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dbs enable

To apply Dynamic Subscriber Bandwidth Selection (DBS) QoS parameters, use the **dbs enable** command in the appropriate configuration mode. To remove DBS QoS parameters, use the **no** form of this command.

```
dbs enable [{aggregated | maximum}]
no dbs enable
```

Syntax Description	
aggregated	(Optional) Specifies the summary of the DBS values of the sessions running on a Virtual Circuit (VC).
maximum	(Optional) Specifies the maximum DBS values of the sessions running on a VC.

Command Default DBS QoS parameters are not applied.

Command Modes

- ATM VC class configuration (config-vc-class)
- ATM VC configuration (config-if-atm-vc)
- ATM PVC range configuration (config-if-atm-range)
- ATM PVC-in-range configuration (cfg-if-atm-range-pvc)

Command History	Release	Modification
	12.2(4)B	This command was introduced.
	12.2(13)T	This command was integrated into Cisco IOS Release 12.2(13)T.
	12.2(28)SB	This command was integrated into Cisco IOS Release 12.2(28)SB.
	12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
	12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.
	Cisco IOS XE Release 2.5	This command was implemented on Cisco ASR 1000 series routers.

Usage Guidelines The **no dbs enable** command configured in any configuration mode overrides the **dbs enable** command configured in any configuration mode. Both the **dbs enable** and **no dbs enable** commands are saved in the running configuration and appear, when configured, in the output of the **show running-config** command. The **default dbs enable** command does not appear in the output of the **show running-config** command when configured.

When you enter the **dbs enable** or **no dbs enable** command, existing sessions are not disconnected. If you have a session that has been configured for DBS and you configure the **no dbs enable** command on a VC, additional sessions that are configured will display DBS-configured QoS values until the first new session is up. After the first session is brought up, the VC has default and locally configured values. If you configure the **dbs enable** command after multiple sessions are already up on the VC, all sessions on that VC have DBS QoS parameters.

RADIUS QoS attributes are applied to PVCs when a new PPP over Ethernet (PPPoE) session has peak cell rate (PCR) and sustainable cell rate (SCR) values that are higher than existing PPPoE sessions. If a new PPPoE session with lower PCR and SCR values is added to a PVC, the RADIUS QoS attributes are not applied to the new session. If the user of the PPPoE session that has the higher PCR and SCR values logs out, the QoS attributes are set to those of the lower bandwidth user.

RADIUS QoS attributes override attributes on a PVC configured in ATM PVC-in-range or ATM PVC range configuration mode. If the RADIUS QoS attributes cannot be applied to a PVC, PPPoE and PPPoA sessions cannot be established.

When DBS is configured, normal ATM precedences apply. PVC configurations take precedence over VC class configurations. Thus, if DBS QoS parameters are applied on a VC class and disabled on one PVC in that VC class, DBS QoS parameters are not applied on the PVC. ATM PVC-in-range configurations take precedence over PVC range configurations.

When you configure DBS on a PVC, existing sessions on that PVC remain connected.

Examples

The following example configures DBS in ATM VC class configuration mode:

```
vc-class atm pppoe
  dbs enable
```

The following example configures DBS in ATM VC configuration mode:

```
interface atm0/0/0.5 point-to-point
ip address 10.0.0.0 255.255.255.0
pvc 0/100
  dbs enable
  protocol pppoe
```

The following example configures DBS in ATM PVC range configuration mode:

```
interface atm0/0/0.1 multipoint
ip address 10.0.0.0 255.255.255.0
range pvc 0/50 0/70
  dbs enable
```

The following example configures DBS in ATM PVC-in-range configuration mode:

```
interface atm0/0/0.1 multipoint
range pvc 0/50 0/70
  pvc-in-range 60
  dbs enable
```

Related Commands

Command	Description
pvc	Creates or assigns a name to an ATM PVC, specifies the encapsulation type on an ATM PVC, or enters interface-ATM-VC configuration mode.
pvc-in-range	Configures an individual PVC within a PVC range.
range pvc	Defines a range of ATM PVCs.
show atm pvc dbs	Displays all ATM PVCs on which DBS QoS parameters are applied.
vc-class atm	Configures a VC class for an ATM VC or interface.

default-name

To provide an emulated LAN name in the configuration server's database for those client MAC addresses and client ATM addresses that do not have explicit emulated LAN name bindings, use the **default-name** command in database configuration mode. To remove the default name, use the **no** form of this command.

default-name *elan-name*
no default-name

Syntax Description

<i>elan-name</i>	Default emulated LAN name for any LAN emulation (LANE) client MAC address or LANE client ATM address not explicitly bound to any emulated LAN name. Maximum length is 32 characters.
------------------	--

Command Default

No name is provided.

Command Modes

Database configuration

Command History

Release	Modification
11.0	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Usage Guidelines

This command affects only the bindings in the configuration server's database. It has no effect on the LANE components themselves.

The named emulated LAN must already exist in the configuration server's database before this command is used. If the default name-to-emulated LAN name binding already exists, the new binding replaces it.

The **default-name** command is a subcommand of the global **lane database** global configuration command.

Examples

The following example shows how to specify the emulated Token Ring LAN named man as the default emulated LAN. Because none of the emulated LANs are restricted, clients are assigned to whichever emulated LAN they request. Clients that do not request a particular emulated LAN will be assigned to the named man emulated LAN.

```
lane database example2
 name eng server-atm-address 39.000001415555121101020304.0800.200c.1001.02
 name eng local-seg-id 1000
 name man server-atm-address 39.000001415555121101020304.0800.200c.1001.01
 name man local-seg-id 2000
 name mkt server-atm-address 39.000001415555121101020304.0800.200c.4001.01
 name mkt local-seg-id 3000
 default-name man
```

Related Commands

Command	Description
client-atm-address name	Adds a LANE client address entry to the configuration database of the configuration server.
lane database	Creates a named configuration database that can be associated with a configuration server.
mac-address	Sets the MAC layer address of the Cisco Token Ring.
name server-atm-address	Specifies or replaces the ATM address of the LANE server for the ELAN in the configuration database of the configuration server.

dxi map

To map a protocol address to a given virtual path identifier (VPI) and virtual channel identifier (VCI), use the **dxi map** command in interface configuration mode. To remove the mapping for that protocol and protocol address, use the **no** form of this command.

dxi map *protocol protocol-address vpi vci* [**broadcast**]
no dxi map *protocol protocol-address*

Syntax Description

<i>protocol</i>	One of the following bridging or protocol keywords: appletalk , bridge , clns , decnet , ip , or novell
<i>protocol-address</i>	Protocol-specific address.
<i>vpi</i>	Virtual path identifier in the range from 0 to 15.
<i>vci</i>	Virtual circuit identifier in the range from 0 to 63.
broadcast	(Optional) Address to which broadcasts should be forwarded.

Command Default

No map definition is established.

Command Modes

Interface configuration

Command History

Release	Modification
10.3	This command was introduced.
12.2(13)T	The apollo , vines , and xns arguments were removed because Apollo Domain, Banyan VINES, and Xerox Network Systems are no longer supported in the Cisco IOS software.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Usage Guidelines

This command is used in configurations where the router is intended to communicate with an ATM network through an ATM data service unit (ADSU). Given the circuit identifier parameters (VPI and VCI) for the ATM permanent virtual circuit (PVC), the router computes and uses the DXI frame address (DFA) that is used for communication between the router and the ADSU.

The **dxi map** command can be used only on a serial interface or HSSI configured for ATM-DXI encapsulation.

Examples

The following example converts all IP packets intended for the host with IP address 172.21.170.49 into ATM cells identified with a VPI of 2 (binary 0000 0010) and a VCI of 46 (binary 0000 0000 0010 1110) by the ADSU:

```
interface serial 0
 dxi map ip 172.21.170.49 2 46 broadcast
```

Using the mapping defined in Annex A of the ATM DXI Specification, the router uses the VPI and VCI information in this example to compute a DFA of 558 (binary 1000101110). The ADSU will use the DFA of the incoming frame to extract the VPI and VCI information when formulating ATM cells.

Related Commands

Command	Description
dxi pvc	Configures multiprotocol or single-protocol ATM-DXI encapsulation.
encapsulation atm-dxi	Enables ATM-DXI encapsulation.

dxi pvc

To configure multiprotocol or single protocol ATM-Data Exchange Interface (DXI) encapsulation, use the **dxi pvc** command in interface configuration mode. To disable multiprotocol ATM-DXI encapsulation, use the **no** form of this command.

```
dxi pvc vpi vci [{snap | nlpid | mux}]
no dxi pvc vpi vci [{snap | nlpid | mux}]
```

Syntax Description

vpi	ATM network virtual path identifier (VPI) of this permanent virtual circuit (PVC), in the range from 0 to 15. The VPI is a 4-bit field in the header of the ATM DXI frame. The VPI value is unique only on a single interface, not throughout the ATM network, because it has local significance only. Both <i>vpi</i> and <i>vci</i> cannot be specified as 0; if one is 0, the other cannot be 0.
vci	ATM network virtual channel identifier (VCI) of this PVC, in the range from 0 to 63. The VCI is a 6-bit field in the header of the ATM DXI frame. The VCI value is unique only on a single interface, not throughout the ATM network, because it has local significance only. Both <i>vpi</i> and <i>vci</i> cannot be specified as 0; if one is 0, the other cannot be 0.
snap	(Optional) LLC/SNAP encapsulation based on the protocol used in the packet. This keyword defines a PVC that can carry multiple network protocols. This is the default.
nlpid	(Optional) RFC 1294/1490 encapsulation. This option is provided for backward compatibility with the default encapsulation in earlier versions of the Cisco IOS software.
mux	(Optional) MUX encapsulation; the carried protocol is defined by the dxi map command when the PVC is set up. This keyword defines a PVC that carries only one network protocol.

Command Default

LLC/SNAP encapsulation

Command Modes

Interface configuration

Command History

Release	Modification
10.3	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Usage Guidelines

This command can be used only on a serial interface or HSSI that is configured with ATM-DXI encapsulation. Select the **nlpid** option if you are using the default encapsulation for software releases earlier than Cisco IOS Release 10.3.

Examples

The following example configures ATM-DXI MUX encapsulation on serial interface 1. The PVC identified by a VPI of 10 and a VCI of 10 can carry a single protocol. Then the protocol to be carried on this PVC is defined by the **dxi map** command.

```
interface serial 1
 dxi pvc 10 10 mux
 dxi map ip 172.21.176.45 10 10 broadcast
```

The following example configures ATM-DXI NLPID encapsulation on serial interface 1. The PVC identified by a VPI of 11 and a VCI of 12 can carry multiprotocol traffic that is encapsulated with a header described in RFC 1294/1490.

```
interface serial 1
 dxi pvc 11 12 nlpid
```

Related Commands

Command	Description
class-int	Maps a protocol address to a given VPI and VCI.
encapsulation atm-dxi	Enables ATM-DXI encapsulation.
show dxi pvc	Displays the PVC statistics for a serial interface.

encapsulation (ATM)

To configure the ATM adaptation layer (AAL) and encapsulation type for an ATM virtual circuit (VC), VC class, VC, bundle, or permanent virtual circuit (PVC) range, use the **encapsulation** command in the appropriate mode. To remove an encapsulation type, use the **no** form of this command.

```
encapsulation {aal2 | aal5auto | aal5autopp | virtual-template template-number | aal5ciscopp
virtual-template template-number | aa5mux protocol | aal5nlpid |
aal5snap} [{group} {globalgroup-name}]
no encapsulation {aal2 | aal5auto | aal5autopp | virtual-template template-number | aal5ciscopp
virtual-template template-number | aa5mux protocol | aal5nlpid |
aal5snap} [{group} {globalgroup-name}]
```

Syntax Description

aal2	Specifies the AAL and encapsulation type for PVCs dedicated to AAL2 Voice over ATM.
aal5auto	Specifies the AAL and encapsulation type for PPP over ATM (PPPoA) switched virtual circuits (SVCs). Enables an ATM SVC to use either the aal5snap or aal5mux encapsulation option.
aal5autopp	Enables PPPoA/PPPoE autosense. PPPoA/PPPoE autosense enables a router to distinguish between incoming PPPoA and PPP over Ethernet (PPPoE) sessions and to create virtual access for both PPP types based on demand.
virtual-template <i>template-number</i>	Specifies the number used to identify the virtual template.
aal5ciscopp	Specifies the AAL and encapsulation type for Cisco PPP over ATM. This keyword is supported on ATM PVCs only.
aal5mux	Specifies the AAL and encapsulation type for multiplex (MUX)-type VCs. A protocol must be specified when you use this encapsulation type.

<i>protocol</i>	<p>Protocol type being used by the multiplex (MUX)-encapsulated VC. Values for the <i>protocol</i> argument are as follows:</p> <ul style="list-style-type: none"> • appletalk --AppleTalk protocol. • bridge ieee8023 --Ethernet LAN protocol. • decnet --DECnet protocol. • frame-relay --Frame Relay-ATM Network Interworking (FRF.5) on the Cisco MC3810. • fr-atm-srv --Frame Relay-ATM Service Interworking (FRF.8) on the Cisco MC3810. • ip --IP protocol. • ipx --Internet Packet Exchange (IPX) protocol. • ppp virtual-template <i>number</i>--Internet Engineering Task Force (IETF)-compliant PPP over ATM. Use the virtual-template number options to identify the virtual template. This keyword is supported on ATM PVCs only. • pppoe --PPP over Ethernet. • voice --Voice over ATM.
aal5nlpid	Specifies the AAL and encapsulation type that allows ATM interfaces to interoperate with High-Speed Serial Interfaces (HSSIs) that are using an ATM data service unit (ADSU) and running ATM-Data Exchange Interface (DXI). This keyword is supported on ATM PVCs only.
aal5snap	Specifies the AAL and encapsulation type that supports Inverse Address Resolution Protocol (ARP). Logical link control/Subnetwork Access Protocol (LLC/SNAP) precedes the protocol datagram.
group	(Optional) Specifies that a PPPoE profile will be used by PPPoE sessions on the interface.
global	(Optional) Specifies that a global PPPoE profile will be used by PPPoE sessions on the interface.
<i>group-name</i>	(Optional) Name of the PPPoE profile to be used by PPPoE sessions on the interface.

