



Upgrading the Cisco cBR Series Converged Broadband Routers for Cisco IOS XE Bengaluru 17.6

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CHAPTER 1

Upgrading the Cisco cBR-8 Router System to Cisco IOS XE Bengaluru 17.6.1z1



Note Starting from Cisco IOS XE Bengaluru 17.6.1a, CBR-CCAP-LC-G2-R can only protect CBR-CCAP-LC-G2-R for linecard HA.



Note If you are using TACACS authentication, the TACACS configuration will be automatically updated to the new version after upgrading to Cisco IOS XE Bengaluru 17.6.1z1. This is a fix to [CSCvu62273](#) and you do not need to take any action regarding the TACACS configuration in the cBR-8 prior to the upgrade.

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

By default, telnet is disabled on Cisco cBR-8. If you are going to use telnet to access the device, make sure the value of line **vtty transport** is correct and save the configuration in order to enable telnet.

```
Router# show run | begin line vty
line vty 0 4
  exec-timeout 0 0
  privilege level 15
  password 7 104D081B094410055F
  exec prompt timestamp
  transport input all
line vty 5 98
  exec-timeout 0 0
  privilege level 15
  password 7 02050D480809
  transport input all
line vty 99
  transport input all
!
```

The following table encompasses all firmware versions that customers are required to update to support Cisco IOS XE Bengaluru 17.6.1z1. All other firmware versions are either not upgradable by the customer, or not required to be upgraded for Cisco IOS XE Bengaluru 17.6.1z1 support. Use the commands in the tables to verify the firmware versions. If you need to upgrade firmware first, refer to the steps in [Upgrading the Cisco cBR-8 Router Firmware](#).



Note If you want to upgrade Supervisor CPLD firmware, refer to [Upgrading Supervisor CPLD Firmware](#), on page 38.

Table 1: Firmware Versions

Internal Name	Component Name	Required Minimum Version	Command
Supervisor CPLD	CBR-CCAP-SUP-160G CPLD	16052011/19071712	show platform
	CBR-CCAP-SUP-250G CPLD	170724E0/190717E1	show platform
Supervisor ROMMON	CBR-CCAP-SUP-160G ROMMON and CBR-CCAP-SUP-250G ROMMON	16.7(8r)S	show platform
Line Card CPLD	CBR-CCAP-LC-40G CPLD	00000026	show platform diag
Docsis 3.1 downstream module Micro	CBR-CCAP-LC-40G Gemini2 Micro	3.1A	show platform diag
Docsis 3.1 downstream module FPGA	CBR-CCAP-LC-40G Gemini2 Apollo	4.484F	show platform diag
DPIC Uboot and FPGA	CBR-DPIC-8X10G Firmware	00010001	show platform diag
DPIC 100G Uboot and FPGA	CBR-DPIC-2X100G Firmware	00020006	show platform diag



Note If the user wants to upgrade Supervisor CPLD to version 19071712 and 190717E1, the chassis must be running with Cisco IOS XE Gibraltar 16.12.1w or later releases.



Note Cisco recommends that operators upgrade their On-Premise SSM Satellite software versions to v7.x or later releases, to ensure the compatibility with cBR-8.

- [Verify max-carrier value](#), on page 3
- [Upgrading from Cisco IOS XE 16.x and later releases to Cisco IOS XE Bengaluru 17.6.1z1](#), on page 4
- [Upgrading Supervisor CPLD Firmware](#), on page 15

- [Upgrading cBR CCAP 8x10G Remote PHY Digital Physical Interface Card, on page 19](#)
- [Upgrading Uboot For CBR-CCAP-LC-40G, on page 22](#)

Verify max-carrier value

Currently in Remote PHY system, max-carrier value can be configured in the downstream controller profile as well as in RPD configuration for Cisco Remote PHY Shelf 300/600/7200. This may lead to inconsistent max-carrier value configurations.

Starting from Cisco IOS XE Gibraltar 16.10.1f, max-carrier value configured in the **cable rpd** mode is removed and RPD will use the max-carrier value configured in the **controller-profile** mode for the power calculation.

Before upgrading to Cisco IOS XE Gibraltar 16.10.1f or later releases, verify if the max-carrier values configured in the RPD shelf configuration and downstream controller profile(s) associated to RPD downstream port are the same. If they are different, update the cBR-8 configuration prior to upgrade.

Below is an example of correct configuration before upgrade.

```

cable downstream controller-profile 1
  max-carrier 128
  max-ofdm-spectrum 384000000
  rf-chan 0 3
    type DOCSIS
    qam-profile 1
    frequency 381000000
    rf-output NORMAL
    docsis-channel-id 1

cable downstream controller-profile 2
  max-carrier 158
  max-ofdm-spectrum 384000000
  rf-chan 158
    docsis-channel-id 159
  ofdm channel-profile 20 start-frequency 579000000 width 48000000 plc 600000000

cable rpd test
  identifier 0001.0001.0001
  type shelf
  rpd-ds 0 max-carrier 128
  rpd-ds 0 base-power 33
  rpd-ds 1 max-carrier 158
  rpd-ds 1 base-power 25
  core-interface Te9/1/0
    rpd-ds 0 downstream-cable 9/0/3 profile 1
    rpd-ds 0 downstream-cable 9/0/4 profile 2
    rpd-us 0 upstream-cable 9/0/3 profile 1
  r-dti 1
  rpd-event profile 0
  rpd-55d1-us-event profile 0

```



Note It is highly recommended to follow this example to check and update configuration if necessary because max-carrier value is used to compute the base power. Otherwise, after upgrade the expected base power value can be different which may affect cable modem coming online.



Note If you upgrade from a version lower than Cisco IOS XE Fuji 16.9.1, base power range may be changed on the port with OFDM channel configured. So be aware of the potential base power change before and after the upgrade.

Upgrading from Cisco IOS XE 16.x and later releases to Cisco IOS XE Bengaluru 17.6.1z1

Prerequisites

Manual ROMMON Upgrade

If you are upgrading from Cisco IOS XE Everest 16.6.x or Cisco IOS XE Fuji 16.7.x to Cisco IOS XE Bengaluru 17.6.1z1, perform the following steps to upgrade SUP ROMMON manually.

1. Download hardware programmable devices upgrade package file **cbrsup-programmable_firmware.17.06.01z1.SPA.pkg** from the following Cisco.com Software Center URL: <https://software.cisco.com/download/home/286283913/type>

2. Copy the package file to harddisk:

```
copy <location>/cbrsup-programmable_firmware.17.06.01z1.SPA.pkg harddisk:
```

3. Verify the hardware programmable devices upgrade package against the md5 hash as provided in the Cisco.com Software center.

```
verify /md5 harddisk:cbrsup-programmable_firmware.17.06.01z1.SPA.pkg
```

4. Upgrade SUP ROMMON.

```
Router#Upgrade rom-mon file harddisk:cbrsup-programmable_firmware.17.06.01z1.SPA.pkg r0
Wait for the following output on the console:
ROMMON upgrade complete.
To make the new ROMMON permanent, you must restart the RP
```

```
Router#Upgrade rom-mon file harddisk:cbrsup-programmable_firmware.17.06.01z1.SPA.pkg r1
Wait for the following output on the console:
ROMMON upgrade complete.
To make the new ROMMON permanent, you must restart the RP
```



Note Do not restart the SUPs currently, you can combine reloading the SUP with the IOS upgrade process.

Downstream-Controller Remapping (CBR-CCAP-LC-G2-R with 8x10G DPIC)

If you are using cBR CCAP 8x10G Remote PHY Digital Physical Interface Card (D-PIC) with CBR-CCAP-LC-G2-R linecards, contact your local Cisco representative before upgrading to Cisco IOS XE Cupertino 17.9.1z1.

Starting with in Cisco IOS XE Bengaluru 17.6.1, Cisco introduces a new feature on cBR-8 that provides initial support for 32 Video and 32 DOCSIS service groups per CBR-CCAP-LC-G2-R linecard. The implementation of this feature introduces new 8x10G DPIC port mapping constraints on existing 'Downstream-Cable' controllers. Cisco has prepared a python tool that can be used to determine if a cBR-8 `running-configuration` includes non-compliant controller mappings, and, to update the `running-configuration` to be compliant with the latest Cisco IOS XE Cupertino 17.6.1z1. Once you have the python tool, perform the following steps in order to predict and avoid downtime:

Before you begin: Special considerations must be taken when using SmartPHY. Contact your local Cisco representative if your installation includes SmartPHY.

1. Collect the following information from the target cBR-8 to upgrade.

```
Router#show cable rpd sum
Router#show cable modem sum
Router#show cable video session all sum
```

2. Save the running configuration to the harddisk of the cBR-8.

```
Router#copy running-config harddisk:SavedConfig.txt
```

3. Copy the saved running configuration from harddisk: to an offline server for editing using SCP.

```
Router#copy harddisk:SavedConfig.txt scp:<path>
```

4. Run the python tool to modify the controllers in the saved configuration.

- Option 1 - Renumber Downstream-Cable controllers only

- a. Execute python script **kobol_ph2_controller_migration.py**. This script is intended for customers who do not immediately intend to take advantage of the Downstream-Video controllers and expanded SG capacity on CBR-CCAP-LC-G2-R.

```
$ python kobol_ph2_controller_migration.py
Enter the name of the configuration file: SavedConfig.txt
```

- b. Output file appends **_remap_controller** to the file name.

```
Output file name: SavedConfig.txt_remap_controller
```

- c. Check to ensure that the script completed successfully. If no output file is created or the size of the output file is 0 byte, then check script output for error messages.

