



## **Upgrading the Cisco cBR Series Converged Broadband Routers for Cisco IOS XE Release 3.18SP**

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## CHAPTER

# 1

## Upgrading the Cisco cBR-8 Router System

This section contains the upgrade procedures for the Cisco cBR-8 Router System, including both the IOS-XE software and firmwares used in the router. If you need to upgrade only the firmware, see [Upgrading the Cisco cBR-8 Router Firmware](#), on page 17.

- [Upgrading Cisco cBR-8 Router to Cisco IOS-XE release 3.18.1SP](#), page 1
- [Upgrading Cisco cBR-8 Router to Cisco IOS-XE release 3.18.0SP](#), page 4
- [Upgrading Cisco cBR-8 Router from Cisco IOS-XE release 3.17.0S to Cisco IOS-XE release 3.17.1S](#), page 10

## Upgrading Cisco cBR-8 Router to Cisco IOS-XE release 3.18.1SP

This use case provides the example procedure to upgrade a Cisco cBR-8 router to IOS-XE release 3.18.1SP from earlier versions.

## Upgrading Cisco IOS-XE software to release 3.18.1SP



### Note

If the system image is upgraded using ISSU, after the ISSU upgrade is finished, use **hw-module subslot 4/1 reload** and **hw-module subslot 5/1 reload** commands to upgrade the SUP MAC firmware.

### Before You Begin

Before upgrading the system, make sure the following requirements are met:

- Download the new image package from the following URL:  
<https://software.cisco.com/download/navigator.html>
- Copy the new image package to the cBR-8 using TFTP.

```
copy tftp://<location>/cbrsup-universalk9.03.18.01.SP.156-2.SP1-ext.SPA.bin bootflash:  
copy tftp://<location>/cbrsup-universalk9.03.18.01.SP.156-2.SP1-ext.SPA.bin stby-bootflash:
```

- Verify the new image package against the known md5 hash.

```
verify /md5 bootflash:cbrsup-universalk9.03.18.01.SP.156-2.SP1-ext.SPA.bin
verify /md5 stby-bootflash:cbrsup-universalk9.03.18.01.SP.156-2.SP1-ext.SPA.bin
```

## Upgrading in Consolidated Package Mode

**Step 1** Change the boot variable to point to the desired new image.

```
configure terminal
no boot system
boot system bootflash:cbrsup-universalk9.03.18.01.SP.156-2.SP1-ext.SPA.bin
end
write memory
```

**Step 2** Verify that the bootvar has changed to point to the new image using **show bootvar** command.

**Step 3** Reload cBR-8 router.

```
reload
```

## Upgrading in Subpackage Mode

**Step 1** Extract the individual subpackages and the provisioning file from a consolidated package to a specific image based directory in the bootflash.

```
request platform software package expand file bootflash:cbrsup-universalk9.03.18.01.SP.156-2.SP1-ext.SPA.bin
to bootflash:/<location>/ wipe
request platform software package expand file stby-bootflash:cbrsup-universalk9.03.18.01.SP.156-2.SP1-ext.SPA.bin
to stby-bootflash:/<location>/ wipe
```

**Step 2** Verify the list of sub-packages and helper files are created in the directory specified in last step using **dir** command.

**Step 3** Change the boot variable to point to the desired new IOS-XE image.

```
configure terminal
no boot system
boot system bootflash:cbrsup-universalk9.03.18.01.SP.156-2.SP1-ext.SPA.bin
end
write memory
```

**Step 4** Verify that the bootvar has changed to point to the new image using **show bootvar** command.

**Step 5** Reload cBR-8 router.

```
reload
```

## Upgrading Firmwares

The correct firmware versions after the upgrade are listed in the tables below. Use the commands in the tables to verify the firmware versions.

**Table 1: Firmware Versions**

Firmware	Correct Version	Command
Supervisor CPLD	16012711	<b>show platform</b>
Supervisor ROMMON	15.5(3r)S	<b>show platform</b>
Linecard CPLD	00000021	<b>show platform</b>
Linecard ROMMON	2011.03.13	<b>show platform</b>
Linecard PSOC 1	v4.6	<b>show platform diag</b>
Linecard PSOC 2	v4.6	<b>show platform diag</b>
Docsis 3.0 downstream module Micro	1000e	<b>show platform diag</b>
Docsis 3.1 downstream module Micro	30016	<b>show platform diag</b>
Docsis 3.1 downstream module FPGA	44147	<b>show platform diag</b>

### Before You Begin

Make sure the Cisco cBR-8 router software is upgraded to Cisco IOS-XE release 3.18.1SP.

## Upgrading Docsis 3.1 and Docsis 3.0 Downstream Module Firmwares



### Note

If the Cisco IOS-XE release is 3.18.1S or 3.18.0SP before upgrading to Cisco IOS-XE release 3.18.1SP, the downstream module upgrade procedure can be performed before Cisco IOS-XE software upgrade, in this way, there is no need to reset the linecard during the upgrade, since linecard will be reloaded during Cisco IOS-XE software upgrade.

For detailed upgrading steps, see [Upgrading Docsis 3.0 downstream module and Docsis 3.1 downstream module \(Cisco IOS-XE Release 3.18.1S and later releases\)](#), on page 44.

### What to Do Next

If there is other firmware that needs upgrade, see [Upgrading the Cisco cBR-8 Router Firmware](#), on page 17 for details.

## Upgrading Cisco cBR-8 Router to Cisco IOS-XE release 3.18.0SP

This use case provides the example procedure to upgrade a Cisco cBR-8 router to IOS-XE release 3.18.0SP from earlier versions. ISSU is not applicable in this case.

## Upgrading Cisco IOS-XE software to release 3.18.0SP

### Before You Begin

Before upgrading the system, make sure the following requirements are met:

- Download the new image package from the following URL:

<https://software.cisco.com/download/navigator.html>

- Copy the new image package to the cBR-8 using TFTP.

```
copy tftp://<location>/cbrsup-universalk9.03.18.00.SP.156-2.SP-ext.SPA.bin bootflash:
copy tftp://<location>/cbrsup-universalk9.03.18.00.SP.156-2.SP-ext.SPA.bin stby-bootflash:
```

- Verify the new image package against the known md5 hash c244aa64b4af3d7bfa7826ef46eda47f.

```
verify /md5 bootflash:cbrsup-universalk9.03.18.00.SP.156-2.SP-ext.SPA.bin
verify /md5 stby-bootflash:cbrsup-universalk9.03.18.00.SP.156-2.SP-ext.SPA.bin
```



## Upgrading in Consolidated Package Mode

---

**Step 1** Change the boot variable to point to the desired new image.

```
configure terminal
no boot system
boot system bootflash:cbrsup-universalk9.03.18.00.SP.156-2.SP-ext.SPA.bin
end
write memory
```

**Step 2** Verify that the bootvar has changed to point to the new image using **show bootvar** command. Below is a sample output:

```
router# show bootvar

Load for five secs: 24%/3%; one minute: 30%; five minutes: 44%
Time source is NTP, 12:18:00.120 PDT Wed Jul 27 2016

BOOT variable = bootflash:cbrsup-universalk9.03.18.00.SP.156-2.SP-ext.SPA.bin,1;
CONFIG_FILE variable =
BOOTLDR variable does not exist
Configuration register is 0x2102

Standby BOOT variable = bootflash:cbrsup-universalk9.03.18.00.SP.156-2.SP-ext.SPA.bin,1;
Standby CONFIG_FILE variable =
Standby BOOTLDR variable does not exist
Standby Configuration register is 0x2102
```

**Step 3** Reload cBR-8 router.

```
reload
```

---

## Upgrading in Subpackage Mode

---

**Step 1** Extract the individual subpackages and the provisioning file from a consolidated package to a specific image based directory in the bootflash.

```
request platform software package expand file bootflash:cbrsup-universalk9.03.18.00.SP.156-2.SP-ext.SPA.bin
to bootflash:/XE318SP/ wipe
request platform software package expand file stby-bootflash:cbrsup-universalk9.03.18.00.SP.156-2.SP-ext.SPA.bin
to stby-bootflash:/XE318SP/ wipe
```

**Step 2** Verify the list of sub-packages and helper files are created in the directory specified in last step using **dir** command.

Below is a sample output:

```

router# dir bootflash:/XE318SP/

Directory of bootflash:/XE318SP/

661250 -rw-          28926928 Jul 27 2016 12:44:40 -07:00
cbrsup-cciomdsup.03.18.00.SP.156-2.SP-ext.SPA.pkg
661251 -rw-          144602072 Jul 27 2016 12:44:40 -07:00
cbrsup-clc-firmware.03.18.00.SP.156-2.SP-ext.SPA.pkg
499969 -rw-          15782888 Jul 27 2016 12:44:40 -07:00
cbrsup-clccontrol.03.18.00.SP.156-2.SP-ext.SPA.pkg
499970 -rw-          13474788 Jul 27 2016 12:44:40 -07:00
cbrsup-clcdocsis.03.18.00.SP.156-2.SP-ext.SPA.pkg
499971 -rw-          32705508 Jul 27 2016 12:44:40 -07:00
cbrsup-clcios.03.18.00.SP.156-2.SP-ext.SPA.pkg
499972 -rw-          32703460 Jul 27 2016 12:44:40 -07:00
cbrsup-clciosdb.03.18.00.SP.156-2.SP-ext.SPA.pkg
499973 -rw-          121892616 Jul 27 2016 12:44:40 -07:00
cbrsup-clcmipsbase.03.18.00.SP.156-2.SP-ext.SPA.pkg
499974 -rw-          14345188 Jul 27 2016 12:44:40 -07:00
cbrsup-clcvideo.03.18.00.SP.156-2.SP-ext.SPA.pkg
499975 -rw-          116792792 Jul 27 2016 12:44:40 -07:00
cbrsup-esp86base.03.18.00.SP.156-2.SP-ext.SPA.pkg
499976 -rw-           12856 Jul 27 2016 12:44:40 -07:00
cbrsup-packages-universalk9.03.18.00.SP.156-2.SP-ext.conf
499977 -rw-          36006868 Jul 27 2016 12:44:40 -07:00
cbrsup-rp-firmware.03.18.00.SP.156-2.SP-ext.SPA.pkg
499978 -rw-          34864096 Jul 27 2016 12:44:40 -07:00
cbrsup-rp-programmable-firmware.03.18.00.SP.156-2.SP-ext.SPA.pkg
499979 -rw-          23325652 Jul 27 2016 12:44:41 -07:00
cbrsup-rpaccess.03.18.00.SP.156-2.SP-ext.SPA.pkg
596737 -rw-          50582996 Jul 27 2016 12:44:41 -07:00
cbrsup-rpbase.03.18.00.SP.156-2.SP-ext.SPA.pkg
596738 -rw-          59765716 Jul 27 2016 12:44:41 -07:00
cbrsup-rpcontrol.03.18.00.SP.156-2.SP-ext.SPA.pkg
596739 -rw-          183200740 Jul 27 2016 12:44:41 -07:00
cbrsup-rpios-universalk9.03.18.00.SP.156-2.SP-ext.SPA.pkg
596740 -rw-          7844820 Jul 27 2016 12:44:41 -07:00
cbrsup-rpvideo.03.18.00.SP.156-2.SP-ext.SPA.pkg
596741 -rw-           13641 Jul 27 2016 12:44:41 -07:00 packages.conf

router# dir stby-bootflash:/XE318SP/

Directory of stby-bootflash:/XE318SP/

661250 -rw-          28926928 Jul 27 2016 12:44:40 -07:00
cbrsup-cciomdsup.03.18.00.SP.156-2.SP-ext.SPA.pkg
661251 -rw-          144602072 Jul 27 2016 12:44:40 -07:00
cbrsup-clc-firmware.03.18.00.SP.156-2.SP-ext.SPA.pkg
499969 -rw-          15782888 Jul 27 2016 12:44:40 -07:00
cbrsup-clccontrol.03.18.00.SP.156-2.SP-ext.SPA.pkg
499970 -rw-          13474788 Jul 27 2016 12:44:40 -07:00
cbrsup-clcdocsis.03.18.00.SP.156-2.SP-ext.SPA.pkg