Command Default

The global default encapsulation option is **aal5snap**. See the “Usage Guidelines” section for other default characteristics.

Command Modes

ATM VC configuration (for an ATM PVC or SVC)
 Bundle
 configuration (for a VC bundle)
 PVC range configuration (for an ATM PVC range)
 PVC-in-range configuration (for an individual PVC within a PVC range)
 VC-class configuration (for a VC class)

Command History	Release	Modification
	11.3T	This command was introduced.
	12.0(3)T	This command was enhanced to provide encapsulation configuration for ATM VC bundles. The aal5mux frame and aal5mux voice keywords were added for the Cisco MC3810 series router.
	12.0(7)XK	Support for the aal5mux voice option was added to Cisco 3600 series routers.
	12.0(7)T	The aal5mux fr-atm-srv option was added for the Cisco MC3810 router. The aal5mux frame option was changed to aal5mux frame-relay .
	12.1(1)XA	Support for the aal2 option was added to the Cisco MC3810 router.
	12.1(3)T	The aal5auto option was added to provide encapsulation configuration for PPP over ATM SVCs.
	12.1(5)XM	Support for the aal2 option was added to the Cisco AS5300 access server and Cisco 3600 multiservice platforms.
	12.1(5)T	The aal5cisco , aal5mux , and aal5snap options were made available in PVC range and PVC-in-range configuration modes.
	12.1(1)DC1	The aal5autopp option was introduced on the Cisco 6400 universal access concentrator.
	12.2(2)T	This command was integrated into Cisco IOS Release 12.2(2)T.
	12.2(4)T	The aal5autopp option was integrated into Cisco IOS Release 12.2(4)T.
	12.2(13)T	The apollo , vines , and xns values were removed as options for the <i>protocol</i> argument because Apollo Domain, Banyan VINES, and Xerox Network Systems are no longer supported in the Cisco IOS software.
	12.2(15)T	The group option was added.
	12.3(7)XI3	This command was integrated into Cisco IOS Release 12.3(7)XI3.
	12.2(28)SB	This command was integrated into Cisco IOS Release 12.2(28)SB.
	12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
	12.4(11)XW	The pppoe and bridge ieee8023 options were added.
	Cisco IOS XE Release 2.5	This command was implemented on Cisco ASR 1000 series routers.
	Cisco IOS XE Release 3.11S	The encapsulation aal5snap option was integrated on the Cisco ASR 903 aggregation services routers.

Usage Guidelines



Note To configure Integrated Local Management Interface (ILMI), Quasi Signaling Application Adaptation Layer (QSAAL), or Switched Multimegabit Data Service (SMDS) encapsulations for an ATM PVC, use the **pvc** command.

Use the **aal5mux** encapsulation option to dedicate the specified PVC to a single protocol; use the **aal5snap** encapsulation option to multiplex two or more protocols over the same PVC. Whether you select **aal5mux** or **aal5snap** encapsulation might depend on practical considerations, such as the type of network and the pricing offered by the network. If the pricing of the network depends on the number of PVCs configured, **aal5snap** might be the appropriate choice. If pricing depends on the number of bytes transmitted, **aal5mux** might be the appropriate choice because it has a slightly lower transmission rate. Use the **aal5mux pppoe** option to reduce SNAP encapsulation bandwidth usage associated with carrying PPPoE frames. Use the **aal5mux bridge ieee8023** option to reduce SNAP encapsulation bandwidth usage associated with carrying bridged frames.

Encapsulation for PPPoA

When you configure Cisco PPP over ATM, use the **aal5ciscopp** keyword and specify the virtual template number.

It is possible to implicitly create a virtual template when configuring Cisco PPP over ATM. In other words, if the parameters of the virtual template are not explicitly defined before you configure the ATM PVC, the PPP interface will be brought up using default values from the virtual template identified. However, some parameters (such as an IP address) take effect only if they are specified before the PPP interface comes up. Therefore, we recommend that you explicitly create and configure the virtual template before configuring the ATM PVC to ensure that such parameters take effect.

If you specify virtual template parameters after the ATM PVC is configured, you should enter a **shutdown** command followed by a **no shutdown** command on the ATM subinterface to restart the interface, causing the newly configured parameters (such as an IP address) to take effect.

Configuring PPPoA/PPPoE Autosense

Use the **encapsulation aal5autopp virtual-template *template-number*** command to configure PPPoA/PPPoE autosense. PPPoA/PPPoE autosense enables a router to distinguish between incoming PPPoA and PPPoE sessions and create virtual access for both PPP types based on demand.

If a PPPoE profile is not specified with the **group *group-name*** option, PPPoE sessions will be established using parameters from the global PPPoE profile. PPPoE profiles must be configured using the **bba-group pppoe** command.



Note Do not use this command on a router that initiates PPPoA sessions.

Entering the **no encapsulation aal5autopp virtual-template** command will terminate the PPPoA or PPPoE session and detach the virtual-access interface from the PVC.

Configuring Encapsulation for VC Bundles

Before using this command to configure a VC bundle, enter the **bundle** subinterface configuration command to create a new bundle or modify an existing one and to enter bundle configuration mode.

A VC bundle can have only one encapsulation keyword configured for it: either **aal5snap** or **aal5mux**.

Encapsulation Rules of Precedence

If the **encapsulation** command is not explicitly configured on an ATM PVC, SVC, or VC bundle, the VC inherits the following default configuration (listed in order of precedence from lowest to highest):

- Configuration of the **encapsulation** command in a VC class assigned to the PVC, PVC bundle, or SVC itself.
- Configuration of the **encapsulation** command in a VC class assigned to the ATM subinterface of the PVC, SVC, or VC bundle.
- Configuration of the **encapsulation** command in a VC class assigned to the ATM main interface of the PVC, SVC, or VC bundle.
- Global encapsulation option default: **aal5snap**.



Note When a VC is a member of a VC bundle, bundle configuration takes precedence over configuration using the **encapsulation** command in VC-class mode.

Configuring Encapsulation for a PVC Range

When a PVC range or an individual PVC within a PVC range is being configured, the following options are available:

- **encapsulation aal5ciscoppp**
- **encapsulation aal5mux**
- **encapsulation aal5snap**

Examples

MUX-Type Encapsulation on a VC Example

The following example configures an ATM PVC with VPI 0 and VCI 33 for a MUX-type encapsulation using IP:

```
interface atm 1/0
 pvc 0/33
 encapsulation aal5mux ip
```

SNAP Encapsulation Example

The following example configures a bundle called “bundle1” for **aal5snap** encapsulation:

```
bundle bundle1
 encapsulation aal5snap
```

PPP over ATM SVCs Example

The following example configures an ATM SVC called “bundle1” with the encapsulation type **aal5auto**. Encapsulation type **aal5auto** enables the SVC to use PPP and either **aal5snap** or **aal5mux** encapsulation.

```
interface ATM 2/0/0
  svc bundle1
  encapsulation aal5auto
```

PPPoA/PPPoE Autosense Example

The following example enables PPPoA/PPPoE autosense on PVC 30/33. PPPoA sessions will use virtual template 1, and PPPoE sessions will use the global PPPoE profile.

```
interface ATM 0/0/0.33 multipoint
  pvc 30/33
    encapsulation aal5autoppv virtual-template 1
  !
  bba-group pppoe global
  virtual-template 1
  sessions max limit 8000
  sessions per-vc limit 8
  sessions per-mac limit 2
```

AAL2 Voice over ATM Example

The following example configures a PVC to support AAL2 encapsulation for Voice over ATM:

```
interface ATM0.2 point-to-point
  pvc 2/200
    vbr-rt 760 760 100
    encapsulation aal2
```

Related Commands

Command	Description
bba-group pppoe	Creates a PPPoE profile.
broadcast	Configures broadcast packet duplication and transmission for an ATM VC class, PVC, SVC, or VC bundle.
bundle	Configures a VC bundle.
class-vc	Assigns a VC class to an ATM PVC, SVC, or VC bundle member.
debug pppoe	Displays debugging information for PPPoE sessions.
inarp	Configures the Inverse ARP time period for an ATM PVC, VC class, or VC bundle.
oam retry	Configures parameters related to OAM management for an ATM PVC, SVC, VC class, or VC bundle.

Command	Description
protocol (ATM)	Configures a static map for an ATM PVC, SVC, VC class, or VC bundle and enables Inverse ARP or Inverse ARP broadcasts on an ATM PVC.
pvc	Creates an ATM PVC.
shutdown	Deactivates an interface or ATM PVC.

encapsulation (Layer 2 local switching)

To configure the ATM adaptation layer (AAL) for a Layer 2 local switching ATM permanent virtual circuit (PVC), use the **encapsulation** command in ATM PVC L2transport configuration mode. To remove an encapsulation from a PVC, use the **no** form of this command.

encapsulation *layer-type*

no encapsulation *layer-type*

Syntax Description

<i>layer-type</i>	Adaptation layer type. The values are: <ul style="list-style-type: none"> • aal5 • aal0 • aal5snap • aal5mux • aal5nlpid (not available on Cisco 12000 series)
-------------------	--

Command Default

If you do not create a PVC, one is created for you. The default encapsulation types for autoprovisioned PVCs are as follows:

- For ATM-to-ATM local switching, the default encapsulation type for the PVC is AAL0.
- For ATM-to-Ethernet or ATM-to-Frame Relay local switching, the default encapsulation type for the PVC is AAL5 SNAP.

Command Modes

ATM PVC L2transport configuration

Command History

Release	Modification
12.0(27)S	This command was introduced for Layer 2 local switching.
12.2(25)S	This command was integrated into Cisco IOS Release 12.2(25)S.
12.0(30)S	This command was integrated into Cisco IOS Release 12.0(30)S.
12.2(28)SB	This command was integrated into Cisco IOS Release 12.2(28)SB.
12.4(11)T	This command was integrated into Cisco IOS Release 12.4(11)T.
12.2(33)SRB	This command was integrated into Cisco IOS Release 12.2(33)SRB.
12.2(33)SXH	This command was integrated into Cisco IOS Release 12.2(33)SXH.

Usage Guidelines

The `pvc` command and the `encapsulation` command work together. The use of these commands with Layer 2 local switching is slightly different from the use of these commands with other applications. The following list highlights the differences:

- For Layer 2 local switching, you must add the **`l2transport`** keyword to the **`pvc`** command. The **`l2transport`** keyword enables the PVC to transport Layer 2 packets.
- The Layer 2 local switching **`encapsulation`** command works only with the **`pvc`** command. You cannot create switched virtual circuits or VC bundles to transport Layer 2 packets. You can use only PVCs to transport Layer 2 packets.

The table below shows the encapsulation types supported for each transport type:

Table 1: Supported Encapsulation Types

Interworking Type	Encapsulation Type
ATM to ATM	AAL0, AAL5
ATM to Ethernet with IP interworking	AAL5SNAP, AAL5MUX
ATM to Ethernet with Ethernet interworking	AAL5SNAP
ATM to Frame-Relay	AAL5SNAP, AAL5NLPID

Examples

The following example shows how to configure a PVC to transport AAL0 packets for Layer 2 local switching:

```
pvc 1/100 l2transport
 encapsulation aal0
```

Related Commands

Command	Description
<code>pvc</code>	Creates or assigns a name to an ATM PVC.

encapsulation atm-dxi

To enable ATM-Data Exchange Interface (DXI) encapsulation, use the **encapsulation atm-dxi** command in interface configuration mode. To disable ATM-DXI, use the **no** form of this command.

encapsulation atm-dxi
no encapsulation atm-dxi

Syntax Description This command has no arguments or keywords.

Command Default When ATM-DXI encapsulation is not configured, HDLC is the default encapsulation.

Command Modes Interface configuration

Release	Modification
10.0	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Examples The following example configures ATM-DXI encapsulation on serial interface 1:

```
interface serial 1
 encapsulation atm-dxi
```

Command	Description
class-int	Maps a protocol address to a given VPI and VCI.

encapsulation priority-tagged

To enable an Ethernet subinterface to transmit and receive priority tagged 802.1Q Ethernet frames with the VLAN identifier (VLAN ID) set to zero, use the **encapsulation priority-tagged** command in subinterface configuration mode. To disable priority tagging, use the **no** form of this command.

encapsulation priority-tagged [{native} [{tx-tagged}]]

Syntax Description	native	(Optional) Sets the priority tagged Ethernet subinterface as the native VLAN.
	tx-tagged	(Optional) Enables the native VLAN to transmit priority tagged frames.

Command Default This command is disabled, priority tagged 802.1Q Ethernet frames are not processed.

Command Modes Subinterface configuration (config-subif)

Command History	Release	Modification
	15.2(3)T	This command was introduced.

Usage Guidelines Use the **encapsulation priority-tagged** command to set the VLAN identifier (VLAN ID) of an 802.1Q Ethernet frame to zero to enable the frame to be processed as per the 802.1P priority bits configured in the 802.1Q Ethernet frame header. Use the **encapsulation priority-tagged native** command to configure the subinterface with the VLAN ID set to zero as a native VLAN, which can receive both tagged and untagged frames but transmit only untagged frames. Use the **encapsulation priority-tagged native tx-tagged** command to enable the VLAN 0 native subinterface to transmit only priority tagged frames.