- Option 2 - Renumber Downstream-Cable and utilize Downstream-Video controllers

- a. Execute python script **kobol_ph2_controller_migration_video.py**. This script is intended for customers who wish to utilize the new Downstream-Video controllers to free up existing Downstream-Cable controllers for expanded DOCSIS service groups.

```
$ python kobol_ph2_controller_migration_video.py
Enter the name of the configuration file: SavedConfig.txt
```

- b. Output file appends **_remap_controller_video** to the file name.

```
Output file name: SavedConfig.txt_remap_controller_video
```

- c. Check to ensure that the script completed successfully. If no output file is created or the size of the output file is 0 byte, then check script output for error messages.

5. **Modify the remapped configuration file to specify the Cisco IOS XE Bengaluru 17.6.1z1 image in the boot parameter.**

```
boot system harddisk:cbrsup-universalk9.17.06.01z1.SPA.bin
```

- Copy the final remapped configuration file back to the cBR-8 harddisk.

```
Router#copy scp:<path>/SavedConfig.txt_remap_controller harddisk:
```

or

```
Router#copy scp:<path>/SavedConfig.txt_remap_controller_video harddisk:
```

- Copy remapped configuration file to startup of the cBR-8.

```
Router#copy harddisk:SavedConfig.txt_remap_controller startup-config
```

or

```
Router#copy harddisk:SavedConfig.txt_remap_controller_video startup-config
```

After performing the remapping procedure, monitor the chassis for any of the following errors after reload:

```
Mismatches TE interface. DS controller should be */*/0~7, configuration failed.
Mismatches TE interface. DS controller should be */*/8~15, configuration failed.
Mismatches TE interface. DS controller should be */*/16~23, configuration failed.
Mismatches TE interface. DS controller should be */*/24~31, configuration failed.
```

Upgrading using reload

Before you begin



Note If you are upgrading from Cisco IOS XE Everest 16.6.x or Cisco IOS XE Fuji 16.7.x to Cisco IOS XE Bengaluru 17.6.1z1, perform [Manual ROMMON Upgrade](#) to upgrade SUP ROMMON manually before proceeding with IOS upgrading.

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

- Download two files from the following Cisco.com Software Center URL:

<https://software.cisco.com/download/home/286283913/type>

- IOS XE Software Version 17.6.1z1: **cbrsup-universalk9.17.06.01z1.SPA.bin**
- IOS XE Hardware Programmable Devices Version 17.6.1z1: **cbrsup-programmable_firmware.17.06.01z1.SPA.pkg**

Step 1 Copy Cisco IOS XE Bengaluru 17.6.1z1 package to harddisk: and stby-harddisk:

```
copy <location>/cbrsup-universalk9.17.06.01z1.SPA.bin harddisk:
copy <location>/cbrsup-universalk9.17.06.01z1.SPA.bin stby-harddisk:
```

Step 2 Verify Cisco IOS XE Bengaluru 17.6.1z1 package against the md5 hash as provided in the Cisco.com Software center.

```
verify /md5 harddisk:cbrsup-universalk9.17.06.01z1.SPA.bin
```

```
verify /md5 stby-harddisk:cbrsup-universalk9.17.06.01z1.SPA.bin
```

Step 3 Copy the hardware programmable devices upgrade package to harddisk: if the file has not been copied already.

```
copy <location>/cbrsup-programmable_firmware.17.06.01z1.SPA.pkg harddisk:
```

Step 4 Verify the hardware programmable devices upgrade package against the md5 hash as provided in the Cisco.com Software center.

```
verify /md5 harddisk:cbrsup-programmable_firmware.17.06.01z1.SPA.pkg
```

Step 5 Configure the chassis to boot the system with Cisco IOS XE Bengaluru 17.6.1z1 image.

- a. Use the following steps if you do not use cBR CCAP 8x10G Remote PHY Digital Physical Interface Card (D-PIC) with CBR-CCAP-LC-40G-R linecards.

```
configure terminal
no boot system
boot system harddisk:cbrsup-universalk9.17.06.01z1.SPA.bin
config-register 0x2102
end
write mem
```

- b. Use the following steps if you use cBR CCAP 8x10G Remote PHY Digital Physical Interface Card (D-PIC) with CBR-CCAP-LC-40G-R linecards.

```
configure terminal
config-register 0x2102
end
```

Step 6 Check line card CPLD version via **show platform**. If it is not the minimum version 00000026, upgrade line card CPLD following the sub steps below. Otherwise skip this step.

Note To upgrade the line card CPLD to version 00000026, the cBR-8 must be running Cisco IOS XE Gibraltar 16.12.1 or later releases.

This procedure will trigger a reload of the linecard and will cause an outage if the system is not backed up with LCHA.

Do not power cycle the cBR-8 router during the firmware upgrade process. Power cycling the chassis may corrupt the ROMMON/Uboot image.

- a) 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 0
Daggits pre-upgrade successful
```

- b) Upgrade the line card CPLD 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:

```
Router# upgrade hw-programmable cable 0 daggit pkg_name
/harddisk/cbrsup-programmable_firmware.17.06.01z1.SPA.pkg
```

- c) 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 0
```

- d) The line card moves from **booting** to **active** state. Check the version of the line card using the **show platform** command to make sure version is changed to 00000026.

Example:

```
Router#show platform
.....
Slot      CPLD Version      Rommon Version
-----
0         00000026         2011.03.18
...
```

- e) 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 0
SUCCESS: Daggit_ver-38 : Booted from upgradable Image-1
```

Step 7

Check the firmware version of the Docsis 3.1 downstream modules in all slots, if it is different with the version listed in [Table 2: Firmware Versions, on page 26](#), update the firmware using the following command. Otherwise skip this step.

```
upgrade hw-programmable cable slot dsphy all pkg_name firmware_pkg_location_path
```

Example:

```
Router# upgrade hw-programmable cable 0 dsphy all pkg_name
/harddisk/cbrsup-programmable_firmware.17.06.01z1.SPA.pkg
```

Step 8

Wait for the system log message asking the user to reload the line card that was upgraded.

```
001860: Jun 15 19:05:05.904 PDT: %IOSXE-5-PLATFORM: CLC0: cdman: Suggest reload the line card for
new FW to take effect using CLI: hw slot <slot-id> reload
```

Step 9 Reload the system.

```
Router#reload
```

During reload, monitor the chassis for any of the following errors, and update the configuration accordingly.

```
Mismatches TE interface. DS controller should be */*/0~7, configuration failed.
Mismatches TE interface. DS controller should be */*/8~15, configuration failed.
Mismatches TE interface. DS controller should be */*/16~23, configuration failed.
Mismatches TE interface. DS controller should be */*/24~31, configuration failed.
```

Step 10 If the system is running with SUP250, perform **no shut** on 100G interface after the system comes up for the first time.

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.
- 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 ospf neighbor**
- **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 inventory**

Upgrading with ISSU for I-CCAP Systems

Before you begin



Note

- ISSU is not supported for Remote PHY systems.
- ISSU to Cisco IOS XE Bengaluru 17.6.1z1 is supported only from Cisco IOS XE Gibraltar 16.10.1g and later releases. If you are upgrading from an earlier release, you must upgrade the cBR-8 system following the steps in [Upgrading using reload, on page 6](#).
- ISSU is not supported from 17.6.1z.

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

- The cBR-8 has two SUPs installed.

```
Router# show redundancy | include Location|state
      Active Location = slot 4
      Current Software state = ACTIVE
      Uptime in current state = 2 days, 21 hours, 37 minutes
      Standby Location = slot 5
      Current Software state = STANDBY HOT
      Uptime in current state = 2 days, 21 hours, 30 minutes
```

- Standby SUP must be in hot standby state.

```
Router# show redundancy | include Location|state
      Active Location = slot 4
      Current Software state = ACTIVE
      Uptime in current state = 2 days, 21 hours, 37 minutes
      Standby Location = slot 5
      Current Software state = STANDBY HOT
      Uptime in current state = 2 days, 21 hours, 30 minutes
```

- Line card redundancy is in stable state with state Active and Stdby warm.

```
Router# show redundancy linecard all
Load for five secs: 14%/1%; one minute: 8%; five minutes: 8%
Time source is NTP, 15:23:26.697 PST Thu Jan 17 2019
```

Slot	Subslot	LC Group	My State	Peer State	Peer Slot	Peer Subslot	Role	Mode
1	-	0	Active	Stdby Warm	0	-	Active	Primary
2	-	0	Active	Stdby Warm	0	-	Active	Primary
3	-	0	Active	Stdby Warm	0	-	Active	Primary

```

6 - 0 Active Stdbby Warm 0 - Active Primary
0 - 0 - - Multiple None Standby Secondary

```

- Auto-boot is enabled.

```

Router# show bootvar
Load for five secs: 14%/0%; one minute: 14%; five minutes: 10%
Time source is NTP, 15:46:59.837 PST Thu Jan 17 2019

```

```

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

```

```

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

```

- Both SUPs are in the sub-package mode, running the same image from the same path.