```

```

499971  -rw-          32705508  Jul 27 2016 12:44:40 -07:00
cbrsup-clcios.03.18.00.SP.156-2.SP-ext.SPA.pkg
499972  -rw-          32703460  Jul 27 2016 12:44:40 -07:00
cbrsup-clciosdb.03.18.00.SP.156-2.SP-ext.SPA.pkg
499973  -rw-          121892616  Jul 27 2016 12:44:40 -07:00
cbrsup-clcmipsbase.03.18.00.SP.156-2.SP-ext.SPA.pkg
499974  -rw-          14345188  Jul 27 2016 12:44:40 -07:00
cbrsup-clcvideo.03.18.00.SP.156-2.SP-ext.SPA.pkg
499975  -rw-          116792792  Jul 27 2016 12:44:40 -07:00
cbrsup-esp86base.03.18.00.SP.156-2.SP-ext.SPA.pkg
499976  -rw-           12856  Jul 27 2016 12:44:40 -07:00
cbrsup-packages-universalk9.03.18.00.SP.156-2.SP-ext.conf
499977  -rw-          36006868  Jul 27 2016 12:44:40 -07:00
cbrsup-rp-firmware.03.18.00.SP.156-2.SP-ext.SPA.pkg
499978  -rw-          34864096  Jul 27 2016 12:44:40 -07:00
cbrsup-rp-programmable-firmware.03.18.00.SP.156-2.SP-ext.SPA.pkg
499979  -rw-          23325652  Jul 27 2016 12:44:41 -07:00
cbrsup-rpaccess.03.18.00.SP.156-2.SP-ext.SPA.pkg
596737  -rw-          50582996  Jul 27 2016 12:44:41 -07:00
cbrsup-rpbase.03.18.00.SP.156-2.SP-ext.SPA.pkg
596738  -rw-          59765716  Jul 27 2016 12:44:41 -07:00
cbrsup-rpcontrol.03.18.00.SP.156-2.SP-ext.SPA.pkg
596739  -rw-          183200740  Jul 27 2016 12:44:41 -07:00
cbrsup-rpios-universalk9.03.18.00.SP.156-2.SP-ext.SPA.pkg
596740  -rw-          7844820  Jul 27 2016 12:44:41 -07:00
cbrsup-rpvideo.03.18.00.SP.156-2.SP-ext.SPA.pkg
596741  -rw-           13641  Jul 27 2016 12:44:41 -07:00  packages.conf

```

**Step 3** Change the boot variable to point to the desired new IOS-XE image.

```

configure terminal
no boot system
boot system bootflash:/XE318SP/cbrsup-packages-universalk9.03.18.00.SP.156-2.SP-ext.conf
end
write memory

```

**Note** When the directory name is created with the uppercase, ensure that you follow the same naming convention when entering the directory name at the command prompt.

For example, if the directory name entered for the **bootflash** command is uppercase (**bootflash:/XE318SP2**), then you need to create the directory using the same naming convention (**mkdir bootflash:/XE318SP2**).

**Step 4** Verify that the bootvar has changed to point to the new image using **show bootvar** command. Below is a sample output:

```

router# show bootvar

Load for five secs: 24%/3%; one minute: 30%; five minutes: 44%
Time source is NTP, 12:18:00.120 PDT Wed Jul 27 2016

BOOT variable = bootflash:cbrsup-universalk9.03.18.00.SP.156-2.SP-ext.SPA.bin,1;
CONFIG_FILE variable =
BOOTLDR variable does not exist
Configuration register is 0x2102

```

```
Standby BOOT variable = bootflash:cbrsup-universalk9.03.18.00.SP.156-2.SP-ext.SPA.bin,1;
Standby CONFIG_FILE variable =
Standby BOOTLDR variable does not exist
Standby Configuration register is 0x2102
```

## Step 5 Reload cBR-8 router.

**reload**

### What to Do Next

Once the system is up, make sure that it is running the new version **Version 03.18.00.SP.156-2.SP-ext** using **show version** command.

Below is a sample output:

```
router# show version

Load for five secs: 82%/3%; one minute: 46%; five minutes: 45%
Time source is NTP, 12:24:50.303 PDT Wed Jul 27 2016
Cisco IOS XE Software, Version 03.18.00.SP.156-2.SP-ext
Cisco IOS Software, cBR Software (X86_64_LINUX_IOSD-UNIVERSALK9-M), Version 15.6(2)SP,
RELEASE SOFTWARE (fc2)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2016 by Cisco Systems, Inc.
Compiled Wed 27-Jul-16 04:49 by mcpre
```

```
Cisco IOS-XE software, Copyright (c) 2005-2016 by cisco Systems, Inc.
All rights reserved. Certain components of Cisco IOS-XE software are
licensed under the GNU General Public License ("GPL") Version 2.0. The
software code licensed under GPL Version 2.0 is free software that comes
with ABSOLUTELY NO WARRANTY. You can redistribute and/or modify such
GPL code under the terms of GPL Version 2.0. For more details, see the
documentation or "License Notice" file accompanying the IOS-XE software,
or the applicable URL provided on the flyer accompanying the IOS-XE
software.
```

```
ROM: IOS-XE ROMMON
```

```
router uptime is 29 minutes
Uptime for this control processor is 33 minutes
System returned to ROM by reload at 11:48:48 PDT Wed Jul 27 2016
System restarted at 11:54:58 PDT Wed Jul 27 2016
System image file is "bootflash:cbrsup-universalk9.03.18.00.SP.156-2.SP-ext.SPA.bi"
Last reload reason: Reload Command
```

This product contains cryptographic features and is subject to United States and local country laws governing import, export, transfer and use. Delivery of Cisco cryptographic products does not imply third-party authority to import, export, distribute or use encryption. Importers, exporters, distributors and users are responsible for compliance with U.S. and local country laws. By using this product you agree to comply with applicable laws and regulations. If you are unable to comply with U.S. and local laws, return this product immediately.

A summary of U.S. laws governing Cisco cryptographic products may be found at: <http://www.cisco.com/wwl/export/crypto/tool/stqrg.html>

If you require further assistance please contact us by sending email to [export@cisco.com](mailto:export@cisco.com).

```

cisco cBR1013 (CBR) processor (revision CBR) with 13397499K/6147K bytes of memory.
Processor board ID FXS1947Q0DA
16 Gigabit Ethernet interfaces
32768K bytes of non-volatile configuration memory.
50331648K bytes of physical memory.
7739391K bytes of eUSB flash at bootflash:.
97620247K bytes of SATA hard disk at harddisk:.
31422288K bytes of USB flash at usb0:.

Configuration register is 0x2102

```

## Upgrading Firmwares

The correct firmware versions after the upgrade are listed in the tables below. Use the commands in the tables to verify the firmware versions.

**Table 2: Firmware Versions**

Firmware	Correct Version	Command
Supervisor CPLD	16012711	<b>show platform</b>
Docsis 3.1 downstream module Micro	3.13	<b>show platform</b>
Docsis 3.1 downstream module FPGA	4.4141	<b>show platform</b>

### Before You Begin

Make sure the Cisco cBR-8 router software is upgraded to Cisco IOS-XE release 3.18.0SP.

### Upgrading Supervisor CPLD Firmware to Version 16012711

For detailed upgrading steps, see [Upgrading Supervisor CPLD Firmware in the Cisco cBR](#), on page 37.

### Upgrading Docsis 3.1 Downstream Module Firmwares

For detailed upgrading steps, see [Upgrading Docsis 3.0 downstream module and Docsis 3.1 downstream module \(Cisco IOS-XE Release 3.18.1S and later releases\)](#), on page 44.

### What to Do Next

If there is other firmware that needs upgrade, see [Upgrading the Cisco cBR-8 Router Firmware](#), on page 17 for details.

# Upgrading Cisco cBR-8 Router from Cisco IOS-XE release 3.17.0S to Cisco IOS-XE release 3.17.1S

Cisco cBR-8 Routers support the In-Service Software Upgrades (ISSU) for redundant platforms. The ISSU process allows software to be updated or otherwise modified while packet forwarding continues with the benefit of LCHA. ISSU supports subpackage software upgrade mode. For more information, please refer to [Cisco IOS-XE In-Service Software Upgrade Process](#).

This use case provides the example procedure to upgrade a Cisco cBR-8 router from IOS-XE release 3.17.0S to IOS-XE release 3.17.1S with subpackage mode.

## Before You Begin

Before upgrading the system, make sure the following requirements are met:

- Verify the chassis is in subpackage mode.

If the chassis is not in subpackage mode, change it to subpackage mode following the steps below:

- 1 Expand the IOS-XE binary image file to a specific image based directory in the bootflash using the following commands:

```
request platform software package expand file bootflash:  
cbrsup-universalk9.03.17.00.S.156-1.S-std.SPA.bin to bootflash:/XE317/ wipe  
request platform software package expand file stby-bootflash:  
cbrsup-universalk9.03.17.00.S.156-1.S-std.SPA.bin to stby-bootflash:/XE317/ wipe
```

- 2 Verify that the following list of sub-packages and helper files are created in the directory using **dir bootflash:/XE317/** and **dir stby-bootflash:/XE317/** commands.

File	Size (Bytes)
cbrsup-cciomdsup.03.17.00.S.156-1.S-std.SPA.pkg	28523472
cbrsup-clc-firmware.03.17.00.S.156-1.S-std.SPA.pkg	125895640
cbrsup-clccontrol.03.17.00.S.156-1.S-std.SPA.pkg	13757412
cbrsup-clcdocsis.03.17.00.S.156-1.S-std.SPA.pkg	12731364
cbrsup-clcios.03.17.00.S.156-1.S-std.SPA.pkg	31560672
cbrsup-clciosdb.03.17.00.S.156-1.S-std.SPA.pkg	31558628
cbrsup-clcmipsbase.03.17.00.S.156-1.S-std.SPA.pkg	121236229
cbrsup-clcvideo.03.17.00.S.156-1.S-std.SPA.pkg	13859812
cbrsup-esp86base.03.17.00.S.156-1.S-std.SPA.pkg	114570324
cbrsup-packages-universalk9.03.17.00.S.156-1.S-std.conf	15440
cbrsup-rp-firmware.03.17.00.S.156-1.S-std.SPA.pkg	35701712

File	Size (Bytes)
cbrsup-rp-programmable-firmware.03.17.00.S.156-1.S-std.SPA.pkg	2786272
cbrsup-rp-access.03.17.00.S.156-1.S-std.SPA.pkg	23290836
cbrsup-rp-base.03.17.00.S.156-1.S-std.SPA.pkg	48516176
cbrsup-rp-control.03.17.00.S.156-1.S-std.SPA.pkg	59235284
cbrsup-rp-ios-universalk9.03.17.00.S.156-1.S-std.SPA.pkg	180753380
cbrsup-rp-video.03.17.00.S.156-1.S-std.SPA.pkg	7455696
packages.conf	16220

- Change boot statement to point to the subpackage mode using following commands:

```

configure terminal
no boot system
boot system bootflash:/XE317/cbrsup-packages-universalk9.03.17.00.S.156-1.S-ext.conf
end
write memory

```

- Verify peer SUP is in hot standby state using **show redundancy** command.
- Switchover from SUP0 to SUP1 using **redundancy force-switchover** command.
- Wait and verify SUP0 is in hot standby state using **show redundancy** command.
- Switchover from SUP1 to SUP0 using **redundancy force-switchover** command.
- Wait and verify SUP1 is in hot standby state using **show redundancy** command.
- Verify the system is running in subpackage mode using **show version** command. System image file should point to a .conf package file. Below is a sample output:

```

cBR8-01 uptime is 6 weeks, 4 days, 5 hours, 36 minutes
Uptime for this control processor is 6 weeks, 4 days, 4 hours, 57 minutes
System returned to ROM by SSO Switchover at 10:33:32 est Thu Nov 19 2015
System restarted at 11:19:15 est Thu Nov 19 2015
System image file is "bootflash:/Upgrade/packages.conf"

```

- Verify the directory in which the .conf file is booted. You will see packages.conf along with a list of package files ending with SPA.pkg.