Examples

```
Device> enable
Device# configure terminal
Device(config)# interface Ethernet 0/0.1
Device(config-subif)# encapsulation priority-tagged
Device(config-subif)# encapsulation priority-tagged native
Device(config-subif)# encapsulation priority-tagged native tx-tagged
Device(config-subif)# end
```

Related Commands	Command	Description
	interface <i>type number</i>	Configures an interface.

encapsulation untagged dot1q second-dot1q

To define the matching criteria to map untagged dot1q ingress Ethernet frames on an interface to the appropriate service instance, use the **encapsulation untagged dot1q second-dot1q** command in the service instance mode. To delete the matching criteria to map untagged dot1q ingress Ethernet frames on an interface to the appropriate service instance, use the **no** form of this command.

encapsulation untagged dot1q {**any** | *vlan-id* [*vlan-id* [*vlan-id*]]} **second-dot1q** {**any** | *vlan-id* [*vlan-id* [*vlan-id*]]}

no encapsulation untagged dot1q second-dot1q

Syntax Description

vlan-id	(Optional) VLAN ID, integer in the range 1 to 4094. Hyphen must be entered to separate the starting and ending VLAN ID values that are used to define a range of VLAN IDs. Comma must be entered to separate each VLAN ID range from the next range.
any	Any second tag in the range 1 to 4094.

Command Default

No matching criteria are defined.

Command Modes

Service instance mode (config-if-srv)

Command History

Release	Modification
12.2(33)SRE	This command was introduced.
15.1(2)SNH	This command was implemented on the Cisco ASR 901 Series Aggregation Services Routers.

Usage Guidelines

Only one service instance per port is allowed to have untagged encapsulation. The reason is to be able to unambiguously map the incoming frames to the service instance. However, it is possible for a port that hosts an service instance matching untagged traffic to host other service instances that match tagged frames.

Only one encapsulation command may be configured per service instance.

Examples

The following example shows how to map untagged dot1q ingress Ethernet frames to a service instance:

```
Router(config-if-srv)# encapsulation untagged dot1q 40 second-dot1q 42
```

Related Commands

Command	Description
encapsulation default	Configures the default service instance on a port.
encapsulation dot1q (service instance)	Defines the matching criteria to map 802.1Q frames ingress on an interface to the appropriate service instance.
encapsulation dot1q second-dot1q	Defines the matching criteria to map Q-in-Q ingress frames on an interface to the appropriate service instance.

framer-type

To set the framer type of supported circuit emulation service (CES) multiservice interchange (MIX) connections to T1 or E1, use the **framer-type** command in CES configuration mode.

framer-type {**t1** | **e1**}

Syntax Description	Parameter	Description
	t1	Sets the framer type of supported CES connections to T1.
	e1	Sets the framer type of supported CES connections to E1.

Command Default T1

Command Modes CES configuration

Command History	Release	Modification
	12.1(5)XM	This command was introduced for the Cisco 3660.
	12.2(4)T	This command was integrated into Cisco IOS Release 12.2(4)T.
	12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
	12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Usage Guidelines This command is needed only with CES-enabled network modules (ATM OC-3 CES network modules) that do *not* contain Cisco T1/E1 multiflex voice/WAN interface cards (VWICs) on the Cisco 3660. Other network modules set their framer type automatically and therefore do not require use of this command. It is also not necessary to use this command for T1 connections, because **t1** is the default argument.

To reach CES configuration mode for a particular slot, enter **ces** and the slot number and port number while in global configuration mode. Note that the port value is always 0, as the interface configuration applies to all ports in the slot.

Examples The following example sets the framer type of the CES card in slot 1 to E1:

```
Router(config)# ces 1/0
Router(config-ces)# framer-type e1
```

Related Commands	Command	Description
	ces	Configures CES on a router port and enters controller configuration mode.

holding-time

To specify the holding time value for the MPS-p7 variable of a Multiprotocol over ATM server (MPS), use the **holding-time** command in MPS configuration mode. To revert to the default value, use the **no** form of this command.

holding-time *seconds*

no holding-time *seconds*

Syntax Description

<i>seconds</i>	Specifies the holding time value in seconds. The default is 1200 seconds.
----------------	---

Command Default

The default holding time is 1200 seconds (20 minutes).

Command Modes

MPS configuration

Command History

Release	Modification
11.3(3a)WA4(5)	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Examples

The following example shows how to set the holding time to 600 seconds (10 minutes):

```
holding-time 600
```


idle-timeout

To configure the idle timeout parameter for tearing down an ATM switched virtual circuit (SVC) connection, use the **idle-timeout** command in the VC-class configuration mode or interface-ATM-VC configuration mode. To disable the timeout parameter, use the **no** form of this command.

idle-timeout *seconds* [*minimum-traffic*]
no idle-timeout *seconds* [*minimum-traffic*]

Syntax Description

<i>seconds</i>	Number of seconds that the SVC is idle, after which the ATM SVC is disconnected. The range is from 0 to 2000000.
<i>minimum-rate</i>	(Optional) Minimum traffic rate, in kilobits per second (kbps), required on an ATM SVC to maintain the SVC connection. The range is from 0 to 149760.

Command Default

For PVCs, the default timeout value is infinity. For SVCs, the default timeout value is 300 seconds.

Command Modes

Interface-ATM-VC configuration (config-if-atm-range-pvc)
 VC-class configuration (config-vc-class)

Command History

Release	Modification
11.3	This command was introduced.
12.2(15)B	This command was integrated into Cisco IOS Release 12.2(15)B. Support for this command was extended to be applied on create-on-demand PVCs
15.0(1)M	This command was integrated into Cisco IOS Release 15.0(1)M.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.
Cisco IOS XE Release 2.5	This command was implemented on Cisco ASR 1000 series routers.

Usage Guidelines

If within the idle timeout period, both the input and output traffic rates are below the *minimum-rate*, the SVC connection is torn down. The input and output traffic rates are set using the **ubr**, **ubr+**, or **vbr-nrt** command.

If the **idle-timeout** command is not explicitly configured on an ATM SVC, the SVC inherits the following default configuration (listed in order of next highest precedence):

- Configuration of the **idle-timeout** command in a VC class assigned to the SVC.
- Configuration of the **idle-timeout** command in a VC class assigned to the SVC's ATM subinterface.
- Configuration of the **idle-timeout** command in a VC class assigned to the SVC's ATM main interface.

- Global default--The global idle timeout default is the value set using the **idle-timeout** command. If the **idle-timeout** command is not configured, the default idle timeout is 300 seconds, and the *minimum-rate* is 0 kbps.

Examples

The following example configures an idle period of 300 seconds for an ATM SVC connection. The SVC connection is also configured so that it is considered inactive if the traffic rate is less than 5 kbps.

```
Router> enable
Router# configure terminal
Router(config)# interface atm 2/0
Router(config-if)# range ran1 pvc 32/45 45/56
Router(config-if-atm-range)# idle-timeout 300 5
```

Related Commands

Command	Description
create on-demand	Configures ATM PVC autoprovisioning, which enables a PVC or range of PVCs to be created automatically on demand.
ubr	Selects UBR QoS and configures the output peak cell rate for an ATM PVC, SVC, or VC class.
ubr+	Selects UBR QoS and configures the output peak cell rate and output minimum guaranteed cell rate for an ATM PVC, SVC, or VC class.
vbr-nrt	Configures the VBR-NRT QoS and specifies output peak cell rate, output sustainable cell rate, and output maximum burst cell size for an ATM PVC, SVC, or VC class.

ilmi manage

To enable Integrated Local Management Interface (ILMI) management on an ATM permanent virtual circuit (PVC), use the **ilmi manage** command in the appropriate command mode. To disable ILMI management, use the **no** form of this command.

ilmi manage
no ilmi manage

Syntax Description This command has no arguments or keywords.

Command Default ILMI management is disabled.

Command Modes

- Interface-ATM-VC configuration (for an ATM PVC)
- VC-class configuration (for a virtual circuit [VC] class)
- PVC range configuration (for an ATM PVC range)
- PVC-in-range configuration (for an individual PVC within a PVC range)

Command History	Release	Modification
	11.3 T	This command was introduced.
	12.1(5)T	This command was made available in PVC range and PVC-in-range configuration modes.
	12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
	12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Usage Guidelines If the **ilmi manage** command is not explicitly configured on an ATM PVC, the PVC inherits the following default configuration (listed in order of precedence):

- Configuration of the **ilmi manage** command in a VC class assigned to the PVC itself.
- Configuration of the **ilmi manage** command in a VC class assigned to the PVC's ATM subinterface.
- Configuration of the **ilmi manage** command in a VC class assigned to the PVC's ATM main interface.
- Global default: ILMI management is disabled.

Examples

The following example enables ILMI management on the ATM PVC with VPI 0 and VCI 60. The ILMI PVC is assigned the name routerA and the VPI and VCI are 0 and 16, respectively.

```
interface atm 0/0
 pvc routerA 0/16 ilmi
 exit
interface atm 0/0.1 multipoint
 pvc 0/60
 ilmi manage
```

ima active-links-minimum

To set the minimum number of links that must be operating in order for an ATM inverse multiplexing over ATM (IMA) group to remain in service, use the **ima active-links-minimum** interface configuration command. To remove the current configuration and set the value to the default, use the **no** form of this command.

ima active-links-minimum *number*
no ima active-links-minimum *number*

Syntax Description	<p><i>number</i> Number of links; a value from 1 to 8.</p> <p>On Cisco 7600 series routers, <i>number</i> is a value from 1 to 16.</p>
---------------------------	--

Command Default Links: 1

Command Modes Interface configuration

Command History	Release	Modification
	12.0(5)XK	This command was introduced on Cisco 2600 and 3600 series routers.
	12.0(5)T	This command was integrated into Cisco IOS Release 12.0(5)T.
	12.0(5)XE	Support for Cisco 7200 and 7500 series routers was added.
	12.0(7)XE1	Support for Cisco 7100 series routers was added.
	12.1(5)T	Support for Cisco 7100, 7200, and 7500 series routers was integrated into Cisco IOS Release 12.1(5)T.
	12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
	12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.
	12.2(33)SRB2	Support for Cisco 7600 CEoP ATM SPAs was added.

Usage Guidelines The minimum number of links that should be active for continued group operation depends upon the applications you are using and the speeds they require. ATM frame size and the number of links in a group affect the overhead required by ATM.

Examples

Cisco 2600, 3600, 7100, 7200, and 7500 series routers

The following example specifies that two links in IMA group 2 must be operational in order for the group to remain in service:

```
interface atm 0/ima2
  ima active-links-minimum 2
```

Cisco 7600 series routers

The following example shows how to specify that three links in IMA group 0 (on the SPA in chassis slot 2, SIP subslot 1) must be operational in order for the group to remain in service:

```
interface atm2/1/ima0
  ima active-links-minimum 3
```

Related Commands

Command	Description
interface atm ima	Configures an ATM IMA group.

ima autorestart

To enable the auto restart feature for an inverse multiplexing over ATM (IMA) group, use the **ima autorestart** command in interface configuration mode. Use the no form of the command to disable auto restart if it is enabled.

ima autorestart near-end-id *near-end-group-id* [**far-end-id** *far-end-group-id*]
no ima autorestart near-end-id *near-end-group-id* [**far-end-id** *far-end-group-id*]

Syntax Description	near-end-id <i>near-end-group-id</i>	The group number of the local IMA group. Valid values are 0 through 41.
	far-end-id <i>far-end-group-id</i>	(Optional) The remote IMA group that the local IMA group is to synchronize with. Valid values are 0 through 41.

Command Default Disabled

Command Modes Interface configuration (IMA interface)

Command History	Release	Modification
		12.2(33)SRB2

Usage Guidelines The IMA auto restart feature controls how IMA groups are to sync up after a restart. When an IMA group stops operating correctly (for example, due to a failure with the CEoP SPA, an IMA link, or the router), the group must be restarted. When it is restarted, the local IMA group must synchronize with an IMA group at the remote end:

- If auto restart is disabled (the default), IMA learns the ID of the remote group each time a restart occurs. In this case, the remote IMA group ID might change between restarts.
- If auto restart is enabled, you can specify which remote IMA group the local group should synchronize with. This allows you to keep an IMA group from synchronize with any group ID.

Include IMA group IDs in the command line to specify how IMA groups are to synchronize:

- If you specify **near-end-id** only, the local IMA group learns the ID of the remote group to synchronize with (which will be the first remote IMA group to become active). This learned remote group ID remains active until the SPA is reloaded.
- If you specify both **near-end-id** and **far-end-id**, the local IMA group will only synchronize with this remote IMA group. Both the near-end and far-end IDs must be the same.

To see the current settings for auto restart, issue the **show ima interface** command and view the Auto-Restart section of the command output.