```

Router# show bootvar
Load for five secs: 14%/0%; one minute: 14%; five minutes: 10%
Time source is NTP, 15:46:59.837 PST Thu Jan 17 2019

```

```

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

```

```

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

```

- The free space on boot device on both SUPs must be greater than 2GB.

```

Router# dir harddisk: | include bytes total

7804653568 bytes total (5691174912 bytes free)

```

- Download two files from the following Cisco.com Software Center URL:

<https://software.cisco.com/download/home/286283913/type>

- IOS XE Software Version 17.6.1z1: **cbrsup-universalk9.17.06.01z1.SPA.bin**
- IOS XE Hardware Programmable Devices Version 17.6.1z1:
cbrsup-programmable_firmware.17.06.01z1.SPA.pkg

- Copy the target consolidated image **cbrsup-universalk9.17.06.01z1.SPA.bin** to the active SUP in the same directory of the **packages.conf** file that the system is booted up with.

Step 1

Copy Cisco IOS XE Bengaluru 17.6.1z1 package to harddisk:

```
copy <location>/cbrsup-universalk9.17.06.01z1.SPA.bin harddisk:<sub-pkg-dir>/
```

Step 2 Verify Cisco IOS XE Bengaluru 17.6.1z1 package against the md5 hash as provided in the Cisco.com Software center.

```
verify /md5 harddisk:<sub-pkg-dir>/cbrsup-universalk9.17.06.01z1.SPA.bin
```

Step 3 Copy the hardware programmable devices upgrade package to harddisk: if the file has not been copied already.

```
copy <location>/cbrsup-programmable_firmware.17.06.01z1.SPA.pkg harddisk:
```

Step 4 Verify the hardware programmable devices upgrade package against the md5 hash as provided in the Cisco.com Software center.

```
verify /md5 harddisk:cbrsup-programmable_firmware.17.06.01z1.SPA.pkg
```

Step 5 Check system status prior to upgrade. Save the information to compare against the system status after upgrade. For the commands to use to check the status, see the **show** commands at the end of this section.

Step 6 Check line card CPLD version via **show platform**. If it is not the minimum version 00000026, upgrade line card CPLD following the sub steps below. Otherwise skip this step.

Note To upgrade the line card CPLD to version 00000026, the cBR-8 must be running Cisco IOS XE Gibraltar 16.12.1 or later releases.

This procedure will trigger a reload of the linecard and will cause an outage if the system is not backed up with LCHA.

Do not power cycle the cBR-8 router during the firmware upgrade process. Power cycling the chassis may corrupt the ROMMON/Uboot image.

a) 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 0
Daggits pre-upgrade successful
```

b) Upgrade the line card CPLD 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:

```
Router# upgrade hw-programmable cable 0 daggit pkg_name
/harddisk/cbrsup-programmable_firmware.17.06.01z1.SPA.pkg
```

c) 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 0
```

- d) The line card moves from **booting** to **active** state. Check the version of the line card using the **show platform** command to make sure version is changed to 00000026.

Example:

```
cBR8#show platform
.....
Slot      CPLD Version      Rommon Version
-----
0         00000026         2011.03.18
...
```

- e) 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 0
SUCCESS: Daggit_ver-38 : Booted from upgradable Image-1
```

Step 7

Check the firmware version of the Docsis 3.1 downstream modules in all slots, if it is different with the version listed in [Table 2: Firmware Versions, on page 26](#), update the firmware using the following command. Otherwise skip this step.

```
upgrade hw-programmable cable slot dsphy all pkg_name firmware_pkg_location_path
```

Example:

```
Router# upgrade hw-programmable cable 0 dsphy all pkg_name
/harddisk/cbrsup-programmable_firmware.17.06.01z1.SPA.pkg
```

Step 8

Wait for the system log message asking the user to reload the line card that was upgraded. But do not reload the line card at this time.

```
001860: Jun 15 19:05:05.904 PDT: %IOSXE-5-PLATFORM: CLC0: cdman: Suggest reload the line card for
new FW to take effect using CLI: hw slot <slot-id> reload
```

Step 9

Perform ISSU.

```
request platform software package install node file harddisk:cbrsup-universalk9.17.06.01z1.SPA.bin
```

Step 10

To monitor the ISSU progress, use the command below.

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

Step 11

Use these CLI to check status after ISSU.

```
show version
show version r0 running
show version r1 running
show version r0 provisioned
show version r1 provisioned
```

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.
- 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 ospf neighbor**
- **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 inventory**

Upgrading Supervisor CPLD Firmware

Before you begin



Note If the supervisor SO CPLD version is lower than 1511_1401 (SUP 160) or 15111401 (SUP 250), or, if the supervisor SIO CPLD version is lower than 1511_1301 (SUP 160) or 15111301 (SUP 250), physically power cycle the chassis when upgrading the supervisor CPLD.

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

- Cisco cBR-8 router is running with Cisco IOS XE Gibraltar 16.12.1w or later releases.
- 2 supervisors are running in the Cisco cBR-8 router and the redundancy is enabled.
- Download the file from the following Cisco.com Software Center URL:

<https://software.cisco.com/download/home/286283913/type>

- IOS XE Hardware Programmable Devices Version 17.6.1z1:
cbrsup-programmable_firmware.17.06.01z1.SPA.pkg

- Console access for both supervisors are required.
- Copy the new firmware package to the cBR-8 using FTP.

```
copy ftp://<location>/cbrsup-programmable_firmware.17.06.01z1.SPA.pkg harddisk:
copy ftp://<location>/cbrsup-programmable_firmware.17.06.01z1.SPA.pkg stby-harddisk:
```



Note When upgrading SUP0, run the CLI with the R0 setting while controlling SUP0. And when upgrading SUP1, run the CLI with the R1 setting.



Note This guide assumes SUP0 is in active state and SUP1 is in standby hot state at the beginning.

Perform step 1 to 4 using console connection of active SUP0:

Step 1

Set the config register.

```
configure terminal
config-register 0x2102
end
write memory
```

Step 2

Run the following command to prepare for R0 upgrade.

```
upgrade hw-programmable cable R0 viper pkg_name
/harddisk/cbrsup-programmable_firmware.17.06.01z1.SPA.pkg
```

On SUP 250, you will see one of the following outputs:

- It takes 10~20 minutes to upgrade. Console would hung. Please don't do any operation during the upgrade.
You are upgrading Viper firmware using harddisk/cbrsup-programmable_firmware.17.06.01z1.SPA.pkg image on SUP0, SUP0 is active.
Upgrade from assigned pkg file harddisk/cbrsup-programmable_firmware.17.06.01z1.SPA.pkg
Using viper firmware /tmp/viper/mount/supve_viper_fpga_psirt.bin
Size of Viper Upgrade image: 16777216 bytes
No.of parts: 65536
Upgrading golden image...
65536+0 records in
65536+0 records out
16777216 bytes (17 MB, 16 MiB) copied, 688.873 s, 24.4 kB/s
Upgrading primary image...
65536+0 records in
65536+0 records out
16777216 bytes (17 MB, 16 MiB) copied, 675.19 s, 24.8 kB/s
Viper upgrade clean up 0
Upgrade successfully. Please make sure Rommon version is matched.
Please power cycle the chassis to let the new firmware take effect
- It takes 10~20 minutes to upgrade. Console would hung. Please don't do any operation during the upgrade.
You are upgrading Viper firmware using harddisk/cbrsup-programmable_firmware.17.06.01z1.SPA.pkg image on SUP0, SUP0 is active.
Upgrade from assigned pkg file harddisk/cbrsup-programmable_firmware.17.06.01z1.SPA.pkg
The golden viper is not compatible with assigned firmware
/tmp/viper/mount/supve_viper_fpga_psirt.bin, no upgrade will be performed
Viper upgrade clean up 2

Note This output means the SUP already has the latest version it can support, skip the rest of the steps.

On SUP 160, you will see one of the following outputs:

- It takes about 10 minutes to upgrade. Console would hung. Please don't do any operation during the upgrade.
You are upgrading Viper firmware using harddisk/cbrsup-programmable_firmware.17.06.01z1.SPA.pkg image
Upgrade from assigned pkg file /harddisk/cbrsup-programmable_firmware.17.06.01z1.SPA.pkg
Using viper firmware /tmp/viper/mount/viper_fpga.bin
Size of Viper Upgrade image: 16777216 bytes
No.of parts: 65536
65536+0 records in
65536+0 records out
Viper upgrade clean up 0
Upgrade successfully. Please make sure Rommon version is matched.
Please power cycle the chassis to let the new firmware take effect
- It takes 10~20 minutes to upgrade. Console would hung. Please don't do any operation during the upgrade.
You are upgrading Viper firmware using harddisk/cbrsup-programmable_firmware.17.06.01z1.SPA.pkg image on SUP0, SUP0 is active.
Upgrade from assigned pkg file harddisk/cbrsup-programmable_firmware.17.06.01z1.SPA.pkg
The golden viper is not compatible with assigned firmware
/tmp/viper/mount/supve_viper_fpga_psirt.bin, no upgrade will be performed
Viper upgrade clean up 2

Note This output means the SUP already has the latest version it can support, skip the rest of the steps.