- Verify both SUPs are running the same image from the same path using **show version | include image** command. Below is a sample output:

```

Router# show version | include image
System image file is "bootflash:/XE317/packages.conf"

```

- Verify autoboot is enabled using **show bootvar** command. Below is a sample output:

```

Router# show bootvar
BOOT variable = bootflash:/XE317/packages.conf,12;
CONFIG_FILE variable =
BOOTLDR variable does not exist

```

```

Configuration register is 0x2102

Standby BOOT variable = bootflash:XE317/packages.conf,12;
Standby CONFIG_FILE variable =
Standby BOOTLDR variable does not exist
Standby Configuration register is 0x2102

```

- Verify both SUPs are in SSO mode, standby SUP is in hot standby mode using **show redundancy state** command. Below is a sample output:

```

Router# show redundancy state
  my state = 13 -ACTIVE
  peer state = 8  -STANDBY HOT
    Mode = Duplex
    Unit = Primary
    Unit ID = 48

Redundancy Mode (Operational) = sso
Redundancy Mode (Configured)  = sso
Redundancy State               = sso
  Maintenance Mode = Disabled
  Manual Swact = enabled
  Communications = Up

  client count = 119
  client_notification_TMR = 30000 milliseconds
  RF debug mask = 0x0

```

- Make sure there is enough bootflash disk space on both SUPs (available space more than 1.8GB).
- Verify the IOS-XE release 3.17.1S image file against the known file md5 hash using **verify /md5 cbrsup-universalk9.03.17.01.S.156-1.S1-std.SPA.bin** command.
- Put IOS-XE release 3.17.1S image *cbrsup-universalk9.03.17.01.S.156-1.S1-std.SPA.bin* in the same folder as current boot package on active SUP using **dir bootflash:/XE317/cbrsup-universalk9.03.17.01.S.156-1.S1-std.SPA.bin** command.
- Verify .issu folder and config files exists on both active and standby SUP hard disk using **dir harddisk:issu/** command. Below is a sample output:

```

Router# dir harddisk:issu/
Directory of harddisk:/.issu/

11108354  -rw-          16220   Mar 7 2016 14:03:12 +08:00  0.conf
11108355  -rw-          16220   Mar 7 2016 14:03:14 +08:00  1.conf
11108356  -rw-          16220   Mar 7 2016 14:03:15 +08:00  2.conf
11108357  -rw-          16220   Mar 7 2016 14:03:21 +08:00  3.conf
11108358  -rw-          16220   Mar 7 2016 14:03:23 +08:00  6.conf
11108359  -rw-          16220   Mar 7 2016 14:03:23 +08:00  7.conf
11108360  -rw-          16220   Mar 7 2016 14:03:26 +08:00  8.conf
11108361  -rw-          16220   Mar 7 2016 14:06:25 +08:00  9.conf
11108362  -rw-          16220   Mar 7 2016 14:18:14 +08:00  rp.conf
11108363  -rw-          16220   Mar 7 2016 14:18:18 +08:00  remote_rp.conf

Router# dir stby-harddisk:issu/
Directory of stby-harddisk:/.issu/

3670018  -rw-          16220   Mar 7 2016 14:18:53 +08:00  rp.conf
3670019  -rw-          16220   Mar 7 2016 14:19:03 +08:00  remote_rp.conf
3670020  -rw-          16220   Mar 7 2016 14:19:29 +08:00  0.conf
3670021  -rw-          16220   Mar 7 2016 14:19:38 +08:00  1.conf
3670022  -rw-          16220   Mar 7 2016 14:19:43 +08:00  2.conf
3670023  -rw-          16220   Mar 7 2016 14:19:47 +08:00  3.conf
3670024  -rw-          16220   Mar 7 2016 14:19:51 +08:00  6.conf
3670025  -rw-          16220   Mar 7 2016 14:19:56 +08:00  7.conf
3670026  -rw-          16220   Mar 7 2016 14:20:00 +08:00  8.conf
3670027  -rw-          16220   Mar 7 2016 14:20:05 +08:00  9.conf

```



If there is no such folder or file is missing, create a new one and generate files needed. Below are sample commands:

```
Router# mkdir harddisk:.issu
Router# mkdir stby-harddisk:.issu
Router# copy bootflash:/XE317/packages.conf harddisk:.issu/rp.conf
Router# copy bootflash:/XE317/packages.conf harddisk:.issu/remote_rp.conf
Router# copy bootflash:/XE317/packages.conf harddisk:.issu/0.conf
Router# copy bootflash:/XE317/packages.conf harddisk:.issu/1.conf
Router# copy bootflash:/XE317/packages.conf harddisk:.issu/2.conf
Router# copy bootflash:/XE317/packages.conf harddisk:.issu/3.conf
Router# copy bootflash:/XE317/packages.conf harddisk:.issu/6.conf
Router# copy bootflash:/XE317/packages.conf harddisk:.issu/7.conf
Router# copy bootflash:/XE317/packages.conf harddisk:.issu/8.conf
Router# copy bootflash:/XE317/packages.conf harddisk:.issu/9.conf

Router# copy harddisk:.issu/rp.conf stby-harddisk:.issu/rp.conf
Router# copy harddisk:.issu/remote_rp.conf stby-harddisk:.issu/remote_rp.conf
Router# copy harddisk:.issu/0.conf stby-harddisk:.issu/0.conf
Router# copy harddisk:.issu/1.conf stby-harddisk:.issu/1.conf
Router# copy harddisk:.issu/2.conf stby-harddisk:.issu/2.conf
Router# copy harddisk:.issu/3.conf stby-harddisk:.issu/3.conf
Router# copy harddisk:.issu/6.conf stby-harddisk:.issu/6.conf
Router# copy harddisk:.issu/7.conf stby-harddisk:.issu/7.conf
Router# copy harddisk:.issu/8.conf stby-harddisk:.issu/8.conf
Router# copy harddisk:.issu/9.conf stby-harddisk:.issu/9.conf
```



**Note** The file with digital as the name corresponds with line card slot, the above example is for fully loaded chassis. If target system is not fully loaded, just copy the files named with inserted slot number.

**Step 1** Perform RP only ISSU.

```
request platform software package install node file
bootflash:XE317/cbrsup-universalk9.03.17.01.S.156-1.S1-std.SPA.bin noreload linecard
```

**Note** Do not interrupt the terminal until ISSU performs automatic SUP switchover.

**Step 2** Attach to ISSU progress status tracking mode after SUP switchover. User can use Ctrl+C to exit to perform other command if needed.

```
request platform software package install node attach
```

Below is a sample output:

```
NOTE: Currently node has booted from a provisioning file
NOTE: Going to resume a dual rp sub-pakcage node ISSU install

--- Starting wait for Standby RP to reach terminal redundancy state ---
```

**Step 3** Reset secondary line card (change slot 0 to secondary slot on target chassis).

```
hw-module slot 0 reload
```

**Step 4** Upgrade all line cards.

**request platform software package install node linecard-only all**

**Note** Do not interrupt the terminal until ISSU is successfully complete.

### What to Do Next

Perform verification test to determine if the upgrade is successful, include:

- Verify the router is running the new IOS-XE release using **show version** command.
- Check facility alarms using **show facility-alarm status** command.



**Note** Some deployments use 5 power supplies which are sufficient, but will show an major alarm which can be ignored.

- Check the status of the power supplies using **show environment power** command.
- Check PS status using **show platform hardware slot P<0-5> mcu status** command.
- Complete trace routes to known good off-network IP address using the source address of customer CPE blocks to verify routing is working.
- Check logs for error messages using **show log** command.

These **show** commands may be useful in the verification test:

- **show redundancy**
- **show platform**
- **show platform diag**
- **show environment**
- **show redundancy linecard all**
- **show isis neighbors**
- **show ip route rip**
- **show ip mroute**
- **show cops servers**
- **show cable modem voice**
- **show cable calls**
- **show cable metering verbose**
- **show cable licenses all**
- **show cable modem summary total**

- **show inventory**
- **Request platform software console attach *slot-id/0* and show version**





## Upgrading the Cisco cBR-8 Router Firmware

This section contains the upgrade procedures for the Cisco cBR-8 Router Firmware.

- [Firmware Upgrades Overview, page 17](#)
- [Bundled FPGA Images Upgrades, page 22](#)
- [Field-Programmable Device Upgrades, page 23](#)
- [HW-Programmable Device Upgrades, page 27](#)

### Firmware Upgrades Overview

The following three types of firmware upgrades are available for the Cisco cBR-8 Series router:

- Field Programmable Gate Array (FPGA) images bundled into the Cisco IOS-XE software image, like certain Supervisor and LC components. These FPGA images are automatically installed when the Cisco IOS-XE software image is upgraded.
- FPD images packages that are upgraded separately or with the Cisco IOS-XE software image upgrade, like the PIC images.
- HW-Programmable device upgrades that include ROM Monitor (ROMMON) upgrades, Universal Boot (U-boot) upgrades, PSoC and CPLD upgrades.

You can view the current firmware images and packages on your router, using the methods outlined in the following sections.

### Displaying Current and Minimum Required FPD Image Versions

To display the current version of FPD images on the FRUs installed on your router, use the **show hw-module** [*slot/subslot* | **all**] **fpd** command, where *slot* is the slot number where the FRU is installed, and *subslot* is the number of the FRU subslot where a target FRU is located. Entering the all keyword shows information for hardware in all router slots.