Examples

The following example shows how to enable IMA auto restart for local IMA group 0 and specify that the group should synchronize with IMA group 5 on the remote end:

```
interface atm2/1/ima0
  ima autorestart far-end-id 5
```

The following example shows how to enable IMA auto restart for local IMA group 3 and specify that the group should synchronize with IMA group 3 on the remote end:

```
interface atm2/1/ima3
  ima autorestart near-end-id 3 far-end-id 3
```

Related Commands

Command	Description
ima restart	Manually restarts an IMA group that had previously stopped operating correctly.
show ima interface atm	Provides information about all configured IMA groups or a specific IMA group.

ima clock-mode

To set the transmit clock mode for an ATM inverse multiplexing over ATM (IMA) group, use the **ima clock-mode** command in interface configuration mode. To remove the current configuration, use the **no** form of this command.

```
ima clock-mode {common port | independent}
no ima clock-mode
```

Syntax Description

common	Sets the transmit clocks for all the links in the group to be derived from the same source.
<i>port</i>	Link that will provide clocking for the IMA group (called the command link). If the common link fails, the system automatically chooses one of the remaining active links to provide clocking. On the Cisco 7600 series router, this argument is not used.
independent	Sets the transmit clock source for at least one link in the IMA group to be different from the clock source used by the other links.

Command Default

The default value is **common**. If no port is specified, the system automatically chooses an active link to provide clocking.

Command Modes

Interface configuration

Command History

Release	Modification
12.0(5)XK	This command was introduced on Cisco 2600 and 3600 series routers.
12.0(5)T	This command was integrated into Cisco IOS Release 12.0(5)T
12.0(5)XE	This command was implemented on Cisco 7200 and 7500 series routers.
12.0(7)XE1	This command was implemented on Cisco 7100 series routers.
12.1(5)T	Support for Cisco 7100, 7200, and 7500 series routers was implemented in Cisco IOS Release 12.1(5)T.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.
12.2(33)SRB2	Support for Cisco 7600 series routers was added.

Usage Guidelines

This command controls the clock for the IMA group as a whole. If all the links in the group share a clock source, use the **common** keyword. If all the links use different clock sources, use the **independent** clock source keyword.

When the **common** keyword is set, the **clock source** ATM interface configuration command for the common link determines clocking for all the links in the group. When the **independent** keyword is set, the **clock source** ATM interface configuration command is used under each interface to determine clocking individually.

Because the system automatically chooses a replacement for the common link when it fails, any link in an IMA group potentially can provide the recovered transmit clock. For this reason, even when the common keyword is set with a specific link stipulated by the port value, you should use the ATM interface configuration **clock source** command to make sure that the clock source is configured correctly on each interface in the IMA group.

Examples

Cisco 2600, 3600, 7100, 7200, and 7500 series routers

The following example specifies that the links in IMA group 2 use a common clock source on link 0:

```
interface atm0/ima2
  ima clock-mode common 0
```

Cisco 7600 series routers

The following example shows how to configure the links in IMA group 0 (on the SPA in slot 2, subslot 1) to use independent clock mode:

```
interface atm2/1/ima0
  ima clock-mode independent
```

Related Commands

Command	Description
clock source	Configures the clock source of a DS1 link.
interface atm ima	Configures an ATM IMA group.
show ima interface atm	Provides information about all configured IMA groups or a specific IMA group.

ima differential-delay-maximum

To specify the maximum differential delay among the active links in an inverse multiplexing over ATM (IMA) group, use the **ima differential-delay-maximum** command in interface configuration mode. To restore the default setting, use the **no** form of this command.

ima differential-delay-maximum *milliseconds*

no ima differential-delay-maximum *milliseconds*

Syntax Description

<i>milliseconds</i>	<p>Specifies the differential delay in milliseconds (ms). The range of values depends on the type of card used:</p> <ul style="list-style-type: none"> • PA-A3-8T1IMA--25 to 250 milliseconds • PA-A3-8E1IMA--25 to 190 milliseconds • NM-8T1-IMA--25 to 200 milliseconds <p>On Cisco 7600 routers, valid values are as follows (depending on link type):</p> <ul style="list-style-type: none"> • 25 to 250 milliseconds (T1) • 25 to 190 milliseconds (E1)
---------------------	---

Command Default

25 milliseconds

Command Modes

Interface configuration

Command History

Release	Modification
12.0(5)XK	This command was introduced on Cisco 2600 and 3600 series routers.
12.0(5)T	This command was integrated into Cisco IOS Release 12.0(5)T.
12.0(5)XE	This command was implemented on Cisco 7200 and 7500 series routers.
12.0(7)XE1	This command was implemented on Cisco 7100 series routers.
12.1(5)T	Support for Cisco 7100, 7200, and 7500 series routers was implemented in Cisco IOS Release 12.1(5)T.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.
12.2(33)SRB2	Support for Cisco 7600 series routers was added.

Usage Guidelines

This command helps control latency in ATM-layer traffic by setting a limit on how much latency the slowest link in the group is allowed to introduce (a slower link has a longer propagation delay--for example, due to a

longer path through the network or less accurate physical layer clocking--than other links). Setting a high value allows a slow link to continue operating as part of the group, although such a setting means there is added delay to links across the group. A low setting may result in less latency for traffic across the group than a high setting, but it can mean that the system takes a slow link out of operation, reducing total bandwidth.

When a link has been removed from service, it is automatically placed back in service when it meets the delay differential standard. If a link delay exceeds the specified maximum, the link is dropped; otherwise, the IMA feature adjusts for differences in delays so that all links in a group are aligned and carry ATM-layer traffic.

Examples

Cisco 2600, 3600, 7100, 7200, and 7500 series routers

The following example specifies that the links in IMA group 2 have a maximum differential delay of 50 ms:

```
interface atm0/ima2
  ima differential-delay-maximum 50
```

Cisco 7600 series routers

The following example shows how to set the differential delay to 50 milliseconds for the links in IMA group 0 (on the SPA in chassis slot 2, SIP subslot 1):

```
interface atm2/1/ima0
  ima differential-delay-maximum 50
```

Related Commands

Command	Description
show ima interface atm	Provides information about all configured IMA groups or a specific IMA group.

ima frame-length

To specify the number of cells in inverse multiplexing over ATM (IMA) frames, use the **ima frame-length** command in interface configuration mode. To remove the current setting and restore the default value, use the **no** form of this command.

```
ima frame-length {32 | 64 | 128 | 256}
no ima frame-length {32 | 64 | 128 | 256}
```

Syntax Description

32	Specifies a value of 32 cells.
64	Specifies a value of 64 cells.
128	Specifies a value of 128 cells.
256	Specifies a value of 256 cells.

Command Default

The default value is 128 cells in a frame.

Command Modes

Interface configuration

Command History

Release	Modification
12.0(5)XE	This command was introduced.
12.0(7)XE1	Support for Cisco 7100 series routers was added.
12.1(5)T	This command was integrated into Cisco IOS Release 12.1(5)T.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.
12.2(33)SRB2	Support for Cisco 7600 series routers was added.

Usage Guidelines

IMA frames are numbered sequentially, and each contains an IMA Control Protocol (ICP) cell at a specific position. This command controls how often ICP cells are sent over the links in an IMA group. For example, with a frame length of 64, 1 out of every 64 cells on the link is an ICP cell.

Frame length can affect performance because the greater the total number of frames required to communicate a given number of cells, the greater the overhead for header and other control cells. In addition, shorter frame lengths might diminish performance when translated ATM-Frame Relay interworking occurs.

Examples

Cisco 7100 and 7200 series routers

The following example specifies that the links in IMA group 2 have a frame length of 64 cells:

```
interface atm 1/ima2
  ima frame-length 64
```

Cisco 7600 series routers

The following example shows how to specify that the links in IMA group 0 on the SPA in slot 2, subslot 1, use a frame length of 256 cells:

```
interface atm2/1/ima0
  ima frame-length 256
```

ima-group

To define inverse multiplexing over ATM (IMA) groups, use the `ima-group` command in interface configuration mode (Cisco 7100, 7200, and 7500 series routers), controller configuration mode (Cisco 7600 router), or config controller mode (Cisco HWIC-4SHDSL). To remove the group, use the **no** form of this command.

Cisco HWIC-4SHDSL

ima-group [**{shutdown | minimum-links** *number* | **clock-mode**}]

Cisco 7100, 7200, 7500, and 7600 series routers

ima-group *group-number*

no ima-group *group-number*

Syntax Description		
	clock-mode	Sets the clock mode for an IMA group
	<i>group-number</i>	Specifies an IMA group number from 0 to 3. IMA groups can span multiple ports on a port adapter or shared port adapter (SPA) but cannot span port adapters or SPAs. On the Cisco 7600 router, the group number must be unique on the SPA. Valid values for group number are: <ul style="list-style-type: none"> • 0 to 23 on the 24-Port Channelized T1/E1 ATM CEoP SPA. • 0 to 41 on the 1-Port Channelized OC-3/STM-1 ATM CEoP SPA.
	minimum-links <i>number</i>	Defines the number of minimum links that must remain in operation for an IMA group to remain in service.
	shutdown	Shuts down physical links in an IMA group.

Command Default No IMA groups are defined.

Command Modes Cisco HWIC-4SHDSL

Config controller

Config controller DSL group

Cisco 7100, 7200, and 7500 series routers

Interface configuration

Cisco 7600 series routers

Controller configuration

Command History	Release	Modification
	12.0(5)XK	This command was introduced on Cisco 2600 and 3600 series routers.
	12.0(5)T	This command was integrated into Cisco IOS Release 12.0(5)T.
	12.0(5)XE	Support for Cisco 7200 and 7500 series routers was added.
	12.0(7)XE1	Support for Cisco 7100 series routers was added.
	12.1(5)T	Support for Cisco 7100, 7200, and 7500 series routers was added.
	12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
	12.4 (11)XJ	This command was integrated into Cisco IOS Release 12.4 (11)XJ.
	12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.
	12.2(33)SRB2	Support for Cisco 7600 series routers was added.

Usage Guidelines

For usage guidelines for using the clock-mode keyword, see the command reference page for the ima group clock-mode command.

Cisco HWIC-4SHDSL

Use the dsl-group command with the optional keyword ima to create an IMA DSL group and to enter config-controller-dsl-group mode. Use the ima group command to define the links as IMA group members.

Cisco 7100, 7200, and 7500 series routers

When the configuration is first performed or when the group number is changed, the interface is automatically disabled, moved to the new group, and then enabled.

Examples

Cisco HWIC-4SHDSL

The following example uses the dsl-group command to create an IMA group and enter config-controller-dsl-group mode on the Cisco HWIC-4SHDSL in a Cisco access router:

```
Router(config-controller)# dsl-group 1 pairs 0-1 ima
Router(config-controller-dsl-group)#
Sep 26 11:43:55.798: %HWIC_SHDSL-5-DSLGROUP_UPDOWN: SHDSL 0/2/0 dsl-group(1) state changed
to down.
Sep 26 11:43:57.798: %LINK-3-UPDOWN: Interface ATM0/2/IMA1, changed state to down
Sep 26 11:43:58.798: %LINEPROTO-5-UPDOWN: Line protocol on Interface ATM0/2/IMA1, changed
state to down
Router (config-controller-dsl-group)# ?
dsl-group configuration sub commands:
  default  Set a command to its defaults
  exit     Exit dsl-group sub commands
  ima      IMA sub commands
  no       Negate a command or set its defaults
  shdsl    Symmetric g.shdsl configuration
  shutdown Shutdown this dsl-group
Router (config-controller-dsl-group)# ima ?
group     IMA group configuration
```

```

link    IMA link configuration
Router (config-controller-dsl-group)# ima group ?
  clock-mode      IMA group clock mode configuration
  minimum-links   Minimum number of active links for group UP
  shutdown        IMA group shutdown
    
```

Cisco 7100, 7200, and 7500 series routers

The following example assigns interface 1 on the ATM module in slot 0 to a member of IMA group 2:

```

interface atm0/1
  ima-group 2
    
```

Cisco 7600 series routers

The following example shows how to create IMA group 0 and add T1 interfaces 2/1/0, 2/1/1, and 2/1/2 to the group. These interfaces represent the T1 links attached to ports 0, 1, and 2 of the SPA in subslot 1 of the SPA interface processor (SIP) in chassis slot 2.

```

controller t1 2/1/0
  ima-group 0
exit
controller t1 2/1/1
  ima-group 0
exit
controller t1 2/1/2
  ima-group 0
exit
    
```

Related Commands

Command	Description
ima group clock-mode	Sets the clock mode for an IMA group.
ima link	Defines physical links for an IMA group.
interface atm	Configures an ATM interface.
interface atm ima	Configures an ATM IMA group.
show ima interface atm	Provides information about all configured IMA groups or a specific IMA group.
shutdown (interface)	Disables an interface.

ima restart

To manually restart an IMA group, issue the **ima restart** command in interface configuration mode on the IMA interface that represents the IMA group you want to restart.

ima restart

Syntax Description

This command has no arguments or keywords.

Command Default

No default behavior or values.

Command Modes

Interface configuration (IMA interface)

Command History

Release	Modification
12.2(33)SRB2	This command was introduced on the Cisco 7600 series router.

Usage Guidelines

If an IMA group stops operating correctly (for example, due to a link or configuration failure), you must restart the group once the problem has been corrected. This command provides a way to manually restart an IMA group. Issue the command on the IMA interface that represents the group you want to restart.

When you issue this command, the IMA group attempts to re-establish the IMA protocol (synchronize) with the remote end.

Examples

The following example shows how to restart IMA for group 0 on the SPA installed in slot 2, subslot 1:

```
interface atm2/1/ima0
  ima restart
```

Related Commands

Command	Description
ima autorestart	Specifies how IMA groups should sync up with remote groups after a restart.

ima test

To specify an interface and test pattern for verifying connectivity of all links in an inverse multiplexing over ATM (IMA) group, use the **ima test** command in interface configuration mode. To stop the test, use the **no form** of this command.