Note Do not power cycle the chassis in this step.

Step 3 Run the following command to prepare for R1 upgrade.

```
upgrade hw-programmable cable R1 viper pkg_name
/harddisk/cbrsup-programmable_firmware.17.06.01z1.SPA.pkg
```

You will see the similar output as the one in Step 2.

Note Do not power cycle the chassis in this step.

Step 4 If the supervisor ViperSO CPLD version is 15111401 and the supervisor ViperSIO CPLD version is 15111301 on both supervisors, follow step 5 - 11 to do the upgrade. Otherwise proceed to step 12.

```
Router#show platform diag
Load for five secs: 6%/1%; one minute: 7%; five minutes: 8%
Time source is NTP, 16:05:43.546 PST Thu Feb 8 2018
Chassis type: CBR-8-CCAP-CHASS
<SNIP>
Slot: SUP0, CBR-CCAP-SUP-160G
  Physical insert detect time : 00:01:58 (1d03h ago)
  CPLD version                 : 16052011
  ViperSO CPLD version       : 15111401
  ViperSIO CPLD version     : 15111301
  Rommon version              : 16.7(1r)S
  Blackbird version          : 00000112
  Raptor ESI version         : 0001003b
  Raptor MAC version        : 00010031
  SUP-PIC CPLD version       : 14071504
  SUP-DC CPLD version        : 14072207
  DTI Client FPGA version    : 00000005
  DTI Firmware version       : 00000A03
  Cortina PHY version        : 201402061607
  SUP PSOC 0 version         : v4.0.9
  SUP PSOC 1 version         : v4.0.8
  SUP PSOC 2 version         : v4.1.0_IVB
  SUP PSOC 3 version         : v4.0.6
  SUP-DC PSOC 0 version      : v4.0.8
  SUP-DC PSOC 1 version      : v4.0.5
  SUP-PIC PSOC 0 version     : V2.0.6
  SUP-PIC PSOC 1 version     : V2.0.6
<SNIP>
Slot: SUP1, CBR-CCAP-SUP-160G
  Physical insert detect time : 00:02:26 (1d03h ago)
  CPLD version                 : 16052011
  ViperSO CPLD version       : 15111401
  ViperSIO CPLD version     : 15111301
  Rommon version              : 16.7(1r)S
  Blackbird version          : 00000112
  Raptor ESI version         : 0001003b
  Raptor MAC version        : 00010031
  SUP-PIC CPLD version       : 14071504
  SUP-DC CPLD version        : 14072207
  DTI Client FPGA version    : 00000005
  DTI Firmware version       : 00000A03
  Cortina PHY version        : 201402061607
  SUP PSOC 0 version         : v4.0.9
  SUP PSOC 1 version         : v4.0.8
  SUP PSOC 2 version         : v4.1.0_IVB
  SUP PSOC 3 version         : v4.0.6
```

```

SUP-DC PSOC 0 version      : v4.0.9
SUP-DC PSOC 1 version      : v4.0.5
SUP-PIC PSOC 0 version     : V3.0.0
SUP-PIC PSOC 1 version     : V3.0.0
<SNIP>

```

Step 5 Set SUP0 to ROMMON using the following command.

```
redundancy force-switchover
```

Perform the following steps 6 to 7 using console connection of current active SUP1.

Step 6 Power cycle the SUP0 to set it to ROMMON.

```
test platform hardware slot R0 oir power-cycle
```

This command will reset and re-initialize the ROMMON. The new version of the supervisor CPLD will now take effect. Verify if it matches the following new version.

SUP 160 new version: 0x19071712

SUP 250 new version: 0x190717E1

Step 7 Boot SUP0 into IOS XE using SUP0 console connection.

```
dir harddisk:
boot harddisk:cbrsup-universalk9.17.06.01z1.SPA.bin
```

Wait until SUP0 is in standby hot.

Step 8 Set SUP1 to ROMMON using the following command.

```
redundancy force-switchover
```

Perform the following steps 9 to 11 using console connection of current active SUP0.

Step 9 Power cycle the SUP1 to set it to ROMMON.

```
test platform hardware slot R1 oir power-cycle
```

This command will reset and re-initialize the ROMMON. The new version of the supervisor CPLD will now take effect. Verify if it matches the following new version.

SUP 160 new version: 0x19071712

SUP 250 new version: 0x190717E1

Step 10 Boot SUP1 into IOS XE using SUP1 console connection.

```
dir harddisk:
boot harddisk:cbrsup-universalk9.17.06.01z1.SPA.bin
```

Wait until SUP1 is in standby hot.

Step 11 Wait for the chassis to become SSO and settled down. Then go to step 16. If you skipped step 5 to 10, perform step 12 to 15.

Note You need physical access to the chassis to power cycle the chassis.

Step 12 Reload the system by issuing **reload** command on the active SUP.

```
Router#reload
```

Step 13 Power cycle both supervisors.

Step 14 Verify if the new version matches the following on both SUPs.

```
SUP 160 new version: 0x19071712
```

```
SUP 250 new version: 0x190717E1
```

Step 15 Boot both SUP0 and SUP1 into IOS XE using SUP0 and SUP1 console.

```
dir harddisk:  
boot harddisk:cbrsup-universalk9.17.06.01z1.SPA.bin
```

Wait till SUP0 become standby hot.

Step 16 Once the system is up and running, perform the following checks.

- Set config register to normal boot.

```
configure terminal  
config-register 0x2102  
end  
write memory
```

- Execute **show redundancy** command to ensure both SUPs are listed, one is active and the other is standby hot.
- Execute **show proc CPU sorted | ex 0.00** command.
- Execute **show platform diag** command.

Upgrading cBR CCAP 8x10G Remote PHY Digital Physical Interface Card

Before you begin

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

- Make sure the latest available IOS XE version is active in Cisco cBR-8 router.
- There are at least 20MB free space on the harddisk.



Note To make use of the new features, it is recommended to upgrade the cBR CCAP 8x10G Remote PHY Digital Physical Interface Card (D-PIC) to the latest version 1.1.

Step 1 Boot up system, wait until IOS is ready.

Step 2 Check current D-PIC version.

```
show hw-module subslot x/1 fpd
```

Note x/1 is D-PIC subslot number which needs upgrade.

Example:

```
Router#show hw-module subslot 9/1 fpd
```

```
==== =====
Slot Card Type                H/W   Field Programmable   Current   Min. Required
                               Ver.   Device: "ID-Name"   Version   Version
==== =====
  9/1 CBR-DPIC-8X10G          1.0   46-CBR DIGI PIC     1.0       1.0
==== =====
```

Step 3 Upgrade D-PIC.

```
upgrade hw-module subslot x/1 fpd bundled reload
```

Example:

```
Router#upgrade hw-module subslot 9/1 fpd bundled reload
```

```
% The following FPD will be upgraded for CBR-DPIC-8X10G (H/W ver = 1.0) in subslot 9/1:
```

```
=====
Field Programmable   Current   Upgrade   Estimated
Device: "ID-Name"   Version   Version   Upgrade Time
=====
46-CBR DIGI PIC     1.0       1.1       00:05:00
=====
```

```
% NOTES:
```

- Use 'show upgrade fpd progress' command to view the progress of the FPD upgrade.
- The target card will be automatically reloaded after the upgrade operation. This reload will interrupt normal operation of the card. If necessary, ensure that appropriate actions have been taken to redirect card traffic before starting the FPD upgrade.

```
% Are you sure that you want to perform this operation? [no]: yes
```

```
% Initiating the upgrade operation on the target card ...
```

```
(Use "show upgrade fpd progress" command to see upgrade progress)
```

Step 4 Check if the upgrade process is finished. Upgrade progress will take about 1 to 2 minutes.

```
show upgrade fpd progress
```

Example:

Upgrade still ongoing:

Router#show upgrade fpd progress

FPD Image Upgrade Progress Table:

```

=====
Slot Card Type          Field Programmable      Approx.
                        Device : "ID-Name"      Time      Elapsed
                        Needed      Time      State
=====
 9/1 CBR-DPIC-8X10G     46-CBR DIGI PIC       00:05:00  00:00:13  Updating...
=====
    
```

Router# show upgrade fpd progress

FPD Image Upgrade Progress Table:

```

=====
Slot Card Type          Field Programmable      Approx.
                        Device : "ID-Name"      Time      Elapsed
                        Needed      Time      State
=====
 9/1 CBR-DPIC-8X10G     46-CBR DIGI PIC       00:05:00  00:00:26  Updating...
=====
    
```

Upgrade finished:

Router#show upgrade fpd progress

% There is no FPD image upgrade in progress.

