undef unctrl  
char *unctrl(  

```

```

ctype ch)
{ return(*(char **)0); }

/* ./trace/visbuf.c */

#undef _nc_visbuf2
const char *_nc_visbuf2(
    int bufnum,
    const char *buf)
{ return(*(const char **)0); }

#undef _nc_visbuf
const char *_nc_visbuf(
    const char *buf)
{ return(*(const char **)0); }

#undef _nc_visbufn
const char *_nc_visbufn(
    const char *buf,
    int len)
{ return(*(const char **)0); }

#undef _nc_visbuf2
const char *_nc_visbuf2(
    int bufnum,
    const ctype *buf,
    int len)
{ return(*(const char **)0); }

#undef _nc_visbuf
const char *_nc_visbuf(
    const ctype *buf,
    int len)
{
    return(*(const char **)0); }

/* ./tinfo/alloc_entry.c */

#undef _nc_init_entry
void _nc_init_entry(
    TERMTYPE *const tp)
{ /* void */ }

#undef _nc_copy_entry
ENTRY *_nc_copy_entry(
    ENTRY *oldp)
{ return(*(ENTRY **)0); }

```

```

#undef _nc_save_str
char *_nc_save_str(
    const char *const string)
{ return(*(char **)0); }

#undef _nc_wrap_entry
void _nc_wrap_entry(
    ENTRY *const ep,
    NCURSES_BOOL copy_strings)
{ /* void */ }

#undef _nc_merge_entry
void _nc_merge_entry(
    TERMTYPE *const to,
    TERMTYPE *const from)
{ /* void */ }

/* ./tinfo/captainfo.c */

#undef _nc_captainfo
char *_nc_captainfo(
    const char *cap,
    const char *s,
    int const parameterized)
{ return(*(char **)0); }

#undef _nc_infotocap
char *_nc_infotocap(
    const char *cap,
    const char *str,
    int const parameterized)
{ return(*(char **)0); }

/* ./comp_captab.c */

#include <hashsize.h>

#undef _nc_get_table
const struct name_table_entry *_nc_get_table(
    NCURSES_BOOL termcap)
{
    return(*(const struct name_table_entry **)0); }

#undef _nc_get_hash_table
const short *_nc_get_hash_table(
    NCURSES_BOOL termcap)
{ return(*(const short **)0); }

```

```

#undef _nc_get_alias_table
const struct alias *_nc_get_alias_table(
    NCURSES_BOOL termcap)
    { return(*(const struct alias **)0); }

/* ./tinfo/comp_expand.c */

#undef _nc_tic_expand
char *_nc_tic_expand(
    const char *srcp,
    NCURSES_BOOL tic_format,
    int numbers)
    { return(*(char **)0); }

/* ./tinfo/comp_hash.c */

#undef _nc_find_entry
struct name_table_entry const *_nc_find_entry(
    const char *string,
    const short *hash_table)
    { return(*(struct name_table_entry const **)0); }

#undef _nc_find_type_entry
struct name_table_entry const *_nc_find_type_entry(
    const char *string,
    int type,
    const struct name_table_entry *table)
    { return(*(struct name_table_entry const **)0); }

/* ./tinfo/comp_parse.c */

#undef _nc_check_termtype2
void (*_nc_check_termtype2)(
    TERMTYPE *p1,
    NCURSES_BOOL p2);
#undef
_nc_check_termtype
void (*_nc_check_termtype)(
    TERMTYPE *p1);

#undef _nc_entry_match
NCURSES_BOOL _nc_entry_match(
    char *n1,
    char *n2)
    { return(*(NCURSES_BOOL *)0); }

#undef _nc_read_entry_source
void _nc_read_entry_source(

```

```

FILE *fp,
char *buf,
int literal,
NCURSES_BOOL silent,
NCURSES_BOOL (*hook)(
ENTRY *p1))
{ /* void */ }

#undef _nc_resolve_uses2
int _nc_resolve_uses2(
    NCURSES_BOOL fullresolve,
    NCURSES_BOOL literal)
{ return(*(int *)0); }

#undef _nc_resolve_uses
int _nc_resolve_uses(
    NCURSES_BOOL fullresolve)
{ return(*(int *)0); }

/* ./tinfo/comp_scan.c */

#undef _nc_syntax
int _nc_syntax;
#undef _nc_curr_file_pos
long _nc_curr_file_pos;
#undef _nc_comment_start
long _nc_comment_start;
#undef _nc_comment_end
long _nc_comment_end;
#undef _nc_start_line
long _nc_start_line;
#undef _nc_curr_token
struct token _nc_curr_token;
#undef _nc_disable_period
NCURSES_BOOL _nc_disable_period;

#undef _nc_reset_input
void _nc_reset_input(
    FILE *fp,

    char *buf)
{ /* void */ }

#undef _nc_get_token
int _nc_get_token(
    NCURSES_BOOL silent)
{ return(*(int *)0); }

```

```

#undef _nc_trans_string
int _nc_trans_string(
    char *ptr,
    char *last)
    { return(*(int *)0); }

#undef _nc_push_token
void _nc_push_token(
    int tokclass)
    { /* void */ }

#undef _nc_panic_mode
void _nc_panic_mode(
    char ch)
    { /* void */ }

/* ./tinfo/parse_entry.c */

#undef _nc_parse_entry
int _nc_parse_entry(
    struct entry *entryp,
    int literal,
    NCURSES_BOOL silent)
    { return(*(int *)0); }

#undef _nc_capcmp
int _nc_capcmp(
    const char *s,
    const char *t)
    { return(*(int *)0); }

typedef struct {
    const char *from;
    const char *to;
} assoc;

/* ./tinfo/write_entry.c */

#undef _nc_set_writedir
void _nc_set_writedir(
    char *dir)
    { /* void */ }

#undef _nc_write_entry
void _nc_write_entry(
    TERMTYPE *const tp)
    { /* void */ }

```

```
#undef _nc_tic_written
int _nc_tic_written(void)
{ return(*(int *)0); }

/* ./base/define_key.c */

#undef
define_key
int define_key(
    const char *str,
    int keycode)
{ return(*(int *)0); }

/* ./tinfo/hashed_db.c */

#undef _nc_hashed_db
void _nc_hashed_db(void)
{ /* void */ }

/* ./base/key_defined.c */

#undef key_defined
int key_defined(
    const char *str)
{ return(*(int *)0); }

/* ./base/keybound.c */

#undef keybound
char *keybound(
    int code,
    int count)
{ return(*(char **)0); }

/* ./base/keyok.c */

#undef keyok
int keyok(
    int c,
    NCURSES_BOOL flag)
{ return(*(int *)0); }

/* ./base/version.c */

#undef curses_version
const char *curses_version(void)
{ return(*(const char **)0); }
```



Found in path(s):

\* /opt/cola/permits/1600019816\_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-  
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/ncurses/lib-Incurses  
No license file was found, but licenses were detected in source scan.

```
// * This makes emacs happy -*-Mode: C++;-*-  
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* authorization. *  
*****/  
  
/*****  
* Author: Juergen Pfeifer, 1997 *  
*****/  
  
// $Id: etip.h.in,v 1.37 2008/08/30 19:27:32 tom Exp $  
  
#ifndef NCURSES_ETIP_H_incl  
#define NCURSES_ETIP_H_incl 1  
  
// These are substituted at configure/build time  
#ifndef HAVE_BUILTIN_H  
#define HAVE_BUILTIN_H 0
```

```
#endif

#ifndef HAVE_GXX_BUILTIN_H
#define HAVE_GXX_BUILTIN_H 0
#endif

#ifndef HAVE_GPP_BUILTIN_H
#define HAVE_GPP_BUILTIN_H 0
#endif

#ifndef HAVE_IOSTREAM
#define HAVE_IOSTREAM 0
#endif

#ifndef HAVE_TYPEINFO
#define HAVE_TYPEINFO 0
#endif

#ifndef HAVE_VALUES_H
#define HAVE_VALUES_H 0
#endif

#ifndef ETIP_NEEDS_MATH_H
#define
    ETIP_NEEDS_MATH_H 0
#endif

#ifndef ETIP_NEEDS_MATH_EXCEPTION
#define ETIP_NEEDS_MATH_EXCEPTION 0
#endif

#ifndef CPP_HAS_PARAM_INIT
#define CPP_HAS_PARAM_INIT 0
#endif

#ifndef CPP_HAS_STATIC_CAST
#define CPP_HAS_STATIC_CAST 0 // workaround for g++ 2.95.3
#endif

#ifndef IOSTREAM_NAMESPACE
#define IOSTREAM_NAMESPACE 0
#endif

#ifdef __GNUG__
# if ((__GNUG__ <= 2) && (__GNUG_MINOR__ < 8))
#   if HAVE_TYPEINFO
#     include <typeinfo>
#   endif
#endif
```

```

# endif
#endif

#if defined(__GNU__)
# if HAVE_BUILTIN_H || HAVE_GXX_BUILTIN_H || HAVE_GPP_BUILTIN_H
#  if ETIP_NEEDS_MATH_H
#   if ETIP_NEEDS_MATH_EXCEPTION
#    undef exception
#    define exception math_exception
#   endif
#   include <math.h>
#  endif
#  undef exception
#  define exception builtin_exception
#  if HAVE_GPP_BUILTIN_H
#   include <gpp/builtin.h>
#  elif HAVE_GXX_BUILTIN_H
#   include <g++/builtin.h>
#  else
#   include <builtin.h>
#  endif
#  undef exception
# endif
#elif defined
  (__SUNPRO_CC)
# include <generic.h>
#endif

#include <ncurses_dll.h>

extern "C" {
#if HAVE_VALUES_H
# include <values.h>
#endif

#include <assert.h>
#include <eti.h>
#include <errno.h>
}

// Language features
#if CPP_HAS_PARAM_INIT
#define NCURSES_PARAM_INIT(value) = value
#else
#define NCURSES_PARAM_INIT(value) /*nothing*/
#endif

#if CPP_HAS_STATIC_CAST

```

```

#define STATIC_CAST(s) static_cast<s>
#else
#define STATIC_CAST(s) (s)
#endif

// Forward Declarations
class NCURSES_IMPEXP NCursesPanel;
class NCURSES_IMPEXP NCursesMenu;
class NCURSES_IMPEXP NCursesForm;

class NCURSES_IMPEXP NCursesException
{
public:
    const char *message;
    int errno;

    NCursesException (const char* msg, int err)
        : message(msg), errno (err)
        {};

    NCursesException (const char* msg)
        : message(msg), errno (E_SYSTEM_ERROR)
        {};

    NCursesException& operator=(const NCursesException& rhs)
    {
        errno = rhs.errno;
        return *this;
    }

    NCursesException(const NCursesException& rhs)
        : message(rhs.message), errno(rhs.errno)
    {
    }

    virtual const char *classname() const {
        return "NCursesWindow";
    }

    virtual ~NCursesException()
    {
    }
};

class NCURSES_IMPEXP NCursesPanelException : public NCursesException
{
public:
    const NCursesPanel* p;

```

```

NCursesPanelException (const char *msg, int err) :
    NCursesException (msg, err),
    p (NULL)
    {};

NCursesPanelException (const NCursesPanel* panel,
    const char *msg,
    int err) :
    NCursesException (msg, err),
    p (panel)
    {};

NCursesPanelException (int err) :
    NCursesException ("panel library error", err),
    p (NULL)
    {};

NCursesPanelException (const NCursesPanel* panel,
    int err) :
    NCursesException ("panel library error", err),
    p (panel)
    {};

NCursesPanelException& operator=(const NCursesPanelException& rhs)
{
    if (this != &rhs) {
        NCursesException::operator=(rhs);
        p = rhs.p;
    }
    return *this;
}

NCursesPanelException(const NCursesPanelException&
rhs)
    : NCursesException(rhs), p(rhs.p)
{
}

virtual const char *classname() const {
    return "NCursesPanel";
}

virtual ~NCursesPanelException()
{
}
};

```

```

class NCURSES_IMPEXP NCursesMenuException : public NCursesException
{
public:
    const NCursesMenu* m;

    NCursesMenuException (const char *msg, int err) :
        NCursesException (msg, err),
        m (NULL)
    {};

    NCursesMenuException (const NCursesMenu* menu,
        const char *msg,
        int err) :
        NCursesException (msg, err),
        m (menu)
    {};

    NCursesMenuException (int err) :
        NCursesException ("menu library error", err),
        m (NULL)
    {};

    NCursesMenuException (const NCursesMenu* menu,
        int err) :
        NCursesException ("menu library error", err),
        m (menu)
    {};

    NCursesMenuException& operator=(const NCursesMenuException& rhs)
    {
        if (this != &rhs) {
            NCursesException::operator=(rhs);
            m = rhs.m;
        }
        return *this;
    }

    NCursesMenuException(const NCursesMenuException&
        rhs)
        : NCursesException(rhs), m(rhs.m)
    {
    }

    virtual const char *classname() const {
        return "NCursesMenu";
    }

    virtual ~NCursesMenuException()

```

```

{
}
};

class NCURSES_IMPEXP NCursesFormException : public NCursesException
{
public:
    const NCursesForm* f;

    NCursesFormException (const char *msg, int err) :
        NCursesException (msg, err),
        f (NULL)
    {};

    NCursesFormException (const NCursesForm* form,
        const char *msg,
        int err) :
        NCursesException (msg, err),
        f (form)
    {};

    NCursesFormException (int err) :
        NCursesException ("form library error", err),
        f (NULL)
    {};

    NCursesFormException (const NCursesForm* form,
        int err) :
        NCursesException ("form library error", err),
        f (form)
    {};

    NCursesFormException& operator=(const NCursesFormException& rhs)
    {
        if (this != &rhs) {
            NCursesException::operator=(rhs);
            f = rhs.f;
        }
        return *this;
    }

    NCursesFormException(const NCursesFormException&
        rhs)
        : NCursesException(rhs), f(rhs.f)
    {
    }

    virtual const char *classname() const {

```

```

    return "NCursesForm";
}

virtual ~NCursesFormException()
{
}
};

#if !((defined(__GNUG__) && defined(__EXCEPTIONS)) || defined(__SUNPRO_CC))
# if HAVE_Iostream
#   include <iostream>
#   if Iostream_NAMESPACE
using std::cerr;
using std::endl;
#   endif
# else
#   include <iostream.h>
# endif
extern "C" void exit(int);
#endif

inline void THROW(const NCursesException *e) {
#if defined(__GNUG__) && defined(__EXCEPTIONS)
# if ((__GNUG__ <= 2) && (__GNUG_MINOR__ < 8))
    (*lib_error_handler)(e->classname() : "", e->message : "");
#else
#define CPP_HAS_TRY_CATCH 1
#endif
#elif defined(__SUNPRO_CC)
# if !defined(__SUNPRO_CC_COMPAT) || (__SUNPRO_CC_COMPAT < 5)
    genericerror(1, ((e != 0) ? (char *) (e->message) : ""));
#else
#define CPP_HAS_TRY_CATCH 1
#endif
#else
    if (e)
        cerr << e->message << endl;
    exit(0);
#endif

#ifndef CPP_HAS_TRY_CATCH
#define
    CPP_HAS_TRY_CATCH 0
#define NCURSES_CPP_TRY /* nothing */
#define NCURSES_CPP_CATCH(e) if (false)
#define THROWS(s) /* nothing */
#elif CPP_HAS_TRY_CATCH
    throw *e;

```



```
#define NCURSES_CPP_TRY try
#define NCURSES_CPP_CATCH(e) catch(e)
#define THROWS(s) throw(s)
#endif
}
```

```
#endif /* NCURSES_ETIP_H_incl */
```

Found in path(s):

```
* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/c++/etip.h.in
```

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```
<!--
```

```
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```

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```
*****
```

```
* @Id: curs_add_wchstr.3x,v 1.6 2005/01/02 01:28:49 tom Exp @
```

```
-->
```

Found in path(s):

```
* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
```

archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/doc/html/man/curs\_add\_wchstr.3x.html

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-- \*- ada -\*

define('HTMLNAME',`terminal\_interface-curses-menus-item\_user\_data\_\_ads.htm')dnl

include(M4MACRO)dnl

-----

-- GNAT ncurses Binding --

-- Terminal\_Interface.Curses.Menus.Item\_User\_Data --

-- S P E C --

-----

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-----

-- Author: Juergen Pfeifer, 1996

-- Version Control:

--

\$Revision: 1.16 \$  
-- \$Date: 2006/06/25 14:30:22 \$  
-- Binding Version 01.00

```
-----  
  
generic  
type User is limited private;  
type User_Access is access User;  
package Terminal_Interface.Curses.Menus.Item_User_Data is  
pragma Preelaborate (Terminal_Interface.Curses.Menus.Item_User_Data);  
  
-- The binding uses the same user pointer for menu items  
-- as the low level C implementation. So you can safely  
-- read or write the user pointer also with the C routines  
--  
-- MANPAGE(^mitem_userptr.3x')  
  
-- ANCHOR(^set_item_userptr',`Set_User_Data')  
procedure Set_User_Data (Itm : in Item;  
                          Data : in User_Access);  
-- AKA  
pragma Inline (Set_User_Data);  
  
-- ANCHOR(^item_userptr',`Get_User_Data')  
procedure Get_User_Data (Itm : in Item;  
                          Data : out User_Access);  
-- AKA  
  
-- ANCHOR(^item_userptr',`Get_User_Data')  
  
function Get_User_Data (Itm : in Item) return User_Access;  
-- AKA  
-- Same as function  
pragma Inline (Get_User_Data);  
  
end Terminal_Interface.Curses.Menus.Item_User_Data;
```

Found in path(s):

\* /opt/cola/permits/1600019816\_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-  
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/Ada95/gen/terminal\_interface-  
curses-menus-item\_user\_data.ads.m4

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<!--

\$Id: index.html,v 1.2 2006/04/22 22:29:12 tom Exp \$

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\* \*  
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```

* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/doc/html/index.html
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```

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```

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*****
* @Id: form_requestname.3x,v 1.7 2006/11/04 17:57:49 tom Exp @
-->

```

Found in path(s):

```

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archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-
5.7/doc/html/man/form_requestname.3x.html

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-----  
-- \$Id: INSTALL,v 1.135 2008/11/02 21:13:51 tom Exp \$  
-----

How to install Ncurses/Terminfo on your system  
-----

\*\*\*\*\*  
\* READ ALL OF THIS FILE BEFORE YOU TRY TO INSTALL NCURSES. \*  
\*\*\*\*\*

You should be reading the file INSTALL in a directory called ncurses-d.d, where d.d is the current version number. There should be several subdirectories, including `c++', `form', `man', `menu', `misc', `ncurses', `panel', `progs', and `test'. See the README file for a roadmap to the package.

If you are a Linux or  
FreeBSD or NetBSD distribution integrator or packager,  
please read and act on the section titled IF YOU ARE A SYSTEM INTEGRATOR  
below.

If you are converting from BSD curses and do not have root access, be sure  
to read the BSD CONVERSION NOTES section below.

If you are trying to build applications using gpm with ncurses,  
read the USING NCURSES WITH GPM section below.

If you are running over the Andrew File System see the note below on  
USING NCURSES WITH AFS.

If you are cross-compiling, see the note below on BUILDING NCURSES WITH A  
CROSS-COMPILER.

If you want to build the Ada95 binding, go to the Ada95 directory and  
follow the instructions there. The Ada95 binding is not covered below.

If you are using anything but (a) Linux, or (b) one of the 4.4BSD-based  
i386 Unixes, go read the Portability section in the TO-DO file before you  
do anything else.

REQUIREMENTS:  
-----

You will need the following to build and install ncurses under UNIX:

- \* ANSI C compiler (gcc, for instance)
- \*
- sh (bash will do)
- \* awk (mawk or gawk will do)
- \* sed
- \* BSD or System V style install (a script is enclosed)

Ncurses has been also built in the OS/2 EMX environment.

#### INSTALLATION PROCEDURE:

-----

1. First, decide whether you want ncurses to replace your existing library (in which case you'll need super-user privileges) or be installed in parallel with it.

The --prefix option to configure changes the root directory for installing ncurses. The default is normally in subdirectories of /usr/local, except for systems where ncurses is normally installed as a system library, e.g., Linux, the various BSD systems and Cygwin. Use --prefix=/usr to replace your default curses distribution.

The package gets installed beneath the --prefix directory as follows:

In \$(prefix)/bin: tic, infocmp, captinfo, tset,  
reset, clear, tput, toe  
In \$(prefix)/lib: libncurses\*.a libcurses.a  
In \$(prefix)/share/terminfo: compiled terminal descriptions  
In \$(prefix)/include: C header files  
Under \$(prefix)/man: the manual pages

Note that the configure script attempts to locate previous installation of ncurses, and will set the default prefix according to where it finds the ncurses headers.

Do not use commands such as

```
make install prefix=XXX
```

to change the prefix after configuration, since the prefix value is used for some absolute pathnames such as TERMINFO. Instead do this

```
make install DESTDIR=XXX
```

See also the discussion of `--with-install-prefix`.

2. Type `./configure` in the top-level directory of the distribution to configure ncurses for your operating system and create the Makefiles. Besides `--prefix`, various configuration options are available to customize the installation; use `./configure --help` to list the available options.

If your operating system is not supported, read the PORTABILITY section in the file `ncurses/README` for information on how to create a configuration file for your system.

The `configure` script generates makefile rules for one or more object models and their associated libraries:

`libncurses.a` (normal)

`libcurses.a` (normal, a link to `libncurses.a`)

This gets left out if you configure with `--disable-overwrite`.

`libncurses.so` (shared)

`libncurses_g.a` (debug)

`libncurses_p.a` (profile)

`libncurses.la` (libtool)

If you configure using the `--enable-widec` option, a "w" is appended to the library names (e.g., `libncursesw.a`), and the resulting libraries support wide-characters, e.g., via a UTF-8 locale. The corresponding header files are compatible with the non-wide-character configuration; wide-character features are provided by `ifdef`'s in the header files. The wide-character library interfaces are not binary-compatible with the non-wide-character version. Building and running the wide-character code relies on a fairly recent implementation of `libiconv`. We have built this configuration on Linux using `libiconv`, sometimes requiring `libutf8`.

If you configure using the `--with-pthread` option, a "t" is appended to the library names (e.g., `libncurset.a`, `libncursetw.a`).

If you do not specify any models, the normal and debug libraries will be configured. Typing `configure` with no arguments is equivalent to:

```
./configure --with-normal --with-debug --enable-overwrite
```

Typing



`./configure --with-shared`

makes the shared libraries the default, resulting in

`./configure --with-shared --with-normal --with-debug --enable-overwrite`

If you want only shared libraries, type

`./configure --with-shared --without-normal --without-debug`

Rules for generating shared libraries are highly dependent upon the choice of host system and compiler. We've been testing shared libraries on Linux and SunOS with gcc, but more work needs to be done to make shared libraries work on other systems.

If you have libtool installed, you can type

`./configure --with-libtool`

to generate the appropriate static and/or shared libraries for your platform using libtool.

You can make curses and terminfo fall back to an existing file of termcap definitions by configuring with `--enable-termcap`. If you do this, the library will search `/etc/termcap` before the terminfo database, and will also interpret the contents of the `TERM` environment variable. See the section `BSD CONVERSION NOTES` below.

3. Type ``make'`. Ignore any warnings, no error messages should be produced. This should compile the ncurses library, the terminfo compiler `tic(1)`, `captoinfo(1)`, `infocmp(1)`, `toe(1)`, `clear(1)`, `tset(1)`, `reset(1)`, and `tput(1)` programs (see the manual pages for explanation of what they do), some test programs, and the panels, menus, and forms libraries.
4. Run ncurses and several other test programs in the test directory to verify that ncurses functions correctly before doing an install that may overwrite system files. Read the file `test/README` for details on the test programs.

NOTE: You must have installed the terminfo database, or set the environment variable `$TERMINFO` to point to a SVr4-compatible terminfo database before running the test programs. Not all vendors' terminfo databases are SVr4-compatible, but most seem to be. Exceptions include DEC's Digital Unix (formerly known as OSF/1).

If you run the test programs WITHOUT installing terminfo, ncurses may read the termcap file and cache that in \$HOME/.terminfo, which will thereafter be used instead of the terminfo database. See the comments on "--enable-getcap-cache", to see why this is a Bad Thing.

It is possible to configure ncurses to use other terminfo database formats. A few are provided as examples in the include-directory (see --with-caps).

The ncurses program is designed specifically to test the ncurses library.

You can use it to verify that the screen highlights work correctly, that cursor addressing and window scrolling works OK, etc.

5. Once you've tested, you can type `make install' to install libraries, the programs, the terminfo database and the manual pages. Alternately, you can type `make install' in each directory you want to install. In the top-level directory, you can do a partial install using these commands:

```
'make install.progs'  installs tic, infocmp, etc...
'make install.includes' installs the headers.
'make install.libs'   installs the libraries (and the headers).
'make install.data'  installs the terminfo data. (Note: `tic' must
                    be installed before the terminfo data can be
                    compiled).
'make install.man'   installs the manual pages.
```

```
#####
#  CAVEAT EMPTOR: `install.data' run as root will NUKE any existing
#
# terminfo database. If you have any custom or unusual entries SAVE them #
# before you install ncurses. I have a file called terminfo.custom for #
# this purpose. Don't forget to run tic on the file once you're done. #
#####
```

The terminfo(5) manual page must be preprocessed with tbl(1) before being formatted by nroff(1). Modern man(1) implementations tend to do this by default, but you may want to look at your version's manual page to be sure. You may also install the manual pages after preprocessing with tbl(1) by specifying the configure option --with-manpage-tbl.

If the system already has a curses library that you need to keep using you'll need to distinguish between it and ncurses. See the discussion of --disable-overwrite. If ncurses is installed outside the standard directories (/usr/include and /usr/lib) then all your users will need to use the -I option to compile programs and -L to link them.

If you have another curses installed in your system and you accidentally

compile using its curses.h you'll end up with a large number of undefined symbols at link time.

**IF YOU DO NOT HAVE ROOT:** Change directory to the `progs' subdirectory and run the `capconvert' script. This script will deduce various things about your environment and use them to build you a private terminfo tree, so you can use ncurses applications.

If more than one user at your site does this, the space for the duplicate trees is wasted. Try to get your site administrators to install a system-wide terminfo tree instead.

See the BSD CONVERSION NOTES section below for a few more details.

6. The c++ directory has C++ classes that are built on top of ncurses and panels. You must have c++ (and its libraries) installed before you can compile and run the demo.

Use `--without-cxx-binding` to tell configure to not build the C++ bindings and demo.

If you do not have C++, you must use the `--without-cxx` option to tell the configure script to not attempt to determine the type of 'bool' which may be supported by C++. **IF YOU USE THIS OPTION, BE ADVISED THAT YOU MAY NOT BE ABLE TO COMPILE (OR RUN) NCURSES APPLICATIONS WITH C++.**

#### SUMMARY OF CONFIGURE OPTIONS:

-----

The configure script provides a short list of its options when you type

```
./configure --help
```

The `--help` and several options are common to all configure scripts that are generated with `autoconf`. Those are all listed before the line

`--enable` and `--with` options recognized:

The other options are specific to this package. We list them in alphabetic order.

`--disable-assumed-color`

With ncurses 5.1, we introduced a new function, `assume_default_colors()` which allows applications to specify what the default foreground and background color are assumed to be. Most color

applications use

full-screen color; but a few do not color the background. While the assumed values can be overridden by invoking `assume_default_colors()`, you may find it useful to set the assumed values to the pre-5.1 convention, using this configure option.

`--disable-big-core`

Assume machine has little memory. The configure script attempts to determine if your machine has enough memory (about 6Mb) to compile the terminfo database without writing portions to disk. Some allocators return deceptive results, so you may have to override the configure script. Or you may be building tic for a smaller machine.

`--disable-big-strings`

Disable compile-time optimization of predefined tables which puts all of their strings into a very long string, to reduce relocation overhead.

`--disable-database`

Use only built-in data. The ncurses libraries normally read terminfo and termcap data from disk. You can configure ncurses to have a built-in database, aka "fallback" entries. Embedded applications may have no need for an external database. Some, but not all of the programs are useful in this configuration, e.g., `reset` and `tput` versus `infocmp` and `tic`.

`--disable-ext-funcs`

Disable function-extensions. Configure ncurses without the functions that are not specified by XSI. See `ncurses/modules` for the exact list of library modules that would be suppressed.

`--disable-hashmap`

Compile without hashmap scrolling-optimization code. This algorithm is the default.

`--disable-home-terminfo`

The `$HOME/.terminfo` directory is normally added to ncurses' search list for reading/writing terminfo entries, since that directory is more likely writable than the system terminfo database. Use this option to disable the feature altogether.

`--disable-largefile`

Disable compiler flags needed to use large-file interfaces.

`--disable-leaks`

For testing, compile-in code that frees memory that normally would not be freed, to simplify analysis

of memory-leaks.

Any implementation of curses must not free the memory associated with a screen, since (even after calling `endwin()`), it must be available for use in the next call to `refresh()`. There are also chunks of memory held for performance reasons. That makes it hard to analyze curses applications for memory leaks. To work around this, build a debugging version of the ncurses library which frees those chunks which it can, and provides the `_nc_free_and_exit()` function to free the remainder on exit. The ncurses utility and test programs use this feature, e.g., via the `ExitProgram()` macro.

`--disable-lp64`

The header files will ignore use of the `_LP64` symbol to make `chtype` and `mmask_t` types 32 bits (they may be long on 64-bit hosts, for compatibility with older releases).

NOTE: this is potentially an ABI change, depending on existing packages. The default for this option is "disabled" for ncurses ABI 5, and "enabled" for ABI 6.

`--disable-macros`

For

testing, use functions rather than macros. The program will run more slowly, but it is simpler to debug. This defines `NCURSES_NOMACROS` at build time. See also the `--enable-expanded` option.

`--disable-overwrite`

If you are installing ncurses on a system which contains another development version of curses, or which could be confused by the loader for another version, we recommend that you leave out the link to `-lcurses`. The ncurses library is always available as `-lncurses`. Disabling overwrite also causes the ncurses header files to be installed into a subdirectory, e.g., `/usr/local/include/ncurses`, rather than the include directory. This makes it simpler to avoid compile-time conflicts with other versions of `curses.h`

`--disable-relink`

If `--enable-rpath` is given, the generated makefiles normally will rebuild the libraries during install. Use this option to simply copy whatever the linker produced.

This option is ignored if `--enable-rpath` is not given.

`--disable-root-enviro`

Compile

with environment restriction, so certain environment variables are not available when running as root, or via a `setuid/setgid`

application. These are (for example \$TERMINFO) those that allow the search path for the terminfo or termcap entry to be customized.

`--disable-scroll-hints`

Compile without scroll-hints code. This option is ignored when hashmap scrolling is configured, which is the default.

`--disable-tic-depends`

When building shared libraries, normally the tic library is linked to depend upon the ncurses library (and in turn, on the term-library if the `--with-term-lib` option was given). The tic- and term-libraries ABI does not depend on the `--enable-widec` option. Some packagers have used this to reduce the number of library files which are packaged by using only one copy of those libraries. To make this work properly, the tic library must be built without an explicit dependency on the ncurses (or ncursesw) library. Use this configure option to do that.

For example

```
configure --with-ticlib --with-shared --disable-tic-depends
```

`--disable-tparm-varargs`

Portable programs should call `tparm()` using the fixed-length parameter list documented in X/Open. ncurses provides varargs support for this function. Use `--disable-tparm-varargs` to disable this support.

`--enable-assertions`

For testing, compile-in assertion code. This is used only for a few places where ncurses cannot easily recover by returning an error code.

`--enable-broken_linker`

A few platforms have what we consider a broken linker: it cannot link objects from an archive solely by referring to data objects in those files, but requires a function reference. This configure option changes several data references to functions to work around this problem.

NOTE: With ncurses 5.1, this may not be necessary, since we are told that some linkers interpret uninitialized global data as a different type of reference which behaves as described above. We have explicitly initialized all of the global data to work around the problem.

`--enable-bsdpadding`

Recognize BSD-style prefix padding. Some ancient BSD programs (such as nethack) call `tputs("50")` to implement delays.

`--enable-colorfgbg`

Compile with experimental \$COLORFGBG code. That environment variable is set by some terminal emulators as a hint to applications, by advertising the default foreground and background colors. During initialization, ncurses sets color pair 0 to match this.

#### --enable-const

The curses interface as documented in XSI is rather old, in fact including features that precede ANSI C. The prototypes generally do not make effective use of "const". When using stricter compilers (or gcc with appropriate warnings), you may see warnings about the mismatch between const and non-const data. We provide a configure option which changes the interfaces to use const - quieting these warnings and reflecting the actual use of the parameters more closely. The ncurses library uses the symbol NCURSES\_CONST for these instances of const, and if you have asked for compiler warnings, will add gcc's const-qual warning. There will still be warnings due to subtle inconsistencies in the interface, but at a lower level.

NOTE: configuring ncurses with this option may detract from the portability of your applications by encouraging you to use const in places where the XSI curses interface would not allow them. Similar issues arise when porting to SVr4 curses, which uses const in even fewer places.

#### --enable-echo

Use the option --disable-echo to make the build-log less verbose by suppressing the display of the compile and link commands. This makes it easier to see the compiler warnings. (You can always use "make -n" to see the options that are used).

#### --enable-expanded

For testing, generate functions for certain macros to make them visible as such to the debugger. See also the --disable-macros option.

#### --enable-ext-colors

Extend the cchar\_t structure to allow more than 16 colors to be encoded. This applies only to the wide-character (--enable-widec) configuration.

NOTE: using this option will make libraries which are not binary-compatible with libncursesw 5.4. None of the interfaces change, but applications which have an array of cchar\_t's must be recompiled.

#### --enable-ext-mouse

Modify the encoding of mouse state to make room for a 5th mouse button. That allows one to use ncurses with a wheel mouse with xterm or

similar X terminal emulators.

NOTE: using this option will make libraries which are not binary-compatible with libncursesw 5.4. None of the interfaces change, but applications which have mouse mask `mmask_t`'s must be recompiled.

#### `--enable-getcap`

Use the 4.4BSD `getcap` code if available, or a bundled version of it to fetch `termcap` entries. Entries read in this way cannot use (make cross-references to) the `terminfo` tree, but it is faster than reading `/etc/termcap`.

If configured for one of the \*BSD systems, this automatically uses the hashed database system produced using `cap_mkdb` or similar tools. In that case, there is no advantage in using the `--enable-getcap-cache` option.

See also the `--with-hashed-db` option.

#### `--enable-getcap-cache`

Cache translated `termcaps` under the directory `$HOME/.terminfo`

NOTE: this sounds good - it makes `ncurses` run faster the second time. But look where the data comes from - an `/etc/termcap` containing lots of entries that are not up to date. If you configure with this option and forget to install the `terminfo` database before running an `ncurses` application, you will end up with a hidden `terminfo` database that generally does not support color and will miss some function keys.

#### `--enable-hard-tabs`

Compile-in cursor-optimization code that uses hard-tabs. We would make this a standard feature except for the concern that the `terminfo` entry may not be accurate, or that your `stty` settings have disabled the use of tabs.

#### `--enable-mixed-case`

Controls whether the filesystem on which the `terminfo` database resides supports mixed-case filenames (normal for UNIX, but not on other systems). If you do not specify this option, the `configure` script checks the current filesystem.

#### `--enable-no-padding`

Compile-in support for the `$NCURSES_NO_PADDING` environment variable, which allows you to suppress the effect of non-mandatory padding in `terminfo` entries. This is the default, unless you have disabled the extended functions.



#### `--enable-reentrant`

Compile experimental configuration which improves reentrant use of the library by reducing global and static variables. This option is also set if `--with-pthread` is used.

#### `--enable-rpath`

Use `rpath` option when generating shared libraries, and (with some restrictions) when linking the corresponding programs. This originally (in 1997) applied mainly to systems using the GNU linker (read the manpage).

#### More

recently it is useful for systems that require special treatment shared libraries in "unusual" locations. The "system" libraries reside in directories which are on the loader's default search-path. While you may be able to use workarounds such as the `$LD_LIBRARY_PATH` environment variable, they do not work with `setuid` applications since the `LD_LIBRARY_PATH` variable would be unset in that situation.

This option does not apply to `--with-libtool`, since `libtool` makes extra assumptions about `rpath`.

#### `--enable-safe-sprintf`

Compile with experimental `safe-sprintf` code. You may consider using this if you are building ncurses for a system that has neither `vsprintf()` or `vsprintf()`. It is slow, however.

#### `--enable-sigwinch`

Compile support for ncurses' `SIGWINCH` handler. If your application has its own `SIGWINCH` handler, ncurses will not use its own. The ncurses handler causes `wgetch()` to return `KEY_RESIZE` when the screen-size changes. This option is the default, unless you have disabled the extended functions.

#### `--enable-signed-char`

The `term.h` header declares a `Booleans[]` array typed "char". But it stores signed values there and "char" is not necessarily signed. Some packagers choose to alter the type of `Booleans[]` though this is not strictly compatible. This option allows one to implement this alteration without patching the source code.

#### `--enable-symlinks`

If your system supports symbolic links, make tic use symbolic links rather than hard links to save disk space when writing aliases in the terminfo database.

`--enable-tcap-names`

Compile-in support for user-definable terminal capabilities. Use the `-x` option of `tic` and `infocmp` to treat unrecognized terminal capabilities as user-defined strings. This option is the default, unless you have disabled the extended functions.

`--enable-termcap`

Compile in support for reading terminal descriptions from `termcap` if no match is found in the `terminfo` database. See also the `--enable-getcap` and `--enable-getcap-cache` options.

`--enable-warnings`

Turn on GCC compiler warnings. There should be only a few.

`--enable-weak-symbols`

If the `--with-pthread` option is set, check if the compiler supports `weak-symbols`. If it does, then name the thread-capable library without the "t" (`libncurses` rather than `libncurses.t`), and provide for dynamically loading the `pthread` entrypoints at runtime. This allows one to reduce the number of library files for `ncurses`.

`--enable-wgetch-events`

Compile with experimental `wgetch-events` code. See `ncurses/README.IZ`

`--enable-widec`

Compile with wide-character code. This makes a different version of the libraries (e.g., `libncursesw.so`), which stores characters as wide-characters,

NOTE: applications compiled with this configuration are not compatible with those built for 8-bit characters. You cannot simply make a symbolic link to equate `libncurses.so` with `libncursesw.so`

NOTE: the Ada95 binding

may be built against either version of the `ncurses` library, but you must decide which: the binding installs the same set of files for either version. Currently (2002/6/22) it does not use the extended features from the wide-character code, so it is probably better to not install the binding for that configuration.

`--enable-xmc-glitch`

Compile-in support experimental `xmc` (magic cookie) code.

`--with-abi-version=NUM`

Override the ABI version, which is used in shared library filenames. Normally this is the same as the release version; some ports have special requirements for compatibility.

This option does not affect linking with libtool, which uses the release major/minor numbers.

`--with-ada-compiler=CMD`

Specify the Ada95 compiler command (default "gnatmake")

`--with-ada-include=DIR`

Tell where to install the Ada includes (default: PREFIX/lib/ada/adainclude)

`--with-ada-objects=DIR`

Tell where to install the Ada objects (default: PREFIX/lib/ada/adalib)

`--with-bool=TYPE`

If `--without-cxx` is specified, override the type used for the "bool" declared in `curses.h` (normally the type is automatically chosen to correspond with that in `<stdbool.h>`, or defaults to platform-specific sizes).

`--with-build-cc=XXX`

If cross-compiling, specify a host C compiler, which is needed to compile a few utilities which generate source modules for `ncurses`.

If you do not give this option, the configure script checks if the `$BUILD_CC` variable is set, and otherwise defaults to `gcc` or `cc`.

`--with-build-cflags=XXX`

If cross-compiling, specify the host C compiler-flags. You might need to do this if the target compiler has unusual flags which confuse the host compiler.

You can also set the environment variable `$BUILD_CFLAGS` rather than use this option.

`--with-build-cppflags=XXX`

If cross-compiling, specify the host C preprocessor-flags. You might need to do this if the target compiler has unusual flags which confuse the host compiler.

You

can also set the environment variable `$BUILD_CPPFLAGS` rather than use this option.

`--with-build-ldflags=XXX`

If cross-compiling, specify the host linker-flags. You might need to do this if the target linker has unusual flags which confuse the host compiler.

You can also set the environment variable `$BUILD_LDFLAGS` rather than use this option.

`--with-build-libs=XXX`

If cross-compiling, the host libraries. You might need to do this if the target environment requires unusual libraries.

You can also set the environment variable `$BUILD_LIBS` rather than use this option.

`--with-caps=XXX`

Specify an alternate terminfo capabilities file, which makes the configure script look for "include/Caps.XXX". A few systems, e.g., AIX 4.x use the same overall file-format as ncurses for terminfo data, but use different alignments within the tables to support legacy applications. For those systems, you can configure ncurses to use a terminfo database which is compatible with the native applications.

`--with-ctype=TYPE`

Override type of ctype, which stores the video attributes and (if `--enable-widc` is not given) a character. Prior to ncurses 5.5, this was always unsigned long, but with ncurses 5.5, it may be unsigned. Use this option if you need to preserve compatibility with 64-bit executables.

`--with-database=XXX`

Specify the terminfo source file to install. Usually you will wish to install ncurses' default (`misc/terminfo.src`). Certain systems have special requirements, e.g, OS/2 EMX has a customized terminfo source file.

`--with-dbmalloc`

For testing, compile and link with Conor Cahill's dbmalloc library. This also sets the `--disable-leaks` option.

`--with-debug`

Generate debug-libraries (default). These are named by adding "\_g" to the root, e.g., `libncurses_g.a`

`--with-default-terminfo-dir=XXX`

Specify the default terminfo database directory. This is normally `DATADIR/terminfo`, e.g., `/usr/share/terminfo`.

`--with-dmalloc`

For testing, compile and link with Gray Watson's dmalloc library. This also sets the `--disable-leaks` option.

`--with-fallbacks=XXX`

Specify a list of fallback terminal descriptions which will be compiled into the ncurses library. See CONFIGURING FALLBACK ENTRIES.

`--with-gpm`

use Alessandro Rubini's GPM library to provide mouse support on the Linux console. Prior to ncurses 5.5, this introduced a dependency on the GPM library.

Currently ncurses uses the `dlsym()` function to bind to the library at runtime, so it is only necessary that the library be present when ncurses is built, to obtain the filename (or soname) used in the corresponding `dlopen()` call. If you give a value for this option, e.g.,

`--with-gpm=$HOME/tmp/test-gpm.so`

that overrides the configure check for the soname.

See also `--without-dlsym`

`--with-hashed-db[=XXX]`

Use a hashed database for storing terminfo data rather than storing each compiled entry in a separate binary file within a directory tree.

In particular, this uses the Berkeley database 1.8.5 interface, as provided by that and its successors db 2, 3, and 4. The actual interface is slightly different in the successor versions of the Berkeley database. The database should have been configured using `"--enable-compat185"`.

If you use this option for configuring ncurses, `tic` will only be able to write entries in the hashed database. `infocmp` can still read entries from a directory tree as well as reading entries from the hashed database. To do this, `infocmp` determines whether the `$TERMINFO` variable points to a directory or a file, and reads the directory-tree or hashed database respectively.

You cannot have a directory containing both hashed-database and filesystem-based terminfo entries.

Use the parameter value to give the install-prefix used for the database, e.g.,

`--with-hashed-db=/usr/local/BigBase`

to find the corresponding include- and lib-directories under the

given  
directory.

See also the `--enable-getcap` option.

`--with-install-prefix=XXX`

Allows you to specify an alternate location for installing ncurses after building it. The value you specify is prepended to the "real" install location. This simplifies making binary packages. The makefile variable `DESTDIR` is set by this option. It is also possible to use

`make install DESTDIR=XXX`  
since the makefiles pass that variable to subordinate makes.

NOTE: a few systems build shared libraries with fixed pathnames; this option probably will not work for those configurations.

`--with-libtool[=XXX]`

Generate libraries with libtool. If this option is selected, then it overrides all other library model specifications. Note that libtool must already be installed, uses makefile rules dependent on GNU make, and does not promise to follow the version numbering convention of other shared libraries on your system. However, if the `--with-shared` option does not succeed, you may get better results with this option.

If a parameter value is given, it must be the full pathname of the particular version of libtool, e.g.,  
`/usr/bin/libtool-1.2.3`

It is possible to rebuild the configure script to use the automake macros for libtool, e.g., `AC_PROG_LIBTOOL`. See the comments in `aclocal.m4` for `CF_PROG_LIBTOOL`, and ensure that you build configure using the appropriate patch for autoconf from  
<http://invisible-island.net/autoconf/>

`--with-manpage-aliases`

Tell the configure script you wish to create entries in the man-directory for aliases to manpages which list them, e.g., the functions in the panel manpage. This is the default. You can disable it if your man program does this. You can also disable `--with-manpage-symlinks` to install files containing a ".so" command rather than symbolic links.

`--with-manpage-format=XXX`

Tell the configure script how you would like to install man-pages. The option value must be one of these: `gzip`, `compress`, `BSDI`,

normal,  
formatted. If you do not give this option, the configure script attempts to determine which is the case.

`--with-manpage-renames=XXX`

Tell the configure script that you wish to rename the manpages while installing. Currently the only distribution which does this is the Linux Debian. The option value specifies the name of a file that lists the renamed files, e.g., `$srcdir/man/man_db.renames`

`--with-manpage-symlinks`

Tell the configure script that you wish to make symbolic links in the man-directory for aliases to the man-pages. This is the default, but can be disabled for systems that provide this automatically. Doing this on systems that do not support symbolic links will result in copying the man-page for each alias.

`--with-manpage-tbl`

Tell the configure script that you wish to preprocess the manpages by running them through `tbl` to generate tables understandable by `nroff`.

`--with-mmask-t=TYPE`

Override type of `mmask_t`, which stores the mouse mask. Prior to ncurses 5.5, this was always unsigned long, but with ncurses 5.5, it may be unsigned. Use this option if you need to preserve compatibility with 64-bit executables.

`--with-normal`

Generate normal (i.e., static) libraries (default).

Note: on Linux, the configure script will attempt to use the GPM library via the `dlsym()` function call. Use `--without-dlsym` to disable this feature, or `--without-gpm`, depending on whether you wish to use GPM.

`--with-ospeed=TYPE`

Override type of `ospeed` variable, which is part of the termcap compatibility interface. In termcap, this is a 'short', which works for a wide range of baudrates because `ospeed` is not the actual speed but the encoded value, e.g., `B9600` would be a small number such as 13. However the encoding scheme originally allowed for values "only" up to 38400bd. A newer set of definitions past 38400bd is not encoded as compactly, and is not guaranteed to fit into a short (see the function `cfgetospeed()`, which returns a `speed_t` for this reason). In practice, applications that required knowledge of the `ospeed` variable, i.e.,

those using termcap, do not use the higher speeds. Your application (or system, in general) may or may not.

--with-profile

Generate profile-libraries These are named by adding "\_p" to the root, e.g., libncurses\_p.a

--with-pthread

Link with POSIX threads, set --enable-reentrant. The use\_window() and use\_screen() functions will use mutex's, allowing rudimentary support for multithreaded applications.

--with-rcs-ids

Compile-in RCS identifiers. Most of the C files have an identifier.

--with-rel-version=NUM

Override the release version, which may be used in shared library filenames. This consists of a major and minor version number separated by ".". Normally the major version number is the same as the ABI version; some ports have special requirements for compatibility.

--with-shared

Generate shared-libraries. The names given depend on the system for which you are building, typically using a ".so" suffix, along with symbolic links that refer to the release version.

NOTE: Unless you override the configure script by setting the \$CFLAGS environment variable, these will not be built with the -g debugging option.

NOTE: For some configurations, e.g., installing a new version of ncurses shared libraries on a machine which already has ncurses shared libraries, you may encounter problems with the linker. For example, it may prevent you from running the build tree's copy of tic (for installing the terminfo database) because it loads the system's copy of the ncurses shared libraries. In that case, using the misc/shlib script may be helpful, since it sets \$LD\_LIBRARY\_PATH to point to the build tree, e.g.,  
./misc/shlib make install

--with-shlib-version=XXX

Specify whether to use the release or ABI version for shared libraries. This is normally chosen automatically based on the type of system which you are building on. We use it for testing the configure script.

--with-sysmouse



use FreeBSD sypmouse interface provide mouse support on the console.

`--with-system-type=XXX`

For testing, override the derived host system-type which is used to decide things such as the linker commands used to build shared libraries. This is normally chosen automatically based on the type of system which you are building on. We use it for testing the configure script.

`--with-terminfo-dirs=XXX`

Specify a search-list of terminfo directories which will be compiled into the ncurses library (default: DATADIR/terminfo)

`--with-termlib[=XXX]`

When building the ncurses library, organize this as two parts: the curses library (libncurses) and the low-level terminfo library (libtinfo). This is done to accommodate applications that use only the latter. The terminfo library is about half the size of the total.

If an option value is given, that overrides the name of the terminfo library. For instance, if the wide-character version is built, the terminfo library would be named libtinfow. But the libtinfow interface is upward compatible from libtinfo, so it would be possible to overlay libtinfo.so with a "wide" version of libtinfow.so by renaming it with this option.

`--with-termcap=XXX`

Specify a search-list of termcap files which will be compiled into the ncurses library (default: /etc/termcap:/usr/share/misc/termcap)

`--with-ticlib[=XXX]`

When building the ncurses library, build a separate library for the modules that are used only by the utility programs. Normally those would be bundled with the termlib or ncurses libraries.

If an option value is given, that overrides the name of the tic library. As in termlib, there is no ABI difference between the "wide" libticw.so and libtic.so

NOTE: Overriding the name of the tic library may be useful if you are also using the `--with-termlib` option to rename libtinfo. If you are not doing that, renaming the tic library can result in conflicting library dependencies for tic and other programs built with the tic library.

`--with-trace`

Configure the trace() function as part of the all models of the ncurses library. Normally it is part of the debug (libncurses\_g) library only.

--with-valgrind

For testing, compile with debug option.

This also sets the --disable-leaks option.

--without-ada

Suppress the configure script's check for Ada95, do not build the Ada95 binding and related demo.

--without-curses-h

Don't install the ncurses header with the name "curses.h". Rather, install as "ncurses.h" and modify the installed headers and manpages accordingly.

--without-cxx

XSI curses declares "bool" as part of the interface. C++ also declares "bool". Neither specifies the size and type of booleans, but both insist on the same name. We chose to accommodate this by making the configure script check for the size and type (e.g., unsigned or signed)

that your C++ compiler uses for booleans. If you do not wish to use ncurses with C++, use this option to tell the configure script to not adjust ncurses bool to match C++.

--without-cxx-binding

Suppress the configure script's check for C++, do not build the C++ binding and related demo.

--without-develop

Disable development options. This does not include those that change the interface, such as --enable-widex.

--without-dlsym

Do not use dlsym() to load GPM dynamically.

--without-progs

Tell the configure script to suppress the build of ncurses' application programs (e.g., tic). The test applications will still be built if you type "make", though not if you simply do "make install".

--without-xterm-new

Tell the configure script to use "xterm-old" for the entry used in the terminfo database. This will work with variations such as X11R5 and X11R6 xterm.

## COMPATIBILITY WITH OLDER VERSIONS OF NCURSES:

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Because ncurses implements the X/Open Curses Specification, its interface is fairly stable. That does not mean the interface does not change. Changes are made to the documented interfaces when we find differences between ncurses and X/Open or implementations which they certify (such as Solaris). We add extensions to those interfaces to solve problems not addressed by the original curses design, but those must not conflict with the X/Open documentation.

Here are some of the major interface changes, and related problems which you may encounter when building a system with different versions of ncurses:

5.7 (November 2, 2008)

Interface changes:

+ generate linkable stubs for some macros:

getattrs

+ Add new library configuration for tic-library (the non-curses portion of the ncurses library used for the tic program as well as some others such as tack. There is no API change, but makefiles would be changed to use the tic-library built separately.

tack, distributed separately from ncurses, uses some of the internal `_nc_XXX` functions, which are declared in the `tic.h` header file.

The reason for providing this separate library is that none of the functions in it are suitable for threaded applications.

+ Add new library configuration (`ncursest`, `ncurseswt`) which provides rudimentary support for POSIX threads. This introduces opaque access functions to the `WINDOW` structure and adds a parameter to several internal functions.

+ move most internal variables (except tic-library) into data blocks `_nc_globals` and `_nc_prescreen` to simplify analysis. Those were globally accessible, but since they were not part of the documented API, there is no ABI change.

+ changed static tables of strings to be indices into long strings, to improve startup performance. This changes parameter lists for some of the internal functions.

Added extensions:

- + add NCURSES\_OPAQUE definition in curses.h to control whether internal details of the WINDOW structure are visible to an application. This is always defined when the threaded library is built, and is optional otherwise. New functions for this: is\_cleared, is\_idcok, is\_idlok, is\_immedok, is\_keypad, is\_leaveok, is\_nodelay, is\_notimeout, is\_scrollok, is\_syncok, wgetparent and wgetscrreg.
- + the threaded library (ncurset) also disallows direct updating of global curses-level variables, providing functions (via macros) for obtaining their value. A few of those variables can be modified by the application, using new functions: set\_escdelay, set\_tabsize
- + added functions use\_window() and use\_screen() which wrap a mutex (if threading is configured) around a call to a user-supplied function.

Added internal functions:

- \_nc\_get\_alias\_table
- \_nc\_get\_screensize
- \_nc\_keyname
- \_nc\_screen\_of
- \_nc\_set\_no\_padding
- \_nc\_tracechar
- \_nc\_tracemouse
- \_nc\_unctrl
- \_nc\_ungetch

These are used for leak-testing, and are stubs for ABI compatibility when ncurses is not configured for that using the --disable-leaks configure script option:

- \_nc\_free\_and\_exit
- \_nc\_leaks\_tinfo

Removed internal functions:

none

Modified internal functions:

- \_nc\_fifo\_dump
- \_nc\_find\_entry
- \_nc\_handle\_sigwinch
- \_nc\_init\_keytry
- \_nc\_keypad
- \_nc\_locale\_breaks\_acs
- \_nc\_timed\_wait

`_nc_update_screensize`

Use new typedef TRIES to replace "struct tries":

`_nc_add_to_try`  
`_nc_expand_try`  
`_nc_remove_key`  
`_nc_remove_string`  
`_nc_trace_tries`

5.6 (December 17, 2006)

Interface changes:

+ generate linkable stubs for some macros:

`getbegx`, `getbegy`, `getcurx`, `getcury`, `getmaxx`, `getmaxy`, `getparx`,  
`getpary`, `getpary`,

and (for libncursesw)

`wgetbkgrnd`

Added extensions:

`nofilter()`  
`use_legacy_coding()`

Added internal functions:

`_nc_first_db`  
`_nc_get_source`  
`_nc_handle_sigwinch`  
`_nc_is_abs_path`  
`_nc_is_dir_path`  
`_nc_is_file_path`  
`_nc_keep_tic_dir`  
`_nc_keep_tic_dir`  
`_nc_last_db`  
`_nc_next_db`  
`_nc_read_termtype`  
`_nc_tic_dir`

Also

(if using the hashed database configuration):

`_nc_db_close`  
`_nc_db_first`  
`_nc_db_get`  
`_nc_db_have_data`  
`_nc_db_have_index`

\_nc\_db\_next  
\_nc\_db\_open  
\_nc\_db\_put

otherwise

\_nc\_hashed\_db

Removed internal functions:

none

Modified internal functions:

\_nc\_add\_to\_try  
\_nc\_do\_color  
\_nc\_expand\_try  
\_nc\_remove\_key  
\_nc\_setupscreen

5.5 (October 10, 2005)

Interface changes:

- + terminfo installs "xterm-new" as "xterm" entry rather than "xterm-old" (aka xterm-r6).
- + terminfo data is installed using the tic -x option (few systems still use ncurses 4.2).
- + modify C++ binding to work with newer C++ compilers by providing initializers and using modern casts. Old-style header names are still used in this release to allow compiling with not-so-old compilers.
- + form and menu libraries now work with wide-character data. Applications which bypassed the form library and manipulated the FIELD.buf data directly will not work properly with libformw, since that no longer points to an array of char. The set\_field\_buffer() and field\_buffer() functions translate to/from the actual field data.
- + change SP->\_current\_attr to a pointer, adjust ifdef's to ensure that libtinfo.so and libtinfow.so have the same ABI. The reason for this is that the corresponding data which belongs to the upper-level ncurses library has a different size in each model.
- + winnstr() now returns multibyte character strings for the wide-character configuration.

+ `assume_default_colors()` no longer requires that `use_default_colors()` be called first.

+ `data_ahead()` now works with wide-characters.

+ `slk_set()` and `slk_wset()` now accept and store multibyte or multicolumn characters.

+ `start_color()` now returns OK if colors have already been started. `start_color()` also returns ERR if it cannot allocate memory.

+ `pair_content()` now returns -1 for consistency with `init_pair()` if it corresponds to the default-color.

+ `unctrl()` now returns null if its parameter does not correspond to an unsigned char.

Added extensions:

Experimental mouse version 2 supports wheel mice with buttons 4 and 5. This requires ABI 6 because it modifies the encoding of mouse events.

Experimental extended colors allows encoding of 256 foreground and background colors, e.g., with the `xterm-256color` or `xterm-88color` terminfo entries. This requires ABI 6 because it changes the size of `cchar_t`.

Added internal functions:

`_nc_check_termtype2`  
`_nc_resolve_uses2`  
`_nc_retrace_cptr`  
`_nc_retrace_cvoid_ptr`  
`_nc_retrace_void_ptr`  
`_nc_setup_term`

Removed internal functions:

none

Modified internal functions:

`_nc_insert_ch`  
`_nc_save_str`  
`_nc_trans_string`

5.4 (February 8, 2004)

Interface changes:

+ add the remaining functions for X/Open curses wide-character support.

These are only available if the library is configured using the

--enable-widex option.

pecho\_wchar()

slk\_wset()

+ write getyx() and related 2-return macros in terms of getcury(), getcurx(), etc.

+ simplify ifdef for bool declaration in curses.h

+ modify ifdef's in curses.h that disabled use of \_\_attribute\_\_((\_\_gnu\_printf\_\_)) for g++, since recent versions implement the cases which ncurses uses.

+ change some interfaces to use const:

define\_key()

mvprintw()

mvwprintw()

printw()

vw\_printw()

winsnstr()

wprintw()

Added extensions:

key\_defined()

Added internal functions:

\_nc\_get\_locale()

\_nc\_insert\_ch()

\_nc\_is\_charable() wide

\_nc\_locale\_breaks\_acs()

\_nc\_pathlast()

\_nc\_to\_char() wide

\_nc\_to\_widechar() wide

\_nc\_tparm\_analyze()

\_nc\_trace\_bufcat() debug

\_nc\_unicode\_locale()

Removed internal functions:

\_nc\_outstr()

\_nc\_sigaction()

Modified internal functions:

\_nc\_remove\_string()

\_nc\_retrace\_ctype()

5.3 (October 12, 2002)

Interface changes:



+ change type for bool used in headers to NCURSES\_BOOL, which usually is the same as the compiler's definition for 'bool'.

+ add all but two functions for X/Open curses wide-character support.

These are only available if the library is configured using the --enable-widenc option. Missing functions are  
pecho\_wchar()  
slk\_wset()

+ add environment variable \$NCURSES\_ASSUMED\_COLORS to modify the assume\_default\_colors() extension.

Added extensions:

is\_term\_resized()  
resize\_term()

Added internal functions:

\_nc\_altcharset\_name() debug  
\_nc\_reset\_colors()  
\_nc\_retrace\_bool() debug  
\_nc\_retrace\_unsigned() debug  
\_nc\_rootname()  
\_nc\_trace\_tty\_mode() debug  
\_nc\_varargs() debug  
\_nc\_visbufn() debug  
\_nc\_wgetch()

Removed internal functions:

\_nc\_background()

Modified internal functions:

\_nc\_freeall() debug

5.2 (October 21, 2000)

Interface changes:

+ revert termcap ospeed variable to 'short' (see discussion of the --with-ospeed configure option).

5.1 (July 8, 2000)

Interface  
changes:

+ made the extended terminal capabilities (configure --enable-tcap-names) a standard feature. This should be transparent to applications that do not require it.

+ removed the trace() function and related trace support from the production library.

+ modified curses.h.in, undef'ing some symbols to avoid conflict with C++ STL.

Added extensions: assume\_default\_colors().

5.0 (October 23, 1999)

Interface changes:

+ implemented the wcolor\_set() and slk\_color() functions.

+ move macro winch to a function, to hide details of struct ldat

+ corrected prototypes for slk\_\* functions, using chtype rather than attr\_t.

+ the slk\_attr\_{set,off,on} functions need an additional void\* parameter according to XSI.

+ modified several prototypes to correspond with 1997 version of X/Open Curses: [w]attr\_get(), [w]attr\_set(), border\_set() have different parameters. Some functions were renamed or misspelled: erase\_wchar(), in\_wchntr(), mvin\_wchntr(). Some developers have used attr\_get().

Added extensions: keybound(), curses\_version().

Terminfo database changes:

+ change translation for termcap 'rs' to terminfo 'rs2', which is the documented equivalent, rather than 'rs1'.

The problems are subtler in recent releases.

a) This release provides users with the ability to define their own terminal capability extensions, like termcap. To accomplish this, we redesigned the TERMTYPE struct (in term.h). Very few applications use this struct. They must be recompiled to work with the 5.0 library.

a) If you use the extended terminfo names (i.e., you used configure --enable-tcap-names), the resulting terminfo database can have some entries which are not readable by older versions of ncurses. This is a bug in the older versions:

- + the terminfo database stores booleans, numbers and strings in arrays. The capabilities that are listed in the arrays are specified by X/Open. ncurses recognizes a number of obsolete and extended names which are stored past the end of the specified entries.
- + a change to read\_entry.c in 951001 made the library do an lseek() call incorrectly skipping data which is already read from the string array. This happens when the number of strings in the terminfo data file is greater than STRCOUNT, the number of specified and obsolete or extended strings.
- + as part of alignment with the X/Open final specification, in the 990109 patch we added two new terminfo capabilities: set\_a\_attributes and set\_pglen\_inch). This makes the indices for the obsolete and extended capabilities shift up by 2.
- + the last two capabilities in the obsolete/extended list are memu and meml, which are found in most terminfo descriptions for xterm.

When trying to read this terminfo entry, the spurious lseek() causes the library to attempt to read the final portion of the terminfo data (the text of the string capabilities) 4 characters past its starting point, and reads 4 characters too few. The library rejects the data, and applications are unable to initialize that terminal type.

FIX: remove memu and meml from the xterm description. They are obsolete, not used by ncurses. (It appears that the feature was added to xterm to make it more like hpterm).

This is not a problem if you do not use the -x option of tic to create a terminfo database with extended names. Note that the user-defined terminal capabilities are not affected by this bug, since they are stored in a table after the older terminfo data ends, and are invisible to the older libraries.

- c) Some developers did not wish to use the C++ binding, and used the configure --without-cxx option. This causes problems if someone uses the ncurses library from C++ because that configure test determines the type for C++'s bool and makes ncurses match it, since both C++ and curses are specified to declare bool. Calling ncurses functions with the incorrect type for bool will cause execution errors. In 5.0 we added a configure option "--without-cxx-binding"

which controls whether the binding itself is built and installed.

4.2 (March 2, 1998)

Interface changes:

+ correct prototype for `termattrs()` as per XPG4 version 2.

+ add placeholder prototypes for `color_set()`, `erasewchar()`,  
`term_attrs()`, `wcolor_set()` as per XPG4 version 2.

+ add macros `getcur[xy]` `getbeg[xy]` `getpar[xy]`, which are defined in SVr4 headers.

New extensions: `keyok()` and `define_key()`.

Terminfo database changes:

+ corrected definition in `curses.h` for `ACS_LANTERN`, which was 'T' rather than 'i'.

4.1 (May 15, 1997)

We added these extensions: `use_default_colors()`. Also added configure option `--enable-const`, to support the use of `const` where X/Open should have, but did not, specify.

The terminfo database content changed the representation of color for most entries that use ANSI colors. SVr4 `curses` treats the `setaf/setab` and `setf/setb` capabilities differently, interchanging the red/blue colors in the latter.

4.0 (December 24, 1996)

We bumped to version 4.0 because the newly released dynamic loader (`ld.so.1.8.5`) on Linux did not load shared libraries whose ABI and REL versions were inconsistent. At that point, `ncurses` ABI was 3.4 and the REL was 1.9.9g, so we made them consistent.

1.9.9g (December 1, 1996)

This fixed most of the problems with 1.9.9e, and made these interface changes:

+ remove `tparam()`, which had been provided for compatibility with some `termcap`. `tparam()` is standard, and does not conflict with application's fallback for missing `tparam()`.

- + turn off hardware echo in `initscr()`. This changes the sense of the `echo()` function, which was initialized to echoing rather than nonechoing (the latter is specified). There were several other corrections to the terminal I/O settings which cause applications to behave differently.
- + implemented several functions (such as `attr_on()`) which were available only as macros.
- + corrected several typos in `curses.h.in` (i.e., the `mvXXXX` macros).
- + corrected prototypes for `delay_output()`, `has_color`, `immedok()` and `idcok()`.
- + corrected misspelled `getbkgd()`. Some applications used the misspelled name.
- + added `_yoffset` to `WINDOW`. The size of `WINDOW` does not impact applications, since they use only pointers to `WINDOW` structs.

These changes were made to the terminfo database:

- + removed boolean 'getm' which was available as an extended name.

We added these extensions: `wresize()`, `resizeterm()`, `has_key()` and `mcprint()`.

1.9.9e (March 24, 1996)

not recommended (a last-minute/untested change left the forms and menus libraries unusable since they do not repaint the screen). Foreground/background colors are combined incorrectly, working properly only on a black background. When this was released, the X/Open specification was available only in draft form.

Some applications (such as `lxdialog`) were "fixed" to work with the incorrect color scheme.

IF YOU ARE A SYSTEM INTEGRATOR:

-----

Configuration and Installation:

On platforms where `ncurses` is assumed to be installed in `/usr/lib`, the configure script uses `"/usr"` as a default:

Linux, FreeBSD, NetBSD, OpenBSD, Cygwin

For other platforms, the default is "/usr/local". See the discussion of the "--disable-overwrite" option.

The location of the terminfo is set indirectly by the "--datadir" configure option, e.g., /usr/share/terminfo, given a datadir of /usr/share. You may want to override this if you are installing ncurses libraries in nonstandard locations, but wish to share the terminfo database.

Normally the ncurses library is configured in a pure-terminfo mode; that is, with the --disable-termcap option. This makes the ncurses library smaller and faster. The ncurses library includes a termcap emulation that queries the terminfo database, so even applications that use raw termcap to query terminal characteristics will win (providing you recompile and relink them!).

If you must configure with termcap fallback enabled, you may also wish to use the --enable-getcap option. This speeds up termcap-based startups, at the expense of not allowing personal termcap entries to reference the terminfo tree. See comments in ncurses/tinfo/read\_termcap.c for further details.

Note that if you have \$TERMCAP set, ncurses will use that value to locate termcap data. In particular, running from xterm will set \$TERMCAP to the contents of the xterm's termcap entry. If ncurses sees that, it will not examine /etc/termcap.

#### Keyboard Mapping:

The terminfo file assumes that Shift-Tab generates \E[Z (the ECMA-48 reverse-tabulation sequence) rather than ^I. Here are the loadkeys -d mappings that will set this up:

```
keycode
15 = Tab      Tab
alt   keycode 15 = Meta_Tab
shift keycode 15 = F26
string F26 = "\033[Z"
```

#### Naming the Console Terminal

In various systems there has been a practice of designating the system console driver type as `console'. Please do not do this! It complicates peoples' lives, because it can mean that several different

terminfo entries from different operating systems all logically want to be called `console`.

Please pick a name unique to your console driver and set that up in the `/etc/inittab` table or local equivalent. Send the entry to the terminfo maintainer (listed in the `misc/terminfo` file) to be included in the terminfo file, if it's not already there. See the `term(7)` manual page included with this distribution for more on conventions for choosing type names.

Here are some recommended primary console names:

linux -- Linux console driver  
freebsd -- FreeBSD  
netbsd -- NetBSD  
bsdos -- BSD/OS

If you are responsible for integrating ncurses for one of these distribution, please either use the recommended name or get back to us explaining why you don't want to, so we can work out nomenclature that will make users' lives easier rather than harder.

#### RECENT XTERM VERSIONS:

-----

The terminfo database file included with this distribution assumes you are running a modern xterm based on XFree86 (i.e., `xterm-new`). The earlier X11R6 entry (`xterm-r6`) and X11R5 entry (`xterm-r5`) is provided as well. See the `--without-xterm-new` configure script option if you are unable to update your system.

#### CONFIGURING FALLBACK ENTRIES:

-----

In order to support operation of ncurses programs before the terminfo tree is accessible (that is, in single-user mode or at OS installation time) the ncurses library can be compiled to include an array of pre-fetched fallback entries. This must be done on a machine which has ncurses' `infocmp` and terminfo database installed.

These entries are checked by `setupterm()` only when the conventional fetches from the terminfo tree and the termcap fallback (if configured) have been tried and failed. Thus, the presence of a fallback will not shadow modifications to the on-disk entry for the same type, when that

entry is accessible.

By default, there are no entries on the fallback list. After you have built the ncurses suite for the first time, you can change the list (the process needs `infocmp(1)`). To do so, use the script `ncurses/tinfo/MKfallback.sh`. A configure script option `--with-fallbacks` does this (it accepts a comma-separated list of the names you wish, and does not require a rebuild).

If you wanted (say) to have `linux`, `vt100`, and `xterm` fallbacks, you would use the commands

```
cd ncurses;  
tinfo/MKfallback.sh linux vt100 xterm >fallback.c
```

Then just rebuild and reinstall the library as you would normally. You can restore the default empty fallback list with

```
tinfo/MKfallback.sh >fallback.c
```

The overhead for an empty fallback list is one trivial stub function. Any non-empty fallback list is const-ed and therefore lives in sharable text space. You can look at the comment trailing each initializer in the generated `ncurses/fallback.c` file to see the core cost of the fallbacks. A good rule of thumb for modern vt100-like entries is that each one will cost about 2.5K of text space.

#### BSD CONVERSION NOTES:

-----

If you need to support really ancient BSD programs, you probably want to configure with the `--enable-bsdpad` option. What this does is enable code in `tputs()` that recognizes a numeric prefix on a capability as a request for that much trailing padding in milliseconds. There are old BSD programs that do things like `tputs("50")`.

(If you are distributing ncurses as a support-library component of an application you probably want to put the remainder of this section in the package README file.)

The following note applies only if you have configured ncurses with `--enable-termcap`.

-----

CUT HERE -----



If you are installing this application privately (either because you have no root access or want to experiment with it before doing a root installation), there are a couple of details you need to be aware of. They have to do with the ncurses library, which uses terminfo rather than termcap for describing terminal characteristics.

Though the ncurses library is terminfo-based, it will interpret your TERMCAP variable (if present), any local termcap files you reference through it, and the system termcap file. However, in order to avoid slowing down your application startup, it will only do this once per terminal type!

The first time you load a given terminal type from your termcap database, the library initialization code will automatically write it in terminfo format to a subdirectory under \$HOME/.terminfo. After that, the initialization code will find it there and do a (much faster) terminfo fetch.

Usually, all this means is that your home directory will silently grow an invisible .terminfo subdirectory which will get filled in with terminfo descriptions of terminal types as you invoke them. If anyone ever installs a global terminfo tree on your system, this will quietly stop happening and your \$HOME/.terminfo will become redundant.

The objective of all this logic is to make converting from BSD termcap as painless as possible without slowing down your application (termcap compilation is expensive).

If you don't have a TERMCAP variable or custom personal termcap file, you can skip the rest of this dissertation.

If you *do* have a TERMCAP variable and/or a custom personal termcap file that defines a terminal type, that definition will stop being visible to this application after the first time you run it, because it will instead see the terminfo entry that it wrote to \$HOME/.terminfo the first time around.

Subsequently, editing the TERMCAP variable or personal TERMCAP file will have no effect unless you explicitly remove the terminfo entry under \$HOME/.terminfo. If you do that, the entry will be recompiled from your termcap resources the next time it is invoked.

To avoid these complications, use infocmp(1) and tic(1) to edit the terminfo directory directly.

----- CUT HERE -----

#### USING NCURSES WITH AFS:

AFS treats each directory as a separate logical filesystem, you can't hard-link across them. The `--enable-symlinks` option copes with this by making `tic` use symbolic links.

#### USING NCURSES WITH GPM:

Ncurses 4.1 and up can be configured to use GPM (General Purpose Mouse) which is used on Linux console. Be aware that GPM is commonly installed as a shared library which contains a wrapper for the `wgetch()` function (`libcurses.o`). Some integrators have simplified linking applications by combining all or part of `libcurses.so` into the `libgpm.so` file, producing symbol conflicts with `ncurses` (specifically the `wgetch` function). This was originally the BSD `curses`, but generally whatever `curses` library exists on the system.

You may be able to work around this problem by linking as follows:

```
cc -o foo foo.o -lncurses -lgpm -lncurses
```

but the linker may not cooperate, producing mysterious errors.

See the FAQ, as well as the discussion under the `--with-gpm` option:

[http://invisible-island.net/ncurses/ncurses.faq.html#using\\_gpm\\_lib](http://invisible-island.net/ncurses/ncurses.faq.html#using_gpm_lib)

#### BUILDING NCURSES WITH A CROSS-COMPILER

Ncurses can be built with a cross-compiler. Some parts must be built with the host's compiler since they are used for building programs (e.g., `ncurses/make_hash` and `ncurses/make_keys`) that generate tables that are compiled into the `ncurses` library. The essential thing to do is set the `BUILD_CC` environment variable to your host's compiler, and run the `configure` script configuring for the cross-compiler.

The `configure` options `--with-build-cc`, etc., are provided to make this simpler. Since

`make_hash` and `make_keys` use only ANSI C features, it is normally not necessary to provide the other options such as `--with-build-libs`, but they are provided for completeness.

Note that all of the generated source-files which are part of `ncurses` will be made if you use

```
make sources
```

This would be useful in porting to an environment which has little support for the tools used to generate the sources, e.g., `sed`, `awk` and `Bourne-shell`.

When ncurses has been successfully cross-compiled, you may want to use "make install" (with a suitable target directory) to construct an install tree. Note that in this case (as with the --with-fallbacks option), ncurses uses the development platform's tic to do the "make install.data" portion.

#### BUGS:

Send any feedback to the ncurses mailing list at bug-ncurses@gnu.org. To subscribe send mail to bug-ncurses-request@gnu.org with body that reads: subscribe ncurses <your-email-address-here>

The Hacker's Guide in the doc directory includes some guidelines on how to report bugs in ways that will get them fixed most quickly.

-- vile:txtmode

Found in path(s):

\* /opt/cola/permits/1600019816\_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/INSTALL

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```
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archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/test/railroad.c

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\*\*\*\*\*

\* @Id: curs\_legacy.3x,v 1.1 2007/04/07 23:54:29 tom Exp @

-->

Found in path(s):

\* /opt/cola/permits/1600019816\_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-  
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-

5.7/doc/html/man/curs\_legacy.3x.html

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```

Found in path(s):

\*/opt/cola/permits/1600019816\_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/ncurses/base/lib\_nl.c

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```

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*****/

/*****
* Author: Thomas E. Dickey 1996,1997,2002,2005
*****/

/* LINTLIBRARY */

/* ./f_trace.c */

#include "form.priv.h"

#undef _nc_retrace_field_ptr
FIELD **_nc_retrace_field_ptr(
    FIELD **code)
{ return(*(FIELD ***)0); }

#undef _nc_retrace_field
FIELD *_nc_retrace_field(
    FIELD *code)
{ return(*(FIELD **)0); }

#undef _nc_retrace_field_type
FIELDTYPE *_nc_retrace_field_type(
    FIELDTYPE *code)
{ return(*(FIELDTYPE **)0); }

#undef _nc_retrace_form
FORM *_nc_retrace_form(
    FORM *code)
{ return(*(FORM **)0); }

```

```
#undef _nc_retrace_form_hook
Form_Hook _nc_retrace_form_hook(
    Form_Hook code)
{ return(*(Form_Hook *)0); }
```

```
/* ./fld_arg.c
*/
```

```
#undef set_fieldtype_arg
int set_fieldtype_arg(
    FIELDTYPE *typ,
    void *(*const make_arg)(
        va_list *p1),
    void *(*const copy_arg)(
        const void *p1),
    void (*const free_arg)(
        void *p1))
{ return(*(int *)0); }
```

```
#undef field_arg
void *field_arg(
    const FIELD *field)
{ return(*(void **)0); }
```

```
/* ./fld_attr.c */
```

```
#undef set_field_fore
int set_field_fore(
    FIELD *field,
    chtype attr)
{ return(*(int *)0); }
```

```
#undef field_fore
chtype field_fore(
    const FIELD *field)
{ return(*(chtype *)0); }
```

```
#undef set_field_back
int set_field_back(
    FIELD *field,
    chtype attr)
{ return(*(int *)0); }
```

```
#undef field_back
chtype field_back(
    const FIELD *field)
{ return(*(chtype *)0); }
```

```

/* ./fld_current.c */

#undef set_current_field
int set_current_field(
    FORM *form,
    FIELD *field)
{ return(*(int *)0); }

#undef current_field
FIELD *current_field(
    const FORM *form)
{ return(*(FIELD **)0); }

#undef field_index
int field_index(
    const FIELD *field)
{ return(*(int
*)0); }

/* ./fld_def.c */

#undef _nc_Default_Field
FIELD *_nc_Default_Field;

#undef _nc_Make_Argument
TypeArgument *_nc_Make_Argument(
    const FIELDTYPE *typ,
    va_list *ap,
    int *err)
{ return(*(TypeArgument **)0); }

#undef _nc_Copy_Argument
TypeArgument *_nc_Copy_Argument(
    const FIELDTYPE *typ,
    const TypeArgument *argp,
    int *err)
{ return(*(TypeArgument **)0); }

#undef _nc_Free_Argument
void _nc_Free_Argument(
    const FIELDTYPE *typ,
    TypeArgument *argp)
{ /* void */ }

#undef _nc_Copy_Type
NCURSES_BOOL _nc_Copy_Type(
    FIELD *dst,
    FIELD const *src)

```



```

    { return(*(NCURSES_BOOL *)0); }

#undef _nc_Free_Type
void _nc_Free_Type(
    FIELD *field)
    { /* void */ }

#undef new_field
FIELD *new_field(
    int rows,
    int cols,
    int frow,
    int fcol,
    int nrow,
    int nbuf)
    { return(*(FIELD **)0); }

#undef free_field
int free_field(
    FIELD *field)
    { return(*(int *)0); }

/* ./fld_dup.c */

#undef dup_field
FIELD *dup_field(
    FIELD *field,
    int frow,

    int fcol)
    { return(*(FIELD **)0); }

/* ./fld_ftchoice.c */

#undef set_fieldtype_choice
int set_fieldtype_choice(
    FIELDTYPE *typ,
    NCURSES_BOOL (*const next_choice)(
    FIELD *p1,
    const void *p2),
    NCURSES_BOOL (*const prev_choice)(
    FIELD *p1,
    const void *p2))
    { return(*(int *)0); }

/* ./fld_ftlink.c */

#undef link_fieldtype

```

```
FIELDTYPE *link_fldtype(  
    FIELDTYPE *type1,  
    FIELDTYPE *type2)  
    { return(*(FIELDTYPE **)0); }
```

```
/* ./fld_info.c */
```

```
#undef field_info  
int field_info(  
    const FIELD *field,  
    int *rows,  
    int *cols,  
    int *frow,  
    int *fcol,  
    int *nrow,  
    int *nbuf)  
    { return(*(int *)0); }
```

```
#undef dynamic_field_info  
int dynamic_field_info(  
    const FIELD *field,  
    int *drows,  
    int *dcols,  
    int *maxgrow)  
    { return(*(int *)0); }
```

```
/* ./fld_just.c */
```

```
#undef set_field_just  
int set_field_just(  
    FIELD *field,  
    int just)  
    { return(*(int *)0); }
```

```
#undef field_just  
int field_just(  
    const FIELD *field)  
    { return(*(int *)0); }
```

```
/* ./fld_link.c  
*/
```

```
#undef link_field  
FIELD *link_field(  
    FIELD *field,  
    int frow,  
    int fcol)  
    { return(*(FIELD **)0); }
```

```

/* ./fld_max.c */

#undef set_max_field
int set_max_field(
    FIELD *field,
    int maxgrow)
{ return(*(int *)0); }

/* ./fld_move.c */

#undef move_field
int move_field(
    FIELD *field,
    int frow,
    int fcol)
{ return(*(int *)0); }

/* ./fld_newftyp.c */

#undef _nc_Default_FieldType
const FIELDTYPE *_nc_Default_FieldType = {0};

#undef new_fieldtype
FIELDTYPE *new_fieldtype(
    NCURSES_BOOL (*const field_check)(
    FIELD *p1,
    const void *p2),
    NCURSES_BOOL (*const char_check)(
    int p1,
    const void *p2))
{ return(*(FIELDTYPE **)0); }

#undef free_fieldtype
int free_fieldtype(
    FIELDTYPE *typ)
{ return(*(int *)0); }

/* ./fld_opts.c */

#undef set_field_opts
int set_field_opts(
    FIELD *field,
    Field_Options opts)
{ return(*(int *)0); }

#undef field_opts
Field_Options field_opts(

```

```

const FIELD *field)
{ return(*(Field_Options *)0); }

#undef field_opts_on
int field_opts_on(
    FIELD *field,

    Field_Options opts)
{ return(*(int *)0); }

#undef field_opts_off
int field_opts_off(
    FIELD *field,
    Field_Options opts)
{ return(*(int *)0); }

/* ./fld_pad.c */

#undef set_field_pad
int set_field_pad(
    FIELD *field,
    int ch)
{ return(*(int *)0); }

#undef field_pad
int field_pad(
    const FIELD *field)
{ return(*(int *)0); }

/* ./fld_page.c */

#undef set_new_page
int set_new_page(
    FIELD *field,
    NCURSES_BOOL new_page_flag)
{ return(*(int *)0); }

#undef new_page
NCURSES_BOOL new_page(
    const FIELD *field)
{ return(*(NCURSES_BOOL *)0); }

/* ./fld_stat.c */

#undef set_field_status
int set_field_status(
    FIELD *field,
    NCURSES_BOOL status)

```

```

    { return(*(int *)0); }

#undef field_status
NCURSES_BOOL field_status(
    const FIELD *field)
    { return*(NCURSES_BOOL *)0; }

/* ./fld_type.c */

#undef set_field_type
int set_field_type(
    FIELD *field,
    FIELDTYPE *type,
    ...)
    { return(*(int *)0); }

#undef field_type
FIELDTYPE
*field_type(
    const FIELD *field)
    { return*(FIELDTYPE **)0; }

/* ./fld_user.c */

#undef set_field_userptr
int set_field_userptr(
    FIELD *field,
    void *usrptr)
    { return(*(int *)0); }

#undef field_userptr
void *field_userptr(
    const FIELD *field)
    { return*(void **)0; }

/* ./frm_cursor.c */

#undef pos_form_cursor
int pos_form_cursor(
    FORM *form)
    { return(*(int *)0); }

/* ./frm_data.c */

#undef data_behind
NCURSES_BOOL data_behind(
    const FORM *form)
    { return*(NCURSES_BOOL *)0; }

```

```
#undef data_ahead
NCURSES_BOOL data_ahead(
    const FORM *form)
    { return(*(NCURSES_BOOL *)0); }
```

```
/* ./frm_def.c */
```

```
#undef _nc_Default_Form
FORM *_nc_Default_Form;
```

```
#undef new_form
FORM *new_form(
    FIELD **fields)
    { return(*(FORM **)0); }
```

```
#undef free_form
int free_form(
    FORM *form)
    { return(*(int *)0); }
```

```
#undef set_form_fields
int set_form_fields(
    FORM *form,
    FIELD **fields)
    { return(*(int *)0); }
```

```
#undef form_fields
FIELD **form_fields(
    const FORM *form)
    {
    return(*(FIELD ***)0); }
```

```
#undef field_count
int field_count(
    const FORM *form)
    { return(*(int *)0); }
```

```
/* ./frm_driver.c */
```

```
#undef _nc_Position_Form_Cursor
int _nc_Position_Form_Cursor(
    FORM *form)
    { return(*(int *)0); }
```

```
#undef _nc_Refresh_Current_Field
int _nc_Refresh_Current_Field(
    FORM *form)
```

```

    { return(*(int *)0); }

#undef _nc_Synchronize_Attributes
int _nc_Synchronize_Attributes(
    FIELD *field)
    { return(*(int *)0); }

#undef _nc_Synchronize_Options
int _nc_Synchronize_Options(
    FIELD *field,
    Field_Options newopts)
    { return(*(int *)0); }

#undef _nc_Set_Current_Field
int _nc_Set_Current_Field(
    FORM *form,
    FIELD *newfield)
    { return(*(int *)0); }

#undef _nc_Internal_Validation
NCURSES_BOOL _nc_Internal_Validation(
    FORM *form)
    { return(*(NCURSES_BOOL *)0); }

#undef _nc_First_Active_Field
FIELD *_nc_First_Active_Field(
    FORM *form)
    { return(*(FIELD **)0); }

#undef _nc_Set_Form_Page
int _nc_Set_Form_Page(
    FORM *form,
    int page,
    FIELD *field)
    {
    return(*(int *)0); }

typedef struct
{
    int keycode;
    int (*cmd) (FORM *);
}
Binding_Info;

#undef form_driver
int form_driver(
    FORM *form,
    int c)

```

```

    { return(*(int *)0); }

#undef set_field_buffer
int set_field_buffer(
    FIELD *field,
    int buffer,
    const char *value)
    { return(*(int *)0); }

#undef field_buffer
char *field_buffer(
    const FIELD *field,
    int buffer)
    { return(*(char **)0); }

/* ./frm_hook.c */

#undef set_field_init
int set_field_init(
    FORM *form,
    Form_Hook func)
    { return(*(int *)0); }

#undef field_init
Form_Hook field_init(
    const FORM *form)
    { return(*(Form_Hook *)0); }

#undef set_field_term
int set_field_term(
    FORM *form,
    Form_Hook func)
    { return(*(int *)0); }

#undef field_term
Form_Hook field_term(
    const FORM *form)
    { return(*(Form_Hook *)0); }

#undef set_form_init
int set_form_init(
    FORM *form,
    Form_Hook func)
    { return(*(int *)0); }

#undef form_init
Form_Hook form_init(
    const FORM *form)

```



```

    { return(*(Form_Hook
    *)0); }

#undef set_form_term
int set_form_term(
    FORM *form,
    Form_Hook func)
    { return(*(int *)0); }

#undef form_term
Form_Hook form_term(
    const FORM *form)
    { return(*(Form_Hook *)0); }

/* ./frm_opts.c */

#undef set_form_opts
int set_form_opts(
    FORM *form,
    Form_Options opts)
    { return(*(int *)0); }

#undef form_opts
Form_Options form_opts(
    const FORM *form)
    { return(*(Form_Options *)0); }

#undef form_opts_on
int form_opts_on(
    FORM *form,
    Form_Options opts)
    { return(*(int *)0); }

#undef form_opts_off
int form_opts_off(
    FORM *form,
    Form_Options opts)
    { return(*(int *)0); }

/* ./frm_page.c */

#undef set_form_page
int set_form_page(
    FORM *form,
    int page)
    { return(*(int *)0); }

#undef form_page

```

```

int form_page(
    const FORM *form)
    { return(*(int *)0); }

/* ./frm_post.c */

#undef post_form
int post_form(
    FORM *form)
    { return(*(int *)0); }

#undef unpost_form
int unpost_form(
    FORM *form)
    { return(*(int *)0); }

/* ./frm_req_name.c
*/

#undef form_request_name
const char *form_request_name(
    int request)
    { return(*(const char **)0); }

#undef form_request_by_name
int form_request_by_name(
    const char *str)
    { return(*(int *)0); }

/* ./frm_scale.c */

#undef scale_form
int scale_form(
    const FORM *form,
    int *rows,
    int *cols)
    { return(*(int *)0); }

/* ./frm_sub.c */

#undef set_form_sub
int set_form_sub(
    FORM *form,
    WINDOW *win)
    { return(*(int *)0); }

#undef form_sub
WINDOW *form_sub(

```

```
const FORM *form)
{ return(*(WINDOW **)0); }
```

```
/* ./frm_user.c */
```

```
#undef set_form_usrptr
int set_form_usrptr(
    FORM *form,
    void *usrptr)
{ return(*(int *)0); }
```

```
#undef form_usrptr
void *form_usrptr(
    const FORM *form)
{ return(*(void **)0); }
```

```
/* ./frm_win.c */
```

```
#undef set_form_win
int set_form_win(
    FORM *form,
    WINDOW *win)
{ return(*(int *)0); }
```

```
#undef form_win
WINDOW *form_win(
    const FORM *form)
{ return(*(WINDOW **)0); }
```

```
/* ./fty_alnum.c */
```

```
typedef struct
{
    int
    width;
}
alnumARG;
```

```
#undef TYPE_ALNUM
FIELDTYPE *TYPE_ALNUM;
```

```
/* ./fty_alpha.c */
```

```
typedef struct
{
    int width;
}
alphaARG;
```

```
#undef TYPE_ALPHA
FIELDTYPE *TYPE_ALPHA;

/* ./fty_enum.c */

typedef struct
{
    char **kwds;
    int count;
    NCURSES_BOOL checkcase;
    NCURSES_BOOL checkunique;
}
enumARG;

#undef TYPE_ENUM
FIELDTYPE *TYPE_ENUM;

/* ./fty_int.c */

typedef struct
{
    int precision;
    long low;
    long high;
}
integerARG;

#undef TYPE_INTEGER
FIELDTYPE *TYPE_INTEGER;

/* ./fty_ipv4.c */
#undef TYPE_IPV4
FIELDTYPE *TYPE_IPV4;

/* ./fty_num.c */

#include <locale.h>

typedef struct
{
    int precision;
    double low;
    double high;
    struct lconv *L;
}
numericARG;
```

```
#undef TYPE_NUMERIC
FIELDTYPE *TYPE_NUMERIC;
```

```
/* ./fty_regex.c */
```

```
#include <regex.h>
```

```
typedef struct
{
    regex_t *pRegExp;
    unsigned long *refCount;
}
RegExp_Arg;
```

```
#undef TYPE_REGEX
FIELDTYPE *TYPE_REGEX;
```

Found in path(s):

```
* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/form/l-lib-lform
```

No license file was found, but licenses were detected in source scan.

```
#####
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```

without prior written      #
# authorization.           #
#####
#
# Author: Thomas Dickey
#
# $Id: Caps.osf1r5,v 1.4 2006/05/27 15:33:04 tom Exp $
#
# This is an adaptation of ncurses' termcap/terminfo capability table, which
# is designed to align with OSF/1 version 5 (Tru64) terminfo.
#
# This table is used to generate initializers for tables that drive tic,
# infocmp, and the library compilation code used to support the termcap
# compatibility hack. It is also used to generate the tabular portion of the
# terminfo(5) man page; lines beginning with `#%' are passed through to become
# the terminfo table.
#
# This file has three major sections; a standard-capabilities table, two
# extension-capability tables, and a section of aliases declarations.
# The first two have the same format, as follows:
#
# FILE FORMAT
#
# Column 1: terminfo variable name
#
# Column 2: terminfo capability name
# Column 3: capability type (boolean, numeric, or string)
# Column 4: termcap capability name
# Column 5: KEY_XXX name, if any, '-' otherwise
# Column 6: value for KEY_XXX name, if any, '-' otherwise
# Column 7: Lead with `Y' if capability should be emitted in termcap
#           translations, '-' otherwise
# Column 8: capability description
#
# The codes following [Y-] in column 7 describe the versions of termcap which
# use the given capability. This information is not used by the curses library
# proper; rather, it's there to help the terminfo maintainer avoid emitting
# termcap entry translations that are more than 1023 bytes long (and tank a
# lot of old termcap-using programs). The codes read as follows:
# B = mentioned in the BSD man page for 4.4BSD curses
# C = used by the 4.4BSD curses library
# G = mentioned in the documentation for GNU termcap
# E = used by GNU Emacs
# K = remove this terminfo capability when translating to standard format
#
# The important codes are C and E. A cap with C or E should be preserved in
# translation if possible. The problem is that preserving all such caps may
# lead to some termcap translations being too long. The termcap maintainer

```

```
# has a bit of a juggling act to do...potential problem cases are marked with
# an asterisk (*).
#
# The aliases section has the following format:
#
# Column 1: either `capalias' or `infoalias'
# Column 2: name to be aliased
# Column 3: what name it should translate to. The name IGNORE means it
# should be discarded with a warning message.
# Column 4: name of the extension set (used for compiler warning messages)
# Column 5: capability description (usually an associated terminfo variable)
#
# HANDLING TERMCPAP AND TERMINFO EXTENSIONS
#
# There are basically five different ways to handle termcap and terminfo
# extensions:
#
# 1. Don't list the capname here, or list it but comment it out (the latter
# is preferable; someone might want to handle it
# in the future). If you do
# this, the capability will be treated as unknown and raise a warning from
# the compiler.
#
# 2. Alias it. This is appropriate if the capability has the same meaning
# as an already-supported one. The compiler will handle aliasing, emitting
# an appropriate informational message whenever an alias fires.
#
# 3. List it in the standard table. You almost certainly do *not* want
# to do this -- the capabilities in that one, and their order, have been
# carefully chosen to be SVr4-binary-compatible when they're written out
# as a terminfo object, and breaking this would be bad. It's up the ncurses
# library what to do with the terminfo data after it's read in.
#
# 4. List it in the aliases table with an IGNORE target field. If you
# do this, the capability will be ignored on input (though the user will
# get a warning message about it).
#
# 5. List it in the extensions table. If you do this, the compiler will
# silently accept the capability, but the curses
# library proper will never
# see it (because it won't be written out as part of the terminfo object
# format). It's up to you what you have the compiler do with it.
#
# There are two opposite reasons to choose option 5. One is when you want
# to eat the capability silently and discard it when doing translations
# to terminfo with tic -I. Some very old obsolete BSD caps like :kn: are
# in this class. Nothing will ever use them again.
#
```

```

# More usually, you want the compiler to try to deduce something from the
# capability value that it can use to translate it into your output format.
# You'll need to write custom code, probably in postprocess_termcap() or
# postprocess_terminfo(), to handle the translation.
#
# CONTROLLING ENTRY LENGTH
#
# Notes on specific elisions made to fit translations within 1023 bytes:
#
# Machines with IBM PC-like keyboards want to be able to define the following
# keys: key_npage, key_ppage, key_home, key_ll (which is used for in termcap-
# only environments
# for End or Home-Down), key_dc, and key_ic. This is also
# the set of keys the `joe' editor will be upset if it can't see. So don't
# trim those out of the set to be translated to termcap, or various users of
# the termcap file will become irate.
#
# It might look tempting to leave those long init strings out of translations.
# We can't do it (yet); 4.4BSD tput and tset use them.
#
# We retain the sgr capability in translation in spite of the fact that neither
# 4.4BSD nor GNU Emacs uses it, because (a) some entry naming distinctions are
# hard to understand without it, and (b) the entries in which it is long tend
# to be older types that don't use up a lot of string space on function keys.
# The tic(1) translation code will complain and elide it if it makes a critical
# difference (there is special code in tic to recognize this situation).
#
# Yes, BSD tset(1) uses hpa. We elide hpa/vpa anyway because the motion
# optimizer in BSD curses didn't use them. This omission seems to
# be the
# single most effective one, it shortened the resolved length of all thirteen
# problem entries in the 9.9.0 version of the terminfo master below critical.
#
# It would be nice to keep f11 and f12 for Emacs use, but a couple of termcap
# translations go back over critical if we do this. As 4.4BSD curses fades
# into history and GNU termcap's application base shrinks towards being GNU
# Emacs only, we'll probably elide out some BSD-only capabilities in order
# to buy space for non-essentials Emacs is still using. Capabilities high
# on that hit list: rc, sc, uc.
#
#####
#
# STANDARD CAPABILITIES
#
##%The following is a complete table of the capabilities included in a
##%terminfo description block and available to terminfo-using code. In each
##%line of the table,
##%

```



```

%% The \fBvariable\fR is the name by which the programmer (at the terminfo level)
%% accesses the capability.
%%
%% The \fBcapname\fR is the short
    name used in the text of the database,
%% and is used by a person updating the database.
%% Whenever possible, capnames are chosen to be the same as or similar to
%% the ANSI X3.64-1979 standard (now superseded by ECMA-48, which uses
%% identical or very similar names). Semantics are also intended to match
%% those of the specification.
%%
%% The termcap code is the old
%% .B termcap
%% capability name (some capabilities are new, and have names which termcap
%% did not originate).
%% .P
%% Capability names have no hard length limit, but an informal limit of 5
%% characters has been adopted to keep them short and to allow the tabs in
%% the source file
%% .B Caps
%% to line up nicely.
%%
%% Finally, the description field attempts to convey the semantics of the
%% capability. You may find some codes in the description field:
%% .TP
%% (P)
%% indicates that padding may be specified
%% .TP
%% #[1-9]
%% in the description field indicates that the string is passed through tparm with
%% parms as given (#\fIi\fP).
%% .TP
%% (P*)
%% indicates
    that padding may vary in proportion to the number of
%% lines affected
%% .TP
%% (#\d\fIi\fP\u)
%% indicates the \fIi\fP\uth\d parameter.
%%
%% .PP
%% These are the boolean capabilities:
%%
%% .na
%% .TS H
%% center expand;
%% c l l c
%% c l l c

```

```

%%lw25 lw6 lw2 lw20.
%%\fBVariable Cap- TCap Description\fR
%%\fBBooleans name Code\fR
auto_left_margin  bw bool bw - - YB-G- cub1 wraps from column 0 to last column
auto_right_margin am bool am - - YBCGE terminal has automatic margins
no_esc_ctlc  xsb bool xb - - YBCG- beehive (f1=escape, f2=ctrl C)
ceol_standout_glitch  xhp bool xs - - YBCGE standout not erased by overwriting (hp)
eat_newline_glitch  xenl bool xn - - YBCGE newline ignored after 80 cols (concept)
erase_overstrike  eo bool eo - - YBCG- can erase overstrikes with a blank
generic_type  gn bool gn - - YB-G- generic line type
hard_copy  hc bool hc - - YBCG- hardcopy terminal
has_meta_key  km bool km - - YB-GE Has a meta key (i.e., sets 8th-bit)
has_status_line  hs bool hs - - YB-G- has
    extra status line
insert_null_glitch  in bool in - - YBCGE insert mode distinguishes nulls
memory_above  da bool da - - YBCG- display may be retained above the screen
memory_below  db bool db - - YB-GE display may be retained below the screen
move_insert_mode  mir bool mi - - YBCGE safe to move while in insert mode
move_standout_mode  msgr bool ms - - YBCGE safe to move while in standout mode
over_strike  os bool os - - YBCG- terminal can overstrike
status_line_esc_ok  eslok bool es - - YB-G- escape can be used on the status line
dest_tabs_magic_sms0  xt bool xt - - YBCGE tabs destructive, magic so char (t1061)
tilde_glitch  hz bool hz - - YB-GE cannot print ~'s (hazeltine)
transparent_underline  ul bool ul - - YBCGE underline character overstrikes
xon_xoff  xon bool xo - - YB--- terminal uses xon/xoff handshaking
back_color_erase  bce bool ut - - ----- screen erased with background color
can_change  ccc bool cc - - ----- terminal can re-define existing
    colors
col_addr_glitch  xhpa bool YA - - ----- only positive motion for hpa/mhpa caps
cpi_changes_res  cpix bool YF - - ----- changing character pitch changes resolution
cr_cancels_micro_mode  crxm bool YB - - ----- using cr turns off micro mode
hard_cursor  chts bool HC - - ----- cursor is hard to see
has_print_wheel  daisy bool YC - - ----- printer needs operator to change character set
hue_lightness_saturation  hls bool hl - - ----- terminal uses only HLS color notation (Tektronix)
lpi_changes_res  lpix bool YG - - ----- changing line pitch changes resolution
needs_xon_xoff  nxon bool nx - - ----- padding will not work, xon/xoff required
non_dest_scroll_region  ndscr bool ND - - ----- scrolling region is non-destructive
non_rev_rmcup  nrrmc bool NR - - ----- smcup does not reverse rmcup
no_pad_char  npc bool NP - - ----- pad character does not exist
ptr_silent  mc5i bool 5i - - ----- printer will not echo on screen
row_addr_glitch  xvpa bool YD - - ----- only positive motion
    for vpa/mvpa caps
semi_auto_right_margin  sam bool YE - - ----- printing in last column causes cr
%%.TE
%%.ad
%%
%%These are the numeric capabilities:
%%

```

```

#%.na
#%.TS H
#%center expand;
#%c 11 c
#%c 11 c
#%lw25 lw6 lw2 lw20.
#%\fBVariable Cap- TCap Description\fR
#%\fBNumeric name Code\fR
columns cols num co - - YBCGE number of columns in a line
init_tabs it num it - - YB-G- tabs initially every # spaces
lines lines num li - - YBCGE number of lines on screen or page
lines_of_memory lm num lm - - YB-G- lines of memory if > line. 0 means varies
magic_cookie_glitch xmc num sg - - YBCGE number of blank characters left by smso or rmso
padding_baud_rate pb num pb - - YB-GE lowest baud rate where padding needed
virtual_terminal vt num vt - - YB--- virtual terminal number (CB/unix)
width_status_line wsl num ws - - YB-G- number of columns in status line
bit_image_entwining bitwin num Yo - - ----- number of passes for each bit-image row
bit_image_type bitype num Yp - - ----- type
of bit-image device
buffer_capacity bufisz num Ya - - ----- numbers of bytes buffered before printing
buttons btns num BT - - ----- number of buttons on mouse
dot_vert_spacing spinv num Yb - - ----- spacing of pins vertically in pins per inch
dot_horz_spacing spinh num Yc - - ----- spacing of dots horizontally in dots per inch
label_height lh num lh - - ----- rows in each label
label_width lw num lw - - ----- columns in each label
max_attributes ma num ma - - YBC-- maximum combined attributes terminal can handle
max_colors colors num Co - - ----- maximum number of colors on screen
max_micro_address maddr num Yd - - ----- maximum value in micro_..._address
max_micro_jump mjump num Ye - - ----- maximum value in parm_..._micro
max_pairs pairs num pa - - ----- maximum number of color-pairs on the screen
maximum_windows wnum num MW - - ----- maximum number of defineable windows
micro_col_size mcs num Yf - - ----- character step size when in micro mode
micro_line_size mls num Yg - - ----- line
step size when in micro mode
no_color_video ncv num NC - - ----- video attributes that can not be used with colors
number_of_pins npins num Yh - - ----- numbers of pins in print-head
num_labels nlab num NI - - ----- number of labels on screen
output_res_char orc num Yi - - ----- horizontal resolution in units per line
output_res_line orl num Yj - - ----- vertical resolution in units per line
output_res_horz_inch orhi num Yk - - ----- horizontal resolution in units per inch
output_res_vert_inch orvi num Yl - - ----- vertical resolution in units per inch
print_rate cps num Ym - - ----- print rate in characters per second
wide_char_size widcs num Yn - - ----- character step size when in double wide mode
#%.TE
#%.ad
#%
#%These are the string capabilities:
#%

```

```

#%.na
#%.TS H
#%center expand;
#%c 1 l c
#%c 1 l c
#%lw25 lw6 lw2 lw20.
#%\fBVariable Cap- TCap Description\fR
#%\fBString name Code\fR
back_tab cbt str bt - - YBCGE back tab (P)
bell bel str bl - - YB-GE audible
signal (bell) (P)
carriage_return cr str cr - - YBCGE carriage return (P*) (P*)
change_scroll_region csr str cs - - YBCGE change region to line #1 to line #2 (P)
clear_all_tabs tbc str ct - - YB-G- clear all tab stops (P)
clear_screen clear str cl - - YBCGE clear screen and home cursor (P*)
clr_eol el str ce - - YBCGE clear to end of line (P)
clr_eos ed str cd - - YBCGE clear to end of screen (P*)
column_address hpa str ch - - B-GE* horizontal position #1, absolute (P)
command_character cmdch str CC - - YB-G- terminal settable cmd character in prototype !?
cursor_address cup str cm - - YBCGE move to row #1 columns #2
cursor_down cud1 str do - - YBCGE down one line
cursor_home home str ho - - YBCGE home cursor (if no cup)
cursor_invisible civis str vi - - YB-G- make cursor invisible
cursor_left cub1 str le - - YBCGE move left one space
cursor_mem_address mrcup str CM - - YB-G- memory relative cursor addressing,
move to row #1 columns #2
cursor_normal cnorm str ve - - YBCGE make cursor appear normal (undo civis/cvvis)
cursor_right cuf1 str nd - - YBCGE non-destructive space (move right one space)
cursor_to_ll ll str ll - - YBCGE last line, first column (if no cup)
cursor_up cuu1 str up - - YBCGE up one line
cursor_visible cvvis str vs - - YBCGE make cursor very visible
delete_character dch1 str dc - - YBCGE delete character (P*)
delete_line dl1 str dl - - YBCGE delete line (P*)
dis_status_line dsl str ds - - YB-G- disable status line
down_half_line hd str hd - - YB-G- half a line down
enter_alt_charset_mode smacs str as - - YB-G- start alternate character set (P)
enter_blink_mode blink str mb - - YB-G- turn on blinking
enter_bold_mode bold str md - - YB-G- turn on bold (extra bright) mode
enter_ca_mode smcup str ti - - YBCGE string to start programs using cup
enter_delete_mode smdc str dm - - YBCGE enter delete mode
enter_dim_mode dim str mh - - YB-G- turn
on half-bright mode
enter_insert_mode smir str im - - YBCGE enter insert mode
enter_secure_mode invis str mk - - B-G-* turn on blank mode (characters invisible)
enter_protected_mode prot str mp - - B-G-* turn on protected mode
enter_reverse_mode rev str mr - - YB-G- turn on reverse video mode
enter_standout_mode smso str so - - YBCGE begin standout mode
enter_underline_mode smul str us - - YBCGE begin underline mode

```

erase\_chars ech str ec - - YB-G- erase #1 characters (P)  
 exit\_alt\_charset\_mode rmacs str ae - - YB-G- end alternate character set (P)  
 exit\_attribute\_mode sgr0 str me - - YB-GE turn off all attributes  
 exit\_ca\_mode rmcup str te - - YBCGE strings to end programs using cup  
 exit\_delete\_mode rmdc str ed - - YBCGE end delete mode  
 exit\_insert\_mode rmir str ei - - YBCGE exit insert mode  
 exit\_standout\_mode rmso str se - - YBCGE exit standout mode  
 exit\_underline\_mode rmul str ue - - YBCGE exit underline mode  
 flash\_screen flash str vb - - YBCGE visible  
 bell (may not move cursor)  
 form\_feed ff str ff - - YB-G- hardcopy terminal page eject (P\*)  
 from\_status\_line fsl str fs - - YB-G- return from status line  
 init\_1string is1 str i1 - - YB-G- initialization string  
 init\_2string is2 str is - - YB-G- initialization string  
 init\_3string is3 str i3 - - YB-G- initialization string  
 init\_file if str if - - YB-G- name of initialization file  
 insert\_character ich1 str ic - - YBCGE insert character (P)  
 insert\_line il1 str al - - YBCGE insert line (P\*)  
 insert\_padding ip str ip - - YBCGE insert padding after inserted character  
 key\_backspace kbs str kb KEY\_BACKSPACE 0407 YB-G- backspace key  
 key\_catab ktbc str ka KEY\_CATAB 0526 -B-G-\* clear-all-tabs key  
 key\_clear kclr str kC KEY\_CLEAR 0515 -B-G-\* clear-screen or erase key  
 key\_ctab kctab str kt KEY\_CTAB 0525 -B-G-\* clear-tab key  
 key\_dc kdch1 str kD KEY\_DC 0512 YB-G- delete-character key  
 key\_dl kdl1 str kL KEY\_DL 0510 -B-G-\* delete-line key  
 key\_down kcucl1 str kd KEY\_DOWN 0402 YBCGE down-arrow  
 key  
 key\_eic krmir str kM KEY\_EIC 0514 -B-G-\* sent by rmir or smir in insert mode  
 key\_eol kel str kE KEY\_EOL 0517 -B-G-\* clear-to-end-of-line key  
 key\_eos ked str kS KEY\_EOS 0516 -B-G-\* clear-to-end-of-screen key  
 key\_f0 kf0 str k0 KEY\_F(0) 0410 YBCGE F0 function key  
 key\_f1 kf1 str k1 KEY\_F(1) - YBCGE F1 function key  
 key\_f10 kf10 str k; KEY\_F(10) - ----E F10 function key  
 key\_f2 kf2 str k2 KEY\_F(2) - YBCGE F2 function key  
 key\_f3 kf3 str k3 KEY\_F(3) - YBCGE F3 function key  
 key\_f4 kf4 str k4 KEY\_F(4) - YBCGE F4 function key  
 key\_f5 kf5 str k5 KEY\_F(5) - YBCGE F5 function key  
 key\_f6 kf6 str k6 KEY\_F(6) - YBCGE F6 function key  
 key\_f7 kf7 str k7 KEY\_F(7) - YBCGE F7 function key  
 key\_f8 kf8 str k8 KEY\_F(8) - YBCGE F8 function key  
 key\_f9 kf9 str k9 KEY\_F(9) - YBCGE F9 function key  
 key\_home khome str kh KEY\_HOME 0406 YBCGE home key  
 key\_ic kich1 str kI KEY\_IC 0513 YB-GE insert-character key  
 key\_il kil1 str kA KEY\_IL 0511 -B-G-\* insert-line  
 key  
 key\_left kcub1 str kI KEY\_LEFT 0404 YBCGE left-arrow key  
 key\_ll kll str kH KEY\_LL 0533 YB-G- lower-left key (home down)  
 key\_npage knp str kN KEY\_NPAGE 0522 YB-GE next-page key

key\_ppage kpp str kP KEY\_PPAGE 0523 YB-GE previous-page key  
key\_right kcuf1 str kr KEY\_RIGHT 0405 YBCGE right-arrow key  
key\_sf kind str kF KEY\_SF 0520 -B-G-\* scroll-forward key  
key\_sr kri str kR KEY\_SR 0521 -B-G-\* scroll-backward key  
key\_stab khts str kT KEY\_STAB 0524 -B-G-\* set-tab key  
key\_up kcuu1 str ku KEY\_UP 0403 YBCGE up-arrow key  
keypad\_local rmkx str ke - - YBCGE leave 'keyboard\_transmit' mode  
keypad\_xmit smkx str ks - - YBCGE enter 'keyboard\_transmit' mode  
lab\_f0 lf0 str l0 - - -B-G-\* label on function key f0 if not f0  
lab\_f1 lf1 str l1 - - -B-G-\* label on function key f1 if not f1  
lab\_f10 lf10 str la - - ---- label on function key f10 if not f10  
lab\_f2 lf2 str l2 - - -B-G-\* label on function key f2 if not f2  
lab\_f3 lf3 str l3 - - -B-G-\* label  
on function key f3 if not f3  
lab\_f4 lf4 str l4 - - -B-G-\* label on function key f4 if not f4  
lab\_f5 lf5 str l5 - - -B-G-\* label on function key f5 if not f5  
lab\_f6 lf6 str l6 - - -B-G-\* label on function key f6 if not f6  
lab\_f7 lf7 str l7 - - -B-G-\* label on function key f7 if not f7  
lab\_f8 lf8 str l8 - - -B-G-\* label on function key f8 if not f8  
lab\_f9 lf9 str l9 - - -B-G-\* label on function key f9 if not f9  
meta\_off rmm str mo - - YB-G-\* turn off meta mode  
meta\_on smm str mm - - YB-G-\* turn on meta mode (8th-bit on)  
newline nel str nw - - YB-G-\* newline (behave like cr followed by lf)  
pad\_char pad str pc - - YBCGE padding char (instead of null)  
parm\_dch dch str DC - - YB-GE delete #1 characters (P\*)  
parm\_delete\_line dl str DL - - YBCGE delete #1 lines (P\*)  
parm\_down\_cursor cud str DO - - YBCGE down #1 lines (P\*)  
parm\_ich ich str IC - - YB-GE insert #1 characters (P\*)  
parm\_index indn str SF - - YBCG- scroll forward  
#1 lines (P)  
parm\_insert\_line il str AL - - YBCGE insert #1 lines (P\*)  
parm\_left\_cursor cub str LE - - YBCGE move #1 characters to the left (P)  
parm\_right\_cursor cuf str RI - - YBCGE move #1 characters to the right (P\*)  
parm\_rindex rin str SR - - YBCG- scroll back #1 lines (P)  
parm\_up\_cursor cuu str UP - - YBCGE up #1 lines (P\*)  
pkey\_key pfkey str pk - - -B--- program function key #1 to type string #2  
pkey\_local pfloc str pl - - -B--- program function key #1 to execute string #2  
pkey\_xmit pfx str px - - -B--- program function key #1 to transmit string #2  
print\_screen mc0 str ps - - -B-G-\* print contents of screen  
prtr\_off mc4 str pf - - -B-G-\* turn off printer  
prtr\_on mc5 str po - - -B-G-\* turn on printer  
repeat\_char rep str rp - - YB-GE repeat char #1 #2 times (P\*)  
reset\_1string rs1 str r1 - - -B--- reset string  
reset\_2string rs2 str r2 - - -B--- reset string  
reset\_3string rs3 str r3 - - -B--- reset string  
reset\_file rf str rf - - -B--- name  
of reset file  
restore\_cursor rc str rc - - YBCG- restore cursor to position of last save\_cursor

```

row_address vpa str cv - -B-GE* vertical position #1 absolute (P)
save_cursor sc str sc - -YBCG- save current cursor position (P)
scroll_forward ind str sf - -YBCGE scroll text up (P)
scroll_reverse ri str sr - -YBCGE scroll text down (P)
set_attributes sgr str sa - -YB-G- define video attributes #1-#9 (PG9)
set_tab hts str st - -YB-G- set a tab in every row, current columns
set_window wind str wi - -B-GE current window is lines #1-#2 cols #3-#4
tab ht str ta - -YBCGE tab to next 8-space hardware tab stop
to_status_line tsl str ts - -YB-G- move to status line, column #1
underline_char uc str uc - -YBCG- underline char and move past it
up_half_line hu str hu - -YB-G- half a line up
init_prog iprog str iP - -B--- path name of program for initialization
key_a1 ka1 str K1 KEY_A1 0534 YB-GE upper left of keypad
key_a3 ka3 str K3 KEY_A3 0535 YB-GE upper
right of keypad
key_b2 kb2 str K2 KEY_B2 0536 YB-GE center of keypad
key_c1 kc1 str K4 KEY_C1 0537 YB-GE lower left of keypad
key_c3 kc3 str K5 KEY_C3 0540 YB-GE lower right of keypad
prtr_non mc5p str pO - -B-G-* turn on printer for #1 bytes
#
# SVr1 capabilities stop here. IBM's version of terminfo is the same as
# SVr4 up to this point, but has a different set afterwards.
#
# OSF1 differences start here, based on IBM version:
#
box_chars_1 box1 str bx - -K box characters primary set
box_chars_2 box2 str by - -K box characters secondary set
box_attr_1 batt1 str Bx - -K attributes for box1
box_attr_2 batt2 str By - -K attributes for box2
color_bg_0 colb0 str d0 - -K background color 0
color_bg_1 colb1 str d1 - -K background color 1
color_bg_2 colb2 str d2 - -K background color 2
color_bg_3 colb3 str d3 - -K background color 3
color_bg_4 colb4 str d4 - -K background color
4
color_bg_5 colb5 str d5 - -K background color 5
color_bg_6 colb6 str d6 - -K background color 6
color_bg_7 colb7 str d7 - -K background color 7
color_fg_0 colf0 str c0 - -K foreground color 0
color_fg_1 colf1 str c1 - -K foreground color 1
color_fg_2 colf2 str c2 - -K foreground color 2
color_fg_3 colf3 str c3 - -K foreground color 3
color_fg_4 colf4 str c4 - -K foreground color 4
color_fg_5 colf5 str c5 - -K foreground color 5
color_fg_6 colf6 str c6 - -K foreground color 6
color_fg_7 colf7 str c7 - -K foreground color 7
font_0 font0 str f0 - - select font 0
font_1 font1 str f1 - - select font 1

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font_2 font2 str f2 - - - - - select font 2
font_3 font3 str f3 - - - - - select font 3
font_4 font4 str f4 - - - - -K select font 4
font_5 font5 str f5 - - - - -K select font 5
font_6 font6 str f6 - - - - -K select font 6
font_7 font7 str f7 - - - - -K select font
7
key_back_tab kbtap str k0 - - - - - backtab key
key_do kdo str ki - - - - -K do request key
key_command kcmd str kc KEY_COMMAND 0545 - - - - - command key
key_command_pane kcpn str kW - - - - -K command-pane key
key_end kend str @7 KEY_END 0550 - - - - - end key
key_help khlp str %1 KEY_HELP 0553 - - - - - help key
key_newline knl str nl - - - - -K newline key
key_next_pane knpn str kv - - - - -K next-pane key
key_prev_cmd kppn str kp - - - - -K previous-command key
key_prev_pane kppn str kV - - - - -K previous-pane key
key_quit kquit str kQ - - - - -K quit key
key_select kslt str *6 KEY_SELECT 0601 - - - - - select key
key_scroll_left kscl str kz - - - - -K scroll left
key_scroll_right kscr str kZ - - - - -K scroll right
key_tab ktab str ko - - - - -K tab key
key_smap_in1 kmpf1 str Kv - - - - -K special mapped key 1 input
key_smap_out1 kmpt1 str KV - - - - -K special mapped key 1 output
key_smap_in2 kmpf2 str Kw - - - - -K special mapped key 2 input
key_smap_out2 kmpt2 str KW - - - - -K special
mapped key 2 output
key_smap_in3 kmpf3 str Kx - - - - -K special mapped key 3 input
key_smap_out3 kmpt3 str KX - - - - -K special mapped key 3 output
key_smap_in4 kmpf4 str Ky - - - - -K special mapped key 4 input
key_smap_out4 kmpt4 str KY - - - - -K special mapped key 4 output
key_smap_in5 kmpf5 str Kz - - - - -K special mapped key 5 input
key_smap_out5 kmpt5 str KZ - - - - -K special mapped key 5 output
appl_defined_str apstr str za - - - - -K application-defined string
# The key_smap_in[6789] and key_smap_out[6789] capabilities are described in
# the Tru64 manual pages.
key_smap_in6 kmpf6 str Kr - - - - -K special mapped key 6 input
key_smap_out6 kmpt6 str KR - - - - -K special mapped key 6 output
key_smap_in7 kmpf7 str Ks - - - - -K special mapped key 7 input
key_smap_out7 kmpt7 str KS - - - - -K special mapped key 7 output
key_smap_in8 kmpf8 str Kt - - - - -K special mapped key 8 input
key_smap_out8 kmpt8 str KT - - - - -K special
mapped key 8 output
key_smap_in9 kmpf9 str Ku - - - - -K special mapped key 9 input
key_smap_out9 kmpt9 str KU - - - - -K special mapped key 9 output
key_sf1 ksf1 str S1 - - - - -K special function key 1
key_sf2 ksf2 str S2 - - - - -K special function key 2
key_sf3 ksf3 str S3 - - - - -K special function key 3