Cisco 2600, 3600, 7100, 7200, and 7500 series router

```
ima test [link port] [pattern pattern-id]
no ima test [link port] [pattern pattern-id]
```

Cisco 7600 series router

```
ima test [link link number] [pattern pattern]
no ima test [link link number] [pattern pattern]
```

Syntax Description

link <i>port</i>	(Optional) The identifier for the interface where the physical link is located.
link <i>link number</i>	(Optional) On Cisco 7600 series routers, <i>link number</i> identifies the link to test. Specify the IMA link ID that is displayed by the show ima interface <i>interface</i> command. Valid values are 0 through 15.
pattern <i>pattern-id</i>	(Optional) A value from 0 to 254, specified as hexadecimal or decimal numbers, identifying a pattern to be sent to the far end of the link.

Command Default

There is no default for the *port* value. The default value for *pattern-id* is 106 (0x6A).

Command Modes

Interface configuration

Command History

Release	Modification
12.0(5)XK	This command was introduced on Cisco 2600 and 3600 series routers.
12.0(5)T	This command was integrated into Cisco IOS 12.0(5)T.
12.0(5)XE	Support for Cisco 7200 and 7500 series routers was added.
12.0(7)XE1	Support for Cisco 7100 series routers was added.
12.1(5)T	This command was integrated into Cisco IOS Release 12.1(5)T.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.
12.2(33)SRB2	Support for Cisco 7600 series routers was added.

Usage Guidelines

To verify link and group connectivity, the pattern is sent from the specified link and looped back from the receiving end across all links belonging to the group as defined at the remote end. Verifying link and group connectivity can help you to troubleshoot physical link connectivity or configuration problems at the remote

end. The local end verifies that the pattern is returned on all links belonging to the group at the local end, and testing is continuous. An IMA control protocol (ICP) cell in each frame identifies the pattern.

When a link is not transmitting or receiving a pattern correctly, the command reports the link number where the problem exists.

Examples

Cisco 2600, 3600, 7100, 7200, and 7500 series routers

The following example configures link 4 to send test pattern 56:

```
interface atm 0/ima 2
  ima test link 2 pattern 56
```

Cisco 7600 series routers

The following example shows how to configure IMA to send the test pattern 255 (0xFE) over link 4 in IMA group 0:

```
interface atm2/1/ima0
  ima test link 4 pattern 0xFE
```

Related Commands

Command	Description
show ima interface atm	Provides information about all configured IMA groups or a specific IMA group.

ima version

To specify which version of inverse multiplexing over ATM (IMA) to use, issue the **ima version** command in interface configuration mode. Use the **no** form of the command to revert to the default value.

ima version {1.0 | 1.1}
no ima version

Syntax Description

1.0	Selects IMA version 1.0.
1.1	Selects IMA version 1.1.

Command Default

The default is version 1.1.

Command Modes

Interface configuration (IMA interface)

Command History

Release	Modification
12.2(33)SRB2	This command was introduced on the Cisco 7600 series router.

Usage Guidelines

Use this command in interface configuration mode on the IMA interface that represents the IMA group that you are configuring for operation.

Examples

The following example shows how to select IMA version 1.0 for IMA group 0 on the SPA installed in chassis slot 2, SIP subslot 1:

```
interface atm2/1/ima0
  ima version 1.0
```

Related Commands

Command	Description
show ima interface atm	Provides information about all configured IMA groups or a specific IMA group.

inarp

To configure the Inverse Address Resolution Protocol (ARP) time period for an ATM permanent virtual circuit (PVC), virtual circuit (VC) class, or VC bundle, use the **inarp** command in the appropriate command mode. To restore the default Inverse ARP time period behavior, use the **no** form of this command.

inarp *minutes*
no inarp *minutes*

Syntax Description

<i>minutes</i>	Number of minutes for the Inverse ARP time period.
----------------	--

Command Default

15 minutes

Command Modes

Interface-ATM-VC configuration (for an ATM PVC)
 VC-class configuration (for a VC class)
 Bundle configuration (for a VC bundle)
 PVC range configuration (for an ATM PVC range)
 PVC-in-range configuration (for an individual PVC within a PVC range)

Command History

Release	Modification
11.3 T	This command was introduced.
12.0(3)T	This command was enhanced to provide support to configure the Inverse ARP time period for an ATM VC bundle.
12.1(5)T	This command was made available in PVC range and PVC-in-range configuration modes.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Usage Guidelines

This command is supported for **aal5snap** encapsulation only when Inverse ARP is enabled. Refer to the **encapsulation** command for configuring **aal5snap** encapsulation and the **protocol** command for enabling Inverse ARP.

If the **inarp** command is not explicitly configured on an ATM PVC, the PVC inherits the following default configuration (listed in order of precedence):

- Configuration of the **inarp** command in a VC class assigned to the PVC itself.
- Configuration of the **inarp** command in a VC class assigned to the PVC's ATM subinterface.
- Configuration of the **inarp** command in a VC class assigned to the PVC's ATM main interface.
- Global default for the *minutes* argument is 15 minutes; this default assumes that Inverse ARP is enabled.



Note As the inheritance rules imply, when a VC is a member of a VC bundle, configuration using the **inarp** command in VC-class configuration mode no longer applies to that VC. Bundle configuration takes precedence.

For ATM VC bundle management, the Inverse ARP parameter can only be enabled at the bundle level and applied to all VC members of the bundle--that is, it cannot be enabled in bundle-vc configuration mode for individual VC bundle members. To use this command in bundle configuration mode, first enter the **bundle** command to create the bundle and enter bundle configuration mode.

Examples

The following example sets the Inverse ARP time period to 10 minutes:

```
inarp 10
```

Related Commands

Command	Description
bundle	Creates a bundle or modifies an existing bundle to enter bundle configuration mode.
broadcast	Configures broadcast packet duplication and transmission for an ATM VC class, PVC, SVC, or VC bundle.
class-int	Assigns a VC class to an ATM main interface or subinterface.
class-vc	Assigns a VC class to an ATM PVC, SVC, or VC bundle member.
encapsulation atm-dxi	Configures the AAL and encapsulation type for an ATM PVC, SVC, or VC class.
oam-bundle	Enables end-to-end F5 OAM loopback cell generation and OAM management for a virtual circuit class that can be applied to a virtual circuit bundle.
oam retry	Configures parameters related to OAM management for an ATM PVC, SVC, VC class, or VC bundle.
protocol (ATM)	Configures a static map for an ATM PVC, SVC, VC class, or VC bundle. Enables Inverse ARP or Inverse ARP broadcasts on an ATM PVC by either configuring Inverse ARP directly on the PVC, on the VC bundle, or in a VC class (applies to IP and IPX protocols only).

inarp-vc

To enable Inverse Address Resolution Protocol (InARP) for a permanent virtual circuit (PVC) bundle member, use the **inarp-vc** command in ATM VC bundle-member configuration mode. To disable InARP for a PVC bundle member, use the **no** form of this command.

inarp-vc
no inarp-vc

Syntax Description This command has no arguments or keywords.

Command Default InARP is disabled for the PVC bundle member.

Command Modes ATM VC bundle-member configuration

Command History	Release	Modification
	12.4(4)T	This command was introduced.
	12.2(31)SB2	This command was integrated into Cisco IOS Release 12.2(31)SB2.

Usage Guidelines You can use this command only when using the quality of service (QoS) groups method for selecting the PVC bundle members. When InARP is enabled for a PVC bundle member, InARP requests are sent and are expected to be received on the PVC bundle member, and InARP replies are expected to be received on the PVC bundle member.

Examples The following example associates QoS group 1 with a PVC bundle member and enables InARP on the PVC bundle member:

```
Router> enable
Password:
Router# configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)# interface atm 2/0
Router(config-subif)# bundle cisco
Router(config-if-atm-bundle)# selection-method qos-group
Router(config-if-atm-bundle)# pvc 1/32
Router(config-if-atm-member)# qos-group 1
Router(config-if-atm-member)# inarp-vc
Router(config-if-atm-member)# end
```

Related Commands	Command	Description
	qos-group (ATM VC bundle member)	Associates a QoS group or groups with a PVC bundle member.
	selection-method	Specifies the method for selection of the PVC bundle member.

interface atm

To configure an ATM interface and enter interface configuration mode, use the **interface atm** command in global configuration mode.

interface atm *interface-number* [*. subinterface-number* {**multipoint** | **point-to-point**}]

Syntax Description

<i>interface-number</i>	Specifies a (physical) ATM interface (for example, 3/0).
<i>. subinterface-number</i>	(Optional) Specifies a subinterface number. A dot (.) must be used to separate the <i>interface-number</i> from the <i>subinterface-number</i> (for example 2/0.1).
multipoint	(Optional) Specifies multipoint as the interface type for which a subinterface is to be created.
point-to-point	(Optional) Specifies point-to-point as the interface type for which a subinterface is to be created.

Command Default

No ATM interfaces are configured.

Command Modes

Global configuration (config)

Command History

Release	Modification
10.0	This command was introduced.
12.1(3)T	New optional subinterface types were introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command was integrated into Cisco IOS Release 12.2SX. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.
Cisco IOS XE Release 2.3	This command was implemented on the Cisco ASR 1000 series routers.

Usage Guidelines

The **interface atm** command enables you to define a subinterface for a specified type of ATM interface. The subinterface for the ATM interface is created the first time this command is issued with a specified subinterface number.

For the Cisco 7600 series routers, you must specify the interface ATM slot, bay, and port for the SIP400 or SIP200.

Examples

For physical ATM interface 3/0, the following command creates an ATM subinterface having subinterface number 1:

```
Router# interface atm 3/0.1
```

For a Cisco 7600 series router where the slot is 4, the bay is 3, and the port is 0, the command is:


```
Router# interface atm 4/3/0
```

Related Commands

Command	Description
show interfaces atm	Displays information about the ATM interface.

interface atm ima

To configure an inverse multiplexing over ATM (IMA) group, use the **interface atm ima** command in global configuration mode.

```
interface atm slot/ imagroup-number
```

Syntax Description

<i>slot/ /</i>	Slot location of the ATM IMA network module. The values range from 0 to 5 depending on the router.
<i>group-number</i>	Group number from 0 to 3. You can create up to four groups. Do not include a space before the group number.

Command Default

There are no IMA groups (only individual ATM links).

Command Modes

Global configuration (config)

Command History

Release	Modification
12.0(5)XK	This command was introduced on Cisco 2600 and 3600 series routers.
12.0(5)T	This command was integrated into Cisco IOS 12.0(5)T.
12.0(5)XE	Support for Cisco 7200 and 7500 series routers was added.
12.0(7)XE1	Support for Cisco 7100 series routers was added.
12.1(5)T	Support for Cisco 7100, 7200, and 7500 series routers was integrated into Cisco IOS Release 12.1(5)T.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.
15.1(2)SNG	This command was implemented on Cisco ASR 901 Series Aggregation Services Routers.

Usage Guidelines

If the group does not exist when this command is issued, the command automatically creates the group.

When a port is configured for IMA functionality, it no longer operates as an individual ATM link.

Specifying ATM links as members of a group by using the **ima-group** interface command does not enable the group. You must use the **interface atm ima** command to create the group.

Examples

The following example configures IMA group 0 on the module in slot 1:

```
interface atm 1/ima0
ip address 10.18.16.121 255.255.255.192
```

Related Commands

Command	Description
ima-group	Defines IMA group members.
imagroup-id	Enables the user to configure the IMA group ID for the IMA interface.
interface atm	Configures an ATM interface.
show ima interface atm	Provides information about all configured IMA groups or a specific IMA group.
shutdown (interface)	Disables an interface.

interface cbr

To specify the T1 or E1 constant bit rate interface on an ATM-CES port adapter, and to enter interface configuration mode, use the **interface cbr** command in global configuration mode.

```
interface cbr slot/port
```

Syntax Description

<i>slot /</i>	Backplane slot number. The slash (/) must be typed.
<i>port</i>	Interface port number.

Command Default

None

Command Modes

Global configuration

Command History

Release	Modification
11.1	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Usage Guidelines

The ATM-CES port adapter has four T1 (1.544 Mbps) or four E1 (2.048 Mbps) ports (75- or 120-ohm) that can support both structured (N x 64 kbps) and unstructured ATM Forum-compliant circuit emulation services (CES), and one port that supports an OC-3 (155 Mbps) single-mode intermediate reach interface or a T3 (45 Mbps) or E3 (34 Mbps) standards-based ATM interface.

Examples

The following example specifies the first T1 or E1 port on the ATM-CES port adapter in slot 1:

```
interface cbr 1/0
```

Related Commands

Command	Description
show ces interface cbr	Displays detailed CBR port information.
show interface cbr	Displays the information about the CBR interface on the ATM-CES port adapter.

keepalive-lifetime

To specify the duration that a keepalive message from a Multiprotocol over ATM server (MPS) is considered valid by the Multiprotocol over ATM client (MPC), use the **keepalive-lifetime** command in global configuration mode.

keepalive-lifetime *seconds*

Syntax Description

<i>seconds</i>	Time (in seconds) for the MPS-p2 variable of the MPS.
----------------	---

Command Default

The default is 35 seconds.

Command Modes

Global configuration

Command History

Release	Modification
12.0(3)T	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Usage Guidelines

The keepalive lifetime (MPS-p2) must be greater than or equal to three times the value of the keepalive time (MPS-p1). MPS-p1 specifies the frequency with which a keepalive message is sent from the MPS to the MPC.

Examples

The following example shows how to specify a keepalive lifetime of 60 seconds:

```
Router(config)# keepalive-lifetime 60
```

Related Commands

Command	Description
keepalive-time	Specifies the keepalive time value for the MPS-p1 variable of an MPS.

keepalive-time

To specify the keepalive time value for the Multiprotocol over ATM (MPOA) server (MPS)-p1 variable of an MPS, use the **keepalive-time** command in MPS configuration mode. To revert to the default value, use the **no** form of this command.

keepalive-time *seconds*

no keepalive-time *seconds*

Syntax Description

<i>seconds</i>	Specifies the keepalive time value (in seconds). The default value is 10 seconds.
----------------	---

Command Default

The default keepalive time is 10 seconds.