The following examples show the output when using this **show** command. The output display in this example shows that FPD versions on the FRUs in the system meet the minimum requirements:

```
Router# show hw-module all fpd
=====
H/W Field Programmable Current Min. Required
Slot Card Type Ver. Device: "ID-Name" Version Version
=====
0/1 CBR-RF-PROT-PIC 0.0 35-CBR STEALTHSTAR 7.14 7.13
-----
2/1 CBR-RF-PROT-PIC 3.0 35-CBR STEALTHSTAR 5.0 7.13 *
-----
3/1 CBR-RF-PIC 0.0 34-CBR RFSW PIC 6.2 7.35 *
-----
4/1 CBR-SUP-8X10G-PIC 2.4 36-CBR SUP PIC 0.130 0.130
-----
5/1 CBR-SUP-8X10G-PIC 3.0 36-CBR SUP PIC 0.130 0.130
-----
6/1 CBR-RF-PIC 3.0 34-CBR RFSW PIC 5.0 7.35 *
=====
```

This example shows the output when using the *slot/subslot* argument to identify a particular FRU:

```
Router# show hw-module subslot 0/1 fpd
=====
H/W Field Programmable Current Min. Required
Slot Card Type Ver. Device: "ID-Name" Version Version
=====
0/1 CBR-RF-PROT-PIC 0.0 35-CBR STEALTHSTAR 7.14 7.13
=====
```

The output display in this example shows that the FRU in subslot 0/1 is disabled because one of the programmable devices does not meet the minimum version requirements.

```
Router#show hw-module all fpd
=====
H/W Field Programmable Current Min. Required
Slot Card Type Ver. Device: "ID-Name" Version Version
=====
0/1 CBR-RF-PROT-PIC 0.0 35-CBR STEALTHSTAR 7.14 7.13
-----
2/1 CBR-RF-PROT-PIC 3.0 35-CBR STEALTHSTAR 5.0 7.13 *
-----
3/1 CBR-RF-PIC 0.0 34-CBR RFSW PIC 6.2 7.35 *
-----
4/1 CBR-SUP-8X10G-PIC 2.4 36-CBR SUP PIC 0.130 0.130
-----
5/1 CBR-SUP-8X10G-PIC 3.0 36-CBR SUP PIC 0.130 0.130
-----
6/1 CBR-RF-PIC 3.0 34-CBR RFSW PIC 5.0 7.35 *
=====
NOTES:
- FPD images that are required to be upgraded are indicated with a '*'
character in the "Minimal Required Version" field.
```

## Displaying Information About the Default FPD Image Package

You can use the **show upgrade fpd package default** command to find out which FRUs are supported with your current Cisco IOS-XE release and which FPD image package you need for an upgrade.

```
Router# show upgrade fpd package default

Load for five secs: 2%/0%; one minute: 3%; five minutes: 4%
Time source is NTP, 16:09:07.658 PDT Tue Jul 28 2015
```

```

*****
This Cisco IOS software image requires the following default FPD Image
Package for the automatic upgrade of FPD images (the package is available
from Cisco.com and is accessible from the Cisco Software Center page where
this IOS software image can be downloaded):
*****

Version: 15.5(3)S

Package Filename: cbr-fpd-bundle.pkg

List of card type supported in this package:

Minimal
No. Card Type HW Ver.
-----
1) RF Switch PIC 0.0
2) RF Switch PIC 0.0
3) 8x10GE Supervisor PIC 0.0
-----
    
```

## Displaying All Firmware on the Router

Use the **show platform diag** command to view all firmware available on the router.

```

Router#show platform diag
Chassis type: CBR-8-CCAP-CHASS

Pic: 0/1, CBR-RF-PROT-PIC
Internal state : inserted
Physical insert detect time : 00:03:27 (00:15:07 ago)
Firmware version: : 0000070E

Slot: 2, CBR-CCAP-LC-40G
Running state : ok
Internal state : online
Internal operational state : ok
Physical insert detect time : 00:01:41 (00:16:53 ago)
Software declared up time : 00:05:04 (00:13:30 ago)
CPLD version : 0000001C
Rommon version : 2011.03.12
Basestar version : 00110002
Raider version : 01010006
Caprica version : 00000017
PSOC 0 version : v3.0
PSOC 1 version : v3.0

Pic: 2/1, CBR-RF-PROT-PIC
Internal state : inserted
Physical insert detect time : 00:03:28 (00:15:06 ago)
Firmware version: : 00000500

Slot: 3, CBR-CCAP-LC-40G
Running state : ok
Internal state : online
Internal operational state : ok
Physical insert detect time : 00:01:41 (00:16:53 ago)
Software declared up time : 00:05:03 (00:13:31 ago)
CPLD version : 0000001C
Rommon version : 2011.03.12
Basestar version : 00110002
Raider version : 01010006
Caprica version : 00000017
PSOC 0 version : v4.2
PSOC 1 version : v4.2

Pic: 3/1, CBR-RF-PIC
    
```

```

Internal state : inserted
Physical insert detect time : 00:03:29 (00:15:05 ago)
Firmware version: : 00000602

```

```

Slot: 6, CBR-CCAP-LC-40G
Running state : ok
Internal state : online
Internal operational state : ok
Physical insert detect time : 00:01:41 (00:16:53 ago)
Software declared up time : 00:05:02 (00:13:31 ago)
CPLD version : 0000001C
Rommon version : 2011.03.12
Basestar version : 00110002
Raider version : 01010006
Caprica version : 00000017
PSOC 0 version : v4.2
PSOC 1 version : v4.2

```

```

Pic: 6/1, CBR-RF-PIC
Internal state : inserted
Physical insert detect time : 00:03:30 (00:15:04 ago)
Firmware version: : 00000500

```

```

Slot: SUP0, CBR-CCAP-SUP-160G
Physical insert detect time : 00:01:41 (00:16:53 ago)
CPLD version : 14121111
ViperSO CPLD version : 13032701
ViperSIO CPLD version : 14010901
Rommon version : 15.5(2r)S
Blackbird version : 00000112
Raptor ESI version : 00010035
Raptor MAC version : 0001002D
SUP-PIC CPLD version : 14071504
SUP-DC CPLD version : ffffffff
DTI Client FPGA version : 00000005
DTI Firmware version : 00000A03
Cortina PHY version : 201402061607
SUP PSOC 0 version : v4.0.8
SUP PSOC 1 version : v4.0.8
SUP PSOC 2 version : v4.0.9_IVY
SUP PSOC 3 version : v4.0.6
SUP-DC PSOC 0 version : N/A
SUP-DC PSOC 1 version : N/A
SUP-PIC PSOC 0 version : V2.0.5
SUP-PIC PSOC 1 version : V2.0.5

```

```

Slot: R0, CBR-CCAP-SUP-160G
Running state : ok, active
Internal state : online
Internal operational state : ok
Software declared up time : 00:01:41 (00:16:53 ago)

```

```

Slot: F0, CBR-CCAP-SUP-160G
Running state : ok, active
Internal state : online
Internal operational state : ok
Software declared up time : 00:03:22 (00:15:12 ago)
Hardware ready signal time : 00:00:00 (never ago)
Packet ready signal time : 00:03:41 (00:14:53 ago)

```

```

Slot: 4, CBR-CCAP-SUP-160G
Running state : ok
Internal state : online
Internal operational state : ok
Software declared up time : 00:03:27 (00:15:07 ago)

```

```

Pic: 4/1, CBR-SUP-8X10G-PIC
Internal state : inserted
Physical insert detect time : 00:03:31 (00:15:03 ago)

```

```

Slot: SUP1, CBR-CCAP-SUP-160G
Physical insert detect time : 00:01:47 (00:16:47 ago)
CPLD version : 14121111

```



```
ViperSO CPLD version : 13080901
ViperSIO CPLD version : 14050801
Rommon version : 15.5(2r)S
Blackbird version : 00000112
Raptor ESI version : 00010035
Raptor MAC version : 0001002D
SUP-PIC CPLD version : 14071504
SUP-DC CPLD version : ffffffff
DTI Client FPGA version : 00000005
DTI Firmware version : 00000A03
Cortina PHY version : 201402061607
SUP PSOC 0 version : v4.0.8
SUP PSOC 1 version : v4.0.8
SUP PSOC 2 version : v4.0.9_IVY
SUP PSOC 3 version : v4.0.6
SUP-DC PSOC 0 version : N/A
SUP-DC PSOC 1 version : N/A
SUP-PIC PSOC 0 version : V2.0.5
SUP-PIC PSOC 1 version : V2.0.5

Slot: R1, CBR-CCAP-SUP-160G
Running state : ok, standby
Internal state : online
Internal operational state : ok
Software declared up time : 00:01:47 (00:16:47 ago)

Slot: F1, CBR-CCAP-SUP-160G
Running state : ok, standby
Internal state : online
Internal operational state : ok
Software declared up time : 00:05:07 (00:13:26 ago)
Hardware ready signal time : 00:00:00 (never ago)
Packet ready signal time : 00:05:28 (00:13:05 ago)

Slot: 5, CBR-CCAP-SUP-160G
Running state : ok
Internal state : online
Internal operational state : ok
Software declared up time : 00:05:12 (00:13:22 ago)

Pic: 5/1, CBR-SUP-8X10G-PIC
Internal state : inserted
Physical insert detect time : 00:03:32 (00:15:02 ago)

Slot: P0, PWR-3KW-AC-V2
State : ok
Physical insert detect time : 00:03:27 (00:15:07 ago)

Slot: P1, PWR-3KW-AC-V2
State : ok
Physical insert detect time : 00:03:27 (00:15:07 ago)

Slot: P2, PWR-3KW-AC-V2
State : ok
Physical insert detect time : 00:03:27 (00:15:07 ago)

Slot: P3, Unknown
State : ps, fail
Physical insert detect time : 00:00:00 (never ago)

Slot: P4, Unknown
State : ps, fail
Physical insert detect time : 00:00:00 (never ago)

Slot: P5, Unknown
State : ps, fail
Physical insert detect time : 00:00:00 (never ago)

Slot: P10, CBR-FAN-ASSEMBLY
State : ok
Physical insert detect time : 00:03:37 (00:14:57 ago)
Firmware version : CBR-FAN FW 1.4
```

```

Slot: P11, CBR-FAN-ASSEMBLY
State : ok
Physical insert detect time : 00:03:37 (00:14:56 ago)
Firmware version : CBR-FAN FW 1.4

Slot: P12, CBR-FAN-ASSEMBLY
State : ok
Physical insert detect time : 00:03:37 (00:14:57 ago)
Firmware version : CBR-FAN FW 1.4

Slot: P13, CBR-FAN-ASSEMBLY
State : ok
Physical insert detect time : 00:03:37 (00:14:57 ago)
Firmware version : CBR-FAN FW 1.4

Slot: P14, CBR-FAN-ASSEMBLY
State : ok
Physical insert detect time : 00:03:37 (00:14:57 ago)
Firmware version : CBR-FAN FW 1.4

```

## Bundled FPGA Images Upgrades

Two methods may be used to upgrade the Cisco IOS-XE software image, as outlined in the following sections.

### Upgrading Your Cisco IOS-XE Release and FPD Image

To upgrade your Cisco IOS-XE release and your FPD image, do the following steps:

- 
- Step 1** Download the package for the Cisco IOS-XE release that you are upgrading to. The package contains both the Cisco IOS-XE image and the FPD image.
  - Step 2** Boot the new version of Cisco IOS-XE. When the new version of Cisco IOS-XE boots, search for the bundled FPD image. The FPD images will be updated automatically as part of the Cisco IOS-XE boot process.
  - Step 3** When the router has booted, verify the upgrade was successful by entering the **show hw-module all fpd** command. The time for updating the FPGA can be read in the log messages. The following is a sample for the log message:

```

#show hw-module all fpd
====
H/W Field Programmable      Current Min. Required Slot Card Type Ver. Device: "ID-Name" Version
Version
====
3/1 CBR-RF-PIC                0.0          34-CBR RFSW PIC 7.35 7.35
-----
4/1 CBR-SUP-8X10G-PIC        2.4          36-CBR SUP PIC 0.130 0.130
-----
5/1 CBR-SUP-8X10G-PIC        3.0          36-CBR SUP PIC 0.130 0.130
-----
7/1 CBR-RF-PROT-PIC          0.0          35-CBR STEALTHSTAR 7.13 7.29 *
====
NOTES: FPD images that are required to be upgraded are indicated with a '*' character in the "Minimal
Required Version" field.

```

---

## Upgrading Only Your Cisco IOS-XE Release and Retaining Your Current FPD Image

You may choose to upgrade your Cisco IOS-XE release with or without retaining your current FPD image.



---

**Note** You may choose to upgrade your Cisco IOS-XE image and retain your current FPD image, although this is not recommended.

---

- 
- Step 1** Use the **no upgrade fpd auto** command to disable the bundled FPD image.  
**Note** The automatic upgrade feature is disabled once you enter the **no upgrade fpd auto** command.
- Step 2** Save the configuration before loading the new image.
- Step 3** Load the new image.  
**Note** If your current FPD image is not compatible with the new image, the FRUs do not come online.
- 

## Field-Programmable Device Upgrades

If you retained the current FPD images and only upgraded the Cisco IOS-XE software image, then use the procedures described in this section to upgrade the FPD images.