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key\_sf4 ksf4 str S4 - - ----K special function key 4  
key\_sf5 ksf5 str S5 - - ----K special function key 5  
key\_sf6 ksf6 str S6 - - ----K special function key 6  
key\_sf7 ksf7 str S7 - - ----K special function key 7  
key\_sf8 ksf8 str S8 - - ----K special function key 8  
key\_sf9 ksf9 str S9 - - ----K special function key 9  
key\_sf10 ksf10 str SA - - ----K special function key 10  
#  
key\_f11 kf11 str F1 KEY\_F(11) - ----E F11 function key  
key\_f12 kf12 str F2 KEY\_F(12) - ----E F12 function key  
key\_f13 kf13 str F3 KEY\_F(13) - ----E F13 function key  
key\_f14 kf14 str F4 KEY\_F(14) - ----E F14 function key  
key\_f15 kf15 str F5 KEY\_F(15) - ----E F15  
function key  
key\_f16 kf16 str F6 KEY\_F(16) - ----E F16 function key  
key\_f17 kf17 str F7 KEY\_F(17) - ----E F17 function key  
key\_f18 kf18 str F8 KEY\_F(18) - ----E F18 function key  
key\_f19 kf19 str F9 KEY\_F(19) - ----E F19 function key  
key\_f20 kf20 str FA KEY\_F(20) - ----E F20 function key  
key\_f21 kf21 str FB KEY\_F(21) - ----E F21 function key  
key\_f22 kf22 str FC KEY\_F(22) - ----E F22 function key  
key\_f23 kf23 str FD KEY\_F(23) - ----E F23 function key  
key\_f24 kf24 str FE KEY\_F(24) - ----E F24 function key  
key\_f25 kf25 str FF KEY\_F(25) - ----E F25 function key  
key\_f26 kf26 str FG KEY\_F(26) - ----E F26 function key  
key\_f27 kf27 str FH KEY\_F(27) - ----E F27 function key  
key\_f28 kf28 str FI KEY\_F(28) - ----E F28 function key  
key\_f29 kf29 str FJ KEY\_F(29) - ----E F29 function key  
key\_f30 kf30 str FK KEY\_F(30) - ----E F30 function key  
key\_f31 kf31 str FL KEY\_F(31) - ----E F31 function key  
key\_f32 kf32 str FM KEY\_F(32) - ----E F32  
function key  
key\_f33 kf33 str FN KEY\_F(33) - ----E F33 function key  
key\_f34 kf34 str FO KEY\_F(34) - ----E F34 function key  
key\_f35 kf35 str FP KEY\_F(35) - ----E F35 function key  
key\_f36 kf36 str FQ KEY\_F(36) - ----E F36 function key  
key\_action kact str kJ KEY\_ACTION 0541 ----K sent by action key  
acs\_chars acsc str ac - - ----- graphics charset pairs, based on vt100  
alt\_scancode\_esc scesa str S8 - - ----- Alternate escape for scancode emulation  
bit\_image\_repeat birep str Xy - - ----- Repeat bit image cell #1 #2 times  
bit\_image\_newline binel str Zz - - ----- Move to next row of the bit image  
bit\_image\_carriage\_return bicr str Yv - - ----- Move to beginning of same row  
change\_char\_pitch cpi str ZA - - ----- Change number of characters per inch to #1  
change\_line\_pitch lpi str ZB - - ----- Change number of lines per inch to #1  
change\_res\_horz chr str ZC - - ----- Change horizontal resolution to #1  
change\_res\_vert cvr str ZD - - ----- Change vertical  
resolution to #1  
char\_padding rmp str rP - - ----- like ip but when in insert mode

char\_set\_names csnm str Zy - - - - - Produce #1'th item from list of character set names  
clear\_margins mgc str MC - - - - - clear right and left soft margins  
clr\_bol e11 str cb - - - - - Clear to beginning of line  
code\_set\_init csin str ci - - - - - Init sequence for multiple codesets  
color\_names colorm str Yw - - - - - Give name for color #1  
create\_window cwin str CW - - - - - define a window #1 from #2,#3 to #4,#5  
define\_bit\_image\_region defbi str Yx - - - - - Define rectangular bit image region  
define\_char defc str ZE - - - - - Define a character #1, #2 dots wide, descender #3  
device\_type devt str dv - - - - - Indicate language/codeset support  
dial\_phone dial str DI - - - - - dial number #1  
display\_clock dclk str DK - - - - - display clock  
display\_pc\_char dispc str S1 - - - - - Display PC character #1  
ena\_acs enacs str eA - - - - - enable alternate char set  
end\_bit\_image\_region endbi str Yy - - - - - End  
a bit-image region  
enter\_am\_mode smam str SA - - - - - turn on automatic margins  
enter\_doublewide\_mode swidm str ZF - - - - - Enter double-wide mode  
enter\_draft\_quality sdrfq str ZG - - - - - Enter draft-quality mode  
enter\_italics\_mode sitm str ZH - - - - - Enter italic mode  
enter\_leftward\_mode slm str ZI - - - - - Start leftward carriage motion  
enter\_micro\_mode smicm str ZJ - - - - - Start micro-motion mode  
enter\_near\_letter\_quality snlq str ZK - - - - - Enter NLQ mode  
enter\_normal\_quality snrmq str ZL - - - - - Enter normal-quality mode  
enter\_pc\_charset\_mode smpch str S2 - - - - - Enter PC character display mode  
enter\_scancode\_mode smsc str S4 - - - - - Enter PC scancode mode  
enter\_shadow\_mode sshm str ZM - - - - - Enter shadow-print mode  
enter\_subscript\_mode ssubm str ZN - - - - - Enter subscript mode  
enter\_superscript\_mode ssupm str ZO - - - - - Enter superscript mode  
enter\_upward\_mode sum str ZP - - - - - Start  
upward carriage motion  
enter\_xon\_mode smxon str SX - - - - - turn on xon/xoff handshaking  
exit\_am\_mode rmam str RA - - - - - turn off automatic margins  
exit\_doublewide\_mode rwidm str ZQ - - - - - End double-wide mode  
exit\_italics\_mode ritm str ZR - - - - - End italic mode  
exit\_leftward\_mode rlm str ZS - - - - - End left-motion mode  
exit\_micro\_mode rmicm str ZT - - - - - End micro-motion mode  
exit\_pc\_charset\_mode rmpch str S3 - - - - - Exit PC character display mode  
exit\_scancode\_mode rmsc str S5 - - - - - Exit PC scancode mode  
exit\_shadow\_mode rshm str ZU - - - - - End shadow-print mode  
exit\_subscript\_mode rsubm str ZV - - - - - End subscript mode  
exit\_superscript\_mode rsupm str ZW - - - - - End superscript mode  
exit\_upward\_mode rum str ZX - - - - - End reverse character motion  
exit\_xon\_mode rmxon str RX - - - - - turn off xon/xoff handshaking  
fixed\_pause pause str PA - - - - - pause for 2-3 seconds  
flash\_hook hook str fh - - - - - flash switch  
hook  
get\_mouse getm str Gm - - - - - Curses should get button events, parameter #1 not documented.  
goto\_window wingo str WG - - - - - go to window #1

hangup hup str HU - - ----- hang-up phone  
 initialize\_color initc str Ic - - ----- initialize color #1 to (#2,#3,#4)  
 initialize\_pair initp str Ip - - ----- Initialize color pair #1 to fg=(#2,#3,#4), bg=(#5,#6,#7)  
 key\_beg kbeg str @1 KEY\_BEG 0542 ----- begin key  
 key\_btab kcbt str kB KEY\_BTAB 0632 ----- back-tab key  
 key\_cancel kcan str @2 KEY\_CANCEL 0543 ----- cancel key  
 key\_close kclo str @3 KEY\_CLOSE 0544 ----- close key  
 key\_copy kcpy str @5 KEY\_COPY 0546 ----- copy key  
 key\_create kcrtr str @6 KEY\_CREATE 0547 ----- create key  
 key\_enter kent str @8 KEY\_ENTER 0527 ----- enter/send key  
 key\_exit kext str @9 KEY\_EXIT 0551 ----- exit key  
 key\_f37 kf37 str FR KEY\_F(37) - ----E F37 function key  
 key\_f38 kf38 str FS KEY\_F(38) - ----E F38 function key  
 key\_f39 kf39 str FT KEY\_F(39) - ----E F39 function key  
 key\_f40 kf40 str FU KEY\_F(40) - ----E F40  
     function key  
 key\_f41 kf41 str FV KEY\_F(41) - ----E F41 function key  
 key\_f42 kf42 str FW KEY\_F(42) - ----E F42 function key  
 key\_f43 kf43 str FX KEY\_F(43) - ----E F43 function key  
 key\_f44 kf44 str FY KEY\_F(44) - ----E F44 function key  
 key\_f45 kf45 str FZ KEY\_F(45) - ----E F45 function key  
 key\_f46 kf46 str Fa KEY\_F(46) - ----E F46 function key  
 key\_f47 kf47 str Fb KEY\_F(47) - ----E F47 function key  
 key\_f48 kf48 str Fc KEY\_F(48) - ----E F48 function key  
 key\_f49 kf49 str Fd KEY\_F(49) - ----E F49 function key  
 key\_f50 kf50 str Fe KEY\_F(50) - ----E F50 function key  
 key\_f51 kf51 str Ff KEY\_F(51) - ----E F51 function key  
 key\_f52 kf52 str Fg KEY\_F(52) - ----E F52 function key  
 key\_f53 kf53 str Fh KEY\_F(53) - ----E F53 function key  
 key\_f54 kf54 str Fi KEY\_F(54) - ----E F54 function key  
 key\_f55 kf55 str Fj KEY\_F(55) - ----E F55 function key  
 key\_f56 kf56 str Fk KEY\_F(56) - ----E F56 function key  
 key\_f57 kf57 str Fl KEY\_F(57) - ----E F57  
     function key  
 key\_f58 kf58 str Fm KEY\_F(58) - ----E F58 function key  
 key\_f59 kf59 str Fn KEY\_F(59) - ----E F59 function key  
 key\_f60 kf60 str Fo KEY\_F(60) - ----E F60 function key  
 key\_f61 kf61 str Fp KEY\_F(61) - ----E F61 function key  
 key\_f62 kf62 str Fq KEY\_F(62) - ----E F62 function key  
 key\_f63 kf63 str Fr KEY\_F(63) - ----E F63 function key  
 key\_find kfnd str @0 KEY\_FIND 0552 ----- find key  
 key\_mark kmrk str %2 KEY\_MARK 0554 ----- mark key  
 key\_message kmsg str %3 KEY\_MESSAGE 0555 ----- message key  
 key\_mouse kmous str Km KEY\_MOUSE 0631 ----- Mouse event has occurred  
 key\_move kmov str %4 KEY\_MOVE 0556 ----- move key  
 key\_next knxt str %5 KEY\_NEXT 0557 ----- next key  
 key\_open kopn str %6 KEY\_OPEN 0560 ----- open key  
 key\_options kopty str %7 KEY\_OPTIONS 0561 ----- options key

key\_previous kprv str %8 KEY\_PREVIOUS 0562 ----- previous key  
key\_print kprr str %9 KEY\_PRINT 0532 ----- print key  
key\_redo krdo str %0 KEY\_REDO 0563 ----- redo  
key  
key\_reference kref str &1 KEY\_REFERENCE 0564 ----- reference key  
key\_refresh krfr str &2 KEY\_REFRESH 0565 ----- refresh key  
key\_replace krpl str &3 KEY\_REPLACE 0566 ----- replace key  
key\_restart krst str &4 KEY\_RESTART 0567 ----- restart key  
key\_resume kres str &5 KEY\_RESUME 0570 ----- resume key  
key\_save ksav str &6 KEY\_SAVE 0571 ----- save key  
key\_sbeg kBEG str &9 KEY\_SBEG 0572 ----- shifted begin key  
key\_scancel kCAN str &0 KEY\_SCANCEL 0573 ----- shifted cancel key  
key\_scommand kCMD str \*1 KEY\_SCOMMAND 0574 ----- shifted command key  
key\_scopy kCPY str \*2 KEY\_SCOPY 0575 ----- shifted copy key  
key\_screate kCRT str \*3 KEY\_SCREATE 0576 ----- shifted create key  
key\_sdc kDC str \*4 KEY\_SDC 0577 ----- shifted delete-character key  
key\_sdl kDL str \*5 KEY\_SDL 0600 ----- shifted delete-line key  
key\_send kEND str \*7 KEY\_SEND 0602 ----- shifted end key  
key\_seol kEOL str \*8 KEY\_SEOL 0603 ----- shifted clear-to-end-of-line key  
key\_sexit kEXT str \*9 KEY\_SEXIT 0604 ----- shifted  
exit key  
key\_sfnd kFND str \*0 KEY\_SFIND 0605 ----- shifted find key  
key\_shelp kHLP str #1 KEY\_SHELP 0606 ----- shifted help key  
key\_shome kHOM str #2 KEY\_SHOME 0607 ----- shifted home key  
key\_sic kIC str #3 KEY\_SIC 0610 ----- shifted insert-character key  
key\_sleft kLFT str #4 KEY\_SLEFT 0611 ----- shifted left-arrow key  
key\_smessage kMSG str %a KEY\_SMESSAGE 0612 ----- shifted message key  
key\_smove kMOV str %b KEY\_SMOVE 0613 ----- shifted move key  
key\_snext kNXT str %c KEY\_SNEXT 0614 ----- shifted next key  
key\_soptions kOPT str %d KEY\_SOPTIONS 0615 ----- shifted options key  
key\_sprevious kPRV str %e KEY\_SPREVIOUS 0616 ----- shifted previous key  
key\_sprint kPRT str %f KEY\_SPRINT 0617 ----- shifted print key  
key\_sredo kRDO str %g KEY\_SREDO 0620 ----- shifted redo key  
key\_sreplace kRPL str %h KEY\_SREPLACE 0621 ----- shifted replace key  
key\_sright kRIT str %i KEY\_SRIGHT 0622 ----- shifted right-arrow key  
key\_sresume kRES str %j KEY\_SRSUME 0623 ----- shifted  
resume key  
key\_ssav kSAV str !1 KEY\_SSAVE 0624 ----- shifted save key  
key\_ssuspend kSPD str !2 KEY\_SSUSPEND 0625 ----- shifted suspend key  
key\_sundo kUND str !3 KEY\_SUNDO 0626 ----- shifted undo key  
key\_suspend kspd str &7 KEY\_SUSPEND 0627 ----- suspend key  
key\_undo kund str &8 KEY\_UNDO 0630 ----- undo key  
label\_format fln str Lf - - ----- label format  
label\_off rmln str LF - - ----- turn off soft labels  
label\_on smln str LO - - ----- turn on soft labels  
micro\_column\_address mhpa str ZY - - ----- Like column\_address in micro mode  
micro\_down mcud1 str ZZ - - ----- Like cursor\_down in micro mode  
micro\_left mcub1 str Za - - ----- Like cursor\_left in micro mode

micro\_right mcuf1 str Zb - - - - - Like cursor\_right in micro mode  
 micro\_row\_address mvpa str Zc - - - - - Like row\_address #1 in micro mode  
 micro\_up mcuu1 str Zd - - - - - Like cursor\_up in micro mode  
 mouse\_info minfo str Mi - - - - - Mouse status information  
 order\_of\_pins porder str Ze - - - - - Match  
 software bits to print-head pins  
 orig\_colors oc str oc - - - - - Set all color pairs to the original ones  
 orig\_pair op str op - - - - - Set default pair to its original value  
 parm\_down\_micro mcud str Zf - - - - - Like parm\_down\_cursor in micro mode  
 parm\_left\_micro mcub str Zg - - - - - Like parm\_left\_cursor in micro mode  
 parm\_right\_micro mcuf str Zh - - - - - Like parm\_right\_cursor in micro mode  
 parm\_up\_micro mcuu str Zi - - - - - Like parm\_up\_cursor in micro mode  
 pc\_term\_options pctrm str S6 - - - - - PC terminal options  
 pkey\_plab pfxl str xl - - - - - Program function key #1 to type string #2 and show string #3  
 plab\_norm pln str pn - - - - - program label #1 to show string #2  
 pulse pulse str PU - - - - - select pulse dialing  
 quick\_dial qdial str QD - - - - - dial number #1 without checking  
 req\_for\_input rfi str RF - - - - - send next input char (for ptys)  
 req\_mouse\_pos reqmp str RQ - - - - - Request mouse  
 position  
 remove\_clock rmclk str RC - - - - - remove clock  
 scancode\_escape scesc str S7 - - - - - Escape for scancode emulation  
 select\_char\_set scs str Zj - - - - - Select character set, #1  
 set0\_des\_seq s0ds str s0 - - - - - Shift to codeset 0 (EUC set 0, ASCII)  
 set1\_des\_seq s1ds str s1 - - - - - Shift to codeset 1  
 set2\_des\_seq s2ds str s2 - - - - - Shift to codeset 2  
 set3\_des\_seq s3ds str s3 - - - - - Shift to codeset 3  
 set\_a\_background setab str AB - - - - - Set background color to #1, using ANSI escape  
 set\_a\_foreground setaf str AF - - - - - Set foreground color to #1, using ANSI escape  
 set\_background setb str Sb - - - - - Set background color #1  
 set\_bottom\_margin smgb str Zk - - - - - Set bottom margin at current line  
 set\_bottom\_margin\_parm smgpb str Zl - - - - - Set bottom margin at line #1 or (if smgtp is not given) #2 lines from  
 bottom  
 set\_clock selk str SC - - - - - set clock, #1 hrs #2 mins #3 secs  
 set\_color\_band setcolor str Yz - - - - - Change  
 to ribbon color #1  
 set\_color\_pair scp str sp - - - - - Set current color pair to #1  
 set\_foreground setf str Sf - - - - - Set foreground color #1  
 set\_left\_margin smgl str ML - - - - - set left soft margin at current column. See smgl. (ML is not in BSD termcap).  
 set\_left\_margin\_parm smglp str Zm - - - - - Set left (right) margin at column #1  
 set\_lr\_margin smglr str ML - - - - - Set both left and right margins to #1, #2. (ML is not in BSD termcap).  
 set\_page\_length slines str YZ - - - - - Set page length to #1 lines  
 set\_right\_margin smgr str MR - - - - - set right soft margin at current column  
 set\_right\_margin\_parm smgrp str Zn - - - - - Set right margin at column #1  
 set\_tb\_margin smgtb str MT - - - - - Sets both top and bottom margins to #1, #2  
 set\_top\_margin smgt str Zo - - - - - Set top margin at current line  
 set\_top\_margin\_parm smgtp str Zp - - - - - Set top (bottom) margin at row #1  
 start\_bit\_image sbim str Zq - - - - - Start printing bit image

```

graphics
start_char_set_def scsd str Zr - - - - - Start character set definition #1, with #2 characters in the set
stop_bit_image rbim str Zs - - - - - Stop printing bit image graphics
stop_char_set_def rcsd str Zt - - - - - End definition of character set #1
subscript_characters subcs str Zu - - - - - List of subscriptable characters
superscript_characters supcs str Zv - - - - - List of superscriptable characters
these_cause_cr docr str Zw - - - - - Printing any of these characters causes CR
tone tone str TO - - - - - select touch tone dialing
user0 u0 str u0 - - - - - User string #0
user1 u1 str u1 - - - - - User string #1
user2 u2 str u2 - - - - - User string #2
user3 u3 str u3 - - - - - User string #3
user4 u4 str u4 - - - - - User string #4
user5 u5 str u5 - - - - - User string #5
user6 u6 str u6 - - - - - User string #6
user7 u7 str u7 - - - - - User string #7
user8 u8 str u8 - - - - - User string #8
user9 u9 str u9 - - - - - User
string #9
wait_tone wait str WA - - - - - wait for dial-tone
xoff_character xoffc str XF - - - - - XOFF character
xon_character xonc str XN - - - - - XON character
zero_motion zerom str Zx - - - - - No motion for subsequent character
set_pglen_inch slength str sL - - - - - YI Set page length to #1 hundredth of an inch
enter_horizontal_hl_mode ehlm str Xh - - - - - Enter horizontal highlight mode
enter_left_hl_mode elhlm str Xl - - - - - Enter left highlight mode
enter_low_hl_mode elohlm str Xo - - - - - Enter low highlight mode
enter_right_hl_mode erhlm str Xr - - - - - Enter right highlight mode
enter_top_hl_mode ethlm str Xt - - - - - Enter top highlight mode
enter_vertical_hl_mode evhlm str Xv - - - - - Enter vertical highlight mode
set_a_attributes sgr1 str sA - - - - - Define second set of video attributes #1-#6
#
#
#
# %%-STOP-HERE-%%
#
# Don't move this casually! In fact, don't move it at all unless you're
# either doing it to add System V
# or XPG4 extensions, or have decided you
# don't care about SVr4 binary compatibility.
#
#####
#
# TERMCAP EXTENSION CAPABILITIES
#
# The capabilities below are either obsolete or extensions on certain systems.
# They are not used by SVR4 terminfo. Some are used by captinfo to translate
# termcap sources; the rest are listed for completeness, and in case somebody

```

```

# cares about them enough to hack in code that will translate them into
# terminfo capabilities.
#
# The first part of the list is from Ross Ridge's `mytinfo' package
# (comp.sources.unix, volume 26); the variable names and terminfo names (as
# well as the termcap codes) match his list.
#
# This group of codes is not marked obsolete in 4.4BSD, but have no direct
# terminfo equivalents. The rs capability is specially translated to terminfo
# r2, and vice versa, if an entry does not already have an r2. Similarly,
# i2 is translated to r3 if there is no r3
# (because SV terminfo maps is to i2).
# The ug capability is thrown away, but assumed to be whatever sg is if the
# latter is nonzero and we're dumping in termcap format.
#
termcap_init2 OTi2 str i2 - - YB--- secondary initialization string
termcap_reset OTrs str rs - - YB-G- terminal reset string
magic_cookie_glitch_ul OTug num ug - - YBCGE number of blanks left by ul
#
# Obsolete termcap capabilities. Some are used for termcap translation. The
# code uses the 'OT' prefix we put on obsolete capabilities to suppress
# printing them in terminfo source dumps of compiled entries.
#
backspaces_with_bs OTbs bool bs - - YBCGE uses ^H to move left
crt_no_scrolling OTns bool ns - - YBCG- crt cannot scroll
no_correctly_working_cr OTnc bool nc - - YBCG- no way to go to start of line
carriage_return_delay OTdC num dC - - YB-G- pad needed for CR
new_line_delay OTdN num dN - - YB-G- pad needed for LF
linefeed_if_not_lf OTnl str nl - - YBCGE use to move down
backspace_if_not_bs OTbc str bc - - YBCGE move
left, if not ^H
#
# GNU termcap library extensions. The GNU termcap file distributed with
# Emacs no longer uses these, but MT showed up in pre-9.0 versions of the
# BSD termcap file. The name clash with terminfo MT is resolved by type
# info; MT is converted to km.
#
gnu_has_meta_key OTMT bool MT - - ---E has meta key
# gnu_tab_width OTtw num tw - - ---E tab width in spaces
#
# GNU termcap *does* include the following extended capability, Only the
# now-obsolete Ann Arbor terminals used it.
#
# gnu_change_scroll_region OTcS str cS - - ---GE alternate set scrolling region
#
# The following comments describe capnames so ancient that I believe no
# software uses them any longer. Some of these have to go because they
# clash with terminfo names in ways that cannot be resolved by type

```

```

# information.
#
# These mytinfo codes are not used in the 4.4BSD curses code. They are
# marked obsolete in the 4.4BSD manual pages.
#
# There is one conflict with
# terminfo; ma is in both. This conflict is
# resolved by type information.
#
# The `ko' capability is translated by special code. It should contain a
# comma-separated list of capabilities for which there are corresponding keys.
# The `kn' code is accepted but ignored.
#
# The `ma' capability seems to have been designed to map between the rogue(2)
# motion keys (including jkhl) and characters emitted by arrow keys on some
# primitive pre-ANSI terminals. It's so obsolete it's fossilized...
#
# Here is a description of memory_lock_above and memory_unlock:
# "You can 'freeze' data on the screen by turning on Memory Lock in a line of
# text. All lines above the cursor's current line become locked in place on
# the screen. Then enter data normally. When the screen fills up, any
# further data entered forces the first line of unfrozen line text to scroll
# under the frozen data. Lines scrolled off the screen are inserted into
# memory immediately preceding the first frozen line." (from
# the HP 700/96
# User's manual). VT100/ANSI memory lock set is \E[>2h, reset is \E[>2l.
#
# Applications that use terminfo are supposed to behave as though xr is
# always true.
#
linefeed_is_newline OTNL bool NL - - YB--- move down with \n
# even_parity OTEP bool EP - - -B--- terminal requires even parity
# odd_parity OTOP bool OP - - -B--- terminal requires odd parity
# half_duplex OTHD bool HD - - -B--- terminal is half-duplex
# lower_case_only OTLC bool LC - - -B--- terminal has only lower case
# upper_case_only OTUC bool UC - - -B--- terminal has only upper case
backspace_delay OTdB num dB - - YB-G- padding required for ^H
# form_feed_delay OTdF num dF - - -B-G- padding required for ^L
horizontal_tab_delay OTdT num dT - - YB-G- padding required for ^I
# vertical_tab_delay OTdV num dV - - -B--- padding required for ^V
number_of_function_keys OTkn num kn - - -B-G- count of function keys
other_non_function_keys OTko str ko - - -B-G- list of self-mapped keycaps
arrow_key_map OTma str ma - - YBC-- map
# arrow keys rogue(1) motion keys
# memory_lock_above OTml str ml - - -B--- lock visible screen memory above the current line
# memory_unlock OTmu str mu - - -B--- unlock visible screen memory above the current line
has_hardware_tabs OTpt bool pt - - YB--- has 8-char tabs invoked with ^I
return_does_clr_eol OTxr bool xr - - YB--- return clears the line

```



```

# tek_4025_insert_line OTxx bool xx - - -BC-- Tektronix 4025 insert-line glitch
#
# mytinfo described this as a termcap capability, but it's not listed in the
# 4.4BSD man pages, and not found in the 4.4BSD termcap file. The ncurses
# package, like System V, behaves as though it is always true.
#
# rind_only_at_top OTxq bool xq - - ---- reverse index only works from top line
#
# University of Waterloo termcap extensions (as described in mytinfo).
# The `xl' termcap file clashes with a terminfo name; this ambiguity cannot
# be resolved by a type check. The descriptions are guesses
# from what was
# in the mytinfo tables.
#
# key_interrupt_char OTki str ki - - ---- string set by interrupt key (?)
# key_kill_char OTkk str kk - - ---- string set by kill key (?)
# key_suspend_char OTkz str kz - - ---- string set by suspend key (?)
# initialization_messy OTxc bool xc - - ---- initialization leaves garbage on the screen (?)
# ind_at_bottom_does_cr OTxl bool xl - - ---- index does a carriage return
#
# Nonstandard capabilities unique to Ross Ridge's `mytinfo' package.
# SR clashes with a terminfo name; this ambiguity cannot be resolved by a type
# check.
#
# scroll_left OTsl1 str Sl - - ---- scroll screen leftward
# scroll_right OTsr1 str Sr - - ---- scroll screen rightward
# parm_scroll_left OTsl str SL - - ---- scroll screen leftward #1 characters
# parm_scroll_right OTsr str SR - - ---- scroll screen rightward #1 characters
#
# The mytinfo capabilities end here.
#
# XENIX extensions:
#
# Xenix defined its own set of forms-drawing capabilities:
#
#
# cap IBM ASCII description      ACS      ASCII
# --- -----
# G1 191 \277 M-? single upper right ACS_URCORNER
# G2 218 \332 M-Z single upper left ACS_ULCORNER
# G3 192 \300 M-@ single lower left ACS_LLCORNER
# G4 217 \331 M-Y single lower right ACS_LRCORNER
# G5 187 \273 M-; double upper right
# G6 201 \311 M-I double upper left
# G7 200 \310 M-H double lower left
# G8 188 \274 M-< double lower right
# GC 197 \305 M-E single intersection ACS_PLUS _ _
# GD 194 \302 M-B single down-tick ACS_TTEE |

```

```

# GH 196 \304 M-D single horizontal line ACS_HLINE
# GL 180 \264 M-4 single left tick ACS_RTEE -|
# GR 195 \303 M-C single right tick ACS_LTEE |-
# GU 193 \301 M-A single up tick ACS_BTEE _|_
# GV 179 \263 M-3 single vertical line ACS_VLINE
# Gc 206 \316 M-N double intersection
# Gd 203 \313 M-K double down tick
# Gh 205 \315 M-M double horizontal line
# G1 204 \204 M-L double left tick
# Gr 185 \271 M-9 double right
tick
# Gu 202 \312 M-J double up tick
# Gv 186 \272 M-: double vertical line
#
# The compiler will translate the single-line caps and discard the others
# (via IGNORE aliases further down). We don't want to do normal pad
# translation on these, they're often single-character printable ASCII
# strings that happen to be numerics. There's awk code in parametrized.sh
# that detects the acs_ prefix and uses it to suppress pad translation.
# These terminfo names are invented.
#
acs_ulcorner OTG2 str G2 - - - - - single upper left
acs_llcorner OTG3 str G3 - - - - - single lower left
acs_urcorner OTG1 str G1 - - - - - single upper right
acs_lrcorner OTG4 str G4 - - - - - single lower right
acs_ltee OTGR str GR - - - - - tee pointing right
acs_rtee OTGL str GL - - - - - tee pointing left
acs_btee OTGU str GU - - - - - tee pointing up
acs_ttee OTGD str GD - - - - - tee pointing down
acs_hline OTGH str GH - - - - - single horizontal line
acs_vline OTGV str GV - - - - - single
vertical line
acs_plus OTGC str GC - - - - - single intersection
#
#####
#
# TERMINFO EXTENSION CAPABILITIES
#
# This section is almost all comments. What it's mainly for is to describe
# what capabilities need to be squeezed out to get down to the XSI Curses
# standard set. They are flagged with K.
#
# HP extensions
#
# These extensions follow ptr_non (replacing everything after it) in HP
# terminfo files. Except for memory_lock and memory_unlock, they are
# functionally identical to SVr4 extensions, but they make the binary format
# different. Grrr...

```

```
#
memory_lock  meml str ml - - ----K lock memory above cursor
memory_unlock memu str mu - - ----K unlock memory
#plab_norm  pln str pn - - ----- program label #1 to show string #2
#label_on   smln str LO - - ----- turn on soft labels
#label_off  rmln str LF - - ----- turn off soft labels
#key_f11   kf11 str F1 - - ----- F11 function
key
#key_f12   kf12 str F2 - - ----- F12 function key
#key_f13   kf13 str F3 - - ----- F13 function key
#key_f14   kf14 str F4 - - ----- F14 function key
#key_f15   kf15 str F5 - - ----- F15 function key
#key_f16   kf16 str F6 - - ----- F16 function key
#key_f17   kf17 str F7 - - ----- F17 function key
#key_f18   kf18 str F8 - - ----- F18 function key
#key_f19   kf19 str F9 - - ----- F19 function key
#key_f20   kf20 str FA - - ----- F20 function key
#key_f21   kf21 str FB - - ----- F21 function key
#key_f22   kf22 str FC - - ----- F22 function key
#key_f23   kf23 str FD - - ----- F23 function key
#key_f24   kf24 str FE - - ----- F24 function key
#key_f25   kf25 str FF - - ----- F25 function key
#key_f26   kf26 str FG - - ----- F26 function key
#key_f27   kf27 str FH - - ----- F27 function key
#key_f28   kf28 str FI - - ----- F28 function key
#key_f29   kf29 str FJ - - ----- F29 function key
#key_f30   kf30 str FK - - ----- F30 function key
#key_f31   kf31 str FL - - ----- F31
function key
#key_f32   kf32 str FM - - ----- F32 function key
#key_f33   kf33 str FN - - ----- F33 function key
#key_f34   kf34 str FO - - ----- F34 function key
#key_f35   kf35 str FP - - ----- F35 function key
#key_f36   kf36 str FQ - - ----- F36 function key
#key_f37   kf37 str FR - - ----- F37 function key
#key_f38   kf38 str FS - - ----- F38 function key
#key_f39   kf39 str FT - - ----- F39 function key
#key_f40   kf40 str FU - - ----- F40 function key
#key_f41   kf41 str FV - - ----- F41 function key
#key_f42   kf42 str FW - - ----- F42 function key
#key_f43   kf43 str FX - - ----- F43 function key
#key_f44   kf44 str FY - - ----- F44 function key
#key_f45   kf45 str FZ - - ----- F45 function key
#key_f46   kf46 str Fa - - ----- F46 function key
#key_f47   kf47 str Fb - - ----- F47 function key
#key_f48   kf48 str Fc - - ----- F48 function key
#key_f49   kf49 str Fd - - ----- F49 function key
#key_f50   kf50 str Fe - - ----- F50 function key
```

```

#key_f51 kf51 str Ff - - ----- F51
function key
#key_f52 kf52 str Fg - - ----- F52 function key
#key_f53 kf53 str Fh - - ----- F53 function key
#key_f54 kf54 str Fi - - ----- F54 function key
#key_f55 kf55 str Fj - - ----- F55 function key
#key_f56 kf56 str Fk - - ----- F56 function key
#key_f57 kf57 str Fl - - ----- F57 function key
#key_f58 kf58 str Fm - - ----- F58 function key
#key_f59 kf59 str Fn - - ----- F59 function key
#key_f60 kf60 str Fo - - ----- F60 function key
#key_f61 kf61 str Fp - - ----- F61 function key
#key_f62 kf62 str Fq - - ----- F62 function key
#key_f63 kf63 str Fr - - ----- F63 function key
#
# IBM extensions
#
# These extensions follow ptr_non (replacing everything after it) in IBM
# terminfo files.
#
# The places in the box[12] capabilities correspond to acsc characters, here is
# the mapping:
#
# box1[0] = ACS_ULCORNER
# box1[1] = ACS_HLINE
# box1[2] = ACS_URCORNER
# box1[3] = ACS_VLINE
# box1[4] = ACS_LRCORNER
# box1[5]
= ACS_LLCORNER
# box1[6] = ACS_TTEE
# box1[7] = ACS_RTEE
# box1[8] = ACS_BTEE
# box1[9] = ACS_LTEE
# box1[10] = ACS_PLUS
#
# The box2 characters are the double-line versions of these forms graphics.
#
#box_chars_1 box1 str bx - - ----K box characters primary set
#box_chars_2 box2 str by - - ----K box characters secondary set
#box_attr_1 batt1 str Bx - - ----K attributes for box1
#box_attr_2 batt2 str By - - ----K attributes for box2
#color_bg_0 colb0 str d0 - - ----K background color 0
#color_bg_1 colb1 str d1 - - ----K background color 1
#color_bg_2 colb2 str d2 - - ----K background color 2
#color_bg_3 colb3 str d3 - - ----K background color 3
#color_bg_4 colb4 str d4 - - ----K background color 4
#color_bg_5 colb5 str d5 - - ----K background color 5

```

```

#color_bg_6 colb6 str d6 - - ----K background color 6
#color_bg_7 colb7 str d7 - - ----K background color 7
#color_fg_0 colf0 str c0 - - ----K foreground color 0
#color_fg_1 colf1 str c1 - - ----K foreground
color 1
#color_fg_2 colf2 str c2 - - ----K foreground color 2
#color_fg_3 colf3 str c3 - - ----K foreground color 3
#color_fg_4 colf4 str c4 - - ----K foreground color 4
#color_fg_5 colf5 str c5 - - ----K foreground color 5
#color_fg_6 colf6 str c6 - - ----K foreground color 6
#color_fg_7 colf7 str c7 - - ----K foreground color 7
#font_0 font0 str f0 - - ----- select font 0
#font_1 font1 str f1 - - ----- select font 1
#font_2 font2 str f2 - - ----- select font 2
#font_3 font3 str f3 - - ----- select font 3
#font_4 font4 str f4 - - ----K select font 4
#font_5 font5 str f5 - - ----K select font 5
#font_6 font6 str f6 - - ----K select font 6
#font_7 font7 str f7 - - ----K select font 7
#key_back_tab kbtap str k0 - - ----- backtab key
#key_do kdo str ki - - ----K do request key
#key_command kcmd str kd - - ----K command-request key
#key_command_pane kcpn str kW - - ----K command-pane key
#key_end kend str kw - - ----- end
key
#key_help khlp str kq - - ----- help key
#key_newline knl str nl - - ----K newline key
#key_next_pane knpn str kv - - ----K next-pane key
#key_prev_cmd kppn str kp - - ----K previous-command key
#key_prev_pane kppn str kV - - ----K previous-pane key
#key_quit kquit str kQ - - ----K quit key
#key_select ksel str kU - - ----- select key
#key_scroll_left kscl str kz - - ----K scroll left
#key_scroll_right kscr str kZ - - ----K scroll right
#key_tab ktab str ko - - ----K tab key
#key_smap_in1 kmpf1 str Kv - - ----K special mapped key 1 input
#key_smap_out1 kmpt1 str KV - - ----K special mapped key 1 output
#key_smap_in2 kmpf2 str Kw - - ----K special mapped key 2 input
#key_smap_out2 kmpt2 str KW - - ----K special mapped key 2 output
#key_smap_in3 kmpf3 str Kx - - ----K special mapped key 3 input
#key_smap_out3 kmpt3 str KX - - ----K special mapped key 3 output
#key_smap_in4 kmpf4 str Ky - - ----K special mapped key 4 input
#key_smap_out4 kmpt4 str KY - - ----K special
mapped key 4 output
#key_smap_in5 kmpf5 str Kz - - ----K special mapped key 5 input
#key_smap_out5 kmpt5 str KZ - - ----K special mapped key 5 output
#appl_defined_str apstr str za - - ----K application-defined string
# The key_smap_in[6789] and key_smap_out[6789] capabilities aren't described in

```

```

# the IBM manual pages, so the cap name strings are guesses. The terminfo
# names are almost certainly right, the termcap ones almost certainly wrong.
#key_smap_in6 kmpf6 str k! - - ----K special mapped key 6 input
#key_smap_out6 kmpt6 str K@ - - ----K special mapped key 6 output
#key_smap_in7 kmpf7 str k# - - ----K special mapped key 7 input
#key_smap_out7 kmpt7 str K$ - - ----K special mapped key 7 output
#key_smap_in8 kmpf8 str k% - - ----K special mapped key 8 input
#key_smap_out8 kmpt8 str K^ - - ----K special mapped key 8 output
#key_smap_in9 kmpf9 str k& - - ----K special mapped key 9 input
#key_smap_out9 kmpt9 str K* - - ----K special
mapped key 9 output
# Undocumented capabilities end here
#key_sf1 ksf1 str S1 - - ----K special function key 1
#key_sf2 ksf2 str S2 - - ----K special function key 2
#key_sf3 ksf3 str S3 - - ----K special function key 3
#key_sf4 ksf4 str S4 - - ----K special function key 4
#key_sf5 ksf5 str S5 - - ----K special function key 5
#key_sf6 ksf6 str S6 - - ----K special function key 6
#key_sf7 ksf7 str S7 - - ----K special function key 7
#key_sf8 ksf8 str S8 - - ----K special function key 8
#key_sf9 ksf9 str S9 - - ----K special function key 9
#key_sf10 ksf10 str SA - - ----K special function key 10
# AIX version 3 documents different codes for F11, F12 and does not mention
# F13-F64. AIX version 4 uses the same naming for F0-F63 as above.
#key_f11 kf11 str k< - - ----- function key 11
#key_f12 kf12 str k> - - ----- function key 12
# Undocumented capabilities end here.
#key_action kact str kJ - - ----K sent by action
key
# The IBM docs say these capabilities are for table-drawing, and are
# valid only for aixterm descriptions.
#enter_topline_mode topl str tp - - ----K start top-line mode
#enter_bottom_mode btml str bm - - ----K start bottom-line mode
#enter_rvert_mode rvert str rv - - ----K start right-vertical mode
#enter_lvert_mode lvert str lv - - ----K start left-vertical mode
#
#####
#
# ALIAS DECLARATIONS
#
# Here we set up aliases for translating extensions into standard terminfo.
#
#----- Termcap aliases -----
#
# BSD aliases:
#
# This is a common error in many termcap files. We'll get notified during
# translation when this (or any other alias) fires.

```

```

#
capalias sb sr BSD scroll text down
#
# AT&T extensions:
#
# The old AT&T 5410, 5420, 5425, pc6300plus, 610, and s4 entries used a set of
# nonstandard capabilities. Its signature is the KM capability, used to name
#
# some sort of keymap file. EE, BO, CI, CV, XS, DS, FL and FE are in this
# set. Comments in the original, and a little cross-checking with other AT&T
# documentation, seem to establish the following mappings:
#
capalias BO mr AT&T enter_reverse_mode
capalias CI vi AT&T cursor_invisible
capalias CV ve AT&T cursor_normal
capalias DS mh AT&T enter_dim_mode
#capalias EE me AT&T exit_attribute_mode
capalias FE LF AT&T label_on
capalias FL LO AT&T label_off
capalias XS mk AT&T enter_secure_mode
#
# We comment out EE because the conflicting XENIX EE is more common in
# old entries.
#
# XENIX extensions:
#
# These are the ones we know how to translate directly:
#
capalias EE mh XENIX exit_attribute_mode
capalias GE ae XENIX exit_alt_charset_mode
capalias GS as XENIX enter_alt_charset_mode
capalias CF vi XENIX cursor_invis
capalias CO ve XENIX cursor_normal
capalias EN @7 XENIX key_end
capalias HM kh XENIX key_home
capalias LD kL XENIX key_dl
capalias PD kN XENIX key_npage
capalias PN po XENIX prtr_off
capalias PS pf XENIX prtr_on
capalias PU kP XENIX key_ppage
capalias RT @8 XENIX kent
capalias UP ku XENIX kcuu1
capalias G6 IGNORE XENIX double-ACS_ULCORNER
capalias G7 IGNORE XENIX double-ACS_LLCORNER
capalias G5 IGNORE XENIX double-ACS_URCORNER
capalias G8 IGNORE XENIX double-ACS_LRCORNER
capalias Gr IGNORE XENIX double-ACS_LTEE
capalias Gr IGNORE XENIX double-ACS_RTEE

```

```

capalias Gu IGNORE XENIX double-ACS_BTEE
capalias Gd IGNORE XENIX double
  ACS_TTEE
capalias Gh IGNORE XENIX double-ACS_HLINE
capalias Gv IGNORE XENIX double-ACS_VLINE
capalias Gc IGNORE XENIX double-ACS_PLUS
capalias GG IGNORE XENIX acs-glitch
#
# IBM extensions:
#
capalias kq %1 IBM key_help
#
# Iris extensions:
#
capalias HS mh IRIS enter_dim_mode
#
# Tektronix extensions:
#
capalias KA k; Tek key_f10
capalias KB F1 Tek key_f11
capalias KC F2 Tek key_f12
capalias KD F3 Tek key_f13
capalias KE F4 Tek key_f14
capalias KF F5 Tek key_f15
capalias BC Sb Tek set_background
capalias FC Sf Tek set_foreground
#
#
  There are also the following:
#
# XENIX XENIX variable name name clash with terminfo?
# -----
# CL key_char_left
# CR key_char_right
# CW key_change_window
# HP ??
# LF key_linefeed label_off
# NU key_next_unlocked_cell
# PL ??
# PR ??
# RC key_recalc remove_clock
# RF key_toggle_ref req_for_input
# WL key_word_left
# WR key_word_right
#
# If you know what any of the question-marked ones mean, please tell us.
#
#----- Terminfo aliases -----

```



```

#
# IBM extensions:
#
infoalias font0 s0ds IBM set0_des_seq
infoalias font1 s1ds IBM set1_des_seq
infoalias font2 s2ds IBM set2_des_seq
infoalias font3 s3ds IBM set3_des_seq
infoalias kbtabs kcbt IBM key_backtab
infoalias ksel kslt IBM key_select
#
# Some others are identical to SVr4/XPG4 capabilities, in particular:
# kcmd, kend, khlp, and kf11...kf63.
#
#####
#
# The following
# sets edit modes for GNU EMACS
# Local Variables:
# case-fold-search:nil
# truncate-lines:t
# End:

Found in path(s):
* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/include/Caps.osf1r5
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\* @Id: menu\_spacing.3x,v 1.8 2004/12/11 23:39:07 tom Exp @  
-->

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\* /opt/cola/permits/1600019816\_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-  
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-  
5.7/doc/html/man/menu\_spacing.3x.html

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\* @Id: curs\_pad.3x,v 1.14 2005/05/15 16:18:43 tom Exp @

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#####

# \$Id: emx.src,v 1.9 2006/04/22 21:46:17 tom Exp \$

# This is a reformatted copy of the terminfo source for OS/2 EMX from

# Juan Jose Garcia Ripoll <worm@arrakis.es>.

# http://www.arrakis.es/~worm/

#-----

#

# This section describes terminal classes and maker brands that are still

# quite common.

#

```
#### Specials
#
# Special "terminals". These are used to label tty lines when you don't
# know what kind of terminal is on it. The characteristics of an unknown
# terminal are the lowest common denominator - they look about like a ti 700.
#

dumb|80-column dumb tty,
am,
cols#80,
bel=^G,
cr=^M,
cud1=^J,
ind=^J,
unknown|unknown terminal type,
gn,
use=dumb,
lpr|printer|line printer,
hc,
os,
cols#132,
lines#66,
bel=^G,
cr=^M,
cub1=^H,
cud1=^J,
ff=^L,
ind=^J,
glasstty|classic
glass tty interpreting ASCII control characters,
am,
cols#80,
bel=^G,
clear=^L,
cr=^M,
cub1=^H,
cud1=^J,
ht=^I,
kbs=^H,
kcub1=^H,
kcud1=^J,
nel=^M^J,

#### ANSI.SYS/ISO 6429/ECMA-48 Capabilities
#
# See the end-of-file comment for more on these.
#
```

```

# The IBM PC alternate character set. Plug this into any Intel console entry.
# We use \E[11m for rmacs rather than \E[12m so the <acsc> string can use the
# ROM graphics for control characters such as the diamond, up- and down-arrow.
# This works with the System V, Linux, and BSDI consoles. It's a safe bet this
# will work with any Intel console, they all seem to have inherited \E[11m
# from the ANSI.SYS de-facto standard.
klone+acs|alternate character set for ansi.sys displays,
acsc=+\020\,021-
\030.^Y0\333`004a\261f\370g\361h\260j\331k\277l\332m\300n\305o~p\304q\304r\304s_t\303u\264v\301w\302x\2
63y\363z\362{\343\330}\234~\376,
rmacs=\E[10m,
smacs=\E[11m,

```

```

#
Highlight controls corresponding to the ANSI.SYS standard. Most
# console drivers for Intel boxes obey these. Makes the same assumption
# about \E[11m as klone+acs. True ANSI/ECMA-48 would have <rmso=\E[27m>,
# <rmul=\E[24m>, but this isn't a documented feature of ANSI.SYS.

```

```

klone+sgr|attribute control for ansi.sys displays,
blink=\E[5m,
bold=\E[1m,
invis=\E[8m,
rev=\E[7m,
rmacs=\E[10m,
rmpch=\E[10m,
rmso=\E[m,
rmul=\E[m,
sgr=\E[0;10m??p1?t;7%;%??p2?t;4%;%??p3?t;7%;%??p4?t;5%;%??p6?t;1%;%??p7?t;8%;%??p9?t;1
1%;m,
sgr0=\E[0;10m,
smacs=\E[11m,
smpch=\E[11m,
smso=\E[7m,
smul=\E[4m,
use=klone+acs,

```

```

# Highlight controls corresponding to the ANSI.SYS standard. *All*
# console drivers for Intel boxes obey these. Does not assume \E[11m will
# work; uses \E[12m instead, which is pretty bulletproof but loses you the ACS
# diamond and arrow characters under curses.

```

```

klone+sgr-dumb|attribute control for ansi.sys displays (no ESC [ 11 m),
blink=\E[5m,
bold=\E[1m,
invis=\E[8m,
rev=\E[7m,
rmacs=\E[10m,
rmso=\E[m,
rmul=\E[m,

```

```

sgr=\E[0;10%p1;t;7%;%?%p2;t;4%;%?%p3;t;7%;%?%p4;t;5%;%?%p6;t;1%;%?%p7;t;8%;%?%p9;t;1
2%;m,
sgr0=\E[0;10m,
smacs=\E[12m,
smso=\E[7m,
smul=\E[4m,
use=klone+acs,

#
ANSI.SYS color control.
# The DOS 5 manual asserts that these sequences meet the ISO 6429 standard.
klone+color|color control for ansi.sys and ISO6429-compatible displays,
colors#8,
ncv#3,
pairs#64,
op=\E[37;40m,
setab=\E[4%p1%dm,
setaf=\E[3%p1%dm,

# This is better than klone+color, it doesn't assume white-on-black as the
# default color pair, but many `ANSI' terminals don't grok the <op> cap.
ecma+color|color control for ECMA-48-compatible terminals,
AX,
colors#8,
ncv#3,
pairs#64,
op=\E[39;49m,
setab=\E[4%p1%dm,
setaf=\E[3%p1%dm,

#### ANSI/ECMA-48 terminals and terminal emulators
#
# See near the end of this file for details on ANSI conformance.
# Don't mess with these entries! Lots of other entries depend on them!
#
# This section lists entries in
a least-capable to most-capable order.
# if you're in doubt about what `ANSI' matches yours, try them in that
# order and back off from the first that breaks.

ansi-mini|any ansi terminal with pessimistic assumptions,
am,
cols#80,
it#8,
lines#24,
clear=\E[H\E[2J$<50>,
cub1=\E[D,
cud1=\E[B,

```

```

cuf1=\E[C,
cup=\E[%i%p1%d;%p2%dH,
cuu1=\E[A,
el=\E[K,
home=\E[H,
ht=^I,

#
# ANSI.SYS entries
#
# This completely describes the sequences specified in the DOS 2.1 ANSI.SYS
# documentation (except for the keyboard key reassignment feature, which
# doesn't fit the <pfkey> model well). The kclone+acs sequences were valid
# though undocumented. The <pfkey> capability is untested but should work for
# keys F1-F10 (%p1 values outside this range will yield unpredictable results).
# From: Eric S. Raymond <esr@snark.thyrsus.com> Nov 7 1995
ansi.sys-old|ANSI.SYS under PC-DOS 2.1,
am,
mir,
msgr,
xon,
cols#80,
lines#25,
clear=\E[2J,
cub1=^H,
cud1=\E[B,
cuf1=\E[C,
cup=\E[%i%p1%d;%p2%dH,
cuu1=\E[A,
el=\E[k,
home=\E[H,
is2=\E[m\E[?7h,
kcub1=^H,
kcud1=^J,
kcuf1=^L,
kcuu1=^K,
khome=^^,
pfkey=\E[0;%p1%{58}%+%d;%p2"%s",
rc=\E[u,
rmam=\E[?7l,
sc=\E[s,
smam=\E[?7h,
u6=\E[%i%d;%dR,
u7=\E[6n,
use=kclone+color,
use=kclone+acs,
use=kclone+sgr,
ansi.sys|ANSI.SYS

```

3.1 and later versions,

el=\E[K,

use=ansi.sys-old,

### EMX termcap.dat compatibility modes

#

# Keypad: Home=\0G Up=\0H PrPag=\0I

# ka1,kh kcuu1 kpp,ka3

#

# Left=\0K 5=\0L Right=\0M

# kcub1 kb2 kcufl

#

# End=\0O Down=\0P NxPag=\0Q

# kc1,kend kcud1 kc3,knp

#

# Ins=\0R Del=\0S

# kich1 kdch1

#

# On keyboard with 12 function keys,

# shifted f-keys: F13-F24

# control f-keys: F25-F36

# alt f-keys: F37-F48

# The shift/control/alt keys do not modify each other, but alt overrides both,

# and control overrides shift.

#

# Also (possibly only EMX, so we don't put it in ansi.sys, etc): set the

# no\_color\_video to inform the application that standout(1), underline(2)

# reverse(4) and invisible(64) don't

work with color.

emx-base|DOS special keys,

bce,

bw,

it#8,

ncv#71,

bel=^G,

ka1=\0G,

ka3=\0I,

kb2=\0L,

kbs=^H,

kc1=\0O,

kc3=\0Q,

kcbt=0^O,

kcub1=\0K,

kcud1=\0P,

kcuf1=\0M,

kcuu1=\0H,

kdch1=\0S,

kend=\0O,



kf1=\0,  
kf10=\0D,  
kf11=\0\205,  
kf12=\0\206,  
kf13=\0T,  
kf14=\0U,  
kf15=\0V,  
kf16=\0W,  
kf17=\0X,  
kf18=\0Y,  
kf19=\0Z,  
kf2=\0<,  
kf20=\0[,  
kf21=\0\\,  
kf22=\0],  
kf23=\0\207,  
kf24=\0\210,  
kf25=\0\^,  
kf26=\0\_,  
kf27=\0` ,  
kf28=\0a,  
kf29=\0b,  
kf3=\0=,  
kf30=\0c,  
kf31=\0d,  
kf32=\0e,  
kf33=\0f,  
kf34=\0g,  
kf35=\0\211,  
kf36=\0\212,  
kf37=\0h,  
kf38=\0i,  
kf39=\0j,  
kf4=\0>,  
kf40=\0k,  
kf41=\0l,  
kf42=\0m,  
kf43=\0n,  
kf44=\0o,  
kf45=\0p,  
kf46=\0q,  
kf47=\0\213,  
kf48=\0\214,  
kf5=\0?,  
kf6=\0@,  
kf7=\0A,  
kf8=\0B,  
kf9=\0C,

```

khome=\OG,
kich1=\OR,
knp=\OQ,
kpp=\OI,
use=ansi.sys,
#
# To properly translate termcap.dat -> terminfo.src remember these
# equivalences:
# ti <-> smcup string to start programs using cup(termcap)
# te <-> rmcup string to end
# programs using cup
# so <-> smso begin standout mode
# se <-> rmso exit standout mode
# us <-> smul begin underline mode
# ue <-> rmul exit underline mode
# mb <-> blink turn on blinking
# md <-> bold turn on extra bright (bold) mode
# mr <-> rev turn on reverse video mode
# me <-> sgr0 turn off all attributes
#
# On my terminal, \E[4m looks dim.
ansi-emx|ANSI.SYS color,
blink=\E[5m,
bold=\E[1m,
kmous=\E[M,
rev=\E[7m,
rmcup=\E[0m,
rmso=\E[0m,
rmul@,
sgr0=\E[0m,
smcup=\E[0;37;40m,
smso=\E[7m,
smul@,
use=emx-base,
window|ANSI.SYS window,
blink=\E[5m,
bold=\E[1;37;47m,
rev=\E[1;37;47m,
rmcup=\E[0m,
rmso=\E[0;37;40m,
rmul=\E[0;37;40m,
sgr0=\E[0;37;40m,
smcup=\E[0;37;40m,
smso=\E[1;37;47m,
smul=\E[1;31;47m,
use=emx-base,
os2|OS/2-emx ANSI.SYS,
cub=\E[%p1%dD,

```

```

cub1=\E[D,
cud=\E[%p1%dB,
cud1=\E[B,
cuf=\E[%p1%dC,
cuf1=\E[C,
cuu=\E[%p1%dA,
cuu1=\E[A,
rc=\E[u,
sc=\E[s,
use=ansi-emx,
use=mono,
mono|ANSI.SYS mono,
blink=\E[5m,
bold=\E[1m,
rev=\E[7m,
rmcup=\E[0m,
rmso=\E[m,
rmul=\E[m,
sgr0=\E[m,
smcup=\E[0m,
smso=\E[1m,
smul=\E[4m,
use=emx-base,
#
# same as mono, but use reverse video for standout (nice for Emacs)
rmono|ANSI.SYS reverse mono,
rmso=\E[7m,
use=mono,
# same as mono, but use a readable color for underlining
mono2|ANSI.SYS mono2,
rmul=\E[0m,
smul=\E[1;31;40m,
use=mono,
# nice colors for Emacs (white on blue, mode line white on cyan)
ansi-color-2-emx|ANSI.SYS color 2,
rmcup=\E[0m,
rmso=\E[0;37;44m,
rmul=\E[0m,
sgr0=\E[0;37;44m,
smcup=\E[0;37;44m,
smso=\E[1;37;46m,
smul=\E[1;31;40m,
use=ansi-emx,
# nice colors for Emacs (white on black, mode line black on cyan)
ansi-color-3-emx|ANSI.SYS color 3,
rmcup=\E[0m,
rmso=\E[0m,
rmul=\E[0m,

```

```

sgr0=\E[0m,
smcup=\E[0m,
smso=\E[30;46m,
smul=\E[1;31;40m,
use=ansi-emx,

#### X terminal emulators
#
# X10/6.6 11/7/86, minus alternate screen, plus (csr)
# (xterm: ":MT:" changed to ":km:"; added <smam>/<rmam> based on init string;
# removed (hs, eslok, tsl=\E[?E\E[?%i%dT, fsl=\E[?F,
dsl=\E[?E)
# as these seem not to work -- esr)
x10term|vs100-x10|xterm terminal emulator (X10 window system),
am,
km,
mir,
msgr,
xenl,
xon,
cols#80,
it#8,
lines#65,
bold=\E[1m,
clear=\E[H\E[2J,
csr=\E[%i%p1%d;%p2%dr,
cub1=^H,
cud1=^J,
cuf1=\E[C,
cup=\E[%i%p1%d;%p2%dH,
cuu1=\E[A,
dch=\E[%p1%dP,
dch1=\E[P,
dl=\E[%p1%dM,
dl1=\E[M,
ed=\E[J,
el=\E[K,
home=\E[H,
ht=^I,
il=\E[%p1%dL,
il1=\E[L,
ind=^J,
is2=\E\E[m\E[?7h\E[?1;4l,
kbs=^H,
kcub1=\EOD,
kcud1=\EOB,
kcuf1=\EOC,
kcuu1=\EOA,

```

```

kf1=\EOP,
kf2=\EOQ,
kf3=\EOR,
kf4=\EOS,
rev=\E[7m,
ri=\EM,
rmam=\E[?7l,
rmir=\E[4l,
rmkx=\E[?1l\E>,
rmso=\E[m,
rmul=\E[m,
sgr0=\E[m,
smam=\E[?7h,
smir=\E[4h,
smkx=\E[?1h\E=,
smso=\E[7m,
smul=\E[4m,
# X11R6 xterm. This is known good for the XFree86 version under Linux.
# It is *way* more featureful than the stock X consortium entry (has ascsc,
# for starters). The <kmous> key is actually the \E[M prefix returned by
# xterm's internal mouse-tracking facility;
# ncurses will interpret the
# following three bytes of mouse status information.
# From: Eric S. Raymond <esr@snark.thyrsus.com> 14 Dec 1995
xterm-r6|xterm terminal emulator (X11R6 Window System),
am,
km,
mir,
msgr,
xenl,
xon,
cols#80,
it#8,
lines#65,
ascsc=+,\,.\,--..00Ii`aaffgghhjjkkllmmnnoopppqqrrssttuuvvwxyyzz{ {||} }~~,
bel=^G,
bold=\E[1m,
clear=\E[H\E[2J,
cr=^M,
csr=\E[%i%p1%d;%p2%dr,
cub=\E[%p1%dD,
cub1=^H,
cud=\E[%p1%dB,
cud1=^J,
cuf=\E[%p1%dC,
cuf1=\E[C,
cup=\E[%i%p1%d;%p2%dH,
cuu=\E[%p1%dA,

```

cuu1=\E[A,  
dch=\E[%p1%dP,  
dch1=\E[P,  
dl=\E[%p1%dM,  
dl1=\E[M,  
ed=\E[J,  
el=\E[K,  
enacs=\E(B\E)0,  
home=\E[H,  
ht=^I,  
ich=\E[%p1%d@,  
ich1=\E[@,  
il=\E[%p1%dL,  
il1=\E[L,  
ind=^J,  
is2=\E[r\E[m\E[2J\E[H\E[?7h\E[?1;3;4;6l\E[4l,  
kbs=^H,  
kcub1=\EOD,  
kcud1=\EOB,  
kcuf1=\EOC,  
kcuu1=\EOA,  
kend=\EOe,  
kent=\EOM,  
kf1=\E[11~,  
kf10=\E[21~,  
kf11=\E[23~,  
kf12=\E[24~,  
kf13=\E[25~,  
kf14=\E[26~,  
kf15=\E[28~,  
kf16=\E[29~,  
kf17=\E[31~,  
kf18=\E[32~,  
kf19=\E[33~,  
kf2=\E[12~,  
kf20=\E[34~,  
kf3=\E[13~,  
kf4=\E[14~,  
kf5=\E[15~,  
kf6=\E[17~,  
kf7=\E[18~,  
kf8=\E[19~,  
kf9=\E[20~,  
kfund=\E[1~,  
khome=\EO\0,  
kich1=\E[2~,  
kmous=\E[M,  
knp=\E[6~,

```

kpp=\E[5~,
rc=\E8,
rev=\E[7m,
ri=\EM,
rmacs=^O,
rmam=\E[?7l,
rmcup=\E[2J\E[?47l\E8,
rmir=\E[4l,
rmkx=\E[?1l\E>,
rmso=\E[m,
rmul=\E[m,
rs1=^O,
rs2=\E[r\E[m\E[2J\E[H\E[?7h\E[?1;3;4;6l\E[4l\E<,
sc=\E7,
sgr0=\E[m,
smacs=^N,
smam=\E[?7h,
smcup=\E7\E[?47h,
smir=\E[4h,
smkx=\E[?1h\E=,
smso=\E[7m,
smul=\E[4m,
tbc=\E[3k,
u6=\E[%i%d;%dR,
u7=\E[6n,
u8=\E[?1;2c,
u9=\E[c,
xterm-bold|xterm
terminal emulator (X11R6 Window System) standout w/bold,
smso=\E[1m,
use=xterm,
xterms|vs100s|xterm terminal emulator (small screen 24x80),
cols#80,
lines#24,
use=xterm,
# (kterm: this had extension capabilities ":KJ:TY=ascii:" -- esr)
kterm|kterm kanji terminal emulator (X window system),
eslok,
hs,
csr=\E[%i%p1%d;%p2%dr,
dsl=\E[?H,
fsl=\E[?F,
rc=\E8,
sc=\E7,
tsl=\E[?E\E[?%i%dT,
use=xterm,
use=ecma+color,

```

```

#
See the note on ICH/ICH1 VERSUS RMIR/SMIR near the end of file
xterm-nic|xterm with ich/ich1 suppressed for non-curses programs,
ich@,
ich1@,
use=xterm,

# Should work with the color xterm on the X11R6 contrib tape.
# Assumes the xterm attribute default is black on white.
# From: Eric S. Raymond <esr@snark.thyrsus.com> March 4 1996
xterm-color|xterm with color support,
op=\E[30;47m,
use=xterm,
use=klone+color,

# From: Thomas Dickey <dickey@clark.net> 13 Dec 1995
rxvt|rxvt terminal emulator,
kend=\EOw,
khome=\E[H,
kmous@,
use=xterm,
use=klone+color,

# From: David J. MacKenzie <djm@va.pubnix.com> 20 Apr 1995
# Here's a termcap entry I've been using for xterm_color, which comes
# with BSD/OS 2.0, and the X11R6 contrib tape too I think. Besides the
# color stuff, I also have a status line defined as the window manager
# title bar. [I have translated it to terminfo -- ESR]
xterm-pcolor|xterm with color used for highlights and status line,
hs,
wsl#40,
bold=\E[1m\E[43m,
dsl=\E]0;\007,
fsl=^G,
rev=\E[7m\E[34m,
smso=\E[7m\E[31m,
smul=\E[4m\E[42m,
tsl=\E]0;,
use=xterm,

#
HP ships this, except for the pb#9600 which was merged in from BSD termcap.
hpterm|X-hpterm|hp X11 terminal emulator,
am,
da,
db,
mir,
xhp,

```



cols#80,  
lh#2,  
lines#24,  
lm#0,  
lw#8,  
nlab#8,  
pb#9600,  
xmc#0,  
bel=^G,  
bold=\E&dB,  
cbt=\Ei,  
clear=\E&a0y0C\EJ,  
cr=^M,  
cub1=^H,  
cud1=\EB,  
cuf1=\EC,  
cup=\E&a%p1%dy%p2%dC,  
cuu1=\EA,  
dch1=\EP,  
dim=\E&dH,  
dl1=\EM,  
ed=\EJ\$<1>,  
el=\EK,  
hpa=\E&a%p1%dC,  
ht=^I,  
hts=\E1,  
il1=\EL,  
ind=^J,  
kbs=^H,  
kclr=\EJ,  
kctab=\E2,  
kcub1=\ED,  
kcud1=\EB,  
kcuf1=\EC,  
kcuu1=\EA,  
kdch1=\EP,  
kd11=\EM,  
ked=\EJ,  
kel=\EK,  
kf1=\Ep,  
kf2=\Eq,  
kf3=\Er,  
kf4=\Es,  
kf5=\Et,  
kf6=\Eu,  
kf7=\Ev,  
kf8=\Ew,  
khome=\Eh,

```

khts=\E1,
kich1=\EQ,
kil1=\EL,
kind=\ES,
kll=\EF,
knp=\EU,
kpp=\EV,
kri=\ET,
krmir=\ER,
ktbc=\E3,
meml=\EI,
memu=\Em,
pfkey=\E&f%p1%dk%p2%l%dl%p2%s,
pfloc=\E&f1a%p1%dk%p2%l%dl%p2%s,
pfx=\E&f2a%p1%dk%p2%l%dl%p2%s,
pln=\E&f%p1%dk%p2%l%dd0L%p2%s,
rev=\E&dB,
ri=\ET,
rmacs=^O,
rmir=\ER,
rmkx=\E&s0A,
rmln=\E&j@,
rmso=\E&d@,
rmul=\E&d@,
sgr=\E&d%?%p7%t%'s'%c%;%p1%p3%|p6%|%{2}%*%p2%{4}%*%+%p4%+%p5%{8}%*%+'@'%+%c%?
%p9%t%\016'%c%e%\017'%c%;,
sgr0=\E&d@,
smacs=^N,
smir=\EQ,
smkx=\E&s1A,
smln=\E&jB,
smso=\E&dJ,
smul=\E&dD,
tbc=\E3,
vpa=\E&a%p1%dY,

```

#

```

This entry describes an xterm with Sun-style function keys enabled
# via the X resource setting "xterm*sunFunctionKeys:true"
# To understand <kf11>/<kf12> note that L1,L2 and F11,F12 are the same.
# The <kf13>...<kf20> keys are L3-L10. We don't set <kf16=\E[197z>
# because we want it to be seen as <kcpy>.
# The <kf31>...<kf45> keys are R1-R15. We treat some of these in accordance
# with their Sun keyboard labels instead.
# From: Simon J. Gerraty <sjg@zen.void.oz.au> 10 Jan 1996
xterm-sun|xterm with sunFunctionKeys true,
kb2=\E[218z,
kcpy=\E[197z,

```

```
kend=\E[220z,
kf1=\E[224z,
kf10=\E[233z,
kf11=\E[192z,
kf12=\E[193z,
kf13=\E[194z,
kf14=\E[195z,
kf15=\E[196z,
kf17=\E[198z,
kf18=\E[199z,
kf19=\E[200z,
kf2=\E[225z,
kf20=\E[201z,
kf3=\E[226z,
kf31=\E[208z,
kf32=\E[209z,
kf33=\E[210z,
kf34=\E[211z,
kf35=\E[212z,
kf36=\E[213z,
kf38=\E[215z,
kf4=\E[227z,
kf40=\E[217z,
kf42=\E[219z,
kf44=\E[221z,
kf5=\E[228z,
kf6=\E[229z,
kf7=\E[230z,
kf8=\E[231z,
kf9=\E[232z,
kfind=\E[200z,
khlp=\E[196z,
khome=\E[214z,
kich1=\E[2z,
knp=\E[222z,
kpp=\E[216z,
kund=\E[195z,
use=xterm,
xterms-sun|small
(80x24) xterm with sunFunctionKeys true,
cols#80,
lines#24,
use=xterm-sun,

# This is for the extensible terminal emulator on the X11R6 contrib tape.
emu|emu native mode,
mir,
msgr,
```

xon,  
colors#15,  
cols#80,  
it#8,  
lines#24,  
pairs#64,  
vt#200,  
acsc=61a\202f\260g2j\213k\214l\215m\216n\217o\220q\222s\224t\225u\226v\227w\230x\231~\244,  
bel=^G,  
blink=\ES\EW,  
bold=\ES\EU,  
civis=\EZ,  
clear=\EP\EE0;0;,  
cnorm=\Ea,  
cr=^M,  
csr=\Ek%p1%d;%p2%d;,  
cub=\Eq-%p1%d;,  
cub1=^H,  
cud=\Ep%p1%d;,  
cud1=\EB,  
cuf=\Eq%p1%d;,  
cuf1=\ED,  
cup=\EE%p1%d;%p2%d;,  
cuu=\Ep-%p1%d;,  
cuu1=\EA,  
dch=\EI%p1%d;,  
dch1=\EI1;,  
dl=\ER%p1%d;,  
dl1=\ER1;,  
ech=\Ej%p1%d;,  
ed=\EN,  
el=\EK,  
el1=\EL,  
enacs=\0,  
home=\EE0;0;,  
ht=^I,  
hts=\Eh,  
il=\EQ%p1%d;,  
il1=\EQ1;,  
ind=\EG,  
is2=\ES\Er0;\Es0;,  
kbs=^H,  
kcub1=\EC,  
kcud1=\EB,  
kcuf1=\ED,  
kcuu1=\EA,  
kdch1=\177,  
kent=^M,

```

kf0=\EF00,
kf1=\EF01,
kf10=\EF10,
kf11=\EF11,
kf12=\EF12,
kf13=\EF13,
kf14=\EF14,
kf15=\EF15,
kf16=\EF16,
kf17=\EF17,
kf18=\EF18,
kf19=\EF19,
kf2=\EF02,
kf20=\EF20,
kf3=\EF03,
kf4=\EF04,
kf5=\EF05,
kf6=\EF06,
kf7=\EF07,
kf8=\EF08,
kf9=\EF09,
kfind=\Efind,
kich1=\Eins,
knp=\Enext,
kpp=\Eprior,
kslt=\Esel,
oc=\Es0;\Er0;,
rev=\ES\ET,
ri=\EF,
rmacs=\0,
rmir=\EX,
rmso=\ES,
rmul=\ES,
rs2=\ES\Es0;\Er0;,
setab=\Es%i%p1%d;,
setaf=\Er%i%p1%d;,
sgr0=\ES,
smacs=\0,
smir=\EY,
smso=\ES\ET,
smul=\ES\EV,
tbc=\Ej,
#####
#
Aliases
which conflict with terminfo.src
ansi|ANSI.SYS color,
use=ansi-emx,

```

ansi-color-2|ANSI.SYS color 2,  
use=ansi-color-2-emx,  
ansi-color-3|ANSI.SYS color 3,  
use=ansi-color-3-emx,  
xterm|vs100|xterm terminal emulator (X11R6 Window System),  
use=xterm-r6,

Found in path(s):

\* /opt/cola/permits/1600019816\_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-  
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/misc/emx.src

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```
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```

Found in path(s):

\* /opt/cola/permits/1600019816\_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-  
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-  
5.7/ncurses/widechar/lib\_in\_wchnstr.c

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archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/ncurses/tinfo/lib_raw.c

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*****
* @Id: menu_post.3x,v 1.9 2006/11/04 17:12:00 tom Exp @
-->

```

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archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-
5.7/doc/html/man/menu_post.3x.html

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- \* /opt/cola/permits/1600019816\_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/panel/p\_move.c
- \* /opt/cola/permits/1600019816\_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/panel/p\_user.c
- \* /opt/cola/permits/1600019816\_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/panel/p\_win.c
- \* /opt/cola/permits/1600019816\_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/panel/p\_update.c
- \*  
/opt/cola/permits/1600019816\_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/panel/p\_above.c
- \* /opt/cola/permits/1600019816\_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/panel/p\_replace.c
- \* /opt/cola/permits/1600019816\_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/panel/p\_below.c
- \* /opt/cola/permits/1600019816\_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/ncurses/base/lib\_slkatrset.c
- \* /opt/cola/permits/1600019816\_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/panel/p\_show.c
- \*  
/opt/cola/permits/1600019816\_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/panel/p\_hidden.c
- \* /opt/cola/permits/1600019816\_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/panel/p\_delete.c
- \* /opt/cola/permits/1600019816\_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/panel/p\_top.c
- \* /opt/cola/permits/1600019816\_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/ncurses/base/lib\_beep.c
- \* /opt/cola/permits/1600019816\_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/panel/p\_hide.c
- \*  
/opt/cola/permits/1600019816\_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/panel/p\_bottom.c
- \* /opt/cola/permits/1600019816\_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/ncurses/base/lib\_slkatrof.c

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*****
* @Id: tput.1,v 1.27 2006/12/24 18:11:31 tom Exp @
-->

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* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/doc/html/man/tput.1.html
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* @Id: form_fieldtype.3x,v 1.14 2006/11/04 17:12:00 tom Exp @
-->

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archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-
5.7/doc/html/man/form_fieldtype.3x.html

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archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/ncurses/base/lib\_winch.c  
\* /opt/cola/permits/1600019816\_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-  
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/ncurses/base/lib\_inchstr.c  
\* /opt/cola/permits/1600019816\_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-  
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/ncurses/base/lib\_scanw.c  
\* /opt/cola/permits/1600019816\_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-  
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/ncurses/base/lib\_delch.c  
\*

/opt/cola/permits/1600019816\_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-archive-  
fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/ncurses/base/lib\_erase.c

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\* @Id: curs\_inopts.3x,v 1.13 2005/05/15 16:18:07 tom Exp @

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archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-  
5.7/doc/html/man/curs\_inopts.3x.html

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-----  
-- \$Id: README,v 1.38 2008/10/18 21:02:45 tom Exp \$  
-----

The programs in this directory are designed to test your newest toy :-)  
Check the sources for any further details.

blue - Blue Moon, a nifty solitaire (uses color)  
bs.c - the game of Battleships (uses color)  
firework.c - multi-colored fireworks (uses color)  
gdc.c - Great Digital Clock (uses color)  
hanoi.c - the game of hanoi (uses color essentially)  
knight.c - the game of Knight's Tour (uses color)  
lrtest.c - test of access to the lower-right corner  
ncurses.c - multi-test program (uses color)  
newdemo.c - another test from PDCurses (uses color)  
rain.c - rain drops keep falling on my head...  
tclock.c  
- analog/digital clock  
testcurs.c - a test from the PDCurses people (uses color)  
worm.c - worms run all over your screen (uses color)  
xmas.c - Xmas greeting card

The bs and knight games demonstrate processing of mouse events under xterm.  
This directory also contains:

tracemunch - Perl script to crunch trace scripts to make them easier to read

-----  
-----  
These programs provide examples of use, but do not comprise a complete set of tests. Here is a list of library externals, noting those that are used:

libform:

-----  
TYPE\_ALNUM test: demo\_forms  
TYPE\_ALPHA test: demo\_forms ncurses  
TYPE\_ENUM test: demo\_forms  
TYPE\_INTEGER test: demo\_forms  
TYPE\_IPV4 test: demo\_forms  
TYPE\_NUMERIC test: demo\_forms  
TYPE\_REGEX test: demo\_forms  
current\_field test: demo\_forms edit\_field ncurses  
data\_ahead test: demo\_forms  
data\_behind test:  
demo\_forms  
dup\_field -

dynamic\_field\_info test: demo\_forms  
field\_arg test: demo\_forms  
field\_back test: demo\_forms  
field\_buffer test: cardfile demo\_forms edit\_field ncurses  
field\_count test: demo\_forms  
field\_fore test: demo\_forms  
field\_index test: demo\_forms  
field\_info test: ncurses  
field\_init -  
field\_just -  
field\_opts test: demo\_forms ncurses  
field\_opts\_off test: cardfile demo\_forms  
field\_opts\_on test: demo\_forms  
field\_pad test: demo\_forms  
field\_status test: demo\_forms  
field\_term -  
field\_type test: demo\_forms  
field\_userptr test: edit\_field ncurses  
form\_driver test: cardfile demo\_forms edit\_field ncurses  
form\_fields test: cardfile demo\_forms  
form\_init -  
form\_opts -  
form\_opts\_off -  
form\_opts\_on -  
form\_page test: demo\_forms  
form\_request\_by\_name -  
form\_request\_name test: edit\_field  
form\_sub test: cardfile demo\_forms ncurses  
form\_term -  
form\_userptr -  
form\_win test: cardfile demo\_forms edit\_field ncurses  
free\_field test:  
cardfile demo\_forms ncurses  
free\_fieldtype test: ncurses  
free\_form test: cardfile demo\_forms ncurses  
link\_field -  
link\_fieldtype -  
move\_field -  
new\_field test: cardfile demo\_forms ncurses  
new\_fieldtype test: ncurses  
new\_form test: cardfile demo\_forms ncurses  
new\_page test: demo\_forms  
pos\_form\_cursor -  
post\_form test: cardfile demo\_forms ncurses  
scale\_form test: demo\_forms ncurses  
set\_current\_field test: demo\_forms  
set\_field\_back test: cardfile demo\_forms edit\_field ncurses  
set\_field\_buffer test: cardfile demo\_forms edit\_field ncurses

set\_field\_fore test: demo\_forms  
set\_field\_init -  
set\_field\_just test: cardfile demo\_forms  
set\_field\_opts test: demo\_forms ncurses  
set\_field\_pad test: demo\_forms  
set\_field\_status test: demo\_forms  
set\_field\_term -  
set\_field\_type test: demo\_forms ncurses  
set\_field\_userptr test: demo\_forms ncurses  
set\_fieldtype\_arg -  
set\_fieldtype\_choice -  
set\_form\_fields -  
set\_form\_init -  
set\_form\_opts -  
set\_form\_page -  
set\_form\_sub test:  
cardfile demo\_forms ncurses  
set\_form\_term -  
set\_form\_userptr -  
set\_form\_win test: cardfile demo\_forms ncurses  
set\_max\_field test: demo\_forms  
set\_new\_page test: demo\_forms  
unpost\_form test: cardfile demo\_forms ncurses

libmenu:

-----

current\_item test: demo\_menus ncurses  
free\_item test: ncurses  
free\_menu test: demo\_menus ncurses  
item\_count test: demo\_menus  
item\_description -  
item\_index test: demo\_menus ncurses  
item\_init -  
item\_name test: demo\_menus ncurses  
item\_opts -  
item\_opts\_off -  
item\_opts\_on -  
item\_term -  
item\_userptr -  
item\_value test: demo\_menus ncurses  
item\_visible -  
menu\_back -  
menu\_driver test: demo\_menus ncurses  
menu\_fore -  
menu\_format -  
menu\_grey -  
menu\_init -  
menu\_items test: demo\_menus ncurses



menu\_mark test: demo\_menus  
menu\_opts -  
menu\_opts\_off test: demo\_menus ncurses  
menu\_opts\_on test: demo\_menus  
menu\_pad -  
menu\_pattern test: demo\_menus  
menu\_request\_by\_name -  
menu\_request\_name -  
menu\_spacing test:  
demo\_menus  
menu\_sub test: demo\_menus  
menu\_term -  
menu\_userptr -  
menu\_win test: demo\_menus ncurses  
new\_item test: demo\_menus ncurses  
new\_menu test: demo\_menus ncurses  
pos\_menu\_cursor lib: menu  
post\_menu test: demo\_menus ncurses  
scale\_menu test: demo\_menus ncurses  
set\_current\_item -  
set\_item\_init -  
set\_item\_opts -  
set\_item\_term -  
set\_item\_userptr -  
set\_item\_value test: demo\_menus ncurses  
set\_menu\_back test: demo\_menus  
set\_menu\_fore test: demo\_menus  
set\_menu\_format test: demo\_menus ncurses  
set\_menu\_grey -  
set\_menu\_init -  
set\_menu\_items -  
set\_menu\_mark test: demo\_menus  
set\_menu\_opts -  
set\_menu\_pad -  
set\_menu\_pattern -  
set\_menu\_spacing -  
set\_menu\_sub test: demo\_menus ncurses  
set\_menu\_term -  
set\_menu\_userptr -  
set\_menu\_win test: demo\_menus ncurses  
set\_top\_row -  
top\_row -  
unpost\_menu test: demo\_menus ncurses

libncurses:

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BC -

COLORS test: echochar ncurses savescreen xmas

COLOR\_PAIR test: background  
blue bs cardfile demo\_forms demo\_menus demo\_panels echochar filter firework gdc hanoi ins\_wide inserts knight  
ncurses newdemo rain savescreen tclock testaddch testcurs view worm xmas

COLOR\_PAIRS test: echochar ncurses newdemo savescreen

COLS test: cardfile demo\_altkeys demo\_defkey demo\_forms demo\_keyok demo\_menus demo\_panels ditto echochar  
edit\_field firework foldkeys hashtest inch\_wide inchs ins\_wide inserts lrtest movewindow ncurses newdemo rain  
savescreen tclock test\_get\_wstr test\_getstr test\_instr test\_inwstr test\_opaque testcurs view worm

ESCDELAY test: test\_opaque

LINES test: cardfile demo\_defkey demo\_keyok demo\_menus demo\_panels ditto echochar edit\_field firework hanoi  
hashtest inch\_wide inchs ins\_wide inserts lrtest movewindow ncurses newdemo rain savescreen tclock test\_get\_wstr  
test\_getstr test\_instr test\_inwstr test\_opaque testcurs view worm xmas

PAIR\_NUMBER test: ncurses

PC lib: ncurses

SP lib: ncurses

TABSIZE test: test\_opaque

UP -

acs\_map test:  
gdc ins\_wide inserts knight movewindow ncurses newdemo testcurs

add\_wch test: demo\_panels ncurses

add\_wchnstr -

add\_wchstr test: view

addch test: blue bs echochar hashtest ncurses savescreen test\_opaque testaddch view worm

addchnstr -

addchstr -

addnstr -

addnwstr test: ncurses

addstr test: blue bs cardfile gdc hanoi lrtest ncurses savescreen

addwstr test: ncurses

assume\_default\_colors test: ncurses

attr\_get test: ncurses

attr\_off test: ncurses

attr\_on test: ncurses

attr\_set test: ncurses

attroff test: echochar filter gdc ncurses tclock

attron test: bs echochar filter gdc ncurses

attrset test: bs firework gdc hanoi ncurses rain tclock testaddch testcurs

baudrate lib: ncurses

beep test: blue bs cardfile chgat demo\_forms demo\_menus demo\_panels edit\_field hanoi inch\_wide inchs ins\_wide  
inserts knight movewindow ncurses savescreen tclock test\_get\_wstr test\_getstr test\_instr test\_inwstr test\_opaque  
testcurs view xmas

bkgd test: background  
cardfile demo\_forms ncurses savescreen tclock view

bkgdset test: background ncurses testaddch

bkgdset test: ncurses

bkgdset test: ncurses

boolcodes test: test\_arrays progs: dump\_entry

boolfnames test: test\_arrays progs: dump\_entry

boolnames test: test\_arrays progs: dump\_entry infocmp

border -  
border\_set -  
box test: cardfile chgat demo\_forms demo\_menus demo\_panels ditto edit\_field inch\_wide inchs ins\_wide inserts  
lrtest ncurses newdemo redraw test\_get\_wstr test\_getstr test\_instr test\_inwstr test\_opaque testcurs  
box\_set test: ncurses  
can\_change\_color test: ncurses  
cbreak test: background blue bs cardfile chgat color\_set demo\_altkeys demo\_defkey demo\_forms demo\_keyok  
demo\_menus demo\_panels ditto filter firework foldkeys gdc hanoi hashtest inch\_wide inchs ins\_wide inserts knight  
lrtest movewindow ncurses newdemo savescreen tclock test\_get\_wstr test\_getstr test\_instr test\_inwstr test\_opaque  
testcurs view worm xmas  
chgat test: chgat  
clear test: blue  
bs gdc ncurses testcurs xmas  
clearok test: bs knight  
clrtoebot test: demo\_menus ncurses  
clrtoeol test: blue bs demo\_altkeys demo\_menus foldkeys hanoi hashtest movewindow ncurses view  
color\_content test: ncurses  
color\_set test: color\_set ncurses  
copywin test: ncurses testcurs  
cur\_term test: dots dots\_mvcur lrtest progs: clear tput tset  
curs\_set test: echochar firework gdc hanoi lrtest ncurses newdemo rain savescreen tclock testcurs worm xmas  
curscr test: demo\_panels edit\_field knight lrtest ncurses savescreen tclock view  
curses\_version test: ncurses progs: infocmp tic toe tput tset  
def\_prog\_mode test: bs ncurses  
def\_shell\_mode lib: ncurses  
define\_key test: demo\_altkeys demo\_defkey foldkeys  
del\_curterm lib: ncurses  
delay\_output test: newdemo  
delch -  
deleteln -  
delscreen test: ditto dots\_mvcur  
delwin test: cardfile chgat demo\_forms demo\_panels edit\_field inch\_wide inchs ins\_wide inserts movewindow  
ncurses newdemo redraw test\_get\_wstr test\_getstr  
test\_instr test\_inwstr test\_opaque testcurs  
derwin test: cardfile chgat demo\_forms demo\_menus ditto inch\_wide inchs ins\_wide inserts movewindow ncurses  
test\_get\_wstr test\_getstr test\_instr test\_inwstr test\_opaque  
doupdate test: cardfile demo\_menus demo\_panels ditto edit\_field ins\_wide inserts knight movewindow ncurses  
redraw savescreen test\_get\_wstr test\_getstr  
dupwin test: edit\_field  
echo test: bs hanoi ncurses test\_get\_wstr test\_getstr testcurs testscanw  
echo\_wchar test: ncurses  
echochar test: echochar ncurses  
endwin test: background blue bs cardfile chgat color\_set demo\_altkeys demo\_defkey demo\_forms demo\_keyok  
demo\_menus demo\_panels ditto dots\_mvcur echochar filter firework firstlast foldkeys gdc hanoi hashtest inch\_wide  
inchs ins\_wide inserts key\_names keynames knight lrtest movewindow ncurses newdemo rain redraw savescreen  
tclock test\_get\_wstr test\_getstr test\_instr test\_inwstr test\_opaque testaddch testcurs testscanw view worm xmas  
erase test: cardfile demo\_menus

filter firework firstlast hanoi lrtest ncurses tclock test\_opaque testcurs  
erasechar lib: ncurses  
eraseswchar -  
filter test: filter  
flash test: cardfile lrtest ncurses tclock testcurs  
flushinp test: ncurses newdemo testcurs  
get\_wch -  
get\_wstr test: test\_get\_wstr  
getattrs -  
getbegx test: chgat demo\_menus demo\_panels movewindow ncurses newdemo redraw testcurs  
getbegy test: chgat demo\_menus demo\_panels movewindow ncurses newdemo redraw testcurs  
getbkgd test: ncurses  
getbkgrnd test: ncurses  
getcchar test: ncurses view  
getch test: background blue bs chgat color\_set demo\_altkeys filter firework firstlast foldkeys hanoi hashtest lrtest  
savescreen tclock test\_opaque testaddch testcurs view xmas  
getcurx test: bs chgat demo\_altkeys demo\_defkey demo\_panels foldkeys movewindow ncurses redraw savescreen  
test\_get\_wstr test\_getstr test\_opaque testcurs  
getcury test: bs chgat demo\_altkeys demo\_defkey demo\_panels edit\_field foldkeys movewindow ncurses redraw  
savescreen test\_opaque testcurs  
getmaxx test: chgat demo\_panels inch\_wide inchs movewindow ncurses newdemo redraw test\_get\_wstr test\_getstr  
test\_instr test\_inwstr test\_opaque testcurs  
getmaxy test: chgat demo\_forms demo\_panels inch\_wide inchs movewindow ncurses newdemo redraw  
test\_get\_wstr test\_getstr test\_instr test\_inwstr test\_opaque testcurs  
getmouse test: bs knight movewindow ncurses  
getn\_wstr test: test\_get\_wstr  
getnstr test: filter ncurses test\_getstr  
getparx test: movewindow  
getpary test: movewindow  
getstr test: test\_getstr  
getwin test: ncurses  
halfdelay test: view  
has\_colors test: background bs cardfile chgat color\_set demo\_forms demo\_menus demo\_panels echochar filter  
firework gdc hanoi ins\_wide inserts knight ncurses newdemo rain savescreen tclock testcurs view worm xmas  
has\_ic test: lrtest  
has\_il lib: ncurses  
has\_key lib: ncurses  
hline test: gdc ncurses  
hline\_set -  
idcok test: test\_opaque  
idlok test: ncurses test\_opaque testscanw  
view  
immedok test: test\_opaque  
in\_wch test: inch\_wide  
in\_wchnstr test: inch\_wide  
in\_wchstr test: inch\_wide  
inch test: inchs  
inchnstr test: inchs

inchstr test: inchs  
init\_color test: ncurses  
init\_pair test: background blue bs cardfile chgat color\_set demo\_forms demo\_menus demo\_panels echochar filter  
firework gdc hanoi ins\_wide inserts knight ncurses newdemo rain savescreen tclock testaddch testcurs view worm  
xmas  
initscr test: background blue bs cardfile chgat color\_set demo\_defkey demo\_forms demo\_keyok demo\_menus  
demo\_panels echochar firework firstlast gdc hanoi hashtest inch\_wide inchs ins\_wide inserts knight lrtest  
movewindow ncurses newdemo rain redraw savescreen tclock test\_get\_wstr test\_getstr test\_instr test\_inwstr  
test\_opaque testaddch testcurs testscanw view worm xmas  
innstr test: test\_instr  
innwstr test: test\_inwstr  
ins\_nwstr test: ins\_wide  
ins\_wch test: ins\_wide  
ins\_wstr test: ins\_wide  
insch test: ins\_wide inserts  
insdelln -  
insertln -  
insnstr test:  
inserts  
insstr test: inserts  
instr test: test\_instr  
intrflush test: demo\_forms movewindow  
inwstr test: test\_inwstr  
is\_cleared test: test\_opaque  
is\_idcok test: test\_opaque  
is\_idlok test: test\_opaque  
is\_immedok test: test\_opaque  
is\_keypad test: test\_opaque  
is\_leaveok test: test\_opaque  
is\_linetouched lib: form  
is\_nodelay test: test\_opaque  
is\_notimeout test: test\_opaque  
is\_scrollok test: test\_opaque  
is\_syncok test: test\_opaque  
is\_term\_resized -  
is\_wintouched lib: ncurses  
isendwin -  
key\_defined test: demo\_defkey foldkeys  
key\_name test: key\_names ncurses  
keybound test: demo\_altkeys demo\_defkey  
keyname test: demo\_altkeys demo\_defkey demo\_keyok demo\_menus edit\_field foldkeys keynames movewindow  
ncurses redraw testcurs view progs: tic  
keyok test: demo\_keyok foldkeys  
keypad test: bs cardfile chgat demo\_altkeys demo\_defkey demo\_forms demo\_keyok demo\_menus demo\_panels  
ditto edit\_field filter firework foldkeys hashtest  
inch\_wide inchs ins\_wide inserts key\_names keynames knight lrtest movewindow ncurses redraw savescreen tclock  
test\_get\_wstr test\_getstr test\_instr test\_inwstr test\_opaque testcurs testscanw view  
killchar lib: ncurses

killwchar -  
leaveok test: hanoi test\_opaque  
longname test: testcurs progs: tput  
mcprint -  
meta test: key\_names keynames ncurses  
mouse\_trafo -  
mouseinterval -  
mousemask test: bs demo\_forms demo\_menus knight movewindow ncurses  
move test: blue bs cardfile chgat demo\_altkeys demo\_menus echochar foldkeys gdc hanoi hashtest inch\_wide inchs  
ins\_wide inserts knight lrtest movewindow ncurses savescreen test\_get\_wstr test\_getstr test\_instr test\_inwstr  
test\_opaque testscanw view xmas  
mvadd\_wch test: ncurses  
mvadd\_wchnstr -  
mvadd\_wchstr -  
mvaddch test: bs gdc hanoi lrtest ncurses rain tclock xmas  
mvaddchnstr test: gdc  
mvaddchstr -  
mvaddnstr -  
mvaddnwstr -  
mvaddstr test: bs demo\_forms gdc hanoi knight ncurses rain tclock testcurs xmas  
mvaddwstr -  
mvchgat test:  
  chgat  
mvcur test: dots\_mvcur redraw  
mvdclch -  
mvderwin test: movewindow  
mvget\_wch -  
mvget\_wstr test: test\_get\_wstr  
mvgetch -  
mvgetn\_wstr test: test\_get\_wstr  
mvgetnstr test: test\_getstr  
mvgetstr test: test\_getstr  
mvhline test: ncurses  
mvhline\_set test: ncurses  
mvin\_wch test: inch\_wide  
mvin\_wchnstr test: inch\_wide  
mvin\_wchstr test: inch\_wide  
mvinch test: inchs  
mvinchnstr test: gdc inchs  
mvinchstr test: inchs  
mvinnstr test: test\_instr  
mvinnwstr test: test\_inwstr  
mvins\_nwstr test: ins\_wide  
mvins\_wch test: ins\_wide  
mvins\_wstr test: ins\_wide  
mvinsch test: ins\_wide inserts  
mvinsnstr test: inserts  
mvinsstr test: inserts

mvinstr test: test\_instr  
mvinwstr test: test\_inwstr  
mvprintw test: bs demo\_menus firework hanoi ncurses tclock view  
mvscanw -  
mvvline test: ncurses  
mvvline\_set test: ncurses  
mvwadd\_wch -  
mvwadd\_wchnstr lib: form  
mvwadd\_wchstr test: inch\_wide  
mvwaddch test: movewindow newdemo testcurs  
xmas  
mvwaddchnstr -  
mvwaddchstr test: inchs  
mvwaddnstr test: newdemo testcurs  
mvwaddnwstr -  
mvwaddstr test: ditto firstlast ins\_wide inserts knight ncurses newdemo test\_instr testcurs xmas  
mvwaddwstr test: test\_inwstr  
mvwchgat test: chgat  
mvwdelch test: ncurses  
mvwget\_wch -  
mvwget\_wstr test: test\_get\_wstr  
mvwgetch test: inch\_wide inchs test\_get\_wstr test\_getstr test\_instr test\_inwstr test\_opaque  
mvwgetn\_wstr test: test\_get\_wstr  
mvwgetnstr test: test\_getstr  
mvwgetstr test: test\_getstr  
mvwhline test: movewindow  
mvwhline\_set -  
mvwin test: cardfile demo\_menus movewindow testcurs xmas  
mvwin\_wch test: inch\_wide  
mvwin\_wchnstr test: inch\_wide  
mvwin\_wchstr test: inch\_wide  
mvwinch test: inchs newdemo testcurs  
mvwinchnstr test: inchs  
mvwinchstr test: inchs  
mvwinnstr test: test\_instr testcurs  
mvwinnwstr test: test\_inwstr  
mvwins\_nwstr test: ins\_wide  
mvwins\_wch test: ins\_wide  
mvwins\_wstr test: ins\_wide  
mvwinsch test: ins\_wide inserts  
mvwinsnstr test:  
inserts  
mvwinsstr test: inserts testcurs  
mvwinstr test: test\_instr  
mvwinwstr test: test\_inwstr  
mvprintw test: chgat demo\_panels inch\_wide inchs ncurses test\_instr test\_inwstr testcurs  
mvwscanw test: testcurs  
mvvline test: ins\_wide inserts movewindow

mvwvline\_set -  
napms test: demo\_panels ditto dots dots\_mvcur echochar firework gdc hanoi lrtest ncurses railroad rain tclock  
test\_opaque testcurs view worm xmas progs: tset  
newpad test: edit\_field ncurses testcurs  
newsr lib: ncurses  
newterm test: demo\_altkeys ditto dots\_mvcur filter foldkeys gdc key\_names keynames  
newwin test: cardfile chgat demo\_defkey demo\_forms demo\_keyok demo\_menus demo\_panels ditto edit\_field  
firstlast inch\_wide inchs ins\_wide inserts knight movewindow ncurses newdemo redraw test\_get\_wstr test\_getstr  
test\_instr test\_inwstr test\_opaque testcurs xmas  
nl test: demo\_forms ncurses rain testcurs  
nocbreak test: testcurs  
nodelay test: ditto firework gdc lrtest ncurses  
newdemo rain tclock test\_opaque view worm xmas  
noecho test: background bs cardfile chgat color\_set demo\_altkeys demo\_defkey demo\_forms demo\_keyok  
demo\_menus demo\_panels ditto firework firstlast foldkeys gdc hanoi hashtest inch\_wide inchs ins\_wide inserts  
knight lrtest movewindow ncurses rain redraw savescreen tclock test\_get\_wstr test\_getstr test\_instr test\_inwstr  
test\_opaque testcurs view worm xmas  
nofilter -  
nonl test: bs demo\_forms hashtest movewindow ncurses view worm xmas  
noqiflush -  
noraw test: demo\_forms demo\_menus ncurses testcurs  
notimeout test: test\_opaque  
numcodes test: test\_arrays progs: dump\_entry  
numfnames test: test\_arrays progs: dump\_entry  
numnames test: test\_arrays progs: dump\_entry infocmp  
ospeed progs: tset  
overlay test: ncurses testcurs xmas  
overwrite test: ncurses savescreen  
pair\_content test: background color\_set  
pecho\_wchar -  
pechochar -  
pnoutrefresh test: edit\_field ncurses  
prefresh test: testcurs  
printw test: background  
blue bs color\_set demo\_altkeys demo\_defkey demo\_keyok demo\_menus filter foldkeys ncurses savescreen testcurs  
testscanw view  
putp progs: tput  
putwin test: ncurses  
qiflush -  
raw test: demo\_forms ncurses redraw testcurs  
redrawwin test: redraw  
refresh test: blue bs demo\_defkey demo\_forms demo\_keyok demo\_menus demo\_panels echochar filter firstlast gdc  
hanoi hashtest lrtest movewindow ncurses savescreen tclock testcurs view xmas  
reset\_prog\_mode test: filter ncurses  
reset\_shell\_mode test: bs filter savescreen  
resetty -  
resize\_term test: view  
resizeterm lib: ncurses



restartterm -  
ripoffline test: demo\_menus ncurses  
savetty -  
scanw test: testcurs testscanw  
scr\_dump test: savescreen  
scr\_init test: savescreen  
scr\_restore test: savescreen  
scr\_set test: savescreen  
sctl test: view  
scroll test: testcurs  
scrollok test: demo\_altkeys demo\_defkey demo\_keyok demo\_panels ditto foldkeys hashtest knight ncurses redraw  
test\_opaque testcurs testscanw view  
set\_curterm lib:  
ncurses  
set\_escdelay test: test\_opaque  
set\_tabsize test: test\_opaque  
set\_term lib: ncurses  
setcchar test: demo\_panels ins\_wide ncurses view  
setscrreg test: view  
setupterm test: dots progs: clear tput tset  
slk\_attr -  
slk\_attr\_off -  
slk\_attr\_on -  
slk\_attr\_set -  
slk\_attroff lib: ncurses  
slk\_attron lib: ncurses  
slk\_attrset -  
slk\_clear test: ncurses  
slk\_color test: ncurses  
slk\_init test: ncurses  
slk\_label test: ncurses  
slk\_noutrefresh -  
slk\_refresh test: ncurses  
slk\_restore test: ncurses  
slk\_set test: ncurses  
slk\_touch lib: ncurses  
slk\_wset test: ncurses  
standend test: blue gdc ncurses  
standout test: blue ncurses  
start\_color test: background blue bs cardfile chgat color\_set demo\_forms demo\_menus demo\_panels echochar filter  
firework gdc hanoi ins\_wide inserts knight ncurses newdemo rain savescreen tclock testaddch testcurs view worm  
xmas  
stdscr test: bs chgat demo\_altkeys demo\_forms demo\_menus demo\_panels ditto filter  
firework foldkeys gdc hanoi hashtest inch\_wide inchs ins\_wide inserts key\_names keynames knight lrtest  
movewindow ncurses rain redraw savescreen tclock test\_get\_wstr test\_getstr test\_instr test\_inwstr test\_opaque  
testcurs testscanw view worm xmas  
strcodes test: test\_arrays progs: dump\_entry  
strfnames test: test\_arrays progs: dump\_entry

strnames test: foldkeys test\_arrays progs: dump\_entry infocmp tic  
subpad test: testcurs  
subwin test: movewindow ncurses newdemo testcurs  
syncok test: test\_opaque  
term\_attrs test: ncurses  
termattrs test: ncurses testcurs  
termname test: testcurs  
tgetent test: demo\_termcap railroad  
tgetflag test: demo\_termcap  
tgetnum test: demo\_termcap railroad  
tgetstr test: demo\_termcap railroad  
tgoto test: railroad  
tigetflag progs: tput  
tigetnum test: ncurses progs: tput  
tgetstr test: blue demo\_defkey foldkeys testcurs progs: tput  
timeout test: rain savescreen  
touchline test: chgat  
touchwin test: chgat demo\_menus edit\_field  
filter firstlast inch\_wide inchs ins\_wide inserts movewindow ncurses redraw test\_get\_wstr test\_getstr test\_instr  
test\_inwstr test\_opaque xmas  
tparm test: dots dots\_mvcur progs: tic tput  
tputs test: dots dots\_mvcur railroad progs: clear tset  
trace test: demo\_menus hanoi hashtest lrtest ncurses testcurs view worm  
ttytype lib: ncurses  
typeahead test: testcurs  
unctrl test: ncurses redraw testcurs  
unget\_wch -  
ungetch test: bs knight  
ungetmouse -  
untouchwin lib: form  
use\_default\_colors test: filter firework gdc hanoi knight ncurses rain tclock worm xmas  
use\_env progs: tput  
use\_extended\_names progs: infocmp tic  
use\_legacy\_coding -  
use\_screen test: ditto  
use\_window test: rain worm  
vid\_attr -  
vid\_puts -  
vidattr lib: ncurses  
vidputs lib: ncurses  
vline test: gdc ncurses  
vline\_set -  
vw\_printw -  
vw\_scanw -  
vwprintw test: movewindow  
vwscanw lib: ncurses  
wadd\_wch test: inch\_wide  
wadd\_wchnstr lib: form

wadd\_wchstr -  
waddch test: demo\_forms  
demo\_panels ditto firstlast inch\_wide inchs knight ncurses test\_get\_wstr test\_getstr test\_instr test\_inwstr  
test\_opaque worm  
waddchnstr lib: ncurses  
waddchstr -  
waddnstr lib: menu  
waddnwstr test: ncurses  
waddstr test: chgat demo\_forms demo\_panels edit\_field firstlast ins\_wide knight ncurses redraw testcurs  
waddwstr test: ins\_wide test\_get\_wstr  
wattr\_get -  
wattr\_off lib: ncurses  
wattr\_on lib: ncurses  
wattr\_set -  
wattroff test: demo\_forms ncurses testcurs xmas  
wattron test: testcurs xmas  
wattrset test: demo\_forms ncurses newdemo test\_get\_wstr test\_getstr testcurs xmas  
wbkgd test: cardfile demo\_forms demo\_menus ncurses newdemo testcurs  
wbkgdset test: demo\_panels ins\_wide inserts ncurses  
wbkgrnd lib: ncurses  
wbkgrndset lib: ncurses  
wborder lib: ncurses  
wborder\_set lib: ncurses  
wchgat test: chgat test\_get\_wstr test\_getstr view  
wclear test: ncurses test\_opaque testcurs  
wclrtobot test: firstlast inch\_wide inchs ncurses test\_instr test\_inwstr  
testcurs  
wclrtoeol test: chgat demo\_defkey demo\_keyok demo\_panels firstlast inch\_wide inchs ins\_wide inserts knight  
ncurses test\_instr test\_inwstr testcurs  
wcolor\_set lib: ncurses  
wcursyncup lib: form  
wdelch test: ncurses testcurs  
wdeleteln test: testcurs  
wecho\_wchar lib: ncurses  
wechochar lib: ncurses  
wenclose lib: form  
werase test: cardfile demo\_forms demo\_menus demo\_panels edit\_field firstlast knight ncurses newdemo  
test\_get\_wstr test\_getstr test\_opaque testcurs xmas  
wget\_wch test: ins\_wide ncurses  
wget\_wstr test: test\_get\_wstr  
wgetbkgrnd lib: ncurses  
wgetch test: cardfile chgat demo\_defkey demo\_keyok demo\_menus demo\_panels ditto edit\_field gdc inserts knight  
movewindow ncurses newdemo rain redraw test\_opaque testcurs worm  
wgetn\_wstr test: ncurses test\_get\_wstr  
wgetnstr test: ncurses test\_getstr  
wgetparent test: test\_opaque  
wgetscrreg test: test\_opaque  
wgetstr test: test\_getstr

whline test: testcurs  
 whline\_set lib: ncurses  
 win\_wch test:  
 inch\_wide  
 win\_wchnstr test: inch\_wide  
 win\_wchstr test: inch\_wide  
 winch test: inchs knight testcurs  
 winchnstr test: inchs  
 winchstr test: inchs  
 winnstr test: demo\_altkeys demo\_defkey foldkeys test\_instr  
 winnwstr test: test\_inwstr  
 wins\_nwstr test: ins\_wide  
 wins\_wch test: ins\_wide  
 wins\_wstr test: ins\_wide  
 winsch test: ins\_wide inserts testcurs  
 winsdelln lib: ncurses  
 winsertln test: testcurs  
 winsnstr test: inserts  
 winsstr test: inserts  
 winstr test: test\_instr  
 winwstr test: test\_inwstr  
 wmouse\_trafo lib: form  
 wmove test: chgat demo\_altkeys demo\_defkey demo\_keyok demo\_menus demo\_panels firstlast foldkeys inch\_wide  
 inchs ins\_wide inserts knight movewindow ncurses newdemo redraw test\_get\_wstr test\_getstr test\_instr test\_inwstr  
 test\_opaque testcurs worm  
 wnoutrefresh test: demo\_menus ditto edit\_field inch\_wide inchs ins\_wide inserts knight movewindow ncurses  
 redraw test\_get\_wstr test\_getstr test\_instr test\_inwstr test\_opaque  
 wprintw test:  
 chgat demo\_defkey demo\_forms demo\_keyok demo\_menus demo\_panels edit\_field inch\_wide inchs ins\_wide  
 inserts knight movewindow ncurses test\_get\_wstr test\_getstr test\_instr test\_inwstr test\_opaque testcurs  
 wredrawln test: redraw  
 wrefresh test: chgat demo\_forms demo\_keyok demo\_menus demo\_panels edit\_field firstlast knight lrtest  
 movewindow ncurses newdemo redraw savescreen tclock testcurs view worm xmas  
 wresize test: cardfile ncurses  
 wscanw test: testcurs  
 wscrln test: ncurses testcurs  
 wsetscrreg test: ncurses testcurs  
 wstandend test: test\_opaque xmas  
 wstandout test: test\_opaque xmas  
 wsyncdown test: movewindow  
 wsyncup lib: form  
 wtimeout test: ncurses  
 wtouchln lib: ncurses  
 wunctrl lib: ncurses  
 wvline test: testcurs  
 wvline\_set lib: ncurses  
  
 libpanel:

-----  
bottom\_panel test: demo\_panels ncurses  
del\_panel test: demo\_panels ncurses  
hide\_panel test: demo\_panels ncurses  
move\_panel test: demo\_panels ncurses  
new\_panel test: cardfile demo\_panels ncurses  
panel\_above test:  
demo\_panels  
panel\_below test: demo\_panels  
panel\_hidden test: demo\_panels  
panel\_userptr test: demo\_panels ncurses  
panel\_window test: cardfile demo\_panels ncurses  
replace\_panel test: demo\_panels  
set\_panel\_userptr test: demo\_panels ncurses  
show\_panel test: demo\_panels ncurses  
top\_panel test: cardfile demo\_panels ncurses  
update\_panels test: cardfile demo\_panels ncurses

Found in path(s):

\* /opt/cola/permits/1600019816\_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-  
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/test/README

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\* @Id: mitem\_userptr.3x,v 1.9 2006/11/04 18:21:03 tom Exp @

-->

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archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-  
5.7/doc/html/man/mitem\_userptr.3x.html

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-- \*- ada -\*

define(HTMLNAME,`terminal\_interface-curses-menus-menu\_user\_data\_\_ads.htm')dnl  
include(M4MACRO)dnl

-----  
--  
-- GNAT ncurses Binding --  
--  
-- Terminal\_Interface.Curses.Menus.Menu\_User\_Data --  
--  
-- S P E C --  
--  
-----

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-----  
-- Author: Juergen Pfeifer, 1996

-- Version Control:

--

\$Revision: 1.14 \$

-- Binding Version 01.00  
-----

generic

type User is limited private;

type User\_Access is access User;

package Terminal\_Interface.Curses.Menus.Menu\_User\_Data is

pragma Preelaborate (Terminal\_Interface.Curses.Menus.Menu\_User\_Data);

-- MANPAGE(^menu\_userptr.3x')

-- ANCHOR(^set\_menu\_userptr,'Set\_User\_Data')

procedure Set\_User\_Data (Men : in Menu;

                          Data : in User\_Access);

-- AKA

pragma Inline (Set\_User\_Data);

-- ANCHOR(^menu\_userptr,'Get\_User\_Data')

procedure Get\_User\_Data (Men : in Menu;

                          Data : out User\_Access);

-- AKA

-- ANCHOR(^menu\_userptr,'Get\_User\_Data')

function Get\_User\_Data (Men : in Menu) return User\_Access;

-- AKA

-- Same as function

pragma Inline (Get\_User\_Data);

end Terminal\_Interface.Curses.Menus.Menu\_User\_Data;

Found in path(s):

\* /opt/cola/permits/1600019816\_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-  
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/Ada95/gen/terminal\_interface-  
curses-menus-menu\_user\_data.ads.m4

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-- \*- ada -\*

```
define(HTMLNAME,'terminal_interface-curses-panels-user_data__ads.htm')dnl
```

```
include(M4MACRO)dnl
```

```
-----  
--  
--          GNAT ncurses Binding          --  
--  
--      Terminal_Interface.Curses.Panels.User_Data      --  
--  
--          S P E C          --  
--  
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-----  
-- Author: Juergen Pfeifer, 1996  
-- Version Control:  
--  
-- $Revision: 1.14 $  
-- Binding Version 01.00  
-----
```

```
generic
```

```
type User is limited private;
```



```

type User_Access is access all User;
package Terminal_Interface.Curses.Panels.User_Data is
pragma Preelaborate (Terminal_Interface.Curses.Panels.User_Data);

-- MANPAGE(^panel.3x')

-- ANCHOR(^set_panel_userptr',`Set_User_Data')
procedure Set_User_Data (Pan : in Panel;
                        Data : in User_Access);

-- AKA
pragma Inline (Set_User_Data);

-- ANCHOR(^panel_userptr',`Get_User_Data')
procedure Get_User_Data (Pan : in Panel;
                        Data : out User_Access);

-- AKA

-- ANCHOR(^panel_userptr',`Get_User_Data')
function Get_User_Data (Pan : in Panel) return User_Access;

-- AKA
-- Same as function
pragma Inline (Get_User_Data);

end Terminal_Interface.Curses.Panels.User_Data;

```

Found in path(s):

```

* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/Ada95/gen/terminal_interface-
curses-panels-user_data.ads.m4

```

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\* @Id: menu\_mark.3x,v 1.9 2006/11/04 18:33:18 tom Exp @

-->

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archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-  
5.7/doc/html/man/menu\_mark.3x.html

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\* @Id: curs\_util.3x,v 1.26 2008/10/11 20:32:56 tom Exp @

-->

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archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/doc/html/man/curs\_util.3x.html  
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#!@SHELL@

# \$Id: run\_tic.in,v 1.23 2006/10/28 19:43:30 tom Exp \$

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#####

#

# Author: Thomas E. Dickey 1996,2000

#

# This script is used to install terminfo.src using tic. We use a script

```

# because the path checking is too awkward to do in a makefile.
#
# Assumes:
# The leaf directory names (lib, tabset, terminfo)
#
echo '** Building terminfo database, please wait...'
#
# The script is designed to be run from the misc/Makefile as
# make install.data

: ${suffix=@PROG_EXT@}
: ${DESTDIR=@DESTDIR@}
: ${prefix=@prefix@}
: ${exec_prefix=@exec_prefix@}
: ${bindir=@bindir@}
: ${top_srcdir=@top_srcdir@}
: ${srcdir=@srcdir@}
: ${datadir=@datadir@}
: ${ticdir=@TERMINFO@}
: ${source=@TERMINFO_SRC@}
: ${LN_S="@LN_S@"}
: ${THAT_CC=cc}
: ${THIS_CC=cc}
: ${ext_funcs=@NCURSES_EXT_FUNCS@}

test -z "${DESTDIR}"
&& DESTDIR=

# Allow tic to run either from the install-path, or from the build-directory.
# Do not do this if we appear to be cross-compiling. In that case, we rely
# on the host's copy of tic to compile the terminfo database.
if test "$THAT_CC" = "$THIS_CC" ; then
case "$PATH" in
:*) PATH=../progs:../lib:${DESTDIR}$bindir:$PATH ;;
*) PATH=../progs:../lib:${DESTDIR}$bindir:$PATH ;;
esac
export PATH
SHLIB="sh $srcdir/shlib"
else
# Cross-compiling, so don't set PATH or run shlib.
SHLIB=
# reset $suffix, since it applies to the target, not the build platform.
suffix=
fi

# set another env var that doesn't get reset when `shlib' runs, so `shlib' uses
# the PATH we just set.

```

```
SHLIB_PATH=$PATH
```

```
export SHLIB_PATH
```

```
# set a variable to simplify environment update in shlib
```

```
SHLIB_HOST=@host_os@
```

```
export SHLIB_HOST
```

```
# don't use user's TERMINFO variable
```

```
TERMINFO=${DESTDIR}$ticdir ; export TERMINFO
```

```
umask 022
```

```
# Construct the name of the old (obsolete) pathname, e.g., /usr/lib/terminfo.
```

```
TICDIR=`echo $TERMINFO
```

```
| sed -e 's%/share/([^\/*]*)$%/lib/1%`
```

```
# Remove the old terminfo stuff; we don't care if it existed before, and it
```

```
# would generate a lot of confusing error messages if we tried to overwrite it.
```

```
# We explicitly remove its contents rather than the directory itself, in case
```

```
# the directory is actually a symbolic link.
```

```
( test -d "$TERMINFO" && cd $TERMINFO && rm -fr ? 2>/dev/null )
```

```
if test "$ext_funcs" = 1 ; then
```

```
cat <<EOF
```

```
Running tic to install $TERMINFO ...
```

You may see messages regarding extended capabilities, e.g., AX.

These are extended terminal capabilities which are compiled

using

```
tic -x
```

If you have ncurses 4.2 applications, you should read the INSTALL

document, and install the terminfo without the -x option.

```
EOF
```

```
if ( $SHLIB tic$suffix -x -s -o $TERMINFO $source )
```

```
then
```

```
echo '** built new $TERMINFO
```

```
else
```

```
echo '? tic could not build $TERMINFO
```

```
exit 1
```

```
fi
```

```
else
```

```
cat <<EOF
```

```
Running tic to install $TERMINFO ...
```

You may see messages regarding unknown capabilities, e.g.,

AX.

These are extended terminal capabilities which may be compiled

using

tic -x

If you have ncurses 4.2 applications, you should read the INSTALL document, and install the terminfo without the -x option.

EOF

```
if ( $SHLIB tic$suffix -s -o $TERMINFO $source )
then
  echo '** built new '$TERMINFO
else
  echo '? tic could not build '$TERMINFO
  exit 1
fi
fi

# Make a symbolic link to provide compatibility with applications that expect
# to find terminfo under /usr/lib. That is, we'll _try_ to do that. Not
# all systems support symbolic links, and those that do provide a variety
# of options for 'test'.
if test "$TICDIR" != "$TERMINFO" ; then
  ( rm -f $TICDIR 2>/dev/null )
  if ( cd $TICDIR 2>/dev/null )
  then
    cd $TICDIR
    TICDIR=`pwd`
    if test $TICDIR != $TERMINFO ; then
      # Well, we tried. Some systems lie to us, so the
      # installer will have to double-check.
      echo "Verify if $TICDIR and $TERMINFO are the same."
      echo "The new terminfo is in $TERMINFO; the other should
be a link to it."
      echo "Otherwise, remove $TICDIR and link it to $TERMINFO."
    fi
  else
    cd ${DESTDIR}$prefix
    # Construct a symbolic link that only assumes $ticdir has the
    # same $prefix as the other installed directories.
    RELATIVE=`echo $ticdir|sed -e 's%^\$prefix'/%%`
    if test "$RELATIVE" != "$ticdir" ; then
      RELATIVE=../`echo $ticdir|sed -e 's%^\$prefix'/%%' -e 's%^\%`
    fi
    if ( @LN_S@ $RELATIVE $TICDIR )
    then
      echo '** sym-linked '$TICDIR' for compatibility'
    else
      echo '** could not sym-link '$TICDIR' for compatibility'
    fi
  fi
fi
fi
```

# vile:shmode

Found in path(s):

\* /opt/cola/permits/1600019816\_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-  
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/misc/run\_tic.in  
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\* @Id: curs\_ins\_wch.3x,v 1.3 2006/02/25 21:42:22 tom Exp @

-->

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archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-  
5.7/doc/html/man/curs\_ins\_wch.3x.html

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*****
* @Id: curs_outopts.3x,v 1.21 2007/06/02 20:40:07 tom Exp @
-->

```

Found in path(s):

```

* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-
5.7/doc/html/man/curs_outopts.3x.html

```

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```

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archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-
5.7/ncurses/widechar/lib_pecho_wchar.c
* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/ncurses/base/lib_insnstr.c
* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/form/f_trace.c

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\* @Id: form\_opts.3x,v 1.9 2007/02/24 17:34:36 tom Exp @

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5.7/doc/html/man/form\_opts.3x.html

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\* @Id: infotocap.1m,v 1.8 2006/12/24 20:13:56 tom Exp @  
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archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/ncurses/trace/varargs.c  
\* /opt/cola/permits/1600019816\_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-  
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/ncurses/trace/visbuf.c

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* DO NOT EDIT THIS FILE BY HAND!
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* Note: this must be run through tbl before nroff.
* The magic cookie on the first line triggers this under some man programs.
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* @Id: terminfo.head,v 1.16 2007/03/04 00:09:46 tom Exp @
* Head of terminfo man page ends here
* @Id: terminfo.tail,v 1.49 2008/02/16 20:57:43 tom Exp @
* Beginning of terminfo.tail file
* This file is part of ncurses.
* See "terminfo.head" for copyright.
*.in -2
*.in +2
*.in -2
*.in +2
*.TH
```

-->

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\* /opt/cola/permits/1600019816\_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/ncurses/base/lib\_instr.c  
\* /opt/cola/permits/1600019816\_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/form/fld\_def.c  
\* /opt/cola/permits/1600019816\_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/ncurses/base/lib\_slkset.c  
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* @Id: curs_move.3x,v 1.12 2006/02/25 21:49:19 tom Exp @
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5.7/doc/html/man/curs_move.3x.html

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/*****
* Author: Thomas E. Dickey          2002,2005
*****/

/* LINTLIBRARY */

/* ./m_attribs.c */

#include "menu.priv.h"

#undef set_menu_fore
int set_menu_fore(
    MENU *menu,
    chtype attr)
{ return(*(int *)0); }

#undef menu_fore
chtype menu_fore(
    const MENU *menu)
{ return(*(chtype *)0); }

```

```
#undef set_menu_back
int set_menu_back(
    MENU *menu,
    chtype attr)
{ return(*(int *)0); }
```

```
#undef menu_back
chtype menu_back(
    const MENU *menu)
{ return(*(chtype *)0); }
```

```
#undef set_menu_grey
int set_menu_grey(
    MENU *menu,
    chtype attr)
{ return(*(int *)0); }
```

```
#undef menu_grey
chtype menu_grey(
    const MENU *menu)
{ return(*(chtype
*)0); }
```

```
/* ./m_cursor.c */
```

```
#undef _nc_menu_cursor_pos
int _nc_menu_cursor_pos(
    const MENU *menu,
    const ITEM *item,
    int *pY,
    int *pX)
{ return(*(int *)0); }
```

```
#undef pos_menu_cursor
int pos_menu_cursor(
    const MENU *menu)
{ return(*(int *)0); }
```

```
/* ./m_driver.c */
```

```
#undef _nc_Match_Next_Character_In_Item_Name
int _nc_Match_Next_Character_In_Item_Name(
    MENU *menu,
    int ch,
    ITEM **item)
{ return(*(int *)0); }
```

```
#undef menu_driver
```



```

int menu_driver(
    MENU *menu,
    int c)
    { return(*(int *)0); }

/* ./m_format.c */

#undef set_menu_format
int set_menu_format(
    MENU *menu,
    int rows,
    int cols)
    { return(*(int *)0); }

#undef menu_format
void menu_format(
    const MENU *menu,
    int *rows,
    int *cols)
    { /* void */ }

/* ./m_global.c */

#undef _nc_Default_Menu
MENU _nc_Default_Menu;
#undef _nc_Default_Item
ITEM _nc_Default_Item;

#undef _nc_Connect_Items
NCURSES_BOOL _nc_Connect_Items(
    MENU *menu,
    ITEM **items)
    { return*(NCURSES_BOOL *)0; }

#undef
_nc_Disconnect_Items
void _nc_Disconnect_Items(
    MENU *menu)
    { /* void */ }

#undef _nc_Calculate_Text_Width
int _nc_Calculate_Text_Width(
    const TEXT *item)
    { return(*(int *)0); }

#undef _nc_Calculate_Item_Length_and_Width
void _nc_Calculate_Item_Length_and_Width(
    MENU *menu)

```

```

{ /* void */ }

#undef _nc_Link_Items
void _nc_Link_Items(
    MENU *menu)
{ /* void */ }

#undef _nc_Show_Menu
void _nc_Show_Menu(
    const MENU *menu)
{ /* void */ }

#undef _nc_New_TopRow_and_CurrentItem
void _nc_New_TopRow_and_CurrentItem(
    MENU *menu,
    int new_toprow,
    ITEM *new_current_item)
{ /* void */ }

/* ./m_hook.c */

#undef set_menu_init
int set_menu_init(
    MENU *menu,
    Menu_Hook func)
{ return(*(int *)0); }

#undef menu_init
Menu_Hook menu_init(
    const MENU *menu)
{ return(*(Menu_Hook *)0); }

#undef set_menu_term
int set_menu_term(
    MENU *menu,
    Menu_Hook func)
{ return(*(int *)0); }

#undef menu_term
Menu_Hook menu_term(
    const MENU *menu)
{ return(*(Menu_Hook
*)0); }

#undef set_item_init
int set_item_init(
    MENU *menu,
    Menu_Hook func)

```

```

    { return(*(int *)0); }

#undef item_init
Menu_Hook item_init(
    const MENU *menu)
    { return(*(Menu_Hook *)0); }

#undef set_item_term
int set_item_term(
    MENU *menu,
    Menu_Hook func)
    { return(*(int *)0); }

#undef item_term
Menu_Hook item_term(
    const MENU *menu)
    { return(*(Menu_Hook *)0); }

/* ./m_item_cur.c */

#undef set_current_item
int set_current_item(
    MENU *menu,
    ITEM *item)
    { return(*(int *)0); }

#undef current_item
ITEM *current_item(
    const MENU *menu)
    { return(*(ITEM **)0); }

#undef item_index
int item_index(
    const ITEM *item)
    { return(*(int *)0); }

/* ./m_item_nam.c */

#undef item_name
const char *item_name(
    const ITEM *item)
    { return(*(const char **)0); }

#undef item_description
const char *item_description(
    const ITEM *item)
    { return(*(const char **)0); }

```

```

/* ./m_item_new.c */

#include <wctype.h>

#undef new_item
ITEM *new_item(
    const char *name,

    const char *description)
    { return(*(ITEM **)0); }

#undef free_item
int free_item(
    ITEM *item)
    { return(*(int *)0); }

#undef set_menu_mark
int set_menu_mark(
    MENU *menu,
    const char *mark)
    { return(*(int *)0); }

#undef menu_mark
const char *menu_mark(
    const MENU *menu)
    { return(*(const char **)0); }

/* ./m_item_opt.c */

#undef set_item_opts
int set_item_opts(
    ITEM *item,
    Item_Options opts)
    { return(*(int *)0); }

#undef item_opts_off
int item_opts_off(
    ITEM *item,
    Item_Options opts)
    { return(*(int *)0); }

#undef item_opts_on
int item_opts_on(
    ITEM *item,
    Item_Options opts)
    { return(*(int *)0); }

#undef item_opts

```

```

Item_Options item_opts(
    const ITEM *item)
    { return(*(Item_Options *)0); }

/* ./m_item_top.c */

#undef set_top_row
int set_top_row(
    MENU *menu,
    int row)
    { return(*(int *)0); }

#undef top_row
int top_row(
    const MENU *menu)
    { return(*(int *)0); }

/* ./m_item_use.c */

#undef set_item_userptr
int set_item_userptr(
    ITEM *item,

    void *userptr)
    { return(*(int *)0); }

#undef item_userptr
void *item_userptr(
    const ITEM *item)
    { return(*(void **)0); }

/* ./m_item_val.c */

#undef set_item_value
int set_item_value(
    ITEM *item,
    NCURSES_BOOL value)
    { return(*(int *)0); }

#undef item_value
NCURSES_BOOL item_value(
    const ITEM *item)
    { return(*(NCURSES_BOOL *)0); }

/* ./m_item_vis.c */

#undef item_visible
NCURSES_BOOL item_visible(

```

```
const ITEM *item)
{ return(*(NCURSES_BOOL *)0); }
```

```
/* ./m_items.c */
```

```
#undef set_menu_items
int set_menu_items(
    MENU *menu,
    ITEM **items)
{ return(*(int *)0); }
```

```
#undef menu_items
ITEM **menu_items(
    const MENU *menu)
{ return(*(ITEM ***)0); }
```

```
#undef item_count
int item_count(
    const MENU *menu)
{ return(*(int *)0); }
```

```
/* ./m_new.c */
```

```
#undef new_menu
MENU *new_menu(
    ITEM **items)
{ return(*(MENU **)0); }
```

```
#undef free_menu
int free_menu(
    MENU *menu)
{ return(*(int *)0); }
```

```
/* ./m_opts.c */
```

```
#undef set_menu_opts
int set_menu_opts(
    MENU *menu,

    Menu_Options opts)
{ return(*(int *)0); }
```

```
#undef menu_opts_off
int menu_opts_off(
    MENU *menu,
    Menu_Options opts)
{ return(*(int *)0); }
```

```
#undef menu_opts_on
int menu_opts_on(
    MENU *menu,
    Menu_Options opts)
{ return(*(int *)0); }

#undef menu_opts
Menu_Options menu_opts(
    const MENU *menu)
{ return(*(Menu_Options *)0); }
```

```
/* ./m_pad.c */
```

```
#undef set_menu_pad
int set_menu_pad(
    MENU *menu,
    int pad)
{ return(*(int *)0); }
```

```
#undef menu_pad
int menu_pad(
    const MENU *menu)
{ return(*(int *)0); }
```

```
/* ./m_pattern.c */
```

```
#undef menu_pattern
char *menu_pattern(
    const MENU *menu)
{ return(*(char **)0); }
```

```
#undef set_menu_pattern
int set_menu_pattern(
    MENU *menu,
    const char *p)
{ return(*(int *)0); }
```

```
/* ./m_post.c */
```

```
#undef _nc_Post_Item
void _nc_Post_Item(
    const MENU *menu,
    const ITEM *item)
{ /* void */ }
```

```
#undef _nc_Draw_Menu
void _nc_Draw_Menu(
    const MENU *menu)
```

```

{ /* void */ }

#undef post_menu
int post_menu(
    MENU *menu)
{
    return(*(int *)0); }

#undef unpost_menu
int unpost_menu(
    MENU *menu)
{ return(*(int *)0); }

/* ./m_req_name.c */

#undef menu_request_name
const char *menu_request_name(
    int request)
{ return(*(const char **)0); }

#undef menu_request_by_name
int menu_request_by_name(
    const char *str)
{ return(*(int *)0); }

/* ./m_scale.c */

#undef scale_menu
int scale_menu(
    const MENU *menu,
    int *rows,
    int *cols)
{ return(*(int *)0); }

/* ./m_spacing.c */

#undef set_menu_spacing
int set_menu_spacing(
    MENU *menu,
    int s_desc,
    int s_row,
    int s_col)
{ return(*(int *)0); }

#undef menu_spacing
int menu_spacing(
    const MENU *menu,
    int *s_desc,

```



```

int *s_row,
int *s_col)
{ return(*(int *)0); }

/* ./m_sub.c */

#undef set_menu_sub
int set_menu_sub(
    MENU *menu,
    WINDOW *win)
{ return(*(int *)0); }

#undef menu_sub
WINDOW *menu_sub(
    const MENU *menu)
{ return(*(WINDOW **)0); }

/* ./m_trace.c */

#undef _nc_retrace_item
ITEM *_nc_retrace_item(
    ITEM *code)
{
return(*(ITEM **)0); }

#undef _nc_retrace_item_ptr
ITEM **_nc_retrace_item_ptr(
    ITEM **code)
{ return(*(ITEM ***)0); }

#undef _nc_retrace_item_opts
Item_Options _nc_retrace_item_opts(
    Item_Options code)
{ return(*(Item_Options *)0); }

#undef _nc_retrace_menu
MENU *_nc_retrace_menu(
    MENU *code)
{ return(*(MENU **)0); }

#undef _nc_retrace_menu_hook
Menu_Hook _nc_retrace_menu_hook(
    Menu_Hook code)
{ return(*(Menu_Hook *)0); }

#undef _nc_retrace_menu_opts
Menu_Options _nc_retrace_menu_opts(
    Menu_Options code)

```

```

    { return(*(Menu_Options *)0); }

/* ./m_userptr.c */

#undef set_menu_userptr
int set_menu_userptr(
    MENU *menu,
    void *userptr)
    { return(*(int *)0); }

#undef menu_userptr
void *menu_userptr(
    const MENU *menu)
    { return(*(void **)0); }

/* ./m_win.c */

#undef set_menu_win
int set_menu_win(
    MENU *menu,
    WINDOW *win)
    { return(*(int *)0); }

#undef menu_win
WINDOW *menu_win(
    const MENU *menu)
    { return(*(WINDOW **)0); }

Found
in path(s):
* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/menu/l-lib-lmenuw
No license file was found, but licenses were detected in source scan.