Command Modes

MPS configuration

Command History

Release	Modification
11.3(3a)WA4(5)	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Examples

The following example shows how to set the keepalive time to 25 seconds:

```
Router(mpoa-server-config)# keepalive-time 25
```

lane auto-config-atm-address



Note Effective with Cisco IOS Release 15.1M, the **lane auto-config-atm-address** command is not available in Cisco IOS software.

To specify that the configuration server ATM address is computed by the Cisco automatic method, use the **lane auto-config-atm-address** command in interface configuration mode. To remove the previously assigned ATM address, use the **no** form of this command.

lane [config] auto-config-atm-address
no lane [config] auto-config-atm-address

Syntax Description

config	(Optional) When the config keyword is used, this command applies only to the LAN Emulation Configuration Server (LECS). This keyword indicates that the LECS should use the auto computed LECS address.
---------------	--

Command Default

No specific ATM address is set.

Command Modes

Interface configuration

Command History

Release	Modification
11.0	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.
15.1M	This command was removed.

Usage Guidelines

When the **config** keyword is not present, this command causes the LANE server and LANE client on the subinterface to use the automatically assigned ATM address for the configuration server.

When the **config** keyword is present, this command assigns the automatically generated ATM address to the configuration server (LECS) configured on the interface. Multiple commands that assign ATM addresses to the LANE configuration server can be issued on the same interface to assign different ATM addresses to the configuration server. Commands that assign ATM addresses to the LANE configuration server include **lane auto-config-atm-address**, **lane config-atm-address**, and **lane fixed-config-atm-address**.

For a discussion of Cisco's method of automatically assigning ATM addresses, refer to the "Configuring LAN Emulation" chapter in the *Cisco IOS Switching Services Configuration Guide*.

Examples

The following example shows how to associate the LANE configuration server with the database named network1 and specifies that the configuration server's ATM address will be assigned by the Cisco automatic method:

```

Router(config)# lane database network1
Router(lane-config-dat)# name eng server-atm-address
39.020304050607080910111213.0800.AA00.1001.02
Router(lane-config-dat)# name mkt server-atm-address
39.020304050607080910111213.0800.AA00.4001.01
Router(config)# interface atm 1/0
Router(config-if)# lane config database network1
Router(config-if)# lane config auto-config-atm-address

```

The following example shows how to cause the LANE server and LANE client on the subinterface to use the automatically assigned ATM address to communicate with the configuration server:

```

Router(config)# interface atm 2/0.1
Router(config-if)# ip address 172.16.0.4 255.255.255.0
Router(config-if)# lane client ethernet
Router(config-if)# lane server-bus ethernet eng
Router(config-if)# lane auto-config-atm-address

```

Related Commands

Command	Description
lane config-atm-address	Specifies the ATM address of the configuration server explicitly.
lane database	Creates a named configuration database that can be associated with a configuration server.
lane fixed-config-atm-address	Specifies that the fixed configuration server ATM address assigned by the ATM Forum will be used.

lane bus-atm-address



Note Effective with Cisco IOS Release 15.1M, the **lane bus-atm-address** command is not available in Cisco IOS software.

To specify an ATM address--and thus override the automatic ATM address assignment--for the broadcast and unknown server on the specified subinterface, use the **lane bus-atm-address** command in interface configuration mode. To remove the ATM address previously specified for the broadcast and unknown server on the specified subinterface and thus revert to the automatic address assignment, use the **no** form of this command.

lane bus-atm-address *atm-address-template*
no lane bus-atm-address [*atm-address-template*]

Syntax Description

<i>atm-address-template</i>	ATM address or a template in which wildcard characters are replaced by any nibble or group of nibbles of the prefix bytes, the end-system identifier (ESI) bytes, or the selector byte of the automatically assigned ATM address.
-----------------------------	---

Command Default

For the broadcast and unknown server, the default is automatic ATM address assignment.

Command Modes

Interface configuration

Command History

Release	Modification
11.0	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.
15.1M	This command was removed.

Usage Guidelines

When applied to a broadcast and unknown server, this command overrides automatic ATM address assignment for the broadcast and unknown server. When applied to a LANE client, this command gives the client the ATM address of the broadcast and unknown server. The client will use this address rather than sending LAN Emulation Address Resolution Protocol (LE ARP) requests for the broadcast address.

When applied to a selected interface, but with a different ATM address from what was used previously, this command replaces the broadcast and unknown server's ATM address.

ATM Addresses

A LANE ATM address has the same syntax as a network service access point (NSAP) (but it is not a network-level address). It consists of the following:

- A 13-byte prefix that includes the following fields defined by the ATM Forum:

- AFI (Authority and Format Identifier) field (1 byte)
 - DCC (Data Country Code) or ICD (International Code Designator) field (2 bytes)
 - DFI field (Domain Specific Part Format Identifier) (1 byte)
 - Administrative Authority field (3 bytes)
 - Reserved field (2 bytes)
 - Routing Domain field (2 bytes)
 - Area field (2 bytes)
- A 6-byte ESI
 - A 1-byte selector field

Address Templates

LANE ATM address templates can use two types of wildcards: an asterisk (*) to match any single character (nibble), and an ellipsis (...) to match any number of leading, middle, or trailing characters. The values of the characters replaced by wildcards come from the automatically assigned ATM address.

The values of the digits that are replaced by wildcards come from the automatic ATM assignment method.

In LANE, a *prefix template* explicitly matches the prefix but uses wildcards for the ESI and selector fields. An *ESI template* explicitly matches the ESI field but uses wildcards for the prefix and selector.

In the Cisco implementation of LANE, the prefix corresponds to the switch, the ESI corresponds to the ATM interface, and the selector field corresponds to the specific subinterface of the interface.

Examples

The following example shows how to use an ESI template to specify the part of the ATM address corresponding to the interface; the remaining values in the ATM address come from automatic assignment:

```
Router(config-if)# lane bus-atm-address ...0800.200C.1001.**
```

The following example shows how to use a prefix template to specify the part of the ATM address corresponding to the switch; the remaining values in the ATM address come from automatic assignment:

```
Router(config-if)# lane bus-atm-address 45.000014155551212f.00.00...
```

Related Commands

Command	Description
lane server-bus	Enables a LANE server and a broadcast and unknown server on the specified subinterface with the ELAN ID.

lane client



Note Effective with Cisco IOS Release 15.1M, the **lane client** command is not available in Cisco IOS software.

To activate a LAN Emulation (LANE) client on the specified subinterface, use the **lane client** command in interface configuration mode. To remove a previously activated LANE client on the subinterface, use the **no** form of this command.

lane client ethernet [*elan-name*]
no lane client ethernet [*elan-name*]

Syntax Description

ethernet	Identifies the emulated LAN (ELAN) attached to this subinterface as an Ethernet ELAN.
<i>elan-name</i>	(Optional) Name of the ELAN. This argument is optional because the client obtains its ELAN name from the configuration server. The maximum length of the name is 32 characters.

Command Default

No LANE clients are enabled on the interface.

Command Modes

Interface configuration

Command History

Release	Modification
11.0	This command was introduced.
12.3(2)T	The tokenring keyword was removed.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.
15.1M	This command was removed.

Usage Guidelines

If a **lane client** command has already been used on the subinterface for a different ELAN, then the client initiates termination procedures for that ELAN and joins the new ELAN.

If you do not provide an *elan-name* value, the client contacts the server to find which ELAN to join. If you do provide an ELAN name, the client consults the configuration server to ensure that no conflicting bindings exist.

Examples

The following example shows how to enable an Ethernet LANE client on an interface:

```
Router(config-if)# lane client ethernet
```

Related Commands

Command	Description
lane client-atm-address	Specifies an ATM address--and thus overrides the automatic ATM address assignment--for the LANE client on the specified subinterface.

lane client flush



Note Effective with Cisco IOS Release 15.1M, the **lane client flush** command is not available in Cisco IOS software.

To enable the flush mechanism of a LAN Emulation Client (LEC), use the **lane client flush** command in global configuration mode. To disable the flush mechanism of a LEC, use the **no** form of this command.

lane client flush
no lane client flush

Syntax Description This command contains no arguments or keywords.

Command Default All the LECs perform the LANE LE_FLUSH process by default.

Command Modes Global configuration

Release	Modification
12.1(2)T	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.
15.1M	This command was removed.

Usage Guidelines In Cisco IOS Release 12.1(3)T and later releases, the **lane client flush** command will be hidden and will not be visible in the configuration.

Configuring the **no lane client flush** command on a Cisco networking device is recommended to prevent the initial packet drops during the establishment of LANE data direct virtual connection (VCC).

Use the **no lane client flush** command to keep LANE clients from sending LE_FLUSH messages to the remote LANE client. This configuration also allows the LANE clients to process the LE_FLUSH messages from the remote LANE clients.



Note Configuring the **no lane client flush** command on a Cisco networking device does not guarantee the orderly delivery of incoming packets. There is a chance of receiving out-of-order packets at the destination during the establishment of a LANE data direct VCC.

Examples

The following example shows how to disable the flush mechanism of a LEC:

```
Router(config)# no lane client flush
```

Related Commands

Command	Description
lane client	Activates a LANE client on the specified subinterface.
lane client-atm-address	Specifies an ATM address--and thus overrides the automatic ATM address assignment--for the LANE client on the specified subinterface.

lane client mpoa client name



Note Effective with Cisco IOS Release 15.1M, the **lane client mpoa client name** command is not available in Cisco IOS software.

To bind a LAN Emulation Client (LEC) to the named Multiprotocol over ATM client (MPC), use the **lane client mpoa client name** command in interface configuration mode. To unbind the named MPC from a LEC, use the **no** form of this command.

lane client mpoa client name *mpc-name*
no lane client mpoa client name *mpc-name*

Syntax Description

<i>mpc-name</i>	Name of the specific MPC.
-----------------	---------------------------

Command Default

No LEC is bound to a named MPC.

Command Modes

Interface configuration

Command History

Release	Modification
11.3(3a)WA4(5)	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.
15.1M	This command was removed.

Usage Guidelines

When you enter this command, the named MPC is bound to a LEC. The named MPC must exist before this command is accepted. If you enter this command before a LEC is configured (not necessarily running), a warning message is issued.

Examples

The following example shows how to bind a LEC on a subinterface to the MPC:

```
Router(config-if)# lane client mpoa client name ip_mpc
```

lane client mpoa server name



Note Effective with Cisco IOS Release 15.1M, the **lane client mpoa server name** command is not available in Cisco IOS software.

To bind a LAN Emulation Client (LEC) with the named Multiprotocol over ATM server (MPS), use the **lane client mpoa server name** command in interface configuration mode. To unbind the server, use the **no** form of this command.

lane client mpoa server name *mps-name*
no lane client mpoa server name *mps-name*

Syntax Description

<i>mps-name</i>	Name of the specific MPS.
-----------------	---------------------------

Command Default

No LEC is bound to a named MPS.

Command Modes

Interface configuration

Command History

Release	Modification
11.3(3a)WA4(5)	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.
15.1M	This command was removed.

Usage Guidelines

This command binds a LEC to the named MPS. The specified MPS must exist before this command is accepted. If this command is entered when a LEC is not already configured (not necessarily running), a warning message will be issued.

Examples

The following example shows how to bind a LANE client with the MPS named MYMPS:

```
Router(config-if)# lane client mpoa server name MYMPS
```


lane client-atm-address



Note Effective with Cisco IOS Release 15.1M, the **lane client-atm-address** command is not available in Cisco IOS software.

To specify an ATM address--and thus override the automatic ATM address assignment--for the LAN Emulation (LANE) client on the specified subinterface, use the **lane client-atm-address** command in interface configuration mode. To remove the ATM address previously specified for the LANE client on the specified subinterface and thus revert to the automatic address assignment, use the **no** form of this command.

lane client-atm-address *atm-address-template*
no lane client-atm-address [*atm-address-template*]

Syntax Description

<i>atm-address-template</i>	ATM address or a template in which wildcard characters are replaced by any nibble or group of nibbles of the prefix bytes, the end-system identifier (ESI) bytes, or the selector byte of the automatically assigned ATM address.
-----------------------------	---

Command Default

Automatic ATM address assignment

Command Modes

Interface configuration

Command History

Release	Modification
11.0	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.
15.1M	This command was removed.

Usage Guidelines

Use of this command on a selected subinterface, but with a different ATM address from what was used previously, replaces the ATM address of the LANE client.

ATM Addresses

A LANE ATM address has the same syntax as a network service access point (NSAP) (but it is not a network-level address). It consists of the following:

- A 13-byte prefix that includes the following fields defined by the ATM Forum:
 - AFI (Authority and Format Identifier) field (1 byte)
 - DCC (Data Country Code) or ICD (International Code Designator) field (2 bytes)
 - DFI field (Domain Specific Part Format Identifier) (1 byte)
 - Administrative Authority field (3 bytes)
 - Reserved field (2 bytes)

- Routing Domain field (2 bytes)
- Area field (2 bytes)
- A 6-byte ESI
- A 1-byte selector field

Address Templates

LANE ATM address templates can use two types of wildcards: an asterisk (*) to match any single character (nibble), and an ellipsis (...) to match any number of leading, middle, or trailing characters. The values of the characters replaced by wildcards come from the automatically assigned ATM address.