Step 5 Check if the D-PIC status is ready.

show platform

Example:

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

Slot	Type	State	Insert time (ago)
2/1	CBR-RF-PROT-PIC	ok	00:08:48
3	CBR-CCAP-LC-40G	ok	00:12:46
3/1	CBR-RF-PIC	ok	00:08:48
8/1	CBR-DPIC-8X10G	ok	00:07:56
9	CBR-CCAP-LC-40G	ok	00:12:46
9/1	CBR-DPIC-8X10G	ok	00:07:54
SUP0	CBR-CCAP-SUP-160G	inserted	00:12:46
R0		ok, active	
F0		ok, active	
4		ok, active	
4/1	CBR-SUP-8X10G-PIC	ok	00:07:55
SUP1	CBR-CCAP-SUP-160G	inserted	00:12:22
R1		ok, standby	
F1		ok, standby	
5		ok, standby	
5/1	CBR-SUP-8X10G-PIC	ok	00:07:54
P0	PWR-3KW-AC-V2	ok	00:09:49
P1	PWR-3KW-AC-V2	ok	00:09:49
P2	PWR-3KW-AC-V2	ps, fail	00:09:49
P3	Unknown	N/A	never
P4	Unknown	N/A	never
P5	PWR-3KW-AC-V2	ok	00:09:49
P10	CBR-FAN-ASSEMBLY	ok	00:09:39
P11	CBR-FAN-ASSEMBLY	ok	00:09:39
P12	CBR-FAN-ASSEMBLY	ok	00:09:39

```
P13      CBR-FAN-ASSEMBLY  ok          00:09:39
P14      CBR-FAN-ASSEMBLY  ok          00:09:39
```

```
Slot      CPLD Version      Rommon Version
-----
3         00000025           2011.03.18
9         00000025           2011.03.18
SUP0     16052011           16.7(3r)S
SUP1     16052011           16.7(3r)S
```

Step 6 Check if the new version works.

```
show hw-module subslot x/1 fpd
```

Example:

```
Router#show hw-module subslot 9/1 fpd
```

```
====
Slot Card Type          H/W   Field Programmable   Current   Min. Required
Ver.   Device: "ID-Name"   Version   Version
====
 9/1 CBR-DPIC-8X10G      1.0   46-CBR DIGI PIC      1.1      1.0
====
```

Upgrading Uboot For CBR-CCAP-LC-40G

Step 1 Copy the package file (cbrsup-programmable_firmware.17.06.01z1.SSA.pkg) to the active SUP's harddisk.

```
copy <location>/cbrsup-programmable_firmware.17.06.01z1.SPA.pkg harddisk:
```

Step 2 Upgrade Uboot using the following CLI command:

```
upgrade hw-programmable cable <slot#> rommon pkg_name
harddisk/cbrsup-programmable_firmware.17.06.01z1.SSA.pkg
```

Example:

```
Router#upgrade hw-programmable cable <slot#> rommon pkg_name
harddisk/cbrsup-programmable_firmware.17.06.01z1.SSA.pkg
UBOOT:
  FILE      : /tmp/fpd/mount/uboot.bin.SPA
  VERSION   : U-Boot 2011.03.19
  BYTES     : 1441792
  Upgrade Field Region: SUCCESS! Please reload the card to let the new firmware take effect.
```

Step 3 Reload Line Card using the following CLI command:

```
Router#hw-module slot <slot#> reload
```

Step 4 Check the Uboot version after LC boot up using the following CLI command:

```
show platform diag
```

Example:

```
Router# show platform diag
...
Slot: 1, CBR-CCAP-LC-40G
```

```
Running state           : ok
Internal state         : online
Internal operational state : ok
Physical insert detect time : 00:03:11 (5d11h ago)
Software declared up time  : 00:07:46 (5d11h ago)
CPLD version           : 00000025
Rommon version        : 2011.03.19
Basestar version       : 00200057
Raider version         : 02010019
dsphy0_fpga version    : 4.484B
dsphy0_micro version   : 3.1A
dsphy0_psoc version    : 4.4
dsphy0_cpld version    : 0.7
dsphyl_fpga version    : 4.484B
dsphyl_micro version   : 3.1A
dsphyl_psoc version    : 4.4
dsphyl_cpld version    : 0.7
Caprica version        : 0002000a
HA-PLL version         : N/A
PSOC 0 version         : v4.6
PSOC 1 version         : v4.6
```

...



CHAPTER 2

Upgrading the Cisco cBR-8 Router System to Cisco IOS XE Bengaluru 17.6.1z



Note Starting from Cisco IOS XE Bengaluru 17.6.1a, CBR-CCAP-LC-G2-R can only protect CBR-CCAP-LC-G2-R for linecard HA.



Note If you are using TACACS authentication, the TACACS configuration will be automatically updated to the new version after upgrading to Cisco IOS XE Bengaluru 17.6.1z. This is a fix to [CSCvu62273](#) and you do not need to take any action regarding the TACACS configuration in the cBR-8 prior to the upgrade.

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

By default, telnet is disabled on Cisco cBR-8. If you are going to use telnet to access the device, make sure the value of line **vtty transport** is correct and save the configuration in order to enable telnet.

```
Router# show run | begin line vty
line vty 0 4
  exec-timeout 0 0
  privilege level 15
  password 7 104D081B094410055F
  exec prompt timestamp
  transport input all
line vty 5 98
  exec-timeout 0 0
  privilege level 15
  password 7 02050D480809
  transport input all
line vty 99
  transport input all
!
```

The following table encompasses all versions that customers are required to update to support Cisco IOS XE Bengaluru 17.6.1z. All other firmware versions are either not upgradable by the customer, or not required to be upgraded for Cisco IOS XE Bengaluru 17.6.1z support. Use the commands in the tables to verify the firmware versions. If you need to upgrade firmware first, refer to the steps in [Upgrading the Cisco cBR-8 Router Firmware](#).



Note If you want to upgrade Supervisor CPLD firmware, refer to [Upgrading Supervisor CPLD Firmware](#), on page 38.

Table 2: Firmware Versions

Internal Name	Component Name	Required Minimum Version	Command
Supervisor CPLD	CBR-CCAP-SUP-160G CPLD	16052011/19071712	show platform
	CBR-CCAP-SUP-250G CPLD	170724E0/190717E1	show platform
Supervisor ROMMON	CBR-CCAP-SUP-160G ROMMON and CBR-CCAP-SUP-250G ROMMON	16.7(8r)S	show platform
Line Card CPLD	CBR-CCAP-LC-40G CPLD	00000026	show platform diag
Docsis 3.1 downstream module Micro	CBR-CCAP-LC-40G Gemini2 Micro	3.1A	show platform diag
Docsis 3.1 downstream module FPGA	CBR-CCAP-LC-40G Gemini2 Apollo	4.484F	show platform diag
DPIC Uboot and FPGA	CBR-DPIC-8X10G Firmware	00010001	show platform diag
DPIC 100G Uboot and FPGA	CBR-DPIC-2X100G Firmware	00020006	show platform diag



Note If the user wants to upgrade Supervisor CPLD to version 19071712 and 190717E1, the chassis must be running with Cisco IOS XE Gibraltar 16.12.1w or later releases.



Note Cisco recommends that operators upgrade their On-Premise SSM Satellite software versions to v7.x or later releases, to ensure the compatibility with cBR-8.

- [Verify max-carrier value](#), on page 27
- [Upgrading from Cisco IOS XE 16.x and later releases to Cisco IOS XE Bengaluru 17.6.1z](#), on page 28
- [Upgrading Supervisor CPLD Firmware](#), on page 38

- [Upgrading cBR CCAP 8x10G Remote PHY Digital Physical Interface Card, on page 43](#)

Verify max-carrier value

Currently in Remote PHY system, max-carrier value can be configured in the downstream controller profile as well as in RPD configuration for Cisco Remote PHY Shelf 300/600/7200. This may lead to inconsistent max-carrier value configurations.

Starting from Cisco IOS XE Gibraltar 16.10.1f, max-carrier value configured in the **cable rpd** mode is removed and RPD will use the max-carrier value configured in the **controller-profile** mode for the power calculation.

Before upgrading to Cisco IOS XE Gibraltar 16.10.1f or later releases, verify if the max-carrier values configured in the RPD shelf configuration and downstream controller profile(s) associated to RPD downstream port are the same. If they are different, update the cBR-8 configuration prior to upgrade.

Below is an example of correct configuration before upgrade.

```
cable downstream controller-profile 1
  max-carrier 128
  max-ofdm-spectrum 384000000
  rf-chan 0 3
    type DOCSIS
    qam-profile 1
    frequency 381000000
    rf-output NORMAL
    docsis-channel-id 1

cable downstream controller-profile 2
  max-carrier 158
  max-ofdm-spectrum 384000000
  rf-chan 158
    docsis-channel-id 159
    ofdm channel-profile 20 start-frequency 579000000 width 48000000 plc 600000000

cable rpd test
  identifier 0001.0001.0001
  type shelf
  rpd-ds 0 max-carrier 128
  rpd-ds 0 base-power 33
  rpd-ds 1 max-carrier 158
  rpd-ds 1 base-power 25
  core-interface Te9/1/0
    rpd-ds 0 downstream-cable 9/0/3 profile 1
    rpd-ds 0 downstream-cable 9/0/4 profile 2
    rpd-us 0 upstream-cable 9/0/3 profile 1
  r-dti 1
  rpd-event profile 0
  rpd-55d1-us-event profile 0
```



Note It is highly recommended to follow this example to check and update configuration if necessary because max-carrier value is used to compute the base power. Otherwise, after upgrade the expected base power value can be different which may affect cable modem coming online.



Note If you upgrade from a version lower than Cisco IOS XE Fuji 16.9.1, base power range may be changed on the port with OFDM channel configured. So be aware of the potential base power change before and after the upgrade.