# quite common, but have proprietary command sets not blessed by ANSI.
# version.
# * Corrected attributions in 10.2.0 release notes.
# * restore section of pre-ncurses-4.2 changelog to fix attribution -TD

Found in path(s):
* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/misc/terminfo.src
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```

-- Author: Juergen Pfeifer, 1996

The documentation is provided in HTML format in the ./html subdirectory. The main document is named index.html

Found in path(s):

```

* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/Ada95/README
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```

```

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#####
#
# Author: Thomas E. Dickey 1996-on
#

```

```

@ base
# Library objects
hardscroll lib $(serial)
hashmap lib $(serial) ../include/term.h
lib_addch lib $(base)
lib_addstr lib $(base)
lib_beep lib $(base) ../include/term.h
lib_bkgd lib $(base)
lib_box lib $(base)
lib_chgat lib $(base)
lib_clear lib $(base)
lib_clearok lib $(base)
lib_clrbot lib $(base)
lib_cleol lib $(base)
lib_color lib $(base) ../include/term.h
lib_colorset lib $(base)
lib_delch lib $(base)
lib_delwin lib $(base)
lib_echo lib $(base)
lib_endwin lib $(base) ../include/term.h
lib_erase lib $(base)
lib_flash lib $(base) ../include/term.h
lib_gen lib . ../include/curses.h
lib_getch lib $(base)
lib_getstr lib $(base) ../include/term.h
lib_hline lib $(base)

```

lib\_immedok lib \$(base)  
lib\_inchstr lib \$(base)  
lib\_initscr lib \$(base) \$(INCDIR)/tic.h  
lib\_insch lib \$(base)  
lib\_insdel lib \$(base)  
lib\_insnstr lib \$(base)  
lib\_instr lib \$(base)  
lib\_isendwin lib \$(base)  
lib\_leaveok lib \$(base)  
lib\_mouse lib \$(base) ../include/term.h  
lib\_move lib \$(base)  
lib\_mvcur lib \$(serial) ../include/term.h  
\$(INCDIR)/tic.h  
lib\_mvwin lib \$(base)  
lib\_newterm lib \$(base) ../include/term.h  
lib\_newwin lib \$(base)  
lib\_nl lib \$(base)  
lib\_overlay lib \$(base)  
lib\_pad lib \$(base)  
lib\_printw lib \$(base)  
lib\_redrawln lib \$(base)  
lib\_refresh lib \$(base)  
lib\_restart lib \$(base) ../include/term.h  
lib\_scanw lib \$(base)  
lib\_screen lib \$(base) ../include/term.h  
lib\_scroll lib \$(base)  
lib\_scrollok lib \$(base)  
lib\_scrreg lib \$(base)  
lib\_set\_term lib \$(base) ../include/term.h  
lib\_slk lib \$(base) ../include/term.h  
lib\_slkatr\_set lib \$(base)  
lib\_slkatrof lib \$(base)  
lib\_slkatron lib \$(base)  
lib\_slkatrset lib \$(base)  
lib\_slkatr lib \$(base)  
lib\_slkclear  
lib \$(base)  
lib\_slkcolor lib \$(base)  
lib\_slkinit lib \$(base)  
lib\_slklab lib \$(base)  
lib\_slkrefr lib \$(base) ../include/term.h  
lib\_slkset lib \$(base)  
lib\_slktouch lib \$(base)  
lib\_touch lib \$(base)  
lib\_tracedmp lib \$(trace)  
lib\_tracemse lib \$(trace)  
lib\_tstp lib \$(serial) \$(srcdir)/SigAction.h  
lib\_ungetch lib \$(base)

```

lib_vidattr lib $(serial) ../include/term.h
lib_vline lib $(base)
lib_wattroff lib $(base)
lib_wattron lib $(base)
lib_winch lib $(base)
lib_window lib $(base)
link_test lib . ../include/curses.h
nc_panel lib $(base)
safe_sprintf lib $(base)
tty_update lib $(serial) ../include/term.h
varargs lib $(trace)

# Modules for porting
memmove lib $(base)
vsscanf lib $(base)

# actually an extension, but with its own configure option (--disable-leaks)
lib_freeall lib $(base)

# XSI extensions to the base library (wide-character)
@ widechar
charable lib $(wide)
lib_add_wch lib $(wide)
lib_box_set lib $(wide)
lib_cchar lib $(wide)
lib_erasewchar lib $(wide)
lib_get_wch lib $(wide)
lib_get_wstr lib $(wide)
lib_hline_set lib $(wide)
lib_in_wch lib $(wide)
lib_in_wchnstr lib $(wide)
lib_ins_wch lib $(wide)
lib_inwstr lib $(wide)
lib_key_name lib $(wide)
lib_pecho_wchar lib $(wide)
lib_slk_wset lib $(wide)
lib_unget_wch lib $(wide)
lib_vid_attr lib $(wide) ../include/term.h
lib_vline_set lib $(wide)
lib_wacs lib $(wide)
lib_wunctrl lib $(wide)

#
Extensions to the base library
@ ext_funcs
expanded lib .
legacy_coding lib $(base) ../include/term.h
lib_dft_fgbg lib $(base) ../include/term.h

```

```

lib_print lib $(tinfo) ../include/term.h
resizeterm lib $(base) ../include/term.h
trace_xnames lib $(trace) ../include/term.h $(INCDIR)/term_entry.h
use_screen lib $(tinfo)
use_window lib $(base)
wresize lib $(base) ../include/term.h

# Support for termcap (and tic, etc.), which can be a separate library
@ termlib
access lib $(tinfo)
add_tries lib $(tinfo)
alloc_ttype lib $(tinfo) ../include/term.h
$(INCDIR)/term_entry.h $(INCDIR)/tic.h
codes lib .
comp_error lib $(tinfo) $(INCDIR)/tic.h
db_iterator lib $(tinfo) $(INCDIR)/tic.h
doalloc lib $(tinfo)
entries lib $(tinfo) ../include/term.h $(INCDIR)/tic.h
fallback lib . ../include/term.h $(INCDIR)/tic.h
free_ttype lib $(tinfo) ../include/term.h $(INCDIR)/term_entry.h $(INCDIR)/tic.h
getenv_num lib $(tinfo)
home_terminfo lib $(tinfo)
init_keytry lib $(tinfo) ../include/term.h $(INCDIR)/tic.h init_keytry.h
lib_acs lib $(tinfo) ../include/term.h
lib_baudrate lib $(tinfo) ../include/term.h
lib_cur_term lib $(tinfo) ../include/term.h $(INCDIR)/term_entry.h
lib_data lib $(tinfo)
lib_has_cap lib $(tinfo) ../include/term.h
lib_kernel lib $(tinfo) ../include/term.h
lib_keyname lib . ../include/term.h
lib_longname lib $(tinfo)
lib_napms lib $(tinfo)
lib_options lib $(tinfo) ../include/term.h
lib_raw lib $(tinfo) ../include/term.h
lib_setup lib $(tinfo) ../include/term.h $(INCDIR)/term_entry.h
lib_termcap lib $(tinfo) ../include/term.h
$(INCDIR)/term_entry.h $(INCDIR)/tic.h $(INCDIR)/capdefaults.c
lib_termname lib $(tinfo) $(INCDIR)/tic.h
lib_tgoto lib $(tinfo) ../include/term.h $(INCDIR)/tic.h
lib_ti lib $(tinfo) ../include/term.h $(INCDIR)/term_entry.h $(INCDIR)/tic.h
lib_tparm lib $(tinfo) ../include/term.h $(INCDIR)/tic.h
lib_tputs lib $(tinfo) ../include/term.h $(INCDIR)/tic.h
lib_trace lib $(trace) $(INCDIR)/tic.h
lib_traceatr lib $(trace) ../include/term.h
lib_tracebits lib $(trace) ../include/term.h
lib_tracechr lib $(trace)
lib_ttyflags lib $(tinfo) ../include/term.h
lib_twait lib $(serial)

```

```

name_match lib $(tinfo) ../include/term.h $(INCDIR)/tic.h
names lib .
read_entry lib $(tinfo) ../include/term.h $(INCDIR)/term_entry.h $(INCDIR)/tic.h
read_termcap lib $(tinfo) ../include/term.h $(INCDIR)/term_entry.h $(INCDIR)/tic.h
setbuf lib $(tinfo)
strings lib $(tinfo)
trace_buf lib $(trace)
trace_tries lib $(trace)
tries lib $(base)
trim_sgr0 lib $(tinfo) ../include/term.h
$(INCDIR)/term_entry.h $(INCDIR)/tic.h
unctrl lib .
visbuf lib $(trace) $(INCDIR)/tic.h

# Modules used only for tic, other programs using internal interfaces
@ ticlib
alloc_entry lib $(tinfo) ../include/term.h $(INCDIR)/term_entry.h $(INCDIR)/tic.h
captainfo lib $(tinfo) $(INCDIR)/tic.h
comp_captab lib . $(INCDIR)/tic.h ../include/term.h ../include/hashtable.h
comp_expand lib $(tinfo) $(INCDIR)/tic.h
comp_hash lib $(tinfo) ../include/term.h $(INCDIR)/tic.h ../include/hashtable.h
comp_parse lib $(tinfo) ../include/term.h $(INCDIR)/term_entry.h $(INCDIR)/tic.h
comp_scan lib $(tinfo) $(INCDIR)/tic.h
parse_entry lib $(tinfo) ../include/term.h $(INCDIR)/term_entry.h $(INCDIR)/tic.h ../include/parametrized.h
$(INCDIR)/capdefaults.c
write_entry lib $(tinfo) ../include/term.h $(INCDIR)/term_entry.h $(INCDIR)/tic.h

# Extensions to the termlib library
@ ext_tinfo
define_key lib $(base)
hashed_db lib $(tinfo)
key_defined lib $(base)
keybound lib $(base)
keyok lib $(base)
version lib $(base)

#
vile:makemode

Found in path(s):
* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
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#####
#
# Author: Thomas E. Dickey
#
# programs used for ncurses tests
background $(LD_FLAGS_CURSES) $(LOCAL_LIBS) background
blue $(LD_FLAGS_CURSES) $(LOCAL_LIBS) blue
bs $(LD_FLAGS_CURSES) $(LOCAL_LIBS) bs
cardfile $(LD_FLAGS_DEFAULT) $(LOCAL_LIBS) cardfile
chgat $(LD_FLAGS_CURSES) $(LOCAL_LIBS) chgat
color_set $(LD_FLAGS_CURSES) $(LOCAL_LIBS) color_set
demo_altkeys $(LD_FLAGS_CURSES) $(LOCAL_LIBS) demo_altkeys
demo_defkey $(LD_FLAGS_CURSES) $(LOCAL_LIBS) demo_defkey
demo_forms $(LD_FLAGS_DEFAULT) $(LOCAL_LIBS) demo_forms edit_field
demo_keyok $(LD_FLAGS_CURSES) $(LOCAL_LIBS) demo_keyok
demo_menus $(LD_FLAGS_DEFAULT) $(LOCAL_LIBS) demo_menus
demo_panels $(LD_FLAGS_DEFAULT) $(LOCAL_LIBS) demo_panels
demo_termcap $(LD_FLAGS_TINFO) $(LOCAL_LIBS) demo_termcap
ditto $(LD_FLAGS_THREADS) $(LOCAL_LIBS) ditto
dots $(LD_FLAGS_TINFO) $(LOCAL_LIBS) dots
dots_mvcur $(LD_FLAGS_CURSES) $(LOCAL_LIBS) dots_mvcur
echochar $(LD_FLAGS_CURSES) $(LOCAL_LIBS) echochar
filter $(LD_FLAGS_CURSES) $(LOCAL_LIBS) filter

```

firework \$(LD\_FLAGS\_CURSES) \$(LOCAL\_LIBS) firework  
firstlast \$(LD\_FLAGS\_DEFAULT) \$(LOCAL\_LIBS) firstlast  
foldkeys \$(LD\_FLAGS\_CURSES) \$(LOCAL\_LIBS) foldkeys  
gdc \$(LD\_FLAGS\_CURSES) \$(LOCAL\_LIBS) gdc  
hanoi \$(LD\_FLAGS\_CURSES) \$(LOCAL\_LIBS) hanoi  
hashtest \$(LD\_FLAGS\_CURSES) \$(LOCAL\_LIBS) hashtest  
inch\_wide \$(LD\_FLAGS\_CURSES) \$(LOCAL\_LIBS) inch\_wide  
inchs \$(LD\_FLAGS\_CURSES) \$(LOCAL\_LIBS) inchs  
ins\_wide \$(LD\_FLAGS\_CURSES) \$(LOCAL\_LIBS) ins\_wide  
inserts \$(LD\_FLAGS\_CURSES) \$(LOCAL\_LIBS) inserts  
key\_names \$(LD\_FLAGS\_CURSES) \$(LOCAL\_LIBS) key\_names  
keynames \$(LD\_FLAGS\_CURSES) \$(LOCAL\_LIBS) keynames  
knight \$(LD\_FLAGS\_CURSES) \$(LOCAL\_LIBS) knight  
lrtest \$(LD\_FLAGS\_CURSES) \$(LOCAL\_LIBS) lrtest  
movewindow \$(LD\_FLAGS\_CURSES) \$(LOCAL\_LIBS) movewindow  
ncurses \$(LD\_FLAGS\_DEFAULT) \$(LOCAL\_LIBS) ncurses  
newdemo \$(LD\_FLAGS\_CURSES) \$(LOCAL\_LIBS) newdemo  
railroad \$(LD\_FLAGS\_TINFO) \$(LOCAL\_LIBS) railroad  
rain \$(LD\_FLAGS\_THREADS) \$(LOCAL\_LIBS) rain  
redraw \$(LD\_FLAGS\_CURSES) \$(LOCAL\_LIBS) redraw  
savescreen \$(LD\_FLAGS\_CURSES) \$(LOCAL\_LIBS) savescreen  
tclock \$(LD\_FLAGS\_CURSES) \$(LOCAL\_LIBS) tclock  
test\_arrays \$(LD\_FLAGS\_TINFO) \$(LOCAL\_LIBS) test\_arrays  
test\_get\_wstr \$(LD\_FLAGS\_CURSES) \$(LOCAL\_LIBS) test\_get\_wstr  
test\_getstr \$(LD\_FLAGS\_CURSES) \$(LOCAL\_LIBS) test\_getstr  
test\_instr \$(LD\_FLAGS\_CURSES) \$(LOCAL\_LIBS) test\_instr  
test\_inwstr \$(LD\_FLAGS\_CURSES) \$(LOCAL\_LIBS) test\_inwstr  
test\_opaque \$(LD\_FLAGS\_CURSES) \$(LOCAL\_LIBS) test\_opaque  
testaddch \$(LD\_FLAGS\_CURSES) \$(LOCAL\_LIBS) testaddch  
testcurs \$(LD\_FLAGS\_CURSES) \$(LOCAL\_LIBS) testcurs  
testscanw \$(LD\_FLAGS\_CURSES) \$(LOCAL\_LIBS) testscanw  
view \$(LD\_FLAGS\_CURSES) \$(LOCAL\_LIBS) view  
worm \$(LD\_FLAGS\_THREADS) \$(LOCAL\_LIBS) worm  
xmas \$(LD\_FLAGS\_CURSES) \$(LOCAL\_LIBS) xmas

#

vile:makemode

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\* /opt/cola/permits/1600019816\_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-  
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/test/programs

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```

```

*****/

```

```

/*****

```

```

* Author: Thomas E. Dickey 1996-2002,2005
*****/

```

```

/* LINTLIBRARY */

```

```

/* ./m_attribs.c */

```

```

#include "menu.priv.h"

```

```

#undef set_menu_fore

```

```

int set_menu_fore(
    MENU *menu,
    chtype attr)
{ return(*(int *)0); }

```

```

#undef menu_fore

```

```

chtype menu_fore(
    const MENU *menu)
{ return(*(chtype *)0); }

```

```

#undef set_menu_back

```

```

int set_menu_back(
    MENU *menu,

```

```

ctype attr)
{ return(*(int *)0); }

#undef menu_back
ctype menu_back(
const MENU *menu)
{ return(*(ctype *)0); }

#undef set_menu_grey
int set_menu_grey(
MENU *menu,
ctype attr)
{ return(*(int *)0); }

#undef menu_grey
ctype menu_grey(
const MENU *menu)
{ return(*(ctype
*)0); }

/* ./m_cursor.c */

#undef _nc_menu_cursor_pos
int _nc_menu_cursor_pos(
const MENU *menu,
const ITEM *item,
int *pY,
int *pX)
{ return(*(int *)0); }

#undef pos_menu_cursor
int pos_menu_cursor(
const MENU *menu)
{ return(*(int *)0); }

/* ./m_driver.c */

#undef _nc_Match_Next_Character_In_Item_Name
int _nc_Match_Next_Character_In_Item_Name(
MENU *menu,
int ch,
ITEM **item)
{ return(*(int *)0); }

#undef menu_driver
int menu_driver(
MENU *menu,
int c)

```

```

    { return(*(int *)0); }

/* ./m_format.c */

#undef set_menu_format
int set_menu_format(
    MENU *menu,
    int rows,
    int cols)
    { return(*(int *)0); }

#undef menu_format
void menu_format(
    const MENU *menu,
    int *rows,
    int *cols)
    { /* void */ }

/* ./m_global.c */

#undef _nc_Default_Menu
MENU _nc_Default_Menu;
#undef _nc_Default_Item
ITEM _nc_Default_Item;

#undef _nc_Connect_Items
NCURSES_BOOL _nc_Connect_Items(
    MENU *menu,
    ITEM **items)
    { return(*(NCURSES_BOOL *)0); }

#undef
_nc_Disconnect_Items
void _nc_Disconnect_Items(
    MENU *menu)
    { /* void */ }

#undef _nc_Calculate_Text_Width
int _nc_Calculate_Text_Width(
    const TEXT *item)
    { return(*(int *)0); }

#undef _nc_Calculate_Item_Length_and_Width
void _nc_Calculate_Item_Length_and_Width(
    MENU *menu)
    { /* void */ }

#undef _nc_Link_Items

```

```

void _nc_Link_Items(
    MENU *menu)
    { /* void */ }

#undef _nc_Show_Menu
void _nc_Show_Menu(
    const MENU *menu)
    { /* void */ }

#undef _nc_New_TopRow_and_CurrentItem
void _nc_New_TopRow_and_CurrentItem(
    MENU *menu,
    int new_toprow,
    ITEM *new_current_item)
    { /* void */ }

/* ./m_hook.c */

#undef set_menu_init
int set_menu_init(
    MENU *menu,
    Menu_Hook func)
    { return(*(int *)0); }

#undef menu_init
Menu_Hook menu_init(
    const MENU *menu)
    { return(*(Menu_Hook *)0); }

#undef set_menu_term
int set_menu_term(
    MENU *menu,
    Menu_Hook func)
    { return(*(int *)0); }

#undef menu_term
Menu_Hook menu_term(
    const MENU *menu)
    { return(*(Menu_Hook
    *)0); }

#undef set_item_init
int set_item_init(
    MENU *menu,
    Menu_Hook func)
    { return(*(int *)0); }

#undef item_init

```

```
Menu_Hook item_init(  
    const MENU *menu)  
    { return(*(Menu_Hook *)0); }
```

```
#undef set_item_term  
int set_item_term(  
    MENU *menu,  
    Menu_Hook func)  
    { return(*(int *)0); }
```

```
#undef item_term  
Menu_Hook item_term(  
    const MENU *menu)  
    { return(*(Menu_Hook *)0); }
```

```
/* ./m_item_cur.c */
```

```
#undef set_current_item  
int set_current_item(  
    MENU *menu,  
    ITEM *item)  
    { return(*(int *)0); }
```

```
#undef current_item  
ITEM *current_item(  
    const MENU *menu)  
    { return(*(ITEM **)0); }
```

```
#undef item_index  
int item_index(  
    const ITEM *item)  
    { return(*(int *)0); }
```

```
/* ./m_item_nam.c */
```

```
#undef item_name  
const char *item_name(  
    const ITEM *item)  
    { return(*(const char **)0); }
```

```
#undef item_description  
const char *item_description(  
    const ITEM *item)  
    { return(*(const char **)0); }
```

```
/* ./m_item_new.c */
```

```
#undef new_item
```

```

ITEM *new_item(
    const char *name,
    const char *description)
{
    return(*(ITEM **)0); }

#undef free_item
int free_item(
    ITEM *item)
{ return(*(int *)0); }

#undef set_menu_mark
int set_menu_mark(
    MENU *menu,
    const char *mark)
{ return(*(int *)0); }

#undef menu_mark
const char *menu_mark(
    const MENU *menu)
{ return(*(const char **)0); }

/* ./m_item_opt.c */

#undef set_item_opts
int set_item_opts(
    ITEM *item,
    Item_Options opts)
{ return(*(int *)0); }

#undef item_opts_off
int item_opts_off(
    ITEM *item,
    Item_Options opts)
{ return(*(int *)0); }

#undef item_opts_on
int item_opts_on(
    ITEM *item,
    Item_Options opts)
{ return(*(int *)0); }

#undef item_opts
Item_Options item_opts(
    const ITEM *item)
{ return(*(Item_Options *)0); }

/* ./m_item_top.c */

```



```

#undef set_top_row
int set_top_row(
    MENU *menu,
    int row)
{ return(*(int *)0); }

#undef top_row
int top_row(
    const MENU *menu)
{ return(*(int *)0); }

/* ./m_item_use.c */

#undef set_item_userptr
int set_item_userptr(
    ITEM *item,
    void *userptr)
{
    return(*(int *)0); }

#undef item_userptr
void *item_userptr(
    const ITEM *item)
{ return(*(void **)0); }

/* ./m_item_val.c */

#undef set_item_value
int set_item_value(
    ITEM *item,
    NCURSES_BOOL value)
{ return(*(int *)0); }

#undef item_value
NCURSES_BOOL item_value(
    const ITEM *item)
{ return(*(NCURSES_BOOL *)0); }

/* ./m_item_vis.c */

#undef item_visible
NCURSES_BOOL item_visible(
    const ITEM *item)
{ return(*(NCURSES_BOOL *)0); }

/* ./m_items.c */

```

```

#undef set_menu_items
int set_menu_items(
    MENU *menu,
    ITEM **items)
{ return(*(int *)0); }

#undef menu_items
ITEM **menu_items(
    const MENU *menu)
{ return(*(ITEM ***)0); }

#undef item_count
int item_count(
    const MENU *menu)
{ return(*(int *)0); }

/* ./m_new.c */

#undef new_menu
MENU *new_menu(
    ITEM **items)
{ return(*(MENU **)0); }

#undef free_menu
int free_menu(
    MENU *menu)
{ return(*(int *)0); }

/* ./m_opts.c */

#undef set_menu_opts
int set_menu_opts(
    MENU *menu,
    Menu_Options
    opts)
{ return(*(int *)0); }

#undef menu_opts_off
int menu_opts_off(
    MENU *menu,
    Menu_Options opts)
{ return(*(int *)0); }

#undef menu_opts_on
int menu_opts_on(
    MENU *menu,
    Menu_Options opts)
{ return(*(int *)0); }

```

```
#undef menu_opts
Menu_Options menu_opts(
    const MENU *menu)
    { return(*(Menu_Options *)0); }
```

```
/* ./m_pad.c */
```

```
#undef set_menu_pad
int set_menu_pad(
    MENU *menu,
    int pad)
    { return(*(int *)0); }
```

```
#undef menu_pad
int menu_pad(
    const MENU *menu)
    { return(*(int *)0); }
```

```
/* ./m_pattern.c */
```

```
#undef menu_pattern
char *menu_pattern(
    const MENU *menu)
    { return(*(char **)0); }
```

```
#undef set_menu_pattern
int set_menu_pattern(
    MENU *menu,
    const char *p)
    { return(*(int *)0); }
```

```
/* ./m_post.c */
```

```
#undef _nc_Post_Item
void _nc_Post_Item(
    const MENU *menu,
    const ITEM *item)
    { /* void */ }
```

```
#undef _nc_Draw_Menu
void _nc_Draw_Menu(
    const MENU *menu)
    { /* void */ }
```

```
#undef post_menu
int post_menu(
    MENU *menu)
```

```

    { return(*(int *)0);
  }

#undef unpost_menu
int unpost_menu(
    MENU *menu)
    { return(*(int *)0); }

/* ./m_req_name.c */

#undef menu_request_name
const char *menu_request_name(
    int request)
    { return(*(const char **)0); }

#undef menu_request_by_name
int menu_request_by_name(
    const char *str)
    { return(*(int *)0); }

/* ./m_scale.c */

#undef scale_menu
int scale_menu(
    const MENU *menu,
    int *rows,
    int *cols)
    { return(*(int *)0); }

/* ./m_spacing.c */

#undef set_menu_spacing
int set_menu_spacing(
    MENU *menu,
    int s_desc,
    int s_row,
    int s_col)
    { return(*(int *)0); }

#undef menu_spacing
int menu_spacing(
    const MENU *menu,
    int *s_desc,
    int *s_row,
    int *s_col)
    { return(*(int *)0); }

/* ./m_sub.c */

```

```

#undef set_menu_sub
int set_menu_sub(
    MENU *menu,
    WINDOW *win)
{ return(*(int *)0); }

#undef menu_sub
WINDOW *menu_sub(
    const MENU *menu)
{ return(*(WINDOW **)0); }

/* ./m_trace.c */

#undef _nc_retrace_item
ITEM *_nc_retrace_item(
    ITEM *code)
{ return(*(ITEM
***)0); }

#undef _nc_retrace_item_ptr
ITEM **_nc_retrace_item_ptr(
    ITEM **code)
{ return(*(ITEM ***)0); }

#undef _nc_retrace_item_opts
Item_Options _nc_retrace_item_opts(
    Item_Options code)
{ return(*(Item_Options *)0); }

#undef _nc_retrace_menu
MENU *_nc_retrace_menu(
    MENU *code)
{ return(*(MENU **)0); }

#undef _nc_retrace_menu_hook
Menu_Hook _nc_retrace_menu_hook(
    Menu_Hook code)
{ return(*(Menu_Hook *)0); }

#undef _nc_retrace_menu_opts
Menu_Options _nc_retrace_menu_opts(
    Menu_Options code)
{ return(*(Menu_Options *)0); }

/* ./m_userptr.c */

#undef set_menu_userptr

```

```

int set_menu_userptr(
    MENU *menu,
    void *userptr)
{ return(*(int *)0); }

#undef menu_userptr
void *menu_userptr(
    const MENU *menu)
{ return(*(void **)0); }

```

/\* ./m\_win.c \*/

```

#undef set_menu_win
int set_menu_win(
    MENU *menu,
    WINDOW *win)
{ return(*(int *)0); }

```

```

#undef menu_win
WINDOW *menu_win(
    const MENU *menu)
{ return(*(WINDOW **)0); }

```

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- \* /opt/cola/permits/1600019816\_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/ncurses/SigAction.h

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\* /opt/cola/permits/1600019816\_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/ncurses/base/lib\_slkattr.c  
\* /opt/cola/permits/1600019816\_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/ncurses/base/lib\_leaveok.c  
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\* Author: Thomas E. Dickey 2003

\* @Id: key\_defined.3x,v 1.4 2006/02/25 21:50:01 tom Exp @

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* @Id: form_data.3x,v 1.8 2006/02/25 21:38:26 tom Exp @
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archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-
5.7/doc/html/man/form_data.3x.html

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#####
# $Id: linux-color.dat,v 1.2 2006/04/22 21:40:00 tom Exp $
# These values are derived from linux/drivers/char/vt.c (default_red[],
# default_grn[] and default_blu[]), commented
/* the default colour table, for VGA+ colour systems */
scale:255
0: 0 0 0
1: 170 0 0
2: 0 170 0
3: 170 85 0
4: 0 0 170
5: 170 0 170
6: 0 170 170
7: 170 170 170
8: 85 85 85
9: 255 85 85
10: 85 255 85
11: 255 255 85
12: 85 85 255
13: 255 85 255
14: 85 255 255
15: 255 255 255

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Found in path(s):

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* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/test/linux-color.dat

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* @Id: form_page.3x,v 1.10 2006/11/04 18:52:32 tom Exp @
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archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-
5.7/doc/html/man/form_page.3x.html

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archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/ncurses/base/memmove.c
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\* @Id: mitem\_name.3x,v 1.6 2006/11/04 17:53:40 tom Exp @  
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archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-  
5.7/doc/html/man/mitem\_name.3x.html

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\* @Id: curs\_addstr.3x,v 1.13 2005/05/15 16:17:14 tom Exp @

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archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-  
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archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/ncurses/widechar/lib\_get\_wch.c  
\* /opt/cola/permits/1600019816\_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-  
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-  
5.7/ncurses/widechar/lib\_unget\_wch.c

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archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/test/demo\_defkey.c

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archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-  
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archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/ncurses/widechar/lib\_slk\_wset.c  
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archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/ncurses/base/sigaction.c  
\* /opt/cola/permits/1600019816\_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-  
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/menu/eti.h  
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curses-forms-field\_types-enumeration-ada.ads  
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overlap\_test.adb  
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\* /opt/cola/permits/1600019816\_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/Ada95/src/terminal\_interface-curses-forms-field\_types-alpha.adb

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\* /opt/cola/permits/1600019816\_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/Ada95/samples/sample-form\_demo-handler.ads

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form\_demo.adb

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\* /opt/cola/permits/1600019816\_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/Ada95/samples/ncurses2-flushinp\_test.adb

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\* /opt/cola/permits/1600019816\_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/Ada95/samples/ncurses2-color\_edit.adb

\* /opt/cola/permits/1600019816\_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/Ada95/src/terminal\_interface-curses-forms-field\_types-regex.adb

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\* /opt/cola/permits/1600019816\_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/Ada95/samples/ncurses2-slk\_test.ads

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\* /opt/cola/permits/1600019816\_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-

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*
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* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-

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/opt/cola/permits/1600019816\_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/Ada95/samples/sample-helpers.adb  
\* /opt/cola/permits/1600019816\_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/Ada95/samples/ncurses.adb  
\* /opt/cola/permits/1600019816\_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/Ada95/samples/sample-function\_key\_setting.ads  
\* /opt/cola/permits/1600019816\_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/Ada95/src/terminal\_interface-curses-aux.adb  
\*  
/opt/cola/permits/1600019816\_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/Ada95/src/terminal\_interface-curses-forms-field\_types-regexp.ads  
\* /opt/cola/permits/1600019816\_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/Ada95/samples/tour.adb  
\* /opt/cola/permits/1600019816\_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/Ada95/src/terminal\_interface-curses-menus-item\_user\_data.adb

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*****
* @Id: menu_requestname.3x,v 1.7 2006/11/04 17:56:09 tom Exp @
-->

```

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* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-
5.7/doc/html/man/menu_requestname.3x.html

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*****
* @Id: mitem_visible.3x,v 1.5 1998/11/29 01:12:55 Rick.Ohnemus Exp @
-->

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* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-
5.7/doc/html/man/mitem_visible.3x.html
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\* @Id: curs\_overlay.3x,v 1.14 2006/02/25 21:49:19 tom Exp @

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archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-  
5.7/doc/html/man/curs\_overlay.3x.html

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\$Id: announce.html,v 1.52 2008/11/02 01:05:08 tom Exp \$

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archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/doc/html/announce.html  
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\*\*\*\*\*  
\* @Id: curs\_trace.3x,v 1.8 2007/02/24 17:33:49 tom Exp @  
-->

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archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-  
5.7/doc/html/man/curs\_trace.3x.html

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*****
* @Id: form.3x,v 1.22 2008/10/11 20:48:11 tom Exp @
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archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/doc/html/man/form.3x.html
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archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/test/redraw.c
* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/ncurses/tinfo/db_iterator.c
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archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/ncurses/base/legacy\_coding.c  
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```

* Author: Thomas E. Dickey <dickey@clark.net> 1997 *
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/*
* $Id: ncurses_cfg.hin,v 1.7 2005/01/02 01:26:58 tom Exp $
*
* This is a template-file used to generate the "ncurses_cfg.h" file.
*
* Rather than list every definition, the configuration script substitutes the
* definitions that it finds using 'sed'. You need a patch (original date
* 971222) to autoconf 2.12 or 2.13 to do this.
*
* See:
* http://invisible-island.net/autoconf/
* ftp://invisible-island.net/autoconf/
*/
#ifndef NC_CONFIG_H
#define NC_CONFIG_H
@DEFS@

#include <ncurses_def.h>

/* The C compiler may not treat these properly but C++ has to */
#ifdef __cplusplus
#undef
const
#undef inline
#else
#if defined(lint) || defined	TRACE)
#undef inline
#define inline /* nothing */
#endif
#endif

/* On HP-UX, the C compiler doesn't grok mbstate_t without
-D_XOPEN_SOURCE=500. However, this causes problems on
IRIX. So, we #define mbstate_t to int in configure.in
only for the C compiler if needed. */
#ifndef __cplusplus
#ifdef NEED_MBSTATE_T_DEF
#define mbstate_t int
#endif
#endif

#endif /* NC_CONFIG_H */

Found in path(s):
* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/include/ncurses_cfg.hin

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*****
* @Id: curs_mouse.3x,v 1.30 2006/12/30 23:43:34 tom Exp @
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archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-
5.7/doc/html/man/curs_mouse.3x.html

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archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/form/fld_link.c
* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/form/fld_newftyp.c
* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/form/fld_dup.c
* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/form/fld_ftlink.c

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```
-- *- ada -*
```

```
define(HTMLNAME,`terminal_interface-curses__adb.htm')dnl
```

```
include(M4MACRO)-----
```

```

--
--          GNAT ncurses Binding          --
--
--          Terminal_Interface.Curses     --
--
--          B O D Y                        --
--
-----

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```

```

-----
-- Author: Juergen Pfeifer, 1996
-- Version Control:
-- $Revision: 1.5
$
-- $Date: 2008/07/26 18:46:32 $
-- Binding Version 01.00
-----

```

with System;

```

with Terminal_Interface.Curses.Aux;
with Interfaces.C;          use Interfaces.C;
with Interfaces.C.Strings;  use Interfaces.C.Strings;
with Ada.Characters.Handling; use Ada.Characters.Handling;
with Ada.Strings.Fixed;

```

package body Terminal\_Interface.Curses is

```

    use Aux;
    use type System.Bit_Order;

```

```

    package ASF renames Ada.Strings.Fixed;

```

```
type chtype_array is array (size_t range <>)
  of aliased Attributed_Character;
pragma Convention (C, chtype_array);
```

---

```
function Key_Name (Key : in Real_Key_Code) return String
is
```

```
  function Keyname (K : C_Int) return chars_ptr;
  pragma Import (C, Keyname, "keyname");

  Ch : Character;
begin
  if Key <= Character'Pos (Character'Last) then
    Ch := Character'Val
(Key);
    if Is_Control (Ch) then
      return Un_Control (Attributed_Character'(Ch => Ch,
        Color => Color_Pair'First,
        Attr => Normal_Video));
    elsif Is_Graphic (Ch) then
      declare
        S : String (1 .. 1);
      begin
        S (1) := Ch;
        return S;
      end;
    else
      return "";
    end if;
  else
    return Fill_String (Keyname (C_Int (Key)));
  end if;
end Key_Name;
```

```
procedure Key_Name (Key : in Real_Key_Code;
  Name : out String)
is
begin
  ASF.Move (Key_Name (Key), Name);
end Key_Name;
```

---

```
procedure Init_Screen
is
```

```
  function Initscr return Window;
  pragma Import (C, Initscr, "initscr");
```

```
  W : Window;
```

```

begin
    W := Initscr;
    if W = Null_Window then
        raise Curses_Exception;
    end if;
end Init_Screen;

procedure End_Windows
is
    function Endwin return C_Int;
    pragma Import (C, Endwin, "endwin");
begin
    if Endwin = Curses_Err then
        raise Curses_Exception;
    end if;
end End_Windows;

function Is_End_Window return Boolean
is
    function Isendwin return Curses_Bool;
    pragma Import (C, Isendwin, "isendwin");
begin
    if Isendwin = Curses_Bool_False then
        return False;
    else
        return True;
    end if;
end Is_End_Window;
-----
procedure Move_Cursor (Win : in Window := Standard_Window;
    Line : in Line_Position;
    Column : in Column_Position)
is
    function Wmove (Win : Window;
        Line : C_Int;
        Column : C_Int
    ) return C_Int;
    pragma Import (C, Wmove, "wmove");
begin
    if Wmove (Win, C_Int (Line), C_Int (Column)) = Curses_Err then
        raise Curses_Exception;
    end if;
end Move_Cursor;
-----
procedure Add (Win : in Window := Standard_Window;
    Ch : in Attributed_Character)
is

```

```

function Waddch (W : Window;
                Ch : C_Chtype) return C_Int;
pragma Import (C, Waddch, "waddch");
begin
  if Waddch (Win, AttrChar_To_Chtype (Ch)) = Curses_Err then
    raise Curses_Exception;
  end if;
end Add;

```

```

procedure Add (Win : in Window := Standard_Window;
              Ch : in Character)
is
begin
  Add (Win,
      Attributed_Character'(Ch => Ch,
                          Color => Color_Pair'First,
                          Attr => Normal_Video));
end Add;

```

```

procedure Add
(Win : in Window :=
Standard_Window;
 Line : in Line_Position;
 Column : in Column_Position;
 Ch : in Attributed_Character)
is
  function mvwaddch (W : Window;
                    Y : C_Int;
                    X : C_Int;
                    Ch : C_Chtype) return C_Int;
  pragma Import (C, mvwaddch, "mvwaddch");
begin
  if mvwaddch (Win, C_Int (Line),
              C_Int (Column),
              AttrChar_To_Chtype (Ch)) = Curses_Err then
    raise Curses_Exception;
  end if;
end Add;

```

```

procedure Add
(Win : in Window := Standard_Window;
 Line : in Line_Position;
 Column : in Column_Position;
 Ch : in Character)
is
begin
  Add (Win,
      Line,

```

```

    Column,
    Attributed_Character'(Ch => Ch,
                        Color => Color_Pair'First,
                        Attr => Normal_Video));
end Add;

procedure Add_With_Immediate_Echo
(Win :
in Window := Standard_Window;
  Ch : in Attributed_Character)
is
function Wechochar (W : Window;
                   Ch : C_Chtype) return C_Int;
pragma Import (C, Wechochar, "wechochar");
begin
if Wechochar (Win, AttrChar_To_Chtype (Ch)) = Curses_Err then
  raise Curses_Exception;
end if;
end Add_With_Immediate_Echo;

procedure Add_With_Immediate_Echo
(Win : in Window := Standard_Window;
  Ch : in Character)
is
begin
  Add_With_Immediate_Echo
  (Win,
   Attributed_Character'(Ch => Ch,
                        Color => Color_Pair'First,
                        Attr => Normal_Video));
end Add_With_Immediate_Echo;
-----
function Create (Number_Of_Lines   : Line_Count;
                Number_Of_Columns : Column_Count;
                First_Line_Position : Line_Position;
                First_Column_Position : Column_Position) return Window
is
function Newwin (Number_Of_Lines   : C_Int;
                Number_Of_Columns : C_Int;
                First_Line_Position : C_Int;
                First_Column_Position : C_Int) return Window;
pragma Import (C, Newwin, "newwin");

W : Window;
begin
W := Newwin (C_Int (Number_Of_Lines),
            C_Int (Number_Of_Columns),

```



```

        C_Int (First_Line_Position),
        C_Int (First_Column_Position));
if W = Null_Window then
    raise Curses_Exception;
end if;
return W;
end Create;

procedure Delete (Win : in out Window)
is
    function Wdelwin (W : Window) return C_Int;
    pragma Import (C, Wdelwin, "delwin");
begin
    if Wdelwin (Win) = Curses_Err then
        raise Curses_Exception;
    end if;
    Win := Null_Window;
end Delete;

function Sub_Window
(Win          : Window
:= Standard_Window;
Number_Of_Lines   : Line_Count;
Number_Of_Columns : Column_Count;
First_Line_Position : Line_Position;
First_Column_Position : Column_Position) return Window
is
    function Subwin
(Win          : Window;
Number_Of_Lines   : C_Int;
Number_Of_Columns : C_Int;
First_Line_Position : C_Int;
First_Column_Position : C_Int) return Window;
    pragma Import (C, Subwin, "subwin");

    W : Window;
begin
    W := Subwin (Win,
        C_Int (Number_Of_Lines),
        C_Int (Number_Of_Columns),
        C_Int (First_Line_Position),
        C_Int (First_Column_Position));
    if W = Null_Window then
        raise Curses_Exception;
    end if;
    return W;
end Sub_Window;

```

```

function Derived_Window
(Win          : Window := Standard_Window;
 Number_Of_Lines  : Line_Count;
 Number_Of_Columns
 : Column_Count;
 First_Line_Position : Line_Position;
 First_Column_Position : Column_Position) return Window

```

is

```

function Derwin
(Win          : Window;
 Number_Of_Lines  : C_Int;
 Number_Of_Columns  : C_Int;
 First_Line_Position : C_Int;
 First_Column_Position : C_Int) return Window;
pragma Import (C, Derwin, "derwin");

```

```

W : Window;

```

begin

```

W := Derwin (Win,
             C_Int (Number_Of_Lines),
             C_Int (Number_Of_Columns),
             C_Int (First_Line_Position),
             C_Int (First_Column_Position));

```

```

if W = Null_Window then

```

```

    raise Curses_Exception;

```

```

end if;

```

```

return W;

```

```

end Derived_Window;

```

```

function Duplicate (Win : Window) return Window

```

is

```

function Dupwin (Win : Window) return Window;
pragma Import (C, Dupwin, "dupwin");

```

```

W : constant Window := Dupwin (Win);

```

begin

```

if W = Null_Window

```

then

```

    raise Curses_Exception;

```

```

end if;

```

```

return W;

```

```

end Duplicate;

```

```

procedure Move_Window (Win  : in Window;

```

```

                    Line  : in Line_Position;

```

```

                    Column : in Column_Position)

```

is

```

function Mvwin (Win  : Window;

```

```

        Line : C_Int;
        Column : C_Int) return C_Int;
pragma Import (C, Mvwin, "mvwin");
begin
    if Mvwin (Win, C_Int (Line), C_Int (Column)) = Curses_Err then
        raise Curses_Exception;
    end if;
end Move_Window;

procedure Move_Derived_Window (Win : in Window;
                               Line : in Line_Position;
                               Column : in Column_Position)
is
    function Mvderwin (Win : Window;
                      Line : C_Int;
                      Column : C_Int) return C_Int;
pragma Import (C, Mvderwin, "mvderwin");
begin
    if Mvderwin (Win, C_Int (Line), C_Int (Column))
= Curses_Err then
        raise Curses_Exception;
    end if;
end Move_Derived_Window;

procedure Set_Synch_Mode (Win : in Window := Standard_Window;
                          Mode : in Boolean := False)
is
    function Syncok (Win : Window;
                    Mode : Curses_Bool) return C_Int;
pragma Import (C, Syncok, "syncok");
begin
    if Syncok (Win, Curses_Bool (Boolean'Pos (Mode))) = Curses_Err then
        raise Curses_Exception;
    end if;
end Set_Synch_Mode;
-----
procedure Add (Win : in Window := Standard_Window;
              Str : in String;
              Len : in Integer := -1)
is
    function Waddnstr (Win : Window;
                     Str : char_array;
                     Len : C_Int := -1) return C_Int;
pragma Import (C, Waddnstr, "waddnstr");

    Txt : char_array (0 .. Str'Length);
    Length : size_t;
begin

```

```

To_C (Str, Txt, Length);
if Waddnstr (Win, Txt, C_Int (Len)) = Curses_Err then
    raise Curses_Exception;
end if;
end Add;

```

```

procedure Add
(Win  : in Window := Standard_Window;
 Line : in Line_Position;
 Column : in Column_Position;
 Str  : in String;
 Len  : in Integer := -1)
is
begin
    Move_Cursor (Win, Line, Column);
    Add (Win, Str, Len);
end Add;

```

```

-----
procedure Add
(Win : in Window := Standard_Window;
 Str : in Attributed_String;
 Len : in Integer := -1)
is
function Waddchnstr (Win : Window;
                    Str : ctype_array;
                    Len : C_Int := -1) return C_Int;
pragma Import (C, Waddchnstr, "waddchnstr");

    Txt : ctype_array (0 .. Str'Length);
begin
    for Length in 1 .. size_t (Str'Length) loop
        Txt (Length - 1) := Str (Natural (Length));
    end loop;
    Txt (Str'Length) := Default_Character;
    if Waddchnstr (Win,
                  Txt,
                  C_Int (Len)) = Curses_Err then
        raise Curses_Exception;
    end if;
end Add;

```

```

procedure Add
(Win  : in Window := Standard_Window;
 Line : in Line_Position;
 Column : in Column_Position;
 Str  : in Attributed_String;

```

```

    Len : in Integer := -1)
is
begin
    Move_Cursor (Win, Line, Column);
    Add (Win, Str, Len);
end Add;
-----
procedure Border
(Win           : in Window := Standard_Window;
 Left_Side_Symbol : in Attributed_Character := Default_Character;
 Right_Side_Symbol : in Attributed_Character := Default_Character;
 Top_Side_Symbol  : in Attributed_Character := Default_Character;
 Bottom_Side_Symbol : in Attributed_Character := Default_Character;

Upper_Left_Corner_Symbol : in Attributed_Character := Default_Character;
Upper_Right_Corner_Symbol : in Attributed_Character := Default_Character;
Lower_Left_Corner_Symbol : in Attributed_Character := Default_Character;
Lower_Right_Corner_Symbol : in Attributed_Character := Default_Character)
is
function Wborder (W : Window;
                 LS : C_Chtype;
                 RS : C_Chtype;
                 TS : C_Chtype;
                 BS : C_Chtype;
                 ULC : C_Chtype;
                 URC : C_Chtype;
                 LLC : C_Chtype;
                 LRC : C_Chtype) return C_Int;
pragma Import (C, Wborder, "wborder");
begin
    if Wborder (Win,
               AttrChar_To_Chtype (Left_Side_Symbol),
               AttrChar_To_Chtype (Right_Side_Symbol),
               AttrChar_To_Chtype (Top_Side_Symbol),
               AttrChar_To_Chtype (Bottom_Side_Symbol),
               AttrChar_To_Chtype (Upper_Left_Corner_Symbol),
               AttrChar_To_Chtype (Upper_Right_Corner_Symbol),
               AttrChar_To_Chtype (Lower_Left_Corner_Symbol),
               AttrChar_To_Chtype (Lower_Right_Corner_Symbol)
              ) = Curses_Err
    then
        raise Curses_Exception;
    end if;
end Border;

procedure Box
(Win           : in Window := Standard_Window;
 Vertical_Symbol : in Attributed_Character := Default_Character;

```

```

Horizontal_Symbol : in Attributed_Character := Default_Character)
is
begin
    Border (Win,
            Vertical_Symbol, Vertical_Symbol,
            Horizontal_Symbol, Horizontal_Symbol);
end Box;

procedure Horizontal_Line
(Win      : in Window := Standard_Window;
 Line_Size : in Natural;
 Line_Symbol : in Attributed_Character := Default_Character)
is
function Whline (W : Window;
                Ch : C_Chtype;

                Len : C_Int) return C_Int;
pragma Import (C, Whline, "whline");
begin
    if Whline (Win,
              AttrChar_To_Chtype (Line_Symbol),
              C_Int (Line_Size)) = Curses_Err then
        raise Curses_Exception;
    end if;
end Horizontal_Line;

procedure Vertical_Line
(Win      : in Window := Standard_Window;
 Line_Size : in Natural;
 Line_Symbol : in Attributed_Character := Default_Character)
is
function Wvline (W : Window;
                Ch : C_Chtype;
                Len : C_Int) return C_Int;
pragma Import (C, Wvline, "wvline");
begin
    if Wvline (Win,
              AttrChar_To_Chtype (Line_Symbol),
              C_Int (Line_Size)) = Curses_Err then
        raise Curses_Exception;
    end if;
end Vertical_Line;

-----
function Get_Keystroke (Win : Window := Standard_Window)
return
Real_Key_Code
is

```

```

function Wgetch (W : Window) return C_Int;
pragma Import (C, Wgetch, "wgetch");

C : constant C_Int := Wgetch (Win);
begin
  if C = Curses_Err then
    return Key_None;
  else
    return Real_Key_Code (C);
  end if;
end Get_Keystroke;

procedure Undo_Keystroke (Key : in Real_Key_Code)
is
  function Ungetch (Ch : C_Int) return C_Int;
  pragma Import (C, Ungetch, "ungetch");
begin
  if Ungetch (C_Int (Key)) = Curses_Err then
    raise Curses_Exception;
  end if;
end Undo_Keystroke;

function Has_Key (Key : Special_Key_Code) return Boolean
is
  function Haskey (Key : C_Int) return C_Int;
  pragma Import (C, Haskey, "has_key");
begin
  if Haskey (C_Int (Key)) = Curses_False then
    return False;
  else
    return True;
  end if;
end Has_Key;

function Is_Function_Key (Key : Special_Key_Code) return Boolean
is
  L : constant Special_Key_Code
:= Special_Key_Code (Natural (Key_F0) +
  Natural (Function_Key_NumberLast));
begin
  if (Key >= Key_F0) and then (Key <= L) then
    return True;
  else
    return False;
  end if;
end Is_Function_Key;

function Function_Key (Key : Real_Key_Code)

```

```

        return Function_Key_Number
is
begin
    if Is_Function_Key (Key) then
        return Function_Key_Number (Key - Key_F0);
    else
        raise Constraint_Error;
    end if;
end Function_Key;

function Function_Key_Code (Key : Function_Key_Number) return Real_Key_Code
is
begin
    return Real_Key_Code (Natural (Key_F0) + Natural (Key));
end Function_Key_Code;
-----
procedure Standout (Win : Window := Standard_Window;
                   On : Boolean := True)
is
    function wstandout (Win : Window) return C_Int;
    pragma Import (C, wstandout, "wstandout");

    function wstandend (Win : Window) return C_Int;
    pragma Import (C, wstandend, "wstandend");

    Err : C_Int;
begin
    if On then
        Err := wstandout (Win);
    else
        Err := wstandend (Win);
    end if;
    if Err = Curses_Err then
        raise Curses_Exception;
    end if;
end Standout;

procedure Switch_Character_Attribute
(Win : in Window := Standard_Window;
 Attr : in Character_Attribute_Set := Normal_Video;
 On : in Boolean := True)
is
    function Wattron (Win : Window;
                    C_Attr : C_AttrType) return C_Int;
    pragma Import (C, Wattron, "wattr_on");
    function Wattroff (Win : Window;
                     C_Attr : C_AttrType) return C_Int;
    pragma Import (C, Wattroff, "wattr_off");

```



```

-- In Ada we use the On Boolean to control whether or not we want to
-- switch on or off the attributes in the set.
Err : C_Int;
AC  : constant Attributed_Character
:= (Ch => Character'First,
      Color => Color_Pair'First,
      Attr => Attr);

begin
  if On then
    Err := Wattron (Win, AttrChar_To_AttrType (AC));
  else
    Err := Wattroff (Win, AttrChar_To_AttrType (AC));
  end if;
  if Err = Curses_Err then
    raise Curses_Exception;
  end if;
end Switch_Character_Attribute;

procedure Set_Character_Attributes
(Win  : in Window := Standard_Window;
 Attr : in Character_Attribute_Set := Normal_Video;
 Color : in Color_Pair := Color_Pair'First)
is
  function Wattrset (Win  : Window;
                    C_Attr : C_AttrType) return C_Int;
  pragma Import (C, Wattrset, "wattrset"); -- ??? wattr_set
begin
  if Wattrset (Win,
              AttrChar_To_AttrType (Attributed_Character'
                                   (Ch => Character'First,
                                   Color => Color,
                                   Attr => Attr))) = Curses_Err then
    raise Curses_Exception;
  end if;
end Set_Character_Attributes;

function Get_Character_Attribute (Win : Window := Standard_Window)
  return Character_Attribute_Set
is
  function Wattrget (Win : Window;
                    Atr : access C_AttrType;
                    Col : access C_Short;
                    Opt : System.Address) return C_Int;
  pragma Import (C, Wattrget, "wattr_get");

  Attr : aliased C_AttrType;
  Col  : aliased C_Short;

```

```

Res : constant C_Int := Wattrget (Win, Attr'Access, Col'Access,
                                System.Null_Address);
Ch  : Attributed_Character;
begin
if Res = Curses_Ok then
    Ch := AttrType_To_AttrChar (Attr);
    return Ch.Attr;
else
    raise Curses_Exception;
end if;
end Get_Character_Attribute;

function Get_Character_Attribute (Win : Window := Standard_Window)
    return Color_Pair
is
function Wattrget (Win : Window;
                  Atr : access C_AttrType;
                  Col : access C_Short;
                  Opt : System.Address) return C_Int;
pragma Import (C, Wattrget, "wattr_get");

Attr : aliased C_AttrType;
Col  : aliased C_Short;
Res  : constant C_Int := Wattrget (Win, Attr'Access, Col'Access,
                                System.Null_Address);
Ch   : Attributed_Character;
begin
if Res = Curses_Ok then
    Ch := AttrType_To_AttrChar (Attr);
    return Ch.Color;
else
    raise Curses_Exception;
end if;
end Get_Character_Attribute;

procedure Set_Color (Win : in Window := Standard_Window;
                    Pair : in Color_Pair)
is
function Wset_Color (Win : Window;
                    Color : C_Short;
                    Opts : C_Void_Ptr) return C_Int;
pragma Import (C, Wset_Color, "wcolor_set");
begin
if Wset_Color (Win,
               C_Short (Pair),
               C_Void_Ptr (System.Null_Address)) = Curses_Err then
    raise Curses_Exception;

```

```

end if;
end Set_Color;

procedure Change_Attributes
(Win  : in Window := Standard_Window;
 Count : in Integer := -1;
 Attr  : in Character_Attribute_Set := Normal_Video;
 Color : in Color_Pair := Color_Pair'First)
is
function Wchgat (Win  : Window;
                Cnt  : C_Int;
                Attr  : C_AttrType;
                Color : C_Short;
                Opts  : System.Address := System.Null_Address)
return C_Int;
pragma Import (C, Wchgat, "wchgat");

Ch : constant Attributed_Character :=
    (Ch => Character'First, Color => Color_Pair'First, Attr => Attr);
begin
    if Wchgat (Win, C_Int (Count), AttrChar_To_AttrType (Ch),
              C_Short (Color)) = Curses_Err then
        raise Curses_Exception;
    end if;
end Change_Attributes;

```

```

procedure Change_Attributes
(Win  : in Window := Standard_Window;
 Line  : in Line_Position := Line_Position'First;
 Column : in Column_Position := Column_Position'First;
 Count : in Integer := -1;
 Attr  : in Character_Attribute_Set := Normal_Video;
 Color : in Color_Pair := Color_Pair'First)
is
begin
    Move_Cursor (Win, Line, Column);
    Change_Attributes (Win, Count, Attr, Color);
end Change_Attributes;

```

```

-----
procedure Beep
is
function Beeper return C_Int;
pragma Import (C, Beeper, "beep");
begin
    if Beeper = Curses_Err then
        raise Curses_Exception;
    end if;
end Beep;

```

```

procedure Flash_Screen
is
    function Flash return C_Int;
    pragma Import (C, Flash, "flash");
begin
    if Flash = Curses_Err then
        raise Curses_Exception;
    end if;
end Flash_Screen;

```

```

-----
procedure Set_Cbreak_Mode (SwitchOn : in Boolean := True)
is
    function Cbreak return C_Int;
    pragma Import (C, Cbreak, "cbreak");
    function NoCbreak return C_Int;
    pragma Import (C, NoCbreak, "nocbreak");

```

```

    Err : C_Int;
begin
    if SwitchOn then
        Err := Cbreak;
    else
        Err := NoCbreak;
    end if;
    if Err = Curses_Err then
        raise Curses_Exception;
    end if;
end Set_Cbreak_Mode;

```

```

procedure Set_Raw_Mode (SwitchOn : in Boolean := True)
is
    function Raw return C_Int;
    pragma Import (C, Raw, "raw");
    function NoRaw return C_Int;
    pragma Import (C, NoRaw, "noraw");

```

```

    Err : C_Int;
begin
    if SwitchOn then
        Err := Raw;
    else
        Err := NoRaw;
    end if;
    if Err = Curses_Err then
        raise Curses_Exception;
    end if;

```

```

end Set_Raw_Mode;

procedure Set_Echo_Mode (SwitchOn : in Boolean := True)
is
    function Echo return C_Int;
    pragma Import (C, Echo, "echo");
    function NoEcho return C_Int;
    pragma Import (C, NoEcho, "noecho");

    Err : C_Int;
begin
    if SwitchOn then
        Err := Echo;
    else
        Err := NoEcho;
    end if;
    if Err = Curses_Err then
        raise Curses_Exception;
    end if;
end Set_Echo_Mode;

procedure Set_Meta_Mode (Win    : in Window := Standard_Window;
                        SwitchOn : in Boolean := True)
is
    function Meta (W : Window; Mode : Curses_Bool) return C_Int;
    pragma Import (C, Meta, "meta");
begin
    if Meta (Win, Curses_Bool (Boolean'Pos (SwitchOn))) = Curses_Err then
        raise Curses_Exception;
    end if;
end Set_Meta_Mode;

procedure Set_KeyPad_Mode (Win
                        : in Window := Standard_Window;
                        SwitchOn : in Boolean := True)
is
    function Keypad (W : Window; Mode : Curses_Bool) return C_Int;
    pragma Import (C, Keypad, "keypad");
begin
    if Keypad (Win, Curses_Bool (Boolean'Pos (SwitchOn))) = Curses_Err then
        raise Curses_Exception;
    end if;
end Set_KeyPad_Mode;

function Get_KeyPad_Mode (Win : in Window := Standard_Window)
                        return Boolean
is
    function Is_Keypad (W : Window) return Curses_Bool;

```

```

pragma Import (C, Is_Keypad, "is_keypad");
begin
    return (Is_Keypad (Win) /= Curses_Bool_False);
end Get_KeyPad_Mode;

procedure Half_Delay (Amount : in Half_Delay_Amount)
is
    function Halfdelay (Amount : C_Int) return C_Int;
    pragma Import (C, Halfdelay, "halfdelay");
begin
    if Halfdelay (C_Int (Amount)) = Curses_Err then
        raise Curses_Exception;
    end if;
end Half_Delay;

procedure Set_Flush_On_Interrupt_Mode
(Win : in Window := Standard_Window;
Mode : in Boolean := True)
is
    function Intrflush (Win : Window; Mode : Curses_Bool) return C_Int;
    pragma Import (C, Intrflush, "intrflush");
begin
    if Intrflush (Win, Curses_Bool (Boolean'Pos (Mode))) = Curses_Err then
        raise Curses_Exception;
    end if;
end Set_Flush_On_Interrupt_Mode;

procedure Set_Queue_Interrupt_Mode
(Win : in Window := Standard_Window;
Flush : in Boolean := True)
is
    procedure Qiflush;
    pragma Import (C, Qiflush, "qiflush");
    procedure No_Qiflush;
    pragma Import (C, No_Qiflush, "noqiflush");
begin
    if Win = Null_Window then
        raise Curses_Exception;
    end if;
    if Flush then
        Qiflush;
    else
        No_Qiflush;
    end if;
end Set_Queue_Interrupt_Mode;

procedure Set_NoDelay_Mode
(Win : in Window := Standard_Window;

```

```

Mode : in Boolean := False)
is
function Nodelay
(Win : Window; Mode : Curses_Bool) return C_Int;
pragma Import (C, Nodelay, "nodelay");
begin
if Nodelay (Win, Curses_Bool (Boolean'Pos (Mode))) = Curses_Err then
raise Curses_Exception;
end if;
end Set_NoDelay_Mode;

procedure Set_Timeout_Mode (Win : in Window := Standard_Window;
Mode : in Timeout_Mode;
Amount : in Natural)
is
procedure Wtimeout (Win : Window; Amount : C_Int);
pragma Import (C, Wtimeout, "wtimeout");

Time : C_Int;
begin
case Mode is
when Blocking => Time := -1;
when Non_Blocking => Time := 0;
when Delayed =>
if Amount = 0 then
raise Constraint_Error;
end if;
Time := C_Int (Amount);
end case;
Wtimeout (Win, Time);
end Set_Timeout_Mode;

procedure Set_Escape_Timer_Mode
(Win : in Window := Standard_Window;
Timer_Off
: in Boolean := False)
is
function Notimeout (Win : Window; Mode : Curses_Bool) return C_Int;
pragma Import (C, Notimeout, "notimeout");
begin
if Notimeout (Win, Curses_Bool (Boolean'Pos (Timer_Off)))
= Curses_Err then
raise Curses_Exception;
end if;
end Set_Escape_Timer_Mode;

-----

procedure Set_NL_Mode (SwitchOn : in Boolean := True)

```

```

is
    function NL return C_Int;
    pragma Import (C, NL, "nl");
    function NoNL return C_Int;
    pragma Import (C, NoNL, "nonl");

    Err : C_Int;
begin
    if SwitchOn then
        Err := NL;
    else
        Err := NoNL;
    end if;
    if Err = Curses_Err then
        raise Curses_Exception;
    end if;
end Set_NL_Mode;

procedure Clear_On_Next_Update
    (Win    : in Window := Standard_Window;
     Do_Clear : in Boolean := True)
is
    function Clear_Ok (W : Window; Flag :
Curses_Bool) return C_Int;
    pragma Import (C, Clear_Ok, "clearok");
begin
    if Clear_Ok (Win, Curses_Bool (Boolean'Pos (Do_Clear))) = Curses_Err then
        raise Curses_Exception;
    end if;
end Clear_On_Next_Update;

procedure Use_Insert_Delete_Line
    (Win    : in Window := Standard_Window;
     Do_Idl : in Boolean := True)
is
    function IDL_Ok (W : Window; Flag : Curses_Bool) return C_Int;
    pragma Import (C, IDL_Ok, "idlok");
begin
    if IDL_Ok (Win, Curses_Bool (Boolean'Pos (Do_Idl))) = Curses_Err then
        raise Curses_Exception;
    end if;
end Use_Insert_Delete_Line;

procedure Use_Insert_Delete_Character
    (Win    : in Window := Standard_Window;
     Do_Idx : in Boolean := True)
is
    procedure IDC_Ok (W : Window; Flag : Curses_Bool);

```



```

pragma Import (C, IDC_Ok, "idcok");
begin
  IDC_Ok (Win, Curses_Bool (Boolean'Pos (Do_Idc)));
end Use_Insert_Delete_Character;

procedure Leave_Cursor_After_Update
  (Win   : in Window := Standard_Window;
   Do_Leave : in Boolean := True)
is
  function Leave_Ok (W : Window; Flag : Curses_Bool) return C_Int;
  pragma Import (C, Leave_Ok, "leaveok");
begin
  if Leave_Ok (Win, Curses_Bool (Boolean'Pos (Do_Leave))) = Curses_Err then
    raise Curses_Exception;
  end if;
end Leave_Cursor_After_Update;

procedure Immediate_Update_Mode
  (Win : in Window := Standard_Window;
   Mode : in Boolean := False)
is
  procedure Immedok (Win : Window; Mode : Curses_Bool);
  pragma Import (C, Immedok, "immedok");
begin
  Immedok (Win, Curses_Bool (Boolean'Pos (Mode)));
end Immediate_Update_Mode;

procedure Allow_Scrolling
  (Win : in Window := Standard_Window;
   Mode : in Boolean := False)
is
  function Scrollok (Win : Window; Mode : Curses_Bool) return C_Int;
  pragma Import (C, Scrollok, "scrollok");
begin
  if Scrollok (Win, Curses_Bool (Boolean'Pos (Mode)))
= Curses_Err then
    raise Curses_Exception;
  end if;
end Allow_Scrolling;

function Scrolling_Allowed (Win : Window := Standard_Window)
  return Boolean
is
  function Is_Scroll_Ok (W : Window) return Curses_Bool;
  pragma Import (C, Is_Scroll_Ok, "is_scrollok");
begin
  return (Is_Scroll_Ok (Win) /= Curses_Bool_False);
end Scrolling_Allowed;

```

```

procedure Set_Scroll_Region
  (Win      : in Window := Standard_Window;
   Top_Line : in Line_Position;
   Bottom_Line : in Line_Position)
is
  function Wsetscrreg (Win : Window;
                      Lin : C_Int;
                      Col : C_Int) return C_Int;
  pragma Import (C, Wsetscrreg, "wsetscrreg");
begin
  if Wsetscrreg (Win, C_Int (Top_Line), C_Int (Bottom_Line))
    = Curses_Err then
    raise Curses_Exception;
  end if;
end Set_Scroll_Region;

```

```

-----
procedure Update_Screen
is
  function Do_Update return C_Int;
  pragma Import (C, Do_Update, "doupdate");
begin
  if Do_Update = Curses_Err then
    raise Curses_Exception;
  end if;
end Update_Screen;

```

```

procedure Refresh (Win : in Window := Standard_Window)
is
  function Wrefresh (W : Window) return C_Int;
  pragma Import (C, Wrefresh, "wrefresh");
begin
  if Wrefresh (Win) = Curses_Err then
    raise Curses_Exception;
  end if;
end Refresh;

```

```

procedure Refresh_Without_Update
  (Win : in Window := Standard_Window)
is
  function Wnoutrefresh (W : Window) return C_Int;
  pragma Import (C, Wnoutrefresh, "wnoutrefresh");
begin
  if Wnoutrefresh (Win) = Curses_Err then
    raise Curses_Exception;
  end if;
end Refresh_Without_Update;

```

```

procedure Redraw (Win : in Window := Standard_Window)
is
    function Redrawwin (Win : Window) return C_Int;
    pragma Import (C, Redrawwin,
"redrawwin");
begin
    if Redrawwin (Win) = Curses_Err then
        raise Curses_Exception;
    end if;
end Redraw;

procedure Redraw
(Win      : in Window := Standard_Window;
 Begin_Line : in Line_Position;
 Line_Count : in Positive)
is
    function Wredrawln (Win : Window; First : C_Int; Cnt : C_Int)
        return C_Int;
    pragma Import (C, Wredrawln, "wredrawln");
begin
    if Wredrawln (Win,
        C_Int (Begin_Line),
        C_Int (Line_Count)) = Curses_Err then
        raise Curses_Exception;
    end if;
end Redraw;

```

```

-----
procedure Erase (Win : in Window := Standard_Window)
is
    function Werase (W : Window) return C_Int;
    pragma Import (C, Werase, "werase");
begin
    if Werase (Win) = Curses_Err then
        raise Curses_Exception;
    end if;
end Erase;

```

```

procedure Clear (Win
: in Window := Standard_Window)
is
    function Wclear (W : Window) return C_Int;
    pragma Import (C, Wclear, "wclear");
begin
    if Wclear (Win) = Curses_Err then
        raise Curses_Exception;
    end if;
end Clear;

```

```

procedure Clear_To_End_Of_Screen (Win : in Window := Standard_Window)
is
    function Wclearbot (W : Window) return C_Int;
    pragma Import (C, Wclearbot, "wclrtobot");
begin
    if Wclearbot (Win) = Curses_Err then
        raise Curses_Exception;
    end if;
end Clear_To_End_Of_Screen;

```

```

procedure Clear_To_End_Of_Line (Win : in Window := Standard_Window)
is
    function Wcleareol (W : Window) return C_Int;
    pragma Import (C, Wcleareol, "wclrtoeol");
begin
    if Wcleareol (Win) = Curses_Err then
        raise Curses_Exception;
    end if;
end Clear_To_End_Of_Line;

```

```

-----
procedure Set_Background
(Win : in Window := Standard_Window;
 Ch : in Attributed_Character)
is
    procedure WBackground (W : in Window; Ch : in C_Chtype);
    pragma Import (C, WBackground, "wbkgdset");
begin
    WBackground (Win, AttrChar_To_Chtype (Ch));
end Set_Background;

```

```

procedure Change_Background
(Win : in Window := Standard_Window;
 Ch : in Attributed_Character)
is
    function WChangeBkgd (W : Window; Ch : C_Chtype) return C_Int;
    pragma Import (C, WChangeBkgd, "wbkgd");
begin
    if WChangeBkgd (Win, AttrChar_To_Chtype (Ch)) = Curses_Err then
        raise Curses_Exception;
    end if;
end Change_Background;

```

```

function Get_Background (Win : Window := Standard_Window)
return Attributed_Character
is
    function Wgetbkgd (Win : Window) return C_Chtype;
    pragma Import (C, Wgetbkgd, "getbkgd");

```

```

begin
    return Chtype_To_AttrChar (Wgetbkgd (Win));
end Get_Background;
-----
procedure
Change_Lines_Status (Win : in Window := Standard_Window;
                    Start : in Line_Position;
                    Count : in Positive;
                    State : in Boolean)
is
    function Wtouchln (Win : Window;
                      Sta : C_Int;
                      Cnt : C_Int;
                      Chg : C_Int) return C_Int;
pragma Import (C, Wtouchln, "wtouchln");
begin
    if Wtouchln (Win, C_Int (Start), C_Int (Count),
                C_Int (Boolean'Pos (State))) = Curses_Err then
        raise Curses_Exception;
    end if;
end Change_Lines_Status;

procedure Touch (Win : in Window := Standard_Window)
is
    Y : Line_Position;
    X : Column_Position;
begin
    Get_Size (Win, Y, X);
    Change_Lines_Status (Win, 0, Positive (Y), True);
end Touch;

procedure Untouch (Win : in Window := Standard_Window)
is
    Y : Line_Position;
    X : Column_Position;

begin
    Get_Size (Win, Y, X);
    Change_Lines_Status (Win, 0, Positive (Y), False);
end Untouch;

procedure Touch (Win : in Window := Standard_Window;
                Start : in Line_Position;
                Count : in Positive)
is
begin
    Change_Lines_Status (Win, Start, Count, True);
end Touch;

```

```

function Is_Touched
  (Win : Window := Standard_Window;
   Line : Line_Position) return Boolean
is
  function WLineTouched (W : Window; L : C_Int) return Curses_Bool;
  pragma Import (C, WLineTouched, "is_linetouched");
begin
  if WLineTouched (Win, C_Int (Line)) = Curses_Bool_False then
    return False;
  else
    return True;
  end if;
end Is_Touched;

```

```

function Is_Touched
  (Win : Window := Standard_Window) return Boolean
is
  function WWinTouched (W : Window) return Curses_Bool;
  pragma Import (C, WWinTouched, "is_wintouched");
begin
  if WWinTouched (Win) = Curses_Bool_False then
    return False;
  else
    return True;
  end if;
end Is_Touched;

```

---

```

procedure Copy
  (Source_Window      : in Window;
   Destination_Window : in Window;
   Source_Top_Row     : in Line_Position;
   Source_Left_Column : in Column_Position;
   Destination_Top_Row : in Line_Position;
   Destination_Left_Column : in Column_Position;
   Destination_Bottom_Row : in Line_Position;
   Destination_Right_Column : in Column_Position;
   Non_Destructive_Mode : in Boolean := True)
is
  function Copywin (Src : Window;
                   Dst : Window;
                   Str : C_Int;
                   Slc : C_Int;
                   Dtr : C_Int;
                   Dlc : C_Int;
                   Dbr : C_Int;
                   Drc : C_Int;
                   Ndm : C_Int) return C_Int;

```

```

pragma Import (C, Copywin, "copywin");
begin
  if Copywin (Source_Window,
              Destination_Window,
              C_Int (Source_Top_Row),
              C_Int (Source_Left_Column),
              C_Int (Destination_Top_Row),
              C_Int (Destination_Left_Column),
              C_Int (Destination_Bottom_Row),
              C_Int (Destination_Right_Column),
              Boolean'Pos (Non_Destructive_Mode)
              ) = Curses_Err then
    raise Curses_Exception;
  end if;
end Copy;

procedure Overwrite
  (Source_Window   : in Window;
   Destination_Window : in Window)
is
  function Overwrite (Src : Window; Dst : Window) return C_Int;
  pragma Import (C, Overwrite, "overwrite");
begin
  if Overwrite (Source_Window, Destination_Window) = Curses_Err then
    raise Curses_Exception;
  end if;
end Overwrite;

procedure Overlay
  (Source_Window   : in Window;
   Destination_Window
: in Window)
is
  function Overlay (Src : Window; Dst : Window) return C_Int;
  pragma Import (C, Overlay, "overlay");
begin
  if Overlay (Source_Window, Destination_Window) = Curses_Err then
    raise Curses_Exception;
  end if;
end Overlay;

-----
procedure Insert_Delete_Lines
  (Win   : in Window := Standard_Window;
   Lines : in Integer := 1) -- default is to insert one line above
is
  function Winsdelln (W : Window; N : C_Int) return C_Int;

```

```

pragma Import (C, Winsdelln, "winsdelln");
begin
  if Winsdelln (Win, C_Int (Lines)) = Curses_Err then
    raise Curses_Exception;
  end if;
end Insert_Delete_Lines;

procedure Delete_Line (Win : in Window := Standard_Window)
is
begin
  Insert_Delete_Lines (Win, -1);
end Delete_Line;

procedure Insert_Line (Win : in Window := Standard_Window)
is
begin
  Insert_Delete_Lines
(Win, 1);
end Insert_Line;

```

```

-----
procedure Get_Size
(Win          : in Window := Standard_Window;
 Number_Of_Lines : out Line_Count;
 Number_Of_Columns : out Column_Count)
is
function GetMaxY (W : Window) return C_Int;
pragma Import (C, GetMaxY, "getmaxy");

function GetMaxX (W : Window) return C_Int;
pragma Import (C, GetMaxX, "getmaxx");

Y : constant C_Int := GetMaxY (Win)
  + C_Int (Offset_XY);
X : constant C_Int := GetMaxX (Win)
  + C_Int (Offset_XY);
begin
  Number_Of_Lines := Line_Count (Y);
  Number_Of_Columns := Column_Count (X);
end Get_Size;

```

```

procedure Get_Window_Position
(Win          : in Window := Standard_Window;
 Top_Left_Line : out Line_Position;
 Top_Left_Column : out Column_Position)
is
function GetBegY (W : Window)

```



```

return C_Int;
pragma Import (C, GetBegY, "getbegy");

function GetBegX (W : Window) return C_Int;
pragma Import (C, GetBegX, "getbegx");

Y : constant C_Short := C_Short (GetBegY (Win));
X : constant C_Short := C_Short (GetBegX (Win));
begin
Top_Left_Line := Line_Position (Y);
Top_Left_Column := Column_Position (X);
end Get_Window_Position;

procedure Get_Cursor_Position
(Win : in Window := Standard_Window;
Line : out Line_Position;
Column : out Column_Position)
is
function GetCurY (W : Window) return C_Int;
pragma Import (C, GetCurY, "getcury");

function GetCurX (W : Window) return C_Int;
pragma Import (C, GetCurX, "getcurx");

Y : constant C_Short := C_Short (GetCurY (Win));
X : constant C_Short := C_Short (GetCurX (Win));
begin
Line := Line_Position (Y);
Column := Column_Position (X);
end Get_Cursor_Position;

procedure Get-Origin_Relative_To_Parent
(Win : in Window;
Top_Left_Line : out Line_Position;
Top_Left_Column : out Column_Position;
Is_Not_A_Subwindow : out Boolean)
is
function GetParY (W : Window) return C_Int;
pragma Import (C, GetParY, "getparY");

function GetParX (W : Window) return C_Int;
pragma Import (C, GetParX, "getparX");

Y : constant C_Int := GetParY (Win);
X : constant C_Int := GetParX (Win);
begin
if Y = -1 then
Top_Left_Line := Line_Position'Last;

```

```

    Top_Left_Column := Column_Position'Last;
    Is_Not_A_Subwindow := True;
else
    Top_Left_Line := Line_Position (Y);
    Top_Left_Column := Column_Position (X);
    Is_Not_A_Subwindow := False;
end if;
end Get-Origin-Relative-To-Parent;
-----
function New_Pad (Lines : Line_Count;
                 Columns : Column_Count) return Window
is
    function Newpad (Lines : C_Int; Columns : C_Int) return Window;
    pragma Import (C, Newpad, "newpad");

    W : Window;
begin
    W := Newpad (C_Int (Lines), C_Int (Columns));
    if W = Null_Window then
        raise Curses_Exception;
    end if;
    return W;
end New_Pad;

function Sub_Pad
(Pad : Window;
 Number_Of_Lines : Line_Count;
 Number_Of_Columns : Column_Count;
 First_Line_Position : Line_Position;
 First_Column_Position : Column_Position) return Window
is
    function Subpad
(Pad : Window;
 Number_Of_Lines : C_Int;
 Number_Of_Columns : C_Int;
 First_Line_Position : C_Int;
 First_Column_Position : C_Int) return Window;
    pragma Import (C, Subpad, "subpad");

    W : Window;
begin
    W := Subpad (Pad,
                C_Int (Number_Of_Lines),
                C_Int (Number_Of_Columns),

                C_Int (First_Line_Position),
                C_Int (First_Column_Position));
    if W = Null_Window then

```

```

    raise Curses_Exception;
end if;
return W;
end Sub_Pad;

```

```

procedure Refresh

```

```

(Pad           : in Window;
 Source_Top_Row   : in Line_Position;
 Source_Left_Column : in Column_Position;
 Destination_Top_Row   : in Line_Position;
 Destination_Left_Column : in Column_Position;
 Destination_Bottom_Row : in Line_Position;
 Destination_Right_Column : in Column_Position)

```

```

is

```

```

function Prefresh

```

```

(Pad           : Window;
 Source_Top_Row   : C_Int;
 Source_Left_Column : C_Int;
 Destination_Top_Row   : C_Int;
 Destination_Left_Column : C_Int;
 Destination_Bottom_Row : C_Int;
 Destination_Right_Column : C_Int) return C_Int;

```

```

pragma Import (C, Prefresh, "prefresh");

```

```

begin

```

```

if Prefresh (Pad,
             C_Int (Source_Top_Row),
             C_Int (Source_Left_Column),
             C_Int (Destination_Top_Row),
             C_Int (Destination_Left_Column),
             C_Int (Destination_Bottom_Row),
             C_Int (Destination_Right_Column)) = Curses_Err then
    raise Curses_Exception;
end if;

```

```

end Refresh;

```

```

procedure Refresh_Without_Update

```

```

(Pad           : in Window;
 Source_Top_Row   : in Line_Position;
 Source_Left_Column : in Column_Position;
 Destination_Top_Row   : in Line_Position;
 Destination_Left_Column : in Column_Position;
 Destination_Bottom_Row : in Line_Position;
 Destination_Right_Column : in Column_Position)

```

```

is

```

```

function Pnoutrefresh

```

```

(Pad           : Window;
 Source_Top_Row   : C_Int;
 Source_Left_Column : C_Int;

```

```

    Destination_Top_Row    : C_Int;
    Destination_Left_Column
: C_Int;
    Destination_Bottom_Row : C_Int;
    Destination_Right_Column : C_Int) return C_Int;
pragma Import (C, Pnoutrefresh, "pnoutrefresh");
begin
    if Pnoutrefresh (Pad,
        C_Int (Source_Top_Row),
        C_Int (Source_Left_Column),
        C_Int (Destination_Top_Row),
        C_Int (Destination_Left_Column),
        C_Int (Destination_Bottom_Row),
        C_Int (Destination_Right_Column)) = Curses_Err then
        raise Curses_Exception;
    end if;
end Refresh_Without_Update;

procedure Add_Character_To_Pad_And_Echo_It
(Pad : in Window;
 Ch  : in Attributed_Character)
is
    function Pechochar (Pad : Window; Ch : C_Chtype)
        return C_Int;
    pragma Import (C, Pechochar, "pechochar");
begin
    if Pechochar (Pad, AttrChar_To_Chtype (Ch)) = Curses_Err then
        raise Curses_Exception;

    end if;
end Add_Character_To_Pad_And_Echo_It;

procedure Add_Character_To_Pad_And_Echo_It
(Pad : in Window;
 Ch  : in Character)
is
begin
    Add_Character_To_Pad_And_Echo_It
(Pad,
    Attributed_Character'(Ch => Ch,
        Color => Color_Pair'First,
        Attr => Normal_Video));
end Add_Character_To_Pad_And_Echo_It;
-----
procedure Scroll (Win  : in Window := Standard_Window;
    Amount : in Integer := 1)
is
    function Wscl (Win : Window; N : C_Int) return C_Int;

```

```

pragma Import (C, Wscr1, "wscr1");

begin
  if Wscr1 (Win, C_Int (Amount)) = Curses_Err then
    raise Curses_Exception;
  end if;
end Scroll;

-----

procedure Delete_Character (Win : in Window := Standard_Window)
is
  function
Wdelch (Win : Window) return C_Int;
  pragma Import (C, Wdelch, "wdelch");
begin
  if Wdelch (Win) = Curses_Err then
    raise Curses_Exception;
  end if;
end Delete_Character;

procedure Delete_Character
(Win  : in Window := Standard_Window;
 Line : in Line_Position;
 Column : in Column_Position)
is
  function Mvwdelch (Win : Window;
                    Lin : C_Int;
                    Col : C_Int) return C_Int;
  pragma Import (C, Mvwdelch, "mvwdelch");
begin
  if Mvwdelch (Win, C_Int (Line), C_Int (Column)) = Curses_Err then
    raise Curses_Exception;
  end if;
end Delete_Character;

-----

function Peek (Win : Window := Standard_Window)
  return Attributed_Character
is
  function Winch (Win : Window) return C_Chtype;
  pragma Import (C, Winch, "winch");
begin
  return Chtype_To_AttrChar (Winch (Win));
end Peek;

function Peek
(Win  : Window := Standard_Window;
 Line : Line_Position;
 Column : Column_Position) return Attributed_Character

```

```

is
function Mvwinch (Win : Window;
                 Lin : C_Int;
                 Col : C_Int) return C_Chtype;
pragma Import (C, Mvwinch, "mvwinch");
begin
return Chtype_To_AttrChar (Mvwinch (Win, C_Int (Line), C_Int (Column)));
end Peek;

```

```

-----
procedure Insert (Win : in Window := Standard_Window;
                 Ch  : in Attributed_Character)
is
function Wunsch (Win : Window; Ch : C_Chtype) return C_Int;
pragma Import (C, Wunsch, "wunsch");
begin
if Wunsch (Win, AttrChar_To_Chtype (Ch)) = Curses_Err then
raise Curses_Exception;
end if;
end Insert;

```

```

procedure Insert
(Win  : in Window := Standard_Window;
 Line : in Line_Position;
 Column : in
Column_Position;
 Ch   : in Attributed_Character)
is
function Mvwunsch (Win : Window;
                  Lin : C_Int;
                  Col : C_Int;
                  Ch  : C_Chtype) return C_Int;
pragma Import (C, Mvwunsch, "mvwunsch");
begin
if Mvwunsch (Win,
             C_Int (Line),
             C_Int (Column),
             AttrChar_To_Chtype (Ch)) = Curses_Err then
raise Curses_Exception;
end if;
end Insert;

```

```

-----
procedure Insert (Win : in Window := Standard_Window;
                 Str : in String;
                 Len : in Integer := -1)
is
function Winsnstr (Win : Window;
                  Str : char_array;
                  Len : Integer := -1) return C_Int;

```

```

pragma Import (C, Winsnstr, "winsnstr");

Txt  : char_array (0 .. Str'Length);
Length : size_t;
begin

To_C (Str, Txt, Length);
if Winsnstr (Win, Txt, Len) = Curses_Err then
    raise Curses_Exception;
end if;
end Insert;

procedure Insert
(Win  : in Window := Standard_Window;
Line  : in Line_Position;
Column : in Column_Position;
Str   : in String;
Len   : in Integer := -1)
is
function Mvwinsnstr (Win  : Window;
                    Line  : C_Int;
                    Column : C_Int;
                    Str   : char_array;
                    Len   : C_Int) return C_Int;
pragma Import (C, Mvwinsnstr, "mvwinsnstr");

Txt  : char_array (0 .. Str'Length);
Length : size_t;
begin
To_C (Str, Txt, Length);
if Mvwinsnstr (Win, C_Int (Line), C_Int (Column), Txt, C_Int (Len))
= Curses_Err then
    raise Curses_Exception;
end if;
end Insert;
-----

procedure Peek (Win
: in Window := Standard_Window;
                Str : out String;
                Len : in Integer := -1)
is
function Winnstr (Win : Window;
                 Str : char_array;
                 Len : C_Int) return C_Int;
pragma Import (C, Winnstr, "winnstr");

N : Integer := Len;
Txt : char_array (0 .. Str'Length);

```

```

    Cnt : Natural;
begin
    if N < 0 then
        N := Str'Length;
    end if;
    if N > Str'Length then
        raise Constraint_Error;
    end if;
    Txt (0) := Interfaces.C.char'First;
    if Winnstr (Win, Txt, C_Int (N)) = Curses_Err then
        raise Curses_Exception;
    end if;
    To_Ada (Txt, Str, Cnt, True);
    if Cnt < Str'Length then
        Str ((Str'First + Cnt) .. Str'Last) := (others => ' ');
    end if;
end Peek;

```

```

procedure Peek
(Win  : in Window := Standard_Window;
 Line : in Line_Position;
 Column : in Column_Position;
 Str  : out String;
 Len  : in Integer := -1)
is
begin
    Move_Cursor (Win, Line, Column);
    Peek (Win, Str, Len);
end Peek;

```

```

-----
procedure Peek
(Win : in Window := Standard_Window;
 Str : out Attributed_String;
 Len : in Integer := -1)
is
function Winchnstr (Win : Window;
                   Str : ctype_array;      -- out
                   Len : C_Int) return C_Int;
pragma Import (C, Winchnstr, "winchnstr");

```

```

    N : Integer := Len;
    Txt : constant ctype_array (0 .. Str'Length)
        := (0 => Default_Character);
    Cnt : Natural := 0;
begin
    if N < 0 then
        N := Str'Length;
    end if;

```



```

if N > Str'Length then
    raise Constraint_Error;
end if;
if Winchnstr (Win, Txt, C_Int (N)) = Curses_Err then
    raise Curses_Exception;
end if;
for To in Str'Range loop
    exit when Txt
(size_t (Cnt)) = Default_Character;
    Str (To) := Txt (size_t (Cnt));
    Cnt := Cnt + 1;
end loop;
if Cnt < Str'Length then
    Str ((Str'First + Cnt) .. Str'Last) :=
        (others => (Ch => ' ',
            Color => Color_Pair'First,
            Attr => Normal_Video));
end if;
end Peek;

```

```

procedure Peek
(Win  : in Window := Standard_Window;
Line  : in Line_Position;
Column : in Column_Position;
Str   : out Attributed_String;
Len   : in Integer := -1)
is
begin
    Move_Cursor (Win, Line, Column);
    Peek (Win, Str, Len);
end Peek;

```

```

-----
procedure Get (Win : in Window := Standard_Window;
              Str : out String;
              Len : in Integer := -1)
is
    function Wgetnstr (Win : Window;
                     Str : char_array;
                     Len : C_Int) return
C_Int;
pragma Import (C, Wgetnstr, "wgetnstr");

```

```

    N : Integer := Len;
    Txt : char_array (0 .. Str'Length);
    Cnt : Natural;
begin
    if N < 0 then
        N := Str'Length;

```

```

end if;
if N > Str'Length then
    raise Constraint_Error;
end if;
Txt (0) := Interfaces.C.char'First;
if Wgetnstr (Win, Txt, C_Int (N)) = Curses_Err then
    raise Curses_Exception;
end if;
To_Ada (Txt, Str, Cnt, True);
if Cnt < Str'Length then
    Str ((Str'First + Cnt) .. Str'Last) := (others => ' ');
end if;
end Get;

```

```

procedure Get
(Window : in Window := Standard_Window;
Line : in Line_Position;
Column : in Column_Position;
Str : out String;
Len : in Integer := -1)
is
begin
    Move_Cursor (Win, Line, Column);
    Get (Win, Str, Len);
end Get;

```

```

-----
procedure Init_Soft_Label_Keys
(Format : in Soft_Label_Key_Format := Three_Two_Three)
is
function Slk_Init (Fmt : C_Int) return C_Int;
pragma Import (C, Slk_Init, "slk_init");
begin
if Slk_Init (Soft_Label_Key_Format'Pos (Format)) = Curses_Err then
    raise Curses_Exception;
end if;
end Init_Soft_Label_Keys;

```

```

procedure Set_Soft_Label_Key (Label : in Label_Number;
Text : in String;
Fmt : in Label_Justification := Left)
is
function Slk_Set (Label : C_Int;
Txt : char_array;
Fmt : C_Int) return C_Int;
pragma Import (C, Slk_Set, "slk_set");

Txt : char_array (0 .. Text'Length);
Len : size_t;

```

```

begin
    To_C (Text, Txt, Len);
    if Slk_Set (C_Int (Label), Txt,
        C_Int (Label_Justification'Pos (Fmt))) = Curses_Err then
        raise Curses_Exception;
    end if;
end Set_Soft_Label_Key;

procedure Refresh_Soft_Label_Keys
is
    function Slk_Refresh return C_Int;
    pragma Import (C, Slk_Refresh, "slk_refresh");
begin
    if Slk_Refresh = Curses_Err then
        raise Curses_Exception;
    end if;
end Refresh_Soft_Label_Keys;

procedure Refresh_Soft_Label_Keys_Without_Update
is
    function Slk_Noutrefresh return C_Int;
    pragma Import (C, Slk_Noutrefresh, "slk_noutrefresh");
begin
    if Slk_Noutrefresh = Curses_Err then
        raise Curses_Exception;
    end if;
end Refresh_Soft_Label_Keys_Without_Update;

procedure Get_Soft_Label_Key (Label : in Label_Number;
    Text : out String)
is
    function Slk_Label (Label : C_Int) return chars_ptr;
    pragma Import (C, Slk_Label, "slk_label");
begin
    Fill_String (Slk_Label (C_Int (Label)), Text);
end Get_Soft_Label_Key;

function Get_Soft_Label_Key (Label : in Label_Number) return String
is
    function Slk_Label (Label : C_Int) return chars_ptr;
    pragma Import (C, Slk_Label, "slk_label");
begin
    return Fill_String (Slk_Label (C_Int (Label)));
end Get_Soft_Label_Key;

procedure Clear_Soft_Label_Keys
is
    function Slk_Clear return C_Int;

```

```

pragma Import (C, Slk_Clear, "slk_clear");
begin
  if Slk_Clear = Curses_Err then
    raise Curses_Exception;
  end if;
end Clear_Soft_Label_Keys;

procedure Restore_Soft_Label_Keys
is
  function Slk_Restore return C_Int;
  pragma Import (C, Slk_Restore, "slk_restore");
begin
  if Slk_Restore = Curses_Err then
    raise Curses_Exception;
  end if;
end Restore_Soft_Label_Keys;

procedure Touch_Soft_Label_Keys
is
  function Slk_Touch return C_Int;
  pragma Import (C, Slk_Touch, "slk_touch");
begin
  if Slk_Touch = Curses_Err then
    raise Curses_Exception;
  end if;
end Touch_Soft_Label_Keys;

procedure Switch_Soft_Label_Key_Attributes
(Attr : in Character_Attribute_Set;
 On   : in Boolean := True)
is
  function Slk_Attron (Ch : C_Chtype) return C_Int;
  pragma Import (C, Slk_Attron, "slk_attron");
  function Slk_Attroff (Ch : C_Chtype) return C_Int;
  pragma Import (C, Slk_Attroff, "slk_attroff");

  Err : C_Int;
  Ch  : constant Attributed_Character := (Ch => Character'First,
                                         Attr => Attr,
                                         Color => Color_Pair'First);
begin
  if On then
    Err := Slk_Attron (AttrChar_To_Chtype (Ch));
  else
    Err := Slk_Attroff (AttrChar_To_Chtype (Ch));
  end if;
  if Err = Curses_Err then
    raise Curses_Exception;

```

```

    end if;
end Switch_Soft_Label_Key_Attributes;

procedure Set_Soft_Label_Key_Attributes
(Attr : in Character_Attribute_Set := Normal_Video;
 Color : in Color_Pair := Color_Pair'First)
is
    function Slk_Attrset (Ch : C_Chtype) return C_Int;
    pragma Import
(C, Slk_Attrset, "slk_attrset");

    Ch : constant Attributed_Character := (Ch => Character'First,
                                           Attr => Attr,
                                           Color => Color);

begin
    if Slk_Attrset (AttrChar_To_Chtype (Ch)) = Curses_Err then
        raise Curses_Exception;
    end if;
end Set_Soft_Label_Key_Attributes;

function Get_Soft_Label_Key_Attributes return Character_Attribute_Set
is
    function Slk_Attr return C_Chtype;
    pragma Import (C, Slk_Attr, "slk_attr");

    Attr : constant C_Chtype := Slk_Attr;
begin
    return Chtype_To_AttrChar (Attr).Attr;
end Get_Soft_Label_Key_Attributes;

function Get_Soft_Label_Key_Attributes return Color_Pair
is
    function Slk_Attr return C_Chtype;
    pragma Import (C, Slk_Attr, "slk_attr");

    Attr : constant C_Chtype := Slk_Attr;
begin
    return Chtype_To_AttrChar (Attr).Color;
end Get_Soft_Label_Key_Attributes;

procedure
Set_Soft_Label_Key_Color (Pair : in Color_Pair)
is
    function Slk_Color (Color : in C_Short) return C_Int;
    pragma Import (C, Slk_Color, "slk_color");
begin
    if Slk_Color (C_Short (Pair)) = Curses_Err then
        raise Curses_Exception;

```

```
end if;
end Set_Soft_Label_Key_Color;
```

```
-----
procedure Enable_Key (Key   : in Special_Key_Code;
                     Enable : in Boolean := True)
is
  function Keyok (Keycode : C_Int;
                 On_Off  : Curses_Bool) return C_Int;
  pragma Import (C, Keyok, "keyok");
begin
  if Keyok (C_Int (Key), Curses_Bool (Boolean'Pos (Enable)))
  = Curses_Err then
    raise Curses_Exception;
  end if;
end Enable_Key;
```

```
-----
procedure Define_Key (Definition : in String;
                    Key         : in Special_Key_Code)
is
  function Defkey (Def : char_array;
                 Key  : C_Int) return C_Int;
  pragma Import (C, Defkey, "define_key");

  Txt   : char_array (0 .. Definition'Length);
  Length : size_t;
begin
  To_C (Definition, Txt, Length);
  if Defkey (Txt, C_Int (Key)) = Curses_Err then
    raise Curses_Exception;
  end if;
end Define_Key;
```

```
-----
procedure Un_Control (Ch : in Attributed_Character;
                    Str : out String)
is
  function Unctrl (Ch : C_Chtype) return chars_ptr;
  pragma Import (C, Unctrl, "unctrl");
begin
  Fill_String (Unctrl (AttrChar_To_Chtype (Ch)), Str);
end Un_Control;
```

```
function Un_Control (Ch : in Attributed_Character) return String
is
  function Unctrl (Ch : C_Chtype) return chars_ptr;
  pragma Import (C, Unctrl, "unctrl");
begin
  return Fill_String (Unctrl (AttrChar_To_Chtype (Ch)));
```

```

end
Un_Control;

procedure Delay_Output (Msecs : in Natural)
is
    function Delayoutput (Msecs : C_Int) return C_Int;
    pragma Import (C, Delayoutput, "delay_output");
begin
    if Delayoutput (C_Int (Msecs)) = Curses_Err then
        raise Curses_Exception;
    end if;
end Delay_Output;

procedure Flush_Input
is
    function Flushinp return C_Int;
    pragma Import (C, Flushinp, "flushinp");
begin
    if Flushinp = Curses_Err then -- docu says that never happens, but...
        raise Curses_Exception;
    end if;
end Flush_Input;
-----
function Baudrate return Natural
is
    function Baud return C_Int;
    pragma Import (C, Baud, "baudrate");
begin
    return Natural (Baud);
end Baudrate;

function Erase_Character return Character
is
    function Erasechar return C_Int;
    pragma Import (C, Erasechar, "erasechar");
begin
    return Character'Val
(Erasechar);
end Erase_Character;

function Kill_Character return Character
is
    function Killchar return C_Int;
    pragma Import (C, Killchar, "killchar");
begin
    return Character'Val (Killchar);
end Kill_Character;

```

```

function Has_Insert_Character return Boolean
is
    function Has_Ic return Curses_Bool;
    pragma Import (C, Has_Ic, "has_ic");
begin
    if Has_Ic = Curses_Bool_False then
        return False;
    else
        return True;
    end if;
end Has_Insert_Character;

function Has_Insert_Line return Boolean
is
    function Has_Il return Curses_Bool;
    pragma Import (C, Has_Il, "has_il");
begin
    if Has_Il = Curses_Bool_False then
        return False;
    else
        return True;
    end if;
end Has_Insert_Line;

function Supported_Attributes return Character_Attribute_Set
is
    function Termatrs return C_Chtype;
    pragma Import (C, Termatrs, "termatrs");

    Ch : constant
Attributed_Character := Chtype_To_AttrChar (Termatrs);
begin
    return Ch.Attr;
end Supported_Attributes;

procedure Long_Name (Name : out String)
is
    function Longname return chars_ptr;
    pragma Import (C, Longname, "longname");
begin
    Fill_String (Longname, Name);
end Long_Name;

function Long_Name return String
is
    function Longname return chars_ptr;
    pragma Import (C, Longname, "longname");
begin

```



```

    return Fill_String (Longname);
end Long_Name;

procedure Terminal_Name (Name : out String)
is
    function Termname return chars_ptr;
    pragma Import (C, Termname, "termname");
begin
    Fill_String (Termname, Name);
end Terminal_Name;

function Terminal_Name return String
is
    function Termname return chars_ptr;
    pragma Import (C, Termname, "termname");
begin
    return Fill_String (Termname);
end Terminal_Name;
-----
procedure Init_Pair (Pair : in Redefinable_Color_Pair;
                    Fore : in Color_Number;
                    Back : in Color_Number)
is
    function Initpair (Pair : C_Short;
                      Fore : C_Short;
                      Back : C_Short) return C_Int;
    pragma Import (C, Initpair, "init_pair");
begin
    if Integer (Pair) >= Number_Of_Color_Pairs then
        raise Constraint_Error;
    end if;
    if Integer (Fore) >= Number_Of_Colors or else
        Integer (Back) >= Number_Of_Colors then
        raise Constraint_Error;
    end if;
    if Initpair (C_Short (Pair), C_Short (Fore), C_Short (Back))
        = Curses_Err then
        raise Curses_Exception;
    end if;
end Init_Pair;

procedure Pair_Content (Pair : in Color_Pair;
                       Fore : out Color_Number;
                       Back : out Color_Number)
is
    type C_Short_Access is access all C_Short;
    function Paircontent

```

```

(Pair : C_Short;
    Fp : C_Short_Access;
    Bp : C_Short_Access) return C_Int;
pragma Import (C, Paircontent, "pair_content");

F, B : aliased C_Short;
begin
    if Paircontent (C_Short (Pair), F'Access, B'Access) = Curses_Err then
        raise Curses_Exception;
    else
        Fore := Color_Number (F);
        Back := Color_Number (B);
    end if;
end Pair_Content;

function Has_Colors return Boolean
is
    function Hascolors return Curses_Bool;
    pragma Import (C, Hascolors, "has_colors");
begin
    if Hascolors = Curses_Bool_False then
        return False;
    else
        return True;
    end if;
end Has_Colors;

procedure Init_Color (Color : in Color_Number;
    Red : in RGB_Value;
    Green : in RGB_Value;
    Blue : in RGB_Value)
is
    function Initcolor (Col : C_Short;
        Red : C_Short;
        Green : C_Short;
        Blue : C_Short) return C_Int;
    pragma Import (C, Initcolor, "init_color");
begin
    if Initcolor (C_Short (Color), C_Short (Red), C_Short (Green),
        C_Short (Blue)) = Curses_Err then
        raise Curses_Exception;
    end if;
end Init_Color;

function Can_Change_Color return Boolean
is
    function Canchangeolor return Curses_Bool;

```

```

pragma Import (C, Canchangecolor, "can_change_color");
begin
  if Canchangecolor = Curses_Bool_False then
    return False;
  else
    return True;
  end if;
end Can_Change_Color;

procedure Color_Content (Color : in Color_Number;
                        Red   : out RGB_Value;
                        Green : out RGB_Value;
                        Blue  : out RGB_Value)
is
  type C_Short_Access is access all C_Short;

  function Colorcontent (Color : C_Short;
                        R, G, B : C_Short_Access)
    return C_Int;
  pragma Import (C, Colorcontent, "color_content");

  R, G, B : aliased C_Short;
begin
  if Colorcontent (C_Short (Color), R'Access, G'Access, B'Access) =
    Curses_Err then
    raise Curses_Exception;
  else
    Red  := RGB_Value (R);
    Green := RGB_Value (G);
    Blue := RGB_Value (B);
  end if;
end Color_Content;

```

```

-----
procedure Save_Curses_Mode (Mode : in Curses_Mode)
is
  function Def_Prog_Mode return C_Int;
  pragma Import (C, Def_Prog_Mode, "def_prog_mode");
  function Def_Shell_Mode return C_Int;
  pragma Import (C, Def_Shell_Mode, "def_shell_mode");

  Err : C_Int;
begin
  case Mode is
    when Curses => Err := Def_Prog_Mode;
    when Shell  => Err := Def_Shell_Mode;
  end case;
  if Err = Curses_Err then

```

```

        raise Curses_Exception;
    end if;
end Save_Curses_Mode;

procedure Reset_Curses_Mode (Mode : in Curses_Mode)
is
    function Reset_Prog_Mode return C_Int;
    pragma Import (C, Reset_Prog_Mode, "reset_prog_mode");
    function Reset_Shell_Mode return C_Int;
    pragma Import (C, Reset_Shell_Mode, "reset_shell_mode");

    Err : C_Int;
begin
    case Mode is
        when Curses => Err := Reset_Prog_Mode;
        when Shell => Err := Reset_Shell_Mode;
    end case;
    if Err = Curses_Err then
        raise Curses_Exception;
    end if;
end Reset_Curses_Mode;

procedure Save_Terminal_State
is
    function Savetty return C_Int;
    pragma Import (C, Savetty, "savetty");
begin
    if Savetty = Curses_Err then
        raise Curses_Exception;
    end if;
end Save_Terminal_State;

procedure Reset_Terminal_State
is
    function Resetty return C_Int;
    pragma Import (C, Resetty, "resetty");
begin
    if Resetty = Curses_Err then
        raise Curses_Exception;
    end if;
end Reset_Terminal_State;

procedure Rip_Off_Lines (Lines : in Integer;
                        Proc : in Stdscr_Init_Proc)
is
    function Ripoffline (Lines : C_Int;
                        Proc : Stdscr_Init_Proc) return C_Int;
    pragma Import (C, Ripoffline, "_nc_ripoffline");

```

```

begin
  if Ripoffline (C_Int (Lines), Proc) = Curses_Err then
    raise Curses_Exception;
  end if;
end Rip_Off_Lines;

procedure Set_Cursor_Visibility (Visibility : in out Cursor_Visibility)
is
  function Curs_Set (Curs : C_Int) return C_Int;
  pragma Import (C, Curs_Set, "curs_set");

  Res : C_Int;
begin
  Res := Curs_Set (Cursor_Visibility'Pos (Visibility));
  if Res /= Curses_Err then
    Visibility := Cursor_Visibility'Val (Res);
  end if;
end Set_Cursor_Visibility;

procedure Nap_Milli_Seconds (Ms : in Natural)
is
  function Napms (Ms : C_Int) return C_Int;
  pragma
Import (C, Napms, "napms");
begin
  if Napms (C_Int (Ms)) = Curses_Err then
    raise Curses_Exception;
  end if;
end Nap_Milli_Seconds;

-----
include('Public_Variables')
-----

procedure Transform_Coordinates
(W      : in Window := Standard_Window;
Line   : in out Line_Position;
Column : in out Column_Position;
Dir    : in Transform_Direction := From_Screen)
is
  type Int_Access is access all C_Int;
  function Transform (W      : Window;
                    Y, X : Int_Access;
                    Dir : Curses_Bool) return C_Int;
  pragma Import (C, Transform, "wmouse_trafo");

  X : aliased C_Int := C_Int (Column);
  Y : aliased C_Int := C_Int (Line);
  D : Curses_Bool := Curses_Bool_False;
  R : C_Int;

```

```

begin
  if Dir = To_Screen then
    D
  := 1;
  end if;
  R := Transform (W, Y'Access, X'Access, D);
  if R = Curses_False then
    raise Curses_Exception;
  else
    Line := Line_Position (Y);
    Column := Column_Position (X);
  end if;
end Transform_Coordinates;
-----

procedure Use_Default_Colors is
  function C_Use_Default_Colors return C_Int;
  pragma Import (C, C_Use_Default_Colors, "use_default_colors");
  Err : constant C_Int := C_Use_Default_Colors;
begin
  if Err = Curses_Err then
    raise Curses_Exception;
  end if;
end Use_Default_Colors;

procedure Assume_Default_Colors (Fore : Color_Number := Default_Color;
                                  Back : Color_Number := Default_Color)
is
  function C_Assume_Default_Colors (Fore : C_Int;
                                     Back : C_Int) return C_Int;
  pragma Import (C, C_Assume_Default_Colors, "assume_default_colors");

  Err : constant C_Int := C_Assume_Default_Colors (C_Int (Fore),
                                                    C_Int (Back));
begin
  if Err = Curses_Err then
    raise Curses_Exception;
  end if;
end Assume_Default_Colors;
-----

function Curses_Version return String
is
  function curses_versionC return chars_ptr;
  pragma Import (C, curses_versionC, "curses_version");
  Result : constant chars_ptr := curses_versionC;
begin
  return Fill_String (Result);
end Curses_Version;
-----

```

```

procedure Curses_Free_All is
  procedure curses_freeall;
  pragma Import (C, curses_freeall, "_nc_freeall");
begin
  -- Use this only for testing: you cannot use curses after calling it,
  -- so it has to be the "last" thing done before exiting the program.
  --
  This will not really free ALL of memory used by curses. That is
  -- because it cannot free the memory used for stdout's setbuf. The
  -- _nc_free_and_exit() procedure can do that, but it can be invoked
  -- safely only from C - and again, that only as the "last" thing done
  -- before exiting the program.
  curses_freeall;
end Curses_Free_All;

```

```

-----
function Use_Extended_Names (Enable : Boolean) return Boolean
is
  function use_extended_namesC (e : Curses_Bool) return C_Int;
  pragma Import (C, use_extended_namesC, "use_extended_names");

```

```

  Res : constant C_Int :=
    use_extended_namesC (Curses_Bool (Boolean'Pos (Enable)));
begin
  if Res = C_Int (Curses_Bool_False) then
    return False;
  else
    return True;
  end if;
end Use_Extended_Names;

```

```

-----
procedure
Screen_Dump_To_File (Filename : in String)
is
  function scr_dump (f : char_array) return C_Int;
  pragma Import (C, scr_dump, "scr_dump");
  Txt  : char_array (0 .. Filename'Length);
  Length : size_t;
begin
  To_C (Filename, Txt, Length);
  if Curses_Err = scr_dump (Txt) then
    raise Curses_Exception;
  end if;
end Screen_Dump_To_File;

```

```

procedure Screen_Restore_From_File (Filename : in String)
is
  function scr_restore (f : char_array) return C_Int;
  pragma Import (C, scr_restore, "scr_restore");

```

```

    Txt : char_array (0 .. Filename'Length);
    Length : size_t;
begin
    To_C (Filename, Txt, Length);
    if Curses_Err = scr_restore (Txt) then
        raise Curses_Exception;
    end if;
end Screen_Restore_From_File;

procedure Screen_Init_From_File (Filename : in String)
is
    function scr_init (f : char_array) return C_Int;
    pragma Import (C, scr_init, "scr_init");
    Txt : char_array
(0 .. Filename'Length);
    Length : size_t;
begin
    To_C (Filename, Txt, Length);
    if Curses_Err = scr_init (Txt) then
        raise Curses_Exception;
    end if;
end Screen_Init_From_File;

procedure Screen_Set_File (Filename : in String)
is
    function scr_set (f : char_array) return C_Int;
    pragma Import (C, scr_set, "scr_set");
    Txt : char_array (0 .. Filename'Length);
    Length : size_t;
begin
    To_C (Filename, Txt, Length);
    if Curses_Err = scr_set (Txt) then
        raise Curses_Exception;
    end if;
end Screen_Set_File;

-----
procedure Resize (Win          : Window := Standard_Window;
                  Number_Of_Lines : Line_Count;
                  Number_Of_Columns : Column_Count) is
    function wresize (win : Window;
                     lines : C_Int;
                     columns : C_Int) return C_Int;
    pragma Import (C, wresize);
begin
    if wresize (Win,
               C_Int (Number_Of_Lines),
               C_Int (Number_Of_Columns)) = Curses_Err then
        raise Curses_Exception;
    end if;
end Resize;

```



end if;  
end Resize;

-----  
end Terminal\_Interface.Curses;

Found in path(s):

\* /opt/cola/permits/1600019816\_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-  
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/Ada95/gen/terminal\_interface-  
curses.adb.m4

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<!--

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\*\*\*\*\*

\* @Id: menu\_driver.3x,v 1.15 2008/06/21 21:55:30 tom Exp @

-->

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\* /opt/cola/permits/1600019816\_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-  
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-

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#####
#
# Author: Thomas Dickey
#
# $Id: Caps.aix4,v 1.7 2006/05/27 15:33:04 tom Exp $
#
# This is an adaptation of ncurses' termcap/terminfo capability table, which
# is designed to align with AIX 4.x's terminfo.
#
# This table is used to generate initializers for tables that drive tic,
# infocmp, and the library compilation code used to support the termcap
# compatibility hack. It is also used to generate the tabular portion of the
# terminfo(5) man page; lines beginning with `#%' are passed through to become
# the terminfo table.
#
# This file has three major sections; a standard-capabilities table, two
# extension-capability tables, and a section of aliases declarations.
```

```

# The first two have the same format, as follows:
#
# FILE FORMAT
#
# Column 1: terminfo variable name
# Column 2: terminfo
#           capability name
# Column 3: capability type (boolean, numeric, or string)
# Column 4: termcap capability name
# Column 5: KEY_XXX name, if any, '-' otherwise
# Column 6: value for KEY_XXX name, if any, '-' otherwise
# Column 7: Lead with 'Y' if capability should be emitted in termcap
#           translations, '-' otherwise
# Column 8: capability description
#
# The codes following [Y-] in column 7 describe the versions of termcap which
# use the given capability. This information is not used by the curses library
# proper; rather, it's there to help the terminfo maintainer avoid emitting
# termcap entry translations that are more than 1023 bytes long (and tank a
# lot of old termcap-using programs). The codes read as follows:
# B = mentioned in the BSD man page for 4.4BSD curses
# C = used by the 4.4BSD curses library
# G = mentioned in the documentation for GNU termcap
# E = used by GNU Emacs
# K = remove this terminfo capability when translating to standard format
# The important
#     codes are C and E. A cap with C or E should be preserved in
#     translation if possible. The problem is that preserving all such caps may
#     lead to some termcap translations being too long. The termcap maintainer
#     has a bit of a juggling act to do...potential problem cases are marked with
#     an asterisk (*).
#
# The aliases section has the following format:
#
# Column 1: either `capalias' or `infoalias'
# Column 2: name to be aliased
# Column 3: what name it should translate to. The name IGNORE means it
#           should be discarded with a warning message.
# Column 4: name of the extension set (used for compiler warning messages)
# Column 5: capability description (usually an associated terminfo variable)
#
# HANDLING TERMCP AND TERMINFO EXTENSIONS
#
# There are basically five different ways to handle termcap and terminfo
# extensions:
#
# 1. Don't list the capname here, or list it but comment it out (the latter
# is preferable; someone might want to handle it in the future).

```

```
If you do
# this, the capability will be treated as unknown and raise a warning from
# the compiler.
#
# 2. Alias it. This is appropriate if the capability has the same meaning
# as an already-supported one. The compiler will handle aliasing, emitting
# an appropriate informational message whenever an alias fires.
#
# 3. List it in the standard table. You almost certainly do *not* want
# to do this -- the capabilities in that one, and their order, have been
# carefully chosen to be SVr4-binary-compatible when they're written out
# as a terminfo object, and breaking this would be bad. It's up the ncurses
# library what to do with the terminfo data after it's read in.
#
# 4. List it in the aliases table with an IGNORE target field. If you
# do this, the capability will be ignored on input (though the user will
# get a warning message about it).
#
# 5. List it in the extensions table. If you do this, the compiler will
# silently accept the capability, but the curses library proper
# will never
# see it (because it won't be written out as part of the terminfo object
# format). It's up to you what you have the compiler do with it.
#
# There are two opposite reasons to choose option 5. One is when you want
# to eat the capability silently and discard it when doing translations
# to terminfo with tic -I. Some very old obsolete BSD caps like :kn: are
# in this class. Nothing will ever use them again.
#
# More usually, you want the compiler to try to deduce something from the
# capability value that it can use to translate it into your output format.
# You'll need to write custom code, probably in postprocess_termcap() or
# postprocess_terminfo(), to handle the translation.
#
# CONTROLLING ENTRY LENGTH
#
# Notes on specific elisions made to fit translations within 1023 bytes:
#
# Machines with IBM PC-like keyboards want to be able to define the following
# keys: key_npage, key_ppage, key_home, key_ll (which is used for in termcap-
# only environments for End or Home-Down),
# key_dc, and key_ic. This is also
# the set of keys the `joe' editor will be upset if it can't see. So don't
# trim those out of the set to be translated to termcap, or various users of
# the termcap file will become irate.
#
# It might look tempting to leave those long init strings out of translations.
# We can't do it (yet); 4.4BSD tput and tset use them.
```

```

#
# We retain the sgr capability in translation in spite of the fact that neither
# 4.4BSD nor GNU Emacs uses it, because (a) some entry naming distinctions are
# hard to understand without it, and (b) the entries in which it is long tend
# to be older types that don't use up a lot of string space on function keys.
# The tic(1) translation code will complain and elide it if it makes a critical
# difference (there is special code in tic to recognize this situation).
#
# Yes, BSD tset(1) uses hpa. We elide hpa/vpa anyway because the motion
# optimizer in BSD curses didn't use them. This omission seems to be the
# single
    most effective one, it shortened the resolved length of all thirteen
# problem entries in the 9.9.0 version of the terminfo master below critical.
#
# It would be nice to keep f11 and f12 for Emacs use, but a couple of termcap
# translations go back over critical if we do this. As 4.4BSD curses fades
# into history and GNU termcap's application base shrinks towards being GNU
# Emacs only, we'll probably elide out some BSD-only capabilities in order
# to buy space for non-essentials Emacs is still using. Capabilities high
# on that hit list: rc, sc, uc.
#
#####
#
# STANDARD CAPABILITIES
#
##% The following is a complete table of the capabilities included in a
##% terminfo description block and available to terminfo-using code. In each
##% line of the table,
##%
##% The \fBvariable\fR is the name by which the programmer (at the terminfo level)
##% accesses the capability.
##%
##% The \fBcapname\fR is the short name used in the
    text of the database,
##% and is used by a person updating the database.
##% Whenever possible, capnames are chosen to be the same as or similar to
##% the ANSI X3.64-1979 standard (now superseded by ECMA-48, which uses
##% identical or very similar names). Semantics are also intended to match
##% those of the specification.
##%
##% The termcap code is the old
    ##%.B termcap
##% capability name (some capabilities are new, and have names which termcap
##% did not originate).
##%.P
##% Capability names have no hard length limit, but an informal limit of 5
##% characters has been adopted to keep them short and to allow the tabs in
##% the source file

```