In LANE, a *prefix template* explicitly matches the ATM address prefix but uses wildcards for the ESI and selector fields. An *ESI template* explicitly matches the ESI field but uses wildcards for the prefix and selector.

The Cisco implementation of LANE, the prefix corresponds to the switch, the ESI corresponds to the ATM interface, and the selector field corresponds to the specific subinterface of the interface.

For a discussion of Cisco's method of automatically assigning ATM addresses, refer to the "Configuring LAN Emulation" chapter in the *Cisco IOS Switching Services Configuration Guide*.

Examples

The following example shows how to use an ESI template to specify the part of the ATM address corresponding to the interface; the remaining parts of the ATM address come from automatic assignment:

```
Router(config-if)# lane client-atm-address...0800.200C.1001.**
```

The following example shows how to use a prefix template to specify the part of the ATM address corresponding to the switch; the remaining parts of the ATM address come from automatic assignment:

```
Router(config-if)# lane client-atm-address 47.000014155551212f.00.00...
```

Related Commands

Command	Description
lane client	Activates a LANE client on the specified subinterface.

lane config database



Note Effective with Cisco IOS Release 15.1M, the **lane config database** command is not available in Cisco IOS software.

To associate a named configuration table (database) with the configuration server on the selected ATM interface, use the **lane config database** command in interface configuration mode. To remove the association between a named database and the configuration server on the specified interface, use the **no** form of this command.

lane config database *database-name*
no lane config database

Syntax Description

<i>database-name</i>	Name of the LAN emulation (LANE) database.
----------------------	--

Command Default

No configuration server is defined, and no database name is provided.

Command Modes

Interface configuration

Command History

Release	Modification
11.0	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.
15.1M	This command was removed.

Usage Guidelines

This command is valid only on a major interface, not a subinterface, because only one LANE Configuration Server (LECS) can exist per interface.

The named database must exist before the **lane config database** command is used. Refer to the **lane database** command for more information.

Multiple **lane config database** commands cannot be used multiple times on the same interface. You must delete an existing association by using the **no** form of this command before you can create a new association on the specified interface.

Activating a LANE configuration server requires the **lane config database** command and one of the following commands: **lane fixed-config-atm-address**, **lane auto-config-atm-address**, or **lane config-atm-address**.

Examples

The following example shows how to associate the LECS with the database named network1 and to specify that the configuration server's ATM address will be assigned by the Cisco automatic method:

```

Router(config)# lane database network1
Router(lane-config-dat)# name eng server-atm-address
39.020304050607080910111213.0800.AA00.1001.02
Router(lane-config-dat)# name mkt server-atm-address
39.020304050607080910111213.0800.AA00.4001.01
Router(config)# interface atm 1/0
Router(config-if)# lane config database network1
Router(config-if)# lane config auto-config-atm-address

```

Related Commands

Command	Description
lane auto-config-atm-address	Specifies that the configuration server ATM address is computed by the Cisco automatic method.
lane config-atm-address	Specifies the ATM address of the configuration server explicitly.
lane database	Creates a named configuration database that can be associated with a configuration server.
lane fixed-config-atm-address	Specifies that the fixed configuration server ATM address assigned by the ATM Forum will be used.

lane config-atm-address



Note Effective with Cisco IOS Release 15.1M, the **lane config-atm-address** command is not available in Cisco IOS software.

To specify a configuration server's ATM address explicitly, use the **lane config-atm-address** command in interface configuration mode. To remove an assigned ATM address, use the **no** form of this command.

lane [config] config-atm-address atm-address-template

no lane [config] config-atm-address atm-address-template

Syntax Description

config	(Optional) When the config keyword is used, this command applies only to the LANE Configuration Server (LECS). This keyword indicates that the LECS should use the 20-byte address that you explicitly entered.
<i>atm-address-template</i>	ATM address or a template in which wildcard characters are replaced by any nibble or group of nibbles of the prefix bytes, the end-system identifier (ESI) bytes, or the selector byte of the automatically assigned ATM address.

Command Default

No specific ATM address or method is set.

Command Modes

Interface configuration

Command History

Release	Modification
11.0	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.
15.1M	This command was removed.

Usage Guidelines

If the **config** keyword is not present, this command causes the LAN Emulation (LANE) server and LANE client on the subinterface to use the specified ATM address for the configuration server.

When the **config** keyword is present, this command adds an ATM address to the configuration server configured on the interface. A LECS can listen on multiple ATM addresses. Multiple commands that assign ATM addresses to the LECS can be issued on the same interface to assign different ATM addresses to the LECS.

ATM Addresses

A LANE ATM address has the same syntax as an NSAP (but it is not a network-level address). It consists of the following:

- A 13-byte prefix that includes the following fields defined by the ATM Forum:

- AFI (Authority and Format Identifier) field (1 byte)
 - DCC (Data Country Code) or ICD (International Code Designator) field (2 bytes)
 - DFI field (Domain Specific Part Format Identifier) (1 byte)
 - Administrative Authority field (3 bytes)
 - Reserved field (2 bytes)
 - Routing Domain field (2 bytes)
 - Area field (2 bytes)
- A 6-byte ESI
 - A 1-byte selector field

Address Templates

LANE ATM address templates can use two types of wildcards: an asterisk (*) to match any single character (nibble), and an ellipsis (...) to match any number of leading, middle, or trailing characters. The values of the characters replaced by wildcards come from the automatically assigned ATM address.

In LANE, a *prefix template* explicitly matches the ATM address prefix but uses wildcards for the ESI and selector fields. An *ESI template* explicitly matches the ESI field but uses wildcards for the prefix and selector.

In our implementation of LANE, the prefix corresponds to the switch prefix, the ESI corresponds to a function of the ATM interface's MAC address, and the selector field corresponds to the specific subinterface of the interface.

For a discussion of the Cisco method of automatically assigning ATM addresses, refer to the “Configuring LAN Emulation” chapter in the *Cisco IOS Switching Services Configuration Guide*.

Examples

The following example shows how to associate the LANE configuration server with the database named network1 and to explicitly specify the configuration server's ATM address:

```
Router(config)# lane database network1
Router(lane-config-dat)# name eng server-atm-address
39.020304050607080910111213.0800.AA00.1001.02
Router(lane-config-dat)# name mkt server-atm-address
39.020304050607080910111213.0800.AA00.4001.01
Router(config)# interface atm 1/0
Router(config-if)# lane config database network1
Router(config-if)# lane config config-atm-address
39.020304050607080910111213.0800.AA00.3000.00
```

The following example shows how to cause the LANE server and LANE client on the subinterface to use the explicitly specified ATM address to communicate with the configuration server:

```
Router(config)# interface atm 2/0.1
Router(config-if)# ip address 172.16.0.4 255.255.255.0
Router(config-if)# lane client ethernet
Router(config-if)# lane server-bus ethernet eng
Router(config-if)# lane config-atm-address 39.020304050607080910111213.0800.AA00.3000.00
```

Related Commands

Command	Description
lane auto-config-atm-address	Specifies that the configuration server ATM address is computed by the Cisco automatic method.

Command	Description
lane config database	Associates a named configuration table (database) with the configuration server on the selected ATM interface.
lane database	Creates a named configuration database that can be associated with a configuration server.
lane fixed-config-atm-address	Specifies that the fixed configuration server ATM address assigned by the ATM Forum will be used.

lane database



Note Effective with Cisco IOS Release 15.1M, the **lane database** command is not available in Cisco IOS software.

To create a named configuration database that can be associated with a configuration server, use the **lane database** command in global configuration mode. To delete the database, use the **no** form of this command.

lane database *database-name*
no lane database *database-name*

Syntax Description

<i>database-name</i>	Database name (32 characters maximum).
----------------------	--

Command Default

No name is provided.

Command Modes

Global configuration

Command History

Release	Modification
11.0	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.
15.1M	This command was removed.

Usage Guidelines

Use of the **lane database** command places you in database configuration mode, in which you can use the **client-atm-address name**, **default name**, **mac-address name**, **name restricted**, **name unrestricted**, **name new-name**, and **name server-atm-address** commands to create entries in the specified database. When you are finished creating entries, type **^Z** or **exit** to return to global configuration mode.

Examples

The following example shows how to create the database named network1 and associates it with the configuration server on interface ATM 1/0:

```
Router(config)# lane database network1
Router(lane-config-dat)# name eng server-atm-address
39.020304050607080910111213.0800.AA00.1001.02
Router(lane-config-dat)# name mkt server-atm-address
39.020304050607080910111213.0800.AA00.4001.01
Router(lane-config-dat)# default-name eng
Router(config)# interface atm 1/0
Router(config-if)# lane config database network1
Router(config-if)# lane config auto-config-atm-address
```


Related Commands	Command	Description
	client-atm-address name	Adds a LANE client address entry to the configuration database of the configuration server.
	default-name	Provides an ELAN name in the database of the configuration server for those client MAC addresses and client ATM addresses that do not have explicit ELAN name bindings.
	lane config database	Associates a named configuration table (database) with the configuration server on the selected ATM interface.
	mac-address	Sets the MAC-layer address of the Cisco Token Ring.
	name	Assigns a name to the internal adapter.
	name server-atm-address	Specifies or replaces the ATM address of the LANE server for the ELAN in the configuration database of the configuration server.

lane fixed-config-atm-address



Note Effective with Cisco IOS Release 15.1M, the **lane fixed-config-atm-address** command is not available in Cisco IOS software.

To specify that the fixed configuration server ATM address assigned by the ATM Forum will be used, use the **lane fixed-config-atm-address** command in interface configuration mode. To specify that the fixed ATM address will not be used, use the **no** form of this command.

lane [config] fixed-config-atm-address
no lane [config] fixed-config-atm-address

Syntax Description

config	(Optional) When the config keyword is used, this command applies only to the LANE Configuration Server (LECS). This keyword indicates that LECS should use the well-known, ATM Forum LEC address.
---------------	--

Command Default

No specific ATM address or method is set.

Command Modes

Interface configuration

Command History

Release	Modification
11.0	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.
15.1M	This command was removed.

Usage Guidelines

When the **config** keyword is not present, this command causes the LAN emulation (LANE) server and LANE client on the subinterface to use that ATM address, rather than the ATM address provided by the ILMI, to locate the configuration server.

When the **config** keyword is present, and the LECS is already up and running, be aware of the following scenarios:

- If you configure the LECS with only the well-known address, the LECS will not participate in the SSRP, will act as a standalone primary, and will listen only on the well-known LECS address. This scenario is ideal if you want a standalone LECS that does not participate in SSRP, and you would like to listen to only the well-known address.
- If only the well-known address is already assigned, and you assign at least one other address to the LECS (additional addresses are assigned using the **lane auto-config-atm-address** command or the **lane config-atm-address** command), the LECS will participate in the SSRP and act as the primary or

subordinate based on the normal SSRP rules. This scenario is ideal if you would like the LECS to participate in SSRP, and you would like to make the primary LECS listen on the well-known address.

- If the LECS is participating in SSRP, has more than one address (one of which is the well-known address), and all the addresses but the well-known address are removed, the LECS will declare itself the primary and stop participating in SSRP completely.
- If the LECS is operating as an SSRP subordinate, and it has the well-known address configured, it will not listen on the well-known address unless it becomes the primary.
- If you want the LECS to assume the well-known address only when it becomes the primary, configure the LECS with the well-known address and at least one other address.

When you use this command with the **config** keyword, and the LECS is primary, the primary will listen on the fixed address. If you use this command when an LECS is not a primary, the LECS will listen on this address when it becomes a primary. If you do not use this command, the LECS will not listen on the fixed address.

Multiple commands that assign ATM addresses to the LECS can be issued on the same interface in order to assign different ATM addresses to the LECS. Commands that assign ATM addresses to the LECS include **lane auto-config-atm-address**, **lane config-atm-address**, and **lane fixed-config-atm-address**. The **lane config database** command and at least one command that assigns an ATM address to the LECS are required to activate a LECS.

Examples

The following example shows how to associate the LECS with the database named `network1` and how to specify that the configuration server's ATM address is the fixed address:

```
Router(config)# lane database network1
Router(lane-config-dat)# name eng server-atm-address
39.020304050607080910111213.0800.AA00.1001.02
Router(lane-config-dat)# name mkt server-atm-address
39.020304050607080910111213.0800.AA00.4001.01
Router(config)# interface atm 1/0
Router(config-if)# lane config database network1
Router(config-if)# lane config fixed-config-atm-address
```

The following example shows how to cause the LANE server and LANE client on the subinterface to use the fixed ATM address to communicate with the configuration server:

```
Router(config)# interface atm 2/0.1
Router(config-if)# ip address 172.16.0.4 255.255.255.0
Router(config-if)# lane client ethernet
Router(config-if)# lane server-bus ethernet eng
Router(config-if)# lane fixed-config-atm-address
```

Related Commands	Command	Description
	lane auto-config-atm-address	Specifies that the configuration server ATM address is computed by the Cisco automatic method.
	lane config-atm-address	Specifies the ATM address of the configuration server explicitly.
	lane config database	Associates a named configuration table (database) with the configuration server on the selected ATM interface.

lane fssrp



Note Effective with Cisco IOS Release 15.1M, the **lane fssrp** command is not available in Cisco IOS software.

To enable the special LANE features such that LANE components (such as the LANE Configuration Server, the LANE client, the LANE server, and the BUS) become aware of the Fast Simple Server Redundancy Protocol (FSSRP), use the **lane fssrp** command in interface configuration mode. To disable the LANE FSSRP configuration, use the **no** form of this command.

lane fssrp
no lane fssrp

Syntax Description This command contains no arguments or keywords.