Upgrading from Cisco IOS XE 16.x and later releases to Cisco IOS XE Bengaluru 17.6.1z

If you are upgrading from Cisco IOS XE Everest 16.6.x or Cisco IOS XE Fuji 16.7.x to Cisco IOS XE Bengaluru 17.6.1z, perform the following steps to upgrade SUP ROMMON manually. Otherwise proceed with the IOS upgrade.

1. Download hardware programmable devices upgrade package file **cbrsup-programmable_firmware.17.06.01z.SPA.pkg** from the following Cisco.com Software Center URL: <https://software.cisco.com/download/home/286283913/type>

2. Copy the package file to harddisk:

```
copy <location>/cbrsup-programmable_firmware.17.06.01z.SPA.pkg harddisk:
```

3. Verify the hardware programmable devices upgrade package against the md5 hash as provided in the Cisco.com Software center.

```
verify /md5 harddisk:cbrsup-programmable_firmware.17.06.01z.SPA.pkg
```

4. Upgrade SUP ROMMON.

```
Router#Upgrade rom-mon file harddisk:cbrsup-programmable_firmware.17.06.01z.SPA.pkg r0
Wait for the following output on the console:
ROMMON upgrade complete.
To make the new ROMMON permanent, you must restart the RP
```

```
Router#Upgrade rom-mon file harddisk:cbrsup-programmable_firmware.17.06.01z.SPA.pkg r1
Wait for the following output on the console:
ROMMON upgrade complete.
To make the new ROMMON permanent, you must restart the RP
```



Note Do not restart the SUPs currently, you can combine reloading the SUP with the IOS upgrade process.

If you are using cBR CCAP 8x10G Remote PHY Digital Physical Interface Card (D-PIC) with CBR-CCAP-LC-G2-R linecards, before upgrading to Cisco IOS XE Bengaluru 17.6.1z, contact your local Cisco representative to get the python tool and perform the following steps in order to predict and avoid downtime. This python tool is developed by Cisco, it is used to analyze the cBR-8 configuration file to determine if the configuration file includes non-compliant TenGigabitEthernet interface to downstream controller mappings, and update the configuration file to be compliant with the latest Cisco IOS XE Bengaluru 17.6.1z.

1. Collect the following information from the target cBR-8 to upgrade.


```
Router#show cable rpd sum
Router#show cable modem sum
Router#show cable video session all sum
```

2. Save the running configuration to the harddisk of the cBR-8.

```
Router#copy running-config harddisk:SavedConfig.txt
```

3. Copy the saved running configuration from harddisk: to an offline server for editing using SCP.

```
Router#copy harddisk:SavedConfig.txt scp:<path>
```

4. Run the python tool to modify the controllers in the saved configuration.

- Option 1 - Renumber Downstream-Cable controllers only

- a. Execute python script **kobol_ph2_controller_migration.py**. This script is intended for customers who do not immediately intend to take advantage of the Downstream-Video controllers and expanded SG capacity on CBR-CCAP-LC-G2-R.

```
$ python kobol_ph2_controller_migration.py
Enter the name of the configuration file: SavedConfig.txt
```

- b. Output file appends **_remap_controller** to the file name.

```
Output file name: SavedConfig.txt_remap_controller
```

- c. Check to ensure that the script completed successfully. If no output file is created or the size of the output file is 0 byte, then check script output for error messages.

- Option 2 - Renumber Downstream-Cable and utilize Downstream-Video controllers

- a. Execute python script **kobol_ph2_controller_migration_video.py**. This script is intended for customers who wish to utilize the new Downstream-Video controllers to free up existing Downstream-Cable controllers for expanded DOCSIS service groups.

```
$ python kobol_ph2_controller_migration_video.py
Enter the name of the configuration file: SavedConfig.txt
```

- b. Output file appends **_remap_controller_video** to the file name.

```
Output file name: SavedConfig.txt_remap_controller_video
```

- c. Check to ensure that the script completed successfully. If no output file is created or the size of the output file is 0 byte, then check script output for error messages.

5. **Modify the remapped configuration file to specify the Cisco IOS XE Bengaluru 17.6.1z image in the boot parameter.**

```
boot system harddisk:cbrsup-universalk9.17.06.01z.SPA.bin
```

6. Copy the final remapped configuration file back to the cBR-8 harddisk.

```
Router#copy scp:<path>/SavedConfig.txt_remap_controller harddisk:
```

or

```
Router#copy scp:<path>/SavedConfig.txt_remap_controller_video harddisk:
```

7. Copy remapped configuration file to startup of the cBR-8.

```
Router#copy harddisk:SavedConfig.txt_remap_controller startup-config
```

or

```
Router#copy harddisk:SavedConfig.txt_remap_controller_video startup-config
```

Upgrading using reload

Before you begin



Note If you are upgrading from Cisco IOS XE Everest 16.6.x or Cisco IOS XE Fuji 16.7.x to Cisco IOS XE Bengaluru 17.6.1z, perform [pre-upgrade steps 1 to 4](#) to upgrade SUP ROMMON manually before proceeding with IOS upgrading.

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

- Download two files from the following Cisco.com Software Center URL:

<https://software.cisco.com/download/home/286283913/type>

- IOS XE Software Version 17.6.1z: **cbrsup-universalk9.17.06.01z.SPA.bin**
- IOS XE Hardware Programmable Devices Version 17.6.1z: **cbrsup-programmable_firmware.17.06.01z.SPA.pkg**

Step 1 Copy Cisco IOS XE Bengaluru 17.6.1z package to harddisk: and stby-harddisk:

```
copy <location>/cbrsup-universalk9.17.06.01z.SPA.bin harddisk:
copy <location>/cbrsup-universalk9.17.06.01z.SPA.bin stby-harddisk:
```

Step 2 Verify Cisco IOS XE Bengaluru 17.6.1z package against the md5 hash as provided in the Cisco.com Software center.

```
verify /md5 harddisk:cbrsup-universalk9.17.06.01z.SPA.bin
verify /md5 stby-harddisk:cbrsup-universalk9.17.06.01z.SPA.bin
```

Step 3 Copy the hardware programmable devices upgrade package to harddisk: if the file has not been copied already.

```
copy <location>/cbrsup-programmable_firmware.17.06.01z.SPA.pkg harddisk:
```

Step 4 Verify the hardware programmable devices upgrade package against the md5 hash as provided in the Cisco.com Software center.

```
verify /md5 harddisk:cbrsup-programmable_firmware.17.06.01z.SPA.pkg
```

Step 5 Configure the chassis to boot the system with Cisco IOS XE Bengaluru 17.6.1z image.

- Use the following steps if you do not use cBR CCAP 8x10G Remote PHY Digital Physical Interface Card (D-PIC) with CBR-CCAP-LC-40G-R linecards.

```

configure terminal
no boot system
boot system harddisk:cbrsup-universalk9.17.06.01z.SPA.bin
config-register 0x2102
end
write mem

```

- b. Use the following steps if you use cBR CCAP 8x10G Remote PHY Digital Physical Interface Card (D-PIC) with CBR-CCAP-LC-40G-R linecards.

```

configure terminal
config-register 0x2102
end

```

Step 6

Check line card CPLD version via **show platform**. If it is not the minimum version 00000026, upgrade line card CPLD following the sub steps below. Otherwise skip this step.

Note To upgrade the line card CPLD to version 00000026, the cBR-8 must be running Cisco IOS XE Gibraltar 16.12.1 or later releases.

This procedure will trigger a reload of the linecard and will cause an outage if the system is not backed up with LCHA.

Do not power cycle the cBR-8 router during the firmware upgrade process. Power cycling the chassis may corrupt the ROMMON/Uboot image.

- a) 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 0
Daggit's pre-upgrade successful
```

- b) Upgrade the line card CPLD 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:

```
Router# upgrade hw-programmable cable 0 daggit pkg_name
/harddisk/cbrsup-programmable_firmware.17.06.01z.SPA.pkg
```

- c) 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 0
```

- d) The line card moves from **booting** to **active** state. Check the version of the line card using the **show platform** command to make sure version is changed to 00000026.

Example:

```
Router#show platform
.....
Slot      CPLD Version      Rommon Version
-----
0         00000026         2011.03.18
...
```

- e) 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 0
SUCCESS: Daggit_ver-38 : Booted from upgradable Image-1
```

Step 7

Check the firmware version of the Docsis 3.1 downstream modules in all slots, if it is different with the version listed in [Table 2: Firmware Versions, on page 26](#), update the firmware using the following command. Otherwise skip this step.

```
upgrade hw-programmable cable slot dsphy all pkg_name firmware_pkg_location_path
```

Example:

```
Router# upgrade hw-programmable cable 0 dsphy all pkg_name
/harddisk/cbrsup-programmable_firmware.17.06.01z.SPA.pkg
```

Step 8

Wait for the system log message asking the user to reload the line card that was upgraded.

```
001860: Jun 15 19:05:05.904 PDT: %IOSXE-5-PLATFORM: CLC0: cdman: Suggest reload the line card for
new FW to take effect using CLI: hw slot <slot-id> reload
```

Step 9

Reload the system.

```
Router#reload
```

During reload, monitor the chassis for any of the following errors, and update the configuration accordingly.