These instructions are not always feasible for operating network environments. If these methods of upgrade are not suitable for your situation, see other sections of this document for other methods of upgrading FPDs.

## Upgrading FPD Images in a Production System

Adding a FRU to a production system presents the possibility that the FRU may contain versions of FPD images that are incompatible with the Cisco IOS-XE release currently running the router. In addition, the FPD upgrade operation can be a very CPU-intensive operation and therefore the upgrade operation may take more time when it is performed on a production system. The performance impact will vary depending on various factors, including network traffic load, the type of processing engine used, type of FRU, and the type of service configured.

For these reasons, we recommend that one of the following alternatives be used to perform the FPD upgrade on a production system if possible:

### Verifying System Compatibility First

If a spare system is not available to perform an upgrade, you can check for system compatibility by disabling the automatic upgrade feature before inserting the FRU.

- If the FPD images on the FRU are compatible with the system, you will only need to re-enable the automatic upgrade feature (the automatic upgrade feature can be re-enabled using the **upgrade fpd auto** command).
- If the FPD images on the FRU are not compatible with the system, the FRU is disabled but will not impact system performance by attempting to perform an automatic upgrade.

Use the following procedure to check the FPD images on the FRU for system compatibility:

- 
- Step 1** Disable the automatic upgrade feature using the **no upgrade fpd auto** global configuration command.
- Step 2** Insert the FRU into the system.  
If the FPD images are compatible, the FRU will operate successfully after bootup.  
If the FPD images are not compatible, the FRU is disabled. At this point we recommend that you wait for a scheduled maintenance when the system is offline to manually perform the FPD upgrade as described in the Manually Upgrading FRU FPD Images section.
- Step 3** Re-enable the automatic upgrade feature using the **upgrade fpd auto** global configuration command.
- 

## Using a Nonproduction System to Upgrade the Cisco cBR Series Converged Broadband Routers FPD Image

Use the following procedure to perform an upgrade on a spare system:

### Before You Begin

- The spare system is running the same version of the Cisco IOS-XE software release that the target production system is running.
- The automatic upgrade feature is enabled on the spare system. (The automatic upgrade feature is enabled by default. It can also be enabled using the **upgrade fpd auto** command).

- 
- Step 1** Insert the FRU into the spare system.  
If an upgrade is required, the system will perform the necessary FPD image updates so that when this FRU is inserted to the target production system it will not trigger an FPD upgrade operation there.
- Step 2** Verify the upgrade was successful by entering the **show hw-module all fpd** command.
- Step 3** Remove the FRU from the spare system after the upgrade.
- Step 4** Insert the FRU into the target production system.
-

## Optional FPD Procedures

This section provides information for optional FPD-related functions. None of the topics discussed in this section are necessary for completing FPD upgrades, but may be useful in some FPD-related scenarios. It covers the following topics:

### Manually Upgrading FRU FPD Images

To manually upgrade the current FPD version on a FRU, use the following command:

```
Router# upgrade hw-module subslot [slot/subslot] fpd bundle [reload]
```

In this example, *slot* is the slot where the FRU is installed, *subslot* is the subslot number where the FRU is located, **fpd** indicates the type of upgrade required, **bundle** selects the bundled FPD package, and **reload** specifies that the FRU is automatically reloaded after the upgrade. Note that **subslot** *slot/subslot* is used to specify a FRU FPD upgrade. The FRU will automatically be reloaded to complete the FPD upgrade.

**Caution**

---

An image upgrade can require a long period of time to complete depending on the FRU.

---

### Upgrading Multiple FPD Images

A single piece of hardware can contain multiple FPD images. The Cisco cBR Series Routers can upgrade up to three FPD images simultaneously. However, only one FPD upgrade per router slot can occur at a time, so all FPD images on all FRUs in a single slot will have to wait for another FPD upgrade to finish.

**Note**

---

Some FPD images require the FRU to reload to complete. The FPD upgrade process will perform this step automatically, so users do not have to intervene. However, the other FPDs in the hardware of the specified slot will have to wait for this reload to complete before their upgrade process begins.

---

**Note**

---

With a manual upgrade, you must include the reload option to cause the FRU to reload automatically.

---

During an automatic upgrade, the Cisco cBR Series Routers will upgrade as many FPDs as possible at a time. No user intervention is possible or necessary. The upgrade process will not stop until all FPD images have been updated.

During manual upgrades, it is important to note that users can only specify upgrades for a single piece of hardware each time the **upgrade hw-module subslot** [*slot/subslot*] command is entered. The maximum of three simultaneous upgrades applies to manual upgrades as well. If you individually specify multiple manual FPD upgrades, only three FPDs can be upgraded simultaneously and that can only occur when the hardware is in different router slots. The FPD upgrade process will stop when all FPDs for the specified hardware have been upgraded.

## Verifying the FPD Image Upgrade Progress

You can use the **show upgrade fpd progress** command to view a snapshot of the upgrade progress while an FPD image upgrade is in progress. The following example shows the type of information this command displays:

```
Router# show upgrade fpd progress

FPD Image Upgrade Progress Table:

4/1 CBR-SUP-8X10G-PIC 36-CBR SUP PIC 00:10:00 00:00:06 Updating...
====
0/1 CBR-RF-PROT-PIC 35-CBR STEALTHSTAR --:--:-- --:--:-- Waiting...
```

## Troubleshooting Problems with FPD Image Upgrades

This section contains information to help troubleshoot problems that can occur during the upgrade process.

It contains the following topics:

### Power Failure or Removal of a FRU During an FPD Image Upgrade

These instructions should only be used if a previous upgrade attempt has failed due to an external factor such as a power failure or a FRU removal.

If the FPD upgrade operation is interrupted by a power failure or the removal of a FRU, it could corrupt the FPD image. This corruption of the FPD image file makes the FRU unusable by the router and the system will display an error message.

The **show hw-module all fpd** command can be used to verify that the FRU is using a corrupted FPD image.

```
Router# show hw-module all fpd
=====
H/W Field Programmable Current Min. Required
Slot Card Type Ver. Device: "ID-Name" Version Version
=====
0/1 CBR-RF-PROT-PIC 0.0 35-CBR STEALTHSTAR 7.14 7.13
-----
2/1 CBR-RF-PROT-PIC 3.0 35-CBR STEALTHSTAR 5.0 7.13 *
-----
3/1 CBR-RF-PIC 0.0 34-CBR RFSW PIC 6.2 7.35 *
-----
4/1 CBR-SUP-8X10G-PIC 2.4 36-CBR SUP PIC 0.130 0.130
-----
5/1 CBR-SUP-8X10G-PIC 3.0 36-CBR SUP PIC 0.130 0.130
-----
6/1 CBR-RF-PIC 3.0 34-CBR RFSW PIC 5.0 7.35 *
=====
```

### Performing an FPD Recovery Upgrade

The recovery upgrade procedure can only be performed on a FRU that has been powered off by the system after it has failed all of the retries attempted to initialize the FRU.




---

**Note** Because a recovery upgrade is done at a more conservative speed, it may take more than the estimated upgrade time.

---




---

**Note** Other factors can cause the system to ask “Do you want to perform the recovery upgrade operation?” Only answer y to this question if you have attempted an FPD upgrade that has failed due to a power failure or a FRU removal. If you are prompted for this question without having previously had a failed upgrade attempt for one of the aforementioned reasons, contact Cisco Technical Support.

---

Perform the manual FPD image upgrade method using the **upgrade hw-module subslot** command to recover from a corrupted image after the FRU has been powered off by the system.

## HW-Programmable Device Upgrades

This section provides information for the HW-Programmable device upgrades.

Effective from Cisco IOS-XE Release 3.16.1S, an all-in-one firmware package is introduced for HW-Programmable device upgrades. Packages such as PSoC, Line Card Daggits, UBoot Images and viper are bundled together into the all-in-one package and released along with Cisco IOS-XE Release 3.16.1S.




---

**Note** The all-in-one package is applicable only for Cisco IOS-XE Release 3.16.1S.

---

## Upgrading ROMMON

The Cisco cBR boots up with the ROM monitor (ROMMON). ROMMON upgrades are released periodically. When a ROMMON upgrade image is released, use the procedure outlined in this section to upgrade the ROMMON in the Cisco cBR.

Use the **showmon** command to display the current image running of ROMMON.

```
rommon > showmon
Current image running (0/1): Boot ROM0
...
```

There are two Boot ROMs that need to be upgraded, Boot ROM0 which is the running Boot ROM on the active SUP and Boot ROM1 which is the Boot ROM1 on the standby SUP not running currently. This procedure upgrades both the Boot ROMs. During the upgrade process, the Boot ROM1 is upgraded first to ensure a reliable backup copy in case the upgrade procedure fails.

During the upgrade process, the IOS sets the ROMMON upgrade flag. At the end of the upgrade procedure, the router is reloaded. After reload, it is important to ensure that the same IOS-XE image (that is on the active SUP) is loaded. There are two possible scenarios:

- 1 AUTOBOOT is set for the IOS-XE image that should be loaded. In this case, the router reload process will automatically load the same IOS-XE image.

2 AUTOBOOT is not set. In this case load the same IOS-XE using step 6 of this procedure.

**Step 1** Boot the image to IOS prompt.

**Step 2** Download the ROMMON package from Cisco.com and copy it to bootflash or harddisk.

**Step 3** Run the following command in IOS prompt:

```
Router# upgrade rom-monitor filename bootflash:[package name] r0
```

The IOS upgrades ROMMON and sets ROMMON Upgrade Flag.

**Step 4** Run the following command if you have a standby supervisor:

```
Router# upgrade rom-monitor filename bootflash:[package name] r1
```

This example shows the output that is displayed after the **upgrade rom-monitor** command is used.

```
Router#upgrade rom-monitor filename  
harddisk:cbrsup-rp-hw-programmable-firmware.155-3.r.S3-ext.01.SPA.pkg r0
```

```
Upgrade rom-monitor
```

```
Target copying rom-monitor image file  
131072+0 records in  
131072+0 records out  
Checking upgrade image...  
4194304+0 records in  
8192+0 records out  
Upgrade image MD5 signature is c4469e1cc016d36b6109252e6565514e  
Burning upgrade partition...  
4194304+0 records in  
4194304+0 records out  
Checking upgrade partition...  
4194304+0 records in  
4194304+0 records out  
131072+0 records in  
131072+0 records out  
131072+0 records in  
131072+0 records out  
Upgrade flash partition MD5 signature is c4469e1cc016d36b6109252e6565514e  
ROMMON upgrade complete.  
To make the new ROMMON permanent, you must restart the RP.
```

**Step 5** Reload the Supervisor cards after the upgrade is complete.

**Note** Do not power cycle the router. Power cycling the chassis may corrupt the ROMMON image.

**Step 6** Rommon > b bootflash:<imagename>

Reload the Cisco IOS-XE software to reset the ROMMON upgrade flag.

**Note** This step is used in case AUTOBOOT is not set for the Cisco IOS-XE software image that should be loaded when the router is reloaded.



This example shows the **bootflash** command with the image name of the Cisco IOS-XE Release 3.16.0S software image.

```
Rommon > b bootflash:cbrsup-universalk9.03.15.00.S.155-2.S-std.SPA.bin
```

## Upgrading Uboot

This section provides the procedure to upgrade the Uboot in Cisco cBR-8 router.

**Step 1** Copy the firmware package file to the hard disk of the Cisco cBR-8 router.

**copy ftp://location/firmware-name harddisk:**

**Step 2** Upgrade the Uboot using the following command:

**upgrade hw-programmable cable slot-id rommon pkg\_name firmware-name**

Example:

```
upgrade hw-programmable cable 3 rommon pkg_name
/harddisk/cbrsub-rp-hw-programmable-firmware.156-1.r.S1-std.02.SPA.pkg
UBOOT:
FILE      : /tmp/fpd/mount/uboot.bin.SPA
VERSION  : U-Boot 2011.03.13
BYTES    : 1441792
Upgrade Field Region: SUCCESS!
```

**Step 3** Reboot the line card after the upgrade command output is displayed using the following command:

**hw-module slot slot-id reload**

## Upgrading the Line Card Daggit Firmware

The RF line card is run by the Daggit firmware. To upgrade the Daggit firmware, use the procedure outlined in this section.