Command Default FSSRP is not enabled by default.

Command Modes Interface configuration

Command History

Release	Modification
12.0(4c)W5(10a)	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.
15.1M	This command was removed.

Usage Guidelines You must execute this command on all ATM interfaces to enable FSSRP capability for all LANE components on that interface and hence all its subinterfaces.

Examples

The following example shows how to enable FSSRP on an ATM interface:

```
Router(config-if)# lane fssrp
```

Related Commands

Command	Description
lane client	Activates a LANE client on the specified subinterface.
lane server	Activates a LANE server on the specified subinterface.
show lane client	Generates additional FSSRP information about a LANE client.
show lane config	Displays global LANE information for the configuration server configured on an interface.

lane global-lecs-address



Note Effective with Cisco IOS Release 15.1M, the **lane global-lecs-address** command is not available in Cisco IOS software.

To specify a list of LAN Emulation Configuration Server (LECS) addresses to use when the addresses cannot be obtained from the Interim Local Management Interface (ILMI), use the **lane global-lecs-address** command in interface configuration mode. To remove a LECS address from the list, use the **no** form of this command.

lane global-lecs-address *address*
no lane global-lecs-address *address*

Syntax Description

<i>address</i>	Address of the LECS. You cannot use the well-known LECS address.
----------------	--

Command Default

No addresses are configured. The router obtains LECS addresses from the ILMI.

Command Modes

Interface configuration

Command History

Release	Modification
11.2	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.
15.1M	This command was removed.

Usage Guidelines

Use this command when your ATM switches do not support the ILMI list of LECS addresses and you want to configure Simple Server Redundancy. This command will simulate the list of LECS addresses, as if they had been obtained from the ILMI. Use this command with a different address for each LECS. The order they are used determines their priority. You should enter the addresses in the same order as you would on the ATM switch.



Note You must configure the same list of addresses on each interface that contains a LAN emulation (LANE) entity.

If your switches do support ILMI, this command forces the router to use the addresses specified and will not use the ILMI to obtain the LECS addresses.

Because the well-known LECS address is always used as a last resort LECS address, you cannot use the address in this command.

lane le-arp



Note Effective with Cisco IOS Release 15.1M, the **lane le-arp** command is not available in Cisco IOS software.

To add a static entry to the LAN Emulation Address Resolution Protocol (LE ARP) table of the LANE client configured on the specified subinterface, use the **lane le-arp** command in interface configuration mode. To remove a static entry from the LE ARP table of the LANE client on the specified subinterface, use the **no** form of this command.

lane le-arp {*mac-address* | **route-desc segment** *segment-number* **bridge** *bridge-number*} *atm-address*
no lane le-arp {*mac-address* | **route-desc segment** *segment-number* **bridge** *bridge-number*} *atm-address*

Syntax Description

<i>mac-address</i>	MAC address to bind to the specified ATM address.
route-desc segment <i>segment-number</i>	LANE segment number. The segment number ranges from 1 to 4095.
bridge <i>bridge-number</i>	Bridge number that is contained in the route descriptor. The bridge number ranges from 1 to 15.
<i>atm-address</i>	ATM address.

Command Default

No static address bindings are provided.

Command Modes

Interface configuration

Command History

Release	Modification
11.0	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.
15.1M	This command was removed.

Usage Guidelines

This command adds or removes a static entry binding a MAC address or segment number and bridge number to an ATM address. It does not add or remove dynamic entries. Removing the static entry for a specified ATM address from a LE ARP table does not release data direct VCCs established to that ATM address. However, clearing a static entry clears any fast-cache entries that were created from the MAC address-to-ATM address binding.

Static LE ARP entries are neither aged nor removed automatically.

To remove dynamic entries from the LE ARP table of the LANE client on the specified subinterface, use the **clear lane le-arp** command.

Examples

The following example shows how to add a static entry to the LE ARP table:

```
Router(config-if)# lane le-arp 0800.aa00.0101 47.000014155551212f.00.00.0800.200c.1001.01
```

The following example shows how to add a static entry to the LE ARP table binding segment number 1, bridge number 1 to the ATM address:

```
Router(config-if)# lane le-arp route-desc segment 1 bridge 1  
39.020304050607080910111213.00000CA05B41.01
```

Related Commands

Command	Description
clear lane le-arp	Forces a LANE server to drop a client and allow the LANE configuration server to assign the client to another ELAN.

lane server-atm-address



Note Effective with Cisco IOS Release 15.1M, the **lane server-atm-address** command is not available in Cisco IOS software.

To specify an ATM address--and thus override the automatic ATM address assignment--for the LAN emulation (LANE) server on the specified subinterface, use the **lane server-atm-address** command in interface configuration mode. To remove the ATM address previously specified for the LANE server on the specified subinterface and thus revert to the automatic address assignment, use the **no** form of this command.

lane server-atm-address *atm-address-template*
no lane server-atm-address [*atm-address-template*]

Syntax Description

<i>atm-address-template</i>	ATM address or a template in which wildcard characters are replaced by any nibble or group of nibbles of the prefix bytes, the end-system identifier (ESI) bytes, or the selector byte of the automatically assigned ATM address.
-----------------------------	---

Command Default

For the LANE server, the default is automatic address assignment; the LANE client finds the LANE server by consulting the configuration server.

Command Modes

Interface configuration

Command History

Release	Modification
11.0	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.
15.1M	This command was removed.

Usage Guidelines

This command also instructs the LANE client configured on this subinterface to reach the LANE server by using the specified ATM address instead of the ATM address provided by the configuration server.

When used on a selected subinterface, but with a different ATM address than was used previously, this command replaces the ATM address of the LANE server.

ATM Addresses

A LANE ATM address has the same syntax as an network service access point (NSAP) (but it is not a network-level address). It consists of the following:

- A 13-byte prefix that includes the following fields defined by the ATM Forum:
 - AFI (Authority and Format Identifier) field (1 byte)
 - DCC (Data Country Code) or ICD (International Code Designator) field (2 bytes)

- DFI field (Domain Specific Part Format Identifier) (1 byte)
 - Administrative Authority field (3 bytes)
 - Reserved field (2 bytes)
 - Routing Domain field (2 bytes)
 - Area field (2 bytes)
- A 6-byte ESI
 - A 1-byte selector field

Address Templates

LANE ATM address templates can use two types of wildcards: an asterisk (*) to match any single character (nibble), and an ellipsis (...) to match any number of leading, middle, or trailing characters. The values of the characters replaced by wildcards come from the automatically assigned ATM address.

In LANE, a *prefix template* explicitly matches the prefix, but uses wildcards for the ESI and selector fields. An *ESI template* explicitly matches the ESI field, but uses wildcards for the prefix and selector.

In the Cisco implementation of LANE, the prefix corresponds to the switch, the ESI corresponds to the ATM interface, and the selector field corresponds to the specific subinterface of the interface.

For a discussion of the Cisco method of automatically assigning ATM addresses, refer to the “Configuring LAN Emulation” chapter of the *Cisco IOS Switching Services Configuration Guide*.

Examples

The following example shows how to use an ESI template to specify the part of the ATM address corresponding to the interface; the remaining parts of the ATM address come from automatic assignment:

```
Router(config-if)# lane server-atm-address ...0800.200C.1001.**
```

The following example shows how to use a prefix template to specify the part of the ATM address corresponding to the switch; the remaining part of the ATM address come from automatic assignment:

```
Router(config-if)# lane server-atm-address 45.000014155551212f.00.00...
```

Related Commands

Command	Description
lane server-bus	Enables a LANE server and a BUS on the specified subinterface with the ELAN ID.

lane server-bus



Note Effective with Cisco IOS Release 15.1M, the **lane server-bus** command is not available in Cisco IOS software.

To enable a LAN emulation (LANE) server and a broadcast and unknown server (BUS) on the specified subinterface with the emulated LAN (ELAN) ID, use the **lane server-bus** command in interface configuration mode. To disable a LANE server and BUS on the specified subinterface, use the **no** form of this command.

lane server-bus ethernet *elan-name* [**elan-id** *id*]
no lane server-bus ethernet *elan-name* [**elan-id** *id*]

Syntax Description

ethernet	Identifies the ELAN attached to this subinterface as an Ethernet ELAN.
<i>elan-name</i>	Name of the ELAN. The maximum length of the name is 32 characters.
elan-id	(Optional) Identifies the ELAN.
<i>id</i>	(Optional) Specifies the ELAN ID of the LAN emulation client (LEC).

Command Default

No LAN type or ELAN name is provided.

Command Modes

Interface configuration

Command History

Release	Modification
11.0	This command was introduced.
12.0	This command was modified to support the elan-id keyword.
12.3(2)T	The tokenring keyword was removed from this command.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.
15.1M	This command was removed.

Usage Guidelines

The LANE server and the BUS are located on the same router.

If a **lane server-bus** command has already been used on the subinterface for a different ELAN, the server initiates termination procedures with all clients and comes up as the server for the new ELAN.

To participate in MPOA, a LEC must have an ELAN ID. This command enables the LEC to get the ELAN ID from the LES when the LEC bypasses the LECS phase.



Caution If an ELAN ID is supplied, make sure that it corresponds to the same ELAN ID value specified in the LECS for the same ELAN.

The LEC can also obtain the ELAN ID from the LECS by using the **name elan-id** command.

Examples

The following example shows how to enable a LANE server and BUS for an Ethernet ELAN named MYELAN:

```
Router(config-if)# lane server-bus ethernet myelan
```

Related Commands

Command	Description
lane server-atm-address	Specifies an ATM address and thus overrides the automatic ATM address assignment for the LANE server on a specified subinterface.
name elan-id	Configures the ELAN ID of an ELAN in the LECS database to participate in MPOA.

logging event atm pvc state

To enable notification of ATM permanent virtual circuit (PVC) state changes, use the **logging event atm pvc state** command in interface configuration mode. To disable notification, use the **no** form of this command.

logging event atm pvc state
no logging event atm pvc state

Syntax Description This command has no arguments or keywords.

Command Default None

Command Modes Interface configuration (config-if)

Command History	Release	Modification
	12.3	This command was introduced.

Usage Guidelines For monitoring purposes, this command can be used to log the state changes for all PVCs associated with an ATM interface.

Examples The following example shows how to enable notification of ATM PVC state changes:

```
Router(config-if)# logging event atm pvc state
```

Related Commands	Command	Description
	debug atm state	Displays messages about ATM PVC state changes.

loopback

To loop packets back to the interface for testing, use the **loopback** interface configuration command with or without an optional keyword. To remove the loopback, use the **no** form of this command.

Cisco 2600 and 3600 Series

loopback [{line | local | payload | remote}]

no loopback [{line | local | payload | remote}]

Cisco 7100, 7200, and 7500 Series -- For T1 lines:

loopback {diagnostic | local {payload | line} | remote {iboc | esf {payload | line}}}

Cisco 7100, 7200, and 7500 Series -- For E1 lines:

loopback {diagnostic | local {payload | line}}

no loopback

Syntax Description

line	Places the interface into external loopback mode at the line.
local	Places the interface into local loopback mode.
payload	Places the interface into external loopback mode at the payload level.
remote	Keeps the local end of the connection in remote loopback mode.
diagnostic	Loops the outgoing transmit signal back to the receive signal.
iboc	Sends an in-band code to the far-end receiver to cause it to go into line loopback.
esf	Specifies the FDL loopbacks. FDL should be configured on the link.

Command Default

The interface is placed into external loopback mode at the line, and loopback is disabled.

Command Modes

Interface configuration

Command History

Release	Modification
10.0	This command was introduced.
11.3 MA	This command was modified for the Cisco MC3810.
12.0(5)XK	Support for the Cisco 2600 and 3600 series routers was added.
12.0(5)T	Support for the Cisco 2600 and 3600 series routers was integrated into Cisco IOS Release 12.0(5)T.
12.0(5)XE	Support for the Cisco 720 0 and 7500 series routers was added.
12.0(7)XE1	Support for the Cisco 7100 series routers was added.

Release	Modification
12.1(5)T	Support for Cisco 7100, 7200, and 7500 series routers was integrated into Cisco IOS Release 12.1(5)T.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Usage Guidelines

You can use a loopback test on lines to detect and distinguish equipment malfunctions caused either by line and channel service unit/digital service unit (CSU/DSU) or by the interface. If correct data transmission is not possible when an interface is in loopback mode, the interface is the source of the problem.

The local loopback does not generate any packets automatically. Instead, the **ping** command is used.

Examples

The following example sets up local loopback diagnostics:

```
interface atm 1/0
  loopback local
```

loopback (ATM)

To configure the ATM interface into loopback mode, use the **loopback** interface configuration command. To remove the loopback, use the **no** form of this command.

```
loopback [{cell | line | payload}]
no loopback [{cell | line | payload}]
```

Syntax Description	cell	(Optional) Places the interface into external loopback at cell level.
	line	(Optional) Places the interface into external loopback at the line.
	payload	(Optional) Places the interface into external loopback at the payload level.

Command Default The interface is placed into external loopback at the line.

Command Modes Interface configuration

Command History	Release	Modification
	11.0	This command was introduced.
	11.1	The following keywords were removed: <ul style="list-style-type: none"> • diagnostic • test
	12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
	12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Usage Guidelines This command is useful for testing because it loops all packets from the ATM interface back to the interface as well as directing the packets to the network.

Use the **loopback line** command to check that the PA-A3 port adapter is working by looping the receive data back to the transmit data.

Examples The following example loops all packets back to the ATM interface:

```
interface atm 4/0
 loopback
```

Related Commands	Command	Description
	ces dsx1 loopback	Enables a loopback for the CBR interface.