```

%%.B Caps
%%to line up nicely.
%%
%%Finally, the description field attempts to convey the semantics of the
%%capability. You may find some codes in the description field:
%%.TP
%%(P)
%%indicates that padding may be specified
%%.TP
%%#[1-9]
%%in the description field indicates that the string is passed through tparm with
%%parms as given (#\fli\fp).
%%.TP
%%(P*)
%%indicates
    that padding may vary in proportion to the number of
%%lines affected
%%.TP
%%(#\d\fli\fp\u)
%%indicates the \fli\fp\uth\d parameter.
%%
%%.PP
%% These are the boolean capabilities:
%%
%%.na
%%.TS H
%%center expand;
%%c 1 l c
%%c 1 l c
%%lw25 lw6 lw2 lw20.
%%\fBVariable Cap- TCap Description\fR
%%\fBBooleans name Code\fR
auto_left_margin  bw bool bw - - YB-G- cub1 wraps from column 0 to last column
auto_right_margin am bool am - - YBCGE terminal has automatic margins
no_esc_ctlc  xsb bool xb - - YBCG- beehive (f1=escape, f2=ctrl C)
ceol_standout_glitch  xhp bool xs - - YBCGE standout not erased by overwriting (hp)
eat_newline_glitch  xenl bool xn - - YBCGE newline ignored after 80 cols (concept)
erase_overstrike  eo bool eo - - YBCG- can erase overstrikes with a blank
generic_type  gn bool gn - - YB-G- generic line type
hard_copy  hc bool hc - - YBCG- hardcopy terminal
has_meta_key  km bool km - - YB-GE Has a meta key (i.e., sets 8th-bit)
has_status_line  hs bool hs - - YB-G- has
    extra status line
insert_null_glitch  in bool in - - YBCGE insert mode distinguishes nulls
memory_above  da bool da - - YBCG- display may be retained above the screen
memory_below  db bool db - - YB-GE display may be retained below the screen
move_insert_mode  mir bool mi - - YBCGE safe to move while in insert mode
move_standout_mode  msgr bool ms - - YBCGE safe to move while in standout mode

```

over\_strike os bool os - - YBCG- terminal can overstrike  
status\_line\_esc\_ok eslok bool es - - YB-G- escape can be used on the status line  
dest\_tabs\_magic\_sms0 xt bool xt - - YBCGE tabs destructive, magic so char (t1061)  
tilde\_glitch hz bool hz - - YB-GE cannot print ~'s (hazeltine)  
transparent\_underline ul bool ul - - YBCGE underline character overstrikes  
xon\_xoff xon bool xo - - YB--- terminal uses xon/xoff handshaking  
needs\_xon\_xoff nxon bool nx - - ----- padding will not work, xon/xoff required  
prtr\_silent me5i bool 5i - - ----- printer will not echo on screen  
hard\_cursor chts bool HC - - ----- cursor  
is hard to see  
non\_rev\_rmcup nrrmc bool NR - - ----- smcup does not reverse rmcup  
no\_pad\_char npc bool NP - - ----- pad character does not exist  
non\_dest\_scroll\_region ndscr bool ND - - ----- scrolling region is non-destructive  
can\_change ccc bool cc - - ----- terminal can re-define existing colors  
back\_color\_erase bce bool ut - - ----- screen erased with background color  
hue\_lightness\_saturation hls bool hl - - ----- terminal uses only HLS color notation (Tektronix)  
col\_addr\_glitch xhpa bool YA - - ----- only positive motion for hpa/mhpa caps  
cr\_cancels\_micro\_mode crxm bool YB - - ----- using cr turns off micro mode  
has\_print\_wheel daisy bool YC - - ----- printer needs operator to change character set  
row\_addr\_glitch xvpa bool YD - - ----- only positive motion for vpa/mvpa caps  
semi\_auto\_right\_margin sam bool YE - - ----- printing in last column causes cr  
cpi\_changes\_res cpix bool YF - - ----- changing character pitch changes resolution  
lpi\_changes\_res lpix bool YG - - ----- changing  
line pitch changes resolution  
#%.TE  
#%.ad  
#%  
#% These are the numeric capabilities:  
#%  
#%.na  
#%.TS H  
#%center expand;  
#%c 1 l c  
#%c 1 l c  
#%lw25 lw6 lw2 lw20.  
#%\fBVariable Cap- TCap Description\fR  
#%\fBNumeric name Code\fR  
columns cols num co - - YBCGE number of columns in a line  
init\_tabs it num it - - YB-G- tabs initially every # spaces  
lines lines num li - - YBCGE number of lines on screen or page  
lines\_of\_memory lm num lm - - YB-G- lines of memory if > line. 0 means varies  
magic\_cookie\_glitch xmc num sg - - YBCGE number of blank characters left by sms0 or rms0  
padding\_baud\_rate pb num pb - - YB-GE lowest baud rate where padding needed  
virtual\_terminal vt num vt - - YB--- virtual terminal number (CB/unix)  
width\_status\_line wsl num ws - - YB-G- number of columns in status line  
num\_labels nlab num NI - - ----- number of labels on screen  
label\_height lh num lh - - ----- rows in each label  
label\_width lw num lw - - ----- columns

```

in each label
max_attributes  ma num ma - - YBC-- maximum combined attributes terminal can handle
maximum_windows  wnum num MW - - ----- maximum number of defineable windows
# These came in with SVr4's color support
max_colors  colors num Co - - ----- maximum number of colors on screen
max_pairs  pairs num pa - - ----- maximum number of color-pairs on the screen
no_color_video  ncv num NC - - ----- video attributes that cannot be used with colors
#%.TE
#%.ad
#%
#%The following numeric capabilities are present in the SVr4.0 term structure,
#%but are not yet documented in the man page.  They came in with SVr4's
#%printer support.
#%
#%.na
#%.TS H
#%center expand;
#%c 1 l c
#%c 1 l c
#%lw25 lw6 lw2 lw20.
#%\fBVariable Cap- TCap Description\fR
#%\fBNumeric name Code\fR
buffer_capacity  bufisz num Ya - - ----- numbers of bytes buffered before printing
dot_vert_spacing  spinv num Yb - - ----- spacing of pins vertically in pins per inch
dot_horz_spacing  spinh num Yc - - ----- spacing
of dots horizontally in dots per inch
max_micro_address  maddr num Yd - - ----- maximum value in micro_..._address
max_micro_jump  mjump num Ye - - ----- maximum value in parm_..._micro
micro_col_size  mcs num Yf - - ----- character step size when in micro mode
micro_line_size  mls num Yg - - ----- line step size when in micro mode
number_of_pins  npins num Yh - - ----- numbers of pins in print-head
output_res_char  orc num Yi - - ----- horizontal resolution in units per line
output_res_line  orl num Yj - - ----- vertical resolution in units per line
output_res_horz_inch  orhi num Yk - - ----- horizontal resolution in units per inch
output_res_vert_inch  orvi num Yl - - ----- vertical resolution in units per inch
print_rate  cps num Ym - - ----- print rate in characters per second
wide_char_size  widcs num Yn - - ----- character step size when in double wide mode
buttons  btns num BT - - ----- number of buttons on mouse
bit_image_entwining  bitwin num Yo - - ----- number
of passes for each bit-image row
bit_image_type  bitype num Yp - - ----- type of bit-image device
#%.TE
#%.ad
#%
#%These are the string capabilities:
#%
#%.na
#%.TS H

```



```

%%center expand;
%%c l l c
%%c l l c
%%lw25 lw6 lw2 lw20.
%%\fBVariable Cap- TCap Description\fR
%%\fBString name Code\fR
back_tab cbt str bt - - YBCGE back tab (P)
bell bel str bl - - YB-GE audible signal (bell) (P)
carriage_return cr str cr - - YBCGE carriage return (P*) (P*)
change_scroll_region csr str cs - - YBCGE change region to line #1 to line #2 (P)
clear_all_tabs tbc str ct - - YB-G- clear all tab stops (P)
clear_screen clear str cl - - YBCGE clear screen and home cursor (P*)
clr_eol el str ce - - YBCGE clear to end of line (P)
clr_eos ed str cd - - YBCGE clear to end of screen (P*)
column_address hpa str ch - - -B-GE* horizontal position #1, absolute (P)
command_character cmdch str CC - - YB-G- terminal settable cmd character in prototype !?
cursor_address cup str cm - - YBCGE move
to row #1 columns #2
cursor_down cudl str do - - YBCGE down one line
cursor_home home str ho - - YBCGE home cursor (if no cup)
cursor_invisible civis str vi - - YB-G- make cursor invisible
cursor_left cubl str le - - YBCGE move left one space
cursor_mem_address mrcup str CM - - YB-G- memory relative cursor addressing, move to row #1 columns #2
cursor_normal cnorm str ve - - YBCGE make cursor appear normal (undo civis/cvvis)
cursor_right cuf1 str nd - - YBCGE non-destructive space (move right one space)
cursor_to_ll ll str ll - - YBCGE last line, first column (if no cup)
cursor_up cuu1 str up - - YBCGE up one line
cursor_visible cvvis str vs - - YBCGE make cursor very visible
delete_character dch1 str dc - - YBCGE delete character (P*)
delete_line dl1 str dl - - YBCGE delete line (P*)
dis_status_line dsl str ds - - YB-G- disable status line
down_half_line hd str hd - - YB-G- half a line down
enter_alt_charset_mode smacs str as - - YB-G- start
alternate character set (P)
enter_blink_mode blink str mb - - YB-G- turn on blinking
enter_bold_mode bold str md - - YB-G- turn on bold (extra bright) mode
enter_ca_mode smcup str ti - - YBCGE string to start programs using cup
enter_delete_mode smdc str dm - - YBCGE enter delete mode
enter_dim_mode dim str mh - - YB-G- turn on half-bright mode
enter_insert_mode smir str im - - YBCGE enter insert mode
enter_secure_mode invis str mk - - -B-G-* turn on blank mode (characters invisible)
enter_protected_mode prot str mp - - -B-G-* turn on protected mode
enter_reverse_mode rev str mr - - YB-G- turn on reverse video mode
enter_standout_mode smso str so - - YBCGE begin standout mode
enter_underline_mode smul str us - - YBCGE begin underline mode
erase_chars ech str ec - - YB-G- erase #1 characters (P)
exit_alt_charset_mode rmacs str ae - - YB-G- end alternate character set (P)
exit_attribute_mode sgr0 str me - - YB-GE turn off all attributes

```

exit\_ca\_mode rmcup str te - - YBCGE strings  
 to end programs using cup  
 exit\_delete\_mode rmdc str ed - - YBCGE end delete mode  
 exit\_insert\_mode rmir str ei - - YBCGE exit insert mode  
 exit\_standout\_mode rmso str se - - YBCGE exit standout mode  
 exit\_underline\_mode rmul str ue - - YBCGE exit underline mode  
 flash\_screen flash str vb - - YBCGE visible bell (may not move cursor)  
 form\_feed ff str ff - - YB-G- hardcopy terminal page eject (P\*)  
 from\_status\_line fsl str fs - - YB-G- return from status line  
 init\_1string is1 str i1 - - YB-G- initialization string  
 init\_2string is2 str is - - YB-G- initialization string  
 init\_3string is3 str i3 - - YB-G- initialization string  
 init\_file if str if - - YB-G- name of initialization file  
 insert\_character ich1 str ic - - YBCGE insert character (P)  
 insert\_line il1 str al - - YBCGE insert line (P\*)  
 insert\_padding ip str ip - - YBCGE insert padding after inserted character  
 key\_backspace kbs str kb KEY\_BACKSPACE 0407 YB-G- backspace  
 key  
 key\_catab ktbc str ka KEY\_CATAB 0526 -B-G-\* clear-all-tabs key  
 key\_clear kclr str kC KEY\_CLEAR 0515 -B-G-\* clear-screen or erase key  
 key\_ctab kctab str kt KEY\_CTAB 0525 -B-G-\* clear-tab key  
 key\_dc kdch1 str kD KEY\_DC 0512 YB-G- delete-character key  
 key\_dl kdl1 str kL KEY\_DL 0510 -B-G-\* delete-line key  
 key\_down kcuD1 str kd KEY\_DOWN 0402 YBCGE down-arrow key  
 key\_eic krmir str kM KEY\_EIC 0514 -B-G-\* sent by rmir or smir in insert mode  
 key\_eol kel str kE KEY\_EOL 0517 -B-G-\* clear-to-end-of-line key  
 key\_eos ked str kS KEY\_EOS 0516 -B-G-\* clear-to-end-of-screen key  
 key\_f0 kf0 str k0 KEY\_F(0) 0410 YBCGE F0 function key  
 key\_f1 kf1 str k1 KEY\_F(1) - YBCGE F1 function key  
 key\_f10 kf10 str k; KEY\_F(10) - ----E F10 function key  
 key\_f2 kf2 str k2 KEY\_F(2) - YBCGE F2 function key  
 key\_f3 kf3 str k3 KEY\_F(3) - YBCGE F3 function key  
 key\_f4 kf4 str k4 KEY\_F(4) - YBCGE F4 function key  
 key\_f5 kf5 str k5 KEY\_F(5) - YBCGE F5 function key  
 key\_f6 kf6 str k6 KEY\_F(6) - YBCGE F6  
 function key  
 key\_f7 kf7 str k7 KEY\_F(7) - YBCGE F7 function key  
 key\_f8 kf8 str k8 KEY\_F(8) - YBCGE F8 function key  
 key\_f9 kf9 str k9 KEY\_F(9) - YBCGE F9 function key  
 key\_home khome str kh KEY\_HOME 0406 YBCGE home key  
 key\_ic kich1 str kI KEY\_IC 0513 YB-GE insert-character key  
 key\_il kil1 str kA KEY\_IL 0511 -B-G-\* insert-line key  
 key\_left kcub1 str kL KEY\_LEFT 0404 YBCGE left-arrow key  
 key\_ll kll str kH KEY\_LL 0533 YB-G- lower-left key (home down)  
 key\_npage knp str kN KEY\_NPAGE 0522 YB-GE next-page key  
 key\_ppage kpp str kP KEY\_PPAGE 0523 YB-GE previous-page key  
 key\_right kcuf1 str kR KEY\_RIGHT 0405 YBCGE right-arrow key  
 key\_sf kind str kF KEY\_SF 0520 -B-G-\* scroll-forward key

key\_sr kri str kR KEY\_SR 0521 -B-G-\* scroll-backward key  
key\_stab khts str kT KEY\_STAB 0524 -B-G-\* set-tab key  
key\_up kcuu1 str ku KEY\_UP 0403 YBCGE up-arrow key  
keypad\_local rmkx str ke - - YBCGE leave 'keyboard\_transmit' mode  
keypad\_xmit smkx str ks - - YBCGE enter  
'keyboard\_transmit' mode  
lab\_f0 lf0 str l0 - - -B-G-\* label on function key f0 if not f0  
lab\_f1 lf1 str l1 - - -B-G-\* label on function key f1 if not f1  
lab\_f10 lf10 str la - - ---- label on function key f10 if not f10  
lab\_f2 lf2 str l2 - - -B-G-\* label on function key f2 if not f2  
lab\_f3 lf3 str l3 - - -B-G-\* label on function key f3 if not f3  
lab\_f4 lf4 str l4 - - -B-G-\* label on function key f4 if not f4  
lab\_f5 lf5 str l5 - - -B-G-\* label on function key f5 if not f5  
lab\_f6 lf6 str l6 - - -B-G-\* label on function key f6 if not f6  
lab\_f7 lf7 str l7 - - -B-G-\* label on function key f7 if not f7  
lab\_f8 lf8 str l8 - - -B-G-\* label on function key f8 if not f8  
lab\_f9 lf9 str l9 - - -B-G-\* label on function key f9 if not f9  
meta\_off rmm str mo - - YB-G-\* turn off meta mode  
meta\_on smm str mm - - YB-G-\* turn on meta mode (8th-bit on)  
newline nel str nw - - YB-G-\* newline (behave like cr followed by lf)  
pad\_char pad str pc - - YBCGE padding  
char (instead of null)  
parm\_dch dch str DC - - YB-GE delete #1 characters (P\*)  
parm\_delete\_line dl str DL - - YBCGE delete #1 lines (P\*)  
parm\_down\_cursor cud str DO - - YBCGE down #1 lines (P\*)  
parm\_ich ich str IC - - YB-GE insert #1 characters (P\*)  
parm\_index indn str SF - - YBCG- scroll forward #1 lines (P)  
parm\_insert\_line il str AL - - YBCGE insert #1 lines (P\*)  
parm\_left\_cursor cub str LE - - YBCGE move #1 characters to the left (P)  
parm\_right\_cursor cuf str RI - - YBCGE move #1 characters to the right (P\*)  
parm\_rindex rin str SR - - YBCG- scroll back #1 lines (P)  
parm\_up\_cursor cuu str UP - - YBCGE up #1 lines (P\*)  
pkey\_key pfkey str pk - - -B--- program function key #1 to type string #2  
pkey\_local pfloc str pl - - -B--- program function key #1 to execute string #2  
pkey\_xmit pfx str px - - -B--- program function key #1 to transmit string #2  
print\_screen mc0 str ps - - -B-G-\* print contents of screen  
prtr\_off mc4 str pf - - -B-G-\* turn  
off printer  
prtr\_on mc5 str po - - -B-G-\* turn on printer  
repeat\_char rep str rp - - YB-GE repeat char #1 #2 times (P\*)  
reset\_1string rs1 str r1 - - -B--- reset string  
reset\_2string rs2 str r2 - - -B--- reset string  
reset\_3string rs3 str r3 - - -B--- reset string  
reset\_file rf str rf - - -B--- name of reset file  
restore\_cursor rc str rc - - YBCG- restore cursor to position of last save\_cursor  
row\_address vpa str cv - - -B-GE\* vertical position #1 absolute (P)  
save\_cursor sc str sc - - YBCG- save current cursor position (P)  
scroll\_forward ind str sf - - YBCGE scroll text up (P)

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scroll_reverse ri str sr - - YBCGE scroll text down (P)
set_attributes sgr str sa - - YB-G- define video attributes #1-#9 (PG9)
set_tab hts str st - - YB-G- set a tab in every row, current columns
set_window wind str wi - - -B-GE current window is lines #1-#2 cols #3-#4
tab ht str ta - - YBCGE tab to next 8-space hardware tab stop
to_status_line tsl str ts - - YB-G- move
to status line, column #1
underline_char uc str uc - - YBCG- underline char and move past it
up_half_line hu str hu - - YB-G- half a line up
init_prog iprog str iP - - B--- path name of program for initialization
key_a1 ka1 str K1 KEY_A1 0534 YB-GE upper left of keypad
key_a3 ka3 str K3 KEY_A3 0535 YB-GE upper right of keypad
key_b2 kb2 str K2 KEY_B2 0536 YB-GE center of keypad
key_c1 kc1 str K4 KEY_C1 0537 YB-GE lower left of keypad
key_c3 kc3 str K5 KEY_C3 0540 YB-GE lower right of keypad
ptr_non mc5p str pO - - -B-G-* turn on printer for #1 bytes
#
# IBM extensions
#
# These extensions follow ptr_non (replacing everything after it) in IBM
# terminfo files.
#
# The places in the box[12] capabilities correspond to acsc characters, here is
# the mapping:
#
# box1[0] = ACS_ULCORNER
# box1[1] = ACS_HLINE
# box1[2] = ACS_URCORNER
# box1[3] = ACS_VLINE
# box1[4] = ACS_LRCORNER
# box1[5] = ACS_LLCORNER
# box1[6]
#   = ACS_TTEE
# box1[7] = ACS_RTEE
# box1[8] = ACS_BTEE
# box1[9] = ACS_LTEE
# box1[10] = ACS_PLUS
#
# The box2 characters are the double-line versions of these forms graphics.
#
box_chars_1 box1 str bx - - ----K box characters primary set
box_chars_2 box2 str by - - ----K box characters secondary set
box_attr_1 batt1 str Bx - - ----K attributes for box1
box_attr_2 batt2 str By - - ----K attributes for box2
color_bg_0 colb0 str d0 - - ----K background color 0
color_bg_1 colb1 str d1 - - ----K background color 1
color_bg_2 colb2 str d2 - - ----K background color 2
color_bg_3 colb3 str d3 - - ----K background color 3

```

color\_bg\_4 colb4 str d4 - - ----K background color 4  
 color\_bg\_5 colb5 str d5 - - ----K background color 5  
 color\_bg\_6 colb6 str d6 - - ----K background color 6  
 color\_bg\_7 colb7 str d7 - - ----K background color 7  
 color\_fg\_0 colf0 str c0 - - ----K foreground color 0  
 color\_fg\_1 colf1 str c1 - - ----K foreground color 1  
 color\_fg\_2 colf2 str c2 - - ----K foreground  
 color 2  
 color\_fg\_3 colf3 str c3 - - ----K foreground color 3  
 color\_fg\_4 colf4 str c4 - - ----K foreground color 4  
 color\_fg\_5 colf5 str c5 - - ----K foreground color 5  
 color\_fg\_6 colf6 str c6 - - ----K foreground color 6  
 color\_fg\_7 colf7 str c7 - - ----K foreground color 7  
 font\_0 font0 str f0 - - ----K select font 0  
 font\_1 font1 str f1 - - ----K select font 1  
 font\_2 font2 str f2 - - ----K select font 2  
 font\_3 font3 str f3 - - ----K select font 3  
 font\_4 font4 str f4 - - ----K select font 4  
 font\_5 font5 str f5 - - ----K select font 5  
 font\_6 font6 str f6 - - ----K select font 6  
 font\_7 font7 str f7 - - ----K select font 7  
 key\_back\_tab kbtap str k0 - - ----K backtab key  
 key\_do kdo str ki - - ----K do request key  
 key\_command kcmd str kd - - ----K command-request key  
 key\_command\_pane kcpn str kW - - ----K command-pane key  
 key\_end kend str kw KEY\_END 0550 ----- end key  
 key\_help khlp str kq - - ----- help  
 key  
 key\_newline knl str nl - - ----K newline key  
 key\_next\_pane knpn str kv - - ----K next-pane key  
 key\_prev\_cmd kppn str kp - - ----K previous-command key  
 key\_prev\_pane kppn str kV - - ----K previous-pane key  
 key\_quit kquit str kQ - - ----K quit key  
 key\_select\_aix ksel str kU - - ----- select key  
 key\_scroll\_left kscl str kz - - ----K scroll left  
 key\_scroll\_right kscr str kZ - - ----K scroll right  
 key\_tab ktab str ko - - ----K tab key  
 key\_smap\_in1 kmpf1 str Kv - - ----K special mapped key 1 input  
 key\_smap\_out1 kmpt1 str KV - - ----K special mapped key 1 output  
 key\_smap\_in2 kmpf2 str Kw - - ----K special mapped key 2 input  
 key\_smap\_out2 kmpt2 str KW - - ----K special mapped key 2 output  
 key\_smap\_in3 kmpf3 str Kx - - ----K special mapped key 3 input  
 key\_smap\_out3 kmpt3 str KX - - ----K special mapped key 3 output  
 key\_smap\_in4 kmpf4 str Ky - - ----K special mapped key 4 input  
 key\_smap\_out4 kmpt4 str KY - - ----K special mapped  
 key 4 output  
 key\_smap\_in5 kmpf5 str Kz - - ----K special mapped key 5 input  
 key\_smap\_out5 kmpt5 str KZ - - ----K special mapped key 5 output

appl\_defined\_str apstr str za - - ----K application-defined string  
 key\_smap\_in6 kmpf6 str kr - - ----K special mapped key 6 input  
 key\_smap\_out6 kmpt6 str KR - - ----K special mapped key 6 output  
 key\_smap\_in7 kmpf7 str ks - - ----K special mapped key 7 input  
 key\_smap\_out7 kmpt7 str KS - - ----K special mapped key 7 output  
 key\_smap\_in8 kmpf8 str kt - - ----K special mapped key 8 input  
 key\_smap\_out8 kmpt8 str KT - - ----K special mapped key 8 output  
 key\_smap\_in9 kmpf9 str ku - - ----K special mapped key 9 input  
 key\_smap\_out9 kmpt9 str KU - - ----K special mapped key 9 output  
 key\_sf1 ksf1 str S1 - - ----K special function key 1  
 key\_sf2 ksf2 str S2 - - ----K special function key 2  
 key\_sf3 ksf3 str S3 - - ----K special function key 3  
 key\_sf4 ksf4 str S4 - - ----K special function key 4  
 key\_sf5 ksf5 str S5 - - ----K special  
 function key 5  
 key\_sf6 ksf6 str S6 - - ----K special function key 6  
 key\_sf7 ksf7 str S7 - - ----K special function key 7  
 key\_sf8 ksf8 str S8 - - ----K special function key 8  
 key\_sf9 ksf9 str S9 - - ----K special function key 9  
 key\_sf10 ksf10 str S0 - - ----K special function key 10  
 key\_f11 kf11 str F1 KEY\_F(11) - ----E F11 function key  
 key\_f12 kf12 str F2 KEY\_F(12) - ----E F12 function key  
 key\_f13 kf13 str F3 KEY\_F(13) - ----E F13 function key  
 key\_f14 kf14 str F4 KEY\_F(14) - ----E F14 function key  
 key\_f15 kf15 str F5 KEY\_F(15) - ----E F15 function key  
 key\_f16 kf16 str F6 KEY\_F(16) - ----E F16 function key  
 key\_f17 kf17 str F7 KEY\_F(17) - ----E F17 function key  
 key\_f18 kf18 str F8 KEY\_F(18) - ----E F18 function key  
 key\_f19 kf19 str F9 KEY\_F(19) - ----E F19 function key  
 key\_f20 kf20 str FA KEY\_F(20) - ----E F20 function key  
 key\_f21 kf21 str FB KEY\_F(21) - ----E F21 function key  
 key\_f22 kf22 str FC KEY\_F(22) - ----E F22  
 function key  
 key\_f23 kf23 str FD KEY\_F(23) - ----E F23 function key  
 key\_f24 kf24 str FE KEY\_F(24) - ----E F24 function key  
 key\_f25 kf25 str FF KEY\_F(25) - ----E F25 function key  
 key\_f26 kf26 str FG KEY\_F(26) - ----E F26 function key  
 key\_f27 kf27 str FH KEY\_F(27) - ----E F27 function key  
 key\_f28 kf28 str FI KEY\_F(28) - ----E F28 function key  
 key\_f29 kf29 str FJ KEY\_F(29) - ----E F29 function key  
 key\_f30 kf30 str FK KEY\_F(30) - ----E F30 function key  
 key\_f31 kf31 str FL KEY\_F(31) - ----E F31 function key  
 key\_f32 kf32 str FM KEY\_F(32) - ----E F32 function key  
 key\_f33 kf33 str FN KEY\_F(33) - ----E F33 function key  
 key\_f34 kf34 str FO KEY\_F(34) - ----E F34 function key  
 key\_f35 kf35 str FP KEY\_F(35) - ----E F35 function key  
 key\_f36 kf36 str FQ KEY\_F(36) - ----E F36 function key  
 key\_f37 kf37 str FR KEY\_F(37) - ----E F37 function key

key\_f38 kf38 str FS KEY\_F(38) - ----E F38 function key  
key\_f39 kf39 str FT KEY\_F(39) - ----E F39 function  
key  
key\_f40 kf40 str FU KEY\_F(40) - ----E F40 function key  
key\_f41 kf41 str FV KEY\_F(41) - ----E F41 function key  
key\_f42 kf42 str FW KEY\_F(42) - ----E F42 function key  
key\_f43 kf43 str FX KEY\_F(43) - ----E F43 function key  
key\_f44 kf44 str FY KEY\_F(44) - ----E F44 function key  
key\_f45 kf45 str FZ KEY\_F(45) - ----E F45 function key  
key\_f46 kf46 str Fa KEY\_F(46) - ----E F46 function key  
key\_f47 kf47 str Fb KEY\_F(47) - ----E F47 function key  
key\_f48 kf48 str Fc KEY\_F(48) - ----E F48 function key  
key\_f49 kf49 str Fd KEY\_F(49) - ----E F49 function key  
key\_f50 kf50 str Fe KEY\_F(50) - ----E F50 function key  
key\_f51 kf51 str Ff KEY\_F(51) - ----E F51 function key  
key\_f52 kf52 str Fg KEY\_F(52) - ----E F52 function key  
key\_f53 kf53 str Fh KEY\_F(53) - ----E F53 function key  
key\_f54 kf54 str Fi KEY\_F(54) - ----E F54 function key  
key\_f55 kf55 str Fj KEY\_F(55) - ----E F55 function key  
key\_f56 kf56 str Fk KEY\_F(56) - ----E F56 function key  
key\_f57 kf57 str Fl KEY\_F(57) - ----E F57  
function key  
key\_f58 kf58 str Fm KEY\_F(58) - ----E F58 function key  
key\_f59 kf59 str Fn KEY\_F(59) - ----E F59 function key  
key\_f60 kf60 str Fo KEY\_F(60) - ----E F60 function key  
key\_f61 kf61 str Fp KEY\_F(61) - ----E F61 function key  
key\_f62 kf62 str Fq KEY\_F(62) - ----E F62 function key  
key\_f63 kf63 str Fr KEY\_F(63) - ----E F63 function key  
key\_action kact str kJ - - ----K sent by action key

# The IBM docs say these capabilities are for table-drawing, and are  
# valid only for aixterm descriptions.

enter\_topline\_mode topl str tp - - ----K start top-line mode  
enter\_bottom\_mode btml str bm - - ----K start bottom-line mode  
enter\_rvert\_mode rvert str rv - - ----K start right-vertical mode  
enter\_lvert\_mode lvert str lv - - ----K start left-vertical mode

#

# SVr4 capabilities resume here. Note that key\_end is in the IBM-extensions.

#

char\_padding rmp str rP - - ----- like ip but when in insert mode  
acs\_chars acsc str ac - - ----- graphics  
charset pairs, based on vt100  
plab\_norm pln str pn - - ----- program label #1 to show string #2  
key\_btab kcbt str kB KEY\_BTAB 0541 ----- back-tab key  
enter\_xon\_mode smxon str SX - - ----- turn on xon/xoff handshaking  
exit\_xon\_mode rmxon str RX - - ----- turn off xon/xoff handshaking  
enter\_am\_mode smam str SA - - ----- turn on automatic margins  
exit\_am\_mode rmam str RA - - ----- turn off automatic margins

xon\_character xonc str XN - - ----- XON character  
xoff\_character xoffc str XF - - ----- XOFF character  
ena\_acs enacs str eA - - ----- enable alternate char set  
label\_on smln str LO - - ----- turn on soft labels  
label\_off rmln str LF - - ----- turn off soft labels  
key\_beg kbeg str @1 KEY\_BEG 0542 ----- begin key  
key\_cancel kcan str @2 KEY\_CANCEL 0543 ----- cancel key  
key\_close kclo str @3 KEY\_CLOSE 0544 ----- close key  
#key\_command kcmd str @4 KEY\_COMMAND 0545 ----- command key  
key\_copy kcpy str @5 KEY\_COPY 0546 ----- copy  
key  
key\_create kcrtr str @6 KEY\_CREATE 0547 ----- create key  
#key\_end kend str @7 KEY\_END 0550 ----- end key  
key\_enter kent str @8 KEY\_ENTER 0527 ----- enter/send key  
key\_exit kext str @9 KEY\_EXIT 0551 ----- exit key  
key\_find kfnd str @0 KEY\_FIND 0552 ----- find key  
#key\_help khlp str %1 KEY\_HELP 0553 ----- help key  
key\_mark kmrk str %2 KEY\_MARK 0554 ----- mark key  
key\_message kmsg str %3 KEY\_MESSAGE 0555 ----- message key  
key\_move kmov str %4 KEY\_MOVE 0556 ----- move key  
key\_next knxt str %5 KEY\_NEXT 0557 ----- next key  
key\_open kopn str %6 KEY\_OPEN 0560 ----- open key  
key\_options kopt str %7 KEY\_OPTIONS 0561 ----- options key  
key\_previous kprv str %8 KEY\_PREVIOUS 0562 ----- previous key  
key\_print kprt str %9 KEY\_PRINT 0532 ----- print key  
key\_redo krdo str %0 KEY\_REDO 0563 ----- redo key  
key\_reference kref str &1 KEY\_REFERENCE 0564 ----- reference key  
key\_refresh krfr str &2 KEY\_REFRESH 0565 ----- refresh key  
key\_replace krpl str &3 KEY\_REPLACE 0566 ----- replace  
key  
key\_restart krst str &4 KEY\_RESTART 0567 ----- restart key  
key\_resume kres str &5 KEY\_RESUME 0570 ----- resume key  
key\_save ksav str &6 KEY\_SAVE 0571 ----- save key  
key\_suspend kspd str &7 KEY\_SUSPEND 0627 ----- suspend key  
key\_undo kund str &8 KEY\_UNDO 0630 ----- undo key  
key\_sbeg kBEG str &9 KEY\_SBEG 0572 ----- shifted begin key  
key\_scancel kCAN str &0 KEY\_SCANCEL 0573 ----- shifted cancel key  
key\_scommand kCMD str \*1 KEY\_SCOMMAND 0574 ----- shifted command key  
key\_scopy kCPY str \*2 KEY\_SCOPY 0575 ----- shifted copy key  
key\_screate kCRT str \*3 KEY\_SCREATE 0576 ----- shifted create key  
key\_sdc kDC str \*4 KEY\_SDC 0577 ----- shifted delete-character key  
key\_sdl kDL str \*5 KEY\_SDL 0600 ----- shifted delete-line key  
key\_select kslt str \*6 KEY\_SELECT 0601 ----- select key  
key\_send kEND str \*7 KEY\_SEND 0602 ----- shifted end key  
key\_seol kEOL str \*8 KEY\_SEOL 0603 ----- shifted clear-to-end-of-line key  
key\_sexit kEXT str \*9 KEY\_SEXIT 0604 ----- shifted  
exit key  
key\_sfnd kfnd str \*0 KEY\_SFIND 0605 ----- shifted find key



key\_shelp kHLP str #1 KEY\_SHELP 0606 ----- shifted help key  
key\_shome kHOM str #2 KEY\_SHOME 0607 ----- shifted home key  
key\_sic kIC str #3 KEY\_SIC 0610 ----- shifted insert-character key  
key\_sleft kLFT str #4 KEY\_SLEFT 0611 ----- shifted left-arrow key  
key\_smessage kMSG str %a KEY\_SMESSAGE 0612 ----- shifted message key  
key\_smove kMOV str %b KEY\_SMOVE 0613 ----- shifted move key  
key\_snext kNXT str %c KEY\_SNEXT 0614 ----- shifted next key  
key\_soptions kOPT str %d KEY\_SOPTIONS 0615 ----- shifted options key  
key\_sprevious kPRV str %e KEY\_SPREVIOUS 0616 ----- shifted previous key  
key\_sprint kPRT str %f KEY\_SPRINT 0617 ----- shifted print key  
key\_sredo kRDO str %g KEY\_SREDO 0620 ----- shifted redo key  
key\_sreplace kRPL str %h KEY\_SREPLACE 0621 ----- shifted replace key  
key\_sright kRIT str %i KEY\_SRIGHT 0622 ----- shifted right-arrow key  
key\_sresume kRES str %j KEY\_SRSUME 0623 ----- shifted  
resume key  
key\_ssave kSAV str !1 KEY\_SSAVE 0624 ----- shifted save key  
key\_ssuspend kSPD str !2 KEY\_SSUSPEND 0625 ----- shifted suspend key  
key\_sundo kUND str !3 KEY\_SUNDO 0626 ----- shifted undo key  
req\_for\_input rfi str RF - - ----- send next input char (for pty)  
clr\_bol el1 str cb - - ----- Clear to beginning of line  
clear\_margins mgc str MC - - ----- clear right and left soft margins  
set\_left\_margin smgl str ML - - ----- set left soft margin at current column. See smgl. (ML is not in BSD termcap).  
set\_right\_margin smgr str MR - - ----- set right soft margin at current column  
label\_format fln str Lf - - ----- label format  
set\_clock sclk str SC - - ----- set clock, #1 hrs #2 mins #3 secs  
display\_clock dclk str DK - - ----- display clock  
remove\_clock rmclk str RC - - ----- remove clock  
create\_window cwin str CW - - ----- define a window #1 from #2,#3 to #4,#5  
goto\_window wingo str WG - - ----- go to window #1  
hangup hup str HU - - ----- hang-up  
phone  
dial\_phone dial str DI - - ----- dial number #1  
quick\_dial qdial str QD - - ----- dial number #1 without checking  
tone tone str TO - - ----- select touch tone dialing  
pulse pulse str PU - - ----- select pulse dialing  
flash\_hook hook str fh - - ----- flash switch hook  
fixed\_pause pause str PA - - ----- pause for 2-3 seconds  
wait\_tone wait str WA - - ----- wait for dial-tone  
user0 u0 str u0 - - ----- User string #0  
user1 u1 str u1 - - ----- User string #1  
user2 u2 str u2 - - ----- User string #2  
user3 u3 str u3 - - ----- User string #3  
user4 u4 str u4 - - ----- User string #4  
user5 u5 str u5 - - ----- User string #5  
user6 u6 str u6 - - ----- User string #6  
user7 u7 str u7 - - ----- User string #7  
user8 u8 str u8 - - ----- User string #8  
user9 u9 str u9 - - ----- User string #9

```

#
# SVr4 added these capabilities to support color
#
orig_pair  op str op - - - - - Set default pair to its original
value
orig_colors  oc str oc - - - - - Set all color pairs to the original ones
initialize_color  initc str Ic - - - - - initialize color #1 to (#2,#3,#4)
initialize_pair  initp str Ip - - - - - Initialize color pair #1 to fg=(#2,#3,#4), bg=(#5,#6,#7)
set_color_pair  scp str sp - - - - - Set current color pair to #1
set_foreground  setf str Sf - - - - - Set foreground color #1
set_background  setb str Sb - - - - - Set background color #1
#
# SVr4 added these capabilities to support printers
#
change_char_pitch  cpi str ZA - - - - - Change number of characters per inch to #1
change_line_pitch  lpi str ZB - - - - - Change number of lines per inch to #1
change_res_horz  chr str ZC - - - - - Change horizontal resolution to #1
change_res_vert  cvr str ZD - - - - - Change vertical resolution to #1
define_char  defc str ZE - - - - - Define a character #1, #2 dots wide, descender #3
enter_doublewide_mode  swidm str ZF - - - - - Enter double-wide mode
enter_draft_quality  sdrfq str ZG - - - - - Enter
draft-quality mode
enter_italics_mode  sitm str ZH - - - - - Enter italic mode
enter_leftward_mode  slm str ZI - - - - - Start leftward carriage motion
enter_micro_mode  smicm str ZJ - - - - - Start micro-motion mode
enter_near_letter_quality  snlq str ZK - - - - - Enter NLQ mode
enter_normal_quality  snrmq str ZL - - - - - Enter normal-quality mode
enter_shadow_mode  sshm str ZM - - - - - Enter shadow-print mode
enter_subscript_mode  ssubm str ZN - - - - - Enter subscript mode
enter_superscript_mode  ssupm str ZO - - - - - Enter superscript mode
enter_upward_mode  sum str ZP - - - - - Start upward carriage motion
exit_doublewide_mode  rwidm str ZQ - - - - - End double-wide mode
exit_italics_mode  ritm str ZR - - - - - End italic mode
exit_leftward_mode  rlm str ZS - - - - - End left-motion mode
exit_micro_mode  rmicm str ZT - - - - - End micro-motion mode
exit_shadow_mode  rshm str ZU - - - - - End shadow-print mode
exit_subscript_mode  rsubm str ZV - - - - - End
subscript mode
exit_superscript_mode  rsupm str ZW - - - - - End superscript mode
exit_upward_mode  rum str ZX - - - - - End reverse character motion
micro_column_address  mhpa str ZY - - - - - Like column_address in micro mode
micro_down  mcud1 str ZZ - - - - - Like cursor_down in micro mode
micro_left  mcub1 str Za - - - - - Like cursor_left in micro mode
micro_right  mcuf1 str Zb - - - - - Like cursor_right in micro mode
micro_row_address  mypa str Zc - - - - - Like row_address #1 in micro mode
micro_up  mcu1 str Zd - - - - - Like cursor_up in micro mode
order_of_pins  porder str Ze - - - - - Match software bits to print-head pins
parm_down_micro  mcud str Zf - - - - - Like parm_down_cursor in micro mode

```

parm\_left\_micro mcub str Zg - - - - - Like parm\_left\_cursor in micro mode  
 parm\_right\_micro mcuf str Zh - - - - - Like parm\_right\_cursor in micro mode  
 parm\_up\_micro mcuu str Zi - - - - - Like parm\_up\_cursor in micro mode  
 select\_char\_set scs str Zj - - - - - Select  
 character set, #1  
 set\_bottom\_margin smgb str Zk - - - - - Set bottom margin at current line  
 set\_bottom\_margin\_parm smgbp str Zl - - - - - Set bottom margin at line #1 or (if smgtp is not given) #2 lines from  
 bottom  
 set\_left\_margin\_parm smglp str Zm - - - - - Set left (right) margin at column #1  
 set\_right\_margin\_parm smgrp str Zn - - - - - Set right margin at column #1  
 set\_top\_margin smgt str Zo - - - - - Set top margin at current line  
 set\_top\_margin\_parm smgtp str Zp - - - - - Set top (bottom) margin at row #1  
 start\_bit\_image sbim str Zq - - - - - Start printing bit image graphics  
 start\_char\_set\_def scsd str Zr - - - - - Start character set definition #1, with #2 characters in the set  
 stop\_bit\_image rbim str Zs - - - - - Stop printing bit image graphics  
 stop\_char\_set\_def rcsd str Zt - - - - - End definition of character set #1  
 subscript\_characters subcs str Zu - - - - - List of subscriptable characters  
 superscript\_characters supcs str Zv - - - - - List  
 of superscriptable characters  
 these\_cause\_cr dochr str Zw - - - - - Printing any of these characters causes CR  
 zero\_motion zerom str Zx - - - - - No motion for subsequent character  
 #%.TE  
 #%.ad  
 #%  
 #%The following string capabilities are present in the SVr4.0 term structure,  
 #%but were originally not documented in the man page.  
 #%  
 #%.na  
 #%.TS H  
 #%center expand;  
 #%c 11 c  
 #%c 11 c  
 #%lw25 lw6 lw2 lw18.  
 #%\fBVariable Cap- TCap Description\fR  
 #%\fBString name Code\fR  
 char\_set\_names csnm str Zy - - - - - Produce #1'th item from list of character set names  
 key\_mouse kmous str Km KEY\_MOUSE 0631 - - - - - Mouse event has occurred  
 mouse\_info minfo str Mi - - - - - Mouse status information  
 req\_mouse\_pos reqmp str RQ - - - - - Request mouse position  
 get\_mouse getm str Gm - - - - - Curses should get button events, parameter #1 not documented.  
 set\_a\_foreground setaf str AF - - - - - Set foreground color to #1, using ANSI escape  
 set\_a\_background setab str AB - - - - - Set  
 background color to #1, using ANSI escape  
 pkey\_plab pfxl str xl - - - - - Program function key #1 to type string #2 and show string #3  
 device\_type devt str dv - - - - - Indicate language/codeset support  
 code\_set\_init csin str ci - - - - - Init sequence for multiple codesets  
 set0\_des\_seq s0ds str s0 - - - - - Shift to codeset 0 (EUC set 0, ASCII)  
 set1\_des\_seq s1ds str s1 - - - - - Shift to codeset 1

```

set2_des_seq s2ds str s2 - - ---- Shift to codeset 2
set3_des_seq s3ds str s3 - - ---- Shift to codeset 3
set_lr_margin smglr str ML - - ---- Set both left and right margins to #1, #2. (ML is not in BSD termcap).
set_tb_margin smgtb str MT - - ---- Sets both top and bottom margins to #1, #2
bit_image_repeat birep str Xy - - ---- Repeat bit image cell #1 #2 times
bit_image_newline binel str Zz - - ---- Move to next row of the bit image
bit_image_carriage_return bicr str Yv - - ---- Move to beginning of same row
color_names colorm str Yw - - ---- Give
name for color #1
define_bit_image_region defbi str Yx - - ---- Define rectangular bit image region
end_bit_image_region endbi str Yy - - ---- End a bit-image region
set_color_band setcolor str Yz - - ---- Change to ribbon color #1
set_page_length slines str YZ - - ---- Set page length to #1 lines
#
# SVr4 added these capabilities for direct PC-clone support
#
display_pc_char dispch str S1 - - ---- Display PC character #1
enter_pc_charset_mode smpch str S2 - - ---- Enter PC character display mode
exit_pc_charset_mode rmpch str S3 - - ---- Exit PC character display mode
enter_scancode_mode smsc str S4 - - ---- Enter PC scancode mode
exit_scancode_mode rmsc str S5 - - ---- Exit PC scancode mode
pc_term_options pctrm str S6 - - ---- PC terminal options
scancode_escape scesc str S7 - - ---- Escape for scancode emulation
alt_scancode_esc scesa str S8 - - ---- Alternate escape for scancode emulation
#%.TE
#%.ad
#%
#%.in .8i
#%The XSI
Curses standard added these. They are some post-4.1
#% versions of System V curses, e.g., Solaris 2.5 and IRIX 6.x.
#% The \fBncurses\fR termcap names for them are invented; according to the
#% XSI Curses standard, they have no termcap names. If your compiled terminfo
#% entries use these, they may not be binary-compatible with System V terminfo
#% entries after SVr4.1; beware!
#%
#%.na
#%.TS H
#%center expand;
#%c 1 l c
#%c 1 l c
#%lw25 lw6 lw2 lw20.
#%\fBVariable Cap- TCap Description\fR
#%\fBString name Code\fR
enter_horizontal_hl_mode ehhl str Xh - - ---- Enter horizontal highlight mode
enter_left_hl_mode elhl str Xl - - ---- Enter left highlight mode
enter_low_hl_mode eloh str Xo - - ---- Enter low highlight mode
enter_right_hl_mode erhl str Xr - - ---- Enter right highlight mode

```

```

enter_top_hl_mode ethlm str Xt - - ---- Enter top highlight mode
enter_vertical_hl_mode evhlm str Xv - - ---- Enter vertical highlight mode
set_a_attributes sgr1 str sA - - ---- Define
    second set of video attributes #1-#6
set_pglen_inch  slength str sL - - ---- YI Set page length to #1 hundredth of an inch
#%.TE
#%.ad
#
# The magic token below tells the tic compiler-generator code that all the caps
# past it should be ignored (not written out) when dumping terminfo objects. It
# also tells the man page table generator not to pass through following lines
# This means we can have obsolete capabilities and pseudo-capabilities that are
# recognized for termcap or terminfo compilation, but not output.
#
# %%-STOP-HERE-%%
#
# Don't move this casually! In fact, don't move it at all unless you're
# either doing it to add System V or XPG4 extensions, or have decided you
# don't care about SVr4 binary compatibility.
#
#####
#
# TERMCAP EXTENSION CAPABILITIES
#
# The capabilities below are either obsolete or extensions on certain systems.
# They are not used by SVR4 terminfo. Some are used by captainfo
to translate
# termcap sources; the rest are listed for completeness, and in case somebody
# cares about them enough to hack in code that will translate them into
# terminfo capabilities.
#
# The first part of the list is from Ross Ridge's `mytinfo' package
# (comp.sources.unix, volume 26); the variable names and terminfo names (as
# well as the termcap codes) match his list.
#
# This group of codes is not marked obsolete in 4.4BSD, but have no direct
# terminfo equivalents. The rs capability is specially translated to terminfo
# r2, and vice versa, if an entry does not already have an r2. Similarly,
# i2 is translated to r3 if there is no r3 (because SV terminfo maps is to i2).
# The ug capability is thrown away, but assumed to be whatever sg is if the
# latter is nonzero and we're dumping in termcap format.
#
termcap_init2  OTi2 str i2 - - YB--- secondary initialization string
termcap_reset  OTrs str rs - - YB-G- terminal reset string
magic_cookie_glitch_ul  OTug num ug - - YBCGE number
of blanks left by ul
#
# Obsolete termcap capabilities. Some are used for termcap translation. The

```

```

# code uses the 'OT' prefix we put on obsolete capabilities to suppress
# printing them in terminfo source dumps of compiled entries.
#
backspaces_with_bs OTbs bool bs - - YBCGE uses ^H to move left
crt_no_scrolling OTns bool ns - - YBCG- crt cannot scroll
no_correctly_working_cr OTnc bool nc - - YBCG- no way to go to start of line
carriage_return_delay OTdC num dC - - YB-G- pad needed for CR
new_line_delay OTdN num dN - - YB-G- pad needed for LF
linefeed_if_not_lf OTnl str nl - - YBCGE use to move down
backspace_if_not_bs OTbc str bc - - YBCGE move left, if not ^H
#
# GNU termcap library extensions. The GNU termcap file distributed with
# Emacs no longer uses these, but MT showed up in pre-9.0 versions of the
# BSD termcap file. The name clash with terminfo MT is resolved by type
# info; MT is converted to km.
#
gnu_has_meta_key OTMT bool MT - - ---E has
meta key
# gnu_tab_width OTtw num tw - - ---E tab width in spaces
#
# GNU termcap *does* include the following extended capability, Only the
# now-obsolete Ann Arbor terminals used it.
#
# gnu_change_scroll_region OTcS str cS - - ---GE alternate set scrolling region
#
# The following comments describe capnames so ancient that I believe no
# software uses them any longer. Some of these have to go because they
# clash with terminfo names in ways that cannot be resolved by type
# information.
#
# These mytinfo codes are not used in the 4.4BSD curses code. They are
# marked obsolete in the 4.4BSD manual pages.
#
# There is one conflict with terminfo; ma is in both. This conflict is
# resolved by type information.
#
# The `ko' capability is translated by special code. It should contain a
# comma-separated list of capabilities for which there are corresponding keys.
# The `kn' code is accepted but ignored.
#
# The `ma' capability seems to have been designed to map between the
# rogue(2)
# motion keys (including jkhl) and characters emitted by arrow keys on some
# primitive pre-ANSI terminals. It's so obsolete it's fossilized...
#
# Here is a description of memory_lock_above and memory_unlock:
# "You can 'freeze' data on the screen by turning on Memory Lock in a line of
# text. All lines above the cursor's current line become locked in place on

```

```

# the screen. Then enter data normally. When the screen fills up, any
# further data entered forces the first line of unfrozen line text to scroll
# under the frozen data. Lines scrolled off the screen are inserted into
# memory immediately preceding the first frozen line." (from the HP 700/96
# User's manual). VT100/ANSI memory lock set is \E[>2h, reset is \E[>2l.
#
# Applications that use terminfo are supposed to behave as though xr is
# always true.
#
linefeed_is_newline OTNL bool NL - - YB--- move down with \n
# even_parity OTEP bool EP - - B--- terminal requires even parity
# odd_parity OTOP bool OP - - B--- terminal
requires odd parity
# half_duplex OTHD bool HD - - B--- terminal is half-duplex
# lower_case_only OTLC bool LC - - B--- terminal has only lower case
# upper_case_only OTUC bool UC - - B--- terminal has only upper case
backspace_delay OTdB num dB - - YB-G- padding required for ^H
# form_feed_delay OTdF num dF - - B-G- padding required for ^L
horizontal_tab_delay OTdT num dT - - YB-G- padding required for ^I
# vertical_tab_delay OTdV num dV - - B--- padding required for ^V
number_of_function_keys OTkn num kn - - B-G- count of function keys
other_non_function_keys OTko str ko - - B-G- list of self-mapped keycaps
arrow_key_map OTma str ma - - YBC-- map arrow keys rogue(1) motion keys
# memory_lock_above OTml str ml - - B--- lock visible screen memory above the current line
# memory_unlock OTmu str mu - - B--- unlock visible screen memory above the current line
has_hardware_tabs OTpt bool pt - - YB--- has 8-char tabs invoked with ^I
return_does_clr_eol OTxr bool xr - - YB--- return
clears the line
# tek_4025_insert_line OTxx bool xx - - BC-- Tektronix 4025 insert-line glitch
#
# mytinfo described this as a termcap capability, but it's not listed in the
# 4.4BSD man pages, and not found in the 4.4BSD termcap file. The ncurses
# package, like System V, behaves as though it is always true.
#
# rind_only_at_top OTxq bool xq - - ----- reverse index only works from top line
#
# University of Waterloo termcap extensions (as described in mytinfo).
# The `xl' termcap file clashes with a terminfo name; this ambiguity cannot
# be resolved by a type check. The descriptions are guesses from what was
# in the mytinfo tables.
#
# key_interrupt_char OTki str ki - - ----- string set by interrupt key (?)
# key_kill_char OTkk str kk - - ----- string set by kill key (?)
# key_suspend_char OTkz str kz - - ----- string set by suspend key (?)
# initialization_messy OTxc bool xc - - ----- initialization leaves garbage
on the screen (?)
# ind_at_bottom_does_cr OTxl bool xl - - ----- index does a carriage return
#

```

```

# Nonstandard capabilities unique to Ross Ridge's `mytinfo' package.
# SR clashes with a terminfo name; this ambiguity cannot be resolved by a type
# check.
#
# scroll_left OTsl1 str Sl - - ---- scroll screen leftward
# scroll_right OTsr1 str Sr - - ---- scroll screen rightward
# parm_scroll_left OTsl str SL - - ---- scroll screen leftward #1 characters
# parm_scroll_right OTsr str SR - - ---- scroll screen rightward #1 characters
#
# The mytinfo capabilities end here.
#
# XENIX extensions:
#
# Xenix defined its own set of forms-drawing capabilities:
#
# cap IBM ASCII description      ACS      ASCII
# --- -----
# G1 191 \277 M-? single upper right ACS_URCORNER
# G2 218 \332 M-Z single upper left ACS_ULCORNER
# G3 192 \300 M-@ single lower left ACS_LLCORNER
# G4 217 \331 M-Y single lower right ACS_LRCORNER
# G5 187
\273 M-; double upper right
# G6 201 \311 M-I double upper left
# G7 200 \310 M-H double lower left
# G8 188 \274 M-< double lower right
# GC 197 \305 M-E single intersection ACS_PLUS _ _
# GD 194 \302 M-B single down-tick ACS_TTEE |
# GH 196 \304 M-D single horizontal line ACS_HLINE
# GL 180 \264 M-4 single left tick ACS_RTEE -|
# GR 195 \303 M-C single right tick ACS_LTEE |-
# GU 193 \301 M-A single up tick ACS_BTEE _|
# GV 179 \263 M-3 single vertical line ACS_VLINE
# Gc 206 \316 M-N double intersection
# Gd 203 \313 M-K double down tick
# Gh 205 \315 M-M double horizontal line
# Gl 204 \204 M-L double left tick
# Gr 185 \271 M-9 double right tick
# Gu 202 \312 M-J double up tick
# Gv 186 \272 M-: double vertical line
#
# The compiler will translate the single-line caps and discard the others
# (via IGNORE aliases further down). We don't want to do normal pad
# translation on these, they're often single-character printable ASCII
# strings that happen to be numerics. There's
awk code in parametrized.sh
# that detects the acs_ prefix and uses it to suppress pad translation.
# These terminfo names are invented.

```



```

#
acs_ulcorner OTG2 str G2 - - - - - single upper left
acs_llcorner OTG3 str G3 - - - - - single lower left
acs_urcorner OTG1 str G1 - - - - - single upper right
acs_lrcorner OTG4 str G4 - - - - - single lower right
acs_ltee OTGR str GR - - - - - tee pointing right
acs_rtee OTGL str GL - - - - - tee pointing left
acs_btee OTGU str GU - - - - - tee pointing up
acs_ttee OTGD str GD - - - - - tee pointing down
acs_hline OTGH str GH - - - - - single horizontal line
acs_vline OTGV str GV - - - - - single vertical line
acs_plus OTGC str GC - - - - - single intersection
#
#####
#
# TERMINFO EXTENSION CAPABILITIES
#
# This section is almost all comments. What it's mainly for is to describe
# what capabilities need to be squeezed out to get down to the
# XSI Curses
# standard set. They are flagged with K.
#
# HP extensions
#
# These extensions follow ptr_non (replacing everything after it) in HP
# terminfo files. Except for memory_lock and memory_unlock, they are
# functionally identical to SVr4 extensions, but they make the binary format
# different. Grrr....
#
memory_lock meml str ml - - - - -K lock memory above cursor
memory_unlock memu str mu - - - - -K unlock memory
#plab_norm pln str pn - - - - - program label #1 to show string #2
#label_on smln str LO - - - - - turn on soft labels
#label_off rmln str LF - - - - - turn off soft labels
#key_f11 kf11 str F1 - - - - - F11 function key
#key_f12 kf12 str F2 - - - - - F12 function key
#key_f13 kf13 str F3 - - - - - F13 function key
#key_f14 kf14 str F4 - - - - - F14 function key
#key_f15 kf15 str F5 - - - - - F15 function key
#key_f16 kf16 str F6 - - - - - F16 function key
#key_f17 kf17 str F7 - - - - - F17 function key
#key_f18 kf18 str F8 - - - - - F18
#key_f19 kf19 str F9 - - - - - F19 function key
#key_f20 kf20 str FA - - - - - F20 function key
#key_f21 kf21 str FB - - - - - F21 function key
#key_f22 kf22 str FC - - - - - F22 function key
#key_f23 kf23 str FD - - - - - F23 function key

```

```

#key_f24 kf24 str FE - - - - - F24 function key
#key_f25 kf25 str FF - - - - - F25 function key
#key_f26 kf26 str FG - - - - - F26 function key
#key_f27 kf27 str FH - - - - - F27 function key
#key_f28 kf28 str FI - - - - - F28 function key
#key_f29 kf29 str FJ - - - - - F29 function key
#key_f30 kf30 str FK - - - - - F30 function key
#key_f31 kf31 str FL - - - - - F31 function key
#key_f32 kf32 str FM - - - - - F32 function key
#key_f33 kf33 str FN - - - - - F33 function key
#key_f34 kf34 str FO - - - - - F34 function key
#key_f35 kf35 str FP - - - - - F35 function key
#key_f36 kf36 str FQ - - - - - F36 function key
#key_f37 kf37 str FR - - - - - F37 function key
#key_f38 kf38 str FS - - - - - F38
function key
#key_f39 kf39 str FT - - - - - F39 function key
#key_f40 kf40 str FU - - - - - F40 function key
#key_f41 kf41 str FV - - - - - F41 function key
#key_f42 kf42 str FW - - - - - F42 function key
#key_f43 kf43 str FX - - - - - F43 function key
#key_f44 kf44 str FY - - - - - F44 function key
#key_f45 kf45 str FZ - - - - - F45 function key
#key_f46 kf46 str Fa - - - - - F46 function key
#key_f47 kf47 str Fb - - - - - F47 function key
#key_f48 kf48 str Fc - - - - - F48 function key
#key_f49 kf49 str Fd - - - - - F49 function key
#key_f50 kf50 str Fe - - - - - F50 function key
#key_f51 kf51 str Ff - - - - - F51 function key
#key_f52 kf52 str Fg - - - - - F52 function key
#key_f53 kf53 str Fh - - - - - F53 function key
#key_f54 kf54 str Fi - - - - - F54 function key
#key_f55 kf55 str Fj - - - - - F55 function key
#key_f56 kf56 str Fk - - - - - F56 function key
#key_f57 kf57 str Fl - - - - - F57 function
key
#key_f58 kf58 str Fm - - - - - F58 function key
#key_f59 kf59 str Fn - - - - - F59 function key
#key_f60 kf60 str Fo - - - - - F60 function key
#key_f61 kf61 str Fp - - - - - F61 function key
#key_f62 kf62 str Fq - - - - - F62 function key
#key_f63 kf63 str Fr - - - - - F63 function key
#
#####
#
# ALIAS DECLARATIONS
#
# Here we set up aliases for translating extensions into standard terminfo.

```

```

#
#----- Termcap aliases -----
#
# BSD aliases:
#
# This is a common error in many termcap files. We'll get notified during
# translation when this (or any other alias) fires.
#
capalias sb sr BSD scroll text down
#
# AT&T extensions:
#
# The old AT&T 5410, 5420, 5425, pc6300plus, 610, and s4 entries used a set of
# nonstandard capabilities. Its signature is the KM capability, used to name
# some sort of keymap file. EE, BO, CI, CV, XS, DS, FL and
FE are in this
# set. Comments in the original, and a little cross-checking with other AT&T
# documentation, seem to establish the following mappings:
#
capalias BO mr AT&T enter_reverse_mode
capalias CI vi AT&T cursor_invisible
capalias CV ve AT&T cursor_normal
capalias DS mh AT&T enter_dim_mode
#capalias EE me AT&T exit_attribute_mode
capalias FE LF AT&T label_on
capalias FL LO AT&T label_off
capalias XS mk AT&T enter_secure_mode
#
# We comment out EE because the conflicting XENIX EE is more common in
# old entries.
#
# XENIX extensions:
#
# These are the ones we know how to translate directly:
#
capalias EE mh XENIX exit_attribute_mode
capalias GE ae XENIX exit_alt_charset_mode
capalias GS as XENIX enter_alt_charset_mode
capalias CF vi XENIX cursor_invis
capalias CO ve XENIX cursor_normal
capalias EN @7 XENIX key_end
capalias HM kh XENIX key_home
capalias LD kL XENIX key_dl
capalias PD kN XENIX key_npage
capalias PN po XENIX prtr_off
capalias PS pf XENIX prtr_on
capalias PU kP XENIX key_ppage
capalias RT @8 XENIX kent

```

```

capalias UP ku XENIX kcuu1
capalias G6 IGNORE XENIX double-ACS_ULCORNER
capalias G7 IGNORE XENIX double-ACS_LLCORNER
capalias G5 IGNORE XENIX double-ACS_URCORNER
capalias G8 IGNORE XENIX double-ACS_LRCORNER
capalias Gr IGNORE XENIX double-ACS_LTEE
capalias Gr IGNORE XENIX double-ACS_RTEE
capalias Gu IGNORE XENIX double-ACS_BTEE
capalias Gd IGNORE XENIX double
  ACS_TTEE
capalias Gh IGNORE XENIX double-ACS_HLINE
capalias Gv IGNORE XENIX double-ACS_VLINE
capalias Gc IGNORE XENIX double-ACS_PLUS
capalias GG IGNORE XENIX acs-glitch
#
# IBM extensions:
#
capalias kq %1 IBM key_help
#
# Iris extensions:
#
capalias HS mh IRIS enter_dim_mode
#
# Tektronix extensions:
#
capalias KA k; Tek key_f10
capalias KB F1 Tek key_f11
capalias KC F2 Tek key_f12
capalias KD F3 Tek key_f13
capalias KE F4 Tek key_f14
capalias KF F5 Tek key_f15
capalias BC Sb Tek set_background
capalias FC Sf Tek set_foreground
#
# There are also the following:
#
# XENIX XENIX variable
  name name clash with terminfo?
# -----
# CL key_char_left
# CR key_char_right
# CW key_change_window
# HP ??
# LF key_linefeed label_off
# NU key_next_unlocked_cell
# PL ??
# PR ??
# RC key_recalc remove_clock

```

```

# RF key_toggle_ref req_for_input
# WL key_word_left
# WR key_word_right
#
# If you know what any of the question-marked ones mean, please tell us.
#
#----- Terminfo aliases -----
#
# IBM extensions:
#
infoalias font0 s0ds IBM set0_des_seq
infoalias font1 s1ds IBM set1_des_seq
infoalias font2 s2ds IBM set2_des_seq
infoalias font3 s3ds IBM set3_des_seq
infoalias kbtabs kcbt IBM key_backtab
infoalias ksel kslt IBM key_select
#
# Some others are identical to SVr4/XPG4 capabilities, in particular:
# kcmd, kend, khlp, and kf11...kf63.
#
#####
#
# The following sets edit modes for GNU EMACS
# Local Variables:
# case-fold-search:nil
#
truncate-lines:t
# End:

Found in path(s):
* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/include/Caps.aix4
No license file was found, but licenses were detected in source scan.

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/*****

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```

* Author: Thomas E. Dickey          2002,2005          *
*****/

```

```

/* LINTLIBRARY */

```

```

/* ./panel.c */

```

```

#include "panel.priv.h"

```

```

#undef _nc_retrace_panel
PANEL *_nc_retrace_panel(
    PANEL *pan)
{ return(*(PANEL **)0); }

```

```

#undef _nc_my_visbuf
const char *_nc_my_visbuf(
    const void *ptr)
{ return(*(const char **)0); }

```

```

#undef _nc_dPanel
void _nc_dPanel(
    const char *text,
    const PANEL *pan)
{ /* void */ }

```

```

#undef _nc_dStack
void _nc_dStack(
    const char *fmt,
    int num,
    const PANEL *pan)
{ /* void */ }

```

```

#undef _nc_Wnoutrefresh
void _nc_Wnoutrefresh(
    const PANEL *pan)
    { /* void */ }

#undef _nc_Touchpan
void _nc_Touchpan(
    const
    PANEL *pan)
    { /* void */ }

#undef _nc_Touchline
void _nc_Touchline(
    const PANEL *pan,
    int start,
    int count)
    { /* void */ }

/* ./p_above.c */

#undef panel_above
PANEL *panel_above(
    const PANEL *pan)
    { return(*(PANEL **)0); }

/* ./p_below.c */

#undef panel_below
PANEL *panel_below(
    const PANEL *pan)
    { return(*(PANEL **)0); }

/* ./p_bottom.c */

#undef bottom_panel
int bottom_panel(
    PANEL *pan)
    { return(*(int *)0); }

/* ./p_delete.c */

#undef del_panel
int del_panel(
    PANEL *pan)
    { return(*(int *)0); }

/* ./p_hide.c */

```

```
#undef hide_panel
int hide_panel(
    PANEL *pan)
{ return(*(int *)0); }

/* ./p_hidden.c */

#undef panel_hidden
int panel_hidden(
    const PANEL *pan)
{ return(*(int *)0); }

/* ./p_move.c */

#undef move_panel
int move_panel(
    PANEL *pan,
    int starty,
    int startx)
{ return(*(int *)0); }

/* ./p_new.c */

#undef new_panel
PANEL *new_panel(
    WINDOW *win)
{ return(*(PANEL **)0); }

/* ./p_replace.c */

#undef replace_panel
int replace_panel(
    PANEL *pan,

    WINDOW *win)
{ return(*(int *)0); }

/* ./p_show.c */

#undef show_panel
int show_panel(
    PANEL *pan)
{ return(*(int *)0); }

/* ./p_top.c */

#undef top_panel
int top_panel(
```



```

PANEL *pan)
{ return(*(int *)0); }

/* ./p_update.c */

#undef update_panels
void update_panels(void)
{ /* void */ }

/* ./p_user.c */

#undef set_panel_userptr
int set_panel_userptr(
    PANEL *pan,
    void *uptr)
{ return(*(int *)0); }

#undef panel_userptr
void *panel_userptr(
    const PANEL *pan)
{ return(*(void **)0); }

/* ./p_win.c */

#undef panel_window
WINDOW *panel_window(
    const PANEL *pan)
{ return(*(WINDOW **)0); }

```

Found in path(s):

\* /opt/cola/permits/1600019816\_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/panel/lib-lpanelw

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-----  
-- \$Id: README,v 1.2 2006/04/22 22:19:37 tom Exp \$  
-----

The functions in this directory are the generic (not device-specific) modules  
of ncurses.

As a rule, these modules should not depend directly on term.h references and  
associated terminfo function and variables.

Found in path(s):

\* /opt/cola/permits/1600019816\_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-  
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/ncurses/base/README  
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<!--

\$Id: Ada95.html,v 1.6 2004/01/18 00:32:47 tom Exp \$

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\* @Id: clear.1,v 1.3 2000/07/15 23:59:35 china Exp @

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archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/doc/html/Ada95.html

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archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/ncurses/widechar/lib\_in\_wch.c  
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archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/form/fty\_regex.c  
\* /opt/cola/permits/1600019816\_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-  
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/form/fty\_alpha.c  
\* /opt/cola/permits/1600019816\_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-  
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/form/fty\_int.c  
\* /opt/cola/permits/1600019816\_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-  
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/ncurses/base/lib\_color.c  
\* /opt/cola/permits/1600019816\_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-  
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/ncurses/base/lib\_slkclear.c

```

*
/opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-archive-
fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/ncurses/tinfo/access.c
* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/include/ncurses_dll.h
* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/include/tic.h
* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/form/fty_num.c
* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/ncurses/base/lib_redrawln.c
*
/opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-archive-
fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/form/fty_enum.c
* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/ncurses/tty/lib_vidattr.c
* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/form/fty_alnum.c
* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/progs/clear.c
* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/ncurses/base/lib_refresh.c
*
/opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-archive-
fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/ncurses/base/lib_addstr.c
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#####
#
# Author: Thomas E. Dickey 1997-on
#
# Test-Program modules

```

```

@ base
background progs $(srcdir) $(HEADER_DEPS)
blue progs $(srcdir) $(HEADER_DEPS)
bs progs $(srcdir) $(HEADER_DEPS)
cardfile progs $(srcdir) $(HEADER_DEPS) ../include/panel.h ../include/form.h
chgat progs $(srcdir) $(HEADER_DEPS)
color_set progs $(srcdir) $(HEADER_DEPS)
demo_altkeys progs $(srcdir) $(HEADER_DEPS)
demo_defkey progs $(srcdir) $(HEADER_DEPS)
demo_forms progs $(srcdir) $(HEADER_DEPS) ../include/form.h $(srcdir)/edit_field.h
demo_keyok progs $(srcdir) $(HEADER_DEPS)
demo_menus progs $(srcdir) $(HEADER_DEPS) ../include/menu.h
demo_panels progs $(srcdir) $(HEADER_DEPS) ../include/panel.h
demo_termcap progs $(srcdir) $(HEADER_DEPS)
ditto progs $(srcdir) $(HEADER_DEPS)
dots progs $(srcdir) $(HEADER_DEPS)
dots_mvcur progs $(srcdir) $(HEADER_DEPS)
echochar progs $(srcdir) $(HEADER_DEPS)
edit_field progs $(srcdir) $(HEADER_DEPS) $(srcdir)/edit_field.h
filter progs $(srcdir) $(HEADER_DEPS) ../include/form.h
firework progs $(srcdir) $(HEADER_DEPS)
firstlast progs $(srcdir) $(HEADER_DEPS)
foldkeys progs $(srcdir) $(HEADER_DEPS)
gdc progs $(srcdir) $(HEADER_DEPS)
hanoi progs $(srcdir) $(HEADER_DEPS)
hashtest progs $(srcdir) $(HEADER_DEPS)
inch_wide progs $(srcdir) $(HEADER_DEPS)
inchs progs $(srcdir) $(HEADER_DEPS)
ins_wide progs $(srcdir) $(HEADER_DEPS)

```

```
inserts progs $(srcdir) $(HEADER_DEPS)
key_names progs $(srcdir) $(HEADER_DEPS)
keynames progs $(srcdir) $(HEADER_DEPS)
knight progs $(srcdir) $(HEADER_DEPS)
lrtest progs $(srcdir) $(HEADER_DEPS)
movewindow progs $(srcdir) $(HEADER_DEPS)
ncurses progs $(srcdir) $(HEADER_DEPS) ../include/panel.h
../include/menu.h ../include/form.h
newdemo progs $(srcdir) $(HEADER_DEPS)
railroad progs $(srcdir) $(HEADER_DEPS)
rain progs $(srcdir) $(HEADER_DEPS)
redraw progs $(srcdir) $(HEADER_DEPS)
savescreen progs $(srcdir) $(HEADER_DEPS)
tclock progs $(srcdir) $(HEADER_DEPS)
test_arrays progs $(srcdir) $(HEADER_DEPS)
test_get_wstr progs $(srcdir) $(HEADER_DEPS)
test_getstr progs $(srcdir) $(HEADER_DEPS)
test_instr progs $(srcdir) $(HEADER_DEPS)
test_inwstr progs $(srcdir) $(HEADER_DEPS)
test_opaque progs $(srcdir) $(HEADER_DEPS)
testaddch progs $(srcdir) $(HEADER_DEPS)
testcurs progs $(srcdir) $(HEADER_DEPS)
testscanw progs $(srcdir) $(HEADER_DEPS)
view progs $(srcdir) $(HEADER_DEPS)
worm progs $(srcdir) $(HEADER_DEPS)
xmas progs $(srcdir) $(HEADER_DEPS)
```

```
#
```

```
vile:makemode
```

```
Found in path(s):
```

```
* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/test/modules
```

```
No license file was found, but licenses were detected in source scan.
```

```
<!--
```

```
$Id: announce.html.in,v 1.70 2008/11/02 01:03:05 tom Exp $
```

```
*****
```

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\*/opt/cola/permits/1600019816\_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-  
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/announce.html.in

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```

-----
--
--          GNAT ncurses Binding          --
--
--          Terminal_Interface.Curses.Trace  --
--
--          B O D Y          --
--
-----
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```

```

-----
-- Author: Juergen Pfeifer, 1996
-- Version Control:
-- $Revision: 1.5 $
-- Binding Version 01.00
-----

```

```

#if
  ADA_TRACE then
with Interfaces.C; use Interfaces.C;
with Terminal_Interface.Curses.Aux; use Terminal_Interface.Curses.Aux;
with Ada.Unchecked_Conversion;
#end if;

```

```

package body Terminal_Interface.Curses.Trace is

```

```

#if ADA_TRACE then
  type C_TraceType is new C_UInt;

  function TraceAda_To_TraceC is new
    Ada.Unchecked_Conversion (Source => Trace_Attribute_Set,
                              Target => C_TraceType);

```

```

  procedure Trace_On (x : Trace_Attribute_Set) is
    procedure traceC (y : C_TraceType);
    pragma Import (C, traceC, "trace");
  begin
    traceC (TraceAda_To_TraceC (x));
  end Trace_On;

```

```

-- 75. (12) A C function that takes a variable number of arguments can
-- correspond to several Ada subprograms, taking various specific
-- numbers and types of parameters.

```

```

  procedure Trace_Put (str : String) is
    procedure tracef (format : char_array; s : char_array);

```

```

pragma Import (C, tracef, "_tracef");
Txt
: char_array (0 .. str'Length);
Length : size_t;
formatstr : constant String := "%s" & ASCII.Nul;
formattxt : char_array (0 .. formatstr'Length);
begin
To_C (formatstr, formattxt, Length);
To_C (str, Txt, Length);
tracef (formattxt, Txt);
end Trace_Put;
#else
procedure Trace_On (x : Trace_Attribute_Set) is
#if PRAGMA_UNREF
pragma Unreferenced (x);
#endif if;
begin
null;
end Trace_On;

procedure Trace_Put (str : String) is
#if PRAGMA_UNREF
pragma Unreferenced (str);
#endif if;
begin
null;
end Trace_Put;
#endif if;

end Terminal_Interface.Curses.Trace;

```

Found in path(s):

```

* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/Ada95/src/terminal_interface-
curses-trace.adb_p

```

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Found in path(s):

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* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/man/form_field_just.3x
*
/opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-archive-
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* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
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* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
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* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
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* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
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*
/opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-archive-
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* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
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* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
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* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
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* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
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* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
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* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
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/opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-archive-
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* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-

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archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/man/curs_outopts.3x
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* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
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* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
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* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
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* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
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*
/opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-archive-
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* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
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* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
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* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
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* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
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*
/opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-archive-
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* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/man/curs_opaque.3x
* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-

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archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/man/term.7
* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
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* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
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*
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* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
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* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
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* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
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*
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* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
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*
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* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
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* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-

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*
/opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-archive-
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* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
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* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
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* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
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* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
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*
/opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-archive-
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*
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*
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* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
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archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/man/form_field_info.3x
* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/man/curs_getcchar.3x
* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/man/captainfo.1m
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archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/progs/tset.c

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```
# $Id: ncurses supp,v 1.7 2008/09/20 18:43:42 tom Exp $
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#####
#
# This is a warning-suppression file for valgrind and ncurses.
```

```
#
# ncurses can also be configured using the --disable-leaks option, which
# allows an application to call _nc_freeall() or _nc_free_and_exit(), to
# free all of ncurses' "permanent" memory.
#
# Some of these leaks can be freed if the application does its own cleanup,
# for example:
# delscreen(SP);
# del_curterm(cur_term);
# However, few applications do this.
```

```
{
  ncurses_leak__nc_add_to_try
  Memcheck:Leak
  fun:*alloc
  fun:_nc_add_to_try
}
```

```
{
  ncurses_leak__nc_home_terminfo
  Memcheck:Leak
  fun:malloc
  fun:_nc_home_terminfo
}
```

```
{
  ncurses_leak__nc_init_wacs
  Memcheck:Leak
  fun:calloc
  fun:_nc_init_wacs
}
```

```
{
  ncurses_leak__nc_keyname
  Memcheck:Leak
  fun:calloc
  fun:_nc_keyname
}
```

```
{
  ncurses_leak__nc_keyname_2
  Memcheck:Leak
  fun:malloc
  fun:strdup
  fun:_nc_keyname
}
```

```
{
```

```
ncurses_leak__nc_printf_string
Memcheck:Leak
fun:malloc
fun:_nc_doalloc
fun:_nc_printf_string
}

{
ncurses_leak__nc_read_termtype
Memcheck:Leak
fun:*alloc
fun:_nc_read_termtype
fun:_nc_read_file_entry
}

{
ncurses_leak__nc_read_termtype_2
Memcheck:Leak
fun:*alloc
fun:_nc_doalloc
fun:_nc_read_termtype
fun:_nc_read_file_entry
}

{
ncurses_leak__nc_scroll_optimize
Memcheck:Leak
fun:*alloc
fun:_nc_hash_map
fun:_nc_scroll_optimize
}

{
ncurses_leak__nc_scroll_optimize_2
Memcheck:Leak
fun:*alloc
fun:_nc_doalloc
fun:_nc_scroll_optimize
}

{
ncurses_leak__nc_setupscreen
Memcheck:Leak
fun:calloc
fun:_nc_setupscreen
fun:newterm
}
```

```
{
ncurses_leak__nc_setupscreen_2
Memcheck:Leak
fun:calloc
fun:newwin
fun:_nc_setupscreen
}
```

```
{
ncurses_leak__nc_setupterm_1
Memcheck:Leak
fun:malloc
fun:strdup
fun:_nc_setupterm
}
```

```
{
ncurses_leak__nc_setupterm
Memcheck:Leak
fun:calloc
fun:_nc_setupterm
}
```

```
{
ncurses_leak__nc_setupscreen_3
Memcheck:Leak
fun:calloc
fun:_nc_makenew
fun:newwin
fun:_nc_setupscreen
}
```

```
{
ncurses_leak__nc_set_buffer
Memcheck:Leak
fun:malloc
fun:_nc_set_buffer
}
```

```
{
ncurses_leak__nc_tparm_analyze
Memcheck:Leak
fun:*alloc
fun:_nc_doalloc
fun:_nc_tparm_analyze
}
```

```
{
```

```
ncurses_leak__nc_trace_alloc
Memcheck:Leak
fun:*alloc
fun:_nc_doalloc
fun:_nc_trace_alloc
}
```

```
{
ncurses_leak_start_color
Memcheck:Leak
fun:calloc
fun:start_color
}
```

```
{
ncurses_leak_tparm
Memcheck:Leak
fun:realloc
fun:_nc_doalloc
fun:tparm
}
```

```
{
ncurses_leak_tparam_internal
Memcheck:Leak
fun:realloc
fun:_nc_doalloc
fun:get_space
fun:save_number
fun:tparam_internal
}
```

Found in path(s):

```
* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/misc/ncurses.supp
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*****
* @Id: form_field_buffer.3x,v 1.14 2006/11/04 17:12:00 tom Exp @
-->

```

Found in path(s):

```

* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-
5.7/doc/html/man/form_field_buffer.3x.html

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\* @Id: curs\_getyx.3x,v 1.16 2007/05/12 16:34:49 tom Exp @

-->

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archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-  
5.7/doc/html/man/curs\_getyx.3x.html

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\* @Id: curs\_window.3x,v 1.14 2006/02/25 21:49:19 tom Exp @

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\*/opt/cola/permits/1600019816\_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/include/hashed\_db.h

\*/opt/cola/permits/1600019816\_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-

archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/test/foldkeys.c  
\* /opt/cola/permits/1600019816\_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-  
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/include/nc\_tparm.h  
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archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/ncurses/trace/trace\_xnames.c  
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* @Id: curs_addwstr.3x,v 1.7 2006/02/25 20:59:08 tom Exp @
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archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-
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dnl*****
dnl
dnl $Id: normal.m4,v 1.2 2006/04/22 23:16:14 tom Exp $
define(`MANPAGE',`define(`MANPG',$1)dnl
|=====
-- | Man page MANPG
-- |=====)dnl
define(`ANCHOR',`define(`CFUNAME',`$1')define(`AFUNAME',`$2')dnl
)dnl
define(`AKA',`AKA': CFUNAME')dnl
define(`ALIAS',`AKA': $1')dnl

```

Found in path(s):

```

* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/Ada95/gen/normal.m4
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\* @Id: menu\_win.3x,v 1.8 2006/11/04 17:12:00 tom Exp @

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5.7/doc/html/man/menu\_win.3x.html

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\* @Id: captoinfo.1m,v 1.22 2007/06/02 20:40:07 tom Exp @

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archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/doc/html/man/captoinfo.1m.html  
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\$Id: hackguide.html,v 1.27 2005/12/24 15:37:13 tom Exp \$

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* @Id: menu_pattern.3x,v 1.11 2008/06/21 21:58:20 tom Exp @
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archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-
5.7/doc/html/man/menu_pattern.3x.html

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* @Id: form_hook.3x,v 1.9 2007/02/24 17:34:18 tom Exp @
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archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-
5.7/doc/html/man/form_hook.3x.html

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archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/ncurses/base/lib\_box.c  
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\* @Id: curs\_slk.3x,v 1.16 2007/06/02 20:40:07 tom Exp @  
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archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/doc/html/man/curs\_slk.3x.html  
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\* @Id: mitem\_current.3x,v 1.11 2006/11/04 18:18:19 tom Exp @  
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archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-

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* @Id: curs_get_wstr.3x,v 1.6 2006/02/25 21:49:19 tom Exp @
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archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-
5.7/doc/html/man/curs_get_wstr.3x.html

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archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/test/cardfile.c
* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/test/dots_mvcur.c
* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/test/dots.c
* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/ncurses/trace/trace_tries.c
* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/ncurses/tinfo/name_match.c

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#
# Author: Thomas E. Dickey <dickey@clark.net> 1996
#
$(srcdir)/eti.h
$(srcdir)/menu.h
# vile:makemode

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* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/menu/headers

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\* @Id: curs\_attr.3x,v 1.31 2007/03/17 20:30:33 tom Exp @

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\* Author: Thomas E. Dickey 1999

\* @Id: keybound.3x,v 1.6 2006/02/25 21:47:06 tom Exp @

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\* @Id: form\_new.3x,v 1.7 2006/11/04 17:12:00 tom Exp @

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#####
# $Id: xterm-88color.dat,v 1.2 2006/04/22 21:40:00 tom Exp $
# This illustrates the predefined colors for XFree86 xterm's "xterm-16color".
# If you set $TERM to "xterm-88color" (and have xterm compiled to support the
# 88-color or 256-color feature), you can use the ncurses 'd' screen to
# manipulate the colors shown in the screen. The 'd' screen is limited to
# the first 16 colors, and xterm happens to use the same first 16 colors in
# the extended color models that support initc.
#
# The colors shown are for xterm patch #189.
scale:255
0: 0 0 0 black
1: 205 0 0 red3
2: 0 205 0 green3
3: 205 205 0 yellow3
4: 30 144 255 DodgerBlue1
```

5: 205 0 205 magenta3  
6: 0 205 205 cyan3  
7: 229 229 229 gray90  
8: 127 127 127 gray50  
9: 255 0 0 red  
10: 0 255 0 green  
11: 255  
255 0 yellow  
12: 99 184 255 SteelBlue1  
13: 255 0 255 magenta  
14: 0 255 255 cyan  
15: 255 255 255 white  
16: 0 0 0  
17: 0 0 139  
18: 0 0 205  
19: 0 0 255  
20: 0 139 0  
21: 0 139 139  
22: 0 139 205  
23: 0 139 255  
24: 0 205 0  
25: 0 205 139  
26: 0 205 205  
27: 0 205 255  
28: 0 255 0  
29: 0 255 139  
30: 0 255 205  
31: 0 255 255  
32: 139 0 0  
33: 139 0 139  
34: 139 0 205  
35: 139 0 255  
36: 139 139 0  
37: 139 139 139  
38: 139 139 205  
39: 139 139 255  
40: 139 205 0  
41: 139 205 139  
42: 139 205 205  
43: 139 205 255  
44: 139 255 0  
45: 139 255 139  
46: 139 255 205  
47: 139 255 255  
48: 205 0 0  
49: 205 0 139  
50: 205 0 205  
51: 205 0 255

52: 205 139 0  
53: 205 139 139  
54: 205 139 205  
55: 205 139 255  
56: 205 205 0  
57: 205 205 139  
58: 205 205 205  
59: 205 205 255  
60: 205 255 0  
61: 205 255 139  
62: 205 255 205  
63: 205 255 255  
64: 255 0 0  
65: 255 0 139  
66: 255 0 205  
67: 255 0 255  
68: 255 139 0  
69: 255 139 139  
70: 255 139  
205  
71: 255 139 255  
72: 255 205 0  
73: 255 205 139  
74: 255 205 205  
75: 255 205 255  
76: 255 255 0  
77: 255 255 139  
78: 255 255 205  
79: 255 255 255  
80: 46 46 46  
81: 92 92 92  
82: 113 113 113  
83: 139 139 139  
84: 162 162 162  
85: 185 185 185  
86: 208 208 208  
87: 231 231 231

Found in path(s):

\* /opt/cola/permits/1600019816\_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/test/xterm-88color.dat

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*****
* @Id: form_driver.3x,v 1.16 2008/06/21 21:55:39 tom Exp @
-->

```

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archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-
5.7/doc/html/man/form_driver.3x.html

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-----  
-- \$Id: README-first,v 1.9 2007/01/27 18:27:09 tom Exp \$  
-----

#### ----- C++ interface to ncurses routines -----

This directory contains the source code for several C++ classes which ease the use of writing ncurses-based programs. The code was originally derived from the lib++ CursesWindow class, but rewritten for ncurses.

The classes simplify the use of window specific functions by encapsulating them in the window object. Function overloading is used in order to narrow the interface. For example, you do not have the distinction between `printw` and `mvprintw` anymore.

A second benefit is the removal of all #defines which are included in the curses.h file. This is a steady cause of trouble because many common identifiers are used. Instead now all #defines are inline functions, which also allows strict type checking of arguments.

The next enhancement is color support. It was originally provided by a derived class. This caused some trouble if you think about Panels or Menus and Forms with colors. We decided to put color support into the base class so that any derived class may use color support also. The implementation chosen here is directed to unrestricted use of mixes of color and monochrome windows. The original NCursesColorWindow class is maintained for compatibility reasons.

The last point to mention is the support of other packages that are distributed with the ncurses package: the panels library, the menu library and the form library. This support is provided by the NCursesPanel class, which is also derived from the NCursesWindow class and the NCursesMenu and NCursesForm classes

which are derived from NCursesPanel. This allows building interfaces with windows.

Please see the example program for a quick introduction.

Note that at this point, there is no documentation for these classes. Hopefully some will be written in the not too distant future. For now, to find out how to use the classes, read the code and the example program.

Suggestions for enhancements and contributions of code (and docs) are welcome. Please let us know which functionality you miss.

Original author:

Eric Newton <newton@rocky.oswego.edu> for FSF's libg++

Authors of first ncurses based release (NCursesWindow, NCursesPanel):

Ulrich Drepper <drepper@ira.uka.de>  
and Anatoly Ivasyuk <anatoly@nick.csh.rit.edu>

Authors of this release:

Juergen Pfeifer  
Thomas E. Dickey

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-- \$Id: README,v 1.2 2006/04/22 22:19:37 tom Exp \$  
-----

The files in this directory (tinfo) are those that support the terminfo database and interfaces for ncurses. The terminfo library can be built separately, as a lower-level library for ncurses, but usually is bundled.

In addition to the standard documented interfaces, ncurses uses internal functions which reside in tinfo to satisfy linkage requirements.

Found in path(s):

\* /opt/cola/permits/1600019816\_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/ncurses/tinfo/README  
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\* @Id: form\_new\_page.3x,v 1.8 2006/11/04 17:12:00 tom Exp @  
-->

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archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-  
5.7/doc/html/man/form\_new\_page.3x.html

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archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/c++/cursesf.h
* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/menu/m_global.c
* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/menu/m_cursor.c
* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/form/firm_opts.c
* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/form/firm_data.c
*
/opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-archive-
fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/menu/m_items.c
* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/menu/menu.priv.h
* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/panel/panel.c
* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/test/lrtest.c
* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/ncurses/base/lib_dft_fgbg.c
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\*\*\*\*\*  
\* Author: Thomas E. Dickey 1997,1999,2000,2005  
\* @Id: default\_colors.3x,v 1.20 2006/12/24 15:02:53 tom Exp @  
-->

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\* /opt/cola/permits/1600019816\_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-  
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-  
5.7/doc/html/man/default\_colors.3x.html  
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\* @Id: curs\_getchar.3x,v 1.11 2008/05/17 19:37:05 tom Exp @  
-->

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-- $Id: TO-DO,v 1.51 2008/10/11 19:22:27 tom Exp $
-----
```

SHORT-TERM TO-DO ITEMS:

Known Problems:

- + libtool does not work with GNAT.
- + The screen optimization has been tested only in an ad hoc manner. We should develop a good set of regression tests to cover lib\_douupdate.c and lib\_mvcur.c.
- + Magic cookie support (for nonzero xmc values) does not work, since the logic

does not take into account refresh. Also, the initial optimize does not adjust the current location when a cookie is emitted.

+ Scrolling optimization has holes: for example, it forces repaints of the screen between calls to refresh().

+ SVr4 uses slightly different rules for determining when softkeys are shown.

For example, they are initially displayed (before the ncurses 'e' test activates them), and a touchwin can apparently also force them to be displayed.

+ The code departs from perfect 8-bit cleanness in one respect; you cannot specify a character `\200` as part of a capability string, because the terminfo library interprets `\200` as a request to embed NUL (`\000`) at that point. This is a legacy terminfo property we can't mess with.

+ The window classes defined in the `c++` subdirectory need documentation. Some C++ programmer could earn a lot of good karma by doing this...

+ `vid_attr()` should support the `set_a_attributes (sgr1)` string, but does not. There appear to be no terminals that require that functionality.

+ the `configure --disable-ext-funcs` option does not work for Ada95 tree.

+ the `--with-pthread` configuration builds for Cygwin, but does not work properly (`test/worm.c` shows all of the worms in the same location).

+ the `--enable-rpath` configure option builds for the corresponding platforms; however combining it with `--with-ticlib` and `--with-termlib` does not always produce libraries that can be run without setting environment variables. Building those with `libtool` does not work either. (This is a problem with the BSD platforms).

Portability (or lack thereof):

+ Users of older System V UNIXes (but not Solaris, and probably not SVr4) may trip over a known problem with the signal-handling code which causes abrupt termination of ncurses applications following resume from a `^Z` suspend (this problem was first seen running lynx). You will not see this problem if you are running Linux or one of the 4.4BSD derivatives like FreeBSD, NetBSD, or BSDI. For details, see the analysis in the header comment of `ncurses/tty/lib_tstp.c`.

+ In theory, `vwprintw` and `vwscanf` are supposed to use the older `varargs.h` interface for handling variadic argument lists (and are deprecated by X/Open for that reason). Linux doesn't have

varargs.h, it has the newer X/Open-standard stdargs.h equivalent. So these functions use stdargs instead. This is unlikely to be a problem unless you're building ncurses on a System V old enough to only have varargs.h. (Solaris 2.5.1 used the stdarg.h binding as well).

+ If you're using a BSD earlier than 4.4BSD, or a Linux old enough not to have a native vsscanf(3) in its library, vwscanw() will not work. You lose. (It should work on any System V, however). If you want to fix this, add an implementation to ncurses/vsscanf.c.

+ The C++ binding fails to build with a few C++ compilers.

+ terminfo.5 does not format with the SunOS (and most other platform's) tbl utility because it relies on a diversion for each table entry. Get the groff package.

Untested features:

+ The code for the HP color model using set\_color\_pair is untested.

+ The code for handling soft labels on a terminal type with built-in support for them (num\_labels > 0, label\_height, label\_width, label\_format, label\_off, label\_on, plab\_norm, lab\_f\*) has not been tested. The label\_format and lab\_f\* capabilities aren't presently used.

LONGER-TERM TO-DO ITEMS:

#### 1. Extended COSE conformance

There is an XPG4 standard released in 1996 which describes a superset of the SVr4 API. The library is BASE conformant with this standard. We would like to make ncurses fully conformant at the EXTENDED level supporting internationalization.

#### 2. DOS port

Only a few of the files in the library depend on the terminfo format. It should be possible to further kernelize the package, then rewrite a small number of core files to produce a functionally-compatible port that would do updates to a memory-mapped screen area. The first result of this would be a DOS port.

#### 3. X port

It would be nice if ncurses could recognize when it was running under X and maintain its own window. With this feature, all ncurses programs would

automatically become X programs. The challenge is to handle resize events properly.

#### 4. Unused capabilities

The currently unused capabilities fall naturally into several groups:

##### A. Status-line capabilities:

Booleans: `has_status_line`, `status_line_esc_ok`.

Numerics: `width_status_line`.

Strings: `dis_status_line`, `from_status_line`, `to_status_line`.

System V Release 1 curses made no use of these at all. SVr4's use, if any, is unknown. From the AT&T termcap file it looks like curses, in general, shouldn't use them; terminal variants with status lines have their line count decremented by 1, suggesting that curses is supposed to leave the status line alone.

##### B. Printer capabilities:

Boolean: `col_addr_glitch`, `cr_cancels_micro_mode`, `has_print_wheel`, `row_addr_glitch`, `semi_auto_right_margin`, `cpi_changes_res`, `lpi_changes_res`.

Numeric: `buffer_capacity`, `dot_horz_spacing`, `dot_vert_spacing`, `max_micro_address`, `max_micro_jump`, `micro_col_size`, `micro_line_size`, `number_of_pins`, `output_res_char`, `output_res_line`, `output_res_horz_inch`, `print_rate`, `wide_char_size`,

`bit_image_entwining`, `bit_image_type`.

String: `down_half_line`, `form_feed`, `up_half_line`, `set_left_margin`, `set_right_margin`, `clear_margins`, `change_char_pitch`  
... `set_page_length` (all the SVr4 printer caps),

Curses doesn't use these.

##### C. Printer-control capabilities:

Boolean: `prtr_silent`.

Strings: `print_screen`, `prtr_on`, `prtr_off`, `prtr_non`.

Curses doesn't use these.

##### D. Dialer strings:

Strings: `hangup`, `dial_phone`, `quick_dial`, `tone`, `pulse`, `flash_hook`, `fixed_pause`, `wait_tone`.

Curses doesn't use these.

E. Window and virtual-terminal capabilities:

Numerics: maximum\_windows, virtual\_terminal.

Strings: req\_for\_input, create\_window, goto\_window, set\_window.

These seem to be fossils from some AT&T experiments on character-based window systems that never escaped the lab. The virtual\_terminal cap had something to do with building terminal emulations into tty line disciplines.

F. Unused VDT capabilities:

Booleans: erase\_overstrike, has\_meta\_key, insert\_null\_glitch,  
move\_insert,  
dest\_tabs\_magic\_sms0, transparent\_underline,  
needs\_xon\_xoff, hard\_cursor.

Numerics: lines\_of\_memory, buttons.

Strings: pkey\_key, pkey\_local, pkey\_xmit, underline\_char,  
enter\_xon\_mode, exit\_xon\_mode, xon\_character, xoff\_character,  
display\_clock, remove\_clock, user[0-5], display\_pc\_char,  
enter\_scancode\_mode, exit\_scancode\_mode, pc\_term\_options,  
scancode\_escape, alt\_scancode\_esc.

These are the potentially important ones for ncurses. Notes:

i) ncurses doesn't need move\_insert; it never uses cup/hpa/vpa while insert\_mode is on.

ii) We probably don't care about dest\_tabs\_magic\_sms0; only Telerays used it and they're all long obsolete.

-- vile:txtmode

Found in path(s):

\* /opt/cola/permits/1600019816\_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/TO-DO

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* @Id: curs_in_wchstr.3x,v 1.6 2006/12/02 17:03:07 tom Exp @
-->

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archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-
5.7/doc/html/man/curs_in_wchstr.3x.html

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\* @Id: curs\_scanw.3x,v 1.14 2006/12/24 16:05:49 tom Exp @

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5.7/doc/html/man/curs\_scanw.3x.html

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\* @Id: form\_post.3x,v 1.7 2006/11/04 18:53:20 tom Exp @

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5.7/doc/html/man/form\_post.3x.html

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\* @Id: curs\_get\_wch.3x,v 1.6 2006/02/25 21:47:06 tom Exp @

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archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-  
5.7/doc/html/man/curs\_get\_wch.3x.html

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*****
* @Id: curs_insstr.3x,v 1.18 2006/12/24 14:59:30 tom Exp @
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5.7/doc/html/man/curs_insstr.3x.html

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/* Feel free to modify the defined string FROMWHO to reflect you, your */

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archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/test/xmas.c

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-----
-- $Id: README.IZ,v 1.2 2006/04/22 23:13:05 tom Exp $
-----
```

Here is the patch. I did no testing whatsoever with event watching requests present (I need some applications which exercise this before this, probably lynx ;-), but the code looks working "the normal way".

I had no way to test that the poll() branch compiles/works...

Here is the API:

- \*) two new functions wgetch\_events() wgetstrn\_event() are introduced, which allow an event-watch specification given as the last argument;
- \*) if the last argument is NULL, they behave as wgetch() and wgetstrn() (TESTED!);
- \*) the event specification is a pointer to \_nc\_eventlist, which contains bookkeeping elements (count and the summary of results), and an array of pointers to \_nc\_event;
- \*) each \_nc\_event is a typed union, with two types supported "as shipped": \_NC\_EVENT\_TIMEOUT\_MSEC, \_NC\_EVENT\_FILE. For \_NC\_EVENT\_FILE the fields are fd, flag, and the output field.
- \*) The only supported flag "as shipped" is \_NC\_EVENT\_FILE\_READABLE. If the file was found readable, the return field is set to this, otherwise to 0;
- \*) If these functions return KEY\_EVENT, this means that the return fields in both the \_nc\_eventlist and \_nc\_event structures make sense. The field result\_flags of \_nc\_eventlist may have a combination of bits \_NC\_EVENT\_TIMEOUT\_MSEC and \_NC\_EVENT\_FILE\_READABLE set;
- \*) The timeout\_msec field of \_NC\_EVENT\_TIMEOUT\_MSEC \_nc\_event's is updated on return, even if the return is not KEY\_EVENT. However, the change in the value represents only the amount of time spent in waiting for events, not the amount of time spent bookkeeping;

\*) the return KEY\_EVENT of wgetstrn\_event() means that the output string includes the user input typed so far, but the user did not have a chance to press ENTER (or whatever). This call should be repeated (with "shifted" pointer to a buffer, of course) to complete the input;

\*) The presence of this extension can be checked via inspecting #ifdef NCURSES\_EVENT\_VERSION. This symbol is not defined on BeOS, since there is no support for this on BeOS.

Known issues: calls interrupted by KEY\_EVENT reset the ESCDELAY timer. This is not entirely new, since other synthetic events behave the same (see "if (ch >= KEY\_MIN)" branch of kgetch()). However, KEY\_EVENT may be generated in a continuous stream (say, when downloading a file), thus this may be more important than with other synthetic keys. An additional field in window structure which keeps timestamp of the first raw key in the queue may be needed to circumvent this.

Another possible issue: KEY\_EVENT has a preference over a user input, so a stream of KEY\_EVENT's can make input hard. Maybe use result\_flags as in input parameter too, which specifies whether the user input should have higher precedence?

Also: I took an opportunity to document kgetch() better.

Enjoy,  
Ilya

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* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/menu/m_pattern.c
* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/ncurses/base/lib_chgat.c
* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/ncurses/base/lib_wattroff.c
* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/test/firstlast.c
*

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fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/ncurses/base/lib_watron.c
* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
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* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/test/firework.c
* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/menu/m_item_new.c
* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/ncurses/tinfo/add_tries.c
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archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/ncurses/fifo_defs.h
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\* @Id: curs\_inwstr.3x,v 1.5 2006/02/25 21:20:20 tom Exp @

-->

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archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-  
5.7/doc/html/man/curs\_inwstr.3x.html

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*****/

/*****
* Author: Thomas E. Dickey <dickey@clark.net> 1998 *
*****/

/*
* $Id: ncurses_tst.hin,v 1.2 1998/02/11 12:14:05 tom Exp $
*
* This is a template-file used to generate the "ncurses_cfg.h" file.
*
* Rather than list every definition, the configuration script substitutes
* the definitions that it finds using 'sed'. You need a patch (971222)
* to autoconf 2.12 to do this.
*/
#ifndef NC_CONFIG_H
#define NC_CONFIG_H
@DEFS@

/* The C compiler may not treat these properly but C++ has to */
#ifdef __cplusplus
#undef const
#undef inline
#else
#if defined(lint) || defined	TRACE)
#undef inline
#define inline /* nothing */
#endif
#endif

#endif
/* NC_CONFIG_H */

Found in path(s):
* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/test/ncurses_tst.hin
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#####
#
# Author: Thomas Dickey
#
# $Id: Caps.hpx11,v 1.4 2006/05/27 15:33:04 tom Exp $
#
# This is an adaptation of ncurses' termcap/terminfo capability table, which
# is designed to align with HPUX 11.x's terminfo.
#
# This table is used to generate initializers for tables that drive tic,
# infocmp, and the library compilation code used to support the termcap
# compatibility hack. It is also used to generate the tabular portion of the
# terminfo(5) man page; lines beginning with `#%' are passed through to become
# the terminfo table.
#
# This file has three major sections; a standard-capabilities table, two
# extension-capability tables, and a section of aliases declarations.
# The first two have the same format, as follows:
#
# FILE FORMAT
#
# Column 1: terminfo variable name
# Column 2:
#         terminfo capability name
# Column 3: capability type (boolean, numeric, or string)
# Column 4: termcap capability name
# Column 5: KEY_XXX name, if any, `-' otherwise
# Column 6: value for KEY_XXX name, if any, `-' otherwise
# Column 7: Lead with `Y' if capability should be emitted in termcap
#         translations, `-' otherwise
# Column 8: capability description

```

```

#
# The codes following [Y-] in column 7 describe the versions of termcap which
# use the given capability. This information is not used by the curses library
# proper; rather, it's there to help the terminfo maintainer avoid emitting
# termcap entry translations that are more than 1023 bytes long (and tank a
# lot of old termcap-using programs). The codes read as follows:
# B = mentioned in the BSD man page for 4.4BSD curses
# C = used by the 4.4BSD curses library
# G = mentioned in the documentation for GNU termcap
# E = used by GNU Emacs
# K = remove this terminfo capability when translating to standard format
# The
# important codes are C and E. A cap with C or E should be preserved in
# translation if possible. The problem is that preserving all such caps may
# lead to some termcap translations being too long. The termcap maintainer
# has a bit of a juggling act to do...potential problem cases are marked with
# an asterisk (*).
#
# The aliases section has the following format:
#
# Column 1: either `capalias' or `infoalias'
# Column 2: name to be aliased
# Column 3: what name it should translate to. The name IGNORE means it
# should be discarded with a warning message.
# Column 4: name of the extension set (used for compiler warning messages)
# Column 5: capability description (usually an associated terminfo variable)
#
# HANDLING TERMCAP AND TERMINFO EXTENSIONS
#
# There are basically five different ways to handle termcap and terminfo
# extensions:
#
# 1. Don't list the capname here, or list it but comment it out (the latter
# is preferable; someone might want to handle it in the future).
# If you do
# this, the capability will be treated as unknown and raise a warning from
# the compiler.
#
# 2. Alias it. This is appropriate if the capability has the same meaning
# as an already-supported one. The compiler will handle aliasing, emitting
# an appropriate informational message whenever an alias fires.
#
# 3. List it in the standard table. You almost certainly do *not* want
# to do this -- the capabilities in that one, and their order, have been
# carefully chosen to be SVr4-binary-compatible when they're written out
# as a terminfo object, and breaking this would be bad. It's up the ncurses
# library what to do with the terminfo data after it's read in.
#

```

```
# 4. List it in the aliases table with an IGNORE target field. If you
# do this, the capability will be ignored on input (though the user will
# get a warning message about it).
#
# 5. List it in the extensions table. If you do this, the compiler will
# silently accept the capability, but the curses library proper
# will never
# see it (because it won't be written out as part of the terminfo object
# format). It's up to you what you have the compiler do with it.
#
# There are two opposite reasons to choose option 5. One is when you want
# to eat the capability silently and discard it when doing translations
# to terminfo with tic -I. Some very old obsolete BSD caps like :kn: are
# in this class. Nothing will ever use them again.
#
# More usually, you want the compiler to try to deduce something from the
# capability value that it can use to translate it into your output format.
# You'll need to write custom code, probably in postprocess_termcap() or
# postprocess_terminfo(), to handle the translation.
#
# CONTROLLING ENTRY LENGTH
#
# Notes on specific elisions made to fit translations within 1023 bytes:
#
# Machines with IBM PC-like keyboards want to be able to define the following
# keys: key_npage, key_ppage, key_home, key_ll (which is used for in termcap-
# only environments for End or
# Home-Down), key_dc, and key_ic. This is also
# the set of keys the `joe' editor will be upset if it can't see. So don't
# trim those out of the set to be translated to termcap, or various users of
# the termcap file will become irate.
#
# It might look tempting to leave those long init strings out of translations.
# We can't do it (yet); 4.4BSD tput and tset use them.
#
# We retain the sgr capability in translation in spite of the fact that neither
# 4.4BSD nor GNU Emacs uses it, because (a) some entry naming distinctions are
# hard to understand without it, and (b) the entries in which it is long tend
# to be older types that don't use up a lot of string space on function keys.
# The tic(1) translation code will complain and elide it if it makes a critical
# difference (there is special code in tic to recognize this situation).
#
# Yes, BSD tset(1) uses hpa. We elide hpa/vpa anyway because the motion
# optimizer in BSD curses didn't use them. This omission seems to be the
# single
# most effective one, it shortened the resolved length of all thirteen
# problem entries in the 9.9.0 version of the terminfo master below critical.
#
```

```

# It would be nice to keep f11 and f12 for Emacs use, but a couple of termcap
# translations go back over critical if we do this. As 4.4BSD curses fades
# into history and GNU termcap's application base shrinks towards being GNU
# Emacs only, we'll probably elide out some BSD-only capabilities in order
# to buy space for non-essentials Emacs is still using. Capabilities high
# on that hit list: rc, sc, uc.
#
#####
#
# STANDARD CAPABILITIES
#
%%The following is a complete table of the capabilities included in a
%%terminfo description block and available to terminfo-using code. In each
%%line of the table,
%%
%%The \fBvariable\fR is the name by which the programmer (at the terminfo level)
%%accesses the capability.
%%
%%The \fBcapname\fR is the short name used in
    the text of the database,
%%and is used by a person updating the database.
%%Whenever possible, capnames are chosen to be the same as or similar to
%%the ANSI X3.64-1979 standard (now superseded by ECMA-48, which uses
%%identical or very similar names). Semantics are also intended to match
%%those of the specification.
%%
%%The termcap code is the old
%%.B termcap
%%capability name (some capabilities are new, and have names which termcap
%%did not originate).
%%.P
%%Capability names have no hard length limit, but an informal limit of 5
%%characters has been adopted to keep them short and to allow the tabs in
%%the source file
%%.B Caps
%%to line up nicely.
%%
%%Finally, the description field attempts to convey the semantics of the
%%capability. You may find some codes in the description field:
%%.TP
%%(P)
%%indicates that padding may be specified
%%.TP
%%#[1-9]
%%in the description field indicates that the string is passed through tparm with
%%parms as given (#fii\fP).
%%.TP
%%(P*)

```

```

%%indicates
that padding may vary in proportion to the number of
%%lines affected
%%.TP
%%(#\d\fi\fp\u)
%%indicates the \fi\fp\uth\d parameter.
%%
%%.PP
%% These are the boolean capabilities:
%%
%%.na
%%.TS H
%%center expand;
%%c l l c
%%c l l c
%%lw25 lw6 lw2 lw20.
%%\fBVariable Cap- TCap Description\fR
%%\fBBooleans name Code\fR
auto_left_margin bw bool bw - - YB-G- cub1 wraps from column 0 to last column
auto_right_margin am bool am - - YBCGE terminal has automatic margins
no_esc_ctlc xsb bool xb - - YBCG- beehive (f1=escape, f2=ctrl C)
ceol_standout_glitch xhp bool xs - - YBCGE standout not erased by overwriting (hp)
eat_newline_glitch xenl bool xn - - YBCGE newline ignored after 80 cols (concept)
erase_overstrike eo bool eo - - YBCG- can erase overstrikes with a blank
generic_type gn bool gn - - YB-G- generic line type
hard_copy hc bool hc - - YBCG- hardcopy terminal
has_meta_key km bool km - - YB-GE Has a meta key (i.e., sets 8th-bit)
has_status_line hs bool hs - - YB-G- has
extra status line
insert_null_glitch in bool in - - YBCGE insert mode distinguishes nulls
memory_above da bool da - - YBCG- display may be retained above the screen
memory_below db bool db - - YB-GE display may be retained below the screen
move_insert_mode mir bool mi - - YBCGE safe to move while in insert mode
move_standout_mode msgr bool ms - - YBCGE safe to move while in standout mode
over_strike os bool os - - YBCG- terminal can overstrike
status_line_esc_ok eslok bool es - - YB-G- escape can be used on the status line
dest_tabs_magic_sms0 xt bool xt - - YBCGE tabs destructive, magic so char (t1061)
tilde_glitch hz bool hz - - YB-GE cannot print ~'s (hazeltine)
transparent_underline ul bool ul - - YBCGE underline character overstrikes
xon_xoff xon bool xo - - YB--- terminal uses xon/xoff handshaking
# end booleans for HPUX 9, 10 (non-color curses)
needs_xon_xoff nxon bool nx - - ----- padding will not work, xon/xoff required
prtr_silent mc5i bool 5i - - ----- printer
will not echo on screen
hard_cursor chts bool HC - - ----- cursor is hard to see
non_rev_rmcup nrrmc bool NR - - ----- smcup does not reverse rmcup
no_pad_char npc bool NP - - ----- pad character does not exist
non_dest_scroll_region ndscr bool ND - - ----- scrolling region is non-destructive

```



```

can_change ccc bool cc - - ----- terminal can re-define existing colors
back_color_erase bce bool ut - - ----- screen erased with background color
hue_lightness_saturation hls bool hl - - ----- terminal uses only HLS color notation (Tektronix)
col_addr_glitch xhpa bool YA - - ----- only positive motion for hpa/mhpa caps
cr_cancels_micro_mode crxm bool YB - - ----- using cr turns off micro mode
has_print_wheel daisy bool YC - - ----- printer needs operator to change character set
row_addr_glitch xvpa bool YD - - ----- only positive motion for vpa/mvpa caps
semi_auto_right_margin sam bool YE - - ----- printing in last column causes cr
cpi_changes_res cpix bool YF - - ----- changing
character pitch changes resolution
lpi_changes_res lpix bool YG - - ----- changing line pitch changes resolution
#%.TE
#%.ad
#%
#%These are the numeric capabilities:
#%
#%.na
#%.TS H
#%center expand;
#%c 1 l c
#%c 1 l c
#%lw25 lw6 lw2 lw20.
#%\fBVariable Cap- TCap Description\fR
#%\fBNumeric name Code\fR
columns cols num co - - YBCGE number of columns in a line
init_tabs it num it - - YB-G- tabs initially every # spaces
lines lines num li - - YBCGE number of lines on screen or page
lines_of_memory lm num lm - - YB-G- lines of memory if > line. 0 means varies
magic_cookie_glitch xmc num sg - - YBCGE number of blank characters left by smso or rmso
padding_baud_rate pb num pb - - YB-GE lowest baud rate where padding needed
virtual_terminal vt num vt - - YB--- virtual terminal number (CB/unix)
width_status_line wsl num ws - - YB-G- number of columns in status line
# end numbers for HPUX 9, 10 (non-color curses)
num_labels nlab num NI - - ----- number
of labels on screen
label_height lh num lh - - ----- rows in each label
label_width lw num lw - - ----- columns in each label
max_attributes ma num ma - - YBC-- maximum combined attributes terminal can handle
maximum_windows wnum num MW - - ----- maximum number of defineable windows
# These came in with SVr4's color support
max_colors colors num Co - - ----- maximum number of colors on screen
max_pairs pairs num pa - - ----- maximum number of color-pairs on the screen
no_color_video ncv num NC - - ----- video attributes that cannot be used with colors
#%.TE
#%.ad
#%
#%The following numeric capabilities are present in the SVr4.0 term structure,
#%but are not yet documented in the man page. They came in with SVr4's

```