```
Mismatches TE interface. DS controller should be */*/0~7, configuration failed.
Mismatches TE interface. DS controller should be */*/8~15, configuration failed.
Mismatches TE interface. DS controller should be */*/16~23, configuration failed.
Mismatches TE interface. DS controller should be */*/24~31, configuration failed.
```

Step 10

If the system is running with SUP250, perform **no shut** on 100G interface after the system comes up for the first time.

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.
- 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 ospf neighbor**
- **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 inventory**

Upgrading with ISSU for I-CCAP Systems

Before you begin



Note ISSU is not supported for Remote PHY systems.



Note ISSU to Cisco IOS XE Bengaluru 17.6.1z is supported only from Cisco IOS XE Gibraltar 16.10.1g and later releases. If you are upgrading from an earlier release, you must upgrade the cBR-8 system following the steps in [Upgrading using reload, on page 30](#).

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

- The cBR-8 has two SUPs installed.

```
Router# show redundancy | include Location|state
      Active Location = slot 4
      Current Software state = ACTIVE
      Uptime in current state = 2 days, 21 hours, 37 minutes
      Standby Location = slot 5
      Current Software state = STANDBY HOT
      Uptime in current state = 2 days, 21 hours, 30 minutes
```

- Standby SUP must be in hot standby state.

```
Router# show redundancy | include Location|state
      Active Location = slot 4
      Current Software state = ACTIVE
      Uptime in current state = 2 days, 21 hours, 37 minutes
      Standby Location = slot 5
      Current Software state = STANDBY HOT
      Uptime in current state = 2 days, 21 hours, 30 minutes
```

- Line card redundancy is in stable state with state Active and Stdbby warm.

```
Router# show redundancy linecard all
Load for five secs: 14%/1%; one minute: 8%; five minutes: 8%
Time source is NTP, 15:23:26.697 PST Thu Jan 17 2019
```

Slot	Subslot	LC Group	My State	Peer State	Peer Slot	Peer Subslot	Role	Mode
1	-	0	Active	Stdbby Warm	0	-	Active	Primary
2	-	0	Active	Stdbby Warm	0	-	Active	Primary
3	-	0	Active	Stdbby Warm	0	-	Active	Primary
6	-	0	Active	Stdbby Warm	0	-	Active	Primary
0	-	0	-	-	Multiple	None	Standby	Secondary

- Auto-boot is enabled.

```
Router# show bootvar
Load for five secs: 14%/0%; one minute: 14%; five minutes: 10%
Time source is NTP, 15:46:59.837 PST Thu Jan 17 2019
```

```
BOOT variable = harddisk:IOSXE/packages.conf,12;
CONFIG_FILE variable =
BOOTLDR variable does not exist
Configuration register is 0x2102
```

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

- Both SUPs are in the sub-package mode, running the same image from the same path.

```
Router# show bootvar
Load for five secs: 14%/0%; one minute: 14%; five minutes: 10%
Time source is NTP, 15:46:59.837 PST Thu Jan 17 2019
```

```
BOOT variable = harddisk:IOSXE/packages.conf,12;
CONFIG_FILE variable =
BOOTLDR variable does not exist
Configuration register is 0x2102
```

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

- The free space on boot device on both SUPs must be greater than 2GB.

```
Router# dir harddisk: | include bytes total

7804653568 bytes total (5691174912 bytes free)
```

- Download two files from the following Cisco.com Software Center URL:

<https://software.cisco.com/download/home/286283913/type>

- IOS XE Software Version 17.6.1z: **cbrsup-universalk9.17.06.01z.SPA.bin**

- IOS XE Hardware Programmable Devices Version 17.6.1z:
cbrsup-programmable_firmware.17.06.01z.SPA.pkg

- Copy the target consolidated image **cbrsup-universalk9.17.06.01z.SPA.bin** to the active SUP in the same directory of the **packages.conf** file that the system is booted up with.

Step 1 Copy Cisco IOS XE Bengaluru 17.6.1z package to harddisk:

```
copy <location>/cbrsup-universalk9.17.06.01z.SPA.bin harddisk:<sub-pkg-dir>/
```

Step 2 Verify Cisco IOS XE Bengaluru 17.6.1z package against the md5 hash as provided in the Cisco.com Software center.

```
verify /md5 harddisk:<sub-pkg-dir>/cbrsup-universalk9.17.06.01z.SPA.bin
```

Step 3 Copy the hardware programmable devices upgrade package to harddisk: if the file has not been copied already.

```
copy <location>/cbrsup-programmable_firmware.17.06.01z.SPA.pkg harddisk:
```

Step 4 Verify the hardware programmable devices upgrade package against the md5 hash as provided in the Cisco.com Software center.

```
verify /md5 harddisk:cbrsup-programmable_firmware.17.06.01z.SPA.pkg
```

Step 5 Check system status prior to upgrade. Save the information to compare against the system status after upgrade. For the commands to use to check the status, see the **show** commands at the end of this section.

Step 6 Check line card CPLD version via **show platform**. If it is not the minimum version 00000026, upgrade line card CPLD following the sub steps below. Otherwise skip this step.

Note To upgrade the line card CPLD to version 00000026, the cBR-8 must be running Cisco IOS XE Gibraltar 16.12.1 or later releases.

This procedure will trigger a reload of the linecard and will cause an outage if the system is not backed up with LCHA.

Do not power cycle the cBR-8 router during the firmware upgrade process. Power cycling the chassis may corrupt the ROMMON/Uboot image.

a) 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 0
Daggits pre-upgrade successful
```

b) Upgrade the line card CPLD 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:

```
Router# upgrade hw-programmable cable 0 daggit pkg_name
/harddisk/cbrsup-programmable_firmware.17.06.01z.SPA.pkg
```

c) 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 0
```

d) The line card moves from **booting** to **active** state. Check the version of the line card using the **show platform** command to make sure version is changed to 00000026.

Example:

```
cBR8#show platform
.....
Slot      CPLD Version      Rommon Version
-----
0         00000026         2011.03.18
...
```


e) 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 0
SUCCESS: Daggit_ver-38 : Booted from upgradable Image-1
```

Step 7

Check the firmware version of the Docsis 3.1 downstream modules in all slots, if it is different with the version listed in [Table 2: Firmware Versions, on page 26](#), update the firmware using the following command. Otherwise skip this step.

```
upgrade hw-programmable cable slot dsphy all pkg_name firmware_pkg_location_path
```

Example:

```
Router# upgrade hw-programmable cable 0 dsphy all pkg_name
/harddisk/cbrsup-programmable_firmware.17.06.01z.SPA.pkg
```

Step 8

Wait for the system log message asking the user to reload the line card that was upgraded. But do not reload the line card at this time.

```
001860: Jun 15 19:05:05.904 PDT: %IOSXE-5-PLATFORM: CLC0: cdman: Suggest reload the line card for
new FW to take effect using CLI: hw slot <slot-id> reload
```

Step 9

Perform ISSU.

```
request platform software package install node file harddisk:cbrsup-universalk9.17.06.01z.SPA.bin
```

Step 10

To monitor the ISSU progress, use the command below.

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

Step 11

Use these CLI to check status after ISSU.

```
show version
show version r0 running
show version r1 running
show version r0 provisioned
show version r1 provisioned
```

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.
- 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 ospf neighbor**
- **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 inventory**

Upgrading Supervisor CPLD Firmware

Before you begin



Note If the supervisor SO CPLD version is lower than 1511_1401 (SUP 160) or 15111401 (SUP 250), or, if the supervisor SIO CPLD version is lower than 1511_1301 (SUP 160) or 15111301 (SUP 250), physically power cycle the chassis when upgrading the supervisor CPLD.

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

- Cisco cBR-8 router is running with Cisco IOS XE Gibraltar 16.12.1w or later releases.
- 2 supervisors are running in the Cisco cBR-8 router and the redundancy is enabled.
- Download the file from the following Cisco.com Software Center URL:

<https://software.cisco.com/download/home/286283913/type>

- IOS XE Hardware Programmable Devices Version 17.6.1z:
cbrsup-programmable_firmware.17.06.01z.SPA.pkg
- Console access for both supervisors are required.
- Copy the new firmware package to the cBR-8 using FTP.

```
copy ftp://<location>/cbrsup-programmable_firmware.17.06.01z.SPA.pkg harddisk:
copy ftp://<location>/cbrsup-programmable_firmware.17.06.01z.SPA.pkg stby-harddisk:
```



Note When upgrading SUP0, run the CLI with the R0 setting while controlling SUP0. And when upgrading SUP1, run the CLI with the R1 setting.



Note This guide assumes SUP0 is in active state and SUP1 is in standby hot state at the beginning.