**Step 1** Copy the line card firmware package to harddisk.

**copy ftp:xxx harddisk:**

**Step 2** Run the following pre-upgrade commands on the SUP IOS:

**upgrade hw-programmable cable active\_SUP daggit pre-upgrade slot LC\_slot\_#**

Example:

```
Router# upgrade hw-programmable cable R0 daggit pre-upgrade slot 3
```

**Step 3** Upgrade the line card firmware using the SUP IOS command.

**Note** Do not reboot the line card until the upgrade is complete. Upgrade takes approximately 15 minutes.

**upgrade hw-programmable cable** *LC\_slot\_# daggit pkg\_name firmware\_pkg\_location\_path*

Example (Cisco IOS-XE Release 3.16.1S):

```
Router# upgrade hw-programmable cable 3 daggit pkg_name /harddisk/
cbrsup-rp-hw-programmable-firmware.155-3.r.S3-ext.03.SPA.pkg
```

Initialize GPIO pins.....

Lattice Semiconductor Corp.

ispVME V12.1 Copyright 1998-2008.

For Daisy Chain of All In-System Programmable Devices

FREQUENCY 25000000 HZ;

NOTE: Daggits upgrade will take 15 mins!

Do Not Reboot Line Card!

Example (Cisco IOS-XE Release 3.16.0S):

```
Router#upgrade hw-programmable cable 3 daggit pkg_name
/harddisk/cbrsup-rp-hw-programmable-firmware.155-3.r.S3-ext.03.SPA.pkg
```

Initialize GPIO pins.....

Lattice Semiconductor Corp.

ispVME V12.1 Copyright 1998-2008.

For Daisy Chain of All In-System Programmable Devices

FREQUENCY 25000000 HZ;

NOTE: Daggits upgrade will take 15 mins!

Do Not Reboot Line Card!

**Step 4** After the upgrade is complete (takes approximately 15 minutes), the line card moves to **unknown** state. Check the status of the line card using the **show platform** command. When the line card is in **unknown** state, run the following command to recover the line card:

**upgrade hw-programmable cable** *active\_SUP daggit lc-recovery slot LC\_slot\_#*

Example:

```
Router# upgrade hw-programmable cable R0 daggit lc-recovery slot 3
```

**Note** This takes approximately 10 minutes.

**Step 5** The line card moves from **booting** to **active** state. Check the status of the line card using the **show platform** command. When the line card is in **active** state, run the following command to verify the upgrade:

```
upgrade hw-programmable cable active_SUP daggit post-active slot LC_slot_#
```

Example:

```
Router# upgrade hw-programmable cable R0 daggit post-active slot 3
```

Verify the output to check if it shows the latest version and if the image can be upgraded or is the golden image.

If the version is not what you expected and you are running golden image, the upgrade process did not complete. Start your upgrade again from step 1 and make sure you do not reboot the line card until the upgrade is complete.

## Upgrading Both the Line Card Daggit Firmware and the UBoot Image

This section outlines the procedure for upgrading the line card Daggit firmware and the UBoot image.



### Note

The UBoot image is not released in Cisco IOS-XE Release 3.16.0S. This procedure cannot be used while upgrading the firmware for Cisco IOS-XE Release 3.16.0S.

**Step 1** Copy the firmware package to harddisk.

```
copy ftp:xxx harddisk:
```

**Step 2** Run the following pre-upgrade commands on the SUP IOS:

```
upgrade hw-programmable cable active_SUP daggit pre-upgrade slot LC_slot_#
```

Example:

```
Router# upgrade hw-programmable cable R0 daggit pre-upgrade slot 3
```

**Step 3** Upgrade both the line card firmware and the uboot image using the following command:

```
Router#upgrade hw-programmable cable 2 pkg_name  
/harddisk/cbrsup-rp-hw-programmable-firmware.155-3.r.S3-ext.03.SPA.pkg
```

UBOOT:

```
FILE : /tmp/fpd/mount/uboot.bin.SPA
```

```
VERSION : U-Boot 2011.03.9
```

```
BYTES : 1441792
```

```
Upgrade Field Region: SUCCESS!
```

Daggits:

```
Initialize GPIO pins.....
```

```
Lattice Semiconductor Corp.
```

```
ispVME V12.1 Copyright 1998-2008.
```

```

For Daisy Chain of All In-System Programmable Devices

FREQUENCY 25000000 HZ;
Feature row programming
+=====+
| PASS! |
+=====+

Programming Daggits CPLD image...
FREQUENCY 25000000 HZ;

NOTE: Daggits upgrade will take 15 mins!
Do Not Reboot Line Card!

```

- Step 4** After the upgrade is complete (takes approximately 15 minutes), the line card moves to **unknown** state. Check the status of the line card using the **show platform** command. When the line card is in **unknown** state, run the following command to recover the line card:

**upgrade hw-programmable cable active\_SUP daggit lc-recovery slot LC\_slot\_#**  
 Example:

```
Router# upgrade hw-programmable cable R0 daggit lc-recovery slot 3
```

**Note** This takes approximately 10 minutes.

- Step 5** The line card moves from **booting** to **active** state. Check the status of the line card using the **show platform** command. When the line card is in **active** state, run the following command to verify the upgrade:

**upgrade hw-programmable cable active\_SUP daggit post-active slot LC\_slot\_#**  
 Example:

```
Router# upgrade hw-programmable cable R0 daggit post-active slot 3
```

Verify the output to check if it shows the latest version and if the image is upgradable or golden.

If the version is not what you expected and you are running golden image, the upgrade process did not complete. Start your upgrade again from step 1 and make sure you do not reboot the line card until the upgrade is complete.

Use the **show platform diag** command to verify the internal state and firmware version of the line card.

## Upgrading the Line Card PSoC Image in the Cisco cBR (Cisco IOS-XE Release 3.16.1S and later releases)

This section provides the procedure to upgrade the line card PSoC (LC PSoC) for Cisco IOS-XE Release 3.16.1S.

**Step 1** Copy the firmware package to harddisk.

*copy ftp:xxx harddisk:*

**Step 2** Run the following upgrade command:

**upgrade hw-programmable cable** *LC\_slot\_# psoc pkg\_name firmware\_pkg\_location\_path*

Example:

```
Router#upgrade hw-programmable cable 8 psoc pkg_name /harddisk/
cbrsup-rp-hw-programmable-firmware.155-3.r.S3-ext.04.SPA.pkg
```

The following message is displayed, indicating that the upgrade has successfully completed this step.

```
PSOC pre-upgrading ready, the card will reload twice to finish the PSOC updating. It will take
20 mins in total.
```

**Step 3** The line card reloads automatically. When the upgrade is completed, the following message is displayed.

```
002456: Sep  8 11:26:58.828 CST: %CMCC-3-FRU_HWPRG_UPG_PSOC_SUCCESS: CLC8: cmcc: Hardware programmable
PSOCs on Line card in slot 8 were successfully programmed. The card will reload to make new firmware
work.
```

**Step 4** The line card reloads automatically once again. After the line card reloads, wait for it to come online.

### What to Do Next

Use the **show platform hardware slot slot psoc psoc id version** command to check the firmware version for each of the two PSoCs on each RF line card.

```
Router#show platform hardware slot 1 psoc 0 version
Load for five secs: 29%/6%; one minute: 30%; five minutes: 31%
Time source is NTP, 10:20:17.662 PORTUGAL-Summer Tue Aug 4 2015
PSOC Version
```

version name	version value
psoc_address	50-0063
reg_pmbus_revision	22
reg_mfr_id	Cypress Semicon
reg_mfr_model	039 Power Spvr
reg_mfr_revision	Version 2.0
reg_mfr_location	Seattle, WA
reg_mfr_date	2013-09-04
reg_mfr_serial	v3.0

```
Router#
```

## Upgrading the Line Card PSoC Image in the Cisco cBR (Cisco IOS-XE Release 3.16.0S)

This section provides the procedure to upgrade the line card PSoC (LC PSoC).

**Step 1** Copy the firmware package to harddisk.

**copy** *tftp:xxx harddisk:*

**Step 2** Run the following upgrade command:

**upgrade hw-programmable cable** *LC\_slot\_# psoc pkg\_name firmware\_pkg\_location\_path*

Example:

```
Router#upgrade hw-programmable cable 7 psoc pkg_name
/harddisk/cbrsup-rp-hw-programmable-firmware.155-3.r.S3-ext.04.SPA.pkg
```

The following message is displayed, indicating that the upgrade has successfully completed this step.

```
PSOC pre-upgrading ready, please power-cycle the board to finish the PSOC updating.
```

Example:

The following message is displayed, indicating that the upgrade has successfully completed this step.

```
PSOC pre-upgrading ready, please power-cycle the board to finish the PSOC updating.
```

**Step 3** Power-cycle the Cisco cBR chassis or perform an OIR of the RF line card.

**Note** Perform the OIR of the RF line card physically, by removing the RF line card from the slot and inserting it back into the slot.

```
Aug 4 09:02:59.836: %IOSXE_OIR-6-OFFLINECARD: Card (cc) offline in slot 1
Aug 4 09:02:59.839: %CABLE_CLC-5-LOGGER_LC_REMOVED: Carrier Card 1 removed
Aug 4 09:02:59.844: %BIPC-6-SESSION_DOWN: IPCCL Session to CLC1 is DOWN
Aug 4 09:02:59.937: %IOSXE_OIR-6-REMCARD: Card (cc) removed from slot 1
Aug 4 09:02:59.938: %CABLE_CLC-5-LOGGER_LC_REMOVED: Carrier Card 1 removed
LAB1_CBR8_DEMO#
Aug 4 09:03:15.622: %IOSXE_OIR-6-INSCARD: Card (cc) inserted in slot 1
```

**Step 4** The RF line card reboots after the chassis power-cycle or the RF line card OIR is completed. The LC PSoC upgrade process continues after the RF line card reboots.

**Note** After the RF line card reboots, the LC PSoC upgrade process takes approximately 15 minutes to complete. Do not perform any operation on the RF line card while the upgrade process is running.

When the upgrade process is completed, the following sample message is displayed, indicating that the upgrade was successful.

```
Aug 4 09:06:31.571: %IOSXE_OIR-6-ONLINECARD: Card (cc) online in slot 1
Router# success
```

```
Aug 4 09:11:45.764: %CMCC-3-FRU_HWPRG_UPG_PSOC_SUCCESS: CLC1: cmcc: Hardware programmable PSOCs
on Line card in slot 1
were successfully programmed. Please power-cycle or OIR the card to make them work
```

**Step 5**

Power cycle the Cisco cBR chassis or perform an OIR of the RF line card again.