```

%%printer support.
%%
%%.na
%%.TS H
%%center expand;
%%c 1 l c
%%c 1 l c
%%lw25 lw6 lw2 lw20.
%%\fBVariable Cap- TCap Description\fR
%%\fBNumeric name Code\fR
buffer_capacity  bufisz num Ya - - - - - numbers of bytes buffered before printing
dot_vert_spacing  spinv num Yb - - - - - spacing
of pins vertically in pins per inch
dot_horz_spacing  spinh num Yc - - - - - spacing of dots horizontally in dots per inch
max_micro_address  maddr num Yd - - - - - maximum value in micro_..._address
max_micro_jump    mjump num Ye - - - - - maximum value in parm_..._micro
micro_col_size    mcs num Yf - - - - - character step size when in micro mode
micro_line_size   mls num Yg - - - - - line step size when in micro mode
number_of_pins    npins num Yh - - - - - numbers of pins in print-head
output_res_char   orc num Yi - - - - - horizontal resolution in units per line
output_res_line   orl num Yj - - - - - vertical resolution in units per line
output_res_horz_inch  orhi num Yk - - - - - horizontal resolution in units per inch
output_res_vert_inch  orvi num Yl - - - - - vertical resolution in units per inch
print_rate        cps num Ym - - - - - print rate in characters per second
wide_char_size    widcs num Yn - - - - - character step size when in double wide mode
buttons          btns num BT - - - - - number
of buttons on mouse
bit_image_entwining  bitwin num Yo - - - - - number of passes for each bit-image row
bit_image_type      bitype num Yp - - - - - type of bit-image device
%%.TE
%%.ad
%%
%%These are the string capabilities:
%%
%%.na
%%.TS H
%%center expand;
%%c 1 l c
%%c 1 l c
%%lw25 lw6 lw2 lw20.
%%\fBVariable Cap- TCap Description\fR
%%\fBString name Code\fR
back_tab          cbt str bt - - YBCGE back tab (P)
bell              bel str bl - - YB-GE audible signal (bell) (P)
carriage_return   cr str cr - - YBCGE carriage return (P*) (P*)
change_scroll_region  csr str cs - - YBCGE change region to line #1 to line #2 (P)
clear_all_tabs    tbc str ct - - YB-G- clear all tab stops (P)
clear_screen      clear str cl - - YBCGE clear screen and home cursor (P*)

```

clr\_eol el str ce - - YBCGE clear to end of line (P)  
 clr\_eos ed str cd - - YBCGE clear to end of screen (P\*)  
 column\_address hpa str ch - - -B-GE\* horizontal position #1, absolute (P)  
 command\_character cmdch str CC - - YB-G- terminal  
 settable cmd character in prototype !?  
 cursor\_address cup str cm - - YBCGE move to row #1 columns #2  
 cursor\_down cud1 str do - - YBCGE down one line  
 cursor\_home home str ho - - YBCGE home cursor (if no cup)  
 cursor\_invisible civis str vi - - YB-G- make cursor invisible  
 cursor\_left cub1 str le - - YBCGE move left one space  
 cursor\_mem\_address mrcup str CM - - YB-G- memory relative cursor addressing, move to row #1 columns #2  
 cursor\_normal cnorm str ve - - YBCGE make cursor appear normal (undo civis/cvvis)  
 cursor\_right cuf1 str nd - - YBCGE non-destructive space (move right one space)  
 cursor\_to\_ll ll str ll - - YBCGE last line, first column (if no cup)  
 cursor\_up cuu1 str up - - YBCGE up one line  
 cursor\_visible cvvis str vs - - YBCGE make cursor very visible  
 delete\_character dch1 str dc - - YBCGE delete character (P\*)  
 delete\_line dl1 str dl - - YBCGE delete line (P\*)  
 dis\_status\_line dsl str ds - - YB-G- disable status  
 line  
 down\_half\_line hd str hd - - YB-G- half a line down  
 enter\_alt\_charset\_mode smacs str as - - YB-G- start alternate character set (P)  
 enter\_blink\_mode blink str mb - - YB-G- turn on blinking  
 enter\_bold\_mode bold str md - - YB-G- turn on bold (extra bright) mode  
 enter\_ca\_mode smcup str ti - - YBCGE string to start programs using cup  
 enter\_delete\_mode smdc str dm - - YBCGE enter delete mode  
 enter\_dim\_mode dim str mh - - YB-G- turn on half-bright mode  
 enter\_insert\_mode smir str im - - YBCGE enter insert mode  
 enter\_secure\_mode invis str mk - - -B-G-\* turn on blank mode (characters invisible)  
 enter\_protected\_mode prot str mp - - -B-G-\* turn on protected mode  
 enter\_reverse\_mode rev str mr - - YB-G- turn on reverse video mode  
 enter\_standout\_mode smso str so - - YBCGE begin standout mode  
 enter\_underline\_mode smul str us - - YBCGE begin underline mode  
 erase\_chars ech str ec - - YB-G- erase #1 characters (P)  
 exit\_alt\_charset\_mode rmacs str ae - - YB-G- end  
 alternate character set (P)  
 exit\_attribute\_mode sgr0 str me - - YB-GE turn off all attributes  
 exit\_ca\_mode rmcup str te - - YBCGE strings to end programs using cup  
 exit\_delete\_mode rmdc str ed - - YBCGE end delete mode  
 exit\_insert\_mode rmir str ei - - YBCGE exit insert mode  
 exit\_standout\_mode rmso str se - - YBCGE exit standout mode  
 exit\_underline\_mode rmul str ue - - YBCGE exit underline mode  
 flash\_screen flash str vb - - YBCGE visible bell (may not move cursor)  
 form\_feed ff str ff - - YB-G- hardcopy terminal page eject (P\*)  
 from\_status\_line fsl str fs - - YB-G- return from status line  
 init\_1string is1 str i1 - - YB-G- initialization string  
 init\_2string is2 str is - - YB-G- initialization string  
 init\_3string is3 str i3 - - YB-G- initialization string

init\_file if str if - - YB-G- name of initialization file  
 insert\_character ich1 str ic - - YBCGE insert character (P)  
 insert\_line il1 str al - - YBCGE insert line (P\*)  
 insert\_padding ip str ip - - YBCGE insert padding after inserted character  
 key\_backspace kbs str kb KEY\_BACKSPACE 0407 YB-G- backspace key  
 key\_catab ktbc str ka KEY\_CATAB 0526 -B-G-\* clear-all-tabs key  
 key\_clear kclr str kC KEY\_CLEAR 0515 -B-G-\* clear-screen or erase key  
 key\_ctab kctab str kt KEY\_CTAB 0525 -B-G-\* clear-tab key  
 key\_dc kdch1 str kD KEY\_DC 0512 YB-G- delete-character key  
 key\_dl kdl1 str kL KEY\_DL 0510 -B-G-\* delete-line key  
 key\_down kcud1 str kd KEY\_DOWN 0402 YBCGE down-arrow key  
 key\_eic krmir str kM KEY\_EIC 0514 -B-G-\* sent by rmir or smir in insert mode  
 key\_eol kel str kE KEY\_EOL 0517 -B-G-\* clear-to-end-of-line key  
 key\_eos ked str kS KEY\_EOS 0516 -B-G-\* clear-to-end-of-screen key  
 key\_f0 kf0 str k0 KEY\_F(0) 0410 YBCGE F0 function key  
 key\_f1 kf1 str k1 KEY\_F(1) - YBCGE F1 function key  
 key\_f10 kf10 str k; KEY\_F(10) - ----E F10 function key  
 key\_f2 kf2 str k2 KEY\_F(2) - YBCGE F2 function key  
 key\_f3 kf3 str k3 KEY\_F(3) - YBCGE F3 function key  
 key\_f4 kf4 str k4 KEY\_F(4) - YBCGE F4 function key  
 key\_f5 kf5 str k5 KEY\_F(5) - YBCGE F5 function key  
 key\_f6 kf6 str k6 KEY\_F(6) - YBCGE F6 function key  
 key\_f7 kf7 str k7 KEY\_F(7) - YBCGE F7 function key  
 key\_f8 kf8 str k8 KEY\_F(8) - YBCGE F8 function key  
 key\_f9 kf9 str k9 KEY\_F(9) - YBCGE F9 function key  
 key\_home khome str kh KEY\_HOME 0406 YBCGE home key  
 key\_ic kich1 str kI KEY\_IC 0513 YB-GE insert-character key  
 key\_il kil1 str kA KEY\_IL 0511 -B-G-\* insert-line key  
 key\_left kcub1 str kI KEY\_LEFT 0404 YBCGE left-arrow key  
 key\_ll kll str kH KEY\_LL 0533 YB-G- lower-left key (home down)  
 key\_npage knp str kN KEY\_NPAGE 0522 YB-GE next-page key  
 key\_ppage kpp str kP KEY\_PPAGE 0523 YB-GE previous-page key  
 key\_right kcuf1 str kr KEY\_RIGHT 0405 YBCGE right-arrow key  
 key\_sf kind str kF KEY\_SF 0520 -B-G-\* scroll-forward key  
 key\_sr kri str kR KEY\_SR 0521 -B-G-\* scroll-backward key  
 key\_stab khst str kT KEY\_STAB 0524 -B-G-\* set-tab key  
 key\_up kcuu1 str ku KEY\_UP 0403 YBCGE up-arrow key  
 keypad\_local rmkx str ke - - YBCGE leave 'keyboard\_transmit' mode  
 keypad\_xmit smkx str ks - - YBCGE enter 'keyboard\_transmit' mode  
 lab\_f0 lf0 str l0 - - -B-G-\* label on function key f0 if not f0  
 lab\_f1 lf1 str l1 - - -B-G-\* label on function key f1 if not f1  
 lab\_f10 lf10 str la - - ----- label on function key f10 if not f10  
 lab\_f2 lf2 str l2 - - -B-G-\* label on function key f2 if not f2  
 lab\_f3 lf3 str l3 - - -B-G-\* label on function key f3 if not f3  
 lab\_f4 lf4 str l4 - - -B-G-\* label on function key f4 if not f4

lab\_f5 lf5 str l5 - -B-G-\* label on function key f5 if not f5  
lab\_f6 lf6 str l6 - -B-G-\* label on function key f6 if not f6  
lab\_f7 lf7 str l7 - -B-G-\* label on function key f7 if not f7  
lab\_f8 lf8 str l8 - -B-G-\* label on function key f8 if not f8  
lab\_f9 lf9 str l9 - -B-G-\* label on function key f9 if not f9  
meta\_off rmm str mo - -YB-G-\* turn off meta mode  
meta\_on smm str mm - -YB-G-\* turn  
on meta mode (8th-bit on)  
newline nel str nw - -YB-G-\* newline (behave like cr followed by lf)  
pad\_char pad str pc - -YBCGE padding char (instead of null)  
parm\_dch dch str DC - -YB-GE delete #1 characters (P\*)  
parm\_delete\_line dl str DL - -YBCGE delete #1 lines (P\*)  
parm\_down\_cursor cud str DO - -YBCGE down #1 lines (P\*)  
parm\_ich ich str IC - -YB-GE insert #1 characters (P\*)  
parm\_index indn str SF - -YBCG- scroll forward #1 lines (P)  
parm\_insert\_line il str AL - -YBCGE insert #1 lines (P\*)  
parm\_left\_cursor cub str LE - -YBCGE move #1 characters to the left (P)  
parm\_right\_cursor cuf str RI - -YBCGE move #1 characters to the right (P\*)  
parm\_rindex rin str SR - -YBCG- scroll back #1 lines (P)  
parm\_up\_cursor cuu str UP - -YBCGE up #1 lines (P\*)  
pkey\_key pfkey str pk - -B--- program function key #1 to type string #2  
pkey\_local pfloc str pl - -B--- program function key #1 to execute string #2  
pkey\_xmit pfx str px - -B--- program  
function key #1 to transmit string #2  
print\_screen mc0 str ps - -B-G-\* print contents of screen  
prtr\_off mc4 str pf - -B-G-\* turn off printer  
prtr\_on mc5 str po - -B-G-\* turn on printer  
repeat\_char rep str rp - -YB-GE repeat char #1 #2 times (P\*)  
reset\_1string rs1 str r1 - -B--- reset string  
reset\_2string rs2 str r2 - -B--- reset string  
reset\_3string rs3 str r3 - -B--- reset string  
reset\_file rf str rf - -B--- name of reset file  
restore\_cursor rc str rc - -YBCG- restore cursor to position of last save\_cursor  
row\_address vpa str cv - -B-GE\* vertical position #1 absolute (P)  
save\_cursor sc str sc - -YBCG- save current cursor position (P)  
scroll\_forward ind str sf - -YBCGE scroll text up (P)  
scroll\_reverse ri str sr - -YBCGE scroll text down (P)  
set\_attributes sgr str sa - -YB-G- define video attributes #1-#9 (PG9)  
set\_tab hts str st - -YB-G- set a tab in every row, current columns  
set\_window wind str wi - -B-GE current  
window is lines #1-#2 cols #3-#4  
tab ht str ta - -YBCGE tab to next 8-space hardware tab stop  
to\_status\_line tsl str ts - -YB-G- move to status line, column #1  
underline\_char uc str uc - -YBCG- underline char and move past it  
up\_half\_line hu str hu - -YB-G- half a line up  
init\_prog iprog str iP - -B--- path name of program for initialization  
key\_a1 ka1 str K1 KEY\_A1 0534 YB-GE upper left of keypad  
key\_a3 ka3 str K3 KEY\_A3 0535 YB-GE upper right of keypad

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key_b2 kb2 str K2 KEY_B2 0536 YB-GE center of keypad
key_c1 kc1 str K4 KEY_C1 0537 YB-GE lower left of keypad
key_c3 kc3 str K5 KEY_C3 0540 YB-GE lower right of keypad
prtr_non mc5p str pO - -B-G-* turn on printer for #1 bytes
#
# SVr1 capabilities stop here. IBM's version of terminfo is the same as
# SVr4 up to this point, but has a different set afterwards.
#
# HPUX defines these if __HP_CURSES_COMPAT is defined:
memory_lock meml str ml - ----K lock memory above cursor
memory_unlock memu str mu - ----K unlock
memory
#
#
plab_norm pln str pn - - ---- program label #1 to show string #2
label_on smln str LO - - ---- turn on soft labels
label_off rmln str LF - - ---- turn off soft labels
key_f11 kf11 str F1 KEY_F(11) - ----E F11 function key
key_f12 kf12 str F2 KEY_F(12) - ----E F12 function key
key_f13 kf13 str F3 KEY_F(13) - ----E F13 function key
key_f14 kf14 str F4 KEY_F(14) - ----E F14 function key
key_f15 kf15 str F5 KEY_F(15) - ----E F15 function key
key_f16 kf16 str F6 KEY_F(16) - ----E F16 function key
key_f17 kf17 str F7 KEY_F(17) - ----E F17 function key
key_f18 kf18 str F8 KEY_F(18) - ----E F18 function key
key_f19 kf19 str F9 KEY_F(19) - ----E F19 function key
key_f20 kf20 str FA KEY_F(20) - ----E F20 function key
key_f21 kf21 str FB KEY_F(21) - ----E F21 function key
key_f22 kf22 str FC KEY_F(22) - ----E F22 function key
key_f23 kf23 str FD KEY_F(23) - ----E F23 function key
key_f24 kf24 str FE KEY_F(24) - ----E F24
function key
key_f25 kf25 str FF KEY_F(25) - ----E F25 function key
key_f26 kf26 str FG KEY_F(26) - ----E F26 function key
key_f27 kf27 str FH KEY_F(27) - ----E F27 function key
key_f28 kf28 str FI KEY_F(28) - ----E F28 function key
key_f29 kf29 str FJ KEY_F(29) - ----E F29 function key
key_f30 kf30 str FK KEY_F(30) - ----E F30 function key
key_f31 kf31 str FL KEY_F(31) - ----E F31 function key
key_f32 kf32 str FM KEY_F(32) - ----E F32 function key
key_f33 kf33 str FN KEY_F(33) - ----E F33 function key
key_f34 kf34 str FO KEY_F(34) - ----E F34 function key
key_f35 kf35 str FP KEY_F(35) - ----E F35 function key
key_f36 kf36 str FQ KEY_F(36) - ----E F36 function key
key_f37 kf37 str FR KEY_F(37) - ----E F37 function key
key_f38 kf38 str FS KEY_F(38) - ----E F38 function key
key_f39 kf39 str FT KEY_F(39) - ----E F39 function key
key_f40 kf40 str FU KEY_F(40) - ----E F40 function key

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key\_f41 kf41 str FV KEY\_F(41) - ----E F41  
function key  
key\_f42 kf42 str FW KEY\_F(42) - ----E F42 function key  
key\_f43 kf43 str FX KEY\_F(43) - ----E F43 function key  
key\_f44 kf44 str FY KEY\_F(44) - ----E F44 function key  
key\_f45 kf45 str FZ KEY\_F(45) - ----E F45 function key  
key\_f46 kf46 str Fa KEY\_F(46) - ----E F46 function key  
key\_f47 kf47 str Fb KEY\_F(47) - ----E F47 function key  
key\_f48 kf48 str Fc KEY\_F(48) - ----E F48 function key  
key\_f49 kf49 str Fd KEY\_F(49) - ----E F49 function key  
key\_f50 kf50 str Fe KEY\_F(50) - ----E F50 function key  
key\_f51 kf51 str Ff KEY\_F(51) - ----E F51 function key  
key\_f52 kf52 str Fg KEY\_F(52) - ----E F52 function key  
key\_f53 kf53 str Fh KEY\_F(53) - ----E F53 function key  
key\_f54 kf54 str Fi KEY\_F(54) - ----E F54 function key  
key\_f55 kf55 str Fj KEY\_F(55) - ----E F55 function key  
key\_f56 kf56 str Fk KEY\_F(56) - ----E F56 function key  
key\_f57 kf57 str Fl KEY\_F(57) - ----E F57 function key  
key\_f58 kf58 str Fm KEY\_F(58) - ----E F58  
function key  
key\_f59 kf59 str Fn KEY\_F(59) - ----E F59 function key  
key\_f60 kf60 str Fo KEY\_F(60) - ----E F60 function key  
key\_f61 kf61 str Fp KEY\_F(61) - ----E F61 function key  
key\_f62 kf62 str Fq KEY\_F(62) - ----E F62 function key  
key\_f63 kf63 str Fr KEY\_F(63) - ----E F63 function key  
# end of strings in HPUX 9  
char\_padding rmp str rP - - ---- like ip but when in insert mode  
acs\_chars acsc str ac - - ---- graphics charset pairs, based on vt100  
key\_btab kcbt str kB KEY\_BTAB 0541 ---- back-tab key  
enter\_xon\_mode smxon str SX - - ---- turn on xon/xoff handshaking  
exit\_xon\_mode rmxon str RX - - ---- turn off xon/xoff handshaking  
enter\_am\_mode smam str SA - - ---- turn on automatic margins  
exit\_am\_mode rmam str RA - - ---- turn off automatic margins  
xon\_character xonc str XN - - ---- XON character  
xoff\_character xoffc str XF - - ---- XOFF character  
ena\_acs enacs str eA - - ---- enable alternate char set  
key\_beg kbeg str @1 KEY\_BEG 0542 ---- begin  
key  
key\_cancel kcan str @2 KEY\_CANCEL 0543 ---- cancel key  
key\_close kclo str @3 KEY\_CLOSE 0544 ---- close key  
key\_command kcmd str @4 KEY\_COMMAND 0545 ---- command key  
key\_copy kcpy str @5 KEY\_COPY 0546 ---- copy key  
key\_create kcrct str @6 KEY\_CREATE 0547 ---- create key  
key\_end kend str @7 KEY\_END 0550 ---- end key  
key\_enter kent str @8 KEY\_ENTER 0527 ---- enter/send key  
key\_exit kext str @9 KEY\_EXIT 0551 ---- exit key  
key\_find kfnd str @0 KEY\_FIND 0552 ---- find key  
key\_help khlp str %1 KEY\_HELP 0553 ---- help key

key\_mark kmrk str %2 KEY\_MARK 0554 ----- mark key  
key\_message kmsg str %3 KEY\_MESSAGE 0555 ----- message key  
key\_move kmov str %4 KEY\_MOVE 0556 ----- move key  
key\_next knxt str %5 KEY\_NEXT 0557 ----- next key  
key\_open kopn str %6 KEY\_OPEN 0560 ----- open key  
key\_options kopt str %7 KEY\_OPTIONS 0561 ----- options key  
key\_previous kprv str %8 KEY\_PREVIOUS 0562 ----- previous key  
key\_print kpri str %9 KEY\_PRINT 0532 ----- print  
key  
key\_redo krdo str %0 KEY\_REDO 0563 ----- redo key  
key\_reference kref str &1 KEY\_REFERENCE 0564 ----- reference key  
key\_refresh krfr str &2 KEY\_REFRESH 0565 ----- refresh key  
key\_replace krpl str &3 KEY\_REPLACE 0566 ----- replace key  
key\_restart krst str &4 KEY\_RESTART 0567 ----- restart key  
key\_resume kres str &5 KEY\_RESUME 0570 ----- resume key  
key\_save ksav str &6 KEY\_SAVE 0571 ----- save key  
key\_suspend kspd str &7 KEY\_SUSPEND 0627 ----- suspend key  
key\_undo kund str &8 KEY\_UNDO 0630 ----- undo key  
key\_sbeg kBEG str &9 KEY\_SBEG 0572 ----- shifted begin key  
key\_scancel kCAN str &0 KEY\_SCANCEL 0573 ----- shifted cancel key  
key\_scommand kCMD str \*1 KEY\_SCOMMAND 0574 ----- shifted command key  
key\_scopy kCPY str \*2 KEY\_SCOPY 0575 ----- shifted copy key  
key\_screate kCRT str \*3 KEY\_SCREATE 0576 ----- shifted create key  
key\_sdc kDC str \*4 KEY\_SDC 0577 ----- shifted delete-character key  
key\_sdl kDL str \*5 KEY\_SDL 0600 ----- shifted delete-line  
key  
key\_select kslt str \*6 KEY\_SELECT 0601 ----- select key  
key\_send kEND str \*7 KEY\_SEND 0602 ----- shifted end key  
key\_seol kEOL str \*8 KEY\_SEOL 0603 ----- shifted clear-to-end-of-line key  
key\_sexit kEXT str \*9 KEY\_SEXIT 0604 ----- shifted exit key  
key\_sfnd kFND str \*0 KEY\_SFIND 0605 ----- shifted find key  
key\_shelp kHLP str #1 KEY\_SHELP 0606 ----- shifted help key  
key\_shome kHOM str #2 KEY\_SHOME 0607 ----- shifted home key  
key\_sic kIC str #3 KEY\_SIC 0610 ----- shifted insert-character key  
key\_sleft kLFT str #4 KEY\_SLEFT 0611 ----- shifted left-arrow key  
key\_smessage kMSG str %a KEY\_SMESSAGE 0612 ----- shifted message key  
key\_smove kMOV str %b KEY\_SMOVE 0613 ----- shifted move key  
key\_snext kNXT str %c KEY\_SNEXT 0614 ----- shifted next key  
key\_soptions kOPT str %d KEY\_SOPTIONS 0615 ----- shifted options key  
key\_sprevious kPRV str %e KEY\_SPREVIOUS 0616 ----- shifted previous key  
key\_sprint kPRT str %f KEY\_SPRINT 0617 ----- shifted print key  
key\_sredo kRDO str %g KEY\_SREDO 0620 ----- shifted  
redo key  
key\_sreplace kRPL str %h KEY\_SREPLACE 0621 ----- shifted replace key  
key\_sright kRIT str %i KEY\_SRIGHT 0622 ----- shifted right-arrow key  
key\_sresume kRES str %j KEY\_SRESUME 0623 ----- shifted resume key  
key\_ssave kSAV str !1 KEY\_SSAVE 0624 ----- shifted save key  
key\_ssuspend kSPD str !2 KEY\_SSUSPEND 0625 ----- shifted suspend key



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key_sundo  kUND str !3 KEY_SUNDO 0626 ----- shifted undo key
req_for_input  rfi str RF - - - - - send next input char (for ptys)
clr_bol  e1l str cb - - - - - Clear to beginning of line
clear_margins  mgc str MC - - - - - clear right and left soft margins
set_left_margin  smgl str ML - - - - - set left soft margin at current column. See smgl. (ML is not in BSD termcap).
set_right_margin  smgr str MR - - - - - set right soft margin at current column
label_format  fln str Lf - - - - - label format
set_clock  sclk str SC - - - - - set clock, #1 hrs #2 mins #3 secs
display_clock  dclk str DK - - - - - display
clock
remove_clock  rmclk str RC - - - - - remove clock
create_window  cwin str CW - - - - - define a window #1 from #2,#3 to #4,#5
goto_window  wingo str WG - - - - - go to window #1
hangup  hup str HU - - - - - hang-up phone
dial_phone  dial str DI - - - - - dial number #1
quick_dial  qdial str QD - - - - - dial number #1 without checking
tone  tone str TO - - - - - select touch tone dialing
pulse  pulse str PU - - - - - select pulse dialing
flash_hook  hook str fh - - - - - flash switch hook
fixed_pause  pause str PA - - - - - pause for 2-3 seconds
wait_tone  wait str WA - - - - - wait for dial-tone
user0  u0 str u0 - - - - - User string #0
user1  u1 str u1 - - - - - User string #1
user2  u2 str u2 - - - - - User string #2
user3  u3 str u3 - - - - - User string #3
user4  u4 str u4 - - - - - User string #4
user5  u5 str u5 - - - - - User string #5
user6  u6 str u6 - - - - - User string #6
user7  u7 str u7 - - - - - User
string #7
user8  u8 str u8 - - - - - User string #8
user9  u9 str u9 - - - - - User string #9
#
# SVr4 added these capabilities to support color
#
orig_pair  op str op - - - - - Set default pair to its original value
orig_colors  oc str oc - - - - - Set all color pairs to the original ones
initialize_color  initc str Ic - - - - - initialize color #1 to (#2,#3,#4)
initialize_pair  initp str Ip - - - - - Initialize color pair #1 to fg=(#2,#3,#4), bg=(#5,#6,#7)
set_color_pair  scp str sp - - - - - Set current color pair to #1
set_foreground  setf str Sf - - - - - Set foreground color #1
set_background  setb str Sb - - - - - Set background color #1
#
# SVr4 added these capabilities to support printers
#
change_char_pitch  cpi str ZA - - - - - Change number of characters per inch to #1
change_line_pitch  lpi str ZB - - - - - Change number of lines per inch to #1
change_res_horz  chr str ZC - - - - - Change horizontal resolution to #1

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change\_res\_vert cvr str ZD - - - - - Change  
 vertical resolution to #1  
 define\_char defc str ZE - - - - - Define a character #1, #2 dots wide, descender #3  
 enter\_doublewide\_mode swidm str ZF - - - - - Enter double-wide mode  
 enter\_draft\_quality sdrfq str ZG - - - - - Enter draft-quality mode  
 enter\_italics\_mode sitm str ZH - - - - - Enter italic mode  
 enter\_leftward\_mode slm str ZI - - - - - Start leftward carriage motion  
 enter\_micro\_mode smicm str ZJ - - - - - Start micro-motion mode  
 enter\_near\_letter\_quality snlq str ZK - - - - - Enter NLQ mode  
 enter\_normal\_quality snrmq str ZL - - - - - Enter normal-quality mode  
 enter\_shadow\_mode sshm str ZM - - - - - Enter shadow-print mode  
 enter\_subscript\_mode ssubm str ZN - - - - - Enter subscript mode  
 enter\_superscript\_mode ssupm str ZO - - - - - Enter superscript mode  
 enter\_upward\_mode sum str ZP - - - - - Start upward carriage motion  
 exit\_doublewide\_mode rwidm str ZQ - - - - - End double-wide mode  
 exit\_italics\_mode ritm str ZR - - - - - End  
 italic mode  
 exit\_leftward\_mode rlm str ZS - - - - - End left-motion mode  
 exit\_micro\_mode rmicm str ZT - - - - - End micro-motion mode  
 exit\_shadow\_mode rshm str ZU - - - - - End shadow-print mode  
 exit\_subscript\_mode rsubm str ZV - - - - - End subscript mode  
 exit\_superscript\_mode rsupm str ZW - - - - - End superscript mode  
 exit\_upward\_mode rum str ZX - - - - - End reverse character motion  
 micro\_column\_address mhpa str ZY - - - - - Like column\_address in micro mode  
 micro\_down mcud1 str ZZ - - - - - Like cursor\_down in micro mode  
 micro\_left mcub1 str Za - - - - - Like cursor\_left in micro mode  
 micro\_right mcuf1 str Zb - - - - - Like cursor\_right in micro mode  
 micro\_row\_address mvpa str Zc - - - - - Like row\_address #1 in micro mode  
 micro\_up mciu1 str Zd - - - - - Like cursor\_up in micro mode  
 order\_of\_pins porder str Ze - - - - - Match software bits to print-head pins  
 parm\_down\_micro mcud str Zf - - - - - Like parm\_down\_cursor in micro mode  
 parm\_left\_micro mcub str Zg - - - - - Like  
 parm\_left\_cursor in micro mode  
 parm\_right\_micro mcuf str Zh - - - - - Like parm\_right\_cursor in micro mode  
 parm\_up\_micro mciu str Zi - - - - - Like parm\_up\_cursor in micro mode  
 select\_char\_set scs str Zj - - - - - Select character set, #1  
 set\_bottom\_margin smgb str Zk - - - - - Set bottom margin at current line  
 set\_bottom\_margin\_parm smgbp str Zl - - - - - Set bottom margin at line #1 or (if smgtp is not given) #2 lines from  
 bottom  
 set\_left\_margin\_parm smglp str Zm - - - - - Set left (right) margin at column #1  
 set\_right\_margin\_parm smgrp str Zn - - - - - Set right margin at column #1  
 set\_top\_margin smgt str Zo - - - - - Set top margin at current line  
 set\_top\_margin\_parm smgtp str Zp - - - - - Set top (bottom) margin at row #1  
 start\_bit\_image sbim str Zq - - - - - Start printing bit image graphics  
 start\_char\_set\_def scsd str Zr - - - - - Start character set definition #1, with #2 characters in the set  
 stop\_bit\_image rbim str Zs - - - - - Stop  
 printing bit image graphics  
 stop\_char\_set\_def rcsd str Zt - - - - - End definition of character set #1

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subscript_characters subcs str Zu - - - - - List of subscriptable characters
superscript_characters supcs str Zv - - - - - List of superscriptable characters
these_cause_cr dochr str Zw - - - - - Printing any of these characters causes CR
zero_motion zerom str Zx - - - - - No motion for subsequent character
#%.TE
#%.ad
#%
#%The following string capabilities are present in the SVr4.0 term structure,
#%but were originally not documented in the man page.
#%
#%.na
#%.TS H
#%center expand;
#%c l l c
#%c l l c
#%lw25 lw6 lw2 lw18.
#%\fBVariable Cap- TCap Description\fR
#%\fBString name Code\fR
char_set_names csnm str Zy - - - - - Produce #1'th item from list of character set names
key_mouse kmous str Km KEY_MOUSE 0631 - - - - - Mouse event has occurred
mouse_info minfo str Mi - - - - - Mouse status information
req_mouse_pos reqmp str RQ - - - - - Request
    mouse position
get_mouse getm str Gm - - - - - Curses should get button events, parameter #1 not documented.
set_a_foreground setaf str AF - - - - - Set foreground color to #1, using ANSI escape
set_a_background setab str AB - - - - - Set background color to #1, using ANSI escape
pkey_plab pfxl str xl - - - - - Program function key #1 to type string #2 and show string #3
device_type devt str dv - - - - - Indicate language/codeset support
code_set_init csin str ci - - - - - Init sequence for multiple codesets
set0_des_seq s0ds str s0 - - - - - Shift to codeset 0 (EUC set 0, ASCII)
set1_des_seq s1ds str s1 - - - - - Shift to codeset 1
set2_des_seq s2ds str s2 - - - - - Shift to codeset 2
set3_des_seq s3ds str s3 - - - - - Shift to codeset 3
set_lr_margin smglr str ML - - - - - Set both left and right margins to #1, #2. (ML is not in BSD termcap).
set_tb_margin smgtb str MT - - - - - Sets both top and bottom margins to #1, #2
bit_image_repeat birep str Xy - - - - - Repeat
    bit image cell #1 #2 times
bit_image_newline binel str Zz - - - - - Move to next row of the bit image
bit_image_carriage_return bicr str Yv - - - - - Move to beginning of same row
color_names colorm str Yw - - - - - Give name for color #1
define_bit_image_region defbi str Yx - - - - - Define rectangular bit image region
end_bit_image_region endbi str Yy - - - - - End a bit-image region
set_color_band setcolor str Yz - - - - - Change to ribbon color #1
set_page_length slines str YZ - - - - - Set page length to #1 lines
#
# SVr4 added these capabilities for direct PC-clone support
#
display_pc_char dispcc str S1 - - - - - Display PC character #1

```

```

enter_pc_charset_mode  smpch str S2 - - ----- Enter PC character display mode
exit_pc_charset_mode  rmpch str S3 - - ----- Exit PC character display mode
enter_scancode_mode   smsc str S4 - - ----- Enter PC scancode mode
exit_scancode_mode    rmsc str S5 - - ----- Exit PC scancode mode
pc_term_options      pctrm str S6 - - ----- PC
terminal options
scancode_escape      scesc str S7 - - ----- Escape for scancode emulation
alt_scancode_esc     scesa str S8 - - ----- Alternate escape for scancode emulation
#%.TE
#%.ad
#%
#%.in .8i
#%The XSI Curses standard added these.  They are some post-4.1
#%versions of System V curses, e.g., Solaris 2.5 and IRIX 6.x.
#%The \fBncurses\fR termcap names for them are invented; according to the
#%XSI Curses standard, they have no termcap names.  If your compiled terminfo
#%entries use these, they may not be binary-compatible with System V terminfo
#%entries after SVr4.1; beware!
#%
#%.na
#%.TS H
#%center expand;
#%c 1 l c
#%c 1 l c
#%lw25 lw6 lw2 lw20.
#%\fBVariable Cap- TCap Description\fR
#%\fBString name Code\fR
set_pglen_inch      slength str sL - - ----- YI Set page length to #1 hundredth of an inch
enter_horizontal_hl_mode ehhlms str Xh - - ----- Enter horizontal highlight mode
enter_left_hl_mode   elhlms str Xl - - ----- Enter left highlight mode
enter_low_hl_mode    elohlms str Xo - - ----- Enter
low highlight mode
enter_right_hl_mode  erhlm str Xr - - ----- Enter right highlight mode
enter_top_hl_mode    ethlm str Xt - - ----- Enter top highlight mode
enter_vertical_hl_mode evhlm str Xv - - ----- Enter vertical highlight mode
set_a_attributes    sgr1 str sA - - ----- Define second set of video attributes #1-#6
exit_horizontal_hl_mode rhhlms str XH - - ----K Exit horizontal highlight mode
exit_left_hl_mode    rlhlms str XL - - ----K Exit left highlight mode
exit_low_hl_mode     rlohlm str XO - - ----K Exit low highlight mode
exit_right_hl_mode   rrlhlm str XR - - ----K Exit right highlight mode
exit_top_hl_mode     rthlm str XT - - ----K Exit top highlight mode
exit_vertical_hl_mode rvhlm str XV - - ----K Exit vertical highlight mode
#%.TE
#%.ad
#
# The magic token below tells the tic compiler-generator code that all the caps
# past it should be ignored (not written out) when dumping terminfo objects.  It
# also tells the man page

```

```

table generator not to pass through following lines
# This means we can have obsolete capabilities and pseudo-capabilities that are
# recognized for termcap or terminfo compilation, but not output.
#
# %%-STOP-HERE-%%
#
# Don't move this casually! In fact, don't move it at all unless you're
# either doing it to add System V or XPG4 extensions, or have decided you
# don't care about SVr4 binary compatibility.
#
#####
#
# TERMCAP EXTENSION CAPABILITIES
#
# The capabilities below are either obsolete or extensions on certain systems.
# They are not used by SVR4 terminfo. Some are used by captinfo to translate
# termcap sources; the rest are listed for completeness, and in case somebody
# cares about them enough to hack in code that will translate them into
# terminfo capabilities.
#
# The first part of the list is from Ross Ridge's `mytinfo' package
# (comp.sources.unix, volume 26); the variable names and terminfo names
# (as
# well as the termcap codes) match his list.
#
# This group of codes is not marked obsolete in 4.4BSD, but have no direct
# terminfo equivalents. The rs capability is specially translated to terminfo
# r2, and vice versa, if an entry does not already have an r2. Similarly,
# i2 is translated to r3 if there is no r3 (because SV terminfo maps i2 to r3).
# The ug capability is thrown away, but assumed to be whatever sg is if the
# latter is nonzero and we're dumping in termcap format.
#
termcap_init2  OTi2 str i2 - - YB--- secondary initialization string
termcap_reset  OTrs str rs - - YB-G- terminal reset string
magic_cookie_glitch_ul  OTug num ug - - YBCGE number of blanks left by ul
#
# Obsolete termcap capabilities. Some are used for termcap translation. The
# code uses the 'OT' prefix we put on obsolete capabilities to suppress
# printing them in terminfo source dumps of compiled entries.
#
backspaces_with_bs  OTbs bool bs - - YBCGE uses ^H to move left
crt_no_scrolling  OTns bool ns - - YBCG- crt
cannot scroll
no_correctly_working_cr  OTnc bool nc - - YBCG- no way to go to start of line
carriage_return_delay  OTdC num dC - - YB-G- pad needed for CR
new_line_delay  OTdN num dN - - YB-G- pad needed for LF
linefeed_if_not_lf  OTnl str nl - - YBCGE use to move down
backspace_if_not_bs  OTbc str bc - - YBCGE move left, if not ^H

```

```

#
# GNU termcap library extensions. The GNU termcap file distributed with
# Emacs no longer uses these, but MT showed up in pre-9.0 versions of the
# BSD termcap file. The name clash with terminfo MT is resolved by type
# info; MT is converted to km.
#
gnu_has_meta_key OTMT bool MT - - ---E has meta key
# gnu_tab_width OTtw num tw - - ---E tab width in spaces
#
# GNU termcap *does* include the following extended capability, Only the
# now-obsolete Ann Arbor terminals used it.
#
# gnu_change_scroll_region OTcS str cS - - ---GE alternate set scrolling region
#
# The following comments describe capnames so ancient
# that I believe no
# software uses them any longer. Some of these have to go because they
# clash with terminfo names in ways that cannot be resolved by type
# information.
#
# These mytinfo codes are not used in the 4.4BSD curses code. They are
# marked obsolete in the 4.4BSD manual pages.
#
# There is one conflict with terminfo; ma is in both. This conflict is
# resolved by type information.
#
# The `ko' capability is translated by special code. It should contain a
# comma-separated list of capabilities for which there are corresponding keys.
# The `kn' code is accepted but ignored.
#
# The `ma' capability seems to have been designed to map between the rogue(2)
# motion keys (including jkhl) and characters emitted by arrow keys on some
# primitive pre-ANSI terminals. It's so obsolete it's fossilized...
#
# Here is a description of memory_lock_above and memory_unlock:
# "You can 'freeze' data on the screen by turning on Memory Lock in a line of
# text. All lines above the cursor's
# current line become locked in place on
# the screen. Then enter data normally. When the screen fills up, any
# further data entered forces the first line of unfrozen line text to scroll
# under the frozen data. Lines scrolled off the screen are inserted into
# memory immediately preceding the first frozen line." (from the HP 700/96
# User's manual). VT100/ANSI memory lock set is \E[>2h, reset is \E[>2l.
#
# Applications that use terminfo are supposed to behave as though xr is
# always true.
#
linefeed_is_newline OTNL bool NL - - YB--- move down with \n

```

```

# even_parity OTEP bool EP - -B--- terminal requires even parity
# odd_parity OTOP bool OP - -B--- terminal requires odd parity
# half_duplex OTHD bool HD - -B--- terminal is half-duplex
# lower_case_only OTLC bool LC - -B--- terminal has only lower case
# upper_case_only OTUC bool UC - -B--- terminal has only upper case
backspace_delay OTdB num dB - -YB-G- padding required for ^H
# form_feed_delay OTdF num dF - -B-G- padding
  required for ^L
horizontal_tab_delay OTdT num dT - -YB-G- padding required for ^I
# vertical_tab_delay OTdV num dV - -B--- padding required for ^V
number_of_function_keys OTkn num kn - -B-G- count of function keys
other_non_function_keys OTko str ko - -B-G- list of self-mapped keycaps
arrow_key_map OTma str ma - -YBC-- map arrow keys rogue(1) motion keys
# memory_lock_above OTml str ml - -B--- lock visible screen memory above the current line
# memory_unlock OTmu str mu - -B--- unlock visible screen memory above the current line
has_hardware_tabs OTpt bool pt - -YB--- has 8-char tabs invoked with ^I
return_does_clr_eol OTxr bool xr - -YB--- return clears the line
# tek_4025_insert_line OTxx bool xx - -BC-- Tektronix 4025 insert-line glitch
#
# mytinfo described this as a termcap capability, but it's not listed in the
# 4.4BSD man pages, and not found in the 4.4BSD termcap file. The ncurses
# package, like System V,
  behaves as though it is always true.
#
# rind_only_at_top OTxq bool xq - ------ reverse index only works from top line
#
# University of Waterloo termcap extensions (as described in mytinfo).
# The `xl' termcap file clashes with a terminfo name; this ambiguity cannot
# be resolved by a type check. The descriptions are guesses from what was
# in the mytinfo tables.
#
# key_interrupt_char OTki str ki - ------ string set by interrupt key (?)
# key_kill_char OTkk str kk - ------ string set by kill key (?)
# key_suspend_char OTkz str kz - ------ string set by suspend key (?)
# initialization_messy OTxc bool xc - ------ initialization leaves garbage on the screen (?)
# ind_at_bottom_does_cr OTxl bool xl - ------ index does a carriage return
#
# Nonstandard capabilities unique to Ross Ridge's `mytinfo' package.
# SR clashes with a terminfo name; this ambiguity cannot be resolved by a type
# check.
#
# scroll_left OTsl1 str Sl - ------ scroll screen leftward
# scroll_right OTsr1 str Sr - ------ scroll
  screen rightward
# parm_scroll_left OTsl str SL - ------ scroll screen leftward #1 characters
# parm_scroll_right OTsr str SR - ------ scroll screen rightward #1 characters
#
# The mytinfo capabilities end here.

```

```

#
# XENIX extensions:
#
# Xenix defined its own set of forms-drawing capabilities:
#
# cap IBM ASCII description      ACS      ASCII
# -----
# G1 191 \277 M-? single upper right  ACS_URCORNER
# G2 218 \332 M-Z single upper left  ACS_ULCORNER
# G3 192 \300 M-@ single lower left  ACS_LLCORNER
# G4 217 \331 M-Y single lower right  ACS_LRCORNER
# G5 187 \273 M-; double upper right
# G6 201 \311 M-I double upper left
# G7 200 \310 M-H double lower left
# G8 188 \274 M-< double lower right
# GC 197 \305 M-E single intersection ACS_PLUS __
# GD 194 \302 M-B single down-tick ACS_TTEE |
# GH 196 \304 M-D single horizontal line ACS_HLINE
# GL 180 \264 M-4 single left tick ACS_RTEE -|
#
# GR 195 \303 M-C single right tick ACS_LTEE |-
# GU 193 \301 M-A single up tick  ACS_BTEE _|
# GV 179 \263 M-3 single vertical line ACS_VLINE
# Gc 206 \316 M-N double intersection
# Gd 203 \313 M-K double down tick
# Gh 205 \315 M-M double horizontal line
# Gl 204 \204 M-L double left tick
# Gr 185 \271 M-9 double right tick
# Gu 202 \312 M-J double up tick
# Gv 186 \272 M-: double vertical line
#
# The compiler will translate the single-line caps and discard the others
# (via IGNORE aliases further down). We don't want to do normal pad
# translation on these, they're often single-character printable ASCII
# strings that happen to be numerics. There's awk code in parametrized.sh
# that detects the acs_ prefix and uses it to suppress pad translation.
# These terminfo names are invented.
#
acs_ulcorner  OTG2 str G2 - - - - - single upper left
acs_llcorner  OTG3 str G3 - - - - - single lower left
acs_urcorner  OTG1 str G1 - - - - - single upper right
acs_lrcorner  OTG4 str G4 - - - - - single
lower right
acs_ltee      OTGR str GR - - - - - tee pointing right
acs_rtee      OTGL str GL - - - - - tee pointing left
acs_btee      OTGU str GU - - - - - tee pointing up
acs_ttee      OTGD str GD - - - - - tee pointing down
acs_hline     OTGH str GH - - - - - single horizontal line

```



```

acs_vline OTGV str GV - - ----- single vertical line
acs_plus OTGC str GC - - ----- single intersection
#
#####
#
# TERMINFO EXTENSION CAPABILITIES
#
# This section is almost all comments. What it's mainly for is to describe
# what capabilities need to be squeezed out to get down to the XSI Curses
# standard set. They are flagged with K.
#
# HP extensions
#
# These extensions follow ptr_non (replacing everything after it) in HP
# terminfo files. Except for memory_lock and memory_unlock, they are
# functionally identical to SVr4 extensions, but they make the binary format
# different. Grrr....
#
#memory_lock meml str ml - - ----K memory
lock above
#memory_unlock memu str mu - - ----K memory unlock
#plab_norm pln str pn - - ----- program label #1 to show string #2
#label_on smln str LO - - ----- turn on soft labels
#label_off rmln str LF - - ----- turn off soft labels
#key_f11 kf11 str F1 - - ----- F11 function key
#key_f12 kf12 str F2 - - ----- F12 function key
#key_f13 kf13 str F3 - - ----- F13 function key
#key_f14 kf14 str F4 - - ----- F14 function key
#key_f15 kf15 str F5 - - ----- F15 function key
#key_f16 kf16 str F6 - - ----- F16 function key
#key_f17 kf17 str F7 - - ----- F17 function key
#key_f18 kf18 str F8 - - ----- F18 function key
#key_f19 kf19 str F9 - - ----- F19 function key
#key_f20 kf20 str FA - - ----- F20 function key
#key_f21 kf21 str FB - - ----- F21 function key
#key_f22 kf22 str FC - - ----- F22 function key
#key_f23 kf23 str FD - - ----- F23 function key
#key_f24 kf24 str FE - - ----- F24 function key
#key_f25 kf25 str FF - - ----- F25
function key
#key_f26 kf26 str FG - - ----- F26 function key
#key_f27 kf27 str FH - - ----- F27 function key
#key_f28 kf28 str FI - - ----- F28 function key
#key_f29 kf29 str FJ - - ----- F29 function key
#key_f30 kf30 str FK - - ----- F30 function key
#key_f31 kf31 str FL - - ----- F31 function key
#key_f32 kf32 str FM - - ----- F32 function key
#key_f33 kf33 str FN - - ----- F33 function key

```

```

#key_f34 kf34 str FO - - ----- F34 function key
#key_f35 kf35 str FP - - ----- F35 function key
#key_f36 kf36 str FQ - - ----- F36 function key
#key_f37 kf37 str FR - - ----- F37 function key
#key_f38 kf38 str FS - - ----- F38 function key
#key_f39 kf39 str FT - - ----- F39 function key
#key_f40 kf40 str FU - - ----- F40 function key
#key_f41 kf41 str FV - - ----- F41 function key
#key_f42 kf42 str FW - - ----- F42 function key
#key_f43 kf43 str FX - - ----- F43 function key
#key_f44 kf44 str FY - - ----- F44 function
key
#key_f45 kf45 str FZ - - ----- F45 function key
#key_f46 kf46 str Fa - - ----- F46 function key
#key_f47 kf47 str Fb - - ----- F47 function key
#key_f48 kf48 str Fc - - ----- F48 function key
#key_f49 kf49 str Fd - - ----- F49 function key
#key_f50 kf50 str Fe - - ----- F50 function key
#key_f51 kf51 str Ff - - ----- F51 function key
#key_f52 kf52 str Fg - - ----- F52 function key
#key_f53 kf53 str Fh - - ----- F53 function key
#key_f54 kf54 str Fi - - ----- F54 function key
#key_f55 kf55 str Fj - - ----- F55 function key
#key_f56 kf56 str Fk - - ----- F56 function key
#key_f57 kf57 str Fl - - ----- F57 function key
#key_f58 kf58 str Fm - - ----- F58 function key
#key_f59 kf59 str Fn - - ----- F59 function key
#key_f60 kf60 str Fo - - ----- F60 function key
#key_f61 kf61 str Fp - - ----- F61 function key
#key_f62 kf62 str Fq - - ----- F62 function key
#key_f63 kf63 str Fr - - ----- F63 function key
#
# IBM extensions
#
#
  These extensions follow ptr_non (replacing everything after it) in IBM
# terminfo files.
#
# The places in the box[12] capabilities correspond to acsc characters, here is
# the mapping:
#
# box1[0] = ACS_ULCORNER
# box1[1] = ACS_HLINE
# box1[2] = ACS_URCORNER
# box1[3] = ACS_VLINE
# box1[4] = ACS_LRCORNER
# box1[5] = ACS_LLCORNER
# box1[6] = ACS_TTEE

```

```

# box1[7] = ACS_RTEE
# box1[8] = ACS_BTEE
# box1[9] = ACS_LTEE
# box1[10] = ACS_PLUS
#
# The box2 characters are the double-line versions of these forms graphics.
#
box_chars_1 box1 str bx - - ----K box characters primary set
#box_chars_2 box2 str by - - ----K box characters secondary set
#box_attr_1 batt1 str Bx - - ----K attributes for box1
#box_attr_2 batt2 str By - - ----K attributes for box2
#color_bg_0 colb0 str d0 - - ----K background color 0
#color_bg_1 colb1 str d1 - - ----K background color 1
#color_bg_2 colb2 str d2 - - ----K background color 2
#color_bg_3 colb3 str d3 - - ----K background
color 3
#color_bg_4 colb4 str d4 - - ----K background color 4
#color_bg_5 colb5 str d5 - - ----K background color 5
#color_bg_6 colb6 str d6 - - ----K background color 6
#color_bg_7 colb7 str d7 - - ----K background color 7
#color_fg_0 colf0 str c0 - - ----K foreground color 0
#color_fg_1 colf1 str c1 - - ----K foreground color 1
#color_fg_2 colf2 str c2 - - ----K foreground color 2
#color_fg_3 colf3 str c3 - - ----K foreground color 3
#color_fg_4 colf4 str c4 - - ----K foreground color 4
#color_fg_5 colf5 str c5 - - ----K foreground color 5
#color_fg_6 colf6 str c6 - - ----K foreground color 6
#color_fg_7 colf7 str c7 - - ----K foreground color 7
#font_0 font0 str f0 - - ----- select font 0
#font_1 font1 str f1 - - ----- select font 1
#font_2 font2 str f2 - - ----- select font 2
#font_3 font3 str f3 - - ----- select font 3
#font_4 font4 str f4 - - ----K select font 4
#font_5 font5 str f5 - - ----K select font 5
#font_6 font6 str f6 - - ----K select
font 6
#font_7 font7 str f7 - - ----K select font 7
#key_back_tab kbtap str k0 - - ----- backtab key
#key_do kdo str ki - - ----K do request key
#key_command kcmd str kd - - ----K command-request key
#key_command_pane kcpn str kW - - ----K command-pane key
#key_end kend str kw - - ----- end key
#key_help khlp str kq - - ----- help key
#key_newline knl str nl - - ----K newline key
#key_next_pane knpn str kv - - ----K next-pane key
#key_prev_cmd kppn str kp - - ----K previous-command key
#key_prev_pane kppn str kV - - ----K previous-pane key
#key_quit kquit str kQ - - ----K quit key

```

```

#key_select ksel str kU - - ---- select key
#key_scroll_left kscl str kz - - ----K scroll left
#key_scroll_right kscr str kZ - - ----K scroll right
#key_tab ktab str ko - - ----K tab key
#key_smap_in1 kmpf1 str Kv - - ----K special mapped key 1 input
#key_smap_out1 kmpt1 str KV - - ----K special mapped key 1 output
#key_smap_in2 kmpf2 str Kw - - ----K special
mapped key 2 input
#key_smap_out2 kmpt2 str KW - - ----K special mapped key 2 output
#key_smap_in3 kmpf3 str Kx - - ----K special mapped key 3 input
#key_smap_out3 kmpt3 str KX - - ----K special mapped key 3 output
#key_smap_in4 kmpf4 str Ky - - ----K special mapped key 4 input
#key_smap_out4 kmpt4 str KY - - ----K special mapped key 4 output
#key_smap_in5 kmpf5 str Kz - - ----K special mapped key 5 input
#key_smap_out5 kmpt5 str KZ - - ----K special mapped key 5 output
#appl_defined_str apstr str za - - ----K application-defined string
# The key_smap_in[6789] and key_smap_out[6789] capabilities aren't described in
# the IBM manual pages, so the cap name strings are guesses. The terminfo
# names are almost certainly right, the termcap ones almost certainly wrong.
#key_smap_in6 kmpf6 str k! - - ----K special mapped key 6 input
#key_smap_out6 kmpt6 str K@ - - ----K special mapped key 6 output
#key_smap_in7 kmpf7 str k# - - ----K special
mapped key 7 input
#key_smap_out7 kmpt7 str K$ - - ----K special mapped key 7 output
#key_smap_in8 kmpf8 str k% - - ----K special mapped key 8 input
#key_smap_out8 kmpt8 str K^ - - ----K special mapped key 8 output
#key_smap_in9 kmpf9 str k& - - ----K special mapped key 9 input
#key_smap_out9 kmpt9 str K* - - ----K special mapped key 9 output
# Undocumented capabilities end here
#key_sf1 ksf1 str S1 - - ----K special function key 1
#key_sf2 ksf2 str S2 - - ----K special function key 2
#key_sf3 ksf3 str S3 - - ----K special function key 3
#key_sf4 ksf4 str S4 - - ----K special function key 4
#key_sf5 ksf5 str S5 - - ----K special function key 5
#key_sf6 ksf6 str S6 - - ----K special function key 6
#key_sf7 ksf7 str S7 - - ----K special function key 7
#key_sf8 ksf8 str S8 - - ----K special function key 8
#key_sf9 ksf9 str S9 - - ----K special function key 9
#key_sf10 ksf10 str SA - - ----K special function key 10
# AIX version
3 documents different codes for F11, F12 and does not mention
# F13-F64. AIX version 4 uses the same naming for F0-F63 as above.
#key_f11 kf11 str k< - - ----- function key 11
#key_f12 kf12 str k> - - ----- function key 12
# Undocumented capabilities end here.
#key_action kact str kJ - - ----K sent by action key
# The IBM docs say these capabilities are for table-drawing, and are
# valid only for aixterm descriptions.

```

```

#enter_topline_mode topl str tp - - ----K start top-line mode
#enter_bottom_mode btml str bm - - ----K start bottom-line mode
#enter_rvert_mode rvert str rv - - ----K start right-vertical mode
#enter_lvert_mode lvert str lv - - ----K start left-vertical mode
#
#####
#
# ALIAS DECLARATIONS
#
# Here we set up aliases for translating extensions into standard terminfo.
#
#----- Termcap aliases -----
#
# BSD aliases:
#
# This is a common error
# in many termcap files. We'll get notified during
# translation when this (or any other alias) fires.
#
capalias sb sr BSD scroll text down
#
# AT&T extensions:
#
# The old AT&T 5410, 5420, 5425, pc6300plus, 610, and s4 entries used a set of
# nonstandard capabilities. Its signature is the KM capability, used to name
# some sort of keymap file. EE, BO, CI, CV, XS, DS, FL and FE are in this
# set. Comments in the original, and a little cross-checking with other AT&T
# documentation, seem to establish the following mappings:
#
capalias BO mr AT&T enter_reverse_mode
capalias CI vi AT&T cursor_invisible
capalias CV ve AT&T cursor_normal
capalias DS mh AT&T enter_dim_mode
#capalias EE me AT&T exit_attribute_mode
capalias FE LF AT&T label_on
capalias FL LO AT&T label_off
capalias XS mk AT&T enter_secure_mode
#
# We comment out EE because the conflicting XENIX EE is more common in
# old entries.
#
# XENIX extensions:
#
# These are the ones we know how to translate directly:
#
capalias EE mh XENIX exit_attribute_mode
capalias GE ae XENIX exit_alt_charset_mode
capalias GS as XENIX enter_alt_charset_mode

```

```
capalias CF vi XENIX cursor_invis
capalias CO ve XENIX cursor_normal
capalias EN @7 XENIX key_end
capalias HM kh XENIX key_home
capalias LD kL XENIX key_dl
capalias PD kN XENIX key_npage
capalias PN po XENIX prtr_off
capalias PS pf XENIX prtr_on
capalias PU kP XENIX key_ppage
capalias RT @8 XENIX kent
capalias UP ku XENIX kcuu1
capalias G6 IGNORE XENIX double-ACS_ULCORNER
capalias G7 IGNORE XENIX double-ACS_LLCORNER
capalias G5 IGNORE XENIX double-ACS_URCORNER
capalias G8 IGNORE XENIX double-ACS_LRCORNER
capalias Gr IGNORE XENIX double-ACS_LTEE
capalias Gr IGNORE XENIX double-ACS_RTEE
capalias Gu IGNORE XENIX double-ACS_BTEE
capalias Gd IGNORE XENIX double
ACS_TTEE
capalias Gh IGNORE XENIX double-ACS_HLINE
capalias Gv IGNORE XENIX double-ACS_VLINE
capalias Gc IGNORE XENIX double-ACS_PLUS
capalias GG IGNORE XENIX acs-glitch
#
# IBM extensions:
#
capalias kq %1 IBM key_help
#
#
Iris extensions:
#
capalias HS mh IRIS enter_dim_mode
#
# Tektronix extensions:
#
capalias KA k; Tek key_f10
capalias KB F1 Tek key_f11
capalias KC F2 Tek key_f12
capalias KD F3 Tek key_f13
capalias KE F4 Tek key_f14
capalias KF F5 Tek key_f15
capalias BC Sb Tek set_background
capalias FC Sf Tek set_foreground
#
# There are also the following:
#
# XENIX XENIX variable name name clash with terminfo?
```

```

# -----
# CL key_char_left
# CR key_char_right
# CW key_change_window
# HP ??
# LF key_linefeed label_off
# NU key_next_unlocked_cell
# PL ??
# PR ??
# RC key_recalc remove_clock
# RF key_toggle_ref req_for_input
# WL key_word_left
# WR key_word_right
#
# If you know what any of the question-marked ones mean, please tell us.
#
#----- Terminfo aliases -----
#
# IBM extensions:
#
infoalias font0 s0ds IBM set0_des_seq
infoalias font1 s1ds IBM set1_des_seq
infoalias font2 s2ds IBM set2_des_seq
infoalias font3 s3ds IBM set3_des_seq
infoalias kbtabs kcbt IBM key_backtab
infoalias ksel kslt IBM key_select
#
#
Some others are identical to SVr4/XPG4 capabilities, in particular:
# kcmd, kend, khlp, and kf11...kf63.
#
#####
#
# The following sets edit modes for GNU EMACS
# Local Variables:
# case-fold-search:nil
# truncate-lines:t
# End:

Found in path(s):
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archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/include/Caps.hpux11
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-----  
-- \$Id: README,v 1.23 2006/04/22 22:19:37 tom Exp \$  
-----

README file for the ncurses package

See the file ANNOUNCE for a summary of ncurses features and ports.  
See the file INSTALL for instructions on how to build and install ncurses.  
See the file NEWS for a release history and bug-fix notes.  
See the file TO-DO for things that still need doing, including known bugs.

Browse the file misc/ncurses-intro.html for narrative descriptions of how  
to use ncurses and the panel, menu, and form libraries.

Browse the file doc/html/hackguide.html for a tour of the package internals.

#### ROADMAP AND PACKAGE OVERVIEW:

You should be reading this file in a directory called: ncurses-d.d, where d.d  
is  
the current version number (see the dist.mk file in this directory for  
that). There should be a number of subdirectories, including `c++', `form',  
`man', `menu', `misc', `ncurses', `panel', `progs', `test', `tack' and `Ada95'.  
(The `tack' program may be distributed separately).



A full build/install of this package typically installs several libraries, a handful of utilities, and a database hierarchy. Here is an inventory of the pieces:

The libraries are:

```
libncurses.a    (normal)
libncurses.so   (shared)
libncurses_g.a (debug and trace code enabled)
libncurses_p.a (profiling enabled)

libpanel.a      (normal)
libpanel.so     (shared)
libpanel_g.a   (debug and trace code enabled)

libmenu.a       (normal)
libmenu.so      (shared)
libmenu_g.a    (debug enabled)

libform.a       (normal)
libform.so      (shared)
libform_g.a    (debug enabled)
```

If you configure using the `--enable-widec` option, a "w" is appended to the library names

(e.g., `libncursesw.a`), and the resulting libraries support wide-characters, e.g., via a UTF-8 locale. The corresponding header files are compatible with the non-wide-character configuration; wide-character features are provided by `ifdef`'s in the header files. The wide-character library interfaces are not binary-compatible with the non-wide-character version.

The ncurses libraries implement the curses API. The panel, menu and forms libraries implement clones of the SVr4 panel, menu and forms APIs. The source code for these lives in the ``ncurses'`, ``panel'`, ``menu'`, and ``form'` directories respectively.

In the ``c++'` directory, you'll find code that defines an interface to the curses, forms, menus and panels library packaged as C++ classes, and a demo program in C++ to test it. These class definition modules are not installed by the `'make install.libs'` rule as `libncurses++`.

In the ``Ada95'` directory, you'll find code and documentation for an Ada95 binding of the curses API, to be used with the GNAT compiler.

This binding is built by a normal top-level ``make'` if `configure` detects an usable version of GNAT (3.11 or above). It is not installed automatically. See the `Ada95` directory for more build and installation instructions and

for documentation of the binding.

To do its job, the ncurses code needs your terminal type to be set in the environment variable TERM (normally set by your OS; under UNIX, `getty(1)` typically does this, but you can override it in your `.profile`); and, it needs a database of terminal descriptions in which to look up your terminal type's capabilities.

In older (V7/BSD) versions of curses, the database was a flat text file, `/etc/termcap`; in newer (USG/USL) versions, the database is a hierarchy of fast-loading binary description blocks under `/usr/lib/terminfo`. These binary blocks are compiled from an improved editable text representation called ``terminfo'` format (documented in `man/terminfo.5`). The ncurses library can use either `/etc/termcap` or the compiled binary terminfo blocks, but prefers the second form.

In the ``misc'` directory, there is a text file `terminfo.src`, in editable terminfo format, which can be used to generate the terminfo binaries (that's what `install.data` does). If the package was built with the `--enable-termcap` option enabled, and the ncurses library cannot find a terminfo description for your terminal, it will fall back to the termcap file supplied with your system (which the ncurses package installation leaves strictly alone).

The utilities are as follows:

```
tic      -- terminfo source to binary compiler
infocmp  -- terminfo binary to source decompiler/comparator
clear    -- emits clear-screen for current terminal
tput     -- shell-script access to terminal capabilities.
toe     -- table of entries utility
tset     -- terminal-initialization utility
```

The first two (`tic` and `infocmp`) are used for manipulating terminfo descriptions; the next two (`clear` and `tput`) are for use in shell scripts. The last (`tset`) is provided for 4.4BSD compatibility. The source code for all of these lives in the ``progs'` directory.

Detailed documentation for all libraries and utilities can be found in the ``man'` and ``doc'` directories. An HTML introduction to ncurses, panels, and menus programming lives in the ``doc/html'` directory. Manpages in HTML format are under ``doc/html/man'`.

The ``test'` directory contains programs that can be used to verify or demonstrate the functions of the ncurses libraries. See `test/README` for descriptions of these programs. Notably, the ``ncurses'` utility is designed to

help you systematically exercise the library functions.

#### AUTHORS:

Pavel Curtis:

wrote the original ncurses

Zeyd M. Ben-Halim:

port of original to Linux and many enhancements.

Thomas Dickey (maintainer for 1.9.9g through 4.1, resuming with FSF's 5.0):

configuration scripts, porting, mods to adhere to XSI Curses in the areas of background color, terminal modes.

Also memory leak testing,

the wresize, default colors and key definition extensions and numerous bug fixes (more than half of those enumerated in NEWS beginning with the internal release 1.8.9).

Florian La Roche (official maintainer for FSF's ncurses 4.2)

Beginning with release 4.2, ncurses is distributed under an MIT-style license.

Eric S. Raymond:

the man pages, infocmp(1), tput(1), clear(1), captinfo(1), tset(1), toe(1), most of tic(1), trace levels, the HTML intro, wgetnstr() and many other entry points, the cursor-movement optimization, the scroll-pack optimizer for vertical motions, the mouse interface and xterm mouse support, and the ncurses test program.

Juergen Pfeifer

The menu and form libraries, C++ bindings for ncurses, menus, forms and panels, as well as the Ada95 binding. Ongoing support for panel.

#### CONTRIBUTORS:

Alexander V. Lukyanov

for numerous fixes and improvements to the optimization logic.

David MacKenzie

for first-class bug-chasing and methodical testing.

Ross Ridge

for the code that hacks termcap parameterized strings into terminfo.

Warren Tucker and Gerhard Fuernkranz,

for writing and sending the panel library.

Hellmuth Michaelis,  
for many patches and testing the optimization code.

Eric Newton, Ulrich Drepper, and Anatoly Ivasyuk:  
the C++ code.

Jonathan Ross,  
for lessons in using sed.

Keith Bostic (maintainer of 4.BSD curses)  
for help, criticism, comments, bug-finding, and being willing to  
deep-six BSD curses for this one when it grew up.

Richard Stallman,  
for his commitment to making ncurses free software.

Countless other people have contributed by reporting bugs, sending fixes,  
suggesting improvements, and generally whining about ncurses :-)

#### BUGS:

See the INSTALL file for bug and developer-list addresses.  
The Hacker's Guide in the doc directory includes some guidelines  
on how to report bugs in ways that will get them fixed most quickly.

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```
* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-  
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/README  
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```

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<!--
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* t
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\* @Id: menu\_format.3x,v 1.10 2006/11/04 17:12:00 tom Exp @

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5.7/doc/html/man/menu\_format.3x.html

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\* @Id: curs\_add\_wch.3x,v 1.6 2006/12/24 15:22:22 tom Exp @  
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 */
```

```
/*
 * $Id: cmpdef.cmd,v 1.3 2006/04/22 23:14:50 tom Exp $
 *
 * Author: Juan Jose Garcia Ripoll <worm@arrakis.es>.
 * Webpage: http://www.arrakis.es/~worm/
 *
 * cmpdef.cmd - compares two .def files, checking whether they have
 * the same entries with the same export codes.
 *
 * returns 0 if there are no conflicts between the files -- that is,
 * the newer one can replace the older one.
 *
 * returns 1 when either of the files is not properly formatted and
 * when there are conflicts: two symbols having the same export code.
```

```

*
* the standard output shows a list with newly added symbols, plus
* replaced symbols and conflicts.
*/
parse arg def_file1 def_file2

def_file1 = translate(def_file1,'\','/')
def_file2 = translate(def_file2,'\','/')

call CleanQueue

/*
* `cmp' is zero when the last file is valid
* and upward compatible
* `numbers' is the stem where symbols are stored
*/
cmp    = 0
names. = "
numbers. = 0

/*
* This sed expression cleans empty lines, comments and special .DEF
* commands, such as LIBRARY..., EXPORTS..., etc
*/
tidy_up = "s/[ ][ ]*/g;s/;.*//g;^[ ]*$d;^[a-zA-Z]/d;"

/*
* First we find all public symbols from the original DLL. All this
* information is pushed into a REXX private list with the RXQUEUE
* utility program.
*/
'@echo off'
'type' def_file1 '| sed' tidy_up '| sort | rxqueue'

do while queued() > 0
/*
* We retrieve the symbol name (NAME) and its number (NUMBER)
*/
parse pull "" name "" '@'number rest
if number = "" || name = "" then
do
say 'Corrupted file' def_file1
say 'Symbol' name 'has no number'
exit 1
end
else
do
numbers.name = number

```



```

    names.number = name
end
end

/*
* Now we find all public symbols from the new DLL, and compare.
*/
'type' def_file2 '| sed'
tidy_up '| sort | rxqueue'

do while queued() > 0
  parse pull "" name "" '@'number rest
  if name = " | number = " then
    do
      say 'Corrupted file' def_file2
      say 'Symbol' name 'has no number'
      exit 1
    end
  if numbers.name = 0 then
    do
      cmp = 1
      if names.number = " then
        say 'New symbol' name 'with code @'number
      else
        say 'Conflict old =' names.number ', new =' name 'at @'number
      end
    end
  else if numbers.name \= number then
    do
      cmp = 1
      say name 'Symbol' name 'changed from @'numbers.name 'to @'number
    end
  end
end /* do */

exit cmp

/*
* Cleans the REXX queue by pulling and forgetting every line.
* This is needed, at least, when `cmpdef.cmd' starts, because an aborted
* REXX program might have left some rubbish in.
*/
CleanQueue: procedure
  do while queued() > 0
    parse pull foo
  end
return

Found in path(s):
* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
```

archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/misc/cmpdef.cmd

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- \* /opt/cola/permits/1600019816\_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/test/chgat.c
- \* /opt/cola/permits/1600019816\_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/ncurses/tinfo/entries.c
- \* /opt/cola/permits/1600019816\_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/test/echochar.c

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```

# $Id: headers,v 1.9 2007/01/20 19:57:04 Miroslav.Lichvar Exp $
#####
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#                                                                    #

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#####
#
# Author: Thomas E. Dickey 1996-on
#
term.h
curses.h
unctrl.h
termcap.h
$(srcdir)/ncurses_dll.h
@ ticlib
$(srcdir)/tic.h
$(srcdir)/term_entry.h
$(srcdir)/nc_tparm.h

# vile:makemode

Found in path(s):
* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/include/headers
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*****
* @Id: mitem_opts.3x,v 1.9 2007/02/24 17:33:32 tom Exp @
-->

```

Found in path(s):

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* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-
5.7/doc/html/man/mitem_opts.3x.html

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*****
* @Id: curs_color.3x,v 1.28 2005/12/18 00:00:37 tom Exp @
-->

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archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-
5.7/doc/html/man/curs_color.3x.html

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archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/include/capdefaults.c
* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/include/nc_panel.h
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#####
# $Id: man_db.renames,v 0.41 2008/10/25 23:24:03 tom Exp $

```

# Manual-page renamings for the man\_db program

#

# Files:

captoinfo.1m captoinfo.1

clear.1 clear.1

curls\_add\_wch.3x add\_wch.3ncurses

curls\_add\_wchstr.3x add\_wchstr.3ncurses

curls\_addch.3x addch.3ncurses

curls\_addchstr.3x addchstr.3ncurses

curls\_addstr.3x addstr.3ncurses

curls\_addwstr.3x addwstr.3ncurses

curls\_attr.3x attr.3ncurses

curls\_beep.3x beep.3ncurses

curls\_bkgd.3x bkgd.3ncurses

curls\_bkgrnd.3x bkgrnd.3ncurses

curls\_border.3x border.3ncurses

curls\_border\_set.3x border\_set.3ncurses

curls\_clear.3x clear.3ncurses

curls\_color.3x color.3ncurses

curls\_delch.3x delch.3ncurses

curls\_deleteln.3x deleteln.3ncurses

curls\_extend.3x extensions.3ncurses

curls\_get\_wch.3x get\_wch.3ncurses

curls\_get\_wstr.3x get\_wstr.3ncurses

curls\_getcchar.3xgetcchar.3ncurses

curls\_getch.3x getch.3ncurses

curls\_getstr.3x getstr.3ncurses

curls\_getyx.3x getyx.3ncurses

curls\_in\_wch.3x in\_wch.3ncurses

curls\_in\_wchstr.3x in\_wchstr.3ncurses

curls\_inch.3x inch.3ncurses

curls\_inchstr.3x inchstr.3ncurses

curls\_initscr.3x initscr.3ncurses

curls\_inopts.3x inopts.3ncurses

curls\_ins\_wch.3x ins\_wch.3ncurses

curls\_ins\_wstr.3x ins\_wstr.3ncurses

curls\_insch.3x insch.3ncurses

curls\_insstr.3x insstr.3ncurses

curls\_instr.3x instr.3ncurses

curls\_inwstr.3x inwstr.3ncurses

curls\_kernel.3x kernel.3ncurses

curls\_legacy.3x legacy.3ncurses

curls\_memleaks.3x memleaks.3ncurses

curls\_mouse.3x mouse.3ncurses

curls\_move.3x move.3ncurses

curls\_opaque.3x opaque.3ncurses

curls\_outopts.3x outopts.3ncurses

curls\_overlay.3x overlay.3ncurses

curs\_pad.3x pad.3ncurses  
curs\_print.3x print.3ncurses  
curs\_printw.3x printw.3ncurses  
curs\_refresh.3x refresh.3ncurses  
curs\_scanw.3x scanw.3ncurses  
curs\_scr\_dump.3x scr\_dump.3ncurses  
curs\_scroll.3x scroll.3ncurses  
curs\_slk.3x slk.3ncurses  
curs\_termattrs.3x termattrs.3ncurses  
curs\_termcap.3x termcap.3ncurses  
curs\_terminfo.3x terminfo.3ncurses  
curs\_threads.3x threads.3ncurses  
curs\_touch.3x touch.3ncurses  
curs\_trace.3x trace.3ncurses  
curs\_util.3x util.3ncurses  
curs\_window.3x window.3ncurses  
curses.3x ncurses.3ncurses  
default\_colors.3x default\_colors.3ncurses  
define\_key.3x define\_key.3ncurses  
form.3x form.3form  
form\_cursor.3x cursor.3form  
form\_data.3x data.3form  
form\_driver.3x driver.3form  
form\_field.3x field.3form  
form\_field\_attributes.3x field\_attributes.3form  
form\_field\_buffer.3x field\_buffer.3form  
form\_field\_info.3x field\_info.3form  
form\_field\_just.3x field\_just.3form  
form\_field\_new.3x field\_new.3form  
form\_field\_opts.3x field\_opts.3form  
form\_field\_userptr.3x field\_userptr.3form  
form\_field\_validation.3x field\_validation.3form  
form\_fieldtype.3x fieldtype.3form  
form\_hook.3x hook.3form  
form\_new.3x new.3form  
form\_new\_page.3x new\_page.3form  
form\_opts.3x opts.3form  
form\_page.3x page.3form  
form\_post.3x post.3form  
form\_requestname.3x requestname.3form  
form\_userptr.3x userptr.3form  
form\_win.3x win.3form  
infocmp.1m infocmp.1  
infotocap.1m infotocap.1  
key\_defined.3x key\_defined.3ncurses  
keybound.3x keybound.3ncurses  
keyok.3x keyok.3ncurses  
legacy\_coding.3x legacy\_coding.3ncurses



menu.3x menu.3menu  
menu\_attributes.3x attributes.3menu  
menu\_cursor.3x cursor.3menu  
menu\_driver.3x driver.3menu  
menu\_format.3x format.3menu  
menu\_hook.3x hook.3menu  
menu\_items.3x items.3menu  
menu\_mark.3x mark.3menu  
menu\_new.3x new.3menu  
menu\_opts.3x opts.3menu  
menu\_pattern.3x pattern.3menu  
menu\_post.3x post.3menu  
menu\_requestname.3x requestname.3menu  
menu\_spacing.3x spacing.3menu  
menu\_userptr.3x userptr.3menu  
menu\_win.3x win.3menu  
mitem\_current.3x menu\_current.3menu  
mitem\_name.3x menu\_name.3menu  
mitem\_new.3x menu\_new.3menu  
mitem\_opts.3x menu\_opts.3menu  
mitem\_userptr.3x menu\_userptr.3menu  
mitem\_value.3x menu\_value.3menu  
mitem\_visible.3x menu\_visible.3menu  
ncurses.3x ncurses.3ncurses  
panel.3x panel.3curses  
printf.3s printf.3  
putc.3s  
    putc.3  
resizeterm.3x resizingterm.3ncurses  
scanf.3s scanf.3  
system.3s system.3  
term.5 term.5  
term.7 term.7  
terminfo.5 terminfo.5  
terminfo.\\\*n terminfo.5  
tic.1m tic.1  
toe.1m toe.1  
tput.1 tput.1  
tset.1 tset.1  
vprintf.3s vprintf.3  
wresize.3x wresize.3ncurses  
#  
# Other:  
tack.1m tack.1  
#  
getty.1 getty.8  
scanf.3 scanf.3  
ttys.5 ttys.4

termio.7 terminos.3  
system.3 system.3  
regcomp.3x regcomp.3  
regexec.3x regexec.3  
#  
# vile:cfgmode

Found in path(s):

\* /opt/cola/permits/1600019816\_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-  
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/man/man\_db.renames  
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* @Id: menu.3x,v 1.19 2006/11/04 18:38:29 tom Exp @
-->
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```
-- *- ada *-
```

```
define(HTMLNAME,`terminal_interface-curses-forms-field_user_data__ads.htm')dnl
```

```
include(M4MACRO)dnl
```

```
-----
```

```
--                                     --  
--           GNAT ncurses Binding           --
```

```
--                                     --  
--           Terminal_Interface.Curses.Forms.Field_Types           --
```

```
--                                     --  
--           S P E C                                     --
```

```
--                                     --  
-----
```

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--
```

```
-- Author: Juergen Pfeifer, 1996
```

```
-- Version Control:
```

```
--
```

```
$Revision: 1.14 $
```

```
-- Binding Version 01.00
```

-----  
with Interfaces.C;

package Terminal\_Interface.Curses.Forms.Field\_Types is  
pragma Preelaborate (Terminal\_Interface.Curses.Forms.Field\_Types);  
use type Interfaces.C.int;  
subtype C\_Int is Interfaces.C.int;

-- MANPAGE(^ form\_fieldtype.3x')

type Field\_Type is abstract tagged null record;

-- Abstract base type for all field types. A concrete field type  
-- is an extension that adds some data elements describing formats or  
-- boundary values for the type and validation routines.  
-- For the builtin low-level fieldtypes, the validation routines are  
-- already defined by the low-level C library.  
-- The builtin types like Alpha or AlphaNumeric etc. are defined in  
-- child packages of this package. You may use one of them as example  
-- how to create you own child packages for low-level field types that  
-- you may  
have already written in C.

type Field\_Type\_Access is access all Field\_Type'Class;

-- ANCHOR(^ set\_field\_type(),`Set\_Type')

procedure Set\_Field\_Type (Fld : in Field;

    Fld\_Type : in Field\_Type) is abstract;

-- AKA

-- But: we hide the vararg mechanism of the C interface. You always  
-- have to pass a single Field\_Type parameter.

-----

-- MANPAGE(^ form\_field\_validation.3x')

-- ANCHOR(^ field\_type(),`Get\_Type')

function Get\_Type (Fld : in Field) return Field\_Type\_Access;

-- AKA

-- ALIAS(^ field\_arg())

-- In Ada95 we can combine these. If you try to retrieve the field type  
-- that is not defined as extension of the abstract tagged type above,  
-- you will raise a Form\_Exception.  
-- This is not inlined

-----

-- | Private Part.

-- | Most of this

```

is used by the implementations of the child packages.
-- |
private
type Makearg_Function is access
  function (Args : System.Address) return System.Address;
pragma Convention (C, Makearg_Function);

type Copyarg_Function is access
  function (Usr : System.Address) return System.Address;
pragma Convention (C, Copyarg_Function);

type Freearg_Function is access
  procedure (Usr : System.Address);
pragma Convention (C, Freearg_Function);

type Field_Check_Function is access
  function (Fld : Field; Usr : System.Address) return C_Int;
pragma Convention (C, Field_Check_Function);

type Char_Check_Function is access
  function (Ch : C_Int; Usr : System.Address) return C_Int;
pragma Convention (C, Char_Check_Function);

type Choice_Function is access
  function (Fld : Field; Usr : System.Address) return C_Int;
pragma Convention (C, Choice_Function);

-- +-----
--
| This must be in sync with the FIELDTYPE structure in form.h
-- |
type Low_Level_Field_Type is
  record
    Status :      Interfaces.C.short;
    Ref_Count :  Interfaces.C.long;
    Left, Right : System.Address;
    Makearg :    Makearg_Function;
    Copyarg :    Copyarg_Function;
    Freearg :    Freearg_Function;
    Fcheck :     Field_Check_Function;
    Ccheck :     Char_Check_Function;
    Next, Prev : Choice_Function;
  end record;
pragma Convention (C, Low_Level_Field_Type);
type C_Field_Type is access all Low_Level_Field_Type;

Null_Field_Type : constant C_Field_Type := null;

```

```

-- +-----
-- | This four low-level fieldtypes are the ones associated with
-- | fieldtypes handled by this binding. Any other low-level fieldtype
-- | will result in a Form_Exception
is function Get_Type.
-- |
M_Generic_Type : C_Field_Type := null;
M_Generic_Choice : C_Field_Type := null;
M_Builtin_Router : C_Field_Type := null;
M_Choice_Router : C_Field_Type := null;

-- Two wrapper functions to access those low-level fieldtypes defined
-- in this package.
function C_Builtin_Router return C_Field_Type;
function C_Choice_Router return C_Field_Type;

procedure Wrap_Builtin (Fld : Field;
                       Typ : Field_Type'Class;
                       Cft : C_Field_Type := C_Builtin_Router);
-- This procedure has to be called by the Set_Field_Type implementation
-- for builtin low-level fieldtypes to replace it by an Ada95
-- conformant Field_Type object.
-- The parameter Cft must be C_Builtin_Router for regular low-level
-- fieldtypes (like TYP_ALPHA or TYP_ALNUM) and C_Choice_Router for
-- low-level fieldtypes witch choice functions (like TYP_ENUM).
-- Any other value will raise a
Form_Exception.

function Make_Arg (Args : System.Address) return System.Address;
pragma Convention (C, Make_Arg);
-- This is the Makearg_Function for the internal low-level types
-- introduced by this binding.

function Copy_Arg (Usr : System.Address) return System.Address;
pragma Convention (C, Copy_Arg);
-- This is the Copyarg_Function for the internal low-level types
-- introduced by this binding.

procedure Free_Arg (Usr : System.Address);
pragma Convention (C, Free_Arg);
-- This is the Freearg_Function for the internal low-level types
-- introduced by this binding.

function Field_Check_Router (Fld : Field;
                             Usr : System.Address) return C_Int;
pragma Convention (C, Field_Check_Router);
-- This is the Field_Check_Function for the internal low-level types
-- introduced to wrap the low-level types by a Field_Type derived

```

```

-- type. It routes the call to the corresponding low-level validation

-- function.

function Char_Check_Router (Ch : C_Int;
                           Usr : System.Address) return C_Int;
pragma Convention (C, Char_Check_Router);
-- This is the Char_Check_Function for the internal low-level types
-- introduced to wrap the low-level types by a Field_Type derived
-- type. It routes the call to the corresponding low-level validation
-- function.

function Next_Router (Fld : Field;
                     Usr : System.Address) return C_Int;
pragma Convention (C, Next_Router);
-- This is the Choice_Function for the internal low-level types
-- introduced to wrap the low-level types by a Field_Type derived
-- type. It routes the call to the corresponding low-level next_choice
-- function.

function Prev_Router (Fld : Field;
                     Usr : System.Address) return C_Int;
pragma Convention (C, Prev_Router);
-- This is the Choice_Function for the internal low-level types
-- introduced to
wrap the low-level types by a Field_Type derived
-- type. It routes the call to the corresponding low-level prev_choice
-- function.

-- This is the Argument structure maintained by all low-level field types
-- introduced by this binding.
type Argument is record
  Typ : Field_Type_Access; -- the Field_Type creating this record
  Usr : System.Address;    -- original arg for builtin low-level types
  Cft : C_Field_Type;     -- the original low-level type
end record;
type Argument_Access is access all Argument;

-- +-----
-- |
-- | Some Imports of libform routines to deal with low-level fieldtypes.
-- |
function New_Fieldtype (Fcheck : Field_Check_Function;
                      Ccheck : Char_Check_Function)
  return C_Field_Type;
pragma Import (C, New_Fieldtype, "new_fieldtype");

function Set_Fieldtype_Arg (Cft : C_Field_Type;

```

```

    Mak : Makearg_Function := Make_Arg'Access;
        Cop : Copyarg_Function := Copy_Arg'Access;
        Fre : Freearg_Function := Free_Arg'Access)
return C_Int;
pragma Import (C, Set_Fieldtype_Arg, "set_fieldtype_arg");

function Set_Fieldtype_Choice (Cft : C_Field_Type;
    Next, Prev : Choice_Function)
return C_Int;
pragma Import (C, Set_Fieldtype_Choice, "set_fieldtype_choice");

end Terminal_Interface.Curses.Forms.Field_Types;

```

Found in path(s):

```

* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/Ada95/gen/terminal_interface-
curses-forms-field_types.ads.m4

```

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```



-----  
-- \$Id: README.emx,v 1.8 2006/04/22 22:19:37 tom Exp \$

-- Author: Thomas Dickey  
-----

You can build ncurses on OS/2 in the EMX environment. But you must build and acquire tools. Not all of the tools distributed with EMX work properly, and some additional ones are required.

First, the configure script distributed with ncurses will not run as-is in EMX. You can generate a new one if you have autoconf built for EMX. You will need the EMX development tools, of course. Get these programs to start:

GNU m4 program (version 1.4)

GNU autoconf (version 2.13).

GNU patch (version 2.5)

Apply the autoconf patches from

<http://invisible-island.net/autoconf>

<ftp://invisible-island.net/autoconf>

These

are ordered by date:

[autoconf-2.13-20030927.patch.gz](#)

[autoconf-2.13-20030927-emx.patch.gz](#)

I built my development environment for ncurses using EMX 0.9c at the end of 1997. Much of the EMX patch for autoconf was done originally by J.J.G.Ripoll, using a similar environment (he prefers using the 'ash' shell). Newer versions may fix these problems:

+ The pdksh program distributed at Hobbes and Leo (with a 1996 date) is defective. It does not process "here documents" correctly (which renders it useless for running the autoconf script). I built my own copy of pdksh 5.2.13, which does have the bug corrected (documented in the change log for pdksh).

+ I also built from sources (because the distributed binaries did not work) the cmp, diff programs.

Other required utilities such as ar, cat, chmod, cp, gawk, grep, mv, ls, rm, mkdir, sed, sort and tr worked.

Once you have autoconf patched and installed, run 'autoconf' from the top-level directory of

ncurses to generate the EMX-specific configure script.

Found in path(s):

\* /opt/cola/permits/1600019816\_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/README.emx  
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```
# Program modules
# $Id: modules,v 1.7 2006/12/24 00:53:08 tom Exp $
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#####
# Author: Thomas E. Dickey 1995-on
#

@ base
cursesf c++ $(srcdir) $(cursesf_h) $(cursesapp_h)
cursesm c++ $(srcdir) $(cursesm_h) $(cursesapp_h)
cursesp c++ $(srcdir) $(cursesp_h)
cursesw c++ $(srcdir) $(cursesw_h)
cursespad c++ $(srcdir) $(cursesw_h)
```

```
cursslk c++ $(srcdir) $(cursslk_h) $(cursesapp_h)
cursesapp c++ $(srcdir) $(cursesapp_h)
cursesmain c++ $(srcdir) $(cursesapp_h)
demo c++ $(srcdir) $(cursesf_h) $(cursesm_h) $(cursesapp_h)
```

```
# vile:makemode
```

```
Found in path(s):
```

```
* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/c++/modules
```

```
No license file was found, but licenses were detected in source scan.
```

```
#!@SHELL@
```

```
# $Id: ncurses-config.in,v 1.12 2007/03/17 20:02:19 tom Exp $
```

```
#####
```

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```
#####
```

```
#
```

```
# Author: Thomas E. Dickey, 2006
```

```
prefix="@prefix@"
```

```
exec_prefix="@exec_prefix@"
```

```

bindir="@bindir@"
libdir="@libdir@"
datadir="@datadir@"
mandir="@mandir@"

THIS="ncurses@DFT_ARG_SUFFIX@"

LANG=C; export LANG
LANGUAGE=C; export LANGUAGE
LC_ALL=C; export LC_ALL
LC_CTYPE=C; export LC_CTYPE

test $# = 0 && exec @SHELL@ $0 --error

while test $# -gt 0; do
case "$1" in
-*=*)
ARG=`echo "$1" | sed 's/[-_a-zA-Z0-9]*=//`
;;
*)
ARG=
;;
esac

case "$1" in
# basic configuration
--prefix=*)
prefix="$ARG"
test -z "$exec_prefix" && exec_prefix="$ARG"
;;
--prefix)
echo "$prefix"
;;
--exec-prefix=*)
exec_prefix="$ARG"
;;
--exec-prefix)
echo "$exec_prefix"
;;
# compile/link
--cflags)
INCS=
if
test "${prefix}/include" != /usr/include ; then
INCS="-I${prefix}/include"
fi
if test "@WITH_OVERWRITE@" != no ; then

```

```

INCS="$INCS -I${prefix}/include/${THIS}"
fi
sed -e 's,^[ ]*,,' -e 's, [ ]*, ,g' -e 's,[ ]*$,,' <<-ENDECHO
$INCS
ENDECHO
;;
--libs)
sed -e 's,^[ ]*,,' -e 's, [ ]*, ,g' -e 's,[ ]*$,,' <<-ENDECHO
-L${exec_prefix}/lib @EXTRA_LDFLAGS@ -I${THIS} @LIBS@
ENDECHO
;;
# identification
--version)
echo "@NCURSES_MAJOR@.@NCURSES_MINOR@.@NCURSES_PATCH@"
;;
--abi-version)
echo "@cf_cv_abi_version@"
;;
--mouse-version)
echo "@NCURSES_MOUSE_VERSION@"
;;
# locations
--bindir)
echo "${bindir}"
;;
--datadir)
echo "${datadir}"
;;
--libdir)
echo "${libdir}"
;;
--mandir)
echo "${mandir}"
;;
--terminfo)
echo "@TERMINFO@"
;;
--terminfo-dirs)
echo "@TERMINFO_DIRS@"
;;
--termpath)
echo "@TERMPATH@"
;;
# general info
--help)
cat <<ENDHELP
Usage: ${THIS}-config [options]

```

Options:

```
--prefix      echos the package-prefix
of ${THIS}
--prefix=ARG   sets the package-prefix of ${THIS}
--exec-prefix  echos the executable-prefix of ${THIS}
--exec-prefix=ARG sets the executable-prefix of ${THIS}

--cflags      echos the C compiler flags needed to compile with ${THIS}
--libs        echos the libraries needed to link with ${THIS}

--version     echos the release+patchdate version of ${THIS}
--abi-version  echos the ABI version of ${THIS}
--mouse-version echos the mouse-interface version of ${THIS}

--bindir      echos the directory containing ${THIS} programs
--datadir     echos the directory containing ${THIS} data
--libdir      echos the directory containing ${THIS} libraries
--mandir      echos the directory containing ${THIS} manpages
--terminfo    echos the \${TERMINFO} terminfo database path
--terminfo-dirs echos the \${TERMINFO_DIRS} directory list
--termpath    echos the \${TERMPATH} termcap list

--help
      prints this message
ENDHELP
;;
--error|*)
  @SHELL@ $0 --help 1>&2
exit 1
;;
esac
shift
done
# vile:shmode
```

Found in path(s):

```
* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/misc/ncurses-config.in
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```

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/******
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archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/test/test_get_wstr.c
* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/test/inch_wide.c
* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/test/test_inwstr.c
* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/test/savescreen.c
* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-
5.7/ncurses/widechar/lib_key_name.c
*
/opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-archive-
fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/c++/cursesw.cc
* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/test/test_instr.c
* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/test/inchs.c
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*****
* @Id: curs_ins_wstr.3x,v 1.4 2005/05/15 17:02:54 tom Exp @
-->

```

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```

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archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-
5.7/doc/html/man/curs_ins_wstr.3x.html

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*****
* @Id: curs_touch.3x,v 1.11 2006/02/25 21:49:19 tom Exp @
-->

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archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-
5.7/doc/html/man/curs_touch.3x.html

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archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/ncurses/widechar/lib_wacs.c
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```

```

-- *- ada *-
define('HTMLNAME',`terminal_interface-curses-aux__ads.htm')dnl
include(M4MACRO)dnl

```

```

-----
--
--          GNAT ncurses Binding          --
--
--          Terminal_Interface.Curses.Aux  --
--
--          S P E C                        --
--
-----

```

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```

```
-----
-- Author: Juergen Pfeifer, 1996
```

```
-- Version Control:
```

```
-- $Revision:
```

```
1.16 $
```

```
-- Binding Version 01.00
-----
```

```
include(`Base_Defs')
```

```
with System;
```

```
with Interfaces.C;
```

```
with Interfaces.C.Strings; use Interfaces.C.Strings;
```

```
with Unchecked_Conversion;
```

```
package Terminal_Interface.Curses.Aux is
```

```
pragma Preelaborate (Terminal_Interface.Curses.Aux);
```

```
use type Interfaces.C.int;
```

```
subtype C_Int is Interfaces.C.int;
```

```
subtype C_Short is Interfaces.C.short;
```

```
subtype C_Long_Int is Interfaces.C.long;
```

```
subtype C_Size_T is Interfaces.C.size_t;
```

```
subtype C_UInt is Interfaces.C.unsigned;
```

```
subtype C_ULong is Interfaces.C.unsigned_long;
```

```
subtype C_Char_Ptr is Interfaces.C.Strings.chars_ptr;
```

```
type C_Void_Ptr is new System.Address;
```

```
include(`Chtype_Def')
```

```
-- This is how those constants are defined in ncurses. I see them also
```

```
-- exactly like this in all ETI implementations I ever tested. So it
```

```
-- could be that this is quite general, but please check with your
```

```
curses.
```

```
-- This is critical, because curses sometime mixes boolean returns with
```

```
-- returning an error status.
```

```
Curses_Ok : constant C_Int := CF_CURSES_OK;
```

```
Curses_Err : constant C_Int := CF_CURSES_ERR;
```

```
Curses_True : constant C_Int := CF_CURSES_TRUE;
```

```
Curses_False : constant C_Int := CF_CURSES_FALSE;
```

```
-- Eti_Error: type for error codes returned by the menu and form subsystem
```

```
include(`Eti_Defs')
```

```
procedure Eti_Exception (Code : Eti_Error);
```

```
-- Dispatch the error code and raise the appropriate exception
```

```
--
```

```

--
-- Some helpers
function Chtype_To_AttrChar is new
  Unchecked_Conversion (Source => C_Chtype,
                        Target => Attributed_Character);
function AttrChar_To_Chtype is new
  Unchecked_Conversion (Source => Attributed_Character,
                        Target => C_Chtype);

function AttrChar_To_AttrType is new
  Unchecked_Conversion (Source => Attributed_Character,
                        Target =>
C_AttrType);

function AttrType_To_AttrChar is new
  Unchecked_Conversion (Source => C_AttrType,
                        Target => Attributed_Character);

procedure Fill_String (Cp : in chars_ptr;
                      Str : out String);
-- Fill the Str parameter with the string denoted by the chars_ptr
-- C-Style string.

function Fill_String (Cp : chars_ptr) return String;
-- Same but as function.

end Terminal_Interface.Curses.Aux;

```

Found in path(s):

```

* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/Ada95/gen/terminal_interface-
curses-aux.ads.m4

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*****
* @Id: curs_in_wch.3x,v 1.2 2006/02/25 21:42:22 tom Exp @
-->

```

Found in path(s):

```

* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-
5.7/doc/html/man/curs_in_wch.3x.html

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archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/ncurses/tinfo/trim\_sgr0.c  
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\* @Id: toe.1m,v 1.21 2008/01/05 20:57:16 tom Exp @

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archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/doc/html/man/toe.1m.html

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\* @Id: curs\_inchstr.3x,v 1.12 2006/12/02 17:00:58 tom Exp @

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archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-

5.7/doc/html/man/curs\_inchstr.3x.html

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*****
* @Id: form_field_info.3x,v 1.10 2006/11/04 17:14:31 tom Exp @
-->

```

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* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-
5.7/doc/html/man/form_field_info.3x.html

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```
-- *- ada -*-
```

```
define(^HTMLNAME',`terminal_interface-curses__ads.htm')dnl
```

```
include(M4MACRO)-----
```

```

--
--          GNAT ncurses Binding          --
--
--          Terminal_Interface.Curses     --
--
--          S P E C                        --
--
-----

```

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```

```

-----
-- Author: Juergen Pfeifer, 1996
-- Version Control:
-- $Revision: 1.41
$
-- $Date: 2007/05/05 20:33:52 $
-- Binding Version 01.00
-----

```

```

include(`Base_Defs')
with System.Storage_Elements;
with Interfaces.C; -- We need this for some assertions.

```

```

package Terminal_Interface.Curses is
  pragma Preelaborate (Terminal_Interface.Curses);
  include(`Linker_Options')
  include(`Version_Info')
  type Window is private;
  Null_Window : constant Window;

  type Line_Position is new Natural; -- line coordinate
  type Column_Position is new Natural; -- column coordinate

  subtype Line_Count is Line_Position range 1 .. Line_Position'Last;

```

```

-- Type to count lines. We do not allow null windows, so must be positive
subtype Column_Count is Column_Position range 1 .. Column_Position'Last;
-- Type to count columns. We do not allow null windows, so must be positive

type Key_Code is new Integer;
-- That is anything including real characters, special keys and logical
--
request codes.

-- FIXME: The "-1" should be Curses_Err
subtype Real_Key_Code is Key_Code range -1 .. M4_KEY_MAX;
-- This are the codes that potentially represent a real keystroke.
-- Not all codes may be possible on a specific terminal. To check the
-- availability of a special key, the Has_Key function is provided.

subtype Special_Key_Code is Real_Key_Code
  range M4_SPECIAL_FIRST .. Real_Key_Code'Last;
-- Type for a function- or special key number

subtype Normal_Key_Code is Real_Key_Code range
  Character'Pos (Character'First) .. Character'Pos (Character'Last);
-- This are the codes for regular (incl. non-graphical) characters.

-- Constants for function- and special keys
--
Key_None          : constant Special_Key_Code := M4_SPECIAL_FIRST;
include(`Key_Definitions')
Key_Max           : constant Special_Key_Code
  := Special_Key_Code'Last;

subtype User_Key_Code is Key_Code
  range (Key_Max +
129) .. Key_Code'Last;
-- This is reserved for user defined key codes. The range between Key_Max
-- and the first user code is reserved for subsystems like menu and forms.

-- For those who like to use the original key names we produce them were
-- they differ from the original. Please note that they may differ in
-- lower/upper case.
include(`Old_Keys')dnl

-----

type Color_Number is range -1 .. Integer (Interfaces.C.short'Last);
for Color_Number'Size use Interfaces.C.short'Size;
-- (n)curses uses a short for the color index
-- The model is, that a Color_Number is an index into an array of
-- (potentially) definable colors. Some of those indices are

```

-- predefined (see below), although they may not really exist.

```
include(`Color_Defs')
type RGB_Value is range 0 .. Integer (Interfaces.C.short'Last);
for RGB_Value'Size use Interfaces.C.short'Size;
-- Some system may
allow to redefine a color by setting RGB values.

type Color_Pair is range 0 .. 255;
for Color_Pair'Size use 8;
subtype Redefinable_Color_Pair is Color_Pair range 1 .. 255;
-- (n)curses reserves 1 Byte for the color-pair number. Color Pair 0
-- is fixed (Black & White). A color pair is simply a combination of
-- two colors described by Color_Numbers, one for the foreground and
-- the other for the background
```

```
include(`Character_Attribute_Set_Rep')
-- (n)curses uses all but the lowest 16 Bits for Attributes.
```

```
Normal_Video : constant Character_Attribute_Set := (others => False);
```

```
type Attributed_Character is
  record
    Attr : Character_Attribute_Set;
    Color : Color_Pair;
    Ch   : Character;
  end record;
pragma Convention (C, Attributed_Character);
-- This is the counterpart for the chtype in C.
```

```
include(`AC_Rep')
Default_Character : constant Attributed_Character
  := (Ch   => Character'First,
     Color
=> Color_Pair'First,
     Attr => (others => False)); -- preelaboratable Normal_Video
```

```
type Attributed_String is array (Positive range <>) of Attributed_Character;
pragma Pack (Attributed_String);
-- In this binding we allow strings of attributed characters.
```

```
-----
-- Exceptions --
-----
```

```
Curses_Exception   : exception;
Wrong_Curses_Version : exception;
```

-- Those exceptions are raised by the ETI (Extended Terminal Interface)

```

-- subpackets for Menu and Forms handling.
--
Eti_System_Error : exception;
Eti_Bad_Argument : exception;
Eti_Posted       : exception;
Eti_Connected    : exception;
Eti_Bad_State    : exception;
Eti_No_Room      : exception;
Eti_Not_Posted   : exception;
Eti_Unknown_Command : exception;
Eti_No_Match     : exception;
Eti_Not_Selectable : exception;
Eti_Not_Connected : exception;
Eti_Request_Denied : exception;
Eti_Invalid_Field
: exception;
Eti_Current      : exception;

-----

-- External C variables
-- Conceptually even in C this are kind of constants, but they are
-- initialized and sometimes changed by the library routines at runtime
-- depending on the type of terminal. I believe the best way to model
-- this is to use functions.
-----

function Lines      return Line_Count;
pragma Inline (Lines);

function Columns    return Column_Count;
pragma Inline (Columns);

function Tab_Size   return Natural;
pragma Inline (Tab_Size);

function Number_Of_Colors return Natural;
pragma Inline (Number_Of_Colors);

function Number_Of_Color_Pairs return Natural;
pragma Inline (Number_Of_Color_Pairs);

include(^ACS_Map)dnl

-- MANPAGE(^curs_initscr.3x')
-- | Not implemented: newterm, set_term,
delscreen

-- ANCHOR(^stdscr,'Standard_Window')
```

```

function Standard_Window return Window;
-- AKA
pragma Inline (Standard_Window);

-- ANCHOR(`curscr`,`Current_Window`)
function Current_Window return Window;
-- AKA
pragma Inline (Current_Window);

-- ANCHOR(`initscr`,`Init_Screen`)
procedure Init_Screen;

-- ANCHOR(`initscr`,`Init_Windows`)
procedure Init_Windows renames Init_Screen;
-- AKA
pragma Inline (Init_Screen);
-- pragma Inline (Init_Windows);

-- ANCHOR(`endwin`,`End_Windows`)
procedure End_Windows;
-- AKA
procedure End_Screen renames End_Windows;
pragma Inline (End_Windows);
-- pragma Inline (End_Screen);

-- ANCHOR(`isendwin`,`Is_End_Window`)
function Is_End_Window return Boolean;
-- AKA
pragma Inline (Is_End_Window);

-- MANPAGE(`curs_move.3x`)

-- ANCHOR(`wmove`,`Move_Cursor`)
procedure Move_Cursor (Win : in Window := Standard_Window;
    Line
: in Line_Position;
    Column : in Column_Position);
-- AKA
-- ALIAS(`move()`)
pragma Inline (Move_Cursor);

-- MANPAGE(`curs_addch.3x`)

-- ANCHOR(`waddch`,`Add`)
procedure Add (Win : in Window := Standard_Window;
    Ch : in Attributed_Character);
-- AKA
-- ALIAS(`addch()`)

```

```

procedure Add (Win : in Window := Standard_Window;
              Ch : in Character);
-- Add a single character at the current logical cursor position to
-- the window. Use the current windows attributes.

-- ANCHOR(`mvwaddch()`,`Add`)
procedure Add
(Win : in Window := Standard_Window;
 Line : in Line_Position;
 Column : in Column_Position;
 Ch : in Attributed_Character);
-- AKA
-- ALIAS(`mvaddch()`)

procedure Add
(Win : in Window := Standard_Window;
 Line : in Line_Position;
 Column : in Column_Position;
 Ch : in Character);
-- Move to the position
and add a single character into the window
-- There are more Add routines, so the Inline pragma follows later

-- ANCHOR(`wechochar()`,`Add_With_Immediate_Echo`)
procedure Add_With_Immediate_Echo
(Win : in Window := Standard_Window;
 Ch : in Attributed_Character);
-- AKA
-- ALIAS(`echochar()`)

procedure Add_With_Immediate_Echo
(Win : in Window := Standard_Window;
 Ch : in Character);
-- Add a character and do an immediate refresh of the screen.
pragma Inline (Add_With_Immediate_Echo);

-- MANPAGE(`curs_window.3x`)
-- Not Implemented: wcursyncup

-- ANCHOR(`newwin()`,`Create`)
function Create
(Number_Of_Lines : Line_Count;
 Number_Of_Columns : Column_Count;
 First_Line_Position : Line_Position;
 First_Column_Position : Column_Position) return Window;
-- Not Implemented: Default Number_Of_Lines, Number_Of_Columns
-- the C version lets them be 0, see the man page.

```

```

-- AKA
pragma Inline (Create);

function New_Window
(Number_Of_Lines    : Line_Count;
 Number_Of_Columns  : Column_Count;
 First_Line_Position : Line_Position;
 First_Column_Position : Column_Position) return Window
renames Create;
-- pragma Inline (New_Window);

-- ANCHOR(`delwin()`,`Delete`)
procedure Delete (Win : in out Window);
-- AKA
-- Reset Win to Null_Window
pragma Inline (Delete);

-- ANCHOR(`subwin()`,`Sub_Window`)
function Sub_Window
(Win           : Window := Standard_Window;
 Number_Of_Lines    : Line_Count;
 Number_Of_Columns  : Column_Count;
 First_Line_Position : Line_Position;
 First_Column_Position : Column_Position) return Window;
-- AKA
pragma Inline (Sub_Window);

-- ANCHOR(`derwin()`,`Derived_Window`)
function Derived_Window
(Win           : Window := Standard_Window;
 Number_Of_Lines    : Line_Count;
 Number_Of_Columns  : Column_Count;
 First_Line_Position : Line_Position;
 First_Column_Position : Column_Position) return Window;
-- AKA
pragma Inline (Derived_Window);

-- ANCHOR(`dupwin()`,`Duplicate`)
function Duplicate (Win : Window) return Window;
-- AKA
pragma Inline (Duplicate);

-- ANCHOR(`mvwin()`,`Move_Window`)
procedure Move_Window (Win  : in Window;
                      Line  : in Line_Position;
                      Column : in Column_Position);
-- AKA

```

```

pragma Inline (Move_Window);

-- ANCHOR(`mvderwin()`,`Move_Derived_Window`)
procedure Move_Derived_Window (Win : in Window;
                               Line : in Line_Position;
                               Column : in Column_Position);

-- AKA
pragma Inline (Move_Derived_Window);

-- ANCHOR(`wsyncup()`,`Synchronize_Upwards`)
procedure Synchronize_Upwards (Win : in Window);
-- AKA
pragma Import (C, Synchronize_Upwards, "wsyncup");

-- ANCHOR(`wsyncdown()`,`Synchronize_Downwards`)
procedure Synchronize_Downwards (Win : in Window);
-- AKA
pragma Import (C, Synchronize_Downwards, "wsyncdown");

-- ANCHOR(`syncok()`,`Set_Synch_Mode`)
procedure Set_Synch_Mode (Win : in Window := Standard_Window;
                          Mode : in Boolean := False);
-- AKA
pragma Inline (Set_Synch_Mode);

-- MANPAGE(`curs_addstr.3x`)

-- ANCHOR(`waddnstr()`,`Add`)
procedure Add (Win : in Window := Standard_Window;
              Str : in String;
              Len : in Integer := -1);
-- AKA
-- ALIAS(`waddstr()`)
-- ALIAS(`addnstr()`)
-- ALIAS(`addstr()`)

-- ANCHOR(`mvwaddnstr()`,`Add`)
procedure Add (Win : in Window := Standard_Window;
              Line : in Line_Position;
              Column : in Column_Position;
              Str : in String;
              Len : in Integer := -1);
-- AKA
-- ALIAS(`mvwaddstr()`)
-- ALIAS(`mvaddnstr()`)
-- ALIAS(`mvaddstr()`)

-- MANPAGE(`curs_addchstr.3x`)

```



```

-- ANCHOR(`waddchnstr()`,`Add`)
procedure Add (Win : in Window := Standard_Window;
              Str : in Attributed_String;
              Len : in Integer := -1);

-- AKA
-- ALIAS(`waddchstr()`)
-- ALIAS(`addchnstr()`)
-- ALIAS(`addchstr()`)

-- ANCHOR(`mvwaddchnstr()`,`Add`)
procedure Add (Win : in Window := Standard_Window;
              Line : in Line_Position;
              Column : in Column_Position;
              Str : in Attributed_String;
              Len : in Integer := -1);

-- AKA
-- ALIAS(`mvwaddchstr()`)
-- ALIAS(`mvaddchnstr()`)
-- ALIAS(`mvaddchstr()`)
pragma Inline (Add);

-- MANPAGE(`curs_border.3x`)
-- | Not implemented: mvhline, mvwhline, mvvline, mvwvline
-- | use Move_Cursor then Horizontal_Line or Vertical_Line

-- ANCHOR(`wborder()`,`Border`)
procedure Border
  (Win : in Window := Standard_Window;
   Left_Side_Symbol : in Attributed_Character := Default_Character;
   Right_Side_Symbol : in Attributed_Character := Default_Character;
   Top_Side_Symbol : in Attributed_Character := Default_Character;
   Bottom_Side_Symbol : in Attributed_Character := Default_Character;
   Upper_Left_Corner_Symbol : in Attributed_Character := Default_Character;
   Upper_Right_Corner_Symbol : in Attributed_Character := Default_Character;
   Lower_Left_Corner_Symbol : in Attributed_Character := Default_Character;
   Lower_Right_Corner_Symbol : in Attributed_Character := Default_Character
  );
-- AKA
-- ALIAS(`border()`)
pragma Inline (Border);

-- ANCHOR(`box()`,`Box`)
procedure Box
  (Win : in Window := Standard_Window;
   Vertical_Symbol : in Attributed_Character := Default_Character;
   Horizontal_Symbol : in Attributed_Character := Default_Character);

```

```

-- AKA
pragma Inline (Box);

-- ANCHOR(`whline()`,`Horizontal_Line`)
procedure Horizontal_Line
  (Win      : in Window := Standard_Window;
   Line_Size : in Natural;
   Line_Symbol : in Attributed_Character := Default_Character);
-- AKA
-- ALIAS(`hline()`)
pragma Inline (Horizontal_Line);

-- ANCHOR(`wvline()`,`Vertical_Line`)
procedure Vertical_Line
  (Win      : in Window := Standard_Window;
   Line_Size : in Natural;
   Line_Symbol : in Attributed_Character := Default_Character);
-- AKA
-- ALIAS(`vline()`)
pragma Inline (Vertical_Line);

-- MANPAGE(`curs_getch.3x`)
-- Not implemented: mvwgetch, mvwgetch

-- ANCHOR(`wgetch()`,`Get_Keystroke`)
function Get_Keystroke (Win : Window := Standard_Window)
  return Real_Key_Code;
-- AKA
-- ALIAS(`getch()`)
-- Get a character from the keyboard and echo it - if enabled - to the
-- window.
-- If for any reason (i.e. a timeout)
we couldn't get a character the
-- returned keycode is Key_None.
pragma Inline (Get_Keystroke);

-- ANCHOR(`ungetch()`,`Undo_Keystroke`)
procedure Undo_Keystroke (Key : in Real_Key_Code);
-- AKA
pragma Inline (Undo_Keystroke);

-- ANCHOR(`has_key()`,`Has_Key`)
function Has_Key (Key : Special_Key_Code) return Boolean;
-- AKA
pragma Inline (Has_Key);

-- |
-- | Some helper functions

```

```

-- |
function Is_Function_Key (Key : Special_Key_Code) return Boolean;
-- Return True if the Key is a function key (i.e. one of F0 .. F63)
pragma Inline (Is_Function_Key);

subtype Function_Key_Number is Integer range 0 .. 63;
-- (n)curses allows for 64 function keys.

function Function_Key (Key : Real_Key_Code) return Function_Key_Number;
-- Return the number of the function key. If the code is not a
-- function key, a CONSTRAINT_ERROR will be raised.
pragma Inline (Function_Key);

function Function_Key_Code (Key : Function_Key_Number)
return Real_Key_Code;
-- Return the key code for a given function-key number.
pragma Inline (Function_Key_Code);

-- MANPAGE(`curs_attr.3x')
-- | Not implemented attr_off, wattr_off,
-- | attr_on, wattr_on, attr_set, wattr_set

-- PAIR_NUMBER
-- PAIR_NUMBER(c) is the same as c.Color

-- ANCHOR(`standout()`,`Standout')
procedure Standout (Win : Window := Standard_Window;
                   On : Boolean := True);
-- ALIAS(`wstandout()')
-- ALIAS(`wstandend()')

-- ANCHOR(`wattron()`,`Switch_Character_Attribute')
procedure Switch_Character_Attribute
(Win : in Window := Standard_Window;
 Attr : in Character_Attribute_Set := Normal_Video;
 On : in Boolean := True); -- if False we switch Off.
-- Switches those Attributes set to true in the list.
-- AKA
-- ALIAS(`wattroff()')
-- ALIAS(`attron()')
-- ALIAS(`attroff()')

-- ANCHOR(`wattrset()`,`Set_Character_Attributes')
procedure Set_Character_Attributes
(Win : in Window := Standard_Window;
 Attr : in Character_Attribute_Set := Normal_Video;
 Color : in Color_Pair := Color_Pair'First);
-- AKA

```

```

-- ALIAS(`attrset()`)
pragma Inline (Set_Character_Attributes);

-- ANCHOR(`wattr_get()`,`Get_Character_Attributes`)
function Get_Character_Attribute
  (Win : in Window := Standard_Window) return Character_Attribute_Set;
-- AKA
-- ALIAS(`attr_get()`)

-- ANCHOR(`wattr_get()`,`Get_Character_Attribute`)
function Get_Character_Attribute
  (Win : in Window := Standard_Window) return Color_Pair;
-- AKA
pragma Inline (Get_Character_Attribute);

-- ANCHOR(`wcolor_set()`,`Set_Color`)
procedure Set_Color (Win : in Window := Standard_Window;
  Pair : in Color_Pair);
-- AKA
-- ALIAS(`color_set()`)
pragma Inline (Set_Color);

-- ANCHOR(`wchgat()`,`Change_Attributes`)
procedure Change_Attributes
  (Win : in Window := Standard_Window;
  Count : in Integer := -1;
  Attr : in Character_Attribute_Set := Normal_Video;
  Color : in Color_Pair := Color_Pair'First);
-- AKA
-- ALIAS(`chgat()`)

-- ANCHOR(`mvwchgat()`,`Change_Attributes`)
procedure Change_Attributes
  (Win : in Window := Standard_Window;
  Line : in Line_Position := Line_Position'First;
  Column : in Column_Position := Column_Position'First;
  Count : in Integer := -1;
  Attr : in Character_Attribute_Set := Normal_Video;
  Color : in Color_Pair := Color_Pair'First);
-- AKA
-- ALIAS(`mvchgat()`)
pragma Inline (Change_Attributes);

-- MANPAGE(`curs_beep.3x`)

-- ANCHOR(`beep()`,`Beep`)
procedure Beep;
-- AKA

```

```

pragma Inline (Beep);

-- ANCHOR(`flash()`,`Flash_Screen`)
procedure Flash_Screen;
-- AKA
pragma Inline (Flash_Screen);

-- MANPAGE(`curs_inopts.3x`)

-- | Not implemented : typeahead
--
-- ANCHOR(`cbreak()`,`Set_Cbreak_Mode`)

procedure Set_Cbreak_Mode (SwitchOn : in Boolean := True);
-- AKA
-- ALIAS(`nocbreak()`)
pragma Inline (Set_Cbreak_Mode);

-- ANCHOR(`raw()`,`Set_Raw_Mode`)
procedure Set_Raw_Mode (SwitchOn : in Boolean := True);
-- AKA
-- ALIAS(`noraw()`)
pragma Inline (Set_Raw_Mode);

-- ANCHOR(`echo()`,`Set_Echo_Mode`)
procedure Set_Echo_Mode (SwitchOn : in Boolean := True);
-- AKA
-- ALIAS(`noecho()`)
pragma Inline (Set_Echo_Mode);

-- ANCHOR(`meta()`,`Set_Meta_Mode`)
procedure Set_Meta_Mode (Win    : in Window := Standard_Window;
                        SwitchOn : in Boolean := True);
-- AKA
pragma Inline (Set_Meta_Mode);

-- ANCHOR(`keypad()`,`Set_KeyPad_Mode`)
procedure Set_KeyPad_Mode (Win    : in Window := Standard_Window;
                          SwitchOn : in Boolean := True);
-- AKA
pragma Inline (Set_KeyPad_Mode);

function Get_KeyPad_Mode (Win : in Window := Standard_Window)

    return Boolean;
-- This has no pendant in C. There you've to look into the WINDOWS
-- structure to get the value. Bad practice, not repeated in Ada.

```

```

type Half_Delay_Amount is range 1 .. 255;

-- ANCHOR(`halfdelay()`,`Half_Delay`)
procedure Half_Delay (Amount : in Half_Delay_Amount);
-- AKA
pragma Inline (Half_Delay);

-- ANCHOR(`intrflush()`,`Set_Flush_On_Interrupt_Mode`)
procedure Set_Flush_On_Interrupt_Mode
  (Win : in Window := Standard_Window;
   Mode : in Boolean := True);
-- AKA
pragma Inline (Set_Flush_On_Interrupt_Mode);

-- ANCHOR(`qiflush()`,`Set_Queue_Interrupt_Mode`)
procedure Set_Queue_Interrupt_Mode
  (Win : in Window := Standard_Window;
   Flush : in Boolean := True);
-- AKA
-- ALIAS(`noqiflush()`)
pragma Inline (Set_Queue_Interrupt_Mode);

-- ANCHOR(`nodelay()`,`Set_NoDelay_Mode`)
procedure Set_NoDelay_Mode
  (Win : in Window := Standard_Window;
   Mode : in Boolean := False);

-- AKA
pragma Inline (Set_NoDelay_Mode);

type Timeout_Mode is (Blocking, Non_Blocking, Delayed);

-- ANCHOR(`wtimeout()`,`Set_Timeout_Mode`)
procedure Set_Timeout_Mode (Win : in Window := Standard_Window;
                           Mode : in Timeout_Mode;
                           Amount : in Natural); -- in Milliseconds
-- AKA
-- ALIAS(`timeout()`)
-- Instead of overloading the semantic of the sign of amount, we
-- introduce the Timeout_Mode parameter. This should improve
-- readability. For Blocking and Non_Blocking, the Amount is not
-- evaluated.
-- We don't inline this procedure.

-- ANCHOR(`notimeout()`,`Set_Escape_Time_Mode`)
procedure Set_Escape_Timer_Mode
  (Win : in Window := Standard_Window;
   Timer_Off : in Boolean := False);

```

```

-- AKA
pragma Inline (Set_Escape_Timer_Mode);

-- MANPAGE(`curs_outopts.3x')

-- ANCHOR(`nl()',`Set_NL_Mode')
procedure Set_NL_Mode (SwitchOn : in Boolean
:= True);
-- AKA
-- ALIAS(`nonl()')
pragma Inline (Set_NL_Mode);

-- ANCHOR(`clearok()',`Clear_On_Next_Update')
procedure Clear_On_Next_Update
(Win   : in Window := Standard_Window;
Do_Clear : in Boolean := True);
-- AKA
pragma Inline (Clear_On_Next_Update);

-- ANCHOR(`idlok()',`Use_Insert_Delete_Line')
procedure Use_Insert_Delete_Line
(Win   : in Window := Standard_Window;
Do_Idl : in Boolean := True);
-- AKA
pragma Inline (Use_Insert_Delete_Line);

-- ANCHOR(`idcok()',`Use_Insert_Delete_Character')
procedure Use_Insert_Delete_Character
(Win   : in Window := Standard_Window;
Do_Idc : in Boolean := True);
-- AKA
pragma Inline (Use_Insert_Delete_Character);

-- ANCHOR(`leaveok()',`Leave_Cursor_After_Update')
procedure Leave_Cursor_After_Update
(Win   : in Window := Standard_Window;
Do_Leave : in Boolean := True);
-- AKA
pragma Inline (Leave_Cursor_After_Update);

--
ANCHOR(`immedok()',`Immediate_Update_Mode')
procedure Immediate_Update_Mode
(Win   : in Window := Standard_Window;
Mode : in Boolean := False);
-- AKA
pragma Inline (Immediate_Update_Mode);

```

```

-- ANCHOR(`scrollok()`,`Allow_Scrolling`)
procedure Allow_Scrolling
  (Win : in Window := Standard_Window;
   Mode : in Boolean := False);
-- AKA
pragma Inline (Allow_Scrolling);

function Scrolling_Allowed (Win : Window := Standard_Window) return Boolean;
-- There is no such function in the C interface.
pragma Inline (Scrolling_Allowed);

-- ANCHOR(`wsetscreg()`,`Set_Scroll_Region`)
procedure Set_Scroll_Region
  (Win      : in Window := Standard_Window;
   Top_Line : in Line_Position;
   Bottom_Line : in Line_Position);
-- AKA
-- ALIAS(`setscreg()`)
pragma Inline (Set_Scroll_Region);

-- MANPAGE(`curs_refresh.3x`)

-- ANCHOR(`douupdate()`,`Update_Screen`)
procedure Update_Screen;
-- AKA
pragma
Inline (Update_Screen);

-- ANCHOR(`wrefresh()`,`Refresh`)
procedure Refresh (Win : in Window := Standard_Window);
-- AKA
-- There is an overloaded Refresh for Pads.
-- The Inline pragma appears there
-- ALIAS(`refresh()`)

-- ANCHOR(`wnoutrefresh()`,`Refresh_Without_Update`)
procedure Refresh_Without_Update
  (Win : in Window := Standard_Window);
-- AKA
-- There is an overloaded Refresh_Without_Update for Pads.
-- The Inline pragma appears there

-- ANCHOR(`redrawwin()`,`Redraw`)
procedure Redraw (Win : in Window := Standard_Window);
-- AKA

-- ANCHOR(`wredrawln()`,`Redraw`)
procedure Redraw (Win      : in Window := Standard_Window;

```



```

        Begin_Line : in Line_Position;
        Line_Count : in Positive);
-- AKA
pragma Inline (Redraw);

-- MANPAGE(^curs_clear.3x')

-- ANCHOR(^werase()`,`Erase')
procedure Erase (Win : in Window := Standard_Window);
-- AKA
-- ALIAS(^erase())
pragma Inline (Erase);

-- ANCHOR(^wclear()`,`Clear')
procedure Clear
  (Win : in Window := Standard_Window);
-- AKA
-- ALIAS(^clear())
pragma Inline (Clear);

-- ANCHOR(^wclrtobot()`,`Clear_To_End_Of_Screen')
procedure Clear_To_End_Of_Screen
  (Win : in Window := Standard_Window);
-- AKA
-- ALIAS(^clrtoobot())
pragma Inline (Clear_To_End_Of_Screen);

-- ANCHOR(^wclrtoeol()`,`Clear_To_End_Of_Line')
procedure Clear_To_End_Of_Line
  (Win : in Window := Standard_Window);
-- AKA
-- ALIAS(^clrtoeol())
pragma Inline (Clear_To_End_Of_Line);

-- MANPAGE(^curs_bkgd.3x')

-- ANCHOR(^wbkgdset()`,`Set_Background')
-- TODO: we could have Set_Background(Window; Character_Attribute_Set)
-- because in C it is common to see bkgdset(A_BOLD) or
-- bkgdset(COLOR_PAIR(n))
procedure Set_Background
  (Win : in Window := Standard_Window;
   Ch : in Attributed_Character);
-- AKA
-- ALIAS(^bkgdset())
pragma Inline (Set_Background);

-- ANCHOR(^wbkgd()`,`Change_Background')

```

```

procedure Change_Background
  (Win : in Window := Standard_Window;
   Ch  : in Attributed_Character);
-- AKA
-- ALIAS(`bkgd()`)
pragma Inline (Change_Background);

-- ANCHOR(`wbkgdget()`,`Get_Background`)
-- ? wbkgdget is not listed in curs_bkgd, getbkgd is through.
function Get_Background (Win : Window := Standard_Window)
  return Attributed_Character;
-- AKA
-- ALIAS(`bkgdget()`)
pragma Inline (Get_Background);

-- MANPAGE(`curs_touch.3x`)

-- ANCHOR(`untouchwin()`,`Untouch`)
procedure Untouch (Win : in Window := Standard_Window);
-- AKA
pragma Inline (Untouch);

-- ANCHOR(`touchwin()`,`Touch`)
procedure Touch (Win : in Window := Standard_Window);
-- AKA

-- ANCHOR(`touchline()`,`Touch`)
procedure Touch (Win  : in Window := Standard_Window;
                 Start : in Line_Position;
                 Count : in Positive);
-- AKA
pragma Inline (Touch);

-- ANCHOR(`wtouchln()`,`Change_Line_Status`)
procedure Change_Lines_Status (Win  : in Window := Standard_Window;
                              Start : in Line_Position;
                              Count : in Positive;
                              State : in Boolean);
-- AKA
pragma Inline (Change_Lines_Status);

-- ANCHOR(`is_linetouched()`,`Is_Touched`)
function Is_Touched (Win : Window := Standard_Window;
                    Line : Line_Position) return Boolean;
-- AKA

-- ANCHOR(`is_wintouched()`,`Is_Touched`)
function Is_Touched (Win : Window := Standard_Window) return Boolean;

```

```

-- AKA
pragma Inline (Is_Touched);

-- MANPAGE(^ curs_overlay.3x')

-- ANCHOR(^copywin()`,`Copy')
procedure Copy
(Source_Window      : in Window;
 Destination_Window : in Window;
 Source_Top_Row     : in Line_Position;
 Source_Left_Column : in Column_Position;
 Destination_Top_Row : in Line_Position;
 Destination_Left_Column : in Column_Position;
 Destination_Bottom_Row : in Line_Position;
 Destination_Right_Column : in Column_Position;
 Non_Destructive_Mode : in Boolean := True);
-- AKA
pragma Inline (Copy);

-- ANCHOR(^overwrite()`,`Overwrite')
procedure Overwrite (Source_Window : in Window;
                    Destination_Window : in Window);
-- AKA
pragma Inline (Overwrite);

-- ANCHOR(^overlay()`,`Overlay')
procedure Overlay (Source_Window : in Window;
                  Destination_Window : in Window);
-- AKA
pragma Inline (Overlay);

-- MANPAGE(^ curs_deleteln.3x')

-- ANCHOR(^windsdelln()`,`Insert_Delete_Lines')
procedure Insert_Delete_Lines
(Win : in Window := Standard_Window;
 Lines : in Integer := 1); -- default is to insert one line above
-- AKA
-- ALIAS(^insdelln())
pragma Inline (Insert_Delete_Lines);

-- ANCHOR(^wdeleteln()`,`Delete_Line')
procedure Delete_Line (Win : in Window := Standard_Window);
-- AKA
-- ALIAS(^deleteln())
pragma Inline (Delete_Line);

-- ANCHOR(^winsertln()`,`Insert_Line')

```

```

procedure Insert_Line (Win : in Window := Standard_Window);
-- AKA
-- ALIAS(`insertln()')
pragma Inline (Insert_Line);

-- MANPAGE(`curs_getyx.3x')

-- ANCHOR(`getmaxyx()',`Get_Size')
procedure Get_Size
(Win          : in Window := Standard_Window;
 Number_Of_Lines : out Line_Count;
 Number_Of_Columns : out Column_Count);
-- AKA
pragma Inline (Get_Size);

-- ANCHOR(`getbegyx()',`Get_Window_Position')
procedure Get_Window_Position
(Win          : in Window := Standard_Window;
 Top_Left_Line : out Line_Position;
 Top_Left_Column : out Column_Position);
-- AKA
pragma Inline (Get_Window_Position);

-- ANCHOR(`getyx()',`Get_Cursor_Position')
procedure Get_Cursor_Position
(Win
 : in Window := Standard_Window;
 Line : out Line_Position;
 Column : out Column_Position);
-- AKA
pragma Inline (Get_Cursor_Position);

-- ANCHOR(`getparyx()',`Get-Origin_Relative_To_Parent')
procedure Get-Origin_Relative_To_Parent
(Win          : in Window;
 Top_Left_Line : out Line_Position;
 Top_Left_Column : out Column_Position;
 Is_Not_A_Subwindow : out Boolean);
-- AKA
-- Instead of placing -1 in the coordinates as return, we use a boolean
-- to return the info that the window has no parent.
pragma Inline (Get-Origin_Relative_To_Parent);

-- MANPAGE(`curs_pad.3x')

-- ANCHOR(`newpad()',`New_Pad')
function New_Pad (Lines : Line_Count;
                 Columns : Column_Count) return Window;

```

```

-- AKA
pragma Inline (New_Pad);

-- ANCHOR(`subpad()`,`Sub_Pad`)
function Sub_Pad
(Pad          : Window;
 Number_Of_Lines  : Line_Count;
 Number_Of_Columns
 : Column_Count;
 First_Line_Position  : Line_Position;
 First_Column_Position : Column_Position) return Window;
-- AKA
pragma Inline (Sub_Pad);

-- ANCHOR(`prefresh()`,`Refresh`)
procedure Refresh
(Pad          : in Window;
 Source_Top_Row      : in Line_Position;
 Source_Left_Column  : in Column_Position;
 Destination_Top_Row : in Line_Position;
 Destination_Left_Column : in Column_Position;
 Destination_Bottom_Row : in Line_Position;
 Destination_Right_Column : in Column_Position);
-- AKA
pragma Inline (Refresh);

-- ANCHOR(`pnoutrefresh()`,`Refresh_Without_Update`)
procedure Refresh_Without_Update
(Pad          : in Window;
 Source_Top_Row      : in Line_Position;
 Source_Left_Column  : in Column_Position;
 Destination_Top_Row : in Line_Position;
 Destination_Left_Column : in Column_Position;
 Destination_Bottom_Row
 : in Line_Position;
 Destination_Right_Column : in Column_Position);
-- AKA
pragma Inline (Refresh_Without_Update);

-- ANCHOR(`pechochar()`,`Add_Character_To_Pad_And_Echo_It`)
procedure Add_Character_To_Pad_And_Echo_It
(Pad : in Window;
 Ch  : in Attributed_Character);
-- AKA

procedure Add_Character_To_Pad_And_Echo_It
(Pad : in Window;
 Ch  : in Character);

```

```

pragma Inline (Add_Character_To_Pad_And_Echo_It);

-- MANPAGE(^curs_scroll.3x')

-- ANCHOR(^wscrl()`,`Scroll')
procedure Scroll (Win : in Window := Standard_Window;
    Amount : in Integer := 1);
-- AKA
-- ALIAS(^scroll())
-- ALIAS(^sctl())
pragma Inline (Scroll);

-- MANPAGE(^curs_delch.3x')

-- ANCHOR(^wdelch()`,`Delete_Character')
procedure Delete_Character (Win : in Window := Standard_Window);
-- AKA
-- ALIAS(^delch())

-- ANCHOR(^mvwdelch()`,`Delete_Character')
procedure Delete_Character
(Win
: in Window := Standard_Window;
    Line : in Line_Position;
    Column : in Column_Position);
-- AKA
-- ALIAS(^mvdelch())
pragma Inline (Delete_Character);

-- MANPAGE(^curs_inch.3x')

-- ANCHOR(^winch()`,`Peek')
function Peek (Win : Window := Standard_Window)
    return Attributed_Character;
-- ALIAS(^inch())
-- AKA

-- ANCHOR(^mvwinch()`,`Peek')
function Peek
(Win : Window := Standard_Window;
    Line : Line_Position;
    Column : Column_Position) return Attributed_Character;
-- AKA
-- ALIAS(^mvinch())
-- More Peek's follow, pragma Inline appears later.

-- MANPAGE(^curs_insch.3x')

```

```

-- ANCHOR(`winsch()`,`Insert`)
procedure Insert (Win : in Window := Standard_Window;
                 Ch  : in Attributed_Character);
-- AKA
-- ALIAS(`insch()`)

-- ANCHOR(`mvwinsch()`,`Insert`)
procedure Insert (Win  : in Window := Standard_Window;
                 Line  : in Line_Position;

                 Column : in Column_Position;
                 Ch    : in Attributed_Character);
-- AKA
-- ALIAS(`mvinsch()`)

-- MANPAGE(`curs_insstr.3x`)

-- ANCHOR(`winsnstr()`,`Insert`)
procedure Insert (Win : in Window := Standard_Window;
                 Str  : in String;
                 Len  : in Integer := -1);
-- AKA
-- ALIAS(`winsnstr()`)
-- ALIAS(`insnstr()`)
-- ALIAS(`insstr()`)

-- ANCHOR(`mvwinsnstr()`,`Insert`)
procedure Insert (Win  : in Window := Standard_Window;
                 Line  : in Line_Position;
                 Column : in Column_Position;
                 Str   : in String;
                 Len   : in Integer := -1);
-- AKA
-- ALIAS(`mvwinsnstr()`)
-- ALIAS(`mvinsnstr()`)
-- ALIAS(`mvinsstr()`)
pragma Inline (Insert);

-- MANPAGE(`curs_instr.3x`)

-- ANCHOR(`winnstr()`,`Peek`)
procedure Peek (Win : in Window := Standard_Window;
              Str  : out
String;
              Len : in Integer := -1);
-- AKA
-- ALIAS(`winstr()`)
-- ALIAS(`innstr()`)

```

```

-- ALIAS(`instr()')

-- ANCHOR(`mvwinstr()`,`Peek')
procedure Peek (Win : in Window := Standard_Window;
               Line : in Line_Position;
               Column : in Column_Position;
               Str : out String;
               Len : in Integer := -1);
-- AKA
-- ALIAS(`mvwinstr()')
-- ALIAS(`mvinnstr()')
-- ALIAS(`mvinstr()')

-- MANPAGE(`curs_inchstr.3x')

-- ANCHOR(`winchnstr()`,`Peek')
procedure Peek (Win : in Window := Standard_Window;
               Str : out Attributed_String;
               Len : in Integer := -1);
-- AKA
-- ALIAS(`winchstr()')
-- ALIAS(`inchnstr()')
-- ALIAS(`inchstr()')

-- ANCHOR(`mvwinchnstr()`,`Peek')
procedure Peek (Win : in Window := Standard_Window;
               Line : in Line_Position;
               Column : in
Column_Position;
               Str : out Attributed_String;
               Len : in Integer := -1);
-- AKA
-- ALIAS(`mvwinchnstr()')
-- ALIAS(`mvinchnstr()')
-- ALIAS(`mvinchstr()')
-- We don't inline the Peek procedures

-- MANPAGE(`curs_getstr.3x')

-- ANCHOR(`wgetnstr()`,`Get')
procedure Get (Win : in Window := Standard_Window;
              Str : out String;
              Len : in Integer := -1);
-- AKA
-- ALIAS(`wgetstr()')
-- ALIAS(`getnstr()')
-- ALIAS(`getstr()')
-- actually getstr is not supported because that results in buffer

```



```

-- overflows.

-- ANCHOR(`mvwgetnstr()`,`Get`)
procedure Get (Win  : in Window := Standard_Window;
              Line : in Line_Position;
              Column : in Column_Position;
              Str  : out String;
              Len  : in Integer := -1);

-- AKA
-- ALIAS(`mvwgetstr()`)
-- ALIAS(`mvwgetnstr()`)
-- ALIAS(`mvgetstr()`)
-- Get is not inlined

-- MANPAGE(`curs_slk.3x`)

-- Not Implemented: slk_attr_on, slk_attr_off, slk_attr_set

type Soft_Label_Key_Format is (Three_Two_Three,
                              Four_Four,
                              PC_Style,      -- ncurses specific
                              PC_Style_With_Index); -- "
type Label_Number is new Positive range 1 .. 12;
type Label_Justification is (Left, Centered, Right);

-- ANCHOR(`slk_init()`,`Init_Soft_Label_Keys`)
procedure Init_Soft_Label_Keys
  (Format : in Soft_Label_Key_Format := Three_Two_Three);
-- AKA
pragma Inline (Init_Soft_Label_Keys);

-- ANCHOR(`slk_set()`,`Set_Soft_Label_Key`)
procedure Set_Soft_Label_Key (Label : in Label_Number;
                             Text  : in String;
                             Fmt   : in Label_Justification := Left);
-- AKA
-- We don't inline this procedure

-- ANCHOR(`slk_refresh()`,`Refresh_Soft_Label_Key`)
procedure Refresh_Soft_Label_Keys;
-- AKA
pragma Inline (Refresh_Soft_Label_Keys);

-- ANCHOR(`slk_noutrefresh()`,`Refresh_Soft_Label_Keys_Without_Update`)
procedure Refresh_Soft_Label_Keys_Without_Update;
-- AKA
pragma Inline (Refresh_Soft_Label_Keys_Without_Update);

```

```

-- ANCHOR(`slk_label()`,`Get_Soft_Label_Key')
procedure Get_Soft_Label_Key (Label : in Label_Number;
                             Text : out String);
-- AKA

-- ANCHOR(`slk_label()`,`Get_Soft_Label_Key')
function Get_Soft_Label_Key (Label : in Label_Number) return String;
-- AKA
-- Same as function
pragma Inline (Get_Soft_Label_Key);

-- ANCHOR(`slk_clear()`,`Clear_Soft_Label_Keys')
procedure Clear_Soft_Label_Keys;
-- AKA
pragma Inline (Clear_Soft_Label_Keys);

-- ANCHOR(`slk_restore()`,`Restore_Soft_Label_Keys')
procedure Restore_Soft_Label_Keys;
-- AKA
pragma Inline (Restore_Soft_Label_Keys);

-- ANCHOR(`slk_touch()`,`Touch_Soft_Label_Keys')
procedure Touch_Soft_Label_Keys;
-- AKA
pragma Inline (Touch_Soft_Label_Keys);

-- ANCHOR(`slk_attron()`,`Switch_Soft_Label_Key_Attributes')
procedure Switch_Soft_Label_Key_Attributes
  (Attr : in Character_Attribute_Set;
   On   : in Boolean := True);
-- AKA
-- ALIAS(`slk_attron()')
pragma Inline (Switch_Soft_Label_Key_Attributes);

-- ANCHOR(`slk_attrset()`,`Set_Soft_Label_Key_Attributes')
procedure Set_Soft_Label_Key_Attributes
  (Attr : in Character_Attribute_Set := Normal_Video;
   Color : in Color_Pair := Color_Pair'First);
-- AKA
pragma Inline (Set_Soft_Label_Key_Attributes);

-- ANCHOR(`slk_attr()`,`Get_Soft_Label_Key_Attributes')
function Get_Soft_Label_Key_Attributes return Character_Attribute_Set;
-- AKA

-- ANCHOR(`slk_attr()`,`Get_Soft_Label_Key_Attributes')
function Get_Soft_Label_Key_Attributes return Color_Pair;
-- AKA

```

```

pragma Inline (Get_Soft_Label_Key_Attributes);

-- ANCHOR(`slk_color()`,`Set_Soft_Label_Key_Color`)
procedure Set_Soft_Label_Key_Color (Pair : in Color_Pair);
-- AKA
pragma Inline (Set_Soft_Label_Key_Color);

-- MANPAGE(`keybound.3x`)
-- Not Implemented: keybound

-- MANPAGE(`keyok.3x`)

-- ANCHOR(`keyok()`,`Enable_Key`)
procedure Enable_Key (Key : in Special_Key_Code;
                    Enable : in Boolean := True);
-- AKA
pragma Inline (Enable_Key);

-- MANPAGE(`define_key.3x`)

-- ANCHOR(`define_key()`,`Define_Key`)
procedure Define_Key (Definition : in String;
                    Key : in Special_Key_Code);
-- AKA
pragma Inline (Define_Key);

-- MANPAGE(`curs_util.3x`)

-- | Not implemented : filter, use_env
-- | putwin, getwin are in the child package PutWin
--

-- ANCHOR(`keyname()`,`Key_Name`)
procedure Key_Name (Key : in Real_Key_Code;
                  Name : out String);
-- AKA
-- The external name for a real
keystroke.

-- ANCHOR(`keyname()`,`Key_Name`)
function Key_Name (Key : in Real_Key_Code) return String;
-- AKA
-- Same as function
-- We don't inline this routine

-- ANCHOR(`unctrl()`,`Un_Control`)
procedure Un_Control (Ch : in Attributed_Character;
                    Str : out String);

```

```

-- AKA

-- ANCHOR(`unctrl()`,`Un_Control`)
function Un_Control (Ch : in Attributed_Character) return String;
-- AKA
-- Same as function
pragma Inline (Un_Control);

-- ANCHOR(`delay_output()`,`Delay_Output`)
procedure Delay_Output (Msecs : in Natural);
-- AKA
pragma Inline (Delay_Output);

-- ANCHOR(`flushinp()`,`Flush_Input`)
procedure Flush_Input;
-- AKA
pragma Inline (Flush_Input);

-- MANPAGE(`curs_termattrs.3x`)

-- ANCHOR(`baudrate()`,`Baudrate`)
function Baudrate return Natural;
-- AKA
pragma Inline (Baudrate);

-- ANCHOR(`erasechar()`,`Erase_Character`)
function Erase_Character return
Character;
-- AKA
pragma Inline (Erase_Character);

-- ANCHOR(`killchar()`,`Kill_Character`)
function Kill_Character return Character;
-- AKA
pragma Inline (Kill_Character);

-- ANCHOR(`has_ic()`,`Has_Insert_Character`)
function Has_Insert_Character return Boolean;
-- AKA
pragma Inline (Has_Insert_Character);

-- ANCHOR(`has_il()`,`Has_Insert_Line`)
function Has_Insert_Line return Boolean;
-- AKA
pragma Inline (Has_Insert_Line);

-- ANCHOR(`termattrs()`,`Supported_Attributes`)
function Supported_Attributes return Character_Attribute_Set;

```

```

-- AKA
pragma Inline (Supported_Attributes);

-- ANCHOR(`longname()`,`Long_Name`)
procedure Long_Name (Name : out String);
-- AKA

-- ANCHOR(`longname()`,`Long_Name`)
function Long_Name return String;
-- AKA
-- Same as function
pragma Inline (Long_Name);

-- ANCHOR(`termname()`,`Terminal_Name`)
procedure Terminal_Name (Name : out String);
-- AKA

-- ANCHOR(`termname()`,`Terminal_Name`)
function Terminal_Name return String;
-- AKA
-- Same as function
pragma Inline (Terminal_Name);

-- MANPAGE(`curs_color.3x`)

-- COLOR_PAIR
-- COLOR_PAIR(n) in C is the same as
-- Attributed_Character(Ch => Nul, Color => n, Attr => Normal_Video)
-- In C you often see something like c = c | COLOR_PAIR(n);
-- This is equivalent to c.Color := n;

-- ANCHOR(`start_color()`,`Start_Color`)
procedure Start_Color;
-- AKA
pragma Import (C, Start_Color, "start_color");

-- ANCHOR(`init_pair()`,`Init_Pair`)
procedure Init_Pair (Pair : in Redefinable_Color_Pair;
                   Fore : in Color_Number;
                   Back : in Color_Number);
-- AKA
pragma Inline (Init_Pair);

-- ANCHOR(`pair_content()`,`Pair_Content`)
procedure Pair_Content (Pair : in Color_Pair;
                      Fore : out Color_Number;
                      Back : out Color_Number);

```

```

-- AKA
pragma Inline (Pair_Content);

-- ANCHOR(`has_colors()`,`Has_Colors`)
function Has_Colors return Boolean;
-- AKA
pragma Inline (Has_Colors);

-- ANCHOR(`init_color()`,`Init_Color`)
procedure Init_Color (Color : in Color_Number;
                     Red   : in RGB_Value;
                     Green : in RGB_Value;
                     Blue  : in RGB_Value);
-- AKA
pragma Inline (Init_Color);

-- ANCHOR(`can_change_color()`,`Can_Change_Color`)
function Can_Change_Color return Boolean;
-- AKA
pragma Inline (Can_Change_Color);

-- ANCHOR(`color_content()`,`Color_Content`)
procedure Color_Content (Color : in Color_Number;
                       Red   : out RGB_Value;
                       Green : out RGB_Value;
                       Blue  : out RGB_Value);
-- AKA
pragma Inline (Color_Content);

-- MANPAGE(`curs_kernel.3x`)
-- | Not implemented: getsyx, setsyx
--
type Curses_Mode is
(Curses, Shell);

-- ANCHOR(`def_prog_mode()`,`Save_Curses_Mode`)
procedure Save_Curses_Mode (Mode : in Curses_Mode);
-- AKA
-- ALIAS(`def_shell_mode()`)
pragma Inline (Save_Curses_Mode);

-- ANCHOR(`reset_prog_mode()`,`Reset_Curses_Mode`)
procedure Reset_Curses_Mode (Mode : in Curses_Mode);
-- AKA
-- ALIAS(`reset_shell_mode()`)
pragma Inline (Reset_Curses_Mode);

```

```

-- ANCHOR(`savetty()`,`Save_Terminal_State`)
procedure Save_Terminal_State;
-- AKA
pragma Inline (Save_Terminal_State);

-- ANCHOR(`resetty()`,`Reset_Terminal_State`)
procedure Reset_Terminal_State;
-- AKA
pragma Inline (Reset_Terminal_State);

type Stdscr_Init_Proc is access
  function (Win   : Window;
           Columns : Column_Count) return Integer;
pragma Convention (C, Stdscr_Init_Proc);
-- N.B.: the return value is actually ignored, but it seems to be
--       a good practice to return 0 if you think all went fine
--       and
-1 otherwise.

-- ANCHOR(`ripoffline()`,`Rip_Off_Lines`)
procedure Rip_Off_Lines (Lines : in Integer;
                        Proc   : in Stdscr_Init_Proc);
-- AKA
-- N.B.: to be more precise, this uses a ncurses specific enhancement of
--       ripoffline(), in which the Lines argument absolute value is the
--       number of lines to be ripped of. The official ripoffline() only
--       uses the sign of Lines to rip of a single line from bottom or top.
pragma Inline (Rip_Off_Lines);

type Cursor_Visibility is (Invisible, Normal, Very_Visible);

-- ANCHOR(`curs_set()`,`Set_Cursor_Visibility`)
procedure Set_Cursor_Visibility (Visibility : in out Cursor_Visibility);
-- AKA
pragma Inline (Set_Cursor_Visibility);

-- ANCHOR(`napms()`,`Nap_Milli_Seconds`)
procedure Nap_Milli_Seconds (Ms : in Natural);
-- AKA
pragma Inline (Nap_Milli_Seconds);

-- |=====
-- |
| Some useful helpers.
-- |=====

type Transform_Direction is (From_Screen, To_Screen);
procedure Transform_Coordinates
  (W   : in Window := Standard_Window;

```

```

Line : in out Line_Position;
Column : in out Column_Position;
Dir : in Transform_Direction := From_Screen);
-- This procedure transforms screen coordinates into coordinates relative
-- to the window and vice versa, depending on the Dir parameter.
-- Screen coordinates are the position informations on the physical device.
-- An Curses_Exception will be raised if Line and Column are not in the
-- Window or if you pass the Null_Window as argument.
-- We don't inline this procedure

-- MANPAGE(^default_colors.3x')

-- ANCHOR(^use_default_colors(),`Use_Default_Colors')
procedure Use_Default_Colors;
-- AKA
pragma Inline (Use_Default_Colors);

-- ANCHOR(^assume_default_colors(),`Assume_Default_Colors')
procedure Assume_Default_Colors (Fore : Color_Number := Default_Color;
                                Back : Color_Number := Default_Color);
-- AKA
pragma Inline (Assume_Default_Colors);

-- MANPAGE(^curs_extend.3x')

-- ANCHOR(^curses_version(),`Curses_Version')
function Curses_Version return String;
-- AKA

-- ANCHOR(^use_extended_names(),`Use_Extended_Names')
-- The returnvalue is the previous setting of the flag
function Use_Extended_Names (Enable : Boolean) return Boolean;
-- AKA

-- MANPAGE(^curs_trace.3x')

-- ANCHOR(^_nc_freeall(),`Curses_Free_All')
procedure Curses_Free_All;
-- AKA

-- MANPAGE(^curs_scr_dump.3x')

-- ANCHOR(^scr_dump(),`Screen_Dump_To_File')
procedure Screen_Dump_To_File (Filename : in String);
-- AKA

-- ANCHOR(^scr_restore(),`Screen_Restore_From_File')
procedure Screen_Restore_From_File (Filename : in String);

```



```

-- AKA

-- ANCHOR(`scr_init()`,`Screen_Init_From_File`)
procedure Screen_Init_From_File (Filename : in String);
-- AKA

-- ANCHOR(`scr_set()`,`Screen_Set_File`)
procedure Screen_Set_File (Filename : in String);
-- AKA

-- MANPAGE(`curs_print.3x`)
-- Not implemented: mcprint

-- MANPAGE(`curs_printw.3x`)
-- Not implemented: printw, wprintw, mvprintw, mvwprintw, vwprintw,
--          vw_printw
-- Please use the Ada style Text_IO child packages for formatted
-- printing. It doesn't make a lot of sense to map the printf style
-- C functions to Ada.

-- MANPAGE(`curs_scanw.3x`)
-- Not implemented: scanw, wscanw, mvscanw, mvwscanw, vwscanw, vw_scanw

-- MANPAGE(`resizeterm.3x`)
-- Not Implemented: resizingterm

-- MANPAGE(`wresize.3x`)

-- ANCHOR(`wresize()`,`Resize`)
procedure Resize (Win          : Window := Standard_Window;
                 Number_Of_Lines : Line_Count;
                 Number_Of_Columns : Column_Count);
--
AKA

private
type Window is new System.Storage_Elements.Integer_Address;
Null_Window : constant Window := 0;

-- The next constants are generated and may be different on your
-- architecture.
--
include(`Window_Offsets`)dnl
Curses_Bool_False : constant Curses_Bool := 0;

end Terminal_Interface.Curses;

Found in path(s):

```

\* /opt/cola/permits/1600019816\_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/Ada95/gen/terminal\_interface-curses.ads.m4

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```

-- \$Id: NEWS,v 1.4 2006/04/22 22:19:37 tom Exp \$

-----  
This is a log of changes that the ncurses C++ binding has gone through starting with the integration of menu and forms integration into the binding.

990731 + Improve support for pads. A viewport window may now be added to a pad. It will then be possible to use a builtin panning mechanism to view the pad.

970908 + Improve NCursesWindow class: added additional methods to cover more ncurses functionality. Make refresh() and noutrefresh() virtual members to allow different implementation in the NCursesPanel class.

- + CAUTION: changed order of parameters in vline() and hline() of NCursesWindow class.
- +
- Make refresh() in NCursesPanel non-static, it is now a reimplementa- tion of refresh() in the base class. Added noutrefresh() to NCursesPanel.
- + Added NCursesForm and related classes to support libform functionality.
- + Moved most of configuration related stuff from cursesw.h to etip.h
- + Added NCursesApplication class to support easy configuration of menu and forms related attributes as well as ripped of title lines and Soft-Label-Keys for an application.
- + Support of Auto-Cleanup for a menus fieldlist.
- + Change of return type for current\_item() and operator[] for menus.
- + Enhanced demo.

970502

- + Introduced the THROW and THROWS functions/macros to prepare a smoother transition to real exception handling.
- + Exception classes provided in etip.h
- + Added the NCursesMenu class to support libmenu functionality.
- + The inheritace relation between NCursesWindow and NCursesColorWindow was kind of brain damage. Monochrome is a special case of colored, so the relation should be just the opposite. This would allow all derived classes like NCursesPanel, NCursesMenu or NCursesForm to have colors.  
To resolve that design flaw I put the color functionality into the NCursesWindow class and it can be switched on by the static member useColors(). NCursesColorWindow is still there for compatibility reasons.

Found in path(s):

```
* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/c++/NEWS
```

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#####
#
# See "MKncurses_def.sh" for an explanation.
#
# (hint: don't try to define NDEBUG ;-)
```

```

BROKEN_LINKER
BSD_TPUTS
CC_HAS_PROTOS
CPP_HAS_PARAM_INIT
CURSES_ACS_ARRAY acs_map
CURSES_WACS_ARRAY _nc_wacs
DECL_ERRNO
ETIP_NEEDS_MATH_H
GCC_NORETURN /* nothing */
GCC_UNUSED /* nothing */
HAVE_BIG_CORE
HAVE_BSD_CGETENT
HAVE_BSD_SIGNAL_H
HAVE_BTOWC
HAVE_BUILTIN_H
HAVE_CHGAT 1
HAVE_COLOR_SET 1
HAVE_DIRENT_H
HAVE_ERRNO
HAVE_FCNTL_H
HAVE_FILTER 1
HAVE_FORM_H
HAVE_GETBEGX 1
```

HAVE\_GETCURX 1  
HAVE\_GETCWD  
HAVE\_GETEGID  
HAVE\_GETEUID  
HAVE\_GETMAXX 1  
HAVE\_GETNSTR  
HAVE\_GETOPT\_H  
HAVE\_GETPARX 1  
HAVE\_GETTIMEOFDAY  
HAVE\_GETTTYNAM  
HAVE\_GETWIN 1  
HAVE\_GPM\_H  
HAVE\_GPP\_BUILTIN\_H  
HAVE\_GXX\_BUILTIN\_H  
HAVE\_HAS\_KEY  
HAVE\_IOSTREAM  
HAVE\_ISASCII  
HAVE\_ISSETUGID  
HAVE\_LANGINFO\_CODESET  
HAVE\_LIBC\_H  
HAVE\_LIBDBMALLOC  
HAVE\_LIBDMALLOC  
HAVE\_LIBFORM  
HAVE\_LIBGPM  
HAVE\_LIBMENU  
HAVE\_LIBMPATROL  
HAVE\_LIBPANEL  
HAVE\_LIMITS\_H  
HAVE\_LINK  
HAVE\_LOCALE\_H  
HAVE\_LONG\_FILE\_NAMES  
HAVE\_MBLEN  
HAVE\_MBRLN  
HAVE\_MBRTOWC  
HAVE\_MBSRTOWCS  
HAVE\_MBSTOWCS  
HAVE\_MBTOWC  
HAVE\_MENU\_H  
HAVE\_MKSTEMP  
HAVE\_MVVLN 1  
HAVE\_MVWVLN 1  
HAVE\_NANOSLEEP  
HAVE\_NC\_ALLOC\_H  
HAVE\_PANEL\_H  
HAVE\_POLL  
HAVE\_POLL\_H  
HAVE\_PURIFY  
HAVE\_PUTWC

HAVE\_PUTWIN 1  
HAVE\_REGEXPR\_H\_FUNCS  
HAVE\_REGEX\_H\_FUNCS  
HAVE\_REGEX\_H\_FUNCS  
HAVE\_REMOVE  
HAVE\_RESIZETERM  
HAVE\_RESIZE\_TERM  
HAVE\_RIPOFFLINE 1  
HAVE\_SELECT  
HAVE\_SETBUF  
HAVE\_SETBUFFER  
HAVE\_SETUPTERM 1  
HAVE\_SETVBUF  
HAVE\_SIGACTION  
HAVE\_SIGVEC  
HAVE\_SIZECHANGE  
HAVE\_SLK\_COLOR  
HAVE\_SLK\_INIT 1  
HAVE\_STRDUP  
HAVE\_STRSTR  
HAVE\_SYMLINK  
HAVE\_SYS\_BSDTYPES\_H  
HAVE\_SYS\_IOCTL\_H  
HAVE\_SYS\_PARAM\_H  
HAVE\_SYS\_POLL\_H  
HAVE\_SYS\_SELECT\_H  
HAVE\_SYS\_TERMIO\_H  
HAVE\_SYS\_TIMES\_H  
HAVE\_SYS\_TIME\_H  
HAVE\_SYS\_TIME\_SELECT  
HAVE\_TCGETATTR  
HAVE\_TCGETPGRP  
HAVE\_TELL  
HAVE\_TERMATTRS 1  
HAVE\_TERMIOS\_H  
HAVE\_TERMIO\_H  
HAVE\_TERMNAME 1  
HAVE\_TERM\_H 1  
HAVE\_TGETENT 1  
HAVE\_TGETNUM 1  
HAVE\_TGETSTR 1  
HAVE\_TIMES  
HAVE\_TTYENT\_H  
HAVE\_TYPEAHEAD 1  
HAVE\_TYPEINFO  
HAVE\_TYPE\_ATTR\_T  
HAVE\_TYPE\_SIGACTION

HAVE\_UNISTD\_H  
HAVE\_UNLINK  
HAVE\_USE\_DEFAULT\_COLORS  
HAVE\_VFSCANF  
HAVE\_VSNPRINTF  
HAVE\_VSSCANF  
HAVE\_WCSRTOMBS  
HAVE\_WCSTOMBS  
HAVE\_WCTOB

HAVE\_WCTOMB  
HAVE\_WCTYPE\_H  
HAVE\_WINSSTR 1  
HAVE\_WORKING\_POLL  
HAVE\_WRESIZE  
HAVE\_DOSCAN  
MIXEDCASE\_FILENAMES  
NCURSES\_CHAR\_EQ  
NCURSES\_EXPANDED  
NCURSES\_EXT\_COLORS  
NCURSES\_EXT\_FUNCS  
NCURSES\_NO\_PADDING  
NCURSES\_PATHSEP ':'  
NDEBUG  
NEED\_PTEM\_H  
NO\_LEAKS  
PURE\_TERMINFO  
RETSIGTYPE  
STDC\_HEADERS  
SVR4\_ACTION  
SVR4\_TERMIO  
SYSTEM\_NAME "unknown"  
TERMINFO "none"  
TERMPATH "none"  
TIME\_WITH\_SYS\_TIME  
TYPEOF\_CHTYPE  
USE\_COLORFGBG  
USE\_DATABASE  
USE\_GETCAP  
USE\_GETCAP\_CACHE  
USE\_HARD\_TABS  
USE\_HASHED\_DB  
USE\_HASHMAP  
USE\_HOME\_TERMINFO  
USE\_LINKS  
USE\_MY\_MEMMOVE  
USE\_OK\_BCOPY  
USE\_RCS\_IDS

USE\_REENTRANT  
USE\_SAFE\_SPRINTF  
USE\_SCROLL\_HINTS  
USE\_SIGWINCH  
USE\_SYMLINKS  
USE\_SYSMOUSE  
USE\_TERMCAP  
USE\_WEAK\_SYMBOLS  
USE\_WIDEC\_SUPPORT  
USE\_XMC\_SUPPORT

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\* /opt/cola/permits/1600019816\_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-  
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/include/ncurses\_defs

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\* @Id: curs\_addchstr.3x,v 1.12 2006/12/02 17:02:45 tom Exp @

-->



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archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-  
5.7/doc/html/man/curs\_addchstr.3x.html

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*****
* @Id: menu_new.3x,v 1.9 2006/11/04 18:31:37 tom Exp @
-->

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archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-  
5.7/doc/html/man/menu\_new.3x.html

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* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/ncurses/widechar/lib_vline_set.c
* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-
5.7/ncurses/widechar/lib_erasewchar.c
* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/ncurses/widechar/lib_hline_set.c
* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/ncurses/widechar/lib_box_set.c
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archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/panel/p_new.c
* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
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* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
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* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
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* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/menu/m_driver.c

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*****
* @Id: form_field.3x,v 1.8 2006/11/04 18:01:38 tom Exp @
-->

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* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
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5.7/doc/html/man/form_field.3x.html

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*****
* @Id: curs_termattrs.3x,v 1.10 2007/06/02 20:40:07 tom Exp @
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* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
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5.7/doc/html/man/curs_termattrs.3x.html

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* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/ncurses/tinfo/MKcodes.awk
*

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* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
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*
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* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
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* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
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* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
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fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/ncurses/base/MKunctrl.awk
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archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/ncurses/base/version.c

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\* @Id: curs\_instr.3x,v 1.13 2006/02/25 21:49:19 tom Exp @

-->



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\* /opt/cola/permits/1600019816\_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/ncurses/base/keybound.c  
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archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/ncurses/base/lib_hline.c
* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/panel/panel.h
* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/ncurses/base/lib_clrbot.c
* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/ncurses/base/lib_mvwin.c
*
/opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-archive-
fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/ncurses/base/lib_vline.c

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*****
* @Id: curs_getstr.3x,v 1.15 2006/01/12 00:30:58 tom Exp @
-->

```

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archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-
5.7/doc/html/man/curs_getstr.3x.html

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dnl  
dnl \$Id: html.m4,v 1.3 2007/09/01 23:59:59 tom Exp \$

define(`ANCHORIDX',`0')dnl

define(`MANPAGE',`define(`MANPG',\$1)dnl

|=====

-- | Man page <A HREF=" ../man/MANPG.html">MANPG</A>

-- |=====)dnl

define(`ANCHOR',`define(`ANCHORIDX',incr(ANCHORIDX))dnl

`#1A NAME="AFU`\_`ANCHORIDX`"#2dnl

define(`CFUNAME',`\$1')define(`AFUNAME',`\$2')dnl

|')dnl

define(`AKA',`AKA': <A HREF=" ../man/MANPG.html">CFUNAME</A>')dnl

define(`ALIAS',`AKA': \$1')dnl

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archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/Ada95/gen/html.m4

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archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/ncurses/widechar/lib\_cchar.c  
\* /opt/cola/permits/1600019816\_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-  
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/ncurses/widechar/lib\_wunctrl.c  
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* @Id: curs_threads.3x,v 1.12 2008/04/12 18:22:51 tom Exp @
* *****
* *****
-->
```

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archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-
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```
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-- $Id: AUTHORS,v 1.2 2006/10/28 21:44:52 tom Exp $
-----
```

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5.7/doc/html/man/curs_refresh.3x.html

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```
-- *- ada -*
```

```
define(^HTMLNAME',`terminal_interface-curses-menus__ads.htm')dnl
include(M4MACRO)dnl
```

```

-----
--
--          GNAT ncurses Binding          --
--
--          Terminal_Interface.Curses.Menu    --
--
--          S P E C          --
--
-----

```

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```

-----
-- Author: Juergen Pfeifer, 1996
-- Version Control:
-- $Revision:
1.27 $
-- $Date: 2007/05/05 20:20:52 $
-- Binding Version 01.00

```

```

-----
include(^Menu_Base_Defs')
with System;
with Ada.Characters.Latin_1;

package Terminal_Interface.Curses.Menus is
  pragma Preelaborate (Terminal_Interface.Curses.Menus);
  include(^Menu_Linker_Options')dnl
  include(^Linker_Options')
  Space : Character renames Ada.Characters.Latin_1.Space;

  type Item is private;
  type Menu is private;

  -----
  -- Interface constants --
  -----
  Null_Item : constant Item;
  Null_Menu : constant Menu;

```

```

subtype Menu_Request_Code is Key_Code
  range (Key_Max + 1) .. (Key_Max + 17);

-- The prefix M_ stands for "Menu Request"
M_Left_Item    : constant Menu_Request_Code := Key_Max + 1;
M_Right_Item   : constant Menu_Request_Code := Key_Max + 2;
M_Up_Item      : constant Menu_Request_Code := Key_Max + 3;
M_Down_Item    :
constant Menu_Request_Code := Key_Max + 4;
M_ScrollUp_Line : constant Menu_Request_Code := Key_Max + 5;
M_ScrollDown_Line : constant Menu_Request_Code := Key_Max + 6;
M_ScrollDown_Page : constant Menu_Request_Code := Key_Max + 7;
M_ScrollUp_Page  : constant Menu_Request_Code := Key_Max + 8;
M_First_Item    : constant Menu_Request_Code := Key_Max + 9;
M_Last_Item     : constant Menu_Request_Code := Key_Max + 10;
M_Next_Item     : constant Menu_Request_Code := Key_Max + 11;
M_Previous_Item : constant Menu_Request_Code := Key_Max + 12;
M_Toggle_Item   : constant Menu_Request_Code := Key_Max + 13;
M_Clear_Pattern : constant Menu_Request_Code := Key_Max + 14;
M_Back_Pattern  : constant Menu_Request_Code := Key_Max + 15;
M_Next_Match    : constant Menu_Request_Code := Key_Max + 16;
M_Previous_Match : constant Menu_Request_Code := Key_Max + 17;

-- For those who like the old 'C' names for the request codes
REQ_LEFT_ITEM   :
Menu_Request_Code renames M_Left_Item;
REQ_RIGHT_ITEM  : Menu_Request_Code renames M_Right_Item;
REQ_UP_ITEM     : Menu_Request_Code renames M_Up_Item;
REQ_DOWN_ITEM   : Menu_Request_Code renames M_Down_Item;
REQ_SCR_ULINE   : Menu_Request_Code renames M_ScrollUp_Line;
REQ_SCR_DLINE   : Menu_Request_Code renames M_ScrollDown_Line;
REQ_SCR_DPAGE   : Menu_Request_Code renames M_ScrollDown_Page;
REQ_SCR_UPAGE   : Menu_Request_Code renames M_ScrollUp_Page;
REQ_FIRST_ITEM  : Menu_Request_Code renames M_First_Item;
REQ_LAST_ITEM   : Menu_Request_Code renames M_Last_Item;
REQ_NEXT_ITEM   : Menu_Request_Code renames M_Next_Item;
REQ_PREV_ITEM   : Menu_Request_Code renames M_Previous_Item;
REQ_TOGGLE_ITEM : Menu_Request_Code renames M_Toggle_Item;
REQ_CLEAR_PATTERN : Menu_Request_Code renames M_Clear_Pattern;
REQ_BACK_PATTERN : Menu_Request_Code renames M_Back_Pattern;
REQ_NEXT_MATCH  : Menu_Request_Code renames M_Next_Match;
REQ_PREV_MATCH  : Menu_Request_Code renames M_Previous_Match;

procedure Request_Name (Key : in Menu_Request_Code;
  Name : out String);

function Request_Name (Key : Menu_Request_Code) return String;
-- Same as function

```

```

-----
-- Exceptions --
-----

Menu_Exception : exception;
--
-- Menu options
--
pragma Warnings (Off);
include(`Menu_Opt_Rep')dnl

pragma Warnings (On);

function Default_Menu_Options return Menu_Option_Set;
-- Initial default options for a menu.
pragma Inline (Default_Menu_Options);
--
-- Item options
--
pragma Warnings (Off);
include(`Item_Rep')dnl

pragma Warnings (On);

function Default_Item_Options return Item_Option_Set;
-- Initial default options for an item.
pragma Inline (Default_Item_Options);

--
-- Item Array
--
type Item_Array is array (Positive range <>) of aliased Item;
pragma Convention (C, Item_Array);

type Item_Array_Access is access Item_Array;

procedure Free (IA      : in out Item_Array_Access;
               Free_Items : Boolean := False);
-- Release the memory for an allocated item array
-- If Free_Items is True, call Delete() for all the items in
-- the array.

-- MANPAGE(`mitem_new.3x')

-- ANCHOR(`new_item()',`Create')
function Create (Name      : String;
                Description : String := "") return Item;

```

```

-- AKA
-- Not inlined.

-- ANCHOR(`new_item()`,`New_Item`)
function New_Item (Name      : String;
                  Description : String := "") return Item
renames Create;
-- AKA

-- ANCHOR(`free_item()`,`Delete`)
procedure Delete (Itm : in out Item);
-- AKA
-- Resets Itm to Null_Item

-- MANPAGE(`mitem_value.3x`)

-- ANCHOR(`set_item_value()`,`Set_Value`)
procedure Set_Value (Itm  : in Item;
                   Value : in Boolean := True);
-- AKA
pragma Inline
(Set_Value);

-- ANCHOR(`item_value()`,`Value`)
function Value (Itm : Item) return Boolean;
-- AKA
pragma Inline (Value);

-- MANPAGE(`mitem_visible.3x`)

-- ANCHOR(`item_visible()`,`Visible`)
function Visible (Itm : Item) return Boolean;
-- AKA
pragma Inline (Visible);

-- MANPAGE(`mitem_opts.3x`)

-- ANCHOR(`set_item_opts()`,`Set_Options`)
procedure Set_Options (Itm  : in Item;
                    Options : in Item_Option_Set);
-- AKA
-- An overloaded Set_Options is defined later. Pragma Inline appears there

-- ANCHOR(`item_opts_on()`,`Switch_Options`)
procedure Switch_Options (Itm  : in Item;
                       Options : in Item_Option_Set;
                       On     : Boolean := True);
-- AKA

```

```

-- ALIAS(`item_opts_off()`)
-- An overloaded Switch_Options is defined later.
-- Pragma Inline appears there

-- ANCHOR(`item_opts()`,`Get_Options`)
procedure Get_Options (Itm
    : in Item;
        Options : out Item_Option_Set);
-- AKA

-- ANCHOR(`item_opts()`,`Get_Options`)
function Get_Options (Itm : Item := Null_Item) return Item_Option_Set;
-- AKA
-- An overloaded Get_Options is defined later. Pragma Inline appears there

-- MANPAGE(`mitem_name.3x`)

-- ANCHOR(`item_name()`,`Name`)
procedure Name (Itm : in Item;
    Name : out String);
-- AKA
function Name (Itm : Item) return String;
-- AKA
-- Implemented as function
pragma Inline (Name);

-- ANCHOR(`item_description()`,`Description`)
procedure Description (Itm : in Item;
    Description : out String);
-- AKA

function Description (Itm : Item) return String;
-- AKA
-- Implemented as function
pragma Inline (Description);

-- MANPAGE(`mitem_current.3x`)

-- ANCHOR(`set_current_item()`,`Set_Current`)
procedure Set_Current (Men : in Menu;
    Itm : in Item);
-- AKA
pragma Inline (Set_Current);

-- ANCHOR(`current_item()`,`Current`)
function Current (Men : Menu) return Item;
-- AKA

```

```

pragma Inline (Current);

-- ANCHOR(`set_top_row()`,`Set_Top_Row`)
procedure Set_Top_Row (Men : in Menu;
                      Line : in Line_Position);
-- AKA
pragma Inline (Set_Top_Row);

-- ANCHOR(`top_row()`,`Top_Row`)
function Top_Row (Men : Menu) return Line_Position;
-- AKA
pragma Inline (Top_Row);

-- ANCHOR(`item_index()`,`Get_Index`)
function Get_Index (Itm : Item) return Positive;
-- AKA
-- Please note that in this binding we start the numbering of items
-- with 1. So this is number is one more than you get from the low
-- level call.
pragma Inline (Get_Index);

-- MANPAGE(`menu_post.3x`)

-- ANCHOR(`post_menu()`,`Post`)
procedure Post (Men : in Menu;
               Post : in Boolean := True);
-- AKA
-- ALIAS(`unpost_menu()`)
pragma Inline (Post);

-- MANPAGE(`menu_opts.3x`)

-- ANCHOR(`set_menu_opts()`,`Set_Options`)
procedure Set_Options (Men : in Menu;
                      Options : in Menu_Option_Set);
-- AKA
pragma Inline (Set_Options);

-- ANCHOR(`menu_opts_on()`,`Switch_Options`)
procedure Switch_Options (Men : in Menu;
                          Options : in Menu_Option_Set;
                          On : Boolean := True);
-- AKA
-- ALIAS(`menu_opts_off()`)
pragma Inline (Switch_Options);

-- ANCHOR(`menu_opts()`,`Get_Options`)
procedure Get_Options (Men : in Menu;

```

```

        Options : out Menu_Option_Set);
-- AKA

-- ANCHOR(`menu_opts()`,`Get_Options`)
function Get_Options (Men : Menu := Null_Menu) return Menu_Option_Set;
-- AKA
pragma Inline (Get_Options);

-- MANPAGE(`menu_win.3x`)

-- ANCHOR(`set_menu_win()`,`Set_Window`)
procedure Set_Window (Men : in Menu;

    Win : in Window);
-- AKA
pragma Inline (Set_Window);

-- ANCHOR(`menu_win()`,`Get_Window`)
function Get_Window (Men : Menu) return Window;
-- AKA
pragma Inline (Get_Window);

-- ANCHOR(`set_menu_sub()`,`Set_Sub_Window`)
procedure Set_Sub_Window (Men : in Menu;

    Win : in Window);
-- AKA
pragma Inline (Set_Sub_Window);

-- ANCHOR(`menu_sub()`,`Get_Sub_Window`)
function Get_Sub_Window (Men : Menu) return Window;
-- AKA
pragma Inline (Get_Sub_Window);

-- ANCHOR(`scale_menu()`,`Scale`)
procedure Scale (Men : in Menu;

    Lines : out Line_Count;
    Columns : out Column_Count);
-- AKA
pragma Inline (Scale);

-- MANPAGE(`menu_cursor.3x`)

-- ANCHOR(`pos_menu_cursor()`,`Position_Cursor`)
procedure Position_Cursor (Men : Menu);
-- AKA
pragma Inline (Position_Cursor);

-- MANPAGE(`menu_mark.3x`)

```



```

-- ANCHOR(`set_menu_mark()`,`Set_Mark`)
procedure Set_Mark (Men : in Menu;
                   Mark : in String);
-- AKA
pragma Inline (Set_Mark);

-- ANCHOR(`menu_mark()`,`Mark`)
procedure Mark (Men : in Menu;
               Mark : out String);
-- AKA

function Mark (Men : Menu) return String;
-- AKA
-- Implemented as function
pragma Inline (Mark);

-- MANPAGE(`menu_attributes.3x`)

-- ANCHOR(`set_menu_fore()`,`Set_Foreground`)
procedure Set_Foreground
(Men : in Menu;
 Fore : in Character_Attribute_Set := Normal_Video;
 Color : in Color_Pair := Color_Pair'First);
-- AKA
pragma Inline (Set_Foreground);

-- ANCHOR(`menu_fore()`,`Foreground`)
procedure Foreground (Men : in Menu;
                     Fore : out Character_Attribute_Set);
-- AKA

-- ANCHOR(`menu_fore()`,`Foreground`)
procedure Foreground (Men : in Menu;
                     Fore : out Character_Attribute_Set;
                     Color : out Color_Pair);
-- AKA
pragma Inline (Foreground);

-- ANCHOR(`set_menu_back()`,`Set_Background`)
procedure Set_Background
(Men : in Menu;
 Back : in Character_Attribute_Set := Normal_Video;
 Color : in Color_Pair := Color_Pair'First);
-- AKA
pragma Inline (Set_Background);

-- ANCHOR(`menu_back()`,`Background`)

```

```

procedure Background (Men : in Menu;
    Back : out Character_Attribute_Set);
-- AKA
-- ANCHOR(`menu_back()`,`Background`)

procedure Background (Men : in Menu;
    Back : out Character_Attribute_Set;
    Color : out Color_Pair);
-- AKA
pragma Inline (Background);

-- ANCHOR(`set_menu_grey()`,`Set_Grey`)
procedure Set_Grey
(Men : in Menu;
    Grey : in Character_Attribute_Set := Normal_Video;
    Color : in Color_Pair := Color_Pair'First);
-- AKA
pragma Inline (Set_Grey);

-- ANCHOR(`menu_grey()`,`Grey`)
procedure Grey (Men
: in Menu;
    Grey : out Character_Attribute_Set);
-- AKA

-- ANCHOR(`menu_grey()`,`Grey`)
procedure Grey
(Men : in Menu;
    Grey : out Character_Attribute_Set;
    Color : out Color_Pair);
-- AKA
pragma Inline (Grey);

-- ANCHOR(`set_menu_pad()`,`Set_Pad_Character`)
procedure Set_Pad_Character (Men : in Menu;
    Pad : in Character := Space);
-- AKA
pragma Inline (Set_Pad_Character);

-- ANCHOR(`menu_pad()`,`Pad_Character`)
procedure Pad_Character (Men : in Menu;
    Pad : out Character);
-- AKA
pragma Inline (Pad_Character);

-- MANPAGE(`menu_spacing.3x`)

-- ANCHOR(`set_menu_spacing()`,`Set_Spacing`)

```

```

procedure Set_Spacing (Men : in Menu;
    Descr : in Column_Position := 0;
    Row : in Line_Position := 0;
    Col : in Column_Position := 0);
-- AKA
pragma Inline
(Set_Spacing);

-- ANCHOR(`menu_spacing()`,`Spacing`)
procedure Spacing (Men : in Menu;
    Descr : out Column_Position;
    Row : out Line_Position;
    Col : out Column_Position);
-- AKA
pragma Inline (Spacing);

-- MANPAGE(`menu_pattern.3x`)

-- ANCHOR(`set_menu_pattern()`,`Set_Pattern`)
function Set_Pattern (Men : Menu;
    Text : String) return Boolean;
-- AKA
-- Return TRUE if the pattern matches, FALSE otherwise
pragma Inline (Set_Pattern);

-- ANCHOR(`menu_pattern()`,`Pattern`)
procedure Pattern (Men : in Menu;
    Text : out String);
-- AKA
pragma Inline (Pattern);

-- MANPAGE(`menu_format.3x`)

-- ANCHOR(`set_menu_format()`,`Set_Format`)
procedure Set_Format (Men : in Menu;
    Lines : in Line_Count;
    Columns : in Column_Count);
-- Not implemented: 0 argument
for Lines or Columns;
-- instead use Format to get the current sizes
-- The default format is 16 rows, 1 column. Calling
-- set_menu_format with a null menu pointer will change this
-- default. A zero row or column argument to set_menu_format
-- is interpreted as a request not to change the current
-- value.
-- AKA
pragma Inline (Set_Format);

```

```

-- ANCHOR(`menu_format()`,`Format`)
procedure Format (Men    : in Menu;
                 Lines  : out Line_Count;
                 Columns : out Column_Count);
-- AKA
pragma Inline (Format);

-- MANPAGE(`menu_hook.3x`)

type Menu_Hook_Function is access procedure (Men : in Menu);
pragma Convention (C, Menu_Hook_Function);

-- ANCHOR(`set_item_init()`,`Set_Item_Init_Hook`)
procedure Set_Item_Init_Hook (Men : in Menu;
                              Proc : in Menu_Hook_Function);
-- AKA
pragma Inline (Set_Item_Init_Hook);

-- ANCHOR(`set_item_term()`,`Set_Item_Term_Hook`)
procedure Set_Item_Term_Hook (Men : in Menu;
                              Proc : in Menu_Hook_Function);
-- AKA
pragma Inline (Set_Item_Term_Hook);

-- ANCHOR(`set_menu_init()`,`Set_Menu_Init_Hook`)
procedure Set_Menu_Init_Hook (Men : in Menu;
                              Proc : in Menu_Hook_Function);
-- AKA
pragma Inline (Set_Menu_Init_Hook);

-- ANCHOR(`set_menu_term()`,`Set_Menu_Term_Hook`)
procedure Set_Menu_Term_Hook (Men : in Menu;
                              Proc : in Menu_Hook_Function);
-- AKA
pragma Inline (Set_Menu_Term_Hook);

-- ANCHOR(`item_init()`,`Get_Item_Init_Hook`)
function Get_Item_Init_Hook (Men : Menu) return Menu_Hook_Function;
-- AKA
pragma Inline (Get_Item_Init_Hook);

-- ANCHOR(`item_term()`,`Get_Item_Term_Hook`)
function Get_Item_Term_Hook (Men : Menu) return Menu_Hook_Function;
-- AKA
pragma Inline (Get_Item_Term_Hook);

-- ANCHOR(`menu_init()`,`Get_Menu_Init_Hook`)

```

```

function Get_Menu_Init_Hook (Men : Menu) return Menu_Hook_Function;
-- AKA
pragma Inline (Get_Menu_Init_Hook);

-- ANCHOR(`menu_term()`,`Get_Menu_Term_Hook`)
function Get_Menu_Term_Hook (Men : Menu) return Menu_Hook_Function;
-- AKA
pragma Inline (Get_Menu_Term_Hook);

-- MANPAGE(`menu_items.3x`)

-- ANCHOR(`set_menu_items()`,`Redefine`)
procedure Redefine (Men : in Menu;
                   Items : in Item_Array_Access);
-- AKA
pragma Inline (Redefine);

procedure Set_Items (Men : in Menu;
                    Items : in Item_Array_Access) renames Redefine;
-- pragma Inline (Set_Items);

-- ANCHOR(`menu_items()`,`Items`)
function Items (Men : Menu;
               Index : Positive) return Item;
-- AKA
pragma Inline (Items);

-- ANCHOR(`item_count()`,`Item_Count`)
function Item_Count (Men : Menu) return Natural;
-- AKA
pragma Inline (Item_Count);

-- MANPAGE(`menu_new.3x`)

-- ANCHOR(`new_menu()`,`Create`)
function Create (Items : Item_Array_Access) return Menu;
-- AKA
-- Not inlined

function New_Menu (Items : Item_Array_Access) return Menu renames Create;

-- ANCHOR(`free_menu()`,`Delete`)
procedure Delete (Men : in out Menu);
-- AKA
-- Reset Men to Null_Menu
-- Not inlined

-- MANPAGE(`menu_driver.3x`)

```

```

type Driver_Result is (Menu_Ok,
    Request_Denied,
    Unknown_Request,
    No_Match);

-- ANCHOR(`menu_driver()`,`Driver`)
function Driver (Men : Menu;
    Key : Key_Code) return Driver_Result;
-- AKA
-- Driver is not inlined

-- ANCHOR(`menu_requestname.3x`)
-- Not Implemented: menu_request_name, menu_request_by_name
-----
private
type Item is new System.Storage_Elements.Integer_Address;
type Menu is
new System.Storage_Elements.Integer_Address;

Null_Item : constant Item := 0;
Null_Menu : constant Menu := 0;

end Terminal_Interface.Curses.Menus;

```

Found in path(s):

```

* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/Ada95/gen/terminal_interface-
curses-menus.ads.m4

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archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/ncurses/tinfo/lib\_print.c  
\* /opt/cola/permits/1600019816\_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-  
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/test/testscanw.c  
\* /opt/cola/permits/1600019816\_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-  
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/test/testaddch.c

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archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/ncurses/widechar/lib\_inwstr.c  
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\* @Id: form\_field\_new.3x,v 1.16 2007/06/02 20:40:07 tom Exp @

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archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-  
5.7/doc/html/man/form\_field\_new.3x.html



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```
# vile:awkmode
```

```
BEGIN {
    print "/******"
    print " * Copyright (c) 1998-2007,2008 Free Software Foundation, Inc.      *"
    print " *                                                                 *"
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    print " * distribute, distribute with modifications, sublicense, and/or sell     *"
    print " * copies of the Software, and to permit persons to whom the Software is  *"
    print " * furnished to do so, subject to the following conditions:
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    print " * sale, use or other dealings in this Software without prior written      *"
    print " * authorization.                                                            *"
    print " /******/"
    print ""
    print "/******/"
    print "/* Author: Zeyd M. Ben-Halim <zmbenhal@netcom.com> 1992,1995          */"
    print "/* and: Eric S. Raymond <esr@snark.thyrsus.com>                        */"
    print "/* and: Thomas E. Dickey          1995-on                               */"

    print "/******/"
    print ""
    print "/* $Id: MKterm.h.awk.in,v 1.50 2008/05/24 23:13:59 tom Exp $ */"
    print ""
    print "/*"
    print "*** term.h -- Definition of struct term"
    print "*/"
```

```

print ""
print "#ifndef NCURSES_TERM_H_incl"
print "#define NCURSES_TERM_H_incl 1"
print ""
print "#undef NCURSES_VERSION"
print "#define NCURSES_VERSION \"@NCURSES_MAJOR@.@NCURSES_MINOR@\""
print ""
print "#include <ncurses_dll.h>"
print ""
print "#ifdef __cplusplus"
print "extern \"C\" {"
print "#endif"
print ""
print "/* Make this file self-contained by providing defaults for the HAVE_TERMIO[S]_H"
print " * definition (based on the system for which this was configured)."
print " */"
print ""
print "#undef NCURSES_CONST"
print "#define NCURSES_CONST @NCURSES_CONST@"

print ""
print "#undef NCURSES_SBOOL"
print "#define NCURSES_SBOOL @NCURSES_SBOOL@"
print ""
print "#undef NCURSES_XNAMES"
print "#define NCURSES_XNAMES @NCURSES_XNAMES@"
print ""
print "/* We will use these symbols to hide differences between"
print " * terminos/termio/sgttyb interfaces."
print " */"
print "#undef TTY"
print "#undef SET_TTY"
print "#undef GET_TTY"
print ""
print "/* Assume POSIX termio if we have the header and function */"
print "/* #if HAVE_TERMIOS_H && HAVE_TCGETATTR */"
print "#if @HAVE_TERMIOS_H@ && @HAVE_TCGETATTR@"
print ""
print "#undef TERMIOS"
print "#define TERMIOS 1"
print ""
print "#include <termios.h>"
print "#define TTY struct termios"
print ""
print "#else /* !HAVE_TERMIOS_H */"
print ""
print "/* #if HAVE_TERMIO_H */"
print "#if @HAVE_TERMIO_H@"

```

```

print ""
print "#undef TERMIO"
print "#define TERMIO 1"
print ""
print "#include <termio.h>"
print "#define TTY struct termio"
print ""
print "/* Add definitions to make termio look like termios."
print " * But ifdef it, since there are some implementations"
print " * that try to do this for us in a fake <termio.h>."
print " */"
print "#ifndef TCSANOW"
print "#define TCSANOW TCSETA"
print "#endif"
print "#ifndef TCSADRAIN"
print "#define TCSADRAIN TCSETAW"
print "#endif"
print "#ifndef TCSAFLUSH"
print "#define TCSAFLUSH TCSETAF"
print "#endif"
print "#ifndef tcsetattr"
print "#define tcsetattr(fd, cmd, arg) ioctl(fd, cmd, arg)"
print "#endif"
print "#ifndef tcgetattr"
print "#define tcgetattr(fd, arg) ioctl(fd, TCGETA, arg)"
print "#endif"
print "#ifndef cfgetospeed"
print "#define cfgetospeed(t)
((t)->c_cflag & CBAUD)"
print "#endif"
print "#ifndef TCIFLUSH "
print "#define TCIFLUSH 0"
print "#endif"
print "#ifndef TCOFLUSH "
print "#define TCOFLUSH 1"
print "#endif"
print "#ifndef TCIOFLUSH "
print "#define TCIOFLUSH 2"
print "#endif"
print "#ifndef tcflush"
print "#define tcflush(fd, arg) ioctl(fd, TCFLSH, arg)"
print "#endif"
print ""
print "#else /* !HAVE_TERMIO_H */"
print ""
print "#undef TERMIO"
print "#include <sgtty.h>"

```

```

print "#include <sys/ioctl.h>"
print "#define TTY struct sgtyb"
print ""
print "#endif /* HAVE_TERMIO_H */"
print ""
print "#endif /* HAVE_TERMIOS_H */"
print ""
print "#ifdef TERMIOS"
print "#define GET_TTY(fd, buf) tcgetattr(fd, buf)"
print "#define SET_TTY(fd, buf) tcsetattr(fd, TCSADRAIN, buf)"
print "#else"
print "#define GET_TTY(fd,
buf) gtty(fd, buf)"
print "#define SET_TTY(fd, buf) stty(fd, buf)"
print "#endif"
print ""
print "#define NAMESIZE 256"
print ""
print "#define CUR cur_term->type."
print ""
}

```

```
$2 == "%%-STOP-HERE-%%" {
```

```

print ""
printf "#define BOOLWRITE %d\n", BoolCount
printf "#define NUMWRITE %d\n", NumberCount
printf "#define STRWRITE %d\n", StringCount
print ""
print "/* older synonyms for some capabilities */"
print "#define beehive_glitch no_esc_ctlc"
print "#define teleray_glitch dest_tabs_magic_smso"
print "#define micro_char_size micro_col_size"
print ""
print "#ifdef __INTERNAL_CAPS_VISIBLE"
}

```

```
/^#/ {next;}
```

```
$1 == "acs_chars" {acsindex = StringCount}
```

```
$3 == "bool" {
printf "#define %-30s CUR Booleans[%d]\n", $1, BoolCount++
}

```

```
$3 == "num" {
printf "#define %-30s CUR Numbers[%d]\n", $1, NumberCount++
}

```

```

$3 == "str" {
    printf "#define %-30s CUR Strings[%d]\n", $1, StringCount++
}

END {
    print
    "#endif /* __INTERNAL_CAPS_VISIBLE */"
    print ""
    print ""
    print "/*"
    print " * Predefined terminfo array sizes"
    print " */"
    printf "#define BOOLCOUNT %d\n", BoolCount
    printf "#define NUMCOUNT %d\n", NumberCount
    printf "#define STRCOUNT %d\n", StringCount
    print ""
    print "/* used by code for comparing entries */"
    print "#define acs_chars_index ", acsindex
    print ""
    print "typedef struct termtype { /* in-core form of terminfo data */"
    print "  char *term_names; /* str_table offset of term names */"
    print "  char *str_table; /* pointer to string table */"
    print "  NCURSES_SBOOL *Booleans; /* array of boolean values */"
    print "  short *Numbers; /* array of integer values */"
    print "  char **Strings; /* array of string offsets */"
    print ""
    print "#if NCURSES_XNAMES"
    print "  char *ext_str_table; /* pointer to extended string table */"
    print "  char **ext_Names; /*
corresponding names */"
    print ""
    print "  unsigned short num_Booleans; /* count total Booleans */"
    print "  unsigned short num_Numbers; /* count total Numbers */"
    print "  unsigned short num_Strings; /* count total Strings */"
    print ""
    print "  unsigned short ext_Booleans; /* count extensions to Booleans */"
    print "  unsigned short ext_Numbers; /* count extensions to Numbers */"
    print "  unsigned short ext_Strings; /* count extensions to Strings */"
    print "#endif /* NCURSES_XNAMES */"
    print ""
    print "} TERMTYPE;"
    print ""
    print "typedef struct term { /* describe an actual terminal */"
    print "  TERMTYPE type; /* terminal type description */"
    print "  short Filedes; /* file description being written to */"
    print "  TTY Ottyb, /* original state of the terminal */"
    print "  Nttyb; /* current state of the terminal */"
    print "  int _baudrate; /* used to compute padding */"

```

```

print " char
* _termname; /* used for termname() */"
print "} TERMINAL;"
print ""
print "#if @BROKEN_LINKER@ || @cf_cv_enable_reentrant@"
print "NCURSES_WRAPPED_VAR(TERMINAL *, cur_term);"
print "NCURSES_WRAPPED_VAR(NCURSES_CONST char * const *, boolnames);"
print "NCURSES_WRAPPED_VAR(NCURSES_CONST char * const *, boolcodes);"
print "NCURSES_WRAPPED_VAR(NCURSES_CONST char * const *, boolfnames);"
print "NCURSES_WRAPPED_VAR(NCURSES_CONST char * const *, numnames);"
print "NCURSES_WRAPPED_VAR(NCURSES_CONST char * const *, numcodes);"
print "NCURSES_WRAPPED_VAR(NCURSES_CONST char * const *, numfnames);"
print "NCURSES_WRAPPED_VAR(NCURSES_CONST char * const *, strnames);"
print "NCURSES_WRAPPED_VAR(NCURSES_CONST char * const *, strcodes);"
print "NCURSES_WRAPPED_VAR(NCURSES_CONST char * const *, strfnames);"
print ""
print "#define cur_term NCURSES_PUBLIC_VAR(cur_term())"
print "#define boolnames NCURSES_PUBLIC_VAR(boolnames())"
print
print "#define boolcodes NCURSES_PUBLIC_VAR(boolcodes())"
print "#define boolfnames NCURSES_PUBLIC_VAR(boolfnames())"
print "#define numnames NCURSES_PUBLIC_VAR(numnames())"
print "#define numcodes NCURSES_PUBLIC_VAR(numcodes())"
print "#define numfnames NCURSES_PUBLIC_VAR(numfnames())"
print "#define strnames NCURSES_PUBLIC_VAR(strnames())"
print "#define strcodes NCURSES_PUBLIC_VAR(strcodes())"
print "#define strfnames NCURSES_PUBLIC_VAR(strfnames())"
print ""
print "#else"
print ""
print "extern NCURSES_EXPORT_VAR(TERMINAL *) cur_term;"
print ""
print "extern NCURSES_EXPORT_VAR(NCURSES_CONST char * const ) boolnames[);"
print "extern NCURSES_EXPORT_VAR(NCURSES_CONST char * const ) boolcodes[);"
print "extern NCURSES_EXPORT_VAR(NCURSES_CONST char * const ) boolfnames[);"
print "extern NCURSES_EXPORT_VAR(NCURSES_CONST char * const ) numnames[);"
print "extern NCURSES_EXPORT_VAR(NCURSES_CONST char *
const ) numcodes[);"
print "extern NCURSES_EXPORT_VAR(NCURSES_CONST char * const ) numfnames[);"
print "extern NCURSES_EXPORT_VAR(NCURSES_CONST char * const ) strnames[);"
print "extern NCURSES_EXPORT_VAR(NCURSES_CONST char * const ) strcodes[);"
print "extern NCURSES_EXPORT_VAR(NCURSES_CONST char * const ) strfnames[);"
print ""
print "#endif"
print ""
print "/* internals */"
print "extern NCURSES_EXPORT(int) _nc_set_tty_mode (TTY *buf);"
print "extern NCURSES_EXPORT(int) _nc_get_tty_mode (TTY *buf);"

```

```

print "extern NCURSES_EXPORT(int) _nc_read_entry (const char * const, char * const, TERMTYPE *const);"
print "extern NCURSES_EXPORT(int) _nc_read_file_entry (const char *const, TERMTYPE *);"
print "extern NCURSES_EXPORT(int) _nc_read_termtype (TERMTYPE *, char *, int);"
print "extern NCURSES_EXPORT(char *) _nc_first_name (const char *const);"
print "extern NCURSES_EXPORT(int) _nc_name_match (const char *const, const char *const,
const char *const);"
print "extern NCURSES_EXPORT(const TERMTYPE *) _nc_fallback (const char *);"
print ""
print "/* entry points */"
print "extern NCURSES_EXPORT(TERMINAL *) set_curterm (TERMINAL *);"
print "extern NCURSES_EXPORT(int) del_curterm (TERMINAL *);"
print ""
print "/* miscellaneous entry points */"
print "extern NCURSES_EXPORT(int) restartterm (NCURSES_CONST char *, int, int *);"
print "extern NCURSES_EXPORT(int) setupterm (NCURSES_CONST char *,int,int *);"
print ""
print "/* terminfo entry points, also declared in curses.h */"
print "#if !defined(__NCURSES_H)"
print "extern NCURSES_EXPORT(char *) tigetstr (NCURSES_CONST char *);"
print "extern NCURSES_EXPORT_VAR(char) ttytype[);"
print "extern NCURSES_EXPORT(int) putp (const char *);"
print "extern NCURSES_EXPORT(int) tigetflag (NCURSES_CONST char *);"
print "extern NCURSES_EXPORT(int) tigetnum (NCURSES_CONST char *);"
print ""
print "#if @NCURSES_TPARAM_VARARGS@
/* NCURSES_TPARAM_VARARGS */"
print "extern NCURSES_EXPORT(char *) tparm (NCURSES_CONST char *, ...); /* special */"
print "#else"
print "extern NCURSES_EXPORT(char *) tparm (NCURSES_CONST char *,
long,long,long,long,long,long,long,long); /* special */"
print "extern NCURSES_EXPORT(char *) tparm_varargs (NCURSES_CONST char *, ...); /* special */"
print "#endif"
print ""
print "#endif /* __NCURSES_H */"
print ""
print "/* termcap database emulation (XPG4 uses const only for 2nd param of tgetent) */"
print "#if !defined(NCURSES_TERMCAP_H_incl)"
print "extern NCURSES_EXPORT(char *) tgetstr (NCURSES_CONST char *, char **);"
print "extern NCURSES_EXPORT(char *) tgoto (const char *, int, int);"
print "extern NCURSES_EXPORT(int) tgetent (char *, const char *);"
print "extern NCURSES_EXPORT(int) tgetflag (NCURSES_CONST char *);"
print "extern NCURSES_EXPORT(int) tgetnum (NCURSES_CONST char *);"
print "extern
NCURSES_EXPORT(int) tputs (const char *, int, int (*)(int));"
print "#endif /* NCURSES_TERMCAP_H_incl */"
print ""
print "#ifdef __cplusplus"
print "}"

```

```
print "#endif"
print ""
print "#endif /* NCURSES_TERM_H_incl */"
}
```

Found in path(s):

```
* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/include/MKterm.h.awk.in
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-----
-- $Id: README,v 1.2 2006/04/22 22:19:37 tom Exp $
-----
```

The files in this directory (trace) support both the terminfo and ncurses libraries. Most of the functions are linked in only when the libraries are compiled with TRACE defined.

Found in path(s):

```
* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
```



archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/ncurses/trace/README  
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*****
* @Id: menu_userptr.3x,v 1.8 2006/11/04 18:21:03 tom Exp @
-->
```

Found in path(s):

```
* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-
5.7/doc/html/man/menu_userptr.3x.html
```

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```
# $Id: modules,v 1.9 2006/12/24 00:53:17 tom Exp $
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#####
#
# Author: Thomas E. Dickey 1995-on
#

```

```

@ base
# Library objects
panel lib $(srcdir) $(PANEL_PRIV_H)
p_above lib $(srcdir) $(PANEL_PRIV_H)
p_below lib $(srcdir) $(PANEL_PRIV_H)
p_bottom lib $(srcdir) $(PANEL_PRIV_H)
p_delete lib $(srcdir) $(PANEL_PRIV_H)
p_hide lib $(srcdir) $(PANEL_PRIV_H)
p_hidden lib $(srcdir) $(PANEL_PRIV_H)
p_move lib $(srcdir) $(PANEL_PRIV_H)
p_new lib $(srcdir) $(PANEL_PRIV_H)
p_replace lib $(srcdir) $(PANEL_PRIV_H)
p_show lib $(srcdir) $(PANEL_PRIV_H)
p_top lib $(srcdir) $(PANEL_PRIV_H)
p_update lib $(srcdir) $(PANEL_PRIV_H)
p_user lib $(srcdir) $(PANEL_PRIV_H)
p_win lib $(srcdir) $(PANEL_PRIV_H)

# vile:makemode

```

Found in path(s):

\* /opt/cola/permits/1600019816\_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/panel/modules

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-- \*- ada -\*--

define(`HTMLNAME',`terminal\_interface-curses-forms-field\_user\_data\_\_ads.htm')dnl

include(M4MACRO)dnl

-----

```
--
--
--          GNAT ncurses Binding
--
--          Terminal_Interface.Curses.Forms.Field_User_Data
--
--          S P E C
--
--
```

-----

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-----

-- Author: Juergen Pfeifer, 1996

-- Version Control:

```

--
$Revision: 1.15 $
-- Binding Version 01.00
-----

generic
type User is limited private;
type User_Access is access User;
package Terminal_Interface.Curses.Forms.Field_User_Data is
pragma Preelaborate (Terminal_Interface.Curses.Forms.Field_User_Data);

-- MANPAGE(`form_field_userptr.3x')

-- ANCHOR(`set_field_userptr',`Set_User_Data')
procedure Set_User_Data (Fld : in Field;
                        Data : in User_Access);
-- AKA
pragma Inline (Set_User_Data);

-- ANCHOR(`field_userptr',`Get_User_Data')
procedure Get_User_Data (Fld : in Field;
                        Data : out User_Access);
-- AKA

-- ANCHOR(`field_userptr',`Get_User_Data')
function Get_User_Data (Fld : in Field) return User_Access;
-- AKA
-- Sama as function
pragma Inline (Get_User_Data);

end Terminal_Interface.Curses.Forms.Field_User_Data;

```

Found in path(s):

```

* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/Ada95/gen/terminal_interface-
curses-forms-field_user_data.ads.m4

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```

```

-----
-- $Id: PROBLEMS,v 1.3 2006/04/22 22:19:37 tom Exp $
-----

```

This is a list of open problems. This mainly lists known missing pieces and design flaws.

1. Testing!!!
2. Better demo program

Found in path(s):

```

* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
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\*\*\*\*\*/

/\*

\* \$Id: makedef.cmd,v 1.5 2006/04/22 23:14:50 tom Exp \$

\*

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\*

\* makedef.cmd - update a DLL export list using a newly created library file

\* in a.out format, plus an old .DEF file.

\*

\* standard output gets a sorted list with all entrypoints with entrycodes.

\* This list, plus a few .def sentences (LIBRARY, DESCRIPTION and EXPORT)

\* is used to build a new .def file.

\*

\* `\_nc\_` symbols are ignored.

\*

\* returns 1 when the old def\_file is corrupted -- that is, export items are

\* not properly formatted.

\*

\* returns 0 if everything went OK.

\*/

parse arg lib\_file def\_file

lib\_file = translate(lib\_file, '\', '/')

def\_file = translate(def\_file, '\', '/')

call CleanQueue

/\*

\* `codes' is the stem that links a

code to every symbol

\* `names' is the stem where symbols are stored sequentially

\* `last' is the index of the last symbol defined

\*/

```

last = 0
used. = 0
codes. = 0
names. = "

tmp_name = 'foo.tmp'

/*
* This sed expression cleans empty lines, comments and special .DEF
* commands, such as LIBRARY..., EXPORTS..., etc
*/
tidy_up = ""/[A-Z]/d;s/[ ]* /g;s/;.*$/g;s/^[ ]*//g;/^[ ]*$ /d""

/*
* First we find all public symbols (functions and variables). Next we
* concatenate this list with the old one, sorting it and wiping out
* all unused data (comments, DLL directives, blanks, etc). All this
* information is pushed into a REXX private list with the RXQUEUE
* utility program.
*/
'@echo off'
'emxexp -u' lib_file '>' tmp_name
'cat' tmp_name def_file '| sed' tidy_up '| sort > foo2.tmp'
'type foo2.tmp | rxqueue'
'del' tmp_name '1>NUL'

/*
* This loop runs over the queue items
*/
do while queued() > 0
/*
* We retrieve the symbol name (NEW_NAME) and its number (NEW_NUMBER)
* When the line comes from `emximp's output, there's no number, so
* we assign it the special value 0.
*/
parse pull new_symbol '@'new_code rest
if Left(new_symbol,1) = "" then
  parse var new_symbol "" new_name "" rest
else
  do
  echo 'Symbol 'new_symbol' was not quoted'
  new_name = new_symbol
  end

if new_code = " then
  new_code = 0
/*
* Here, one would place all smart checks that would kill unused symbols.

```

```

* However, export tables are not that big, so why bothering?
if Left(new_name,4) = '_nc_' then
  iterate
*/
/*
* The algorithm:
* IF (this is the 2nd time the symbol appears) THEN
* (this symbol comes from a .DEF file)
* it has a valid code that we store
* we mark that code as used
* ELIF (it has no number) THEN
* (it's a new symbol)
* we increase the counter of defined symbols
* we assign it the special number 0
* (later on it'll be assigned an
unused export code)
* ELSE
* this symbol was in the old DLL and it's no longer
* here, so we skip it.
*/
select
  when new_name = " then
    'echo Warning: empty symbol found 1>&2'
  when names.last = new_name then
    do
      codes.last = new_code
      used.new_code = 1
    end
  when new_code = 0 then
    do
      last = last + 1
      names.last = new_name
      codes.last = 0
    end
  otherwise
    'echo Warning: symbol "'new_name'" has disappeared 1>&2'
end /* select */
end /* do while queued() */

/*
* Finally we scan the stem, writing out all symbols with export codes.
* Those that did not have a valid one (just 0) are assigned a new one.
*/
new_code = 1
inx = 1
do while inx <= last
  if codes.inx = 0 then
    do

```



```

do while used.new_code \= 0
    new_code = new_code + 1
end
codes.inx = new_code
used.new_code = 1
end
say ' "names.inx" '@codes.inx' NONAME'
inx = inx + 1
end
'del foo2.tmp 1>NUL'
exit 0

/*
* Cleans the REXX queue by pulling and forgetting every line.
* This is needed, at least, when `makedef.cmd' starts, because an aborted
* REXX program might have left some rubbish in.
*/
CleanQueue: procedure
do while queued() > 0
    parse pull foo
end
return

```

Found in path(s):

```
* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/misc/makedef.cmd
```

No license file was found, but licenses were detected in source scan.

```

-- *- ada *-
define(^HTMLNAME',`terminal_interface-curses-trace__ads.htm')dnl
include(M4MACRO)-----
--
--          GNAT ncurses Binding          --
--
--          Terminal_Interface.Curses.Trace          --
--
--          S P E C          --
--
-----
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--
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```

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--
-----
-- Author: Eugene V. Melaragno <aldomel@ix.netcom.com> 2000
-- Version
Control:
-- $Revision: 1.1 $
-- Binding Version 01.00
-----

```

```

package Terminal_Interface.Curses.Trace is
pragma Preelaborate (Terminal_Interface.Curses.Trace);

pragma Warnings (Off);
include(^Trace_Defs')

pragma Warnings (On);

Trace_Disable : constant Trace_Attribute_Set := (others => False);

Trace_Ordinary : constant Trace_Attribute_Set :=
(Times      => True,
 Tputs      => True,
 Update     => True,
 Cursor_Move => True,
 Character_Output => True,
 others     => False);
Trace_Maximum : constant Trace_Attribute_Set := (others => True);

-----

-- MANPAGE(^curs_trace.3x')

```

```

-- ANCHOR(`trace()`,`Trace_on`)
procedure Trace_On (x : Trace_Attribute_Set);
-- The debugging library has trace.

-- ANCHOR(`_tracef()`,`Trace_Put`)
procedure Trace_Put
(str : String);
-- AKA

Current_Trace_Setting : Trace_Attribute_Set;
pragma Import (C, Current_Trace_Setting, "_nc_tracing");

end Terminal_Interface.Curses.Trace;

```

Found in path(s):

```

* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/Ada95/gen/terminal_interface-
curses-trace.ads.m4

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```

```

prior written      *
* authorization.          *
*****/

/*****

* Author: Thomas E. Dickey      2002,2005      *
*****/

/* LINTLIBRARY */

/* ./f_trace.c */

#include "form.priv.h"

#undef _nc_retrace_field_ptr
FIELD **_nc_retrace_field_ptr(
    FIELD **code)
{ return>(*(_FIELD **))0; }

#undef _nc_retrace_field
FIELD *_nc_retrace_field(
    FIELD *code)
{ return>(*(_FIELD **))0; }

#undef _nc_retrace_field_type
FIELDTYPE *_nc_retrace_field_type(
    FIELDTYPE *code)
{ return>(*(_FIELDTYPE **))0; }

#undef _nc_retrace_form
FORM *_nc_retrace_form(
    FORM *code)
{ return>(*(_FORM **))0; }

#undef _nc_retrace_form_hook
Form_Hook _nc_retrace_form_hook(
    Form_Hook code)
{ return>(*(_Form_Hook *))0; }

/*
./fld_arg.c */

#undef set_fieldtype_arg
int set_fieldtype_arg(
    FIELDTYPE *typ,
    void *(*const make_arg)(
        va_list *p1),
    void *(*const copy_arg)(
        const void *p1),

```

```

void (*const free_arg)(
void *p1)
{ return(*(int *)0); }

#undef field_arg
void *field_arg(
const FIELD *field)
{ return(*(void **)0); }

/* ./fld_attr.c */

#undef set_field_fore
int set_field_fore(
FIELD *field,
ctype attr)
{ return(*(int *)0); }

#undef field_fore
ctype field_fore(
const FIELD *field)
{ return(*(ctype *)0); }

#undef set_field_back
int set_field_back(
FIELD *field,
ctype attr)
{ return(*(int *)0); }

#undef field_back
ctype field_back(
const FIELD *field)
{ return(*(ctype *)0); }

/* ./fld_current.c */

#undef set_current_field
int set_current_field(
FORM *form,
FIELD *field)
{ return(*(int *)0); }

#undef current_field
FIELD *current_field(
const FORM *form)
{ return(*(FIELD **)0); }

#undef field_index
int field_index(

```

```

const FIELD *field)
{
return(*(int *)0); }

/* ./fld_def.c */

#undef _nc_Default_Field
FIELD *_nc_Default_Field;

#undef _nc_Make_Argument
TypeArgument *_nc_Make_Argument(
const FIELDTYPE *typ,
va_list *ap,
int *err)
{ return(*(TypeArgument **)0); }

#undef _nc_Copy_Argument
TypeArgument *_nc_Copy_Argument(
const FIELDTYPE *typ,
const TypeArgument *argp,
int *err)
{ return(*(TypeArgument **)0); }

#undef _nc_Free_Argument
void _nc_Free_Argument(
const FIELDTYPE *typ,
TypeArgument *argp)
{ /* void */ }

#undef _nc_Copy_Type
NCURSES_BOOL _nc_Copy_Type(
FIELD *dst,
FIELD const *src)
{ return(*(NCURSES_BOOL *)0); }

#undef _nc_Free_Type
void _nc_Free_Type(
FIELD *field)
{ /* void */ }

#undef new_field
FIELD *new_field(
int rows,
int cols,
int frow,
int fcol,
int nrow,
int nbuf)

```

```

    { return(*(FIELD **))0); }

#undef free_field
int free_field(
    FIELD *field)
    { return(*(int *)0); }

/* ./fld_dup.c */

#undef dup_field
FIELD *dup_field(
    FIELD *field,
    int frow,

    int fcol)
    { return(*(FIELD **))0); }

/* ./fld_ftchoice.c */

#undef set_fieldtype_choice
int set_fieldtype_choice(
    FIELDTYPE *typ,
    NCURSES_BOOL (*const next_choice)(
    FIELD *p1,
    const void *p2),
    NCURSES_BOOL (*const prev_choice)(
    FIELD *p1,
    const void *p2))
    { return(*(int *)0); }

/* ./fld_ftlink.c */

#undef link_fieldtype
FIELDTYPE *link_fieldtype(
    FIELDTYPE *type1,
    FIELDTYPE *type2)
    { return(*(FIELDTYPE **))0); }

/* ./fld_info.c */

#undef field_info
int field_info(
    const FIELD *field,
    int *rows,
    int *cols,
    int *frow,
    int *fcol,
    int *nrow,

```

```

int *nbuf)
{ return(*(int *)0); }

#undef dynamic_field_info
int dynamic_field_info(
    const FIELD *field,
    int *drows,
    int *dcols,
    int *maxgrow)
{ return(*(int *)0); }

/* ./fld_just.c */

#undef set_field_just
int set_field_just(
    FIELD *field,
    int just)
{ return(*(int *)0); }

#undef field_just
int field_just(
    const FIELD *field)
{ return(*(int *)0); }

/* ./fld_link.c
*/

#undef link_field
FIELD *link_field(
    FIELD *field,
    int frow,
    int fcol)
{ return(*(FIELD **)0); }

/* ./fld_max.c */

#undef set_max_field
int set_max_field(
    FIELD *field,
    int maxgrow)
{ return(*(int *)0); }

/* ./fld_move.c */

#undef move_field
int move_field(
    FIELD *field,
    int frow,

```



```

int fcol)
{ return(*(int *)0); }

/* ./fld_newftyp.c */

#undef _nc_Default_FieldType
const FIELDTYPE *_nc_Default_FieldType = {0};

#undef new_fieldtype
FIELDTYPE *new_fieldtype(
    NCURSES_BOOL (*const field_check)(
        FIELD *p1,
        const void *p2),
    NCURSES_BOOL (*const char_check)(
        int p1,
        const void *p2))
{ return(*(FIELDTYPE **)0); }

#undef free_fieldtype
int free_fieldtype(
    FIELDTYPE *typ)
{ return(*(int *)0); }

/* ./fld_opts.c */

#undef set_field_opts
int set_field_opts(
    FIELD *field,
    Field_Options opts)
{ return(*(int *)0); }

#undef field_opts
Field_Options field_opts(
    const FIELD *field)
{ return(*(Field_Options *)0); }

#undef field_opts_on
int field_opts_on(
    FIELD *field,

    Field_Options opts)
{ return(*(int *)0); }

#undef field_opts_off
int field_opts_off(
    FIELD *field,
    Field_Options opts)
{ return(*(int *)0); }

```

```

/* ./fld_pad.c */

#undef set_field_pad
int set_field_pad(
    FIELD *field,
    int ch)
    { return(*(int *)0); }

#undef field_pad
int field_pad(
    const FIELD *field)
    { return(*(int *)0); }

/* ./fld_page.c */

#undef set_new_page
int set_new_page(
    FIELD *field,
    NCURSES_BOOL new_page_flag)
    { return(*(int *)0); }

#undef new_page
NCURSES_BOOL new_page(
    const FIELD *field)
    { return(*(NCURSES_BOOL *)0); }

/* ./fld_stat.c */

#undef set_field_status
int set_field_status(
    FIELD *field,
    NCURSES_BOOL status)
    { return(*(int *)0); }

#undef field_status
NCURSES_BOOL field_status(
    const FIELD *field)
    { return(*(NCURSES_BOOL *)0); }

/* ./fld_type.c */

#undef set_field_type
int set_field_type(
    FIELD *field,
    FIELDTYPE *type,
    ...)
    { return(*(int *)0); }

```

```

#undef field_type
FIELDTYPE
*field_type(
    const FIELD *field)
    { return(*(FIELDTYPE ***)0); }

/* ./fld_user.c */

#undef set_field_usrptr
int set_field_usrptr(
    FIELD *field,
    void *usrptr)
    { return(*(int *)0); }

#undef field_usrptr
void *field_usrptr(
    const FIELD *field)
    { return(*(void ***)0); }

/* ./frm_cursor.c */

#undef pos_form_cursor
int pos_form_cursor(
    FORM *form)
    { return(*(int *)0); }

/* ./frm_data.c */

#undef data_behind
NCURSES_BOOL data_behind(
    const FORM *form)
    { return(*(NCURSES_BOOL *)0); }

#undef data_ahead
NCURSES_BOOL data_ahead(
    const FORM *form)
    { return(*(NCURSES_BOOL *)0); }

/* ./frm_def.c */

#undef _nc_Default_Form
FORM *_nc_Default_Form;

#undef new_form
FORM *new_form(
    FIELD **fields)
    { return(*(FORM ***)0); }

```

```

#undef free_form
int free_form(
    FORM *form)
    { return(*(int *)0); }

#undef set_form_fields
int set_form_fields(
    FORM *form,
    FIELD **fields)
    { return(*(int *)0); }

#undef form_fields
FIELD **form_fields(
    const FORM
    *form)
    { return(*(FIELD ***)0); }

#undef field_count
int field_count(
    const FORM *form)
    { return(*(int *)0); }

/* ./frm_driver.c */

#undef _nc_Position_Form_Cursor
int _nc_Position_Form_Cursor(
    FORM *form)
    { return(*(int *)0); }

#undef _nc_Refresh_Current_Field
int _nc_Refresh_Current_Field(
    FORM *form)
    { return(*(int *)0); }

#undef _nc_Synchronize_Attributes
int _nc_Synchronize_Attributes(
    FIELD *field)
    { return(*(int *)0); }

#undef _nc_Synchronize_Options
int _nc_Synchronize_Options(
    FIELD *field,
    Field_Options newopts)
    { return(*(int *)0); }

#undef _nc_Set_Current_Field
int _nc_Set_Current_Field(

```

```

FORM *form,
FIELD *newfield)
{ return(*(int *)0); }

#undef _nc_Internal_Validation
NCURSES_BOOL _nc_Internal_Validation(
    FORM *form)
{ return(*(NCURSES_BOOL *)0); }

#undef _nc_First_Active_Field
FIELD *_nc_First_Active_Field(
    FORM *form)
{ return(*(FIELD **)0); }

#undef _nc_Set_Form_Page
int _nc_Set_Form_Page(
    FORM *form,
    int page,
    FIELD *field)
{
    return(*(int *)0); }

typedef struct
{
    int keycode;
    int (*cmd) (FORM *);
}
Binding_Info;

#undef form_driver
int form_driver(
    FORM *form,
    int c)
{ return(*(int *)0); }

#undef set_field_buffer
int set_field_buffer(
    FIELD *field,
    int buffer,
    const char *value)
{ return(*(int *)0); }

#undef field_buffer
char *field_buffer(
    const FIELD *field,
    int buffer)
{ return(*(char **)0); }

```

```
#undef _nc_Widen_String
wchar_t *_nc_Widen_String(
    char *source,
    int *lengthp)
    { return(*(wchar_t **)0); }

/* ./frm_hook.c */

#undef set_field_init
int set_field_init(
    FORM *form,
    Form_Hook func)
    { return(*(int *)0); }

#undef field_init
Form_Hook field_init(
    const FORM *form)
    { return(*(Form_Hook *)0); }

#undef set_field_term
int set_field_term(
    FORM *form,
    Form_Hook func)
    { return(*(int *)0); }

#undef field_term
Form_Hook field_term(
    const FORM *form)
    { return(*(Form_Hook *)0); }

#undef set_form_init
int set_form_init(
    FORM *form,

    Form_Hook func)
    { return(*(int *)0); }

#undef form_init
Form_Hook form_init(
    const FORM *form)
    { return(*(Form_Hook *)0); }

#undef set_form_term
int set_form_term(
    FORM *form,
    Form_Hook func)
    { return(*(int *)0); }
```

```

#undef form_term
Form_Hook form_term(
    const FORM *form)
    { return(*(Form_Hook *)0); }

/* ./frm_opts.c */

#undef set_form_opts
int set_form_opts(
    FORM *form,
    Form_Options opts)
    { return(*(int *)0); }

#undef form_opts
Form_Options form_opts(
    const FORM *form)
    { return(*(Form_Options *)0); }

#undef form_opts_on
int form_opts_on(
    FORM *form,
    Form_Options opts)
    { return(*(int *)0); }

#undef form_opts_off
int form_opts_off(
    FORM *form,
    Form_Options opts)
    { return(*(int *)0); }

/* ./frm_page.c */

#undef set_form_page
int set_form_page(
    FORM *form,
    int page)
    { return(*(int *)0); }

#undef form_page
int form_page(
    const FORM *form)
    { return(*(int *)0); }

/* ./frm_post.c */

#undef post_form
int post_form(
    FORM *form)

```

```

{
return(*(int *)0); }

#undef unpost_form
int unpost_form(
    FORM *form)
{ return(*(int *)0); }

/* ./frm_req_name.c */

#undef form_request_name
const char *form_request_name(
    int request)
{ return(*(const char **)0); }

#undef form_request_by_name
int form_request_by_name(
    const char *str)
{ return(*(int *)0); }

/* ./frm_scale.c */

#undef scale_form
int scale_form(
    const FORM *form,
    int *rows,
    int *cols)
{ return(*(int *)0); }

/* ./frm_sub.c */

#undef set_form_sub
int set_form_sub(
    FORM *form,
    WINDOW *win)
{ return(*(int *)0); }

#undef form_sub
WINDOW *form_sub(
    const FORM *form)
{ return(*(WINDOW **)0); }

/* ./frm_user.c */

#undef set_form_userptr
int set_form_userptr(
    FORM *form,
    void *usrptr)

```



```

    { return(*(int *)0); }

#undef form_userptr
void *form_userptr(
    const FORM *form)
    { return(*(void **)0); }

/* ./frm_win.c */

#undef set_form_win
int set_form_win(
    FORM *form,
    WINDOW *win)
    { return(*(int *)0); }

#undef form_win
WINDOW *form_win(
    const
    FORM *form)
    { return(*(WINDOW **)0); }

/* ./fty_alnum.c */

typedef struct
{
    int width;
}
alnumARG;

#undef TYPE_ALNUM
FIELDTYPE *TYPE_ALNUM;

/* ./fty_alpha.c */

typedef struct
{
    int width;
}
alphaARG;

#undef TYPE_ALPHA
FIELDTYPE *TYPE_ALPHA;

/* ./fty_enum.c */

typedef struct
{
    char **kwds;

```

```
    int count;
    NCURSES_BOOL checkcase;
    NCURSES_BOOL checkunique;
}
enumARG;
```

```
#undef TYPE_ENUM
FIELDTYPE *TYPE_ENUM;
```

```
/* ./fty_int.c */
```

```
typedef struct
{
    int precision;
    long low;
    long high;
}
integerARG;
```

```
#undef TYPE_INTEGER
FIELDTYPE *TYPE_INTEGER;
```

```
/* ./fty_ipv4.c */
```

```
#undef TYPE_IPV4
FIELDTYPE *TYPE_IPV4;
```

```
/* ./fty_num.c */
```

```
#include <locale.h>
```

```
typedef struct
{
    int precision;
    double low;
    double high;
    struct lconv *L;
}
numericARG;
```

```
#undef TYPE_NUMERIC
FIELDTYPE *TYPE_NUMERIC;
```

```
/* ./fty_regex.c */
```

```
#include <regex.h>
```

```
typedef struct
{
```

```
regex_t *pRegExp;
unsigned long *refCount;
}
RegExp_Arg;
```

```
#undef
TYPE_REGEX
FIELDTYPE *TYPE_REGEX;
```

Found in path(s):

```
* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/form/l1ib-lformw
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\* @Id: form\_userptr.3x,v 1.11 2006/11/04 18:43:24 tom Exp @

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archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-  
5.7/doc/html/man/form\_userptr.3x.html

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\* @Id: curs\_printw.3x,v 1.17 2006/12/24 16:05:17 tom Exp @

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5.7/doc/html/man/curs\_printw.3x.html

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*****
* @Id: term.7,v 1.18 2007/06/02 20:40:07 tom Exp @
-->

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*****
* @Id: mitem_value.3x,v 1.8 2006/11/04 17:12:00 tom Exp @
-->

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archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-
5.7/doc/html/man/mitem_value.3x.html

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archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/menu/m\_trace.c  
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archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/c++/cursesf.cc  
\* /opt/cola/permits/1600019816\_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-  
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/ncurses/base/lib\_slkatr\_set.c

```

* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/c++/cursslk.h
* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/c++/cursespp.cc
* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/c++/cursslk.c
*
/opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-archive-
fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/ncurses/base/lib_slkcolor.c
* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/c++/cursesapp.h
* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/c++/cursesm.h
* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/ncurses/base/lib_colorset.c
* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/ncurses/base/lib_printw.c
*
/opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-archive-
fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/c++/cursesm.cc
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#
# Author: Thomas E. Dickey <dickey@clark.net> 1996
#
$(srcdir)/panel.h
# vile:makemode
```

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```
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archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/panel/headers
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archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/ncurses/base/lib_pad.c
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archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/mkdirs.sh  
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archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/test/demo\_forms.c  
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/*****
* Author: Thomas E. Dickey 1996-2008
*****/

/* LINTLIBRARY */

/* ./tty/hardscroll.c */

#include <curses.priv.h>

#undef _nc_oldnums
int *_nc_oldnums;

#undef _nc_scroll_optimize
void _nc_scroll_optimize(void)
{ /* void */ }

#undef _nc_linedump
void _nc_linedump(void)
{ /* void */ }

/* ./tty/hashmap.c */

```

```

#include <term.h>

#undef _nc_hash_map
void _nc_hash_map(void)
    { /* void */ }

#undef _nc_make_oldhash
void _nc_make_oldhash(
    int i)
    { /* void */ }

#undef _nc_scroll_oldhash
void _nc_scroll_oldhash(
    int n,
    int top,
    int bot)
    { /* void */ }

/* ./base/lib_addch.c */

#include <ctype.h>

#undef _nc_render
ctype _nc_render(
    WINDOW *win,

    ctype ch)
    { return(*(ctype *)0); }

#undef _nc_waddch_nosync
int _nc_waddch_nosync(
    WINDOW *win,
    const ctype c)
    { return(*(int *)0); }

#undef waddch
int waddch(
    WINDOW *win,
    const ctype ch)
    { return(*(int *)0); }

#undef wechochar
int wechochar(
    WINDOW *win,
    const ctype ch)
    { return(*(int *)0); }

/* ./base/lib_addstr.c */

```

```
#undef waddnstr
int waddnstr(
    WINDOW *win,
    const char *astr,
    int n)
{ return(*(int *)0); }
```

```
#undef waddchnstr
int waddchnstr(
    WINDOW *win,
    const chtype *astr,
    int n)
{ return(*(int *)0); }
```

```
/* ./base/lib_bEEP.c */
```

```
#undef beep
int beep(void)
{ return(*(int *)0); }
```

```
/* ./base/lib_bkgd.c */
```

```
#undef wbgdset
void wbgdset(
    WINDOW *win,
    chtype ch)
{ /* void */ }
```

```
#undef wbgd
int wbgd(
    WINDOW *win,
    chtype ch)
{ return(*(int *)0); }
```

```
/* ./base/lib_box.c */
```

```
#undef wborder
int wborder(
    WINDOW *win,
    chtype ls,
    chtype rs,
    chtype ts,
    chtype bs,
    chtype tl,
```

```
    chtype tr,
    chtype bl,
```

```

ctype br)
{ return(*(int *)0); }

/* ./base/lib_chgat.c */

#undef wchgat
int wchgat(
    WINDOW *win,
    int n,
    attr_t attr,
    short color,
    const void *opts)
{ return(*(int *)0); }

/* ./base/lib_clear.c */

#undef wclear
int wclear(
    WINDOW *win)
{ return(*(int *)0); }

/* ./base/lib_clearok.c */

#undef clearok
int clearok(
    WINDOW *win,
    NCURSES_BOOL flag)
{ return(*(int *)0); }

/* ./base/lib_clrbot.c */

#undef wclrbot
int wclrbot(
    WINDOW *win)
{ return(*(int *)0); }

/* ./base/lib_clreol.c */

#undef wclrtoeol
int wclrtoeol(
    WINDOW *win)
{ return(*(int *)0); }

/* ./base/lib_color.c */

#include <tic.h>

#undef COLOR_PAIRS

```

```

int COLOR_PAIRS;
#undef COLORS
int COLORS;

#undef _nc_reset_colors
NCURSES_BOOL _nc_reset_colors(void)
{ return(*(NCURSES_BOOL *)0); }

#undef start_color
int start_color(void)
{ return(*(int *)0); }

#undef init_pair
int init_pair(
    short pair,
    short f,
    short b)
{ return(*(int *)0);
}

#undef init_color
int init_color(
    short color,
    short r,
    short g,
    short b)
{ return(*(int *)0); }

#undef can_change_color
NCURSES_BOOL can_change_color(void)
{ return(*(NCURSES_BOOL *)0); }

#undef has_colors
NCURSES_BOOL has_colors(void)
{ return(*(NCURSES_BOOL *)0); }

#undef color_content
int color_content(
    short color,
    short *r,
    short *g,
    short *b)
{ return(*(int *)0); }

#undef pair_content
int pair_content(
    short pair,
    short *f,

```

```

short *b)
{ return(*(int *)0); }

#undef _nc_do_color
void _nc_do_color(
    short old_pair,
    short pair,
    NCURSES_BOOL reverse,
    int (*outc)(
        int p1))
    { /* void */ }

/* ./base/lib_colorset.c */

#undef wcolor_set
int wcolor_set(
    WINDOW *win,
    short color_pair_number,
    void *opts)
    { return(*(int *)0); }

/* ./base/lib_delch.c */

#undef wdelch
int wdelch(
    WINDOW *win)
    { return(*(int *)0); }

/* ./base/lib_delwin.c */

#undef delwin
int delwin(
    WINDOW *win)
    { return(*(int *)0); }

/* ./base/lib_echo.c
*/

#undef echo
int echo(void)
    { return(*(int *)0); }

#undef noecho
int noecho(void)
    { return(*(int *)0); }

/* ./base/lib_endwin.c */

```



```
#undef endwin
int endwin(void)
{ return(*(int *)0); }

/* ./base/lib_erase.c */

#undef werase
int werase(
    WINDOW *win)
{ return(*(int *)0); }

/* ./base/lib_flash.c */

#undef flash
int flash(void)
{ return(*(int *)0); }

/* ./lib_gen.c */

#undef addch
int addch(
    const chtype z)
{ return(*(int *)0); }

#undef addchnstr
int addchnstr(
    const chtype *a1,
    int z)
{ return(*(int *)0); }

#undef addchstr
int addchstr(
    const chtype *z)
{ return(*(int *)0); }

#undef addnstr
int addnstr(
    const char *a1,
    int z)
{ return(*(int *)0); }

#undef addstr
int addstr(
    const char *z)
{ return(*(int *)0); }

#undef attroff
int attroff(
```

```
NCURSES_ATTR_T z)
```

```
{ return(*(int *)0); }
```

```
#undef attron
```

```
int attron(
```

```
NCURSES_ATTR_T z)
```

```
{ return(*(int *)0); }
```

```
#undef attrset
```

```
int attrset(
```

```
NCURSES_ATTR_T z)
```

```
{ return(*(int *)0);
```

```
}
```

```
#undef attr_get
```

```
int attr_get(
```

```
attr_t *a1,
```

```
short *a2,
```

```
void *z)
```

```
{ return(*(int *)0); }
```

```
#undef attr_off
```

```
int attr_off(
```

```
attr_t a1,
```

```
void *z)
```

```
{ return(*(int *)0); }
```

```
#undef attr_on
```

```
int attr_on(
```

```
attr_t a1,
```

```
void *z)
```

```
{ return(*(int *)0); }
```

```
#undef attr_set
```

```
int attr_set(
```

```
attr_t a1,
```

```
short a2,
```

```
void *z)
```

```
{ return(*(int *)0); }
```

```
#undef bkgd
```

```
int bkgd(
```

```
chtype z)
```

```
{ return(*(int *)0); }
```

```
#undef bkgdset
```

```
void bkgdset(
```

```
chtype z)
```

```
{ /* void */ }

#undef border
int border(
    chtype a1,
    chtype a2,
    chtype a3,
    chtype a4,
    chtype a5,
    chtype a6,
    chtype a7,
    chtype z)
{ return(*(int *)0); }

#undef box
int box(
    WINDOW *a1,
    chtype a2,
    chtype z)
{ return(*(int *)0); }

#undef chgat
int chgat(
    int a1,
    attr_t a2,
    short a3,
    const void *z)
{ return(*(int *)0); }

#undef clear
int clear(void)
{ return(*(int *)0); }

#undef clrrobot
int clrrobot(void)
{ return(*(int *)0); }

#undef clrtoeol
int clrtoeol(void)
{ return(*(int *)0);
}

#undef color_set
int color_set(
    short a1,
    void *z)
{ return(*(int *)0); }
```

```
#undef COLOR_PAIR
int COLOR_PAIR(
    int z)
    { return(*(int *)0); }
```

```
#undef delch
int delch(void)
    { return(*(int *)0); }
```

```
#undef deleteln
int deleteln(void)
    { return(*(int *)0); }
```

```
#undef echochar
int echochar(
    const chtype z)
    { return(*(int *)0); }
```

```
#undef erase
int erase(void)
    { return(*(int *)0); }
```

```
#undef getbkgd
chtype getbkgd(
    WINDOW *z)
    { return(*(chtype *)0); }
```

```
#undef getch
int getch(void)
    { return(*(int *)0); }
```

```
#undef getnstr
int getnstr(
    char *a1,
    int z)
    { return(*(int *)0); }
```

```
#undef getstr
int getstr(
    char *z)
    { return(*(int *)0); }
```

```
#undef hline
int hline(
    chtype a1,
    int z)
    { return(*(int *)0); }
```

```
#undef inch
ctype inch(void)
{ return(*(ctype *)0); }
```

```
#undef inchnstr
int inchnstr(
  ctype *a1,
  int z)
{ return(*(int *)0); }
```

```
#undef inchstr
int inchstr(
  ctype *z)
{ return(*(int *)0); }
```

```
#undef innstr
int innstr(
  char *a1,
  int z)
{
  return(*(int *)0); }
```

```
#undef insch
int insch(
  ctype z)
{ return(*(int *)0); }
```

```
#undef insdelln
int insdelln(
  int z)
{ return(*(int *)0); }
```

```
#undef insertln
int insertln(void)
{ return(*(int *)0); }
```

```
#undef insnstr
int insnstr(
  const char *a1,
  int z)
{ return(*(int *)0); }
```

```
#undef insstr
int insstr(
  const char *z)
{ return(*(int *)0); }
```

```
#undef instr
```

```

int instr(
    char *z)
    { return(*(int *)0); }

#undef move
int move(
    int a1,
    int z)
    { return(*(int *)0); }

#undef mvaddch
int mvaddch(
    int a1,
    int a2,
    const chtype z)
    { return(*(int *)0); }

#undef mvaddchnstr
int mvaddchnstr(
    int a1,
    int a2,
    const chtype *a3,
    int z)
    { return(*(int *)0); }

#undef mvaddchstr
int mvaddchstr(
    int a1,
    int a2,
    const chtype *z)
    { return(*(int *)0); }

#undef mvaddnstr
int mvaddnstr(
    int a1,
    int a2,
    const char *a3,
    int z)
    { return(*(int *)0); }

#undef mvaddstr
int mvaddstr(
    int a1,
    int a2,
    const char *z)
    { return(*(int *)0);
    }

```

```
#undef mvchgat
int mvchgat(
    int a1,
    int a2,
    int a3,
    attr_t a4,
    short a5,
    const void *z)
{ return(*(int *)0); }
```

```
#undef mvdelch
int mvdelch(
    int a1,
    int z)
{ return(*(int *)0); }
```

```
#undef mvgetch
int mvgetch(
    int a1,
    int z)
{ return(*(int *)0); }
```

```
#undef mvgetnstr
int mvgetnstr(
    int a1,
    int a2,
    char *a3,
    int z)
{ return(*(int *)0); }
```

```
#undef mvgetstr
int mvgetstr(
    int a1,
    int a2,
    char *z)
{ return(*(int *)0); }
```

```
#undef mvhline
int mvhline(
    int a1,
    int a2,
    chtype a3,
    int z)
{ return(*(int *)0); }
```

```
#undef mvinch
chtype mvinch(
    int a1,
```

```
int z)
{ return(*(ctype *)0); }
```

```
#undef mvinchnstr
int mvinchnstr(
int a1,
int a2,
ctype *a3,
int z)
{ return(*(int *)0); }
```

```
#undef mvinchstr
int mvinchstr(
int a1,
int a2,
ctype *z)
{ return(*(int *)0); }
```

```
#undef mvinnstr
int mvinnstr(
int a1,
int a2,
char *a3,
int z)
{ return(*(int *)0); }
```

```
#undef mvinsch
int mvinsch(
int a1,
int a2,
ctype z)
{
return(*(int *)0); }
```

```
#undef mvinsnstr
int mvinsnstr(
int a1,
int a2,
const char *a3,
int z)
{ return(*(int *)0); }
```

```
#undef mvinsstr
int mvinsstr(
int a1,
int a2,
const char *z)
{ return(*(int *)0); }
```



```
#undef mvinstr
int mvinstr(
    int a1,
    int a2,
    char *z)
{ return(*(int *)0); }
```

```
#undef mvvline
int mvvline(
    int a1,
    int a2,
    chtype a3,
    int z)
{ return(*(int *)0); }
```

```
#undef mvwaddch
int mvwaddch(
    WINDOW *a1,
    int a2,
    int a3,
    const chtype z)
{ return(*(int *)0); }
```

```
#undef mvwaddchnstr
int mvwaddchnstr(
    WINDOW *a1,
    int a2,
    int a3,
    const chtype *a4,
    int z)
{ return(*(int *)0); }
```

```
#undef mvwaddchstr
int mvwaddchstr(
    WINDOW *a1,
    int a2,
    int a3,
    const chtype *z)
{ return(*(int *)0); }
```

```
#undef mvwaddnstr
int mvwaddnstr(
    WINDOW *a1,
    int a2,
    int a3,
    const char *a4,
    int z)
```

```
{ return(*(int *)0); }
```

```
#undef mvwaddstr  
int mvwaddstr(  
    WINDOW *a1,  
    int a2,  
    int a3,  
    const char *z)  
{  
    return(*(int *)0); }
```

```
#undef mvwchgat  
int mvwchgat(  
    WINDOW *a1,  
    int a2,  
    int a3,  
    int a4,  
    attr_t a5,  
    short a6,  
    const void *z)  
{ return(*(int *)0); }
```

```
#undef mvwdelch  
int mvwdelch(  
    WINDOW *a1,  
    int a2,  
    int z)  
{ return(*(int *)0); }
```

```
#undef mvwgetch  
int mvwgetch(  
    WINDOW *a1,  
    int a2,  
    int z)  
{ return(*(int *)0); }
```

```
#undef mvwgetnstr  
int mvwgetnstr(  
    WINDOW *a1,  
    int a2,  
    int a3,  
    char *a4,  
    int z)  
{ return(*(int *)0); }
```

```
#undef mvwgetstr  
int mvwgetstr(  
    WINDOW *a1,
```

```
int a2,  
int a3,  
char *z)  
{ return(*(int *)0); }
```

```
#undef mvwhline  
int mvwhline(  
WINDOW *a1,  
int a2,  
int a3,  
chtype a4,  
int z)  
{ return(*(int *)0); }
```

```
#undef mvwinch  
chtype mvwinch(  
WINDOW *a1,  
int a2,  
int z)  
{ return(*(chtype *)0); }
```

```
#undef mvwinchnstr  
int mvwinchnstr(  
WINDOW *a1,  
int a2,  
int a3,  
chtype *a4,  
int z)  
{ return(*(int *)0); }
```

```
#undef mvwinchstr  
int mvwinchstr(  
WINDOW *a1,  
int a2,  
int a3,  
chtype *z)  
{  
return(*(int *)0); }
```

```
#undef mvwinnstr  
int mvwinnstr(  
WINDOW *a1,  
int a2,  
int a3,  
char *a4,  
int z)  
{ return(*(int *)0); }
```

```
#undef mvwvline
int mvwvline(
    WINDOW *a1,
    int a2,
    int a3,
    chtype z)
{ return(*(int *)0); }
```

```
#undef mvwinsnstr
int mvwinsnstr(
    WINDOW *a1,
    int a2,
    int a3,
    const char *a4,
    int z)
{ return(*(int *)0); }
```

```
#undef mvwinsstr
int mvwinsstr(
    WINDOW *a1,
    int a2,
    int a3,
    const char *z)
{ return(*(int *)0); }
```

```
#undef mvwinstr
int mvwinstr(
    WINDOW *a1,
    int a2,
    int a3,
    char *z)
{ return(*(int *)0); }
```

```
#undef mvwvline
int mvwvline(
    WINDOW *a1,
    int a2,
    int a3,
    chtype a4,
    int z)
{ return(*(int *)0); }
```

```
#undef PAIR_NUMBER
int PAIR_NUMBER(
    int z)
{ return(*(int *)0); }
```

```
#undef redrawwin
```

```
int redrawwin(
    WINDOW *z)
    { return(*(int *)0); }

#undef refresh
int refresh(void)
    { return(*(int *)0); }

#undef scl
int scl(
    int z)
    { return(*(int *)0); }

#undef scroll
int scroll(
    WINDOW *z)
    {
    return(*(int *)0); }

#undef setscreg
int setscreg(
    int a1,
    int z)
    { return(*(int *)0); }

#undef standout
int standout(void)
    { return(*(int *)0); }

#undef standend
int standend(void)
    { return(*(int *)0); }

#undef timeout
void timeout(
    int z)
    { /* void */ }

#undef touchline
int touchline(
    WINDOW *a1,
    int a2,
    int z)
    { return(*(int *)0); }

#undef touchwin
int touchwin(
    WINDOW *z)
```

```
{ return(*(int *)0); }
```

```
#undef untouchedwin
```

```
int untouchedwin(  
    WINDOW *z)  
{ return(*(int *)0); }
```

```
#undef vline
```

```
int vline(  
    chtype a1,  
    int z)  
{ return(*(int *)0); }
```

```
#undef vw_printw
```

```
int vw_printw(  
    WINDOW *a1,  
    const char *a2,  
    va_list z)  
{ return(*(int *)0); }
```

```
#undef vw_scanw
```

```
int vw_scanw(  
    WINDOW *a1,  
    char *a2,  
    va_list z)  
{ return(*(int *)0); }
```

```
#undef waddchstr
```

```
int waddchstr(  
    WINDOW *a1,  
    const chtype *z)  
{ return(*(int *)0); }
```

```
#undef waddstr
```

```
int waddstr(  
    WINDOW *a1,  
    const char *z)  
{ return(*(int *)0); }
```

```
#undef wattron
```

```
int wattron(  
    WINDOW *a1,  
  
    int z)  
{ return(*(int *)0); }
```

```
#undef wattroff
```

```
int wattroff(  

```

```
WINDOW *a1,  
int z)  
{ return(*(int *)0); }
```

```
#undef wattrset  
int wattrset(  
WINDOW *a1,  
int z)  
{ return(*(int *)0); }
```

```
#undef wattr_get  
int wattr_get(  
WINDOW *a1,  
attr_t *a2,  
short *a3,  
void *z)  
{ return(*(int *)0); }
```

```
#undef wattr_set  
int wattr_set(  
WINDOW *a1,  
attr_t a2,  
short a3,  
void *z)  
{ return(*(int *)0); }
```

```
#undef wdeleteln  
int wdeleteln(  
WINDOW *z)  
{ return(*(int *)0); }
```

```
#undef wgetstr  
int wgetstr(  
WINDOW *a1,  
char *z)  
{ return(*(int *)0); }
```

```
#undef winchstr  
int winchstr(  
WINDOW *a1,  
chtype *z)  
{ return(*(int *)0); }
```

```
#undef winsertln  
int winsertln(  
WINDOW *z)  
{ return(*(int *)0); }
```

```
#undef winsstr
int winsstr(
    WINDOW *a1,
    const char *z)
{ return(*(int *)0); }
```

```
#undef winstr
int winstr(
    WINDOW *a1,
    char *z)
{ return(*(int *)0); }
```

```
#undef wstandout
int wstandout(
    WINDOW *z)
{ return(*(int *)0); }
```

```
#undef wstandend
int wstandend(
    WINDOW *z)
{
    return(*(int *)0); }
```

```
#undef getattrs
int getattrs(
    const WINDOW *z)
{ return(*(int *)0); }
```

```
#undef getcurx
int getcurx(
    const WINDOW *z)
{ return(*(int *)0); }
```

```
#undef getcury
int getcury(
    const WINDOW *z)
{ return(*(int *)0); }
```

```
#undef getbegx
int getbegx(
    const WINDOW *z)
{ return(*(int *)0); }
```

```
#undef getbegy
int getbegy(
    const WINDOW *z)
{ return(*(int *)0); }
```



```

#undef getmaxx
int getmaxx(
    const WINDOW *z)
    { return(*(int *)0); }

#undef getmaxy
int getmaxy(
    const WINDOW *z)
    { return(*(int *)0); }

#undef getparx
int getparx(
    const WINDOW *z)
    { return(*(int *)0); }

#undef getpary
int getpary(
    const WINDOW *z)
    { return(*(int *)0); }

#undef wgetparent
WINDOW *wgetparent(
    const WINDOW *z)
    { return(*(WINDOW **)0); }

#undef is_cleared
NCURSES_BOOL is_cleared(
    const WINDOW *z)
    { return(*(NCURSES_BOOL *)0); }

#undef is_idcok
NCURSES_BOOL is_idcok(
    const WINDOW *z)
    { return(*(NCURSES_BOOL *)0); }

#undef is_idlok
NCURSES_BOOL
is_idlok(
    const WINDOW *z)
    { return(*(NCURSES_BOOL *)0); }

#undef is_immedok
NCURSES_BOOL is_immedok(
    const WINDOW *z)
    { return(*(NCURSES_BOOL *)0); }

#undef is_keypad
NCURSES_BOOL is_keypad(

```

```

const WINDOW *z)
{ return(*(NCURSES_BOOL *)0); }

#undef is_leaveok
NCURSES_BOOL is_leaveok(
    const WINDOW *z)
{ return(*(NCURSES_BOOL *)0); }

#undef is_nodelay
NCURSES_BOOL is_nodelay(
    const WINDOW *z)
{ return(*(NCURSES_BOOL *)0); }

#undef is_notimeout
NCURSES_BOOL is_notimeout(
    const WINDOW *z)
{ return(*(NCURSES_BOOL *)0); }

#undef is_scrollok
NCURSES_BOOL is_scrollok(
    const WINDOW *z)
{ return(*(NCURSES_BOOL *)0); }

#undef is_syncok
NCURSES_BOOL is_syncok(
    const WINDOW *z)
{ return(*(NCURSES_BOOL *)0); }

#undef wgetscrreg
int wgetscrreg(
    const WINDOW *a1,
    int *a2,
    int *z)
{ return(*(int *)0); }

#undef mouse_trafo
NCURSES_BOOL mouse_trafo(
    int *a1,
    int *a2,
    NCURSES_BOOL z)
{ return(*(NCURSES_BOOL *)0); }

/* ./base/lib_getch.c */

#include
<fifo_defs.h>

#undef ESCDELAY

```

```

int ESCDELAY;

#undef set_escdelay
int set_escdelay(
    int value)
    { return(*(int *)0); }

#undef _nc_wgetch
int _nc_wgetch(
    WINDOW *win,
    unsigned long *result,
    int use_meta)
    { return(*(int *)0); }

#undef wgetch
int wgetch(
    WINDOW *win)
    { return(*(int *)0); }

/* ./base/lib_getstr.c */

#undef wgetnstr
int wgetnstr(
    WINDOW *win,
    char *str,
    int maxlen)
    { return(*(int *)0); }

/* ./base/lib_hline.c */

#undef whline
int whline(
    WINDOW *win,
    chtype ch,
    int n)
    { return(*(int *)0); }

/* ./base/lib_immedok.c */

#undef immedok
void immedok(
    WINDOW *win,
    NCURSES_BOOL flag)
    { /* void */ }

/* ./base/lib_inchstr.c */

#undef winchnstr

```

```

int winchnstr(
    WINDOW *win,
    chtype *str,
    int n)
{ return(*(int *)0); }

/* ./base/lib_initscr.c */

#undef initscr
WINDOW *initscr(void)
{ return(*(WINDOW **)0); }

/* ./base/lib_insch.c */

#undef _nc_insert_ch
int _nc_insert_ch(
    WINDOW *win,
    chtype ch)
{ return(*(int
*)0); }

#undef winsch
int winsch(
    WINDOW *win,
    chtype c)
{ return(*(int *)0); }

/* ./base/lib_insdel.c */

#undef winsdelln
int winsdelln(
    WINDOW *win,
    int n)
{ return(*(int *)0); }

/* ./base/lib_insnstr.c */

#undef winsnstr
int winsnstr(
    WINDOW *win,
    const char *s,
    int n)
{ return(*(int *)0); }

/* ./base/lib_instr.c */

#undef winnstr
int winnstr(

```

```

WINDOW *win,
char *str,
int n)
{ return(*(int *)0); }

/* ./base/lib_isendwin.c */

#undef isendwin
NCURSES_BOOL isendwin(void)
{ return*(NCURSES_BOOL *)0; }

/* ./base/lib_leaveok.c */

#undef leaveok
int leaveok(
    WINDOW *win,
    NCURSES_BOOL flag)
{ return(*(int *)0); }

/* ./base/lib_mouse.c */

#undef getmouse
int getmouse(
    MEVENT *aevent)
{ return(*(int *)0); }

#undef ungetmouse
int ungetmouse(
    MEVENT *aevent)
{ return(*(int *)0); }

#undef mousemask
mmask_t mousemask(
    mmask_t newmask,
    mmask_t *oldmask)
{ return*(mmask_t *)0; }

#undef wenclose
NCURSES_BOOL wenclose(
    const
    WINDOW *win,
    int y,
    int x)
{ return*(NCURSES_BOOL *)0; }

#undef mouseinterval
int mouseinterval(
    int maxclick)

```

```

    { return(*(int *)0); }

#undef _nc_has_mouse
int _nc_has_mouse(void)
    { return(*(int *)0); }

#undef wmouse_trafo
NCURSES_BOOL wmouse_trafo(
    const WINDOW *win,
    int *pY,
    int *pX,
    NCURSES_BOOL to_screen)
    { return(*(NCURSES_BOOL *)0); }

/* ./base/lib_move.c */

#undef wmove
int wmove(
    WINDOW *win,
    int y,
    int x)
    { return(*(int *)0); }

/* ./tty/lib_mvcur.c */

#undef _nc_msec_cost
int _nc_msec_cost(
    const char *const cap,
    int affcnt)
    { return(*(int *)0); }

#undef _nc_mvcur_resume
void _nc_mvcur_resume(void)
    { /* void */ }

#undef _nc_mvcur_init
void _nc_mvcur_init(void)
    { /* void */ }

#undef _nc_mvcur_wrap
void _nc_mvcur_wrap(void)
    { /* void */ }

#undef mvcur
int mvcur(
    int yold,
    int xold,
    int ynew,

```

```

int xnew)
{ return(*(int *)0); }

#undef _nc_optimize_enable
int _nc_optimize_enable;

/* ./base/lib_mvwin.c
*/

#undef mvwin
int mvwin(
    WINDOW *win,
    int by,
    int bx)
{ return(*(int *)0); }

/* ./base/lib_newterm.c */

#undef filter
void filter(void)
{ /* void */ }

#undef nofilter
void nofilter(void)
{ /* void */ }

#undef newterm
SCREEN *newterm(
    char *name,
    FILE *ofp,
    FILE *ifp)
{ return(*(SCREEN **)0); }

/* ./base/lib_newwin.c */

#undef _nc_freewin
int _nc_freewin(
    WINDOW *win)
{ return(*(int *)0); }

#undef newwin
WINDOW *newwin(
    int num_lines,
    int num_columns,
    int begy,
    int begx)
{ return(*(WINDOW **)0); }

```

```
#undef derwin
WINDOW *derwin(
    WINDOW *orig,
    int num_lines,
    int num_columns,
    int begy,
    int begx)
{ return(*(WINDOW **)0); }
```

```
#undef subwin
WINDOW *subwin(
    WINDOW *w,
    int l,
    int c,
    int y,
    int x)
{ return(*(WINDOW **)0); }
```

```
#undef _nc_makenew
WINDOW *_nc_makenew(
    int num_lines,
    int num_columns,
    int begy,
    int begx,
    int flags)
{ return(*(WINDOW **)0); }
```

```
#undef _nc_screen_of
SCREEN *_nc_screen_of(
    WINDOW *win)
{
    return(*(SCREEN **)0); }
```

```
/* ./base/lib_nl.c */
```

```
#undef nl
int nl(void)
{ return(*(int *)0); }
```

```
#undef nonl
int nonl(void)
{ return(*(int *)0); }
```

```
/* ./base/lib_overlay.c */
```

```
#undef overlay
int overlay(
    const WINDOW *win1,
```



```

WINDOW *win2)
{ return(*(int *)0); }

#undef overwrite
int overwrite(
    const WINDOW *win1,
    WINDOW *win2)
{ return(*(int *)0); }

#undef copywin
int copywin(
    const WINDOW *src,
    WINDOW *dst,
    int sminrow,
    int smincol,
    int dminrow,
    int dmincol,
    int dmaxrow,
    int dmaxcol,
    int over)
{ return(*(int *)0); }

/* ./base/lib_pad.c */

#undef newpad
WINDOW *newpad(
    int l,
    int c)
{ return(*(WINDOW **)0); }

#undef subpad
WINDOW *subpad(
    WINDOW *orig,
    int l,
    int c,
    int begy,
    int begx)
{ return(*(WINDOW **)0); }

#undef prefresh
int prefresh(
    WINDOW *win,
    int pminrow,
    int pmincol,
    int sminrow,
    int smincol,
    int smaxrow,
    int smaxcol)