The PSOC 0 and PSOC 1 versions are indicated in the display that appears after the chassis power-cycle or the RF line card OIR is complete and the RF line card reboots. This example shows the sample messages displayed after the RF line card reboots:

```
Aug 4 09:16:18.124: %IOSXE_OIR-6-ONLINECARD: Card (cc) online in slot 1
LAB1_CBR8_DEMO# success
LAB1_CBR8_DEMO#
Aug 4 09:16:29.021: %BIPC-6-SESSION_UP: IPCCL Session to CLC1 is UP
LAB1_CBR8_DEMO#sh plat diag
Load for five secs: 1%/0%; one minute: 5%; five minutes: 3%
Time source is NTP, 10:20:17.662 PORTUGAL-Summer Tue Aug 4 2015
```

```
Chassis type: CBR-8-CCAP-CHASS
```

```
Slot: 0, CBR-CCAP-LC-40G
Running state          : ok
Internal state         : online
Internal operational state : ok
Physical insert detect time : 15:37:00 (00:59:22 ago)
Software declared up time  : 15:40:20 (00:56:01 ago)
CPLD version           : 00000021
Rommon version         : 2011.03.12
Basestar version       : 00110004
Raider version         : 01010008
Caprica version        : 00000020
PSOC 0 version         : v4.6
PSOC 1 version         : v4.6
```

```
Pic: 0/1, CBR-RF-PROT-PIC
Internal state         : inserted
Physical insert detect time : 00:03:22 (16:32:59 ago)
Firmware version:      : 0000071E
```

```
Slot: 1, CBR-CCAP-LC-40G
Running state          : ok
Internal state         : online
Internal operational state : ok
Physical insert detect time : 16:29:06 (00:07:15 ago)
Software declared up time  : 16:32:23 (00:03:59 ago)
CPLD version           : 00000021
Rommon version         : 2011.03.12
Basestar version       : 00110004
Raider version         : 01010008
Caprica version        : 00000020
PSOC 0 version         : v4.6
PSOC 1 version         : v4.6
```

```
Pic: 1/1, CBR-RF-PIC
```

```
Internal state           : inserted
Physical insert detect time : 00:03:23 (16:32:59 ago)
Firmware version:       : 0000073E
```

### What to Do Next

Use the **show platform hardware slot *slot* psoc *psoc id* version** command to check the firmware version for each of the two PSoCs on each RF line card.

```
Router#show platform hardware slot 1 psoc 0 version
Load for five secs: 29%/6%; one minute: 30%; five minutes: 31%
Time source is NTP, 10:20:17.662 PORTUGAL-Summer Tue Aug 4 2015
PSoC Version

version name           version value
-----
psoc_address           50-0063
reg_pmbus_revision     22
reg_mfr_id             Cypress Semicon
reg_mfr_model          039 Power Spvr
reg_mfr_revision       Version 2.0
reg_mfr_location       Seattle, WA
reg_mfr_date           2013-09-04
reg_mfr_serial         v3.0

Router#
```

## Upgrading the Fan PSoC Image in the Cisco cBR

This section provides the procedure to upgrade the fan module PSoC.

### Before You Begin

You could identify the fan module hardware using the **show platform hardware slot *Pslot* psoc 0 version** command. The `reg_ic_device_rev` field shows the fan module firmware version.

**Step 1** Copy the firmware package to harddisk.

```
copy tftp:xxx harddisk:
```

**Step 2** Run the following upgrade command on the SUP IOS:  
For Cisco IOS-XE Release 3.16.1S:

```
upgrade hw-programmable cable active_SUP fan pkg_name firmware_pkg_location_path
```

Example:

```
Router#upgrade hw-programmable cable R0 fan pkg_name
/harddisk/cbrsup-rp-hw-programmable-firmware.155-3.r.S3-ext.05.SPA.pkg
```

For Cisco IOS-XE Release 3.16.0S:



**Caution** This command is specific to Cisco IOS-XE Release 3.16.0S alone. Using this command to upgrade the Fan PSoC firmware on Cisco IOS-XE Release 3.16.1S may cause unexpected results.

**Caution** For upgrading Cisco IOS-XE Release 3.16.0S, do not use the firmware package **cbrsup-rp-hw-programmable-firmware.155-3.r.S3-ext.05.SPA.pkg** released for Cisco IOS-XE Release 3.16.1S. Use the firmware package **cbrsup-rp-hw-programmable-firmware.155-3.r.S3-ext.02.SPA.pkg** for upgrading Cisco IOS-XE Release 3.16.

**upgrade hw-programmable cable** *active\_SUP psoc pkg\_name firmware\_pkg\_location\_path*

Example:

```
Router#upgrade hw-programmable cable R0 psoc pkg_name
/harddisk/cbrsup-rp-hw-programmable-firmware.155-3.r.S3-ext.02.SPA.pkg
```

It takes approximately 15 minutes to upgrade the fan module PSoC for all the fan modules.

**Note** Do not power-cycle or reload the router while the upgrade process is running.

When the upgrade is complete, the messages that indicate that the hardware programmable PSoC on each fan module in each fan bay is upgraded successfully, are displayed.

## What to Do Next



**Note** The following procedures are applicable only for Cisco IOS-XE Release 3.16.0S and not for Cisco IOS-XE Release 3.16.1S.

Perform one of the following two procedures:

- OIR the Fan modules one by one. Do not remove the fan module fully from the chassis. Pull the fan modules out until the back connector is disconnected fully, then re-insert the fan module.
- Power cycle the Cisco cBR chassis.

Use the **show platform hardware slot Pslot psoc 0 version** command to check the firmware version for each slot and each of the two PSoCs on each fan module.

## Upgrading Supervisor CPLD Firmware in the Cisco cBR

This section provides the procedure to upgrade the Supervisor CPLD firmware. The upgrade to Supervisor CPLD firmware version 16012711 is optional. Compared to the version 15091511, the version 16012711 provides SEU support. The customers can decide if they need to upgrade to the new Supervisor CPLD version at their own discretion.

### Before You Begin

Before upgrading the Supervisor CPLD firmware, make sure the following requirements are met:

- Download Supervisor CPLD firmware from <http://www.cisco.com>

- System running IOS-XE image: 3.16.0, 3.16.1, 3.16 engineering specials, and later releases
- Console connections and login to both Supervisor cards
- Run the following command to verify Supervisor CPLD firmware version on the cBR-8:

Command	Current Version	Upgrade Version	Package Name
show platform	15091511	16012711	cbrsup-rp-programmable-firmware.156-2.r.SP-ext.01.SPA.pkg
show platform	14121111	15091511	cbrsup-rp-hw-programmable-firmware.155-3.r.S3-ext.05.SPA.pkg

**Step 1** Copy the new firmware package to the cBR-8 using FTP.

**copy filename bootflash:**

**copy filename stby-bootflash:**

Example:

```
Router# copy ftp://location/cbrsup-rp-programmable-firmware.156-2.r.SP-ext.01.SPA.pkg bootflash:
Router# copy ftp://location/cbrsup-rp-programmable-firmware.156-2.r.SP-ext.01.SPA.pkg stby-bootflash:
```

**Step 2** Verify the firmware package against the known md5 hash.

**verify /md5 bootflash:filename**

Example:

```
Router# verify /md5 bootflash:cbrsup-rp-programmable-firmware.156-2.r.SP-ext.01.SPA.pkg
```

**Step 3** Log into active SUP0 using console connection.

**Step 4** Check if there is any previous failed SUP0 and SUP1 CPLD or other firmware attempt and delete if any.

**dir bootflash:already\_in\_progress\_file**

**delete bootflash:already\_in\_progress\_file**

**dir stby-bootflash:already\_in\_progress\_file**

**delete stby-bootflash:already\_in\_progress\_file**

**Step 5** Run the following command to upgrade Viper firmware on SUP0 (R0) and SUP1 (R1):

**upgrade hw-programmable cable R0 viper pkg\_name filename**

**upgrade hw-programmable cable R1 viper pkg\_name filename**

Example:

```
Router# upgrade hw-programmable cable R0 viper pkg_name
/bootflash/cbrsup-rp-programmable-firmware.156-2.r.SP-ext.01.SPA.pkg
```

```
Router# upgrade hw-programmable cable R1 viper pkg_name
/bootflash/cbrsup-rp-programmable-firmware.156-2.r.SP-ext.01.SPA.pkg
```

It takes about 10 minutes to upgrade. You should see the following messages when upgrade finished:

```
Upgrade successfully. Please make sure Rommon version is matched.
Please power cycle the chassis to let the new firmware take effect
```

**Caution** Disregard the power cycle instruction for now. Do not power cycle the chassis at this time.

**Step 6** To mitigate the known modem registration rate issue, the following configuration commands needs to be added.

```
Router# configure terminal
Router(config)# platform punt-policer 24 50
Router(config)# platform punt-policer 24 50 high
Router(config)# platform punt-policer 105 300
Router(config)# platform punt-policer 100 100
Router(config)# platform punt-sbri wan punt-cause 10 rate 4
Router(config)# platform punt-sbri wan punt-cause 11 rate 4
Router(config)# platform punt-sbri wan punt-cause 24 rate 4
Router(config)# platform punt-sbri subscriber rate 16
Router(config)# interface bundle x
Router(config)# hold-queue 1024 in
Router(config)# hold-queue 1024 out
Router(config)# end
Router(config)# write memory
Router#
```

**Step 7** Copy the system startup-config to bootflash: and stby-bootflash: as a precaution.

```
copy startup-config bootflash:filename
```

```
copy startup-config stby-bootflash:filename
```

**Step 8** Set the config register to 0, so both SUPs will boot in ROMMON mode after reset.

```
Router# configure terminal
Router(config)# config-register 0x0
Router(config)# end
Router# write memory
```

**Step 9** Check console connectivity on both SUP0 and SUP1. Then reload cBR-8.

```
Router# reload
```

**Step 10** Confirm both SUP0 and SUP1 are in ROMMON mode, and check bootflash on both SUPs.

```
Router# dir bootflash:
```

**Step 11** Power cycle the cBR-8. Wait for both SUP0 and SUP1 to load into ROMMON mode. You will see the new CPLD version has been loaded on both SUPs from both console connections.

```
rommon 1 >
```

```
Initializing Hardware ...
```

```
?
```

## Upgrading Docsis 3.0 downstream module and Docsis 3.1 downstream module (Cisco IOS-XE Release 3.18.0S and earlier releases)

```
System Bootstrap, Version 15.5(3r)S, RELEASE SOFTWARE
Copyright (c) 1994-2016 by cisco Systems, Inc.
```

```
Current image running: Boot ROM1
```

```
Last reset cause: PowerOn
```

```
Viper version register: 0x16012711
Set Chassis Type to 13RU
Cisco cBR-8 platform with 50331648 Kbytes of main memory
```

**Step 12** Boot the IOS-XE on SUP0 and SUP1 from ROMMON.

**boot bootflash:***filename*

**Step 13** Check the CPLD firmware has been upgraded on both SUPs using the command below.

**show platform**

Example:

```
Router# show platform
```

Slot	CPLD Version	Rommon Version
0	00000021	2011.03.13
1	00000021	2011.03.13
2	00000021	2011.03.13
SUP0	16012711	15.5(3r)S
SUP1	16012711	15.5(3r)S

**Step 14** After secondary SUP goes into STANDBY HOT state, set the config register back to 0x2102 (Both SUPs will be changed back to autoboot mode). Also check your boot statement in config to point to the desired image.

```
Router# configure terminal
Router(config)# config-register 0x2102
Router(config)# end
Router# write memory
```

**Step 15** Verify that the bootvar has changed to point at the new image.

```
Router# show bootvar
```

**Step 16** Verify that the config-register has changed to point at the new image on next reboot.

```
Router# show redundancy
```

## Upgrading Docsis 3.0 downstream module and Docsis 3.1 downstream module (Cisco IOS-XE Release 3.18.0S and earlier releases)

This section provides the procedure to upgrade the Docsis 3.0 downstream and Docsis 3.1 downstream (DSPHY) module installed in Cisco cBR-8 router for Cisco IOS-XE Release 3.18.0S and earlier releases.