```

```

    { return(*(int *)0); }

#undef pnoutrefresh
int pnoutrefresh(
    WINDOW *win,

    int pminrow,
    int pmincol,
    int sminrow,
    int smincol,
    int smaxrow,
    int smaxcol)
    { return(*(int *)0); }

#undef pechochar
int pechochar(
    WINDOW *pad,
    const chtype ch)
    { return(*(int *)0); }

/* ./base/lib_printw.c */

#undef printw
int printw(
    const char *fmt,
    ...)
    { return(*(int *)0); }

#undef wprintw
int wprintw(
    WINDOW *win,
    const char *fmt,
    ...)
    { return(*(int *)0); }

#undef mvprintw
int mvprintw(
    int y,
    int x,
    const char *fmt,
    ...)
    { return(*(int *)0); }

#undef mvwprintw
int mvwprintw(
    WINDOW *win,
    int y,
    int x,

```

```

const char *fmt,
...)
{ return(*(int *)0); }

#undef vwprintw
int vwprintw(
    WINDOW *win,
    const char *fmt,
    va_list argp)
{ return(*(int *)0); }

/* ./base/lib_redrawln.c */

#undef wredrawln
int wredrawln(
    WINDOW *win,
    int beg,
    int num)
{ return(*(int *)0); }

/* ./base/lib_refresh.c */

#undef wrefresh
int wrefresh(
    WINDOW *win)
{ return(*(int
*)0); }

#undef wnoutrefresh
int wnoutrefresh(
    WINDOW *win)
{ return(*(int *)0); }

/* ./base/lib_restart.c */

#undef restartterm
int restartterm(
    char *term,
    int filenum,
    int *errret)
{ return(*(int *)0); }

/* ./base/lib_scanw.c */

#undef vwscanw
int vwscanw(
    WINDOW *win,
    char *fmt,

```

```

va_list argp)
{ return(*(int *)0); }

#undef scanw
int scanw(
    char *fmt,
    ...)
{ return(*(int *)0); }

#undef wscanw
int wscanw(
    WINDOW *win,
    char *fmt,
    ...)
{ return(*(int *)0); }

#undef mvscanw
int mvscanw(
    int y,
    int x,
    char *fmt,
    ...)
{ return(*(int *)0); }

#undef mvwscanw
int mvwscanw(
    WINDOW *win,
    int y,
    int x,
    char *fmt,
    ...)
{ return(*(int *)0); }

/* ./base/lib_screen.c */

#undef getwin
WINDOW *getwin(
    FILE *filep)
{ return(*(WINDOW **)0); }

#undef putwin
int putwin(
    WINDOW *win,
    FILE *filep)
{ return(*(int *)0); }

#undef scr_restore
int scr_restore(

```

```

const char *file)
{ return(*(int *)0); }

#undef scr_dump
int scr_dump(
    const
    char *file)
{ return(*(int *)0); }

#undef scr_init
int scr_init(
    const char *file)
{ return(*(int *)0); }

#undef scr_set
int scr_set(
    const char *file)
{ return(*(int *)0); }

/* ./base/lib_scroll.c */

#undef _nc_scroll_window
void _nc_scroll_window(
    WINDOW *win,
    int const n,
    short const top,
    short const bottom,
    chtype blank)
{ /* void */ }

#undef wscr1
int wscr1(
    WINDOW *win,
    int n)
{ return(*(int *)0); }

/* ./base/lib_scrollok.c */

#undef scrollok
int scrollok(
    WINDOW *win,
    NCURSES_BOOL flag)
{ return(*(int *)0); }

/* ./base/lib_scrreg.c */

#undef wsetscrreg
int wsetscrreg(

```

```

WINDOW *win,
int top,
int bottom)
{ return(*(int *)0); }

/* ./base/lib_set_term.c */

#undef set_term
SCREEN *set_term(
SCREEN *screenp)
{ return(*(SCREEN **)0); }

#undef delscreen
void delscreen(
SCREEN *sp)
{ /* void */ }

#undef _nc_setupscreen
int _nc_setupscreen(
int slines,
int scolumns,
FILE *output,
NCURSES_BOOL
filtered,
int slk_format)
{ return(*(int *)0); }

#undef _nc_ripoffline
int _nc_ripoffline(
int line,
int (*init)(
WINDOW *p1,
int p2))
{ return(*(int *)0); }

#undef ripoffline
int ripoffline(
int line,
int (*init)(
WINDOW *p1,
int p2))
{ return(*(int *)0); }

/* ./base/lib_slk.c */

#undef _nc_slk_initialize
int _nc_slk_initialize(
WINDOW *stwin,

```

```

int cols)
{ return(*(int *)0); }

#undef slk_restore
int slk_restore(void)
{ return(*(int *)0); }

/* ./base/lib_slkatr_set.c */

#undef slk_attr_set
int slk_attr_set(
    const attr_t attr,
    short color_pair_number,
    void *opts)
{ return(*(int *)0); }

/* ./base/lib_slkatrof.c */

#undef slk_attroff
int slk_attroff(
    const chtype attr)
{ return(*(int *)0); }

/* ./base/lib_slkatron.c */

#undef slk_atron
int slk_atron(
    const chtype attr)
{ return(*(int *)0); }

/* ./base/lib_slkatrset.c */

#undef slk_attrset
int slk_attrset(
    const chtype attr)
{ return(*(int *)0); }

/* ./base/lib_slkatr.c
*/

#undef slk_attr
attr_t slk_attr(void)
{ return(*(attr_t *)0); }

/* ./base/lib_slkclear.c */

#undef slk_clear
int slk_clear(void)

```

```
{ return(*(int *)0); }

/* ./base/lib_slkcolor.c */

#undef slk_color
int slk_color(
    short color_pair_number)
    { return(*(int *)0); }

/* ./base/lib_slkinit.c */

#undef slk_init
int slk_init(
    int format)
    { return(*(int *)0); }

/* ./base/lib_slklab.c */

#undef slk_label
char *slk_label(
    int n)
    { return(*(char **)0); }

/* ./base/lib_slkrefr.c */

#undef slk_noutrefresh
int slk_noutrefresh(void)
    { return(*(int *)0); }

#undef slk_refresh
int slk_refresh(void)
    { return(*(int *)0); }

/* ./base/lib_slkset.c */

#undef slk_set
int slk_set(
    int i,
    const char *astr,
    int format)
    { return(*(int *)0); }

/* ./base/lib_slktouch.c */

#undef slk_touch
int slk_touch(void)
    { return(*(int *)0); }
```



```

/* ./base/lib_touch.c */

#undef is_linetouched
NCURSES_BOOL is_linetouched(
    WINDOW *win,
    int line)
{ return(*(NCURSES_BOOL
*)0); }

#undef is_wintouched
NCURSES_BOOL is_wintouched(
    WINDOW *win)
{ return(*(NCURSES_BOOL *)0); }

#undef wtouchln
int wtouchln(
    WINDOW *win,
    int y,
    int n,
    int changed)
{ return(*(int *)0); }

/* ./trace/lib_tracedmp.c */

#undef _tracedump
void _tracedump(
    const char *name,
    WINDOW *win)
{ /* void */ }

/* ./trace/lib_tracemse.c */

#undef _nc_tracemouse
char *_nc_tracemouse(
    SCREEN *sp,
    MEVENT const *ep)
{ return(*(char **)0); }

#undef _tracemouse
char *_tracemouse(
    MEVENT const *ep)
{ return(*(char **)0); }

/* ./tty/lib_tstp.c */

#include <SigAction.h>

#undef _nc_signal_handler

```

```
void _nc_signal_handler(  
    NCURSES_BOOL enable)  
    { /* void */ }
```

```
/* ./base/lib_ungetch.c */
```

```
#undef _nc_fifo_dump  
void _nc_fifo_dump(  
    SCREEN *sp)  
    { /* void */ }
```

```
#undef _nc_ungetch  
int _nc_ungetch(  
    SCREEN *sp,  
    int ch)  
    { return(*(int *)0); }
```

```
#undef ungetch  
int ungetch(  
    int ch)  
    { return(*(int *)0); }
```

```
/* ./tty/lib_vidattr.c */
```

```
#undef vidputs  
int vidputs(  
    chtype newmode,  
  
    int (*outc)(  
        int p1))  
    { return(*(int *)0); }
```

```
#undef vidattr  
int vidattr(  
    chtype newmode)  
    { return(*(int *)0); }
```

```
#undef termattrs  
chtype termattrs(void)  
    { return(*(chtype *)0); }
```

```
/* ./base/lib_vline.c */
```

```
#undef wvline  
int wvline(  
    WINDOW *win,  
    chtype ch,  
    int n)
```

```

    { return(*(int *)0); }

/* ./base/lib_wattroff.c */

#undef wattr_off
int wattr_off(
    WINDOW *win,
    attr_t at,
    void *opts)
    { return(*(int *)0); }

/* ./base/lib_wattron.c */

#undef wattr_on
int wattr_on(
    WINDOW *win,
    attr_t at,
    void *opts)
    { return(*(int *)0); }

/* ./base/lib_winch.c */

#undef winch
chtype winch(
    WINDOW *win)
    { return(*(chtype *)0); }

/* ./base/lib_window.c */

#undef _nc_synchook
void _nc_synchook(
    WINDOW *win)
    { /* void */ }

#undef mvderwin
int mvderwin(
    WINDOW *win,
    int y,
    int x)
    { return(*(int *)0); }

#undef syncok
int syncok(
    WINDOW *win,
    NCURSES_BOOL bf)
    { return(*(int *)0); }

#undef wsyncup

```

```

void wsyncup(
    WINDOW *win)
{
    /* void */ }

#undef wsyncdown
void wsyncdown(
    WINDOW *win)
{ /* void */ }

#undef wcursyncup
void wcursyncup(
    WINDOW *win)
{ /* void */ }

#undef dupwin
WINDOW *dupwin(
    WINDOW *win)
{ return(*(WINDOW **)0); }

/* ./base/nc_panel.c */

#undef _nc_panelhook
struct panelhook *_nc_panelhook(void)
{ return(*(struct panelhook **)0); }

/* ./base/safe_sprintf.c */

#undef _nc_printf_string
char *_nc_printf_string(
    const char *fmt,
    va_list ap)
{ return(*(char **)0); }

/* ./tty/tty_update.c */

#include <sys/time.h>
#include <sys/times.h>

#undef douupdate
int douupdate(void)
{ return(*(int *)0); }

#undef _nc_scrolln
int _nc_scrolln(
    int n,
    int top,
    int bot,

```

```

int maxy)
{ return(*(int *)0); }

#undef _nc_screen_resume
void _nc_screen_resume(void)
{ /* void */ }

#undef _nc_screen_init
void _nc_screen_init(void)
{ /* void */ }

#undef _nc_screen_wrap
void _nc_screen_wrap(void)
{ /* void */ }

#undef _nc_do_xmc_glitch
void _nc_do_xmc_glitch(
    attr_t previous)
{
    /* void */ }

/* ./trace/varargs.c */

typedef enum {
    atUnknown = 0, atInteger, atFloat, atPoint, atString
} ARGTYPE;

#undef _nc_varargs
char *_nc_varargs(
    const char *fmt,
    va_list ap)
{ return(*(char **)0); }

/* ./base/memmove.c */

#undef _nc_memmove
void _nc_memmove(void)
{ /* void */ }

/* ./base/vsscanf.c */

#undef _nc_vsscanf
void _nc_vsscanf(void)
{ /* void */ }

/* ./base/lib_freeall.c */

#include <term_entry.h>

```

```

#undef _nc_freall
void _nc_freall(void)
{ /* void */ }

#undef _nc_free_and_exit
void _nc_free_and_exit(
    int code)
{ /* void */ }

/* ./expanded.c */

#undef _nc_toggle_attr_on
void _nc_toggle_attr_on(
    attr_t *S,
    attr_t at)
{ /* void */ }

#undef _nc_toggle_attr_off
void _nc_toggle_attr_off(
    attr_t *S,
    attr_t at)
{ /* void */ }

#undef _nc_DelCharCost
int _nc_DelCharCost(
    int count)
{ return(*(int *)0); }

#undef _nc_InsCharCost
int _nc_InsCharCost(
    int count)
{ return(*(int *)0); }

#undef
    _nc_UpdateAttrs
void _nc_UpdateAttrs(
    chtype c)
{ /* void */ }

/* ./base/legacy_coding.c */

#undef use_legacy_coding
int use_legacy_coding(
    int level)
{ return(*(int *)0); }

/* ./base/lib_dft_fgbg.c */

```

```

#undef use_default_colors
int use_default_colors(void)
{ return(*(int *)0); }

#undef assume_default_colors
int assume_default_colors(
    int fg,
    int bg)
{ return(*(int *)0); }

/* ./tinfo/lib_print.c */

#undef mcprint
int mcprint(
    char *data,
    int len)
{ return(*(int *)0); }

/* ./base/resizeterm.c */

#undef is_term_resized
NCURSES_BOOL is_term_resized(
    int ToLines,
    int ToCols)
{ return(*(NCURSES_BOOL *)0); }

#undef resize_term
int resize_term(
    int ToLines,
    int ToCols)
{ return(*(int *)0); }

#undef resizeterm
int resizeterm(
    int ToLines,
    int ToCols)
{ return(*(int *)0); }

/* ./trace/trace_xnames.c */

#undef _nc_trace_xnames
void _nc_trace_xnames(
    TERMTYPE *tp)
{ /* void */ }

/* ./tinfo/use_screen.c */

```

```

#undef use_screen
int use_screen(
    SCREEN *screen,

    NCURSES_SCREEN_CB func,
    void *data)
{ return(*(int *)0); }

/* ./base/use_window.c */

#undef use_window
int use_window(
    WINDOW *win,
    NCURSES_WINDOW_CB func,
    void *data)
{ return(*(int *)0); }

/* ./base/wresize.c */

#undef wresize
int wresize(
    WINDOW *win,
    int ToLines,
    int ToCols)
{ return(*(int *)0); }

/* ./tinfo/access.c */

#include <sys/stat.h>
#include <nc_alloc.h>

#undef _nc_rootname
char *_nc_rootname(
    char *path)
{ return(*(char **)0); }

#undef _nc_is_abs_path
NCURSES_BOOL _nc_is_abs_path(
    const char *path)
{ return(*(NCURSES_BOOL *)0); }

#undef _nc_pathlast
unsigned _nc_pathlast(
    const char *path)
{ return(*(unsigned *)0); }

#undef _nc_basename
char *_nc_basename(

```



```

char *path)
{ return(*(char **)0); }

#undef _nc_access
int _nc_access(
    const char *path,
    int mode)
{ return(*(int *)0); }

#undef _nc_is_dir_path
NCURSES_BOOL _nc_is_dir_path(
    const char *path)
{ return*(NCURSES_BOOL *)0; }

#undef
_nc_is_file_path
NCURSES_BOOL _nc_is_file_path(
    const char *path)
{ return*(NCURSES_BOOL *)0; }

#undef _nc_env_access
int _nc_env_access(void)
{ return(*(int *)0); }

/* ./tinfo/add_tries.c */

#undef _nc_add_to_try
int _nc_add_to_try(
    TRIES **tree,
    const char *str,
    unsigned code)
{ return(*(int *)0); }

/* ./tinfo/alloc_ttype.c */

#undef _nc_align_termtype
void _nc_align_termtype(
    TERMTYPE *to,
    TERMTYPE *from)
{ /* void */ }

#undef _nc_copy_termtype
void _nc_copy_termtype(
    TERMTYPE *dst,
    TERMTYPE *src)
{ /* void */ }

/* ./codes.c */

```

```

#undef boolcodes
char *const boolcodes[] = {0};
#undef numcodes
char *const numcodes[] = {0};
#undef strcodes
char *const strcodes[] = {0};

/* ./tinfo/comp_error.c */
#undef _nc_suppress_warnings
NCURSES_BOOL _nc_suppress_warnings;
#undef _nc_curr_line
int _nc_curr_line;
#undef _nc_curr_col
int _nc_curr_col;

#undef _nc_get_source
const char *_nc_get_source(void)
{ return(*(const char **)0); }

#undef _nc_set_source
void _nc_set_source(
    const
    char *const name)
{ /* void */ }

#undef _nc_set_type
void _nc_set_type(
    const char *const name)
{ /* void */ }

#undef _nc_get_type
void _nc_get_type(
    char *name)
{ /* void */ }

#undef _nc_warning
void _nc_warning(
    const char *const fmt,
    ...)
{ /* void */ }

#undef _nc_err_abort
void _nc_err_abort(
    const char *const fmt,
    ...)
{ /* void */ }

```

```

#undef _nc_syserr_abort
void _nc_syserr_abort(
    const char *const fmt,
    ...)
    { /* void */ }

/* ./tinfo/db_iterator.c */

#undef _nc_tic_dir
const char *_nc_tic_dir(
    const char *path)
    { return(*(const char **)0); }

#undef _nc_keep_tic_dir
void _nc_keep_tic_dir(
    const char *path)
    { /* void */ }

#undef _nc_last_db
void _nc_last_db(void)
    { /* void */ }

#undef _nc_next_db
const char *_nc_next_db(
    DBDIRS *state,
    int *offset)
    { return(*(const char **)0); }

#undef _nc_first_db
void _nc_first_db(
    DBDIRS *state,
    int *offset)
    { /* void */ }

/* ./tinfo/doalloc.c */

#undef
    _nc_doalloc
void *_nc_doalloc(
    void *oldp,
    size_t amount)
    { return(*(void **)0); }

/* ./tinfo/entries.c */

#undef _nc_head
ENTRY *_nc_head;
#undef _nc_tail

```

```

ENTRY *_nc_tail;

#undef _nc_free_entry
void _nc_free_entry(
    ENTRY *headp,
    TERMTYPE *tterm)
    { /* void */ }

#undef _nc_free_entries
void _nc_free_entries(
    ENTRY *headp)
    { /* void */ }

#undef _nc_delink_entry
ENTRY *_nc_delink_entry(
    ENTRY *headp,
    TERMTYPE *tterm)
    { return(*(ENTRY **)0); }

#undef _nc_leaks_tinfo
void _nc_leaks_tinfo(void)
    { /* void */ }

/* ./fallback.c */

#undef _nc_fallback
const TERMTYPE *_nc_fallback(
    const char *name)
    { return(*(const TERMTYPE **)0); }

/* ./tinfo/free_ttype.c */

#undef _nc_free_termtype
void _nc_free_termtype(
    TERMTYPE *ptr)
    { /* void */ }

#undef _nc_user_definable
NCURSES_BOOL _nc_user_definable;

#undef use_extended_names
int use_extended_names(
    NCURSES_BOOL flag)
    { return(*(int *)0); }

/* ./tinfo/getenv_num.c */

#undef _nc_getenv_num

```

```

int _nc_getenv_num(
    const
    char *name)
    { return(*(int *)0); }

/* ./tinfo/home_tinfo.c */

#undef _nc_home_tinfo
char *_nc_home_tinfo(void)
    { return(*(char **)0); }

/* ./tinfo/init_keytry.c */

#if 0

#include <init_keytry.h>

#undef _nc_tinfo_fkeys
const struct tinfo_fkeys _nc_tinfo_fkeys[] = {0};

#endif

#undef _nc_init_keytry
void _nc_init_keytry(
    SCREEN *sp)
    { /* void */ }

/* ./tinfo/lib_acs.c */

#undef acs_map
ctype acs_map[128];

#undef _nc_init_acs
void _nc_init_acs(void)
    { /* void */ }

/* ./tinfo/lib_baudrate.c */

#include <termcap.h>

struct speed {
    int s;
    int sp;
};

#undef _nc_baudrate
int _nc_baudrate(
    int OSpeed)

```

```

    { return(*(int *)0); }

#undef _nc_ospeed
int _nc_ospeed(
    int BaudRate)
    { return(*(int *)0); }

#undef baudrate
int baudrate(void)
    { return(*(int *)0); }

/* ./tinfo/lib_cur_term.c */

#undef cur_term
TERMINAL *cur_term;

#undef set_curterm
TERMINAL *set_curterm(
    TERMINAL *termp)
    { return(*(TERMINAL **)0); }

#undef
del_curterm
int del_curterm(
    TERMINAL *termp)
    { return(*(int *)0); }

/* ./tinfo/lib_data.c */

#undef stdscr
WINDOW *stdscr;
#undef curscr
WINDOW *curscr;
#undef newscr
WINDOW *newscr;
#undef _nc_screen_chain
SCREEN *_nc_screen_chain;
#undef SP
SCREEN *SP;
#undef _nc_globals
NCURSES_GLOBALS _nc_globals;
#undef _nc_prescreen
NCURSES_PREScreen _nc_prescreen;

/* ./tinfo/lib_has_cap.c */

#undef has_ic
NCURSES_BOOL has_ic(void)

```

```

    { return(*(NCURSES_BOOL *)0); }

#undef has_il
NCURSES_BOOL has_il(void)
    { return(*(NCURSES_BOOL *)0); }

/* ./tinfo/lib_kernel.c */

#undef erasechar
char erasechar(void)
    { return(*(char *)0); }

#undef killchar
char killchar(void)
    { return(*(char *)0); }

#undef flushing
int flushing(void)
    { return(*(int *)0); }

/* ./lib_keyname.c */

struct kn { short offset; int code; };

#undef _nc_keyname
char *_nc_keyname(
    SCREEN *sp,
    int c)
    { return(*(char **)0); }

#undef keyname
char *keyname(
    int c)
    { return(*(char **)0); }

/* ./tinfo/lib_longname.c
 */

#undef longname
char *longname(void)
    { return(*(char **)0); }

/* ./tinfo/lib_napms.c */

#include <time.h>

#undef napms
int napms(

```

```

int ms)
{ return(*(int *)0); }

/* ./tinfo/lib_options.c */

#undef idlok
int idlok(
    WINDOW *win,
    NCURSES_BOOL flag)
{ return(*(int *)0); }

#undef idcok
void idcok(
    WINDOW *win,
    NCURSES_BOOL flag)
{ /* void */ }

#undef halfdelay
int halfdelay(
    int t)
{ return(*(int *)0); }

#undef nodelay
int nodelay(
    WINDOW *win,
    NCURSES_BOOL flag)
{ return(*(int *)0); }

#undef notimeout
int notimeout(
    WINDOW *win,
    NCURSES_BOOL f)
{ return(*(int *)0); }

#undef wtimeout
void wtimeout(
    WINDOW *win,
    int delay)
{ /* void */ }

#undef keypad
int keypad(
    WINDOW *win,
    NCURSES_BOOL flag)
{ return(*(int *)0); }

#undef meta
int meta(

```



```

WINDOW *win,
NCURSES_BOOL flag)
{ return(*(int *)0); }

#undef curs_set
int curs_set(
    int vis)
{ return(*(int *)0); }

#undef typeahead
int typeahead(
    int fd)
{ return(*(int
* *)0); }

#undef has_key
int has_key(
    int keycode)
{ return(*(int *)0); }

#undef _nc_keypad
int _nc_keypad(
    SCREEN *sp,
    NCURSES_BOOL flag)
{ return(*(int *)0); }

/* ./tinfo/lib_raw.c */

#undef raw
int raw(void)
{ return(*(int *)0); }

#undef cbreak
int cbreak(void)
{ return(*(int *)0); }

#undef qiflush
void qiflush(void)
{ /* void */ }

#undef noraw
int noraw(void)
{ return(*(int *)0); }

#undef nocbreak
int nocbreak(void)
{ return(*(int *)0); }

```

```

#undef noqiflush
void noqiflush(void)
{ /* void */ }

#undef intrflush
int intrflush(
    WINDOW *win,
    NCURSES_BOOL flag)
{ return(*(int *)0); }

/* ./tinfo/lib_setup.c */

#include <locale.h>
#include <sys/ioctl.h>
#include <langinfo.h>

#undef ttytype
char ttytype[256];
#undef LINES
int LINES;
#undef COLS
int COLS;
#undef TABSIZE
int TABSIZE;

#undef set_tabsize
int set_tabsize(
    int value)
{ return(*(int *)0); }

#undef _nc_handle_sigwinch
int _nc_handle_sigwinch(
    SCREEN *sp)
{ return(*(int *)0); }

#undef
use_env
void use_env(
    NCURSES_BOOL f)
{ /* void */ }

#undef _nc_get_screensize
void _nc_get_screensize(
    SCREEN *sp,
    int *linep,
    int *colp)
{ /* void */ }

```

```
#undef _nc_update_screensize
void _nc_update_screensize(
    SCREEN *sp)
    { /* void */ }
```

```
#undef _nc_get_locale
char *_nc_get_locale(void)
    { return(*(char **)0); }
```

```
#undef _nc_unicode_locale
int _nc_unicode_locale(void)
    { return(*(int *)0); }
```

```
#undef _nc_locale_breaks_acs
int _nc_locale_breaks_acs(
    TERMINAL *termp)
    { return(*(int *)0); }
```

```
#undef _nc_setupterm
int _nc_setupterm(
    char *tname,
    int Filedes,
    int *errret,
    NCURSES_BOOL reuse)
    { return(*(int *)0); }
```

```
#undef setupterm
int setupterm(
    char *tname,
    int Filedes,
    int *errret)
    { return(*(int *)0); }
```

```
/* ./tinfo/lib_termcap.c */
```

```
#undef UP
char *UP;
#undef BC
char *BC;
```

```
#undef tgetent
int tgetent(
    char *bufp,
    const char *name)
    { return(*(int *)0); }
```

```
#if 0
```

```
#include <capdefaults.c>
```

```
#endif
```

```
#undef tgetflag
```

```
int tgetflag(  
    char *id  
    {  
    return(*(int *)0); }
```

```
#undef tgetnum
```

```
int tgetnum(  
    char *id  
    { return(*(int *)0); }
```

```
#undef tgetstr
```

```
char *tgetstr(  
    char *id,  
    char **area)  
    { return(*(char **)0); }
```

```
/* ./tinfo/lib_termname.c */
```

```
#undef termname
```

```
char *termname(void)  
    { return(*(char **)0); }
```

```
/* ./tinfo/lib_tgoto.c */
```

```
#undef tgoto
```

```
char *tgoto(  
    const char *string,  
    int x,  
    int y)  
    { return(*(char **)0); }
```

```
/* ./tinfo/lib_ti.c */
```

```
#undef tigetflag
```

```
int tigetflag(  
    char *str)  
    { return(*(int *)0); }
```

```
#undef tigetnum
```

```
int tigetnum(  
    char *str)  
    { return(*(int *)0); }
```

```

#undef tigetstr
char *tigetstr(
    char *str)
    { return(*(char **)0); }

/* ./tinfo/lib_tparm.c */

#undef _nc_tparm_err
int _nc_tparm_err;

#undef _nc_tparm_analyze
int _nc_tparm_analyze(
    const char *string,
    char *p_is_s[9],
    int *popcount)
    { return(*(int *)0); }

#undef tparm
char *tparm(
    char *string,
    ...)
    { return(*(char **)0); }

/* ./tinfo/lib_tputs.c */

#undef PC
char PC;
#undef ospeed
NCURSES_OSPEED ospeed;
#undef
    _nc_nulls_sent
int _nc_nulls_sent;

#undef _nc_set_no_padding
void _nc_set_no_padding(
    SCREEN *sp)
    { /* void */ }

#undef delay_output
int delay_output(
    int ms)
    { return(*(int *)0); }

#undef _nc_flush
void _nc_flush(void)
    { /* void */ }

#undef _nc_outch

```

```

int _nc_outh(
    int ch)
    { return(*(int *)0); }

#undef putp
int putp(
    const char *string)
    { return(*(int *)0); }

#undef tputs
int tputs(
    const char *string,
    int affcnt,
    int (*outc)(
    int p1))
    { return(*(int *)0); }

/* ./trace/lib_trace.c */

#undef _nc_tracing
unsigned _nc_tracing;
#undef _nc_tputs_trace
const char *_nc_tputs_trace = {0};
#undef _nc_outchars
long _nc_outchars;

#undef trace
void trace(
    const unsigned int tracelevel)
    { /* void */ }

#undef _tracef
void _tracef(
    const char *fmt,
    ...)
    { /* void */ }

#undef _nc_retrace_bool
NCURSES_BOOL _nc_retrace_bool(
    NCURSES_BOOL code)
    { return(*(NCURSES_BOOL *)0); }

#undef _nc_retrace_int
int _nc_retrace_int(
    int code)
    {
    return(*(int *)0); }

```

```
#undef _nc_retrace_unsigned
unsigned _nc_retrace_unsigned(
    unsigned code)
    { return(*(unsigned *)0); }
```

```
#undef _nc_retrace_ptr
char *_nc_retrace_ptr(
    char *code)
    { return(*(char **)0); }
```

```
#undef _nc_retrace_cptr
const char *_nc_retrace_cptr(
    const char *code)
    { return(*(const char **)0); }
```

```
#undef _nc_retrace_cvoid_ptr
void *_nc_retrace_cvoid_ptr(
    void *code)
    { return(*(void **)0); }
```

```
#undef _nc_retrace_void_ptr
void *_nc_retrace_void_ptr(
    void *code)
    { return(*(void **)0); }
```

```
#undef _nc_retrace_sp
SCREEN *_nc_retrace_sp(
    SCREEN *code)
    { return(*(SCREEN **)0); }
```

```
#undef _nc_retrace_win
WINDOW *_nc_retrace_win(
    WINDOW *code)
    { return(*(WINDOW **)0); }
```

```
/* ./trace/lib_traceatr.c */
```

```
#undef _traceattr2
char *_traceattr2(
    int bufnum,
    chtype newmode)
    { return(*(char **)0); }
```

```
#undef _traceattr
char *_traceattr(
    attr_t newmode)
    { return(*(char **)0); }
```

```

#undef _nc_retrace_attr_t
attr_t _nc_retrace_attr_t(
    attr_t code)
{ return(*(attr_t
*); }

#undef _nc_altcharset_name
const char *_nc_altcharset_name(
    attr_t attr,
    chtype ch)
{ return(*(const char **)0); }

#undef _tracechtype2
char *_tracechtype2(
    int bufnum,
    chtype ch)
{ return(*(char **)0); }

#undef _tracechtype
char *_tracechtype(
    chtype ch)
{ return(*(char **)0); }

#undef _nc_retrace_chtype
chtype _nc_retrace_chtype(
    chtype code)
{ return(*(chtype *)0); }

/* ./trace/lib_tracebits.c */

typedef struct {
    unsigned int val;
    const char *name;
} BITNAMES;

#undef _nc_trace_ttymode
char *_nc_trace_ttymode(
    struct termios *tty)
{ return(*(char **)0); }

#undef _nc_tracebits
char *_nc_tracebits(void)
{ return(*(char **)0); }

/* ./trace/lib_tracechr.c */

#undef _nc_tracechar
char *_nc_tracechar(

```



```

SCREEN *sp,
int ch)
{ return(*(char **)0); }

#undef _tracechar
char *_tracechar(
int ch)
{ return(*(char **)0); }

/* ./tinfo/lib_ttyflags.c */

#undef _nc_get_tty_mode
int _nc_get_tty_mode(
struct termios *buf)
{ return(*(int
*)0); }

#undef _nc_set_tty_mode
int _nc_set_tty_mode(
struct termios *buf)
{ return(*(int *)0); }

#undef def_shell_mode
int def_shell_mode(void)
{ return(*(int *)0); }

#undef def_prog_mode
int def_prog_mode(void)
{ return(*(int *)0); }

#undef reset_prog_mode
int reset_prog_mode(void)
{ return(*(int *)0); }

#undef reset_shell_mode
int reset_shell_mode(void)
{ return(*(int *)0); }

#undef savetty
int savetty(void)
{ return(*(int *)0); }

#undef resetty
int resetty(void)
{ return(*(int *)0); }

/* ./tty/lib_twait.c */

```

```

#undef _nc_timed_wait
int _nc_timed_wait(
    SCREEN *sp,
    int mode,
    int milliseconds,
    int *timeleft)
{ return(*(int *)0); }

/* ./tinfo/name_match.c */

#undef _nc_first_name
char *_nc_first_name(
    const char *const sp)
{ return(*(char **)0); }

#undef _nc_name_match
int _nc_name_match(
    const char *const namelst,
    const char *const name,
    const char *const delim)
{ return(*(int *)0); }

/* ./names.c */

#undef boolnames
char *const
boolnames[] = {0};
#undef boolfnames
char *const boolfnames[] = {0};
#undef numnames
char *const numnames[] = {0};
#undef numfnames
char *const numfnames[] = {0};
#undef strnames
char *const strnames[] = {0};
#undef strfnames
char *const strfnames[] = {0};

/* ./tinfo/read_entry.c */

#include <hashed_db.h>

#undef _nc_read_termtype
int _nc_read_termtype(
    TERMTYPE *ptr,
    char *buffer,
    int limit)
{ return(*(int *)0); }

```

```

#undef _nc_read_file_entry
int _nc_read_file_entry(
    const char *const filename,
    TERMTYPE *ptr)
{ return(*(int *)0); }

#undef _nc_read_entry
int _nc_read_entry(
    const char *const name,
    char *const filename,
    TERMTYPE *const tp)
{ return(*(int *)0); }

/* ./tinfo/read_termcap.c */

#include <sys/types.h>

#undef _nc_read_termcap_entry
int _nc_read_termcap_entry(
    const char *const tn,
    TERMTYPE *const tp)
{ return(*(int *)0); }

/* ./tinfo/setbuf.c */

#undef _nc_set_buffer
void _nc_set_buffer(
    FILE *ofp,
    NCURSES_BOOL buffered)
{
    /* void */ }

/* ./tinfo/strings.c */

#undef _nc_str_init
string_desc *_nc_str_init(
    string_desc *dst,
    char *src,
    size_t len)
{ return(*(string_desc **)0); }

#undef _nc_str_null
string_desc *_nc_str_null(
    string_desc *dst,
    size_t len)
{ return(*(string_desc **)0); }

```

```

#undef _nc_str_copy
string_desc *_nc_str_copy(
    string_desc *dst,
    string_desc *src)
    { return(*(string_desc **)0); }

#undef _nc_safe_strcat
NCURSES_BOOL _nc_safe_strcat(
    string_desc *dst,
    const char *src)
    { return(*(NCURSES_BOOL *)0); }

#undef _nc_safe_strcpy
NCURSES_BOOL _nc_safe_strcpy(
    string_desc *dst,
    const char *src)
    { return(*(NCURSES_BOOL *)0); }

/* ./trace/trace_buf.c */

#undef _nc_trace_buf
char *_nc_trace_buf(
    int bufnum,
    size_t want)
    { return(*(char **)0); }

#undef _nc_trace_bufcat
char *_nc_trace_bufcat(
    int bufnum,
    const char *value)
    { return(*(char **)0); }

/* ./trace/trace_tries.c */

#undef _nc_trace_tries
void _nc_trace_tries(
    TRIES *tree)
    {
    /* void */ }

/* ./base/tries.c */

#undef _nc_expand_try
char *_nc_expand_try(
    TRIES *tree,
    unsigned code,
    int *count,
    size_t len)

```

```

    { return(*(char **)0); }

#undef _nc_remove_key
int _nc_remove_key(
    TRIES **tree,
    unsigned code)
    { return(*(int *)0); }

#undef _nc_remove_string
int _nc_remove_string(
    TRIES **tree,
    const char *string)
    { return(*(int *)0); }

/* ./tinfo/trim_sgr0.c */

#undef _nc_trim_sgr0
char *_nc_trim_sgr0(
    TERMTYPE *tp)
    { return(*(char **)0); }

/* ./unctrl.c */

#undef _nc_unctrl
char *_nc_unctrl(
    SCREEN *sp,
    chtype ch)
    { return(*(char **)0); }

#undef unctrl
char *unctrl(
    chtype ch)
    { return(*(char **)0); }

/* ./trace/visbuf.c */

#undef _nc_visbuf2
const char *_nc_visbuf2(
    int bufnum,
    const char *buf)
    { return(*(const char **)0); }

#undef _nc_visbuf
const char *_nc_visbuf(
    const char *buf)
    { return(*(const char **)0); }

#undef _nc_visbufn

```

```

const char *_nc_visbufn(
    const char *buf,
    int len)
    { return(*(const
char **)); }

#undef _nc_visbuf2
const char *_nc_visbuf2(
    int bufnum,
    const chtype *buf,
    int len)
    { return(*(const char **)); }

#undef _nc_visbuf
const char *_nc_visbuf(
    const chtype *buf,
    int len)
    { return(*(const char **)); }

/* ./tinfo/alloc_entry.c */

#undef _nc_init_entry
void _nc_init_entry(
    TERMTYPE *const tp)
    { /* void */ }

#undef _nc_copy_entry
ENTRY *_nc_copy_entry(
    ENTRY *oldp)
    { return(*(ENTRY **)); }

#undef _nc_save_str
char *_nc_save_str(
    const char *const string)
    { return(*(char **)); }

#undef _nc_wrap_entry
void _nc_wrap_entry(
    ENTRY *const ep,
    NCURSES_BOOL copy_strings)
    { /* void */ }

#undef _nc_merge_entry
void _nc_merge_entry(
    TERMTYPE *const to,
    TERMTYPE *const from)
    { /* void */ }

```

```

/* ./tinfo/captainfo.c */

#undef _nc_captainfo
char *_nc_captainfo(
    const char *cap,
    const char *s,
    int const parameterized)
    { return(*(char **)0); }

#undef _nc_infotocap
char *_nc_infotocap(
    const char *cap,

    const char *str,
    int const parameterized)
    { return(*(char **)0); }

/* ./comp_captab.c */

#include <hashsize.h>

#undef _nc_get_table
const struct name_table_entry *_nc_get_table(
    NCURSES_BOOL termcap)
    { return(*(const struct name_table_entry **)0); }

#undef _nc_get_hash_table
const short *_nc_get_hash_table(
    NCURSES_BOOL termcap)
    { return(*(const short **)0); }

#undef _nc_get_alias_table
const struct alias *_nc_get_alias_table(
    NCURSES_BOOL termcap)
    { return(*(const struct alias **)0); }

/* ./tinfo/comp_expand.c */

#undef _nc_tic_expand
char *_nc_tic_expand(
    const char *srcp,
    NCURSES_BOOL tic_format,
    int numbers)
    { return(*(char **)0); }

/* ./tinfo/comp_hash.c */

#undef _nc_find_entry

```

```

struct name_table_entry const *_nc_find_entry(
    const char *string,
    const short *hash_table)
    { return(*(struct name_table_entry const **)0); }

#undef _nc_find_type_entry
struct name_table_entry const *_nc_find_type_entry(
    const char *string,
    int type,
    const
    struct name_table_entry *table)
    { return(*(struct name_table_entry const **)0); }

/* ./tinfo/comp_parse.c */

#undef _nc_check_termtype2
void (_nc_check_termtype2)(
    TERMTYPE *p1,
    NCURSES_BOOL p2);
#undef _nc_check_termtype
void (_nc_check_termtype)(
    TERMTYPE *p1);

#undef _nc_entry_match
NCURSES_BOOL _nc_entry_match(
    char *n1,
    char *n2)
    { return(*(NCURSES_BOOL *)0); }

#undef _nc_read_entry_source
void _nc_read_entry_source(
    FILE *fp,
    char *buf,
    int literal,
    NCURSES_BOOL silent,
    NCURSES_BOOL (*hook)(
    ENTRY *p1))
    { /* void */ }

#undef _nc_resolve_uses2
int _nc_resolve_uses2(
    NCURSES_BOOL fullresolve,
    NCURSES_BOOL literal)
    { return(*(int *)0); }

#undef _nc_resolve_uses
int _nc_resolve_uses(
    NCURSES_BOOL fullresolve)

```



```

    { return(*(int *)0); }

/* ./tinfo/comp_scan.c */

#undef _nc_syntax
int _nc_syntax;
#undef _nc_curr_file_pos
long _nc_curr_file_pos;
#undef _nc_comment_start
long _nc_comment_start;
#undef _nc_comment_end
long _nc_comment_end;
#undef
    _nc_start_line
long _nc_start_line;
#undef _nc_curr_token
struct token _nc_curr_token;
#undef _nc_disable_period
NCURSES_BOOL _nc_disable_period;

#undef _nc_reset_input
void _nc_reset_input(
    FILE *fp,
    char *buf)
    { /* void */ }

#undef _nc_get_token
int _nc_get_token(
    NCURSES_BOOL silent)
    { return(*(int *)0); }

#undef _nc_trans_string
int _nc_trans_string(
    char *ptr,
    char *last)
    { return(*(int *)0); }

#undef _nc_push_token
void _nc_push_token(
    int tokclass)
    { /* void */ }

#undef _nc_panic_mode
void _nc_panic_mode(
    char ch)
    { /* void */ }

/* ./tinfo/parse_entry.c */

```

```
#undef _nc_parse_entry
int _nc_parse_entry(
    struct entry *entryp,
    int literal,
    NCURSES_BOOL silent)
{ return(*(int *)0); }
```

```
#undef _nc_capcmp
int _nc_capcmp(
    const char *s,
    const char *t)
{ return(*(int *)0); }
```

```
typedef struct {
    const char *from;
    const char *to;
} assoc;
```

```
/* ./tinfo/write_entry.c */
```

```
#undef _nc_set_writedir
void _nc_set_writedir(
    char *dir)
{
/* void */ }
```

```
#undef _nc_write_entry
void _nc_write_entry(
    TERMTYPE *const tp)
{ /* void */ }
```

```
#undef _nc_tic_written
int _nc_tic_written(void)
{ return(*(int *)0); }
```

```
/* ./base/define_key.c */
```

```
#undef define_key
int define_key(
    const char *str,
    int keycode)
{ return(*(int *)0); }
```

```
/* ./tinfo/hashed_db.c */
```

```
#undef _nc_hashed_db
void _nc_hashed_db(void)
```

```

{ /* void */ }

/* ./base/key_defined.c */

#undef key_defined
int key_defined(
    const char *str)
{ return(*(int *)0); }

/* ./base/keybound.c */

#undef keybound
char *keybound(
    int code,
    int count)
{ return(*(char **)0); }

/* ./base/keyok.c */

#undef keyok
int keyok(
    int c,
    NCURSES_BOOL flag)
{ return(*(int *)0); }

/* ./base/version.c */

#undef curses_version
const char *curses_version(void)
{ return(*(const char **)0); }

```

Found in path(s):

```

* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/ncurses/lib-ncurses
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```

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*****
* @Id: ncurses.3x,v 1.91 2008/10/11 20:43:11 tom Exp @
-->

```

Found in path(s):

```

* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/doc/html/man/ncurses.3x.html
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*****
* Author: Thomas E. Dickey 1996-2005
* @Id: resizeterm.3x,v 1.11 2005/06/25 22:19:42 tom Exp @
-->

```

Found in path(s):

```

* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-
5.7/doc/html/man/resizeterm.3x.html

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*****/

```



```
-- $Revision:
1.29 $
-- $Date: 2006/06/25 14:30:21 $
-- Binding Version 01.00
```

```
-----
include('Form_Base_Defs')
with System;
with Ada.Characters.Latin_1;

package Terminal_Interface.Curses.Forms is
  pragma Preelaborate (Terminal_Interface.Curses.Forms);
include('Form_Linker_Options')dnl
include('Linker_Options')
  Space : Character renames Ada.Characters.Latin_1.Space;
```

```
type Field    is private;
type Form     is private;
```

```
Null_Field    : constant Field;
Null_Form     : constant Form;
```

```
type Field_Justification is (None,
                             Left,
                             Center,
                             Right);
```

```
pragma Warnings (Off);
include('Field_Rep')Dnl
```

```
pragma Warnings (On);
```

```
function Default_Field_Options return Field_Option_Set;
-- The initial defaults for the field options.
pragma Inline (Default_Field_Options);
```

```
pragma Warnings (Off);
include('Form_Opt_Rep')Dnl
```

```
pragma Warnings (On);
```

```
function Default_Form_Options return Form_Option_Set;
-- The initial defaults for the form options.
pragma Inline (Default_Form_Options);
```

```
type Buffer_Number is new Natural;
```

```
type Field_Array is array (Positive range <>) of aliased Field;
pragma Convention (C, Field_Array);
```

```

type Field_Array_Access is access Field_Array;

procedure Free (FA      : in out Field_Array_Access;
               Free_Fields : in Boolean := False);
-- Release the memory for an allocated field array
-- If Free_Fields is True, call Delete() for all the fields in
-- the array.

subtype Form_Request_Code is Key_Code range (Key_Max + 1) .. (Key_Max + 57);

-- The prefix F_ stands for "Form Request"
F_Next_Page      : constant Form_Request_Code := Key_Max + 1;
F_Previous_Page  : constant Form_Request_Code := Key_Max + 2;
F_First_Page     : constant Form_Request_Code := Key_Max
+ 3;
F_Last_Page      : constant Form_Request_Code := Key_Max + 4;

F_Next_Field     : constant Form_Request_Code := Key_Max + 5;
F_Previous_Field : constant Form_Request_Code := Key_Max + 6;
F_First_Field    : constant Form_Request_Code := Key_Max + 7;
F_Last_Field     : constant Form_Request_Code := Key_Max + 8;
F_Sorted_Next_Field : constant Form_Request_Code := Key_Max + 9;
F_Sorted_Previous_Field : constant Form_Request_Code := Key_Max + 10;
F_Sorted_First_Field : constant Form_Request_Code := Key_Max + 11;
F_Sorted_Last_Field : constant Form_Request_Code := Key_Max + 12;
F_Left_Field     : constant Form_Request_Code := Key_Max + 13;
F_Right_Field    : constant Form_Request_Code := Key_Max + 14;
F_Up_Field       : constant Form_Request_Code := Key_Max + 15;
F_Down_Field     : constant Form_Request_Code := Key_Max + 16;

F_Next_Char      : constant Form_Request_Code := Key_Max + 17;
F_Previous_Char  : constant Form_Request_Code := Key_Max + 18;
F_Next_Line      : constant Form_Request_Code := Key_Max + 19;
F_Previous_Line  : constant Form_Request_Code := Key_Max + 20;
F_Next_Word      : constant Form_Request_Code := Key_Max + 21;
F_Previous_Word  : constant Form_Request_Code := Key_Max + 22;
F_Begin_Field    : constant Form_Request_Code := Key_Max + 23;
F_End_Field      : constant Form_Request_Code := Key_Max + 24;
F_Begin_Line     : constant Form_Request_Code := Key_Max + 25;
F_End_Line       : constant Form_Request_Code := Key_Max + 26;
F_Left_Char      : constant Form_Request_Code := Key_Max + 27;
F_Right_Char     : constant Form_Request_Code := Key_Max + 28;
F_Up_Char        : constant Form_Request_Code := Key_Max + 29;
F_Down_Char      : constant Form_Request_Code := Key_Max + 30;

```



```

F_New_Line           : constant Form_Request_Code := Key_Max + 31;
F_Insert_Char       : constant Form_Request_Code := Key_Max + 32;
F_Insert_Line      : constant Form_Request_Code := Key_Max + 33;
F_Delete_Char      : constant Form_Request_Code := Key_Max + 34;
F_Delete_Previous  : constant Form_Request_Code := Key_Max + 35;
F_Delete_Line      : constant Form_Request_Code := Key_Max + 36;
F_Delete_Word      : constant Form_Request_Code := Key_Max + 37;
F_Clear_EOL        : constant Form_Request_Code := Key_Max + 38;
F_Clear_EOF        : constant Form_Request_Code := Key_Max + 39;
F_Clear_Field      : constant Form_Request_Code := Key_Max + 40;
F_Overlay_Mode     : constant Form_Request_Code := Key_Max + 41;
F_Insert_Mode      : constant Form_Request_Code := Key_Max + 42;

-- Vertical Scrolling

F_ScrollForward_Line   : constant Form_Request_Code := Key_Max + 43;
F_ScrollBackward_Line  : constant Form_Request_Code := Key_Max + 44;
F_ScrollForward_Page   : constant Form_Request_Code := Key_Max + 45;
F_ScrollBackward_Page  : constant Form_Request_Code := Key_Max + 46;
F_ScrollForward_HalfPage : constant Form_Request_Code := Key_Max + 47;
F_ScrollBackward_HalfPage : constant Form_Request_Code := Key_Max + 48;

-- Horizontal Scrolling

F_HScrollForward_Char   : constant Form_Request_Code := Key_Max + 49;
F_HScrollBackward_Char  : constant Form_Request_Code := Key_Max + 50;
F_HScrollForward_Line   : constant Form_Request_Code := Key_Max + 51;
F_HScrollBackward_Line  : constant Form_Request_Code := Key_Max + 52;
F_HScrollForward_HalfLine : constant Form_Request_Code := Key_Max + 53;
F_HScrollBackward_HalfLine : constant Form_Request_Code := Key_Max + 54;

F_Validate_Field       : constant Form_Request_Code :=
Key_Max + 55;
F_Next_Choice          : constant Form_Request_Code := Key_Max + 56;
F_Previous_Choice      : constant Form_Request_Code := Key_Max + 57;

-- For those who like the old 'C' style request names
REQ_NEXT_PAGE         : Form_Request_Code renames F_Next_Page;
REQ_PREV_PAGE         : Form_Request_Code renames F_Previous_Page;
REQ_FIRST_PAGE        : Form_Request_Code renames F_First_Page;
REQ_LAST_PAGE         : Form_Request_Code renames F_Last_Page;

REQ_NEXT_FIELD        : Form_Request_Code renames F_Next_Field;
REQ_PREV_FIELD        : Form_Request_Code renames F_Previous_Field;
REQ_FIRST_FIELD       : Form_Request_Code renames F_First_Field;
REQ_LAST_FIELD        : Form_Request_Code renames F_Last_Field;
REQ_SNEXT_FIELD       : Form_Request_Code renames F_Sorted_Next_Field;
REQ_SPREV_FIELD       : Form_Request_Code renames F_Sorted_Previous_Field;
REQ_SFIRST_FIELD      : Form_Request_Code renames F_Sorted_First_Field;

```

REQ\_SLAST\_FIELD : Form\_Request\_Code renames F\_Sorted\_Last\_Field;  
REQ\_LEFT\_FIELD : Form\_Request\_Code renames F\_Left\_Field;  
REQ\_RIGHT\_FIELD : Form\_Request\_Code renames F\_Right\_Field;  
REQ\_UP\_FIELD : Form\_Request\_Code renames F\_Up\_Field;  
REQ\_DOWN\_FIELD : Form\_Request\_Code renames F\_Down\_Field;

REQ\_NEXT\_CHAR : Form\_Request\_Code renames F\_Next\_Char;  
REQ\_PREV\_CHAR : Form\_Request\_Code renames F\_Previous\_Char;  
REQ\_NEXT\_LINE : Form\_Request\_Code renames F\_Next\_Line;  
REQ\_PREV\_LINE : Form\_Request\_Code renames F\_Previous\_Line;  
REQ\_NEXT\_WORD : Form\_Request\_Code renames F\_Next\_Word;  
REQ\_PREV\_WORD : Form\_Request\_Code renames F\_Previous\_Word;  
REQ\_BEG\_FIELD : Form\_Request\_Code renames F\_Begin\_Field;  
REQ\_END\_FIELD : Form\_Request\_Code renames F\_End\_Field;  
REQ\_BEG\_LINE : Form\_Request\_Code renames F\_Begin\_Line;  
REQ\_END\_LINE : Form\_Request\_Code renames F\_End\_Line;  
REQ\_LEFT\_CHAR : Form\_Request\_Code renames F\_Left\_Char;  
REQ\_RIGHT\_CHAR : Form\_Request\_Code renames F\_Right\_Char;  
REQ\_UP\_CHAR : Form\_Request\_Code renames F\_Up\_Char;  
REQ\_DOWN\_CHAR : Form\_Request\_Code renames F\_Down\_Char;

REQ\_NEW\_LINE : Form\_Request\_Code renames F\_New\_Line;  
REQ\_INS\_CHAR : Form\_Request\_Code renames F\_Insert\_Char;  
REQ\_INS\_LINE : Form\_Request\_Code renames F\_Insert\_Line;  
REQ\_DEL\_CHAR : Form\_Request\_Code renames F\_Delete\_Char;  
REQ\_DEL\_PREV : Form\_Request\_Code renames F\_Delete\_Previous;  
REQ\_DEL\_LINE : Form\_Request\_Code renames F\_Delete\_Line;  
REQ\_DEL\_WORD : Form\_Request\_Code renames F\_Delete\_Word;  
REQ\_CLR\_EOL : Form\_Request\_Code renames F\_Clear\_EOL;  
REQ\_CLR\_EOF : Form\_Request\_Code renames F\_Clear\_EOF;  
REQ\_CLR\_FIELD : Form\_Request\_Code renames F\_Clear\_Field;  
REQ\_OVL\_MODE : Form\_Request\_Code renames F\_Overlay\_Mode;  
REQ\_INS\_MODE : Form\_Request\_Code renames F\_Insert\_Mode;

REQ\_SCR\_FLINE : Form\_Request\_Code renames F\_ScrollForward\_Line;  
REQ\_SCR\_BLINE : Form\_Request\_Code renames F\_ScrollBackward\_Line;  
REQ\_SCR\_FPAGE : Form\_Request\_Code renames F\_ScrollForward\_Page;  
REQ\_SCR\_BPAGE : Form\_Request\_Code renames F\_ScrollBackward\_Page;  
REQ\_SCR\_FHPAGE : Form\_Request\_Code renames F\_ScrollForward\_HalfPage;  
REQ\_SCR\_BHPAGE : Form\_Request\_Code renames F\_ScrollBackward\_HalfPage;

REQ\_SCR\_FCHAR : Form\_Request\_Code renames F\_HScrollForward\_Char;  
REQ\_SCR\_BCHAR : Form\_Request\_Code renames F\_HScrollBackward\_Char;  
REQ\_SCR\_HFLINE : Form\_Request\_Code renames F\_HScrollForward\_Line;  
REQ\_SCR\_HBLINE : Form\_Request\_Code renames F\_HScrollBackward\_Line;  
REQ\_SCR\_HFHALLF : Form\_Request\_Code renames F\_HScrollForward\_HalfLine;  
REQ\_SCR\_HBHALLF : Form\_Request\_Code renames F\_HScrollBackward\_HalfLine;

```
REQ_VALIDATION : Form_Request_Code renames F_Validate_Field;
REQ_NEXT_CHOICE : Form_Request_Code renames F_Next_Choice;
REQ_PREV_CHOICE : Form_Request_Code renames F_Previous_Choice;
```

```
procedure Request_Name (Key : in Form_Request_Code;
                        Name : out String);
```

```
function Request_Name (Key : Form_Request_Code) return String;
-- Same as function
pragma Inline (Request_Name);
```

```
-----
-- Exceptions --
-----
```

```
Form_Exception : exception;
```

```
-- MANPAGE(`form_field_new.3x')
```

```
-- ANCHOR(`new_field()`,`Create')
```

```
function Create (Height : Line_Count;
                Width   : Column_Count;
                Top     : Line_Position;
                Left    : Column_Position;
                Off_Screen : Natural := 0;
                More_Buffers : Buffer_Number := Buffer_Number'First)
return Field;
```

```
-- AKA
```

```
-- An overloaded Create is defined later. Pragma Inline appears there.
```

```
-- ANCHOR(`new_field()`,`New_Field')
```

```
function New_Field (Height : Line_Count;
                  Width   : Column_Count;
                  Top     : Line_Position;

                  Left    : Column_Position;
                  Off_Screen : Natural := 0;
                  More_Buffers : Buffer_Number := Buffer_Number'First)
return Field renames Create;
```

```
-- AKA
```

```
pragma Inline (New_Field);
```

```
-- ANCHOR(`free_field()`,`Delete')
```

```
procedure Delete (Fld : in out Field);
```

```
-- AKA
```

```
-- Reset Fld to Null_Field
```

```
-- An overloaded Delete is defined later. Pragma Inline appears there.
```

```
-- ANCHOR(`dup_field()`,`Duplicate')
```

```

function Duplicate (Fld : Field;
                  Top : Line_Position;
                  Left : Column_Position) return Field;
-- AKA
pragma Inline (Duplicate);

-- ANCHOR(`link_field()`,`Link`)
function Link (Fld : Field;
              Top : Line_Position;
              Left : Column_Position) return Field;
-- AKA
pragma Inline (Link);

-- MANPAGE(`form_field_just.3x`)

-- ANCHOR(`set_field_just()`,`Set_Justification`)
procedure Set_Justification
(Fld : in Field;
 Just : in Field_Justification := None);
-- AKA
pragma Inline (Set_Justification);

-- ANCHOR(`field_just()`,`Get_Justification`)
function Get_Justification (Fld : Field) return Field_Justification;
-- AKA
pragma Inline (Get_Justification);

-- MANPAGE(`form_field_buffer.3x`)

-- ANCHOR(`set_field_buffer()`,`Set_Buffer`)
procedure Set_Buffer
(Fld : in Field;
 Buffer : in Buffer_Number := Buffer_Number'First;
 Str : in String);
-- AKA
-- Not inlined

-- ANCHOR(`field_buffer()`,`Get_Buffer`)
procedure Get_Buffer
(Fld : in Field;
 Buffer : in Buffer_Number := Buffer_Number'First;
 Str : out String);
-- AKA

function Get_Buffer
(Fld : in Field;
 Buffer : in Buffer_Number := Buffer_Number'First) return String;
-- AKA

```

```

-- Same but as function
pragma Inline (Get_Buffer);

-- ANCHOR(`set_field_status()`,`Set_Status`)
procedure Set_Status (Fld   : in Field;
                    Status : in Boolean := True);
-- AKA
pragma Inline (Set_Status);

-- ANCHOR(`field_status()`,`Changed`)
function Changed (Fld : Field) return Boolean;
-- AKA
pragma Inline (Changed);

-- ANCHOR(`set_field_max()`,`Set_Maximum_Size`)
procedure Set_Maximum_Size (Fld : in Field;
                          Max : in Natural := 0);
-- AKA
pragma Inline (Set_Maximum_Size);

-- MANPAGE(`form_field_opts.3x`)

-- ANCHOR(`set_field_opts()`,`Set_Options`)
procedure Set_Options (Fld   : in Field;
                    Options : in Field_Option_Set);
-- AKA
-- An overloaded version is defined later. Pragma Inline appears there

-- ANCHOR(`field_opts_on()`,`Switch_Options`)
procedure Switch_Options (Fld   : in Field;
                       Options : in Field_Option_Set;
                       On     : Boolean := True);
-- AKA
-- ALIAS(`field_opts_off()`)
-- An overloaded version is defined later. Pragma Inline appears there

-- ANCHOR(`field_opts()`,`Get_Options`)
procedure Get_Options (Fld   : in Field;
                    Options : out Field_Option_Set);
-- AKA

-- ANCHOR(`field_opts()`,`Get_Options`)
function Get_Options (Fld : Field := Null_Field)
                    return Field_Option_Set;
-- AKA
-- An overloaded version is defined later. Pragma Inline appears there

-- MANPAGE(`form_field_attributes.3x`)

```

```

-- ANCHOR(`set_field_fore()`,`Set_Foreground`)
procedure Set_Foreground
  (Fld : in Field;
   Fore : in Character_Attribute_Set := Normal_Video;
   Color : in Color_Pair := Color_Pair'First);
-- AKA
pragma Inline (Set_Foreground);

-- ANCHOR(`field_fore()`,`Foreground`)
procedure Foreground (Fld : in Field;
                     Fore : out Character_Attribute_Set);
-- AKA

-- ANCHOR(`field_fore()`,`Foreground`)

procedure Foreground (Fld : in Field;
                     Fore : out Character_Attribute_Set;
                     Color : out Color_Pair);
-- AKA
pragma Inline (Foreground);

-- ANCHOR(`set_field_back()`,`Set_Background`)
procedure Set_Background
  (Fld : in Field;
   Back : in Character_Attribute_Set := Normal_Video;
   Color : in Color_Pair := Color_Pair'First);
-- AKA
pragma Inline (Set_Background);

-- ANCHOR(`field_back()`,`Background`)
procedure Background (Fld : in Field;
                     Back : out Character_Attribute_Set);
-- AKA

-- ANCHOR(`field_back()`,`Background`)
procedure Background (Fld : in Field;
                     Back : out Character_Attribute_Set;
                     Color : out Color_Pair);
-- AKA
pragma Inline (Background);

-- ANCHOR(`set_field_pad()`,`Set_Pad_Character`)
procedure Set_Pad_Character (Fld : in Field;
                            Pad : in Character
:= Space);
-- AKA
pragma Inline (Set_Pad_Character);

```

```

-- ANCHOR(`field_pad()`,`Pad_Character`)
procedure Pad_Character (Fld : in Field;
                        Pad : out Character);
-- AKA
pragma Inline (Pad_Character);

-- MANPAGE(`form_field_info.3x`)

-- ANCHOR(`field_info()`,`Info`)
procedure Info (Fld          : in Field;
               Lines        : out Line_Count;
               Columns      : out Column_Count;
               First_Row    : out Line_Position;
               First_Column : out Column_Position;
               Off_Screen   : out Natural;
               Additional_Buffers : out Buffer_Number);
-- AKA
pragma Inline (Info);

-- ANCHOR(`dynamic_field_info()`,`Dynamic_Info`)
procedure Dynamic_Info (Fld : in Field;
                       Lines : out Line_Count;
                       Columns : out Column_Count;
                       Max    : out Natural);
-- AKA
pragma Inline (Dynamic_Info);

-- MANPAGE(`form_win.3x`)

-- ANCHOR(`set_form_win()`,`Set_Window`)
procedure Set_Window (Frm : in Form;
                     Win : in Window);
-- AKA
pragma Inline (Set_Window);

-- ANCHOR(`form_win()`,`Get_Window`)
function Get_Window (Frm : Form) return Window;
-- AKA
pragma Inline (Get_Window);

-- ANCHOR(`set_form_sub()`,`Set_Sub_Window`)
procedure Set_Sub_Window (Frm : in Form;
                          Win : in Window);
-- AKA
pragma Inline (Set_Sub_Window);

```

```

-- ANCHOR(`form_sub()`,`Get_Sub_Window`)
function Get_Sub_Window (Frm : Form) return Window;
-- AKA
pragma Inline (Get_Sub_Window);

-- ANCHOR(`scale_form()`,`Scale`)
procedure Scale (Frm   : in Form;
                Lines  : out Line_Count;
                Columns : out Column_Count);
-- AKA
pragma Inline (Scale);

-- MANPAGE(`form_hook.3x`)

type Form_Hook_Function
is access procedure (Frm : in Form);
pragma Convention (C, Form_Hook_Function);

-- ANCHOR(`set_field_init()`,`Set_Field_Init_Hook`)
procedure Set_Field_Init_Hook (Frm : in Form;
                              Proc : in Form_Hook_Function);
-- AKA
pragma Inline (Set_Field_Init_Hook);

-- ANCHOR(`set_field_term()`,`Set_Field_Term_Hook`)
procedure Set_Field_Term_Hook (Frm : in Form;
                              Proc : in Form_Hook_Function);
-- AKA
pragma Inline (Set_Field_Term_Hook);

-- ANCHOR(`set_form_init()`,`Set_Form_Init_Hook`)
procedure Set_Form_Init_Hook (Frm : in Form;
                              Proc : in Form_Hook_Function);
-- AKA
pragma Inline (Set_Form_Init_Hook);

-- ANCHOR(`set_form_term()`,`Set_Form_Term_Hook`)
procedure Set_Form_Term_Hook (Frm : in Form;
                              Proc : in Form_Hook_Function);
-- AKA
pragma Inline (Set_Form_Term_Hook);

-- ANCHOR(`field_init()`,`Get_Field_Init_Hook`)
function Get_Field_Init_Hook (Frm : Form) return Form_Hook_Function;
-- AKA
pragma Import (C, Get_Field_Init_Hook, "field_init");

-- ANCHOR(`field_term()`,`Get_Field_Term_Hook`)

```



```

function Get_Field_Term_Hook (Frm : Form) return Form_Hook_Function;
-- AKA
pragma Import (C, Get_Field_Term_Hook, "field_term");

-- ANCHOR(`form_init()`,`Get_Form_Init_Hook`)
function Get_Form_Init_Hook (Frm : Form) return Form_Hook_Function;
-- AKA
pragma Import (C, Get_Form_Init_Hook, "form_init");

-- ANCHOR(`form_term()`,`Get_Form_Term_Hook`)
function Get_Form_Term_Hook (Frm : Form) return Form_Hook_Function;
-- AKA
pragma Import (C, Get_Form_Term_Hook, "form_term");

-- MANPAGE(`form_field.3x`)

-- ANCHOR(`set_form_fields()`,`Redefine`)
procedure Redefine (Frm : in Form;
                   Flds : in Field_Array_Access);
-- AKA
pragma Inline (Redefine);

-- ANCHOR(`set_form_fields()`,`Set_Fields`)

procedure Set_Fields (Frm : in Form;
                     Flds : in Field_Array_Access) renames Redefine;
-- AKA
-- pragma Inline (Set_Fields);

-- ANCHOR(`form_fields()`,`Fields`)
function Fields (Frm : Form;
                Index : Positive) return Field;
-- AKA
pragma Inline (Fields);

-- ANCHOR(`field_count()`,`Field_Count`)
function Field_Count (Frm : Form) return Natural;
-- AKA
pragma Inline (Field_Count);

-- ANCHOR(`move_field()`,`Move`)
procedure Move (Fld : in Field;
               Line : in Line_Position;
               Column : in Column_Position);
-- AKA
pragma Inline (Move);

-- MANPAGE(`form_new.3x`)

```

```

-- ANCHOR(`new_form()`,`Create`)
function Create (Fields : Field_Array_Access) return Form;
-- AKA
pragma Inline (Create);

-- ANCHOR(`new_form()`,`New_Form`)
function New_Form (Fields : Field_Array_Access) return Form
renames Create;
-- AKA
-- pragma Inline (New_Form);

-- ANCHOR(`free_form()`,`Delete`)
procedure Delete (Frm : in out Form);
-- AKA
-- Reset Frm to Null_Form
pragma Inline (Delete);

-- MANPAGE(`form_opts.3x`)

-- ANCHOR(`set_form_opts()`,`Set_Options`)
procedure Set_Options (Frm : in Form;
Options : in Form_Option_Set);
-- AKA
pragma Inline (Set_Options);

-- ANCHOR(`form_opts_on()`,`Switch_Options`)
procedure Switch_Options (Frm : in Form;
Options : in Form_Option_Set;
On : Boolean := True);
-- AKA
-- ALIAS(`form_opts_off()`)
pragma Inline (Switch_Options);

-- ANCHOR(`form_opts()`,`Get_Options`)
procedure Get_Options (Frm : in Form;
Options : out Form_Option_Set);
-- AKA

-- ANCHOR(`form_opts()`,`Get_Options`)
function Get_Options (Frm : Form := Null_Form) return Form_Option_Set;
-- AKA
pragma Inline (Get_Options);

--
MANPAGE(`form_post.3x`)

-- ANCHOR(`post_form()`,`Post`)

```

```

procedure Post (Frm : in Form;
               Post : in Boolean := True);
-- AKA
-- ALIAS(`unpost_form()`)
pragma Inline (Post);

-- MANPAGE(`form_cursor.3x`)

-- ANCHOR(`pos_form_cursor()`,`Position_Cursor`)
procedure Position_Cursor (Frm : Form);
-- AKA
pragma Inline (Position_Cursor);

-- MANPAGE(`form_data.3x`)

-- ANCHOR(`data_ahead()`,`Data_Ahead`)
function Data_Ahead (Frm : Form) return Boolean;
-- AKA
pragma Inline (Data_Ahead);

-- ANCHOR(`data_behind()`,`Data_Behind`)
function Data_Behind (Frm : Form) return Boolean;
-- AKA
pragma Inline (Data_Behind);

-- MANPAGE(`form_driver.3x`)

type Driver_Result is (Form_Ok,
                      Request_Denied,
                      Unknown_Request,
                      Invalid_Field);

-- ANCHOR(`form_driver()`,`Driver`)
function Driver (Frm : Form;
               Key : Key_Code)
return Driver_Result;
-- AKA
-- Driver not inlined

-- MANPAGE(`form_page.3x`)

type Page_Number is new Natural;

-- ANCHOR(`set_current_field()`,`Set_Current`)
procedure Set_Current (Frm : in Form;
                     Fld : in Field);
-- AKA
pragma Inline (Set_Current);

```

```

-- ANCHOR(`current_field()`,`Current`)
function Current (Frm : in Form) return Field;
-- AKA
pragma Inline (Current);

-- ANCHOR(`set_form_page()`,`Set_Page`)
procedure Set_Page (Frm : in Form;
                   Page : in Page_Number := Page_Number'First);
-- AKA
pragma Inline (Set_Page);

-- ANCHOR(`form_page()`,`Page`)
function Page (Frm : Form) return Page_Number;
-- AKA
pragma Inline (Page);

-- ANCHOR(`field_index()`,`Get_Index`)
function Get_Index (Fld : Field) return Positive;
-- AKA
-- Please note that in this binding we start the numbering of fields
-- with 1. So this is number is one more than you get
-- from the low
-- level call.
pragma Inline (Get_Index);

-- MANPAGE(`form_new_page.3x`)

-- ANCHOR(`set_new_page()`,`Set_New_Page`)
procedure Set_New_Page (Fld : in Field;
                      New_Page : in Boolean := True);
-- AKA
pragma Inline (Set_New_Page);

-- ANCHOR(`new_page()`,`Is_New_Page`)
function Is_New_Page (Fld : Field) return Boolean;
-- AKA
pragma Inline (Is_New_Page);

-- MANPAGE(`form_requestname.3x`)
-- Not Implemented: form_request_name, form_request_by_name

-----
private
type Field is new System.Storage_Elements.Integer_Address;
type Form is new System.Storage_Elements.Integer_Address;

Null_Field : constant Field := 0;

```

```
Null_Form : constant Form := 0;
```

```
end Terminal_Interface.Curses.Forms;
```

Found in path(s):

```
* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-  
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/Ada95/gen/terminal_interface-  
curses-forms.ads.m4
```

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```
-- *- ada *-
```

```
define('HTMLNAME',`terminal_interface-curses-mouse__ads.htm')dnl  
include(M4MACRO)dnl
```

```
-----
```

```
--  
-- GNAT ncurses Binding --  
--  
-- Terminal_Interface.Curses.Mouse --  
--  
-- S P E C --  
--  
-----
```

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-- authorization.                                     --
-----
-- Author: Juergen Pfeifer, 1996
-- Version Control:
-- $Revision:
1.27 $
-- $Date: 2006/06/25 14:30:22 $
-- Binding Version 01.00
-----
include(^Mouse_Base_Defs')
with System;

package Terminal_Interface.Curses.Mouse is
pragma Preelaborate (Terminal_Interface.Curses.Mouse);

-- MANPAGE(^curs_mouse.3x')
-- Please note, that in ncurses-1.9.9e documentation mouse support
-- is still marked as experimental. So also this binding will change
-- if the ncurses methods change.
--
-- mouse_trafo, wmouse_trafo are implemented as Transform_Coordinates
-- in the parent package.
--
-- Not implemented:
-- REPORT_MOUSE_POSITION (i.e. as a parameter to Register_Reportable_Event
-- or Start_Mouse)
type Event_Mask is private;
No_Events : constant Event_Mask;
All_Events : constant Event_Mask;

type Mouse_Button is (Left, -- aka: Button 1
Middle, -- aka: Button 2
Right, -- aka:
Button 3
Button4, -- aka: Button 4
Control, -- Control Key
Shift, -- Shift Key
Alt); -- ALT Key

subtype Real_Buttons is Mouse_Button range Left .. Button4;
subtype Modifier_Keys is Mouse_Button range Control .. Alt;

type Button_State is (Released,
Pressed,
Clicked,
Double_Clicked,
Triple_Clicked);

```

```

type Button_States is array (Button_State) of Boolean;
pragma Pack (Button_States);

All_Clicks : constant Button_States := (Clicked .. Triple_Clicked => True,
                                         others => False);
All_States : constant Button_States := (others => True);

type Mouse_Event is private;

-- MANPAGE(^curs_mouse.3x')

function Has_Mouse return Boolean;
-- Return true if a mouse device is supported, false otherwise.

procedure
Register_Reportable_Event
  (Button : in Mouse_Button;
   State  : in Button_State;
   Mask   : in out Event_Mask);
-- Stores the event described by the button and the state in the mask.
-- Before you call this the first time, you should init the mask
-- with the Empty_Mask constant
pragma Inline (Register_Reportable_Event);

procedure Register_Reportable_Events
  (Button : in Mouse_Button;
   State  : in Button_States;
   Mask   : in out Event_Mask);
-- Register all events described by the Button and the State bitmap.
-- Before you call this the first time, you should init the mask
-- with the Empty_Mask constant

-- ANCHOR(^mousemask(),`Start_Mouse')
-- There is one difference to mousmask(): we return the value of the
-- old mask, that means the event mask value before this call.
-- Not Implemented: The library version
-- returns a Mouse_Mask that tells which events are reported.
function Start_Mouse (Mask : Event_Mask
:= All_Events)
    return Event_Mask;
-- AKA
pragma Inline (Start_Mouse);

procedure End_Mouse (Mask : in Event_Mask := No_Events);
-- Terminates the mouse, restores the specified event mask
pragma Inline (End_Mouse);

-- ANCHOR(^getmouse(),`Get_Mouse')

```

```

function Get_Mouse return Mouse_Event;
-- AKA
pragma Inline (Get_Mouse);

procedure Get_Event (Event : in Mouse_Event;
                    Y    : out Line_Position;
                    X    : out Column_Position;
                    Button : out Mouse_Button;
                    State : out Button_State);
-- !!! Warning: X and Y are screen coordinates. Due to ripped of lines they
-- may not be identical to window coordinates.
-- Not Implemented: Get_Event only reports one event, the C library
-- version supports multiple events, e.g. {click-1, click-3}
pragma Inline (Get_Event);

-- ANCHOR(`ungetmouse()`,`Unget_Mouse`)
procedure
Unget_Mouse (Event : in Mouse_Event);
-- AKA
pragma Inline (Unget_Mouse);

-- ANCHOR(`wenclose()`,`Enclosed_In_Window`)
function Enclosed_In_Window (Win    : Window := Standard_Window;
                             Event  : Mouse_Event) return Boolean;
-- AKA
-- But : use event instead of screen coordinates.
pragma Inline (Enclosed_In_Window);

-- ANCHOR(`mouseinterval()`,`Mouse_Interval`)
function Mouse_Interval (Msec : Natural := 200) return Natural;
-- AKA
pragma Inline (Mouse_Interval);

private
type Event_Mask is new Interfaces.C.unsigned_long;

type Mouse_Event is
record
    Id    : Integer range Integer (Interfaces.C.short'First) ..
           Integer (Interfaces.C.short'Last);
    X, Y, Z : Integer range Integer (Interfaces.C.int'First) ..
           Integer (Interfaces.C.int'Last);
    Bstate : Event_Mask;
end record;
pragma Convention (C, Mouse_Event);

include(`Mouse_Event_Rep`)

```



```
Generation_Bit_Order : constant System.Bit_Order := System.M4_BIT_ORDER;  
-- This constant may be different on your system.
```

```
include(`Mouse_Events`)  
No_Events : constant Event_Mask := 0;  
All_Events : constant Event_Mask := ALL_MOUSE_EVENTS;  
  
end Terminal_Interface.Curses.Mouse;
```

```
Found in path(s):  
* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-  
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/Ada95/gen/terminal_interface-  
curses-mouse.ads.m4  
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archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/ncurses/widechar/charable.c
```

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*****
* @Id: curs_clear.3x,v 1.11 2007/12/29 15:58:38 tom Exp @
-->

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archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-
5.7/doc/html/man/curs_clear.3x.html

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archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/ncurses/base/lib_creol.c
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*****
* @Id: curs_beep.3x,v 1.10 2005/01/08 17:55:51 tom Exp @
-->

```

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```

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archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/doc/html/man/curs_beep.3x.html
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archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/menu/m_scale.c
* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/form/fld_ftchoice.c
* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/menu/m_item_val.c
* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/form/fld_pad.c
* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/form/frm_cursor.c
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fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/form/frm_scale.c
* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/menu/m_hook.c
* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/menu/m_item_nam.c
* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/menu/m_win.c
* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
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archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/form/fld\_current.c

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* @Id: curs_initscr.3x,v 1.14 2005/05/15 16:18:01 tom Exp @
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\* @Id: curs\_kernel.3x,v 1.15 2005/05/15 16:18:13 tom Exp @

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\* Author: Thomas E. Dickey 1997

\* @Id: keyok.3x,v 1.9 2006/02/25 21:47:06 tom Exp @

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\* @Id: form\_field\_opts.3x,v 1.13 2007/02/24 17:34:27 tom Exp @

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\* /opt/cola/permits/1600019816\_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/form/fty\_ipv4.c  
\* /opt/cola/permits/1600019816\_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/ncurses/base/lib\_scroll.c

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\$Id: ncurses-intro.html,v 1.43 2007/03/03 19:31:50 tom Exp \$

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* @Id: term.5,v 1.19 2006/12/24 18:12:38 tom Exp @
-->

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archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/doc/html/man/term.5.html
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/\*\*\*\*\*

\* Author: Zeyd M. Ben-Halim <zmbenhal@netcom.com> 1992,1995 \*

\* and: Eric S. Raymond <esr@snark.thyrsus.com> \*

\*\*\*\*\*/

/\* \$Id: termcap.h.in,v 1.16 2001/03/24 21:53:27 tom Exp \$ \*/

#ifndef NCURSES\_TERMCAP\_H\_incl

#define NCURSES\_TERMCAP\_H\_incl 1

#undef NCURSES\_VERSION

#define NCURSES\_VERSION "@NCURSES\_MAJOR@.@NCURSES\_MINOR@"

#include <ncurses\_dll.h>

#ifdef \_\_cplusplus

extern "C"

{

#endif /\* \_\_cplusplus \*/

#include <sys/types.h>

#undef NCURSES\_CONST

#define NCURSES\_CONST @NCURSES\_CONST@

#undef NCURSES\_OSPEED

#define NCURSES\_OSPEED @NCURSES\_OSPEED@

extern NCURSES\_EXPORT\_VAR(char) PC;

extern NCURSES\_EXPORT\_VAR(char

\*) UP;

extern NCURSES\_EXPORT\_VAR(char \*) BC;

extern NCURSES\_EXPORT\_VAR(NCURSES\_OSPEED) ospeed;

#if !defined(NCURSES\_TERM\_H\_incl)

extern NCURSES\_EXPORT(char \*) tgetstr (NCURSES\_CONST char \*, char \*\*);

extern NCURSES\_EXPORT(char \*) tgoto (const char \*, int, int);

extern NCURSES\_EXPORT(int) tgetent (char \*, const char \*);

extern NCURSES\_EXPORT(int) tgetflag (NCURSES\_CONST char \*);

extern NCURSES\_EXPORT(int) tgetnum (NCURSES\_CONST char \*);

extern NCURSES\_EXPORT(int) tputs (const char \*, int, int (\*)(int));

#endif

```
#ifdef __cplusplus
}
#endif
```

#endif /\* NCURSES\_TERMCAP\_H\_incl \*/

Found in path(s):

\* /opt/cola/permits/1600019816\_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/include/termcap.h.in

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\* /opt/cola/permits/1600019816\_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/ncurses/tinfo/lib\_ti.c



\* /opt/cola/permits/1600019816\_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-  
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/ncurses/base/lib\_slklib.c  
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# $Id: modules,v 1.17 2006/12/24 00:52:39 tom Exp $
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#####
#
# Author: Thomas E. Dickey 1996-on
#

@ base
# Library objects
m_attrbs lib $(srcdir) $(MENU_PRIV_H)
m_cursor lib $(srcdir) $(MENU_PRIV_H)
m_driver lib $(srcdir) $(MENU_PRIV_H)
m_format lib $(srcdir) $(MENU_PRIV_H)
m_global lib $(srcdir) $(MENU_PRIV_H)
m_hook lib $(srcdir) $(MENU_PRIV_H)
m_item_cur lib $(srcdir) $(MENU_PRIV_H)
m_item_nam lib $(srcdir) $(MENU_PRIV_H)
```

m\_item\_new lib \$(srcdir) \$(MENU\_PRIV\_H)  
m\_item\_opt lib \$(srcdir) \$(MENU\_PRIV\_H)  
m\_item\_top lib \$(srcdir) \$(MENU\_PRIV\_H)  
m\_item\_use lib \$(srcdir) \$(MENU\_PRIV\_H)  
m\_item\_val lib \$(srcdir) \$(MENU\_PRIV\_H)  
m\_item\_vis lib \$(srcdir) \$(MENU\_PRIV\_H)  
m\_items lib \$(srcdir) \$(MENU\_PRIV\_H)  
m\_new lib \$(srcdir) \$(MENU\_PRIV\_H)  
m\_opts lib \$(srcdir) \$(MENU\_PRIV\_H)  
m\_pad lib \$(srcdir) \$(MENU\_PRIV\_H)  
m\_pattern lib \$(srcdir) \$(MENU\_PRIV\_H)  
m\_post lib \$(srcdir) \$(MENU\_PRIV\_H)  
m\_req\_name lib \$(srcdir) \$(MENU\_PRIV\_H)  
m\_scale lib \$(srcdir) \$(MENU\_PRIV\_H)  
m\_spacing lib \$(srcdir) \$(MENU\_PRIV\_H)  
m\_sub lib \$(srcdir) \$(MENU\_PRIV\_H)  
m\_trace lib \$(srcdir) \$(MENU\_PRIV\_H)  
m\_userptr lib \$(srcdir) \$(MENU\_PRIV\_H)  
m\_win lib \$(srcdir) \$(MENU\_PRIV\_H)

#

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archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/menu/modules

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archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/ncurses/tinfo/lib\_termname.c  
\* /opt/cola/permits/1600019816\_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-  
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/ncurses/base/lib\_insdcl.c  
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archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/ncurses/widechar/lib\_add\_wch.c  
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\* @Id: menu\_opts.3x,v 1.10 2007/02/24 17:33:59 tom Exp @

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#
# Author: Zeyd M. Ben-Halim <zmbenhal@netcom.com> 1992,1995
# and: Eric S. Raymond <esr@snark.thyrsus.com>
#
# $Id: Caps,v 1.36 2006/05/27 15:33:04 tom Exp $
#
# This is the master termcap/terminfo capability table.
#
# This table is used to generate initializers for tables that drive tic,
# infocmp, and the library compilation code used to support the termcap
# compatibility hack. It is also used to generate the tabular portion of the
# terminfo(5) man page; lines beginning with `#%' are passed through to become
# the terminfo table.
#
# This file has three major sections; a standard-capabilities table, two
# extension-capability tables, and a section of aliases declarations.
# The first two have the same format, as follows:
#
# FILE FORMAT
#
# Column 1: terminfo variable name
#

```

```

Column 2: terminfo capability name
# Column 3: capability type (boolean, numeric, or string)
# Column 4: termcap capability name
# Column 5: KEY_xxx name, if any, '-' otherwise
# Column 6: value for KEY_xxx name, if any, '-' otherwise
# Column 7: Lead with `Y' if capability should be emitted in termcap
#      translations, '-' otherwise
# Column 8: capability description
#
# The codes following [Y-] in column 7 describe the versions of termcap which
# use the given capability. This information is not used by the curses library
# proper; rather, it's there to help the terminfo maintainer avoid emitting
# termcap entry translations that are more than 1023 bytes long (and tank a
# lot of old termcap-using programs). The codes read as follows:
# B = mentioned in the BSD man page for 4.4BSD curses
# C = used by the 4.4BSD curses library
# G = mentioned in the documentation for GNU termcap
# E = used by GNU Emacs
# K = remove this terminfo capability when translating to standard format
#
The important codes are C and E. A cap with C or E should be preserved in
# translation if possible. The problem is that preserving all such caps may
# lead to some termcap translations being too long. The termcap maintainer
# has a bit of a juggling act to do...potential problem cases are marked with
# an asterisk (*).
#
# The aliases section has the following format:
#
# Column 1: either `capalias' or `infoalias'
# Column 2: name to be aliased
# Column 3: what name it should translate to. The name IGNORE means it
#      should be discarded with a warning message.
# Column 4: name of the extension set (used for compiler warning messages)
# Column 5: capability description (usually an associated terminfo variable)
#
# HANDLING TERMCAP AND TERMINFO EXTENSIONS
#
# There are basically five different ways to handle termcap and terminfo
# extensions:
#
# 1. Don't list the capname here, or list it but comment it out (the latter
# is preferable; someone might want to handle it in
the future). If you do
# this, the capability will be treated as unknown and raise a warning from
# the compiler.
#
# 2. Alias it. This is appropriate if the capability has the same meaning
# as an already-supported one. The compiler will handle aliasing, emitting

```

```

# an appropriate informational message whenever an alias fires.
#
# 3. List it in the standard table. You almost certainly do *not* want
# to do this -- the capabilities in that one, and their order, have been
# carefully chosen to be SVr4-binary-compatible when they're written out
# as a terminfo object, and breaking this would be bad. It's up the ncurses
# library what to do with the terminfo data after it's read in.
#
# 4. List it in the aliases table with an IGNORE target field. If you
# do this, the capability will be ignored on input (though the user will
# get a warning message about it).
#
# 5. List it in the extensions table. If you do this, the compiler will
# silently accept the capability, but the curses library
proper will never
# see it (because it won't be written out as part of the terminfo object
# format). It's up to you what you have the compiler do with it.
#
# There are two opposite reasons to choose option 5. One is when you want
# to eat the capability silently and discard it when doing translations
# to terminfo with tic -I. Some very old obsolete BSD caps like :kn: are
# in this class. Nothing will ever use them again.
#
# More usually, you want the compiler to try to deduce something from the
# capability value that it can use to translate it into your output format.
# You'll need to write custom code, probably in postprocess_termcap() or
# postprocess_terminfo(), to handle the translation.
#
# CONTROLLING ENTRY LENGTH
#
# Notes on specific elisions made to fit translations within 1023 bytes:
#
# Machines with IBM PC-like keyboards want to be able to define the following
# keys: key_npage, key_ppage, key_home, key_ll (which is used for in termcap-
# only environments
for End or Home-Down), key_dc, and key_ic. This is also
# the set of keys the `joe' editor will be upset if it can't see. So don't
# trim those out of the set to be translated to termcap, or various users of
# the termcap file will become irate.
#
# It might look tempting to leave those long init strings out of translations.
# We can't do it (yet); 4.4BSD tput and tset use them.
#
# We retain the sgr capability in translation in spite of the fact that neither
# 4.4BSD nor GNU Emacs uses it, because (a) some entry naming distinctions are
# hard to understand without it, and (b) the entries in which it is long tend
# to be older types that don't use up a lot of string space on function keys.
# The tic(1) translation code will complain and elide it if it makes a critical

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# difference (there is special code in tic to recognize this situation).
#
# Yes, BSD tset(1) uses hpa. We elide hpa/vpa anyway because the motion
# optimizer in BSD curses didn't use them. This omission seems to be
# the
# single most effective one, it shortened the resolved length of all thirteen
# problem entries in the 9.9.0 version of the terminfo master below critical.
#
# It would be nice to keep f11 and f12 for Emacs use, but a couple of termcap
# translations go back over critical if we do this. As 4.4BSD curses fades
# into history and GNU termcap's application base shrinks towards being GNU
# Emacs only, we'll probably elide out some BSD-only capabilities in order
# to buy space for non-essentials Emacs is still using. Capabilities high
# on that hit list: rc, sc, uc.
#
#####
#
# STANDARD CAPABILITIES
#
##% The following is a complete table of the capabilities included in a
##% terminfo description block and available to terminfo-using code. In each
##% line of the table,
##%
##% The \fBvariable\fR is the name by which the programmer (at the terminfo level)
##% accesses the capability.
##%
##% The \fBcapname\fR is the short name
##% used in the text of the database,
##% and is used by a person updating the database.
##% Whenever possible, capnames are chosen to be the same as or similar to
##% the ANSI X3.64-1979 standard (now superseded by ECMA-48, which uses
##% identical or very similar names). Semantics are also intended to match
##% those of the specification.
##%
##% The termcap code is the old
##% .B termcap
##% capability name (some capabilities are new, and have names which termcap
##% did not originate).
##% .P
##% Capability names have no hard length limit, but an informal limit of 5
##% characters has been adopted to keep them short and to allow the tabs in
##% the source file
##% .B Caps
##% to line up nicely.
##%
##% Finally, the description field attempts to convey the semantics of the
##% capability. You may find some codes in the description field:
##% .TP

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%%(P)
%%indicates that padding may be specified
%%.TP
%%#[1-9]
%%in the description field indicates that the string is passed through tparm with
%%parms as given (#\fI\fP).
%%.TP
%%(P*)
%%indicates
    that padding may vary in proportion to the number of
%%lines affected
%%.TP
%%(#\d\fI\fP\u)
%%indicates the \fI\fP\uth\d parameter.
%%
%%.PP
%% These are the boolean capabilities:
%%
%%.na
%%.TS H
%%center expand;
%%c l l c
%%c l l c
%%lw25 lw6 lw2 lw20.
%%\fBVariable Cap- TCap Description\fR
%%\fBBooleans name Code\fR
auto_left_margin  bw bool bw - - YB-G- cub1 wraps from column 0 to last column
auto_right_margin am bool am - - YBCGE terminal has automatic margins
no_esc_ctlc  xsb bool xb - - YBCG- beehive (f1=escape, f2=ctrl C)
ceol_standout_glitch  xhp bool xs - - YBCGE standout not erased by overwriting (hp)
eat_newline_glitch  xenl bool xn - - YBCGE newline ignored after 80 cols (concept)
erase_overstrike  eo bool eo - - YBCG- can erase overstrikes with a blank
generic_type  gn bool gn - - YB-G- generic line type
hard_copy  hc bool hc - - YBCG- hardcopy terminal
has_meta_key  km bool km - - YB-GE Has a meta key (i.e., sets 8th-bit)
has_status_line  hs bool hs - - YB-G- has
    extra status line
insert_null_glitch  in bool in - - YBCGE insert mode distinguishes nulls
memory_above  da bool da - - YBCG- display may be retained above the screen
memory_below  db bool db - - YB-GE display may be retained below the screen
move_insert_mode  mir bool mi - - YBCGE safe to move while in insert mode
move_standout_mode  msgr bool ms - - YBCGE safe to move while in standout mode
over_strike  os bool os - - YBCG- terminal can overstrike
status_line_esc_ok  eslok bool es - - YB-G- escape can be used on the status line
dest_tabs_magic_sms0  xt bool xt - - YBCGE tabs destructive, magic so char (t1061)
tilde_glitch  hz bool hz - - YB-GE cannot print ~'s (hazeltine)
transparent_underline  ul bool ul - - YBCGE underline character overstrikes
xon_xoff  xon bool xo - - YB--- terminal uses xon/xoff handshaking

```

needs\_xon\_xoff nxon bool nx - - - - - padding will not work, xon/xoff required  
prtr\_silent mc5i bool 5i - - - - - printer will not echo on screen  
hard\_cursor chts bool HC - - - - - cursor  
is hard to see  
non\_rev\_rmcup nrrmc bool NR - - - - - smcup does not reverse rmcup  
no\_pad\_char npc bool NP - - - - - pad character does not exist  
non\_dest\_scroll\_region ndscr bool ND - - - - - scrolling region is non-destructive  
can\_change ccc bool cc - - - - - terminal can re-define existing colors  
back\_color\_erase bce bool ut - - - - - screen erased with background color  
hue\_lightness\_saturation hls bool hl - - - - - terminal uses only HLS color notation (Tektronix)  
col\_addr\_glitch xhpa bool YA - - - - - only positive motion for hpa/mhpa caps  
cr\_cancels\_micro\_mode crxm bool YB - - - - - using cr turns off micro mode  
has\_print\_wheel daisy bool YC - - - - - printer needs operator to change character set  
row\_addr\_glitch xvpa bool YD - - - - - only positive motion for vpa/mvpa caps  
semi\_auto\_right\_margin sam bool YE - - - - - printing in last column causes cr  
cpi\_changes\_res cpix bool YF - - - - - changing character pitch  
changes resolution  
lpi\_changes\_res lpix bool YG - - - - - changing line pitch changes resolution  
#%.TE  
#%.ad  
#%  
#% These are the numeric capabilities:  
#%  
#%.na  
#%.TS H  
#%center expand;  
#%c 11 c  
#%c 11 c  
#%lw25 lw6 lw2 lw20.  
#%\fBVariable Cap- TCap Description\fR  
#%\fBNumeric name Code\fR  
columns cols num co - - YBCGE number of columns in a line  
init\_tabs it num it - - YB-G- tabs initially every # spaces  
lines lines num li - - YBCGE number of lines on screen or page  
lines\_of\_memory lm num lm - - YB-G- lines of memory if > line. 0 means varies  
magic\_cookie\_glitch xmc num sg - - YBCGE number of blank characters left by smso or rmso  
padding\_baud\_rate pb num pb - - YB-GE lowest baud rate where padding needed  
virtual\_terminal vt num vt - - YB--- virtual terminal number (CB/unix)  
width\_status\_line wsl num ws - - YB-G- number of columns in status line  
num\_labels nlab num NI - - - - - number of labels on screen  
label\_height lh num lh - - - - - rows in each label  
label\_width lw num lw - - - - - columns  
in each label  
max\_attributes ma num ma - - YBC-- maximum combined attributes terminal can handle  
maximum\_windows wnum num MW - - - - - maximum number of defineable windows  
# These came in with SVr4's color support  
max\_colors colors num Co - - - - - maximum number of colors on screen  
max\_pairs pairs num pa - - - - - maximum number of color-pairs on the screen

```

no_color_video  ncv num NC - - ----- video attributes that cannot be used with colors
#%.TE
#%.ad
#%
#%The following numeric capabilities are present in the SVr4.0 term structure,
#%but are not yet documented in the man page.  They came in with SVr4's
#%printer support.
#%
#%.na
#%.TS H
#%center expand;
#%c 11 c
#%c 11 c
#%lw25 lw6 lw2 lw20.
#%\fBVariable Cap- TCap Description\fR
#%\fBNumeric name Code\fR
buffer_capacity  bufisz num Ya - - ----- numbers of bytes buffered before printing
dot_vert_spacing  spinv num Yb - - ----- spacing of pins vertically in pins per inch
dot_horz_spacing  spinh num Yc - - ----- spacing
of dots horizontally in dots per inch
max_micro_address  maddr num Yd - - ----- maximum value in micro_..._address
max_micro_jump    mjump num Ye - - ----- maximum value in parm_..._micro
micro_col_size    mcs num Yf - - ----- character step size when in micro mode
micro_line_size   mls num Yg - - ----- line step size when in micro mode
number_of_pins    npins num Yh - - ----- numbers of pins in print-head
output_res_char   orc num Yi - - ----- horizontal resolution in units per line
output_res_line   orl num Yj - - ----- vertical resolution in units per line
output_res_horz_inch  orhi num Yk - - ----- horizontal resolution in units per inch
output_res_vert_inch  orvi num Yl - - ----- vertical resolution in units per inch
print_rate       cps num Ym - - ----- print rate in characters per second
wide_char_size   widcs num Yn - - ----- character step size when in double wide mode
buttons         btns num BT - - ----- number of buttons on mouse
bit_image_entwining  bitwin num Yo - - ----- number
of passes for each bit-image row
bit_image_type    bitype num Yp - - ----- type of bit-image device
#%.TE
#%.ad
#%
#%These are the string capabilities:
#%
#%.na
#%.TS H
#%center expand;
#%c 11 c
#%c 11 c
#%lw25 lw6 lw2 lw20.
#%\fBVariable Cap- TCap Description\fR
#%\fBString name Code\fR

```

back\_tab cbt str bt - - YBCGE back tab (P)  
bell bel str bl - - YB-GE audible signal (bell) (P)  
carriage\_return cr str cr - - YBCGE carriage return (P\*) (P\*)  
change\_scroll\_region csr str cs - - YBCGE change region to line #1 to line #2 (P)  
clear\_all\_tabs tbc str ct - - YB-G- clear all tab stops (P)  
clear\_screen clear str cl - - YBCGE clear screen and home cursor (P\*)  
clr\_eol el str ce - - YBCGE clear to end of line (P)  
clr\_eos ed str cd - - YBCGE clear to end of screen (P\*)  
column\_address hpa str ch - -B-GE\* horizontal position #1, absolute (P)  
command\_character cmdch str CC - - YB-G- terminal settable cmd character in prototype !?  
cursor\_address cup str cm - - YBCGE move  
to row #1 columns #2  
cursor\_down cud1 str do - - YBCGE down one line  
cursor\_home home str ho - - YBCGE home cursor (if no cup)  
cursor\_invisible civis str vi - - YB-G- make cursor invisible  
cursor\_left cub1 str le - - YBCGE move left one space  
cursor\_mem\_address mrcup str CM - - YB-G- memory relative cursor addressing, move to row #1 columns #2  
cursor\_normal cnorm str ve - - YBCGE make cursor appear normal (undo civis/cvvis)  
cursor\_right cuf1 str nd - - YBCGE non-destructive space (move right one space)  
cursor\_to\_ll ll str ll - - YBCGE last line, first column (if no cup)  
cursor\_up cuu1 str up - - YBCGE up one line  
cursor\_visible cvvis str vs - - YBCGE make cursor very visible  
delete\_character dch1 str dc - - YBCGE delete character (P\*)  
delete\_line dl1 str dl - - YBCGE delete line (P\*)  
dis\_status\_line dsl str ds - - YB-G- disable status line  
down\_half\_line hd str hd - - YB-G- half a line down  
enter\_alt\_charset\_mode smacs str as - - YB-G- start  
alternate character set (P)  
enter\_blink\_mode blink str mb - - YB-G- turn on blinking  
enter\_bold\_mode bold str md - - YB-G- turn on bold (extra bright) mode  
enter\_ca\_mode smcup str ti - - YBCGE string to start programs using cup  
enter\_delete\_mode smdc str dm - - YBCGE enter delete mode  
enter\_dim\_mode dim str mh - - YB-G- turn on half-bright mode  
enter\_insert\_mode smir str im - - YBCGE enter insert mode  
enter\_secure\_mode invis str mk - -B-G-\* turn on blank mode (characters invisible)  
enter\_protected\_mode prot str mp - -B-G-\* turn on protected mode  
enter\_reverse\_mode rev str mr - - YB-G- turn on reverse video mode  
enter\_standout\_mode smso str so - - YBCGE begin standout mode  
enter\_underline\_mode smul str us - - YBCGE begin underline mode  
erase\_chars ech str ec - - YB-G- erase #1 characters (P)  
exit\_alt\_charset\_mode rmacs str ae - - YB-G- end alternate character set (P)  
exit\_attribute\_mode sgr0 str me - - YB-GE turn off all attributes  
exit\_ca\_mode rmcup str te - - YBCGE strings  
to end programs using cup  
exit\_delete\_mode rmdc str ed - - YBCGE end delete mode  
exit\_insert\_mode rmir str ei - - YBCGE exit insert mode  
exit\_standout\_mode rmso str se - - YBCGE exit standout mode  
exit\_underline\_mode rmul str ue - - YBCGE exit underline mode

flash\_screen flash str vb - - YBCGE visible bell (may not move cursor)  
form\_feed ff str ff - - YB-G- hardcopy terminal page eject (P\*)  
from\_status\_line fsl str fs - - YB-G- return from status line  
init\_1string is1 str i1 - - YB-G- initialization string  
init\_2string is2 str is - - YB-G- initialization string  
init\_3string is3 str i3 - - YB-G- initialization string  
init\_file if str if - - YB-G- name of initialization file  
insert\_character ich1 str ic - - YBCGE insert character (P)  
insert\_line il1 str al - - YBCGE insert line (P\*)  
insert\_padding ip str ip - - YBCGE insert padding after inserted character  
key\_backspace kbs str kb KEY\_BACKSPACE 0407 YB-G- backspace  
key  
key\_catab ktbc str ka KEY\_CATAB 0526 -B-G-\* clear-all-tabs key  
key\_clear kclr str kC KEY\_CLEAR 0515 -B-G-\* clear-screen or erase key  
key\_ctab kctab str kt KEY\_CTAB 0525 -B-G-\* clear-tab key  
key\_dc kdch1 str kD KEY\_DC 0512 YB-G- delete-character key  
key\_dl kdll str kL KEY\_DL 0510 -B-G-\* delete-line key  
key\_down kcud1 str kd KEY\_DOWN 0402 YBCGE down-arrow key  
key\_eic krmir str kM KEY\_EIC 0514 -B-G-\* sent by rmir or smir in insert mode  
key\_eol kel str kE KEY\_EOL 0517 -B-G-\* clear-to-end-of-line key  
key\_eos ked str kS KEY\_EOS 0516 -B-G-\* clear-to-end-of-screen key  
key\_f0 kf0 str k0 KEY\_F(0) 0410 YBCGE F0 function key  
key\_f1 kf1 str k1 KEY\_F(1) - YBCGE F1 function key  
key\_f10 kf10 str k; KEY\_F(10) - ----E F10 function key  
key\_f2 kf2 str k2 KEY\_F(2) - YBCGE F2 function key  
key\_f3 kf3 str k3 KEY\_F(3) - YBCGE F3 function key  
key\_f4 kf4 str k4 KEY\_F(4) - YBCGE F4 function key  
key\_f5 kf5 str k5 KEY\_F(5) - YBCGE F5 function  
key  
key\_f6 kf6 str k6 KEY\_F(6) - YBCGE F6 function key  
key\_f7 kf7 str k7 KEY\_F(7) - YBCGE F7 function key  
key\_f8 kf8 str k8 KEY\_F(8) - YBCGE F8 function key  
key\_f9 kf9 str k9 KEY\_F(9) - YBCGE F9 function key  
key\_home khome str kh KEY\_HOME 0406 YBCGE home key  
key\_ic kich1 str kI KEY\_IC 0513 YB-GE insert-character key  
key\_il kil1 str kA KEY\_IL 0511 -B-G-\* insert-line key  
key\_left kcub1 str kI KEY\_LEFT 0404 YBCGE left-arrow key  
key\_ll kll str kH KEY\_LL 0533 YB-G- lower-left key (home down)  
key\_npage knp str kN KEY\_NPAGE 0522 YB-GE next-page key  
key\_ppage kpp str kP KEY\_PPAGE 0523 YB-GE previous-page key  
key\_right kcuf1 str kr KEY\_RIGHT 0405 YBCGE right-arrow key  
key\_sf kind str kF KEY\_SF 0520 -B-G-\* scroll-forward key  
key\_sr kri str kR KEY\_SR 0521 -B-G-\* scroll-backward key  
key\_stab khts str kT KEY\_STAB 0524 -B-G-\* set-tab key  
key\_up kcuu1 str ku KEY\_UP 0403 YBCGE up-arrow key  
keypad\_local rmkx str ke - - YBCGE leave 'keyboard\_transmit'  
mode  
keypad\_xmit smkx str ks - - YBCGE enter 'keyboard\_transmit' mode

lab\_f0 lf0 str l0 - -B-G-\* label on function key f0 if not f0  
lab\_f1 lf1 str l1 - -B-G-\* label on function key f1 if not f1  
lab\_f10 lf10 str la - ----- label on function key f10 if not f10  
lab\_f2 lf2 str l2 - -B-G-\* label on function key f2 if not f2  
lab\_f3 lf3 str l3 - -B-G-\* label on function key f3 if not f3  
lab\_f4 lf4 str l4 - -B-G-\* label on function key f4 if not f4  
lab\_f5 lf5 str l5 - -B-G-\* label on function key f5 if not f5  
lab\_f6 lf6 str l6 - -B-G-\* label on function key f6 if not f6  
lab\_f7 lf7 str l7 - -B-G-\* label on function key f7 if not f7  
lab\_f8 lf8 str l8 - -B-G-\* label on function key f8 if not f8  
lab\_f9 lf9 str l9 - -B-G-\* label on function key f9 if not f9  
meta\_off rmm str mo - -YB-G-\* turn off meta mode  
meta\_on smm str mm - -YB-G-\* turn on meta mode (8th-bit on)  
newline nel str nw - -YB-G-\* newline (behave like cr  
followed by lf)  
pad\_char pad str pc - -YBCGE padding char (instead of null)  
parm\_dch dch str DC - -YB-GE delete #1 characters (P\*)  
parm\_delete\_line dl str DL - -YBCGE delete #1 lines (P\*)  
parm\_down\_cursor cud str DO - -YBCGE down #1 lines (P\*)  
parm\_ich ich str IC - -YB-GE insert #1 characters (P\*)  
parm\_index indn str SF - -YBCG- scroll forward #1 lines (P)  
parm\_insert\_line il str AL - -YBCGE insert #1 lines (P\*)  
parm\_left\_cursor cub str LE - -YBCGE move #1 characters to the left (P)  
parm\_right\_cursor cuf str RI - -YBCGE move #1 characters to the right (P\*)  
parm\_rindex rin str SR - -YBCG- scroll back #1 lines (P)  
parm\_up\_cursor cuu str UP - -YBCGE up #1 lines (P\*)  
pkey\_key pfkey str pk - -B--- program function key #1 to type string #2  
pkey\_local pfloc str pl - -B--- program function key #1 to execute string #2  
pkey\_xmit pfx str px - -B--- program function key #1 to transmit string #2  
print\_screen mc0 str ps - -B-G-\* print contents  
of screen  
prtr\_off mc4 str pf - -B-G-\* turn off printer  
prtr\_on mc5 str po - -B-G-\* turn on printer  
repeat\_char rep str rp - -YB-GE repeat char #1 #2 times (P\*)  
reset\_1string rs1 str r1 - -B--- reset string  
reset\_2string rs2 str r2 - -B--- reset string  
reset\_3string rs3 str r3 - -B--- reset string  
reset\_file rf str rf - -B--- name of reset file  
restore\_cursor rc str rc - -YBCG- restore cursor to position of last save\_cursor  
row\_address vpa str cv - -B-GE\* vertical position #1 absolute (P)  
save\_cursor sc str sc - -YBCG- save current cursor position (P)  
scroll\_forward ind str sf - -YBCGE scroll text up (P)  
scroll\_reverse ri str sr - -YBCGE scroll text down (P)  
set\_attributes sgr str sa - -YB-G- define video attributes #1-#9 (PG9)  
set\_tab hts str st - -YB-G- set a tab in every row, current columns  
set\_window wind str wi - -B-GE current window is lines #1-#2 cols #3-#4  
tab ht str ta - -YBCGE tab to next 8-space hardware

```

tab stop
to_status_line tsl str ts - - YB-G- move to status line, column #1
underline_char uc str uc - - YBCG- underline char and move past it
up_half_line hu str hu - - YB-G- half a line up
init_prog iprog str iP - -B--- path name of program for initialization
key_a1 ka1 str K1 KEY_A1 0534 YB-GE upper left of keypad
key_a3 ka3 str K3 KEY_A3 0535 YB-GE upper right of keypad
key_b2 kb2 str K2 KEY_B2 0536 YB-GE center of keypad
key_c1 kc1 str K4 KEY_C1 0537 YB-GE lower left of keypad
key_c3 kc3 str K5 KEY_C3 0540 YB-GE lower right of keypad
prtr_non mc5p str pO - -B-G-* turn on printer for #1 bytes
#
# SVr1 capabilities stop here. IBM's version of terminfo is the same as
# SVr4 up to this point, but has a different set afterwards.
#
char_padding rmp str rP - - ----- like ip but when in insert mode
acs_chars acsc str ac - - ----- graphics charset pairs, based on vt100
plab_norm pln str pn - - ----- program label #1 to show string #2
key_btab kcbt str kB KEY_BTAB 0541 ----- back-tab
key
enter_xon_mode smxon str SX - - ----- turn on xon/xoff handshaking
exit_xon_mode rmxon str RX - - ----- turn off xon/xoff handshaking
enter_am_mode smam str SA - - ----- turn on automatic margins
exit_am_mode rmam str RA - - ----- turn off automatic margins
xon_character xonc str XN - - ----- XON character
xoff_character xoffc str XF - - ----- XOFF character
ena_acs enacs str eA - - ----- enable alternate char set
label_on smln str LO - - ----- turn on soft labels
label_off rmln str LF - - ----- turn off soft labels
key_beg kbeg str @1 KEY_BEG 0542 ----- begin key
key_cancel kcan str @2 KEY_CANCEL 0543 ----- cancel key
key_close kclo str @3 KEY_CLOSE 0544 ----- close key
key_command kcmd str @4 KEY_COMMAND 0545 ----- command key
key_copy kcpy str @5 KEY_COPY 0546 ----- copy key
key_create kcrct str @6 KEY_CREATE 0547 ----- create key
key_end kend str @7 KEY_END 0550 ----- end key
key_enter kent str @8 KEY_ENTER 0527 ----- enter/send
key
key_exit kext str @9 KEY_EXIT 0551 ----- exit key
key_find kfnd str @0 KEY_FIND 0552 ----- find key
key_help khlp str %1 KEY_HELP 0553 ----- help key
key_mark kmrk str %2 KEY_MARK 0554 ----- mark key
key_message kmsg str %3 KEY_MESSAGE 0555 ----- message key
key_move kmov str %4 KEY_MOVE 0556 ----- move key
key_next knxt str %5 KEY_NEXT 0557 ----- next key
key_open kopn str %6 KEY_OPEN 0560 ----- open key
key_options kopt str %7 KEY_OPTIONS 0561 ----- options key
key_previous kprv str %8 KEY_PREVIOUS 0562 ----- previous key

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key\_print kprr str %9 KEY\_PRINT 0532 ----- print key  
key\_redo krdo str %0 KEY\_REDO 0563 ----- redo key  
key\_reference kref str &1 KEY\_REFERENCE 0564 ----- reference key  
key\_refresh krfr str &2 KEY\_REFRESH 0565 ----- refresh key  
key\_replace krpl str &3 KEY\_REPLACE 0566 ----- replace key  
key\_restart krst str &4 KEY\_RESTART 0567 ----- restart key  
key\_resume kres str &5 KEY\_RESUME 0570 ----- resume  
key  
key\_save ksav str &6 KEY\_SAVE 0571 ----- save key  
key\_suspend kspd str &7 KEY\_SUSPEND 0627 ----- suspend key  
key\_undo kund str &8 KEY\_UNDO 0630 ----- undo key  
key\_sbeg kBEG str &9 KEY\_SBEG 0572 ----- shifted begin key  
key\_scancel kCAN str &0 KEY\_SCANCEL 0573 ----- shifted cancel key  
key\_scommand kCMD str \*1 KEY\_SCOMMAND 0574 ----- shifted command key  
key\_scopy kCPY str \*2 KEY\_SCOPY 0575 ----- shifted copy key  
key\_screate kCRT str \*3 KEY\_SCREATE 0576 ----- shifted create key  
key\_sdc kDC str \*4 KEY\_SDC 0577 ----- shifted delete-character key  
key\_sdl kDL str \*5 KEY\_SDL 0600 ----- shifted delete-line key  
key\_select kslt str \*6 KEY\_SELECT 0601 ----- select key  
key\_send kEND str \*7 KEY\_SEND 0602 ----- shifted end key  
key\_seol kEOL str \*8 KEY\_SEOL 0603 ----- shifted clear-to-end-of-line key  
key\_sexit kEXT str \*9 KEY\_SEXIT 0604 ----- shifted exit key  
key\_sfind kFND str \*0 KEY\_SFIND 0605 ----- shifted find key  
key\_shelp kHLP str #1 KEY\_SHELP 0606 ----- shifted  
help key  
key\_shome kHOM str #2 KEY\_SHOME 0607 ----- shifted home key  
key\_sic kIC str #3 KEY\_SIC 0610 ----- shifted insert-character key  
key\_sleft kLFT str #4 KEY\_SLEFT 0611 ----- shifted left-arrow key  
key\_smessage kMSG str %a KEY\_SMESSAGE 0612 ----- shifted message key  
key\_smove kMOV str %b KEY\_SMOVE 0613 ----- shifted move key  
key\_snext kNXT str %c KEY\_SNEXT 0614 ----- shifted next key  
key\_soptions kOPT str %d KEY\_SOPTIONS 0615 ----- shifted options key  
key\_sprevious kPRV str %e KEY\_SPREVIOUS 0616 ----- shifted previous key  
key\_sprint kPRT str %f KEY\_SPRINT 0617 ----- shifted print key  
key\_sredo krdo str %g KEY\_SREDO 0620 ----- shifted redo key  
key\_sreplace krpl str %h KEY\_SREPLACE 0621 ----- shifted replace key  
key\_sright kRIT str %i KEY\_SRIGHT 0622 ----- shifted right-arrow key  
key\_sresume kRES str %j KEY\_SRSUME 0623 ----- shifted resume key  
key\_ssave kSAV str !1 KEY\_SSAVE 0624 ----- shifted save key  
key\_ssuspend kSPD str !2 KEY\_SSUSPEND 0625 ----- shifted  
suspend key  
key\_sundo kUND str !3 KEY\_SUNDO 0626 ----- shifted undo key  
req\_for\_input rfi str RF - - ----- send next input char (for ptys)  
key\_f11 kf11 str F1 KEY\_F(11) - ----E F11 function key  
key\_f12 kf12 str F2 KEY\_F(12) - ----E F12 function key  
key\_f13 kf13 str F3 KEY\_F(13) - ----E F13 function key  
key\_f14 kf14 str F4 KEY\_F(14) - ----E F14 function key  
key\_f15 kf15 str F5 KEY\_F(15) - ----E F15 function key



key\_f16 kf16 str F6 KEY\_F(16) - ----E F16 function key  
key\_f17 kf17 str F7 KEY\_F(17) - ----E F17 function key  
key\_f18 kf18 str F8 KEY\_F(18) - ----E F18 function key  
key\_f19 kf19 str F9 KEY\_F(19) - ----E F19 function key  
key\_f20 kf20 str FA KEY\_F(20) - ----E F20 function key  
key\_f21 kf21 str FB KEY\_F(21) - ----E F21 function key  
key\_f22 kf22 str FC KEY\_F(22) - ----E F22 function key  
key\_f23 kf23 str FD KEY\_F(23) - ----E F23 function key  
key\_f24 kf24 str FE KEY\_F(24) - ----E F24 function key  
key\_f25 kf25 str FF KEY\_F(25) - ----E F25

function key

key\_f26 kf26 str FG KEY\_F(26) - ----E F26 function key  
key\_f27 kf27 str FH KEY\_F(27) - ----E F27 function key  
key\_f28 kf28 str FI KEY\_F(28) - ----E F28 function key  
key\_f29 kf29 str FJ KEY\_F(29) - ----E F29 function key  
key\_f30 kf30 str FK KEY\_F(30) - ----E F30 function key  
key\_f31 kf31 str FL KEY\_F(31) - ----E F31 function key  
key\_f32 kf32 str FM KEY\_F(32) - ----E F32 function key  
key\_f33 kf33 str FN KEY\_F(33) - ----E F33 function key  
key\_f34 kf34 str FO KEY\_F(34) - ----E F34 function key  
key\_f35 kf35 str FP KEY\_F(35) - ----E F35 function key  
key\_f36 kf36 str FQ KEY\_F(36) - ----E F36 function key  
key\_f37 kf37 str FR KEY\_F(37) - ----E F37 function key  
key\_f38 kf38 str FS KEY\_F(38) - ----E F38 function key  
key\_f39 kf39 str FT KEY\_F(39) - ----E F39 function key  
key\_f40 kf40 str FU KEY\_F(40) - ----E F40 function key  
key\_f41 kf41 str FV KEY\_F(41) - ----E F41 function key  
key\_f42 kf42 str FW KEY\_F(42) - ----E F42

function key

key\_f43 kf43 str FX KEY\_F(43) - ----E F43 function key  
key\_f44 kf44 str FY KEY\_F(44) - ----E F44 function key  
key\_f45 kf45 str FZ KEY\_F(45) - ----E F45 function key  
key\_f46 kf46 str Fa KEY\_F(46) - ----E F46 function key  
key\_f47 kf47 str Fb KEY\_F(47) - ----E F47 function key  
key\_f48 kf48 str Fc KEY\_F(48) - ----E F48 function key  
key\_f49 kf49 str Fd KEY\_F(49) - ----E F49 function key  
key\_f50 kf50 str Fe KEY\_F(50) - ----E F50 function key  
key\_f51 kf51 str Ff KEY\_F(51) - ----E F51 function key  
key\_f52 kf52 str Fg KEY\_F(52) - ----E F52 function key  
key\_f53 kf53 str Fh KEY\_F(53) - ----E F53 function key  
key\_f54 kf54 str Fi KEY\_F(54) - ----E F54 function key  
key\_f55 kf55 str Fj KEY\_F(55) - ----E F55 function key  
key\_f56 kf56 str Fk KEY\_F(56) - ----E F56 function key  
key\_f57 kf57 str Fl KEY\_F(57) - ----E F57 function key  
key\_f58 kf58 str Fm KEY\_F(58) - ----E F58 function key  
key\_f59 kf59 str Fn KEY\_F(59) - ----E F59

function key

key\_f60 kf60 str Fo KEY\_F(60) - ----E F60 function key

```

key_f61 kf61 str Fp KEY_F(61) - ----E F61 function key
key_f62 kf62 str Fq KEY_F(62) - ----E F62 function key
key_f63 kf63 str Fr KEY_F(63) - ----E F63 function key
clr_bol  el1 str cb - - - - - Clear to beginning of line
clear_margins  mgc str MC - - - - - clear right and left soft margins
set_left_margin  smgl str ML - - - - - set left soft margin at current column. See smgl. (ML is not in BSD termcap).
set_right_margin  smgr str MR - - - - - set right soft margin at current column
label_format  fln str Lf - - - - - label format
set_clock  sclk str SC - - - - - set clock, #1 hrs #2 mins #3 secs
display_clock  delk str DK - - - - - display clock
remove_clock  rmclk str RC - - - - - remove clock
create_window  cwin str CW - - - - - define a window #1 from #2,#3 to #4,#5
goto_window  wingo str WG - - - - - go to window #1
hangup  hup str HU - - - - - hang-up phone
dial_phone  dial str DI - - - - - dial
    number #1
quick_dial  qdial str QD - - - - - dial number #1 without checking
tone  tone str TO - - - - - select touch tone dialing
pulse  pulse str PU - - - - - select pulse dialing
flash_hook  hook str fh - - - - - flash switch hook
fixed_pause  pause str PA - - - - - pause for 2-3 seconds
wait_tone  wait str WA - - - - - wait for dial-tone
user0  u0 str u0 - - - - - User string #0
user1  u1 str u1 - - - - - User string #1
user2  u2 str u2 - - - - - User string #2
user3  u3 str u3 - - - - - User string #3
user4  u4 str u4 - - - - - User string #4
user5  u5 str u5 - - - - - User string #5
user6  u6 str u6 - - - - - User string #6
user7  u7 str u7 - - - - - User string #7
user8  u8 str u8 - - - - - User string #8
user9  u9 str u9 - - - - - User string #9
#
# SVr4 added these capabilities to support color
#
orig_pair  op str op - - - - - Set default pair to its original value
orig_colors  oc str oc - - - - - Set all color
    pairs to the original ones
initialize_color  initc str Ic - - - - - initialize color #1 to (#2,#3,#4)
initialize_pair  initp str Ip - - - - - Initialize color pair #1 to fg=(#2,#3,#4), bg=(#5,#6,#7)
set_color_pair  scp str sp - - - - - Set current color pair to #1
set_foreground  setf str Sf - - - - - Set foreground color #1
set_background  setb str Sb - - - - - Set background color #1
#
# SVr4 added these capabilities to support printers
#
change_char_pitch  cpi str ZA - - - - - Change number of characters per inch to #1
change_line_pitch  lpi str ZB - - - - - Change number of lines per inch to #1

```

change\_res\_horz chr str ZC - - - - - Change horizontal resolution to #1  
change\_res\_vert cvr str ZD - - - - - Change vertical resolution to #1  
define\_char defc str ZE - - - - - Define a character #1, #2 dots wide, descender #3  
enter\_doublewide\_mode swidm str ZF - - - - - Enter double-wide mode  
enter\_draft\_quality sdrfq str ZG - - - - - Enter draft-quality mode  
enter\_italics\_mode sitm str ZH - - - - - Enter  
italic mode  
enter\_leftward\_mode slm str ZI - - - - - Start leftward carriage motion  
enter\_micro\_mode smicm str ZJ - - - - - Start micro-motion mode  
enter\_near\_letter\_quality snlq str ZK - - - - - Enter NLQ mode  
enter\_normal\_quality snrmq str ZL - - - - - Enter normal-quality mode  
enter\_shadow\_mode sshm str ZM - - - - - Enter shadow-print mode  
enter\_subscript\_mode ssubm str ZN - - - - - Enter subscript mode  
enter\_superscript\_mode ssupm str ZO - - - - - Enter superscript mode  
enter\_upward\_mode sum str ZP - - - - - Start upward carriage motion  
exit\_doublewide\_mode rwidm str ZQ - - - - - End double-wide mode  
exit\_italics\_mode ritm str ZR - - - - - End italic mode  
exit\_leftward\_mode rlm str ZS - - - - - End left-motion mode  
exit\_micro\_mode rmicm str ZT - - - - - End micro-motion mode  
exit\_shadow\_mode rshm str ZU - - - - - End shadow-print mode  
exit\_subscript\_mode rsubm str ZV - - - - - End subscript mode  
exit\_superscript\_mode rsupm str ZW - - - - - End  
superscript mode  
exit\_upward\_mode rum str ZX - - - - - End reverse character motion  
micro\_column\_address mhpa str ZY - - - - - Like column\_address in micro mode  
micro\_down mcud1 str ZZ - - - - - Like cursor\_down in micro mode  
micro\_left mcub1 str Za - - - - - Like cursor\_left in micro mode  
micro\_right mcuf1 str Zb - - - - - Like cursor\_right in micro mode  
micro\_row\_address mypa str Zc - - - - - Like row\_address #1 in micro mode  
micro\_up mcu1 str Zd - - - - - Like cursor\_up in micro mode  
order\_of\_pins porder str Ze - - - - - Match software bits to print-head pins  
parm\_down\_micro mcud str Zf - - - - - Like parm\_down\_cursor in micro mode  
parm\_left\_micro mcub str Zg - - - - - Like parm\_left\_cursor in micro mode  
parm\_right\_micro mcuf str Zh - - - - - Like parm\_right\_cursor in micro mode  
parm\_up\_micro mcuu str Zi - - - - - Like parm\_up\_cursor in micro mode  
select\_char\_set scs str Zj - - - - - Select character set, #1  
set\_bottom\_margin smgb str Zk - - - - - Set  
bottom margin at current line  
set\_bottom\_margin\_parm smgbp str Zl - - - - - Set bottom margin at line #1 or (if smgtp is not given) #2 lines from  
bottom  
set\_left\_margin\_parm smglp str Zm - - - - - Set left (right) margin at column #1  
set\_right\_margin\_parm smgrp str Zn - - - - - Set right margin at column #1  
set\_top\_margin smgt str Zo - - - - - Set top margin at current line  
set\_top\_margin\_parm smgtp str Zp - - - - - Set top (bottom) margin at row #1  
start\_bit\_image sbim str Zq - - - - - Start printing bit image graphics  
start\_char\_set\_def scsd str Zr - - - - - Start character set definition #1, with #2 characters in the set  
stop\_bit\_image rbim str Zs - - - - - Stop printing bit image graphics  
stop\_char\_set\_def rcsd str Zt - - - - - End definition of character set #1

```

subscript_characters subcs str Zu - - ----- List of subscriptable characters
superscript_characters supcs str Zv - - ----- List of superscriptable characters
these_cause_cr docr str Zw - - ----- Printing
any of these characters causes CR
zero_motion zerom str Zx - - ----- No motion for subsequent character
#%.TE
#%.ad
#%
#%The following string capabilities are present in the SVr4.0 term structure,
#%but were originally not documented in the man page.
#%
#%.na
#%.TS H
#%center expand;
#%c 11 c
#%c 11 c
#%lw25 lw6 lw2 lw18.
#%\fBVariable Cap- TCap Description\fR
#%\fBString name Code\fR
char_set_names csnm str Zy - - ----- Produce #1'th item from list of character set names
key_mouse kmous str Km KEY_MOUSE 0631 ----- Mouse event has occurred
mouse_info minfo str Mi - - ----- Mouse status information
req_mouse_pos reqmp str RQ - - ----- Request mouse position
get_mouse getm str Gm - - ----- Curses should get button events, parameter #1 not documented.
set_a_foreground setaf str AF - - ----- Set foreground color to #1, using ANSI escape
set_a_background setab str AB - - ----- Set background color to #1, using ANSI escape
pkey_plab pfxl str xl - - ----- Program
function key #1 to type string #2 and show string #3
device_type devt str dv - - ----- Indicate language/codeset support
code_set_init csin str ci - - ----- Init sequence for multiple codesets
set0_des_seq s0ds str s0 - - ----- Shift to codeset 0 (EUC set 0, ASCII)
set1_des_seq s1ds str s1 - - ----- Shift to codeset 1
set2_des_seq s2ds str s2 - - ----- Shift to codeset 2
set3_des_seq s3ds str s3 - - ----- Shift to codeset 3
set_lr_margin smglr str ML - - ----- Set both left and right margins to #1, #2. (ML is not in BSD termcap).
set_tb_margin smgtb str MT - - ----- Sets both top and bottom margins to #1, #2
bit_image_repeat birep str Xy - - ----- Repeat bit image cell #1 #2 times
bit_image_newline binel str Zz - - ----- Move to next row of the bit image
bit_image_carriage_return bicr str Yv - - ----- Move to beginning of same row
color_names colorm str Yw - - ----- Give name for color #1
define_bit_image_region defbi str Yx - - ----- Define
rectangular bit image region
end_bit_image_region endbi str Yy - - ----- End a bit-image region
set_color_band setcolor str Yz - - ----- Change to ribbon color #1
set_page_length slines str YZ - - ----- Set page length to #1 lines
#
# SVr4 added these capabilities for direct PC-clone support
#

```

```

display_pc_char  dispc str S1 - - - - - Display PC character #1
enter_pc_charset_mode  smpch str S2 - - - - - Enter PC character display mode
exit_pc_charset_mode  rmpch str S3 - - - - - Exit PC character display mode
enter_scancode_mode  smsc str S4 - - - - - Enter PC scancode mode
exit_scancode_mode  rMSC str S5 - - - - - Exit PC scancode mode
pc_term_options  pctrm str S6 - - - - - PC terminal options
scancode_escape  scesc str S7 - - - - - Escape for scancode emulation
alt_scancode_esc  scesa str S8 - - - - - Alternate escape for scancode emulation
#%.TE
#%.ad
#%
#%.in .8i
#%The XSI Curses standard added these.  They are some post-4.1

#%versions of System V curses, e.g., Solaris 2.5 and IRIX 6.x.
#%The \fBncurses\fR termcap names for them are invented; according to the
#%XSI Curses standard, they have no termcap names.  If your compiled terminfo
#%entries use these, they may not be binary-compatible with System V terminfo
#%entries after SVr4.1; beware!
#%
#%.na
#%.TS H
#%center expand;
#%c 1 l c
#%c 1 l c
#%lw25 lw6 lw2 lw20.
#%\fBVariable Cap- TCap Description\fR
#%\fBString name Code\fR
enter_horizontal_hl_mode  ehhlM str Xh - - - - - Enter horizontal highlight mode
enter_left_hl_mode  elhlM str Xl - - - - - Enter left highlight mode
enter_low_hl_mode  elohlm str Xo - - - - - Enter low highlight mode
enter_right_hl_mode  erhlM str Xr - - - - - Enter right highlight mode
enter_top_hl_mode  ethlm str Xt - - - - - Enter top highlight mode
enter_vertical_hl_mode  evhlM str Xv - - - - - Enter vertical highlight mode
set_a_attributes  sgr1 str sA - - - - - Define second set of video attributes #1-#6
set_pglen_inch  slength str sL - - - - - YI
Set page length to #1 hundredth of an inch
#%.TE
#%.ad
#
# The magic token below tells the tic compiler-generator code that all the caps
# past it should be ignored (not written out) when dumping terminfo objects.  It
# also tells the man page table generator not to pass through following lines
# This means we can have obsolete capabilities and pseudo-capabilities that are
# recognized for termcap or terminfo compilation, but not output.
#
# %%-STOP-HERE-%%
#

```

```

# Don't move this casually! In fact, don't move it at all unless you're
# either doing it to add System V or XPG4 extensions, or have decided you
# don't care about SVr4 binary compatibility.
#
#####
#
# TERMCAP EXTENSION CAPABILITIES
#
# The capabilities below are either obsolete or extensions on certain systems.
# They are not used by SVR4 terminfo. Some are used by captinfo to translate
# termcap sources; the rest are listed
# for completeness, and in case somebody
# cares about them enough to hack in code that will translate them into
# terminfo capabilities.
#
# The first part of the list is from Ross Ridge's `mytinfo' package
# (comp.sources.unix, volume 26); the variable names and terminfo names (as
# well as the termcap codes) match his list.
#
# This group of codes is not marked obsolete in 4.4BSD, but have no direct
# terminfo equivalents. The rs capability is specially translated to terminfo
# r2, and vice versa, if an entry does not already have an r2. Similarly,
# i2 is translated to r3 if there is no r3 (because SV terminfo maps i2 to r2).
# The ug capability is thrown away, but assumed to be whatever sg is if the
# latter is nonzero and we're dumping in termcap format.
#
termcap_init2 OTi2 str i2 - - YB--- secondary initialization string
termcap_reset OTrs str rs - - YB-G- terminal reset string
magic_cookie_glitch_ul OTug num ug - - YBCGE number of blanks left by ul
#
# Obsolete termcap
# capabilities. Some are used for termcap translation. The
# code uses the 'OT' prefix we put on obsolete capabilities to suppress
# printing them in terminfo source dumps of compiled entries.
#
backspaces_with_bs OTbs bool bs - - YBCGE uses ^H to move left
crt_no_scrolling OTns bool ns - - YBCG- crt cannot scroll
no_correctly_working_cr OTnc bool nc - - YBCG- no way to go to start of line
carriage_return_delay OTdC num dC - - YB-G- pad needed for CR
new_line_delay OTdN num dN - - YB-G- pad needed for LF
linefeed_if_not_lf OTnl str nl - - YBCGE use to move down
backspace_if_not_bs OTbc str bc - - YBCGE move left, if not ^H
#
# GNU termcap library extensions. The GNU termcap file distributed with
# Emacs no longer uses these, but MT showed up in pre-9.0 versions of the
# BSD termcap file. The name clash with terminfo MT is resolved by type
# info; MT is converted to km.
#

```

```

gnu_has_meta_key OTMT bool MT - - ----E has meta key
# gnu_tab_width OTtw num tw - - ----E tab
width in spaces
#
# GNU termcap *does* include the following extended capability, Only the
# now-obsolete Ann Arbor terminals used it.
#
# gnu_change_scroll_region OTcS str cS - - ----GE alternate set scrolling region
#
# The following comments describe capnames so ancient that I believe no
# software uses them any longer. Some of these have to go because they
# clash with terminfo names in ways that cannot be resolved by type
# information.
#
# These mytinfo codes are not used in the 4.4BSD curses code. They are
# marked obsolete in the 4.4BSD manual pages.
#
# There is one conflict with terminfo; ma is in both. This conflict is
# resolved by type information.
#
# The `ko' capability is translated by special code. It should contain a
# comma-separated list of capabilities for which there are corresponding keys.
# The `kn' code is accepted but ignored.
#
# The `ma' capability seems to have been designed to map between the rogue(2)
# motion keys (including jkhl) and characters
emitted by arrow keys on some
# primitive pre-ANSI terminals. It's so obsolete it's fossilized...
#
# Here is a description of memory_lock_above and memory_unlock:
# "You can 'freeze' data on the screen by turning on Memory Lock in a line of
# text. All lines above the cursor's current line become locked in place on
# the screen. Then enter data normally. When the screen fills up, any
# further data entered forces the first line of unfrozen line text to scroll
# under the frozen data. Lines scrolled off the screen are inserted into
# memory immediately preceding the first frozen line." (from the HP 700/96
# User's manual). VT100/ANSI memory lock set is \E[>2h, reset is \E[>2l.
#
# Applications that use terminfo are supposed to behave as though xr is
# always true.
#
linefeed_is_newline OTNL bool NL - - YB--- move down with \n
# even_parity OTEP bool EP - - -B--- terminal requires even parity
# odd_parity OTOP bool OP - - -B--- terminal requires odd parity
# half_duplex OTHD bool HD - - -B--- terminal
is half-duplex
# lower_case_only OTLC bool LC - - -B--- terminal has only lower case
# upper_case_only OTUC bool UC - - -B--- terminal has only upper case

```

```

backspace_delay OTdB num dB - - YB-G- padding required for ^H
# form_feed_delay OTdF num dF - -B-G- padding required for ^L
horizontal_tab_delay OTdT num dT - - YB-G- padding required for ^I
# vertical_tab_delay OTdV num dV - -B--- padding required for ^V
number_of_function_keys OTkn num kn - -B-G- count of function keys
other_non_function_keys OTko str ko - -B-G- list of self-mapped keycaps
arrow_key_map OTma str ma - - YBC-- map arrow keys rogue(1) motion keys
# memory_lock_above OTml str ml - -B--- lock visible screen memory above the current line
# memory_unlock OTmu str mu - -B--- unlock visible screen memory above the current line
has_hardware_tabs OTpt bool pt - - YB--- has 8-char tabs invoked with ^I
return_does_clr_eol OTxr bool xr - - YB--- return
clears the line
# tek_4025_insert_line OTxx bool xx - -BC-- Tektronix 4025 insert-line glitch
#
# mytinfo described this as a termcap capability, but it's not listed in the
# 4.4BSD man pages, and not found in the 4.4BSD termcap file. The ncurses
# package, like System V, behaves as though it is always true.
#
# rind_only_at_top OTxq bool xq - - ---- reverse index only works from top line
#
# University of Waterloo termcap extensions (as described in mytinfo).
# The `xl' termcap file clashes with a terminfo name; this ambiguity cannot
# be resolved by a type check. The descriptions are guesses from what was
# in the mytinfo tables.
#
# key_interrupt_char OTki str ki - - ---- string set by interrupt key (?)
# key_kill_char OTkk str kk - - ---- string set by kill key (?)
# key_suspend_char OTkz str kz - - ---- string set by suspend key (?)
# initialization_messy OTxc bool xc - - ---- initialization leaves garbage on the screen (?)
# ind_at_bottom_does_cr OTxl bool xl - - ---- index
does a carriage return
#
# Nonstandard capabilities unique to Ross Ridge's `mytinfo' package.
# SR clashes with a terminfo name; this ambiguity cannot be resolved by a type
# check.
#
# scroll_left OTsl str Sl - - ---- scroll screen leftward
# scroll_right OTsr1 str Sr - - ---- scroll screen rightward
# parm_scroll_left OTsl str SL - - ---- scroll screen leftward #1 characters
# parm_scroll_right OTsr str SR - - ---- scroll screen rightward #1 characters
#
# The mytinfo capabilities end here.
#
# XENIX extensions:
#
# Xenix defined its own set of forms-drawing capabilities:
#
# cap IBM ASCII description      ACS      ASCII

```



```

# -----
# G1 191 \277 M-? single upper right ACS_URCORNER
# G2 218 \332 M-Z single upper left ACS_ULCORNER
# G3 192 \300 M-@ single lower left ACS_LLCORNER
# G4 217 \331 M-Y single lower right ACS_LRCORNER
# G5 187 \273 M-; double upper right
# G6 201 \311 M-I double
  upper left
# G7 200 \310 M-H double lower left
# G8 188 \274 M-< double lower right
# GC 197 \305 M-E single intersection ACS_PLUS _ _
# GD 194 \302 M-B single down-tick ACS_TTEE |
# GH 196 \304 M-D single horizontal line ACS_HLINE
# GL 180 \264 M-4 single left tick ACS_RTEE -|
# GR 195 \303 M-C single right tick ACS_LTEE |-
# GU 193 \301 M-A single up tick ACS_BTEE _|
# GV 179 \263 M-3 single vertical line ACS_VLINE
# Gc 206 \316 M-N double intersection
# Gd 203 \313 M-K double down tick
# Gh 205 \315 M-M double horizontal line
# Gl 204 \204 M-L double left tick
# Gr 185 \271 M-9 double right tick
# Gu 202 \312 M-J double up tick
# Gv 186 \272 M-: double vertical line
#
# The compiler will translate the single-line caps and discard the others
# (via IGNORE aliases further down). We don't want to do normal pad
# translation on these, they're often single-character printable ASCII
# strings that happen to be numerics. There's awk code in parametrized.sh
# that detects the acs_
  prefix and uses it to suppress pad translation.
# These terminfo names are invented.
#
acs_ulcorner OTG2 str G2 - - - - - single upper left
acs_llcorner OTG3 str G3 - - - - - single lower left
acs_urcorner OTG1 str G1 - - - - - single upper right
acs_lrcorner OTG4 str G4 - - - - - single lower right
acs_ltee OTGR str GR - - - - - tee pointing right
acs_rtee OTGL str GL - - - - - tee pointing left
acs_btee OTGU str GU - - - - - tee pointing up
acs_ttee OTGD str GD - - - - - tee pointing down
acs_hline OTGH str GH - - - - - single horizontal line
acs_vline OTGV str GV - - - - - single vertical line
acs_plus OTGC str GC - - - - - single intersection
#
#####
#
# TERMINFO EXTENSION CAPABILITIES

```

```

#
# This section is almost all comments. What it's mainly for is to describe
# what capabilities need to be squeezed out to get down to the XSI Curses
# standard set. They are flagged with K.
#
#
HP extensions
#
# These extensions follow ptr_non (replacing everything after it) in HP
# terminfo files. Except for memory_lock and memory_unlock, they are
# functionally identical to SVr4 extensions, but they make the binary format
# different. Grrr....
#
memory_lock  meml str ml - - ----K lock memory above cursor
memory_unlock  memu str mu - - ----K unlock memory
#plab_norm  pln str pn - - ----- program label #1 to show string #2
#label_on  smln str LO - - ----- turn on soft labels
#label_off  rmln str LF - - ----- turn off soft labels
#key_f11  kf11 str F1 - - ----- F11 function key
#key_f12  kf12 str F2 - - ----- F12 function key
#key_f13  kf13 str F3 - - ----- F13 function key
#key_f14  kf14 str F4 - - ----- F14 function key
#key_f15  kf15 str F5 - - ----- F15 function key
#key_f16  kf16 str F6 - - ----- F16 function key
#key_f17  kf17 str F7 - - ----- F17 function key
#key_f18  kf18 str F8 - - ----- F18 function key
#key_f19  kf19 str F9 - - ----- F19
function key
#key_f20  kf20 str FA - - ----- F20 function key
#key_f21  kf21 str FB - - ----- F21 function key
#key_f22  kf22 str FC - - ----- F22 function key
#key_f23  kf23 str FD - - ----- F23 function key
#key_f24  kf24 str FE - - ----- F24 function key
#key_f25  kf25 str FF - - ----- F25 function key
#key_f26  kf26 str FG - - ----- F26 function key
#key_f27  kf27 str FH - - ----- F27 function key
#key_f28  kf28 str FI - - ----- F28 function key
#key_f29  kf29 str FJ - - ----- F29 function key
#key_f30  kf30 str FK - - ----- F30 function key
#key_f31  kf31 str FL - - ----- F31 function key
#key_f32  kf32 str FM - - ----- F32 function key
#key_f33  kf33 str FN - - ----- F33 function key
#key_f34  kf34 str FO - - ----- F34 function key
#key_f35  kf35 str FP - - ----- F35 function key
#key_f36  kf36 str FQ - - ----- F36 function key
#key_f37  kf37 str FR - - ----- F37 function key
#key_f38  kf38 str FS - - ----- F38 function key
#key_f39  kf39 str FT - - ----- F39

```

```
function key
#key_f40 kf40 str FU - - ----- F40 function key
#key_f41 kf41 str FV - - ----- F41 function key
#key_f42 kf42 str FW - - ----- F42 function key
#key_f43 kf43 str FX - - ----- F43 function key
#key_f44 kf44 str FY - - ----- F44 function key
#key_f45 kf45 str FZ - - ----- F45 function key
#key_f46 kf46 str Fa - - ----- F46 function key
#key_f47 kf47 str Fb - - ----- F47 function key
#key_f48 kf48 str Fc - - ----- F48 function key
#key_f49 kf49 str Fd - - ----- F49 function key
#key_f50 kf50 str Fe - - ----- F50 function key
#key_f51 kf51 str Ff - - ----- F51 function key
#key_f52 kf52 str Fg - - ----- F52 function key
#key_f53 kf53 str Fh - - ----- F53 function key
#key_f54 kf54 str Fi - - ----- F54 function key
#key_f55 kf55 str Fj - - ----- F55 function key
#key_f56 kf56 str Fk - - ----- F56 function key
#key_f57 kf57 str Fl - - ----- F57 function key
#key_f58 kf58 str Fm - - ----- F58 function
key
#key_f59 kf59 str Fn - - ----- F59 function key
#key_f60 kf60 str Fo - - ----- F60 function key
#key_f61 kf61 str Fp - - ----- F61 function key
#key_f62 kf62 str Fq - - ----- F62 function key
#key_f63 kf63 str Fr - - ----- F63 function key
#
# IBM extensions
#
# These extensions follow ptr_non (replacing everything after it) in IBM
# terminfo files.
#
# The places in the box[12] capabilities correspond to acsc characters, here is
# the mapping:
#
# box1[0] = ACS_ULCORNER
# box1[1] = ACS_HLINE
# box1[2] = ACS_URCORNER
# box1[3] = ACS_VLINE
# box1[4] = ACS_LRCORNER
# box1[5] = ACS_LLCORNER
# box1[6] = ACS_TTEE
# box1[7] = ACS_RTEE
# box1[8] = ACS_BTEE
# box1[9] = ACS_LTEE
# box1[10] = ACS_PLUS
#
# The box2 characters are the double-line versions of these forms graphics.
```

```

#
box_chars_1 box1 str bx - - ----K box characters primary set
#box_chars_2 box2 str by - - ----K box characters secondary set
#box_attr_1 batt1 str Bx - - ----K attributes for
    box1
#box_attr_2 batt2 str By - - ----K attributes for box2
#color_bg_0 colb0 str d0 - - ----K background color 0
#color_bg_1 colb1 str d1 - - ----K background color 1
#color_bg_2 colb2 str d2 - - ----K background color 2
#color_bg_3 colb3 str d3 - - ----K background color 3
#color_bg_4 colb4 str d4 - - ----K background color 4
#color_bg_5 colb5 str d5 - - ----K background color 5
#color_bg_6 colb6 str d6 - - ----K background color 6
#color_bg_7 colb7 str d7 - - ----K background color 7
#color_fg_0 colf0 str c0 - - ----K foreground color 0
#color_fg_1 colf1 str c1 - - ----K foreground color 1
#color_fg_2 colf2 str c2 - - ----K foreground color 2
#color_fg_3 colf3 str c3 - - ----K foreground color 3
#color_fg_4 colf4 str c4 - - ----K foreground color 4
#color_fg_5 colf5 str c5 - - ----K foreground color 5
#color_fg_6 colf6 str c6 - - ----K foreground color 6
#color_fg_7 colf7 str c7 - - ----K foreground color 7
#font_0 font0 str f0 - - ----- select
    font 0
#font_1 font1 str f1 - - ----- select font 1
#font_2 font2 str f2 - - ----- select font 2
#font_3 font3 str f3 - - ----- select font 3
#font_4 font4 str f4 - - ----K select font 4
#font_5 font5 str f5 - - ----K select font 5
#font_6 font6 str f6 - - ----K select font 6
#font_7 font7 str f7 - - ----K select font 7
#key_back_tab kbtap str k0 - - ----- backtab key
#key_do kdo str ki - - ----K do request key
#key_command kcmd str kd - - ----K command-request key
#key_command_pane kcpn str kW - - ----K command-pane key
#key_end kend str kw - - ----- end key
#key_help khlp str kq - - ----- help key
#key_newline knl str nl - - ----K newline key
#key_next_pane knpn str kv - - ----K next-pane key
#key_prev_cmd kppn str kp - - ----K previous-command key
#key_prev_pane kppn str kV - - ----K previous-pane key
#key_quit kquit str kQ - - ----K quit key
#key_select ksel str kU - - ----- select key
#key_scroll_left kscl str kz - - ----K scroll
    left
#key_scroll_right kscr str kZ - - ----K scroll right
#key_tab ktab str ko - - ----K tab key
#key_smap_in1 kmpf1 str Kv - - ----K special mapped key 1 input

```

```

#key_smap_out1 kmpt1 str KV - - ----K special mapped key 1 output
#key_smap_in2 kmpf2 str Kw - - ----K special mapped key 2 input
#key_smap_out2 kmpt2 str KW - - ----K special mapped key 2 output
#key_smap_in3 kmpf3 str Kx - - ----K special mapped key 3 input
#key_smap_out3 kmpt3 str KX - - ----K special mapped key 3 output
#key_smap_in4 kmpf4 str Ky - - ----K special mapped key 4 input
#key_smap_out4 kmpt4 str KY - - ----K special mapped key 4 output
#key_smap_in5 kmpf5 str Kz - - ----K special mapped key 5 input
#key_smap_out5 kmpt5 str KZ - - ----K special mapped key 5 output
#appl_defined_str apstr str za - - ----K application-defined string
# The key_smap_in[6789] and key_smap_out[6789] capabilities aren't described in
# the IBM manual pages, so the cap
name strings are guesses. The terminfo
# names are almost certainly right, the termcap ones almost certainly wrong.
#key_smap_in6 kmpf6 str k! - - ----K special mapped key 6 input
#key_smap_out6 kmpt6 str K@ - - ----K special mapped key 6 output
#key_smap_in7 kmpf7 str k# - - ----K special mapped key 7 input
#key_smap_out7 kmpt7 str K$ - - ----K special mapped key 7 output
#key_smap_in8 kmpf8 str k% - - ----K special mapped key 8 input
#key_smap_out8 kmpt8 str K^ - - ----K special mapped key 8 output
#key_smap_in9 kmpf9 str k& - - ----K special mapped key 9 input
#key_smap_out9 kmpt9 str K* - - ----K special mapped key 9 output
# Undocumented capabilities end here
#key_sf1 ksf1 str S1 - - ----K special function key 1
#key_sf2 ksf2 str S2 - - ----K special function key 2
#key_sf3 ksf3 str S3 - - ----K special function key 3
#key_sf4 ksf4 str S4 - - ----K special function key 4
#key_sf5 ksf5 str S5 - - ----K special function key 5
#key_sf6 ksf6 str S6 - - ----K special
function key 6
#key_sf7 ksf7 str S7 - - ----K special function key 7
#key_sf8 ksf8 str S8 - - ----K special function key 8
#key_sf9 ksf9 str S9 - - ----K special function key 9
#key_sf10 ksf10 str SA - - ----K special function key 10
# AIX version 3 documents different codes for F11, F12 and does not mention
# F13-F64. AIX version 4 uses the same naming for F0-F63 as above.
#key_f11 kf11 str k< - - ----- function key 11
#key_f12 kf12 str k> - - ----- function key 12
# Undocumented capabilities end here.
#key_action kact str kJ - - ----K sent by action key
# The IBM docs say these capabilities are for table-drawing, and are
# valid only for aixterm descriptions.
#enter_topline_mode topl str tp - - ----K start top-line mode
#enter_bottom_mode btml str bm - - ----K start bottom-line mode
#enter_rvert_mode rvert str rv - - ----K start right-vertical mode
#enter_lvert_mode lvert str lv - - ----K start left-vertical mode
#
#####

```

```

#
#
ALIAS DECLARATIONS
#
# Here we set up aliases for translating extensions into standard terminfo.
#
#----- Termcap aliases -----
#
# BSD aliases:
#
# This is a common error in many termcap files. We'll get notified during
# translation when this (or any other alias) fires.
#
capalias sb sr BSD scroll text down
#
# AT&T extensions:
#
# The old AT&T 5410, 5420, 5425, pc6300plus, 610, and s4 entries used a set of
# nonstandard capabilities. Its signature is the KM capability, used to name
# some sort of keymap file. EE, BO, CI, CV, XS, DS, FL and FE are in this
# set. Comments in the original, and a little cross-checking with other AT&T
# documentation, seem to establish the following mappings:
#
capalias BO mr AT&T enter_reverse_mode
capalias CI vi AT&T cursor_invisible
capalias CV ve AT&T cursor_normal
capalias DS mh AT&T enter_dim_mode
#capalias EE me AT&T exit_attribute_mode
capalias FE LF AT&T label_on
capalias FL LO AT&T label_off
capalias XS mk AT&T enter_secure_mode
#
#
# We comment out EE because the conflicting XENIX EE is more common in
# old entries.
#
# XENIX extensions:
#
# These are the ones we know how to translate directly:
#
capalias EE mh XENIX exit_attribute_mode
capalias GE ae XENIX exit_alt_charset_mode
capalias GS as XENIX enter_alt_charset_mode
capalias CF vi XENIX cursor_invis
capalias CO ve XENIX cursor_normal
capalias EN @7 XENIX key_end
capalias HM kh XENIX key_home
capalias LD kL XENIX key_dl

```

```

capalias PD kN XENIX key_npage
capalias PN po XENIX prtr_off
capalias PS pf XENIX prtr_on
capalias PU kP XENIX key_ppage
capalias RT @8 XENIX kent
capalias UP ku XENIX kcuu1
capalias G6 IGNORE XENIX double-ACS_ULCORNER
capalias G7 IGNORE XENIX double-ACS_LLCORNER
capalias G5 IGNORE XENIX double-ACS_URCORNER
capalias G8 IGNORE XENIX double-ACS_LRCORNER
capalias Gr IGNORE XENIX double-ACS_LTEE
capalias Gr IGNORE XENIX double-ACS_RTEE
capalias Gu IGNORE XENIX double-ACS_BTEE
capalias Gd IGNORE XENIX double
  ACS_TTEE
capalias Gh IGNORE XENIX double-ACS_HLINE
capalias Gv IGNORE XENIX double-ACS_VLINE
capalias Gc IGNORE XENIX double-ACS_PLUS
capalias GG IGNORE XENIX acs-glitch
#
# IBM extensions:
#
capalias kq %1 IBM key_help
#
# Iris extensions:
#
capalias HS mh IRIS enter_dim_mode
#
# Tektronix extensions:
#
capalias KA k; Tek key_f10
capalias KB F1 Tek key_f11
capalias KC F2 Tek key_f12
capalias KD F3 Tek key_f13
capalias KE F4 Tek key_f14
capalias KF F5 Tek key_f15
capalias BC Sb Tek set_background
capalias FC Sf Tek set_foreground
#
# There are also the following:
#
# XENIX XENIX variable name name clash with terminfo?
# -----
# CL key_char_left
# CR key_char_right
# CW key_change_window
# HP ??
# LF key_linefeed label_off

```

```

# NU key_next_unlocked_cell
# PL ??
# PR ??
# RC key_recalc remove_clock
# RF key_toggle_ref req_for_input
# WL key_word_left
# WR key_word_right
#
#
If you know what any of the question-marked ones mean, please tell us.
#
#----- Terminfo aliases -----
#
# IBM extensions:
#
infoalias font0 s0ds IBM set0_des_seq
infoalias font1 s1ds IBM set1_des_seq
infoalias font2 s2ds IBM set2_des_seq
infoalias font3 s3ds IBM set3_des_seq
infoalias kbtabs kcbt IBM key_backtab
infoalias ksel kslt IBM key_select
#
# Some others are identical to SVr4/XPG4 capabilities, in particular:
# kcmd, kend, khlp, and kf11...kf63.
#
#####
#
# The following sets edit modes for GNU EMACS
# Local Variables:
# case-fold-search:nil
# truncate-lines:t
# End:

Found in path(s):
* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/include/Caps
No license file was found, but licenses were detected in source scan.

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*****/

/* Author: Thomas E. Dickey 2001-2008
*****/

/* LINTLIBRARY */

/* ./tty/hardscroll.c */

#include <curses.priv.h>

#undef _nc_oldnums
int *_nc_oldnums;

#undef _nc_scroll_optimize
void _nc_scroll_optimize(void)
{ /* void */ }

#undef _nc_linedump
void _nc_linedump(void)
{ /* void */ }

/* ./tty/hashmap.c */

#include <term.h>

#undef _nc_hash_map
void _nc_hash_map(void)
{ /* void */ }

```

```
#undef _nc_make_oldhash
void _nc_make_oldhash(
    int i)
    { /* void */ }
```

```
#undef _nc_scroll_oldhash
void _nc_scroll_oldhash(
    int n,
    int top,
    int bot)
    { /* void */ }
```

```
/* ./base/lib_addch.c */
```

```
#include <ctype.h>
```

```
#undef _nc_render
cchar_t _nc_render(
    WINDOW *win,

    cchar_t ch)
    { return(*(cchar_t *)0); }
```

```
#undef _nc_build_wch
int _nc_build_wch(
    WINDOW *win,
    cchar_t *ch)
    { return(*(int *)0); }
```

```
#undef _nc_waddch_nosync
int _nc_waddch_nosync(
    WINDOW *win,
    const cchar_t c)
    { return(*(int *)0); }
```

```
#undef waddch
int waddch(
    WINDOW *win,
    const chtype ch)
    { return(*(int *)0); }
```

```
#undef wechochar
int wechochar(
    WINDOW *win,
    const chtype ch)
    { return(*(int *)0); }
```

```
/* ./base/lib_addstr.c */
```

```
#undef waddnstr
int waddnstr(
    WINDOW *win,
    const char *astr,
    int n)
{ return(*(int *)0); }

#undef waddchnstr
int waddchnstr(
    WINDOW *win,
    const chtype *astr,
    int n)
{ return(*(int *)0); }

#undef _nc_wchstrlen
int _nc_wchstrlen(
    const cchar_t *s)
{ return(*(int *)0); }

#undef wadd_wchnstr
int wadd_wchnstr(
    WINDOW *win,
    const cchar_t *astr,
    int n)
{ return(*(int *)0); }

#undef waddnwstr
int waddnwstr(
    WINDOW *win,
    const wchar_t *str,
    int n)
{ return(*(int
*)0); }

/* ./base/lib_bEEP.c */

#undef beep
int beep(void)
{ return(*(int *)0); }

/* ./base/lib_bkgd.c */

#undef wbkgndset
void wbkgndset(
    WINDOW *win,
    const cchar_t *ch)
{ /* void */ }
```

```
#undef wbkgdset
void wbkgdset(
    WINDOW *win,
    chtype ch)
    { /* void */ }

#undef wbkgrnd
int wbkgrnd(
    WINDOW *win,
    const cchar_t *ch)
    { return(*(int *)0); }

#undef wbkgd
int wbkgd(
    WINDOW *win,
    chtype ch)
    { return(*(int *)0); }

/* ./base/lib_box.c */

#undef wborder
int wborder(
    WINDOW *win,
    chtype ls,
    chtype rs,
    chtype ts,
    chtype bs,
    chtype tl,
    chtype tr,
    chtype bl,
    chtype br)
    { return(*(int *)0); }

/* ./base/lib_chgat.c */

#undef wchgat
int wchgat(
    WINDOW *win,
    int n,
    attr_t attr,
    short color,
    const void *opts)
    { return(*(int *)0); }

/* ./base/lib_clear.c */

#undef wclear
```

```

int wclear(
    WINDOW *win)
    { return(*(int *)0); }

/* ./base/lib_clearok.c */

#undef clearok
int clearok(
    WINDOW *win,
    NCURSES_BOOL flag)
    {
    return(*(int *)0); }

/* ./base/lib_clrbot.c */

#undef wclrbot
int wclrbot(
    WINDOW *win)
    { return(*(int *)0); }

/* ./base/lib_clreol.c */

#undef wclrtoeol
int wclrtoeol(
    WINDOW *win)
    { return(*(int *)0); }

/* ./base/lib_color.c */

#include <tic.h>

#undef COLOR_PAIRS
int COLOR_PAIRS;
#undef COLORS
int COLORS;

#undef _nc_reset_colors
NCURSES_BOOL _nc_reset_colors(void)
    { return*(NCURSES_BOOL *)0; }

#undef start_color
int start_color(void)
    { return(*(int *)0); }

#undef init_pair
int init_pair(
    short pair,
    short f,

```

```

short b)
{ return(*(int *)0); }

#undef init_color
int init_color(
    short color,
    short r,
    short g,
    short b)
{ return(*(int *)0); }

#undef can_change_color
NCURSES_BOOL can_change_color(void)
{ return(*(NCURSES_BOOL *)0); }

#undef has_colors
NCURSES_BOOL has_colors(void)
{ return(*(NCURSES_BOOL *)0); }

#undef color_content
int color_content(
    short color,
    short *r,
    short *g,
    short *b)
{ return(*(int *)0); }

#undef
pair_content
int pair_content(
    short pair,
    short *f,
    short *b)
{ return(*(int *)0); }

#undef _nc_do_color
void _nc_do_color(
    short old_pair,
    short pair,
    NCURSES_BOOL reverse,
    int (*outc)(
    int p1))
{ /* void */ }

/* ./base/lib_colorset.c */

#undef wcolor_set
int wcolor_set(

```

```
WINDOW *win,  
short color_pair_number,  
void *opts)  
{ return(*(int *)0); }  
  
/* ./base/lib_delch.c */  
  
#undef wdelch  
int wdelch(  
WINDOW *win)  
{ return(*(int *)0); }  
  
/* ./base/lib_delwin.c */  
  
#undef delwin  
int delwin(  
WINDOW *win)  
{ return(*(int *)0); }  
  
/* ./base/lib_echo.c */  
  
#undef echo  
int echo(void)  
{ return(*(int *)0); }  
  
#undef noecho  
int noecho(void)  
{ return(*(int *)0); }  
  
/* ./base/lib_endwin.c */  
  
#undef endwin  
int endwin(void)  
{ return(*(int *)0); }  
  
/* ./base/lib_erase.c */  
  
#undef werase  
int werase(  
WINDOW *win)  
{ return(*(int *)0); }  
  
/* ./base/lib_flash.c */  
  
#undef flash  
int flash(void)  
{ return(*(int *)0); }
```

```
/* ./lib_gen.c */

#undef addch
int addch(
    const
    chtype z)
    { return(*(int *)0); }

#undef addchnstr
int addchnstr(
    const chtype *a1,
    int z)
    { return(*(int *)0); }

#undef addchstr
int addchstr(
    const chtype *z)
    { return(*(int *)0); }

#undef addnstr
int addnstr(
    const char *a1,
    int z)
    { return(*(int *)0); }

#undef addstr
int addstr(
    const char *z)
    { return(*(int *)0); }

#undef attroff
int attroff(
    NCURSES_ATTR_T z)
    { return(*(int *)0); }

#undef attron
int attron(
    NCURSES_ATTR_T z)
    { return(*(int *)0); }

#undef attrset
int attrset(
    NCURSES_ATTR_T z)
    { return(*(int *)0); }

#undef attr_get
int attr_get(
    attr_t *a1,
```



```
short *a2,  
void *z)  
{ return(*(int *)0); }
```

```
#undef attr_off  
int attr_off(  
attr_t a1,  
void *z)  
{ return(*(int *)0); }
```

```
#undef attr_on  
int attr_on(  
attr_t a1,  
void *z)  
{ return(*(int *)0); }
```

```
#undef attr_set  
int attr_set(  
attr_t a1,  
short a2,  
void *z)  
{ return(*(int *)0); }
```

```
#undef bkgd  
int bkgd(  
chtype z)  
{ return(*(int *)0);  
}
```

```
#undef bkgdset  
void bkgdset(  
chtype z)  
{ /* void */ }
```

```
#undef border  
int border(  
chtype a1,  
chtype a2,  
chtype a3,  
chtype a4,  
chtype a5,  
chtype a6,  
chtype a7,  
chtype z)  
{ return(*(int *)0); }
```

```
#undef box  
int box(  

```

```
WINDOW *a1,  
chtype a2,  
chtype z)  
{ return(*(int *)0); }
```

```
#undef chgat  
int chgat(  
int a1,  
attr_t a2,  
short a3,  
const void *z)  
{ return(*(int *)0); }
```

```
#undef clear  
int clear(void)  
{ return(*(int *)0); }
```

```
#undef clrrobot  
int clrrobot(void)  
{ return(*(int *)0); }
```

```
#undef clrtoeol  
int clrtoeol(void)  
{ return(*(int *)0); }
```

```
#undef color_set  
int color_set(  
short a1,  
void *z)  
{ return(*(int *)0); }
```

```
#undef COLOR_PAIR  
int COLOR_PAIR(  
int z)  
{ return(*(int *)0); }
```

```
#undef delch  
int delch(void)  
{ return(*(int *)0); }
```

```
#undef deleteln  
int deleteln(void)  
{ return(*(int *)0); }
```

```
#undef echochar  
int echochar(  
const chtype z)  
{ return(*(int *)0); }
```

```
#undef erase
int erase(void)
{ return(*(int *)0); }

#undef getbkgd
ctype getbkgd(
WINDOW *z)
{
return(*(ctype *)0); }

#undef getch
int getch(void)
{ return(*(int *)0); }

#undef getnstr
int getnstr(
char *a1,
int z)
{ return(*(int *)0); }

#undef getstr
int getstr(
char *z)
{ return(*(int *)0); }

#undef hline
int hline(
ctype a1,
int z)
{ return(*(int *)0); }

#undef inch
ctype inch(void)
{ return(*(ctype *)0); }

#undef inchnstr
int inchnstr(
ctype *a1,
int z)
{ return(*(int *)0); }

#undef inchstr
int inchstr(
ctype *z)
{ return(*(int *)0); }

#undef innstr
```

```
int innstr(  
    char *a1,  
    int z)  
    { return(*(int *)0); }
```

```
#undef insch  
int insch(  
    ctype z)  
    { return(*(int *)0); }
```

```
#undef insdelln  
int insdelln(  
    int z)  
    { return(*(int *)0); }
```

```
#undef insertln  
int insertln(void)  
    { return(*(int *)0); }
```

```
#undef insnstr  
int insnstr(  
    const char *a1,  
    int z)  
    { return(*(int *)0); }
```

```
#undef insstr  
int insstr(  
    const char *z)  
    { return(*(int *)0); }
```

```
#undef instr  
int instr(  
    char *z)  
    { return(*(int  
    *)0); }
```

```
#undef move  
int move(  
    int a1,  
    int z)  
    { return(*(int *)0); }
```

```
#undef mvaddch  
int mvaddch(  
    int a1,  
    int a2,  
    const ctype z)  
    { return(*(int *)0); }
```

```
#undef mvaddchnstr
int mvaddchnstr(
    int a1,
    int a2,
    const chtype *a3,
    int z)
{ return(*(int *)0); }
```

```
#undef mvaddchstr
int mvaddchstr(
    int a1,
    int a2,
    const chtype *z)
{ return(*(int *)0); }
```

```
#undef mvaddnstr
int mvaddnstr(
    int a1,
    int a2,
    const char *a3,
    int z)
{ return(*(int *)0); }
```

```
#undef mvaddstr
int mvaddstr(
    int a1,
    int a2,
    const char *z)
{ return(*(int *)0); }
```

```
#undef mvchgat
int mvchgat(
    int a1,
    int a2,
    int a3,
    attr_t a4,
    short a5,
    const void *z)
{ return(*(int *)0); }
```

```
#undef mvdelch
int mvdelch(
    int a1,
    int z)
{ return(*(int *)0); }
```

```
#undef mvgetch
```

```
int mvgetch(  
    int a1,  
    int z)  
    { return(*(int *)0); }
```

```
#undef mvgetnstr  
int mvgetnstr(  
    int a1,  
    int a2,  
    char *a3,  
    int z)  
    { return(*(int *)0); }
```

```
#undef mvgetstr  
int mvgetstr(  
    int a1,  
  
    int a2,  
    char *z)  
    { return(*(int *)0); }
```

```
#undef mvhline  
int mvhline(  
    int a1,  
    int a2,  
    chtype a3,  
    int z)  
    { return(*(int *)0); }
```

```
#undef mvinch  
chtype mvinch(  
    int a1,  
    int z)  
    { return(*(chtype *)0); }
```

```
#undef mvinchnstr  
int mvinchnstr(  
    int a1,  
    int a2,  
    chtype *a3,  
    int z)  
    { return(*(int *)0); }
```

```
#undef mvinchstr  
int mvinchstr(  
    int a1,  
    int a2,  
    chtype *z)
```

```
{ return(*(int *)0); }
```

```
#undef mvinnstr
```

```
int mvinnstr(  
    int a1,  
    int a2,  
    char *a3,  
    int z)  
{ return(*(int *)0); }
```

```
#undef mvinsch
```

```
int mvinsch(  
    int a1,  
    int a2,  
    chtype z)  
{ return(*(int *)0); }
```

```
#undef mvinsnstr
```

```
int mvinsnstr(  
    int a1,  
    int a2,  
    const char *a3,  
    int z)  
{ return(*(int *)0); }
```

```
#undef mvinsstr
```

```
int mvinsstr(  
    int a1,  
    int a2,  
    const char *z)  
{ return(*(int *)0); }
```

```
#undef mvinstr
```

```
int mvinstr(  
    int a1,  
    int a2,  
    char *z)  
{ return(*(int *)0); }
```

```
#undef mvvline
```

```
int mvvline(  
    int a1,  
    int a2,  
    chtype a3,  
    int z)  
{ return(*(int  
*)0); }
```

```
#undef mvwaddch
int mvwaddch(
    WINDOW *a1,
    int a2,
    int a3,
    const chtype z)
{ return(*(int *)0); }
```

```
#undef mvwaddchnstr
int mvwaddchnstr(
    WINDOW *a1,
    int a2,
    int a3,
    const chtype *a4,
    int z)
{ return(*(int *)0); }
```

```
#undef mvwaddchstr
int mvwaddchstr(
    WINDOW *a1,
    int a2,
    int a3,
    const chtype *z)
{ return(*(int *)0); }
```

```
#undef mvwaddnstr
int mvwaddnstr(
    WINDOW *a1,
    int a2,
    int a3,
    const char *a4,
    int z)
{ return(*(int *)0); }
```

```
#undef mvwaddstr
int mvwaddstr(
    WINDOW *a1,
    int a2,
    int a3,
    const char *z)
{ return(*(int *)0); }
```

```
#undef mvwchgat
int mvwchgat(
    WINDOW *a1,
    int a2,
    int a3,
    int a4,
```



```
attr_t a5,  
short a6,  
const void *z)  
{ return(*(int *)0); }
```

```
#undef mvwdelch  
int mvwdelch(  
    WINDOW *a1,  
    int a2,  
    int z)  
{ return(*(int *)0); }
```

```
#undef mvwgetch  
int mvwgetch(  
    WINDOW *a1,  
    int a2,  
    int z)  
{ return(*(int *)0); }
```

```
#undef mvwgetnstr  
int mvwgetnstr(  
    WINDOW *a1,  
    int a2,  
    int a3,  
  
    char *a4,  
    int z)  
{ return(*(int *)0); }
```

```
#undef mvwgetstr  
int mvwgetstr(  
    WINDOW *a1,  
    int a2,  
    int a3,  
    char *z)  
{ return(*(int *)0); }
```

```
#undef mvwhline  
int mvwhline(  
    WINDOW *a1,  
    int a2,  
    int a3,  
    chtype a4,  
    int z)  
{ return(*(int *)0); }
```

```
#undef mvwinch  
chtype mvwinch(  
    WINDOW *a1,  
    int a2,  
    int a3,  
    chtype a4,  
    int z)
```

```
WINDOW *a1,  
int a2,  
int z)  
{ return(*(chtype *)0); }
```

```
#undef mvwinchnstr  
int mvwinchnstr(  
WINDOW *a1,  
int a2,  
int a3,  
chtype *a4,  
int z)  
{ return(*(int *)0); }
```

```
#undef mvwinchstr  
int mvwinchstr(  
WINDOW *a1,  
int a2,  
int a3,  
chtype *z)  
{ return(*(int *)0); }
```

```
#undef mvwinnstr  
int mvwinnstr(  
WINDOW *a1,  
int a2,  
int a3,  
char *a4,  
int z)  
{ return(*(int *)0); }
```

```
#undef mvwinsch  
int mvwinsch(  
WINDOW *a1,  
int a2,  
int a3,  
chtype z)  
{ return(*(int *)0); }
```

```
#undef mvwinsnstr  
int mvwinsnstr(  
WINDOW *a1,  
int a2,  
int a3,  
const char *a4,  
int z)  
{ return(*(int *)0); }
```

```
#undef mvwinsstr
int mvwinsstr(
    WINDOW *a1,

    int a2,
    int a3,
    const char *z)
{ return(*(int *)0); }
```

```
#undef mvwinstr
int mvwinstr(
    WINDOW *a1,
    int a2,
    int a3,
    char *z)
{ return(*(int *)0); }
```

```
#undef mvwvline
int mvwvline(
    WINDOW *a1,
    int a2,
    int a3,
    chtype a4,
    int z)
{ return(*(int *)0); }
```

```
#undef PAIR_NUMBER
int PAIR_NUMBER(
    int z)
{ return(*(int *)0); }
```

```
#undef redrawwin
int redrawwin(
    WINDOW *z)
{ return(*(int *)0); }
```

```
#undef refresh
int refresh(void)
{ return(*(int *)0); }
```

```
#undef scr1
int scr1(
    int z)
{ return(*(int *)0); }
```

```
#undef scroll
int scroll(
    WINDOW *z)
```

```
{ return(*(int *)0); }

#undef setscreg
int setscreg(
    int a1,
    int z)
    { return(*(int *)0); }

#undef slk_attr_off
int slk_attr_off(
    const attr_t a1,
    void *z)
    { return(*(int *)0); }

#undef slk_attr_on
int slk_attr_on(
    attr_t a1,
    void *z)
    { return(*(int *)0); }

#undef standout
int standout(void)
    { return(*(int *)0); }

#undef standend
int standend(void)
    { return(*(int *)0); }

#undef
timeout
void timeout(
    int z)
    { /* void */ }

#undef touchline
int touchline(
    WINDOW *a1,
    int a2,
    int z)
    { return(*(int *)0); }

#undef touchwin
int touchwin(
    WINDOW *z)
    { return(*(int *)0); }

#undef untouchwin
int untouchwin(
```

```
WINDOW *z)
{ return(*(int *)0); }
```

```
#undef vline
int vline(
    chtype a1,
    int z)
{ return(*(int *)0); }
```

```
#undef vw_printw
int vw_printw(
    WINDOW *a1,
    const char *a2,
    va_list z)
{ return(*(int *)0); }
```

```
#undef vw_scanw
int vw_scanw(
    WINDOW *a1,
    char *a2,
    va_list z)
{ return(*(int *)0); }
```

```
#undef waddchstr
int waddchstr(
    WINDOW *a1,
    const chtype *z)
{ return(*(int *)0); }
```

```
#undef waddstr
int waddstr(
    WINDOW *a1,
    const char *z)
{ return(*(int *)0); }
```

```
#undef wattron
int wattron(
    WINDOW *a1,
    int z)
{ return(*(int *)0); }
```

```
#undef wattroff
int wattroff(
    WINDOW *a1,
    int z)
{ return(*(int *)0); }
```

```
#undef wattrset
```

```
int wattrset(
    WINDOW *a1,
    int z)
{ return(*(int *)0); }
```

```
#undef wattr_get
int wattr_get(
    WINDOW *a1,

    attr_t *a2,
    short *a3,
    void *z)
{ return(*(int *)0); }
```

```
#undef wattr_set
int wattr_set(
    WINDOW *a1,
    attr_t a2,
    short a3,
    void *z)
{ return(*(int *)0); }
```

```
#undef wdeleteln
int wdeleteln(
    WINDOW *z)
{ return(*(int *)0); }
```

```
#undef wgetstr
int wgetstr(
    WINDOW *a1,
    char *z)
{ return(*(int *)0); }
```

```
#undef winchstr
int winchstr(
    WINDOW *a1,
    chtype *z)
{ return(*(int *)0); }
```

```
#undef winsertln
int winsertln(
    WINDOW *z)
{ return(*(int *)0); }
```

```
#undef winsstr
int winsstr(
    WINDOW *a1,
    const char *z)
```

```
{ return(*(int *)0); }

#undef winstr
int winstr(
    WINDOW *a1,
    char *z)
    { return(*(int *)0); }

#undef wstandout
int wstandout(
    WINDOW *z)
    { return(*(int *)0); }

#undef wstandend
int wstandend(
    WINDOW *z)
    { return(*(int *)0); }

#undef getattrs
int getattrs(
    const WINDOW *z)
    { return(*(int *)0); }

#undef getcurx
int getcurx(
    const WINDOW *z)
    { return(*(int *)0); }

#undef getcury
int getcury(
    const WINDOW
    *z)
    { return(*(int *)0); }

#undef getbegx
int getbegx(
    const WINDOW *z)
    { return(*(int *)0); }

#undef getbegy
int getbegy(
    const WINDOW *z)
    { return(*(int *)0); }

#undef getmaxx
int getmaxx(
    const WINDOW *z)
    { return(*(int *)0); }
```

```

#undef getmaxy
int getmaxy(
    const WINDOW *z)
    { return(*(int *)0); }

#undef getparx
int getparx(
    const WINDOW *z)
    { return(*(int *)0); }

#undef getpary
int getpary(
    const WINDOW *z)
    { return(*(int *)0); }

#undef wgetparent
WINDOW *wgetparent(
    const WINDOW *z)
    { return(*(WINDOW **)0); }

#undef is_cleared
NCURSES_BOOL is_cleared(
    const WINDOW *z)
    { return(*(NCURSES_BOOL *)0); }

#undef is_idcok
NCURSES_BOOL is_idcok(
    const WINDOW *z)
    { return(*(NCURSES_BOOL *)0); }

#undef is_idlok
NCURSES_BOOL is_idlok(
    const WINDOW *z)
    { return(*(NCURSES_BOOL *)0); }

#undef is_immedok
NCURSES_BOOL is_immedok(
    const WINDOW *z)
    { return(*(NCURSES_BOOL *)0); }

#undef is_keypad
NCURSES_BOOL is_keypad(
    const WINDOW *z)
    {
    return(*(NCURSES_BOOL *)0); }

#undef is_leaveok

```



```
NCURSES_BOOL is_leaveok(  
    const WINDOW *z)  
    { return(*(NCURSES_BOOL *)0); }
```

```
#undef is_nodelay  
NCURSES_BOOL is_nodelay(  
    const WINDOW *z)  
    { return(*(NCURSES_BOOL *)0); }
```

```
#undef is_notimeout  
NCURSES_BOOL is_notimeout(  
    const WINDOW *z)  
    { return(*(NCURSES_BOOL *)0); }
```

```
#undef is_scrollok  
NCURSES_BOOL is_scrollok(  
    const WINDOW *z)  
    { return(*(NCURSES_BOOL *)0); }
```

```
#undef is_syncok  
NCURSES_BOOL is_syncok(  
    const WINDOW *z)  
    { return(*(NCURSES_BOOL *)0); }
```

```
#undef wgetscrreg  
int wgetscrreg(  
    const WINDOW *a1,  
    int *a2,  
    int *z)  
    { return(*(int *)0); }
```

```
#undef add_wch  
int add_wch(  
    const cchar_t *z)  
    { return(*(int *)0); }
```

```
#undef add_wchnstr  
int add_wchnstr(  
    const cchar_t *a1,  
    int z)  
    { return(*(int *)0); }
```

```
#undef add_wchstr  
int add_wchstr(  
    const cchar_t *z)  
    { return(*(int *)0); }
```

```
#undef addnwstr
```

```
int addnwstr(  
    const wchar_t *a1,  
    int z)  
    { return(*(int *)0); }
```

```
#undef addwstr  
int addwstr(  
    const wchar_t  
    *z)  
    { return(*(int *)0); }
```

```
#undef bkgrnd  
int bkgrnd(  
    const cchar_t *z)  
    { return(*(int *)0); }
```

```
#undef bkgrndset  
void bkgrndset(  
    const cchar_t *z)  
    { /* void */ }
```

```
#undef border_set  
int border_set(  
    const cchar_t *a1,  
    const cchar_t *a2,  
    const cchar_t *a3,  
    const cchar_t *a4,  
    const cchar_t *a5,  
    const cchar_t *a6,  
    const cchar_t *a7,  
    const cchar_t *z)  
    { return(*(int *)0); }
```

```
#undef box_set  
int box_set(  
    WINDOW *a1,  
    const cchar_t *a2,  
    const cchar_t *z)  
    { return(*(int *)0); }
```

```
#undef echo_wchar  
int echo_wchar(  
    const cchar_t *z)  
    { return(*(int *)0); }
```

```
#undef get_wch  
int get_wch(  
    wint_t *z)
```

```
{ return(*(int *)0); }
```

```
#undef get_wstr
```

```
int get_wstr(  
    wint_t *z)  
    { return(*(int *)0); }
```

```
#undef getbkgrnd
```

```
int getbkgrnd(  
    cchar_t *z)  
    { return(*(int *)0); }
```

```
#undef getn_wstr
```

```
int getn_wstr(  
    wint_t *a1,  
    int z)  
    { return(*(int *)0); }
```

```
#undef hline_set
```

```
int hline_set(  
    const cchar_t *a1,  
    int z)  
    { return(*(int *)0); }
```

```
#undef in_wch
```

```
int in_wch(  
    cchar_t *z)  
    {  
    return(*(int *)0); }
```

```
#undef in_wchnstr
```

```
int in_wchnstr(  
    cchar_t *a1,  
    int z)  
    { return(*(int *)0); }
```

```
#undef in_wchstr
```

```
int in_wchstr(  
    cchar_t *z)  
    { return(*(int *)0); }
```

```
#undef innwstr
```

```
int innwstr(  
    wchar_t *a1,  
    int z)  
    { return(*(int *)0); }
```

```
#undef ins_nwstr
```

```
int ins_nwstr(  
    const wchar_t *a1,  
    int z)  
    { return(*(int *)0); }
```

```
#undef ins_wch  
int ins_wch(  
    const cchar_t *z)  
    { return(*(int *)0); }
```

```
#undef ins_wstr  
int ins_wstr(  
    const wchar_t *z)  
    { return(*(int *)0); }
```

```
#undef inwstr  
int inwstr(  
    wchar_t *z)  
    { return(*(int *)0); }
```

```
#undef mvadd_wch  
int mvadd_wch(  
    int a1,  
    int a2,  
    const cchar_t *z)  
    { return(*(int *)0); }
```

```
#undef mvadd_wchnstr  
int mvadd_wchnstr(  
    int a1,  
    int a2,  
    const cchar_t *a3,  
    int z)  
    { return(*(int *)0); }
```

```
#undef mvadd_wchstr  
int mvadd_wchstr(  
    int a1,  
    int a2,  
    const cchar_t *z)  
    { return(*(int *)0); }
```

```
#undef mvaddnwstr  
int mvaddnwstr(  
    int a1,  
    int a2,  
    const wchar_t *a3,  
    int z)
```

```
{
return(*(int *)0); }

#undef mvaddwstr
int mvaddwstr(
    int a1,
    int a2,
    const wchar_t *z)
{ return(*(int *)0); }

#undef mvget_wch
int mvget_wch(
    int a1,
    int a2,
    wint_t *z)
{ return(*(int *)0); }

#undef mvget_wstr
int mvget_wstr(
    int a1,
    int a2,
    wint_t *z)
{ return(*(int *)0); }

#undef mvgetn_wstr
int mvgetn_wstr(
    int a1,
    int a2,
    wint_t *a3,
    int z)
{ return(*(int *)0); }

#undef mvhline_set
int mvhline_set(
    int a1,
    int a2,
    const cchar_t *a3,
    int z)
{ return(*(int *)0); }

#undef mvin_wch
int mvin_wch(
    int a1,
    int a2,
    cchar_t *z)
{ return(*(int *)0); }

#undef mvin_wchnstr
```

```
int mvin_wchnstr(  
    int a1,  
    int a2,  
    cchar_t *a3,  
    int z)  
    { return(*(int *)0); }
```

```
#undef mvin_wchstr  
int mvin_wchstr(  
    int a1,  
    int a2,  
    cchar_t *z)  
    { return(*(int *)0); }
```

```
#undef mvinnwstr  
int mvinnwstr(  
    int a1,  
    int a2,  
    wchar_t *a3,  
    int z)  
    { return(*(int *)0); }
```

```
#undef mvins_nwstr  
int mvins_nwstr(  
    int a1,  
    int a2,  
    const  
    wchar_t *a3,  
    int z)  
    { return(*(int *)0); }
```

```
#undef mvins_wch  
int mvins_wch(  
    int a1,  
    int a2,  
    const cchar_t *z)  
    { return(*(int *)0); }
```

```
#undef mvins_wstr  
int mvins_wstr(  
    int a1,  
    int a2,  
    const wchar_t *z)  
    { return(*(int *)0); }
```

```
#undef mvinwstr  
int mvinwstr(  
    int a1,
```

```
int a2,
wchar_t *z)
{ return(*(int *)0); }

#undef mvvline_set
int mvvline_set(
int a1,
int a2,
const cchar_t *a3,
int z)
{ return(*(int *)0); }

#undef mvwadd_wch
int mvwadd_wch(
WINDOW *a1,
int a2,
int a3,
const cchar_t *z)
{ return(*(int *)0); }

#undef mvwadd_wchnstr
int mvwadd_wchnstr(
WINDOW *a1,
int a2,
int a3,
const cchar_t *a4,
int z)
{ return(*(int *)0); }

#undef mvwadd_wchstr
int mvwadd_wchstr(
WINDOW *a1,
int a2,
int a3,
const cchar_t *z)
{ return(*(int *)0); }

#undef mvwaddnwstr
int mvwaddnwstr(
WINDOW *a1,
int a2,
int a3,
const wchar_t *a4,
int z)
{ return(*(int *)0); }

#undef mvwaddwstr
int mvwaddwstr(
```

```

WINDOW *a1,

int a2,
int a3,
const wchar_t *z)
{ return(*(int *)0); }

#undef mvwget_wch
int mvwget_wch(
    WINDOW *a1,
    int a2,
    int a3,
    wint_t *z)
{ return(*(int *)0); }

#undef mvwget_wstr
int mvwget_wstr(
    WINDOW *a1,
    int a2,
    int a3,
    wint_t *z)
{ return(*(int *)0); }

#undef mvwgetn_wstr
int mvwgetn_wstr(
    WINDOW *a1,
    int a2,
    int a3,
    wint_t *a4,
    int z)
{ return(*(int *)0); }

#undef mvwhline_set
int mvwhline_set(
    WINDOW *a1,
    int a2,
    int a3,
    const cchar_t *a4,
    int z)
{ return(*(int *)0); }

#undef mvwin_wch
int mvwin_wch(
    WINDOW *a1,
    int a2,
    int a3,
    cchar_t *z)
{ return(*(int *)0); }

```



```
#undef mvwin_wchnstr
int mvwin_wchnstr(
    WINDOW *a1,
    int a2,
    int a3,
    cchar_t *a4,
    int z)
{ return(*(int *)0); }
```

```
#undef mvwin_wchstr
int mvwin_wchstr(
    WINDOW *a1,
    int a2,
    int a3,
    cchar_t *z)
{ return(*(int *)0); }
```

```
#undef mvwinnwstr
int mvwinnwstr(
    WINDOW *a1,
    int a2,
    int a3,
    wchar_t *a4,

    int z)
{ return(*(int *)0); }
```

```
#undef mvwins_nwstr
int mvwins_nwstr(
    WINDOW *a1,
    int a2,
    int a3,
    const wchar_t *a4,
    int z)
{ return(*(int *)0); }
```

```
#undef mvwins_wch
int mvwins_wch(
    WINDOW *a1,
    int a2,
    int a3,
    const cchar_t *z)
{ return(*(int *)0); }
```

```
#undef mvwins_wstr
int mvwins_wstr(
    WINDOW *a1,
```

```
int a2,  
int a3,  
const wchar_t *z)  
{ return(*(int *)0); }
```

```
#undef mvwinwstr  
int mvwinwstr(  
WINDOW *a1,  
int a2,  
int a3,  
wchar_t *z)  
{ return(*(int *)0); }
```

```
#undef mvwvline_set  
int mvwvline_set(  
WINDOW *a1,  
int a2,  
int a3,  
const cchar_t *a4,  
int z)  
{ return(*(int *)0); }
```

```
#undef vline_set  
int vline_set(  
const cchar_t *a1,  
int z)  
{ return(*(int *)0); }
```

```
#undef wadd_wchstr  
int wadd_wchstr(  
WINDOW *a1,  
const cchar_t *z)  
{ return(*(int *)0); }
```

```
#undef waddwstr  
int waddwstr(  
WINDOW *a1,  
const wchar_t *z)  
{ return(*(int *)0); }
```

```
#undef wget_wstr  
int wget_wstr(  
WINDOW *a1,  
wint_t *z)  
{ return(*(int  
*)0); }
```

```
#undef wgetbkgrnd
```

```

int wgetbkgrnd(
    WINDOW *a1,
    cchar_t *z)
    { return(*(int *)0); }

#undef win_wchstr
int win_wchstr(
    WINDOW *a1,
    cchar_t *z)
    { return(*(int *)0); }

#undef wins_wstr
int wins_wstr(
    WINDOW *a1,
    const wchar_t *z)
    { return(*(int *)0); }

#undef mouse_trafo
NCURSES_BOOL mouse_trafo(
    int *a1,
    int *a2,
    NCURSES_BOOL z)
    { return(*(NCURSES_BOOL *)0); }

/* ./base/lib_getch.c */

#include <fifo_defs.h>

#undef ESCDELAY
int ESCDELAY;

#undef set_escdelay
int set_escdelay(
    int value)
    { return(*(int *)0); }

#undef _nc_wgetch
int _nc_wgetch(
    WINDOW *win,
    unsigned long *result,
    int use_meta)
    { return(*(int *)0); }

#undef wgetch
int wgetch(
    WINDOW *win)
    { return(*(int *)0); }

```

```

/* ./base/lib_getstr.c */

#undef wgetnstr
int wgetnstr(
    WINDOW *win,
    char *str,
    int maxlen)
{ return(*(int *)0); }

/* ./base/lib_hline.c */

#undef whline
int whline(
    WINDOW *win,
    chtype ch,
    int n)
{ return(*(int *)0); }

/* ./base/lib_immedok.c
*/

#undef immedok
void immedok(
    WINDOW *win,
    NCURSES_BOOL flag)
{ /* void */ }

/* ./base/lib_inchstr.c */

#undef winchnstr
int winchnstr(
    WINDOW *win,
    chtype *str,
    int n)
{ return(*(int *)0); }

/* ./base/lib_initscr.c */

#undef initscr
WINDOW *initscr(void)
{ return(*(WINDOW **)0); }

/* ./base/lib_insch.c */

#undef _nc_insert_ch
int _nc_insert_ch(
    WINDOW *win,
    chtype ch)

```

```

    { return(*(int *)0); }

#undef wish
int wish(
    WINDOW *win,
    chtype c)
    { return(*(int *)0); }

/* ./base/lib_insdel.c */

#undef winsdelln
int winsdelln(
    WINDOW *win,
    int n)
    { return(*(int *)0); }

/* ./base/lib_insnstr.c */

#undef winsnstr
int winsnstr(
    WINDOW *win,
    const char *s,
    int n)
    { return(*(int *)0); }

/* ./base/lib_instr.c */

#undef winnstr
int winnstr(
    WINDOW *win,
    char *str,
    int n)
    { return(*(int *)0); }

/* ./base/lib_isendwin.c */

#undef isendwin
NCURSES_BOOL isendwin(void)
    { return*(NCURSES_BOOL *)0; }

/* ./base/lib_leaveok.c
 */

#undef leaveok
int leaveok(
    WINDOW *win,
    NCURSES_BOOL flag)
    { return(*(int *)0); }

```

```
/* ./base/lib_mouse.c */

#undef getmouse
int getmouse(
    MEVENT *aevent)
    { return(*(int *)0); }

#undef ungetmouse
int ungetmouse(
    MEVENT *aevent)
    { return(*(int *)0); }

#undef mousemask
mmask_t mousemask(
    mmask_t newmask,
    mmask_t *oldmask)
    { return(*(mmask_t *)0); }

#undef wenclose
NCURSES_BOOL wenclose(
    const WINDOW *win,
    int y,
    int x)
    { return(*(NCURSES_BOOL *)0); }

#undef mouseinterval
int mouseinterval(
    int maxclick)
    { return(*(int *)0); }

#undef _nc_has_mouse
int _nc_has_mouse(void)
    { return(*(int *)0); }

#undef wmouse_trafo
NCURSES_BOOL wmouse_trafo(
    const WINDOW *win,
    int *pY,
    int *pX,
    NCURSES_BOOL to_screen)
    { return(*(NCURSES_BOOL *)0); }

/* ./base/lib_move.c */

#undef wmove
int wmove(
    WINDOW *win,
```

```

int y,
int x)
{ return(*(int *)0); }

/* ./tty/lib_mvcur.c */

#undef _nc_msec_cost
int _nc_msec_cost(
const
char *const cap,
int affcnt)
{ return(*(int *)0); }

#undef _nc_mvcur_resume
void _nc_mvcur_resume(void)
{ /* void */ }

#undef _nc_mvcur_init
void _nc_mvcur_init(void)
{ /* void */ }

#undef _nc_mvcur_wrap
void _nc_mvcur_wrap(void)
{ /* void */ }

#undef mvcur
int mvcur(
int yold,
int xold,
int ynew,
int xnew)
{ return(*(int *)0); }

#undef _nc_optimize_enable
int _nc_optimize_enable;

/* ./base/lib_mvwin.c */

#undef mvwin
int mvwin(
WINDOW *win,
int by,
int bx)
{ return(*(int *)0); }

/* ./base/lib_newterm.c */

#undef filter

```

```

void filter(void)
{ /* void */ }

#undef nofilter
void nofilter(void)
{ /* void */ }

#undef newterm
SCREEN *newterm(
    char *name,
    FILE *ofp,
    FILE *ifp)
{ return(*(SCREEN **)0); }

/* ./base/lib_newwin.c */

#undef _nc_freewin
int _nc_freewin(
    WINDOW *win)
{ return(*(int *)0); }

#undef newwin
WINDOW *newwin(
    int num_lines,
    int num_columns,
    int begy,
    int begx)
{ return(*(WINDOW **)0); }

#undef derwin
WINDOW *derwin(
    WINDOW *orig,

    int num_lines,
    int num_columns,
    int begy,
    int begx)
{ return(*(WINDOW **)0); }

#undef subwin
WINDOW *subwin(
    WINDOW *w,
    int l,
    int c,
    int y,
    int x)
{ return(*(WINDOW **)0); }

```



```
#undef _nc_makenew
WINDOW *_nc_makenew(
    int num_lines,
    int num_columns,
    int begy,
    int begx,
    int flags)
{ return(*(WINDOW **)0); }
```

```
#undef _nc_screen_of
SCREEN *_nc_screen_of(
    WINDOW *win)
{ return(*(SCREEN **)0); }
```

```
/* ./base/lib_nl.c */
```

```
#undef nl
int nl(void)
{ return(*(int *)0); }
```

```
#undef nonl
int nonl(void)
{ return(*(int *)0); }
```

```
/* ./base/lib_overlay.c */
```

```
#undef overlay
int overlay(
    const WINDOW *win1,
    WINDOW *win2)
{ return(*(int *)0); }
```

```
#undef overwrite
int overwrite(
    const WINDOW *win1,
    WINDOW *win2)
{ return(*(int *)0); }
```

```
#undef copywin
int copywin(
    const WINDOW *src,
    WINDOW *dst,
    int sminrow,
    int smincol,
    int dminrow,
    int dmincol,
    int dmaxrow,
    int dmaxcol,
```

```

int over)
{
return(*(int *)0); }

/* ./base/lib_pad.c */

#undef newpad
WINDOW *newpad(
int l,
int c)
{ return(*(WINDOW **)0); }

#undef subpad
WINDOW *subpad(
WINDOW *orig,
int l,
int c,
int begy,
int begx)
{ return(*(WINDOW **)0); }

#undef prefresh
int prefresh(
WINDOW *win,
int pminrow,
int pmincol,
int sminrow,
int smincol,
int smaxrow,
int smaxcol)
{ return(*(int *)0); }

#undef pnoutrefresh
int pnoutrefresh(
WINDOW *win,
int pminrow,
int pmincol,
int sminrow,
int smincol,
int smaxrow,
int smaxcol)
{ return(*(int *)0); }

#undef pechochar
int pechochar(
WINDOW *pad,
const chtype ch)
{ return(*(int *)0); }

```

```
/* ./base/lib_printw.c */
```

```
#undef printw
int printw(
    const char *fmt,
    ...)
    { return(*(int *)0); }
```

```
#undef wprintw
int wprintw(
    WINDOW *win,
    const char *fmt,
    ...)
    { return(*(int *)0); }
```

```
#undef mvprintw
int mvprintw(
    int y,
    int x,
    const char *fmt,
    ...)
    { return(*(int *)0); }
```

```
#undef mvwprintw
int mvwprintw(
    WINDOW *win,

    int y,
    int x,
    const char *fmt,
    ...)
    { return(*(int *)0); }
```

```
#undef vwprintw
int vwprintw(
    WINDOW *win,
    const char *fmt,
    va_list argp)
    { return(*(int *)0); }
```

```
/* ./base/lib_redrawln.c */
```

```
#undef wredrawln
int wredrawln(
    WINDOW *win,
    int beg,
    int num)
```

```
{ return(*(int *)0); }

/* ./base/lib_refresh.c */

#undef wrefresh
int wrefresh(
    WINDOW *win)
    { return(*(int *)0); }

#undef wnoutrefresh
int wnoutrefresh(
    WINDOW *win)
    { return(*(int *)0); }

/* ./base/lib_restart.c */

#undef restartterm
int restartterm(
    char *term,
    int filenum,
    int *erret)
    { return(*(int *)0); }

/* ./base/lib_scanw.c */

#undef vwscanw
int vwscanw(
    WINDOW *win,
    char *fmt,
    va_list argp)
    { return(*(int *)0); }

#undef scanw
int scanw(
    char *fmt,
    ...)
    { return(*(int *)0); }

#undef wscanw
int wscanw(
    WINDOW *win,
    char *fmt,
    ...)
    { return(*(int *)0); }

#undef mvscanw
int mvscanw(
    int y,
```

```
int x,  
char *fmt,  
  
...)  
{ return(*(int *)0); }  
  
#undef mvwscanw  
int mvwscanw(  
WINDOW *win,  
int y,  
int x,  
char *fmt,  
...)  
{ return(*(int *)0); }  
  
/* ./base/lib_screen.c */  
  
#undef getwin  
WINDOW *getwin(  
FILE *filep)  
{ return(*(WINDOW **)0); }  
  
#undef putwin  
int putwin(  
WINDOW *win,  
FILE *filep)  
{ return(*(int *)0); }  
  
#undef scr_restore  
int scr_restore(  
const char *file)  
{ return(*(int *)0); }  
  
#undef scr_dump  
int scr_dump(  
const char *file)  
{ return(*(int *)0); }  
  
#undef scr_init  
int scr_init(  
const char *file)  
{ return(*(int *)0); }  
  
#undef scr_set  
int scr_set(  
const char *file)  
{ return(*(int *)0); }
```

```

/* ./base/lib_scroll.c */

#undef _nc_scroll_window
void _nc_scroll_window(
    WINDOW *win,
    int const n,
    short const top,
    short const bottom,
    cchar_t blank)
{ /* void */ }

#undef wscr1
int wscr1(
    WINDOW *win,
    int n)
{ return(*(int *)0); }

/* ./base/lib_scrollok.c */

#undef scrollok
int scrollok(
    WINDOW *win,
    NCURSES_BOOL flag)
{
    return(*(int *)0); }

/* ./base/lib_scrreg.c */

#undef wsetscrreg
int wsetscrreg(
    WINDOW *win,
    int top,
    int bottom)
{ return(*(int *)0); }

/* ./base/lib_set_term.c */

#undef set_term
SCREEN *set_term(
    SCREEN *screenp)
{ return(*(SCREEN **)0); }

#undef delscreen
void delscreen(
    SCREEN *sp)
{ /* void */ }

#undef _nc_setupscreen

```

```
int _nc_setupscreen(  
    int slines,  
    int scolumns,  
    FILE *output,  
    NCURSES_BOOL filtered,  
    int slk_format)  
    { return(*(int *)0); }
```

```
#undef _nc_ripoffline  
int _nc_ripoffline(  
    int line,  
    int (*init)(  
        WINDOW *p1,  
        int p2))  
    { return(*(int *)0); }
```

```
#undef ripoffline  
int ripoffline(  
    int line,  
    int (*init)(  
        WINDOW *p1,  
        int p2))  
    { return(*(int *)0); }
```

```
/* ./base/lib_slk.c */
```

```
#undef _nc_slk_initialize  
int _nc_slk_initialize(  
    WINDOW *stwin,  
    int cols)  
    { return(*(int *)0); }
```

```
#undef slk_restore  
int slk_restore(void)  
    { return(*(int *)0); }
```

```
/* ./base/lib_slkatr_set.c */
```

```
#undef slk_attr_set  
int slk_attr_set(  
    const  
    attr_t attr,  
    short color_pair_number,  
    void *opts)  
    { return(*(int *)0); }
```

```
/* ./base/lib_slkatrof.c */
```

```
#undef slk_atroff
int slk_atroff(
    const chtype attr)
    { return(*(int *)0); }

/* ./base/lib_slkatron.c */

#undef slk_atron
int slk_atron(
    const chtype attr)
    { return(*(int *)0); }

/* ./base/lib_slkatrset.c */

#undef slk_attrset
int slk_attrset(
    const chtype attr)
    { return(*(int *)0); }

/* ./base/lib_slkatrr.c */

#undef slk_attr
attr_t slk_attr(void)
    { return(*(attr_t *)0); }

/* ./base/lib_slkclear.c */

#undef slk_clear
int slk_clear(void)
    { return(*(int *)0); }

/* ./base/lib_slkcolor.c */

#undef slk_color
int slk_color(
    short color_pair_number)
    { return(*(int *)0); }

/* ./base/lib_slkinit.c */

#undef slk_init
int slk_init(
    int format)
    { return(*(int *)0); }

/* ./base/lib_slklab.c */

#undef slk_label
```



```

char *slk_label(
    int n)
    { return(*(char **)0); }

/* ./base/lib_slkrefr.c */

#undef slk_noutrefresh
int slk_noutrefresh(void)
    {
    return(*(int *)0); }

#undef slk_refresh
int slk_refresh(void)
    { return(*(int *)0); }

/* ./base/lib_slkset.c */

#include <wctype.h>

#undef slk_set
int slk_set(
    int i,
    const char *astr,
    int format)
    { return(*(int *)0); }

/* ./base/lib_slktouch.c */

#undef slk_touch
int slk_touch(void)
    { return(*(int *)0); }

/* ./base/lib_touch.c */

#undef is_linetouched
NCURSES_BOOL is_linetouched(
    WINDOW *win,
    int line)
    { return(*(NCURSES_BOOL *)0); }

#undef is_wintouched
NCURSES_BOOL is_wintouched(
    WINDOW *win)
    { return(*(NCURSES_BOOL *)0); }

#undef wtouchln
int wtouchln(
    WINDOW *win,

```

```

int y,
int n,
int changed)
{ return(*(int *)0); }

/* ./trace/lib_tracedmp.c */

#undef _tracedump
void _tracedump(
const char *name,
WINDOW *win)
{ /* void */ }

/* ./trace/lib_tracemse.c */

#undef _nc_tracemouse
char *_nc_tracemouse(
SCREEN *sp,
MEVENT const *ep)
{ return(*(char **)0); }

#undef _tracemouse
char *_tracemouse(
MEVENT const *ep)
{ return(*(char
***)0); }

/* ./tty/lib_tstp.c */

#include <SigAction.h>

#undef _nc_signal_handler
void _nc_signal_handler(
NCURSES_BOOL enable)
{ /* void */ }

/* ./base/lib_ungetch.c */

#undef _nc_fifo_dump
void _nc_fifo_dump(
SCREEN *sp)
{ /* void */ }

#undef _nc_ungetch
int _nc_ungetch(
SCREEN *sp,
int ch)
{ return(*(int *)0); }

```

```
#undef ungetch
int ungetch(
    int ch)
    { return(*(int *)0); }

/* ./tty/lib_vidattr.c */

#undef vidputs
int vidputs(
    chtype newmode,
    int (*outc)(
    int p1))
    { return(*(int *)0); }

#undef vidattr
int vidattr(
    chtype newmode)
    { return(*(int *)0); }

#undef termattrs
chtype termattrs(void)
    { return(*(chtype *)0); }

/* ./base/lib_vline.c */

#undef wvline
int wvline(
    WINDOW *win,
    chtype ch,
    int n)
    { return(*(int *)0); }

/* ./base/lib_wattroff.c */

#undef wattr_off
int wattr_off(
    WINDOW *win,
    attr_t at,
    void *opts)
    { return(*(int *)0); }

/* ./base/lib_wattron.c */

#undef wattr_on
int wattr_on(
    WINDOW *win,
    attr_t at,
```

```

void *opts)
{ return(*(int *)0); }

/* ./base/lib_winch.c */

#undef winch
chtype winch(
    WINDOW *win)
{ return(*(chtype *)0); }

/* ./base/lib_window.c */

#undef _nc_synchook
void _nc_synchook(
    WINDOW *win)
{ /* void */ }

#undef mvderwin
int mvderwin(
    WINDOW *win,
    int y,
    int x)
{ return(*(int *)0); }

#undef syncok
int syncok(
    WINDOW *win,
    NCURSES_BOOL bf)
{ return(*(int *)0); }

#undef wsyncup
void wsyncup(
    WINDOW *win)
{ /* void */ }

#undef wsyncdown
void wsyncdown(
    WINDOW *win)
{ /* void */ }

#undef wcursyncup
void wcursyncup(
    WINDOW *win)
{ /* void */ }

#undef dupwin
WINDOW *dupwin(

```

```

WINDOW *win)
{ return(*(WINDOW **)0); }

/* ./base/nc_panel.c */

#undef _nc_panelhook
struct panelhook *_nc_panelhook(void)
{ return(*(struct panelhook **)0); }

/* ./base/safe_sprintf.c */

#undef _nc_printf_string
char *_nc_printf_string(
    const char *fmt,
    va_list ap)
{ return(*(char **)0); }

/* ./tty/tty_update.c */

#include <sys/time.h>
#include
<sys/times.h>

#undef doupdate
int doupdate(void)
{ return(*(int *)0); }

#undef _nc_scrolln
int _nc_scrolln(
    int n,
    int top,
    int bot,
    int maxy)
{ return(*(int *)0); }

#undef _nc_screen_resume
void _nc_screen_resume(void)
{ /* void */ }

#undef _nc_screen_init
void _nc_screen_init(void)
{ /* void */ }

#undef _nc_screen_wrap
void _nc_screen_wrap(void)
{ /* void */ }

#undef _nc_do_xmc_glitch

```

```

void _nc_do_xmc_glitch(
    attr_t previous)
    { /* void */ }

/* ./trace/varargs.c */

typedef enum {
    atUnknown = 0, atInteger, atFloat, atPoint, atString
} ARGTYPE;

#undef _nc_varargs
char *_nc_varargs(
    const char *fmt,
    va_list ap)
    { return(*(char **)0); }

/* ./base/memmove.c */

#undef _nc_memmove
void _nc_memmove(void)
    { /* void */ }

/* ./base/vsscanf.c */

#undef _nc_vsscanf
void _nc_vsscanf(void)
    { /* void */ }

/* ./base/lib_freeall.c */

#include <term_entry.h>

#undef _nc_freeall
void _nc_freeall(void)
    { /* void */ }

#undef _nc_free_and_exit
void _nc_free_and_exit(
    int code)
    {
    /* void */ }

/* ./widechar/charable.c */

#undef _nc_is_charable
NCURSES_BOOL _nc_is_charable(
    wchar_t ch)
    { return(*(NCURSES_BOOL *)0); }

```

```

#undef _nc_to_char
int _nc_to_char(
    wint_t ch)
    { return(*(int *)0); }

#undef _nc_to_widechar
wint_t _nc_to_widechar(
    int ch)
    { return(*(wint_t *)0); }

/* ./widechar/lib_add_wch.c */

#undef wadd_wch
int wadd_wch(
    WINDOW *win,
    const cchar_t *wch)
    { return(*(int *)0); }

#undef wecho_wchar
int wecho_wchar(
    WINDOW *win,
    const cchar_t *wch)
    { return(*(int *)0); }

/* ./widechar/lib_box_set.c */

#undef wborder_set
int wborder_set(
    WINDOW *win,
    const cchar_t *ls,
    const cchar_t *rs,
    const cchar_t *ts,
    const cchar_t *bs,
    const cchar_t *tl,
    const cchar_t *tr,
    const cchar_t *bl,
    const cchar_t *br)
    { return(*(int *)0); }

/* ./widechar/lib_cchar.c */

#undef setcchar
int setcchar(
    cchar_t *wcval,
    const wchar_t *wch,
    const attr_t attrs,
    short color_pair,

```

```

const void *opts)
{ return(*(int *)0); }

#undef getcchar
int getcchar(
const cchar_t *wcval,
wchar_t *wch,
attr_t *attrs,
short *color_pair,
void *opts)
{ return(*(int *)0); }

/* ./widechar/lib_erasewchar.c */

#undef erasewchar
int erasewchar(
wchar_t *wch)
{ return(*(int *)0); }

#undef killwchar
int killwchar(
wchar_t *wch)
{ return(*(int *)0); }

/* ./widechar/lib_get_wch.c */

#undef wget_wch
int wget_wch(
WINDOW *win,
wint_t *result)
{ return(*(int *)0); }

/* ./widechar/lib_get_wstr.c */

#undef wgetn_wstr
int wgetn_wstr(
WINDOW *win,
wint_t *str,
int maxlen)
{ return(*(int *)0); }

/* ./widechar/lib_hline_set.c */

#undef whline_set
int whline_set(
WINDOW *win,
const cchar_t *ch,

```



```

int n)
{ return(*(int *)0); }

/* ./widechar/lib_in_wch.c */

#undef win_wch
int win_wch(
    WINDOW *win,
    cchar_t *wcval)
{ return(*(int *)0); }

/* ./widechar/lib_in_wchnstr.c */

#undef win_wchnstr
int win_wchnstr(
    WINDOW *win,

    cchar_t *wchstr,
    int n)
{ return(*(int *)0); }

/* ./widechar/lib_ins_wch.c */

#undef wins_wch
int wins_wch(
    WINDOW *win,
    const cchar_t *wch)
{ return(*(int *)0); }

#undef wins_nwstr
int wins_nwstr(
    WINDOW *win,
    const wchar_t *wstr,
    int n)
{ return(*(int *)0); }

/* ./widechar/lib_inwstr.c */

#undef winnwstr
int winnwstr(
    WINDOW *win,
    wchar_t *wstr,
    int n)
{ return(*(int *)0); }

#undef winwstr
int winwstr(
    WINDOW *win,

```

```

wchar_t *wstr)
{ return(*(int *)0); }

/* ./widechar/lib_key_name.c */

#undef key_name
char *key_name(
    wchar_t c)
{ return(*(char **)0); }

/* ./widechar/lib_pecho_wchar.c */

#undef pecho_wchar
int pecho_wchar(
    WINDOW *pad,
    const cchar_t *wch)
{ return(*(int *)0); }

/* ./widechar/lib_slk_wset.c */

#undef slk_wset
int slk_wset(
    int i,
    const wchar_t *astr,
    int format)
{ return(*(int *)0); }

/* ./widechar/lib_unget_wch.c */

#undef _nc_wcrtomb
size_t _nc_wcrtomb(
    char *target,
    wchar_t source,

    mbstate_t *state)
{ return(*(size_t *)0); }

#undef unget_wch
int unget_wch(
    const wchar_t wch)
{ return(*(int *)0); }

/* ./widechar/lib_vid_attr.c */

#undef vid_puts
int vid_puts(
    attr_t newmode,
    short pair,

```

```

void *opts,
int (*outc)(
int p1))
{ return(*(int *)0); }

#undef vid_attr
int vid_attr(
attr_t newmode,
short pair,
void *opts)
{ return(*(int *)0); }

#undef term_attrs
attr_t term_attrs(void)
{ return(*(attr_t *)0); }

/* ./widechar/lib_vline_set.c */

#undef wvline_set
int wvline_set(
WINDOW *win,
const cchar_t *ch,
int n)
{ return(*(int *)0); }

/* ./widechar/lib_wacs.c */

#undef _nc_wacs
cchar_t *_nc_wacs;

#undef _nc_init_wacs
void _nc_init_wacs(void)
{ /* void */ }

/* ./widechar/lib_wunctrl.c */

#undef wunctrl
wchar_t *wunctrl(
cchar_t *wc)
{ return(*(wchar_t **)0); }

/* ./expanded.c */

#undef _nc_toggle_attr_on
void _nc_toggle_attr_on(
attr_t *S,
attr_t at)
{ /* void */ }

```

```
#undef _nc_toggle_attr_off
void _nc_toggle_attr_off(
    attr_t *S,
```

```
    attr_t at)
    { /* void */ }
```

```
#undef _nc_DelCharCost
int _nc_DelCharCost(
    int count)
    { return(*(int *)0); }
```

```
#undef _nc_InsCharCost
int _nc_InsCharCost(
    int count)
    { return(*(int *)0); }
```

```
#undef _nc_UpdateAttrs
void _nc_UpdateAttrs(
    cchar_t c)
    { /* void */ }
```

```
/* ./base/legacy_coding.c */
```

```
#undef use_legacy_coding
int use_legacy_coding(
    int level)
    { return(*(int *)0); }
```

```
/* ./base/lib_dft_fgbg.c */
```

```
#undef use_default_colors
int use_default_colors(void)
    { return(*(int *)0); }
```

```
#undef assume_default_colors
int assume_default_colors(
    int fg,
    int bg)
    { return(*(int *)0); }
```

```
/* ./tinfo/lib_print.c */
```

```
#undef mcprint
int mcprint(
    char *data,
    int len)
```

```

    { return(*(int *)0); }

/* ./base/resizeterm.c */

#undef is_term_resized
NCURSES_BOOL is_term_resized(
    int ToLines,
    int ToCols)
    { return*(NCURSES_BOOL *)0; }

#undef resize_term
int resize_term(
    int ToLines,
    int ToCols)
    { return(*(int *)0); }

#undef resizeterm
int resizeterm(
    int ToLines,

    int ToCols)
    { return(*(int *)0); }

/* ./trace/trace_xnames.c */

#undef _nc_trace_xnames
void _nc_trace_xnames(
    TERMTYPE *tp)
    { /* void */ }

/* ./tinfo/use_screen.c */

#undef use_screen
int use_screen(
    SCREEN *screen,
    NCURSES_SCREEN_CB func,
    void *data)
    { return(*(int *)0); }

/* ./base/use_window.c */

#undef use_window
int use_window(
    WINDOW *win,
    NCURSES_WINDOW_CB func,
    void *data)
    { return(*(int *)0); }

```

```

/* ./base/wresize.c */

#undef wresize
int wresize(
    WINDOW *win,
    int ToLines,
    int ToCols)
{ return(*(int *)0); }

/* ./tinfo/access.c */

#include <sys/stat.h>
#include <nc_alloc.h>

#undef _nc_rootname
char *_nc_rootname(
    char *path)
{ return(*(char **)0); }

#undef _nc_is_abs_path
NCURSES_BOOL _nc_is_abs_path(
    const char *path)
{ return(*(NCURSES_BOOL *)0); }

#undef _nc_pathlast
unsigned _nc_pathlast(
    const char *path)
{ return(*(unsigned *)0); }

#undef _nc_basename
char *_nc_basename(
    char *path)
{
    return(*(char **)0); }

#undef _nc_access
int _nc_access(
    const char *path,
    int mode)
{ return(*(int *)0); }

#undef _nc_is_dir_path
NCURSES_BOOL _nc_is_dir_path(
    const char *path)
{ return(*(NCURSES_BOOL *)0); }

#undef _nc_is_file_path
NCURSES_BOOL _nc_is_file_path(

```

```

const char *path)
{ return(*(NCURSES_BOOL *)0); }

#undef _nc_env_access
int _nc_env_access(void)
{ return(*(int *)0); }

/* ./tinfo/add_tries.c */

#undef _nc_add_to_try
int _nc_add_to_try(
    TRIES **tree,
    const char *str,
    unsigned code)
{ return(*(int *)0); }

/* ./tinfo/alloc_ttype.c */

#undef _nc_align_termttype
void _nc_align_termttype(
    TERMTYPE *to,
    TERMTYPE *from)
{ /* void */ }

#undef _nc_copy_termttype
void _nc_copy_termttype(
    TERMTYPE *dst,
    TERMTYPE *src)
{ /* void */ }

/* ./codes.c */

#undef boolcodes
char *const boolcodes[] = {0};
#undef numcodes
char *const numcodes[] = {0};
#undef strcodes
char *const strcodes[] = {0};

/* ./tinfo/comp_error.c */
#undef _nc_suppress_warnings
NCURSES_BOOL
    _nc_suppress_warnings;
#undef _nc_curr_line
int _nc_curr_line;
#undef _nc_curr_col
int _nc_curr_col;

```

```
#undef _nc_get_source
const char *_nc_get_source(void)
{ return(*(const char **)0); }
```

```
#undef _nc_set_source
void _nc_set_source(
    const char *const name)
{ /* void */ }
```

```
#undef _nc_set_type
void _nc_set_type(
    const char *const name)
{ /* void */ }
```

```
#undef _nc_get_type
void _nc_get_type(
    char *name)
{ /* void */ }
```

```
#undef _nc_warning
void _nc_warning(
    const char *const fmt,
    ...)
{ /* void */ }
```

```
#undef _nc_err_abort
void _nc_err_abort(
    const char *const fmt,
    ...)
{ /* void */ }
```

```
#undef _nc_syserr_abort
void _nc_syserr_abort(
    const char *const fmt,
    ...)
{ /* void */ }
```

```
/* ./tinfo/db_iterator.c */
```

```
#undef _nc_tic_dir
const char *_nc_tic_dir(
    const char *path)
{ return(*(const char **)0); }
```

```
#undef _nc_keep_tic_dir
void _nc_keep_tic_dir(
    const char *path)
{ /* void */ }
```



```

#undef _nc_last_db
void _nc_last_db(void)
{ /* void
*/ }

#undef _nc_next_db
const char *_nc_next_db(
    DBDIRS *state,
    int *offset)
{ return(*(const char **)0); }

#undef _nc_first_db
void _nc_first_db(
    DBDIRS *state,
    int *offset)
{ /* void */ }

/* ./tinfo/doalloc.c */

#undef _nc_doalloc
void *_nc_doalloc(
    void *oldp,
    size_t amount)
{ return(*(void **)0); }

/* ./tinfo/entries.c */

#undef _nc_head
ENTRY *_nc_head;
#undef _nc_tail
ENTRY *_nc_tail;

#undef _nc_free_entry
void _nc_free_entry(
    ENTRY *headp,
    TERMTYPE *tterm)
{ /* void */ }

#undef _nc_free_entries
void _nc_free_entries(
    ENTRY *headp)
{ /* void */ }

#undef _nc_delink_entry
ENTRY *_nc_delink_entry(
    ENTRY *headp,
    TERMTYPE *tterm)

```

```

    { return(*(ENTRY **); }

#undef _nc_leaks_tinfo
void _nc_leaks_tinfo(void)
    { /* void */ }

/* ./fallback.c */

#undef _nc_fallback
const TERMTYPE *_nc_fallback(
    const char *name)
    { return(*(const TERMTYPE **); }

/* ./tinfo/free_ttype.c */

#undef _nc_free_termtype
void _nc_free_termtype(
    TERMTYPE
    *ptr)
    { /* void */ }

#undef _nc_user_definable
NCURSES_BOOL _nc_user_definable;

#undef use_extended_names
int use_extended_names(
    NCURSES_BOOL flag)
    { return(*(int *)0); }

/* ./tinfo/getenv_num.c */

#undef _nc_getenv_num
int _nc_getenv_num(
    const char *name)
    { return(*(int *)0); }

/* ./tinfo/home_terminfo.c */

#undef _nc_home_terminfo
char *_nc_home_terminfo(void)
    { return(*(char **)0); }

/* ./tinfo/init_keytry.c */

#if 0

#include <init_keytry.h>

```

```

#undef _nc_tinfo_fkeys
const struct tinfo_fkeys _nc_tinfo_fkeys[] = {0};

#endif

#undef _nc_init_keytry
void _nc_init_keytry(
    SCREEN *sp)
    { /* void */ }

/* ./tinfo/lib_acs.c */

#undef acs_map
ctype acs_map[128];

#undef _nc_init_acs
void _nc_init_acs(void)
    { /* void */ }

/* ./tinfo/lib_baudrate.c */

#include <termcap.h>

struct speed {
    int s;
    int sp;
};

#undef _nc_baudrate
int _nc_baudrate(
    int OSpeed)
    { return(*(int *)0); }

#undef _nc_ospeed
int _nc_ospeed(
    int BaudRate)
    { return(*(int *)0);
    }

#undef baudrate
int baudrate(void)
    { return(*(int *)0); }

/* ./tinfo/lib_cur_term.c */

#undef cur_term
TERMINAL *cur_term;

```

```

#undef set_curterm
TERMINAL *set_curterm(
    TERMINAL *termp)
{ return(*(TERMINAL **)0); }

#undef del_curterm
int del_curterm(
    TERMINAL *termp)
{ return(*(int *)0); }

/* ./tinfo/lib_data.c */

#undef stdscr
WINDOW *stdscr;
#undef curscr
WINDOW *curscr;
#undef newscr
WINDOW *newscr;
#undef _nc_screen_chain
SCREEN *_nc_screen_chain;
#undef SP
SCREEN *SP;
#undef _nc_globals
NCURSES_GLOBALS _nc_globals;
#undef _nc_prescreen
NCURSES_PREScreen _nc_prescreen;

/* ./tinfo/lib_has_cap.c */

#undef has_ic
NCURSES_BOOL has_ic(void)
{ return(*(NCURSES_BOOL *)0); }

#undef has_il
NCURSES_BOOL has_il(void)
{ return(*(NCURSES_BOOL *)0); }

/* ./tinfo/lib_kernel.c */

#undef erasechar
char erasechar(void)
{ return(*(char *)0); }

#undef killchar
char killchar(void)
{ return(*(char *)0); }

#undef flushing

```

```

int flushinp(void)
{ return(*(int *)0); }

/* ./lib_keyname.c
*/

struct kn { short offset; int code; };

#undef _nc_keyname
char *_nc_keyname(
    SCREEN *sp,
    int c)
{ return(*(char **)0); }

#undef keyname
char *keyname(
    int c)
{ return(*(char **)0); }

/* ./tinfo/lib_longname.c */

#undef longname
char *longname(void)
{ return(*(char **)0); }

/* ./tinfo/lib_napms.c */

#include <time.h>

#undef napms
int napms(
    int ms)
{ return(*(int *)0); }

/* ./tinfo/lib_options.c */

#undef idlok
int idlok(
    WINDOW *win,
    NCURSES_BOOL flag)
{ return(*(int *)0); }

#undef idcok
void idcok(
    WINDOW *win,
    NCURSES_BOOL flag)
{ /* void */ }

```

```
#undef halfdelay
int halfdelay(
    int t)
    { return(*(int *)0); }

#undef nodelay
int nodelay(
    WINDOW *win,
    NCURSES_BOOL flag)
    { return(*(int *)0); }

#undef notimeout
int notimeout(
    WINDOW *win,
    NCURSES_BOOL f)
    { return(*(int *)0); }

#undef wtimeout
void wtimeout(
    WINDOW *win,
    int delay)
    { /* void */ }

#undef keypad
int keypad(
    WINDOW *win,
    NCURSES_BOOL flag)
    {
    return(*(int *)0); }

#undef meta
int meta(
    WINDOW *win,
    NCURSES_BOOL flag)
    { return(*(int *)0); }

#undef curs_set
int curs_set(
    int vis)
    { return(*(int *)0); }

#undef typeahead
int typeahead(
    int fd)
    { return(*(int *)0); }

#undef has_key
int has_key(
```

```

int keycode)
{ return(*(int *)0); }

#undef _nc_keypad
int _nc_keypad(
    SCREEN *sp,
    NCURSES_BOOL flag)
{ return(*(int *)0); }

/* ./tinfo/lib_raw.c */

#undef raw
int raw(void)
{ return(*(int *)0); }

#undef cbreak
int cbreak(void)
{ return(*(int *)0); }

#undef qiflush
void qiflush(void)
{ /* void */ }

#undef noraw
int noraw(void)
{ return(*(int *)0); }

#undef nocbreak
int nocbreak(void)
{ return(*(int *)0); }

#undef noqiflush
void noqiflush(void)
{ /* void */ }

#undef intrflush
int intrflush(
    WINDOW *win,
    NCURSES_BOOL flag)
{ return(*(int *)0); }

/* ./tinfo/lib_setup.c */

#include <locale.h>
#include <sys/ioctl.h>
#include <langinfo.h>

#undef ttytype

```

```

char ttytype[256];
#undef
    LINES
int LINES;
#undef COLS
int COLS;
#undef TABSIZE
int TABSIZE;

#undef set_tabsize
int set_tabsize(
    int value)
    { return(*(int *)0); }

#undef _nc_handle_sigwinch
int _nc_handle_sigwinch(
    SCREEN *sp)
    { return(*(int *)0); }

#undef use_env
void use_env(
    NCURSES_BOOL f)
    { /* void */ }

#undef _nc_get_screensize
void _nc_get_screensize(
    SCREEN *sp,
    int *linep,
    int *colp)
    { /* void */ }

#undef _nc_update_screensize
void _nc_update_screensize(
    SCREEN *sp)
    { /* void */ }

#undef _nc_get_locale
char *_nc_get_locale(void)
    { return(*(char **)0); }

#undef _nc_unicode_locale
int _nc_unicode_locale(void)
    { return(*(int *)0); }

#undef _nc_locale_breaks_acs
int _nc_locale_breaks_acs(
    TERMINAL *term)
    { return(*(int *)0); }

```



```
#undef _nc_setupterm
int _nc_setupterm(
    char *tname,
    int Filedes,
    int *erret,
    NCURSES_BOOL reuse)
{ return(*(int *)0); }
```

```
#undef setupterm
int setupterm(
    char *tname,
    int Filedes,
    int *erret)
{ return(*(int *)0); }
```

```
/*
./tinfo/lib_termcap.c */
```

```
#undef UP
char *UP;
#undef BC
char *BC;
```

```
#undef tgetent
int tgetent(
    char *bufp,
    const char *name)
{ return(*(int *)0); }
```

```
#if 0
```

```
#include <capdefaults.c>
```

```
#endif
```

```
#undef tgetflag
int tgetflag(
    char *id)
{ return(*(int *)0); }
```

```
#undef tgetnum
int tgetnum(
    char *id)
{ return(*(int *)0); }
```

```
#undef tgetstr
char *tgetstr(
```

```

char *id,
char **area)
{ return(*(char **)0); }

/* ./tinfo/lib_termname.c */

#undef termname
char *termname(void)
{ return(*(char **)0); }

/* ./tinfo/lib_tgoto.c */

#undef tgoto
char *tgoto(
const char *string,
int x,
int y)
{ return(*(char **)0); }

/* ./tinfo/lib_ti.c */

#undef tigetflag
int tigetflag(
char *str)
{ return(*(int *)0); }

#undef tigetnum
int tigetnum(
char *str)
{ return(*(int *)0); }

#undef tigetstr
char *tigetstr(
char *str)
{ return(*(char **)0); }

/* ./tinfo/lib_tparm.c */

#undef _nc_tparm_err
int _nc_tparm_err;

#undef _nc_tparm_analyze
int _nc_tparm_analyze(
const
char *string,
char *p_is_s[9],
int *popcount)
{ return(*(int *)0); }

```

```

#undef tparm
char *tparm(
    char *string,
    ...)
{ return(*(char **)0); }

/* ./tinfo/lib_tputs.c */

#undef PC
char PC;
#undef ospeed
NCURSES_OSPEED ospeed;
#undef _nc_nulls_sent
int _nc_nulls_sent;

#undef _nc_set_no_padding
void _nc_set_no_padding(
    SCREEN *sp)
{ /* void */ }

#undef delay_output
int delay_output(
    int ms)
{ return(*(int *)0); }

#undef _nc_flush
void _nc_flush(void)
{ /* void */ }

#undef _nc_outch
int _nc_outch(
    int ch)
{ return(*(int *)0); }

#undef putp
int putp(
    const char *string)
{ return(*(int *)0); }

#undef tputs
int tputs(
    const char *string,
    int affcnt,
    int (*outc)(
        int p1))
{ return(*(int *)0); }

```

```

/* ./trace/lib_trace.c */

#undef _nc_tracing
unsigned _nc_tracing;
#undef _nc_tputs_trace
const char *_nc_tputs_trace = {0};
#undef _nc_outchars
long _nc_outchars;

#undef trace
void trace(
    const unsigned int tracelevel)
    { /* void */ }

#undef _tracef
void _tracef(
    const
    char *fmt,
    ...)
    { /* void */ }

#undef _nc_retrace_bool
NCURSES_BOOL _nc_retrace_bool(
    NCURSES_BOOL code)
    { return(*(NCURSES_BOOL *)0); }

#undef _nc_retrace_int
int _nc_retrace_int(
    int code)
    { return(*(int *)0); }

#undef _nc_retrace_unsigned
unsigned _nc_retrace_unsigned(
    unsigned code)
    { return(*(unsigned *)0); }

#undef _nc_retrace_ptr
char *_nc_retrace_ptr(
    char *code)
    { return(*(char **)0); }

#undef _nc_retrace_cptr
const char *_nc_retrace_cptr(
    const char *code)
    { return(*(const char **)0); }

#undef _nc_retrace_cvoid_ptr
void *_nc_retrace_cvoid_ptr(

```

```

void *code)
{ return(*(void **)0); }

#undef _nc_retrace_void_ptr
void *_nc_retrace_void_ptr(
void *code)
{ return(*(void **)0); }

#undef _nc_retrace_sp
SCREEN *_nc_retrace_sp(
SCREEN *code)
{ return(*(SCREEN **)0); }

#undef _nc_retrace_win
WINDOW *_nc_retrace_win(
WINDOW *code)
{ return(*(WINDOW **)0); }

/* ./trace/lib_traceatr.c */

#undef _traceattr2
char *_traceattr2(
int bufnum,

chtype newmode)
{ return(*(char **)0); }

#undef _traceattr
char *_traceattr(
attr_t newmode)
{ return(*(char **)0); }

#undef _nc_retrace_attr_t
attr_t _nc_retrace_attr_t(
attr_t code)
{ return(*(attr_t *)0); }

#undef _nc_altcharset_name
const char *_nc_altcharset_name(
attr_t attr,
chtype ch)
{ return(*(const char **)0); }

#undef _tracechtype2
char *_tracechtype2(
int bufnum,
chtype ch)
{ return(*(char **)0); }

```

```

#undef _tracectype
char *_tracectype(
    ctype ch)
    { return(*(char **)0); }

#undef _nc_retrace_ctype
ctype _nc_retrace_ctype(
    ctype code)
    { return(*(ctype *)0); }

#undef _tracecchar_t2
char *_tracecchar_t2(
    int bufnum,
    const cchar_t *ch)
    { return(*(char **)0); }

#undef _tracecchar_t
char *_tracecchar_t(
    const cchar_t *ch)
    { return(*(char **)0); }

/* ./trace/lib_tracebits.c */

typedef struct {
    unsigned int val;
    const char *name;
} BITNAMES;

#undef _nc_trace_ttymode
char *_nc_trace_ttymode(
    struct
    termios *tty)
    { return(*(char **)0); }

#undef _nc_tracebits
char *_nc_tracebits(void)
    { return(*(char **)0); }

/* ./trace/lib_tracechr.c */

#undef _nc_tracechar
char *_nc_tracechar(
    SCREEN *sp,
    int ch)
    { return(*(char **)0); }

#undef _tracechar

```

```

char *_tracechar(
    int ch)
    { return(*(char **)0); }

/* ./tinfo/lib_ttyflags.c */

#undef _nc_get_tty_mode
int _nc_get_tty_mode(
    struct termios *buf)
    { return(*(int *)0); }

#undef _nc_set_tty_mode
int _nc_set_tty_mode(
    struct termios *buf)
    { return(*(int *)0); }

#undef def_shell_mode
int def_shell_mode(void)
    { return(*(int *)0); }

#undef def_prog_mode
int def_prog_mode(void)
    { return(*(int *)0); }

#undef reset_prog_mode
int reset_prog_mode(void)
    { return(*(int *)0); }

#undef reset_shell_mode
int reset_shell_mode(void)
    { return(*(int *)0); }

#undef savetty
int savetty(void)
    { return(*(int *)0); }

#undef resetty
int resetty(void)
    { return(*(int *)0); }

/* ./tty/lib_twait.c */

#undef _nc_timed_wait
int _nc_timed_wait(
    SCREEN *sp,

    int mode,
    int milliseconds,

```

```

int *timeleft)
{ return(*(int *)0); }

/* ./tinfo/name_match.c */

#undef _nc_first_name
char *_nc_first_name(
    const char *const sp)
{ return(*(char **)0); }

#undef _nc_name_match
int _nc_name_match(
    const char *const namelst,
    const char *const name,
    const char *const delim)
{ return(*(int *)0); }

/* ./names.c */

#undef boolnames
char *const boolnames[] = {0};
#undef boolfnames
char *const boolfnames[] = {0};
#undef numnames
char *const numnames[] = {0};
#undef numfnames
char *const numfnames[] = {0};
#undef strnames
char *const strnames[] = {0};
#undef strfnames
char *const strfnames[] = {0};

/* ./tinfo/read_entry.c */

#include <hashed_db.h>

#undef _nc_read_termtype
int _nc_read_termtype(
    TERMTYPE *ptr,
    char *buffer,
    int limit)
{ return(*(int *)0); }

#undef _nc_read_file_entry
int _nc_read_file_entry(
    const char *const filename,
    TERMTYPE *ptr)
{ return(*(int *)0); }

```



```

}

#undef _nc_read_entry
int _nc_read_entry(
    const char *const name,
    char *const filename,
    TERMTYPE *const tp)
{ return(*(int *)0); }

/* ./tinfo/read_termcap.c */

#include <sys/types.h>

#undef _nc_read_termcap_entry
int _nc_read_termcap_entry(
    const char *const tn,
    TERMTYPE *const tp)
{ return(*(int *)0); }

/* ./tinfo/setbuf.c */

#undef _nc_set_buffer
void _nc_set_buffer(
    FILE *ofp,
    NCURSES_BOOL buffered)
{ /* void */ }

/* ./tinfo/strings.c */

#undef _nc_str_init
string_desc *_nc_str_init(
    string_desc *dst,
    char *src,
    size_t len)
{ return(*(string_desc **)0); }

#undef _nc_str_null
string_desc *_nc_str_null(
    string_desc *dst,
    size_t len)
{ return(*(string_desc **)0); }

#undef _nc_str_copy
string_desc *_nc_str_copy(
    string_desc *dst,
    string_desc *src)
{ return(*(string_desc **)0); }

```

```
#undef _nc_safe_strcat
NCURSES_BOOL _nc_safe_strcat(
    string_desc *dst,
    const char *src)
{ return(*(NCURSES_BOOL *)0); }
```

```
#undef _nc_safe_strcpy
NCURSES_BOOL
_nc_safe_strcpy(
    string_desc *dst,
    const char *src)
{ return(*(NCURSES_BOOL *)0); }
```

```
/* ./trace/trace_buf.c */
```

```
#undef _nc_trace_buf
char *_nc_trace_buf(
    int bufnum,
    size_t want)
{ return(*(char **)0); }
```

```
#undef _nc_trace_bufcat
char *_nc_trace_bufcat(
    int bufnum,
    const char *value)
{ return(*(char **)0); }
```

```
/* ./trace/trace_tries.c */
```

```
#undef _nc_trace_tries
void _nc_trace_tries(
    TRIES *tree)
{ /* void */ }
```

```
/* ./base/tries.c */
```

```
#undef _nc_expand_try
char *_nc_expand_try(
    TRIES *tree,
    unsigned code,
    int *count,
    size_t len)
{ return(*(char **)0); }
```

```
#undef _nc_remove_key
int _nc_remove_key(
    TRIES **tree,
    unsigned code)
```

```

    { return(*(int *)0); }

#undef _nc_remove_string
int _nc_remove_string(
    TRIES **tree,
    const char *string)
    { return(*(int *)0); }

/* ./tinfo/trim_sgr0.c */

#undef _nc_trim_sgr0
char *_nc_trim_sgr0(
    TERMTYPE *tp)
    { return(*(char **)0); }

/* ./unctrl.c */

#undef _nc_unctrl
char *_nc_unctrl(
    SCREEN *sp,

    chtype ch)
    { return(*(char **)0); }

#undef unctrl
char *unctrl(
    chtype ch)
    { return(*(char **)0); }

/* ./trace/visbuf.c */

#undef _nc_visbuf2
const char *_nc_visbuf2(
    int bufnum,
    const char *buf)
    { return(*(const char **)0); }

#undef _nc_visbuf
const char *_nc_visbuf(
    const char *buf)
    { return(*(const char **)0); }

#undef _nc_visbufn
const char *_nc_visbufn(
    const char *buf,
    int len)
    { return(*(const char **)0); }

```

```
#undef _nc_viswbuf2
const char *_nc_viswbuf2(
    int bufnum,
    const wchar_t *buf)
{ return(*(const char **)0); }
```

```
#undef _nc_viswbuf
const char *_nc_viswbuf(
    const wchar_t *buf)
{ return(*(const char **)0); }
```

```
#undef _nc_viswbufn
const char *_nc_viswbufn(
    const wchar_t *buf,
    int len)
{ return(*(const char **)0); }
```

```
#undef _nc_viswibuf
const char *_nc_viswibuf(
    const wint_t *buf)
{ return(*(const char **)0); }
```

```
#undef _nc_viscbuf2
const char *_nc_viscbuf2(
    int bufnum,
    const cchar_t *buf,
    int len)
{ return(*(const
char **)0); }
```

```
#undef _nc_viscbuf
const char *_nc_viscbuf(
    const cchar_t *buf,
    int len)
{ return(*(const char **)0); }
```

```
/* ./tinfo/alloc_entry.c */
```

```
#undef _nc_init_entry
void _nc_init_entry(
    TERMTYPE *const tp)
{ /* void */ }
```

```
#undef _nc_copy_entry
ENTRY *_nc_copy_entry(
    ENTRY *oldp)
{ return(*(ENTRY **)0); }
```

```

#undef _nc_save_str
char *_nc_save_str(
    const char *const string)
{ return(*(char **)0); }

#undef _nc_wrap_entry
void _nc_wrap_entry(
    ENTRY *const ep,
    NCURSES_BOOL copy_strings)
{ /* void */ }

#undef _nc_merge_entry
void _nc_merge_entry(
    TERMTYPE *const to,
    TERMTYPE *const from)
{ /* void */ }

/* ./tinfo/captainfo.c */

#undef _nc_captainfo
char *_nc_captainfo(
    const char *cap,
    const char *s,
    int const parameterized)
{ return(*(char **)0); }

#undef _nc_infotocap
char *_nc_infotocap(
    const char *cap,
    const char *str,
    int const parameterized)
{ return(*(char **)0); }

/* ./comp_captab.c */

#include <hashsize.h>

#undef _nc_get_table
const
struct name_table_entry *_nc_get_table(
    NCURSES_BOOL termcap)
{ return(*(const struct name_table_entry **)0); }

#undef _nc_get_hash_table
const short *_nc_get_hash_table(
    NCURSES_BOOL termcap)
{ return(*(const short **)0); }

```

```

#undef _nc_get_alias_table
const struct alias *_nc_get_alias_table(
    NCURSES_BOOL termcap)
    { return(*(const struct alias **)0); }

/* ./tinfo/comp_expand.c */

#undef _nc_tic_expand
char *_nc_tic_expand(
    const char *srcp,
    NCURSES_BOOL tic_format,
    int numbers)
    { return(*(char **)0); }

/* ./tinfo/comp_hash.c */

#undef _nc_find_entry
struct name_table_entry const *_nc_find_entry(
    const char *string,
    const short *hash_table)
    { return(*(struct name_table_entry const **)0); }

#undef _nc_find_type_entry
struct name_table_entry const *_nc_find_type_entry(
    const char *string,
    int type,
    const struct name_table_entry *table)
    { return(*(struct name_table_entry const **)0); }

/* ./tinfo/comp_parse.c */

#undef _nc_check_termtype2
void (*_nc_check_termtype2)(
    TERMTYPE
    *p1,
    NCURSES_BOOL p2);
#undef _nc_check_termtype
void (*_nc_check_termtype)(
    TERMTYPE *p1);

#undef _nc_entry_match
NCURSES_BOOL _nc_entry_match(
    char *n1,
    char *n2)
    { return(*(NCURSES_BOOL *)0); }

#undef _nc_read_entry_source
void _nc_read_entry_source(

```

```

FILE *fp,
char *buf,
int literal,
NCURSES_BOOL silent,
NCURSES_BOOL (*hook)(
ENTRY *p1))
{ /* void */ }

#undef _nc_resolve_uses2
int _nc_resolve_uses2(
    NCURSES_BOOL fullresolve,
    NCURSES_BOOL literal)
{ return(*(int *)0); }

#undef _nc_resolve_uses
int _nc_resolve_uses(
    NCURSES_BOOL fullresolve)
{ return(*(int *)0); }

/* ./tinfo/comp_scan.c */

#undef _nc_syntax
int _nc_syntax;
#undef _nc_curr_file_pos
long _nc_curr_file_pos;
#undef _nc_comment_start
long _nc_comment_start;
#undef _nc_comment_end
long _nc_comment_end;
#undef _nc_start_line
long _nc_start_line;
#undef _nc_curr_token
struct token _nc_curr_token;
#undef _nc_disable_period
NCURSES_BOOL
_nc_disable_period;

#undef _nc_reset_input
void _nc_reset_input(
    FILE *fp,
    char *buf)
{ /* void */ }

#undef _nc_get_token
int _nc_get_token(
    NCURSES_BOOL silent)
{ return(*(int *)0); }

```

```

#undef _nc_trans_string
int _nc_trans_string(
    char *ptr,
    char *last)
    { return(*(int *)0); }

#undef _nc_push_token
void _nc_push_token(
    int tokclass)
    { /* void */ }

#undef _nc_panic_mode
void _nc_panic_mode(
    char ch)
    { /* void */ }

/* ./tinfo/parse_entry.c */

#undef _nc_parse_entry
int _nc_parse_entry(
    struct entry *entryp,
    int literal,
    NCURSES_BOOL silent)
    { return(*(int *)0); }

#undef _nc_capcmp
int _nc_capcmp(
    const char *s,
    const char *t)
    { return(*(int *)0); }

typedef struct {
    const char *from;
    const char *to;
} assoc;

/* ./tinfo/write_entry.c */

#undef _nc_set_writedir
void _nc_set_writedir(
    char *dir)
    { /* void */ }

#undef _nc_write_entry
void _nc_write_entry(
    TERMTYPE *const tp)
    { /* void */ }

```



```
#undef _nc_tic_written
int _nc_tic_written(void)
{
    return(*(int *)0); }

/* ./base/define_key.c */

#undef define_key
int define_key(
    const char *str,
    int keycode)
{ return(*(int *)0); }

/* ./tinfo/hashed_db.c */

#undef _nc_hashed_db
void _nc_hashed_db(void)
{ /* void */ }

/* ./base/key_defined.c */

#undef key_defined
int key_defined(
    const char *str)
{ return(*(int *)0); }

/* ./base/keybound.c */

#undef keybound
char *keybound(
    int code,
    int count)
{ return(*(char **)0); }

/* ./base/keyok.c */

#undef keyok
int keyok(
    int c,
    NCURSES_BOOL flag)
{ return(*(int *)0); }

/* ./base/version.c */

#undef curses_version
const char *curses_version(void)
{ return(*(const char **)0); }
```

Found in path(s):

\* /opt/cola/permits/1600019816\_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-  
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/ncurses/lib-Incursesw  
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*****
* @Id: curs_termcap.3x,v 1.22 2007/06/02 20:40:07 tom Exp @
-->

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archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-  
5.7/doc/html/man/curs\_termcap.3x.html  
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dnl*****
dnl
dnl $Id: table.m4,v 1.2 2006/04/22 23:16:44 tom Exp $
define(`ANCHORIDX',`0')dnl
define(`MANPAGE',`define(`MANPG', $1)')dnl
divert(-1)dnl
define(`ANCHOR',`divert(0)define(`ANCHORIDX',incr(ANCHORIDX))dnl
<TR><TD>$1</TD><TD><A HREF="HTMLNAME`#AFU`_'ANCHORIDX">$2</A></TD><TD><A
HREF=" ../man/MANPG.html">MANPG</A></TD></TR>
divert(-1)')

```

Found in path(s):

```

* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/Ada95/gen/table.m4
No license file was found, but licenses were detected in source scan.

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/*****

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Found in path(s):

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archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/test/test_arrays.c
* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/ncurses/base/use_window.c
* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/ncurses/tinfo/use_screen.c
* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/test/test_getstr.c
*
/opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-archive-
fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/test/demo_panels.c
* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/test/test_opaque.c
* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-5.7/test/key_names.c

```

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*****
* @Id: curs_bkgrnd.3x,v 1.3 2006/02/25 21:49:19 tom Exp @
-->

```

Found in path(s):

```

* /opt/cola/permits/1600019816_1679051494.3903115/0/ncurses-5.7-4.20090207.el6-1.src.rpm-cosi-expand-
archive-fUamzfKa/ncurses-5.7.tar.gz-cosi-expand-archive-8COB63hG/ncurses-
5.7/doc/html/man/curs_bkgrnd.3x.html

```

## 1.430 pcre 7.8-7.el6

### 1.430.1 Available under license :

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End

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## THE BASIC LIBRARY FUNCTIONS

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Written by: Philip Hazel  
Email local part: ph10  
Email domain: cam.ac.uk

University of Cambridge Computing Service,  
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## THE C++ WRAPPER FUNCTIONS

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## 1.431 cast

# acbeb36b902d72a7a4c18e8f3241075e7ab763e

## 4

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## 1.432 libpkit 0.23.7

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