## Before You Begin

Before upgrading the module, make sure the following requirements are met:

- Put the new IOS-XE image file *image-file-name* in bootflash via FTP using **copy ftp://location/image-file-name bootflash:** and **copy ftp://location/image-file-name stby-bootflash:** command.
- Verify the IOS-XE image file against the known file md5 hash using **verify /md5 image-file-name** command.
- Access to TSV, both console connections, all passwords including enable, and logging sessions for both supervisor cards.
- Insert a USB drive into the supervisor front USB port just behind the small cover. Verify that the system can read the drive directory usb0:. Backup the configuration to USB drive before upgrade using **copy running-config usb0: name.txt** command.
- Check if the redundancy is enabled using **show redundancy** command.
- Perform standard pre-checks (total modems online, any 911 calls, etc). See verification section for **show** commands to verify system health before upgrade.

---

**Step 1** Change the boot variable to point to desired IOS-XE image.

```
boot system bootflash:image-file-name
no boot system
end
write memory
```

**Step 2** Verify that the bootvar has changed to point to the new image.

```
show bootvar
```

**Step 3** To mitigate the known modem registration rate issue, the following configuration commands needs to be added.

```
configure terminal
no platform punt-policer 105 300
platform punt-policer 24 10
platform punt-policer 24 10 high
platform punt-policer 100 10
ipv6 access-list dhcp_up
permit ipv6 any host FF02::1:2 sequence 10
exit
ip access-list extended dhcp_v4_up
10 permit ip host 0.0.0.0 host 255.255.255.255
exit
class-map match-all dhcp_drop
match access-group name dhcp_up
class-map match-all dhcp_drop_v4
match access-group name dhcp_v4_up
policy-map copp_policy
class dhcp_drop
police rate 100 pps conform-action transmit exceed-action drop
class dhcp_drop_v4
```

```

police rate 100 pps conform-action transmit exceed-action drop
interface bundle 10
hold-queue 1024 in
hold-queue 1024 out
end
write memory

```

**Step 4** Copy the system startup-config to bootflash: and stby-bootflash: as a precaution.

```
copy startup-config bootflash:filename
```

```
copy startup-config stby-bootflash:filename
```

**Step 5** Check console connectivity on both SUP0 and SUP1. Then reload cBR-8.

```
Router# reload
```

**Step 6** Once the system is up, check if it is running the new version of IOS-XE using **show redundancy** command. You will find following information in the command output if the new IOS-XE image is running:

```
Image Version = Cisco IOS Software, cBR Software (X86_64_LINUX_IOSD-UNIVERSALK9-M),
cbrsup-universalk9.03.16.01.S.155-3.S1-ext.SPA.bin
```

**Note** The command output depends on the IOS-XE version.

**Step 7** If the chassis has DSPHY modules on the line cards, the firmware of each line card will automatically upgrade. You need to watch the logs for a suggested line card reload. If you find following content in the output of the **show log | include DSPHY** command, it means an upgrade is taking place.

```
router: CLC9: cdman: DSPHY downloading gemini 0 FW done, total packets 514
```

If you find following content in the output of the **show log | include reload** command, it means an upgrade is complete.

```
router: CLC0: cdman: Suggest reload the line card for new FW to take effect using CLI:
```

**Note** No upgrade is occurring means router image upgrade is complete.

**Step 8** Disable line card redundancy for line card reloads.

```

configure terminal
redundancy
mode sso
linecard-group 0 internal-switch
no member slot 0 secondary
end

```

**Step 9** Verify that there is no line card redundancy using **show run | begin redundancy** command. The following information will not appear in the command output:

```
member slot 0 secondary
```

**Step 10** At this point you need to reload each line card and wait for the modems to come back online. Reload one card at a time, allow approximate 5 minutes between each line card reload. This helps to stagger the modem recovery and will be faster than reloading all the line cards at once.

```

hw-module slot 0 reload
hw-module slot 1 reload
hw-module slot 2 reload
hw-module slot 3 reload
hw-module slot 4 reload
hw-module slot 5 reload

```

```
hw-module slot 6 reload
hw-module slot 7 reload
hw-module slot 8 reload
hw-module slot 9 reload
```

**Step 11** Check to see if all DSPHY modules are upgraded.

```
show cable card 0/0 ds-phy display | include version
show cable card 1/0 ds-phy display | include version
show cable card 2/0 ds-phy display | include version
show cable card 3/0 ds-phy display | include version
show cable card 6/0 ds-phy display | include version
show cable card 7/0 ds-phy display | include version
show cable card 8/0 ds-phy display | include version
show cable card 9/0 ds-phy display | include version
```

**Step 12** Check for DSPHY module detection status, repeat for each line card slot:

```
show cable card 0/0 ds-phy display | include detected
show cable card 1/0 ds-phy display | include detected
show cable card 2/0 ds-phy display | include detected
show cable card 3/0 ds-phy display | include detected
show cable card 6/0 ds-phy display | include detected
show cable card 7/0 ds-phy display | include detected
show cable card 8/0 ds-phy display | include detected
show cable card 9/0 ds-phy display | include detected
```

**Step 13** Check for keeplive (KA) counts sent and received to match closely, repeat for each line card slot:

```
show cable card 0/0 ds-phy display | include KA MicoAPSeSet
show cable card 1/0 ds-phy display | include KA MicoAPSeSet
show cable card 2/0 ds-phy display | include KA MicoAPSeSet
show cable card 3/0 ds-phy display | include KA MicoAPSeSet
show cable card 6/0 ds-phy display | include KA MicoAPSeSet
show cable card 7/0 ds-phy display | include KA MicoAPSeSet
show cable card 8/0 ds-phy display | include KA MicoAPSeSet
show cable card 9/0 ds-phy display | include KA MicoAPSeSet
```

**Step 14** Re-enable the line card redundancy.

```
configure terminal
redundancy
mode sso
linecard-group 0 internal-switch
member slot 0 secondary
end
write memory
```

**Step 15** Verify if the redundancy has been re-enabled using **show run | begin redundancy** command. You can find following information in the command output:

```
member slot 0 secondary
```

## What to Do Next

Perform verification test to determine if the upgrade is successful, include:

- Check facility alarms using **show facility-alarm status** command.




---

**Note** Some deployments use 5 power supplies which are sufficient, but will show an major alarm which can be ignored.

---

- Check the status of the power supplies using **show environment power** command.
- Check PS status using **show platform hardware slot P<0-5> mcu status** command.
- Complete trace routes to known good off-network IP address using the source address of customer CPE blocks to verify routing is working.
- Check logs for error messages using **show log** command.

These **show** commands may be useful in the verification test:

- **show redundancy**
- **show platform**
- **show platform diag**
- **show environment**
- **show redundancy linecard all**
- **show isis neighbors**
- **show ip route rip**
- **show ip mroute**
- **show cops servers**
- **show cable modem voice**
- **show cable calls**
- **show cable metering verbose**
- **show version**
- **show cable licenses all**
- **show inventory**

## Upgrading Docsis 3.0 downstream module and Docsis 3.1 downstream module (Cisco IOS-XE Release 3.18.1S and later releases)

This section provides the procedure to upgrade the Docsis 3.0 downstream and Docsis 3.1 downstream (DSPHY) module installed in Cisco cBR-8 router for Cisco IOS-XE Release 3.18.1S and later releases.

From Cisco IOS-XE Release 3.18.1S, DSPHY module firmware upgrade will be changed from IOS bundled auto-upgrade to external programmable upgrades via manual FPD upgrade, it is mandatory to upgrade Docsis 3.1 downstream module to the latest FPD (cbrsup-rp-programmable-firmware.156-2.r.S1-ext.01.SPA.pkg) while moving to Cisco IOS-XE Release 3.18.1S image.



**Note**

This upgrade procedure is only applicable to Cisco IOS-XE Release 3.18.1S and later releases, upgrading from any release earlier, the FPD auto option is not supported. With the auto option, the firmwares that need upgrade can be determined by the system automatically and upgraded all at once, the whole process is more user-friendly and faster.

**Before You Begin**

Before upgrading the module, make sure the following requirements are met:

- Cisco cBR-8 router is running the IOS-XE release 3.18.1S and later releases.
- Check the module firmware version to determine if the upgrade is needed.

**For non-LCHA enabled Chassis****Note**

There is service impact during upgrade.

**Step 1** Copy the new DSPHY module firmware package to the hard disk of the cBR-8.

**copy package name harddisk:**

**Step 2** Verify the new DSPHY module firmware package against the known md5 hash.

**verify /md5 harddisk:package name**

**Step 3** Upgrade the DSPHY module firmware using the command below.

**upgrade hw-programmable cable slot number dsphy auto pkg-name package name**

Example:

```
Router# upgrade hw-programmable cable 7 dsphy auto pkg-name
/harddisk/cbrsup-rp-programmable-firmware.156-2.r.S1-ext.01.SPA.pkg
```

**Step 4** Reload the linecard when you see the "reload" instruction in the console CLI output for the new firmware to take effect, service will be impacted during the linecard reload.

```
*Mar 9 07:34:27.211: %IOSXE-5-PLATFORM: CLC7: cdman: Suggest reload the line card for new FW to
take effect using CLI: hw slot <slot-id> reload
```

```
Router# hw-module slot 7 reload
```

**Step 5** After the linecard is online after the reload, check DSPHY module version to confirm the new firmware has taken effect.

```
Router# show cable card 7/0 ds-phy display | i ver
```

```
img info: section 2, running ver 30016 (micro)
img info: section 2, running ver 44147 (fpga)
```

## For LCHA enabled Chassis

**Step 1** Copy the new DSPHY module firmware package to the hard disk of the cBR-8.

**copy package name harddisk:**

**Step 2** Verify the new DSPHY module firmware package against the known md5 hash.

**verify /md5 harddisk:package name**

**Step 3** Upgrade the protect linecard 0 when it is in stand-by hot state using the command below.

**upgrade hw-programmable cable 0 dsphy auto pkg-name package name**

Example:

```
Router# upgrade hw-programmable cable 0 dsphy auto pkg-name
/harddisk/cbrsup-rp-programmable-firmware.156-2.r.S1-ext.01.SPA.pkg
```

**Step 4** Reload the linecard when you see the "reload" instruction in the console CLI output for the new firmware to take effect.

```
*Mar 9 07:34:27.211: %IOSXE-5-PLATFORM: CLC0: cdman: Suggest reload the line card for new FW to
take effect using CLI: hw slot <slot-id> reload
```

```
Router# hw-module slot 0 reload
```

**Step 5** Wait until the protect linecard 0 becomes stand-by warm state, check DSPHY module version to confirm the new firmware has taken effect.

```
Router# show cable card 0/0 ds-phy display | i ver
```

```
img info: section 2, running ver 30016 (micro)
```

```
img info: section 2, running ver 44147 (fpga)
```

**Step 6** Upgrade the first working linecard using the command below.

**upgrade hw-programmable cable slot number dsphy auto pkg-name package name**

Example:

```
Router# upgrade hw-programmable cable 1 dsphy auto pkg-name
/harddisk/cbrsup-rp-programmable-firmware.156-2.r.S1-ext.01.SPA.pkg
```

**Step 7** Reload the linecard when you see the "reload" instruction in the console CLI output for the new firmware to take effect.

```
*Mar 9 07:34:27.211: %IOSXE-5-PLATFORM: CLC1: cdman: Suggest reload the line card for new FW to
take effect using CLI: hw slot <slot-id> reload
```

```
Router# hw-module slot 1 reload
```

**Step 8** When the linecard reload command is executed, a linecard switchover will be triggered for service protection. When the original working linecard is back online after the reload, perform linecard revertback.

**Step 9** Check DSPHY module version to confirm the new firmware has taken effect on the first working linecard.

```
Router# show cable card 1/0 ds-phy display | i ver
```

```
img info: section 2, running ver 30016 (micro)
```

```
img info: section 2, running ver 44147 (fpga)
```

**Step 10** Wait until the protect linecard 0 goes to standby-hot state, perform step 6 to 9 on the other working linecards one by one.