Perform step 1 to 4 using console connection of active SUP0:

Step 1 Set the config register.

```
configure terminal
config-register 0x2102
end
write memory
```

Step 2 Run the following command to prepare for R0 upgrade.

```
upgrade hw-programmable cable R0 viper pkg_name
/harddisk/cbrsup-programmable_firmware.17.06.01z.SPA.pkg
```

On SUP 250, you will see one of the following outputs:

- It takes 10~20 minutes to upgrade. Console would hung. Please don't do any operation during the upgrade.
You are upgrading Viper firmware using harddisk/cbrsup-programmable_firmware.17.06.01z.SPA.pkg image on SUP0, SUP0 is active.
Upgrade from assigned pkg file harddisk/cbrsup-programmable_firmware.17.06.01z.SPA.pkg
Using viper firmware /tmp/viper/mount/supve_viper_fpga_psirt.bin
Size of Viper Upgrade image: 16777216 bytes
No.of parts: 65536
Upgrading golden image...
65536+0 records in
65536+0 records out
16777216 bytes (17 MB, 16 MiB) copied, 688.873 s, 24.4 kB/s
Upgrading primary image...
65536+0 records in
65536+0 records out
16777216 bytes (17 MB, 16 MiB) copied, 675.19 s, 24.8 kB/s

```
Viper upgrade clean up 0
Upgrade successfully. Please make sure Rommon version is matched.
Please power cycle the chassis to let the new firmware take effect
```

- It takes 10~20 minutes to upgrade. Console would hung. Please don't do any operation during the upgrade.
You are upgrading Viper firmware using `harddisk/cbrsup-programmable_firmware.17.06.01z.SPA.pkg` image on SUP0, SUP0 is active.
Upgrade from assigned pkg file `harddisk/cbrsup-programmable_firmware.17.06.01z.SPA.pkg`
The golden viper is not compatible with assigned firmware
`/tmp/viper/mount/supve_viper_fpga_psirt.bin`, no upgrade will be performed
Viper upgrade clean up 2

Note This output means the SUP already has the latest version it can support, skip the rest of the steps.

On SUP 160, you will see one of the following outputs:

- It takes about 10 minutes to upgrade. Console would hung. Please don't do any operation during the upgrade.
You are upgrading Viper firmware using `harddisk/cbrsup-programmable_firmware.17.06.01z.SPA.pkg` image
Upgrade from assigned pkg file `/harddisk/cbrsup-programmable_firmware.17.06.01z.SPA.pkg`
Using viper firmware `/tmp/viper/mount/viper_fpga.bin`
Size of Viper Upgrade image: 16777216 bytes
No.of parts: 65536
65536+0 records in
65536+0 records out
Viper upgrade clean up 0
Upgrade successfully. Please make sure Rommon version is matched.
Please power cycle the chassis to let the new firmware take effect
- It takes 10~20 minutes to upgrade. Console would hung. Please don't do any operation during the upgrade.
You are upgrading Viper firmware using `harddisk/cbrsup-programmable_firmware.17.06.01z.SPA.pkg` image on SUP0, SUP0 is active.
Upgrade from assigned pkg file `harddisk/cbrsup-programmable_firmware.17.06.01z.SPA.pkg`
The golden viper is not compatible with assigned firmware
`/tmp/viper/mount/supve_viper_fpga_psirt.bin`, no upgrade will be performed
Viper upgrade clean up 2

Note This output means the SUP already has the latest version it can support, skip the rest of the steps.

Note Do not power cycle the chassis in this step.

Step 3 Run the following command to prepare for R1 upgrade.

```
upgrade hw-programmable cable R1 viper pkg_name
/harddisk/cbrsup-programmable_firmware.17.06.01z.SPA.pkg
```

You will see the similar output as the one in Step 2.

Note Do not power cycle the chassis in this step.

Step 4 If the supervisor ViperSO CPLD version is 15111401 and the supervisor ViperSIO CPLD version is 15111301 on both supervisors, follow step 5 - 11 to do the upgrade. Otherwise proceed to step 12.

```
Router#show platform diag
Load for five secs: 6%/1%; one minute: 7%; five minutes: 8%
Time source is NTP, 16:05:43.546 PST Thu Feb 8 2018
```

```

Chassis type: CBR-8-CCAP-CHASS
<SNIP>
Slot: SUP0, CBR-CCAP-SUP-160G
  Physical insert detect time : 00:01:58 (1d03h ago)
  CPLD version                 : 16052011
  ViperSO CPLD version       : 15111401
  ViperSIO CPLD version     : 15111301
  Rommon version               : 16.7(1r)S
  Blackbird version           : 00000112
  Raptor ESI version          : 0001003b
  Raptor MAC version          : 00010031
  SUP-PIC CPLD version        : 14071504
  SUP-DC CPLD version         : 14072207
  DTI Client FPGA version     : 00000005
  DTI Firmware version        : 00000A03
  Cortina PHY version         : 201402061607
  SUP PSOC 0 version          : v4.0.9
  SUP PSOC 1 version          : v4.0.8
  SUP PSOC 2 version          : v4.1.0_IVB
  SUP PSOC 3 version          : v4.0.6
  SUP-DC PSOC 0 version       : v4.0.8
  SUP-DC PSOC 1 version       : v4.0.5
  SUP-PIC PSOC 0 version      : V2.0.6
  SUP-PIC PSOC 1 version      : V2.0.6
<SNIP>
Slot: SUP1, CBR-CCAP-SUP-160G
  Physical insert detect time : 00:02:26 (1d03h ago)
  CPLD version                 : 16052011
  ViperSO CPLD version       : 15111401
  ViperSIO CPLD version     : 15111301
  Rommon version               : 16.7(1r)S
  Blackbird version           : 00000112
  Raptor ESI version          : 0001003b
  Raptor MAC version          : 00010031
  SUP-PIC CPLD version        : 14071504
  SUP-DC CPLD version         : 14072207
  DTI Client FPGA version     : 00000005
  DTI Firmware version        : 00000A03
  Cortina PHY version         : 201402061607
  SUP PSOC 0 version          : v4.0.9
  SUP PSOC 1 version          : v4.0.8
  SUP PSOC 2 version          : v4.1.0_IVB
  SUP PSOC 3 version          : v4.0.6
  SUP-DC PSOC 0 version       : v4.0.9
  SUP-DC PSOC 1 version       : v4.0.5
  SUP-PIC PSOC 0 version      : V3.0.0
  SUP-PIC PSOC 1 version      : V3.0.0
<SNIP>

```

Step 5 Set SUP0 to ROMMON using the following command.

```
redundancy force-switchover
```

Perform the following steps 6 to 7 using console connection of current active SUP1.

Step 6 Power cycle the SUP0 to set it to ROMMON.

```
test platform hardware slot R0 oir power-cycle
```

This command will reset and re-initialize the ROMMON. The new version of the supervisor CPLD will now take effect. Verify if it matches the following new version.

```
SUP 160 new version: 0x19071712
```

SUP 250 new version: 0x190717E1

Step 7 Boot SUP0 into IOS XE using SUP0 console connection.

```
dir harddisk:
boot harddisk:cbrsup-universalk9.17.06.01z.SPA.bin
```

Wait until SUP0 is in standby hot.

Step 8 Set SUP1 to ROMMON using the following command.

```
redundancy force-switchover
```

Perform the following steps 9 to 11 using console connection of current active SUP0.

Step 9 Power cycle the SUP1 to set it to ROMMON.

```
test platform hardware slot R1 oir power-cycle
```

This command will reset and re-initialize the ROMMON. The new version of the supervisor CPLD will now take effect. Verify if it matches the following new version.

SUP 160 new version: 0x19071712

SUP 250 new version: 0x190717E1

Step 10 Boot SUP1 into IOS XE using SUP1 console connection.

```
dir harddisk:
boot harddisk:cbrsup-universalk9.17.06.01z.SPA.bin
```

Wait until SUP1 is in standby hot.

Step 11 Wait for the chassis to become SSO and settled down. Then go to step 16. If you skipped step 5 to 10, perform step 12 to 15.

Note You need physical access to the chassis to power cycle the chassis.

Step 12 Reload the system by issuing **reload** command on the active SUP.

```
Router#reload
```

Step 13 Power cycle both supervisors.

Step 14 Verify if the new version matches the following on both SUPs.

SUP 160 new version: 0x19071712

SUP 250 new version: 0x190717E1

Step 15 Boot both SUP0 and SUP1 into IOS XE using SUP0 and SUP1 console.

```
dir harddisk:
boot harddisk:cbrsup-universalk9.17.06.01z.SPA.bin
```

Wait till SUP0 become standby hot.

Step 16 Once the system is up and running, perform the following checks.

- Set config register to normal boot.

```
configure terminal
config-register 0x2102
end
write memory
```

- Execute **show redundancy** command to ensure both SUPs are listed, one is active and the other is standby hot.
- Execute **show proc CPU sorted | ex 0.00** command.
- Execute **show platform diag** command.

Upgrading cBR CCAP 8x10G Remote PHY Digital Physical Interface Card

Before you begin

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

- Make sure the latest available IOS XE version is active in Cisco cBR-8 router.
- There are at least 20MB free space on the harddisk.



Note To make use of the new features, it is recommended to upgrade the cBR CCAP 8x10G Remote PHY Digital Physical Interface Card (D-PIC) to the latest version 1.1.

Step 1 Boot up system, wait until IOS is ready.

Step 2 Check current D-PIC version.

```
show hw-module subslot x/1 fpd
```

Note x/1 is D-PIC subslot number which needs upgrade.

Example:

```
Router#show hw-module subslot 9/1 fpd
```

```
==== =====
Slot Card Type                H/W  Field Programmable  Current  Min. Required
Ver.  Device: "ID-Name"  Version  Version
==== =====
```

```

9/1 CBR-DPIC-8X10G          1.0  46-CBR DIGI PIC          1.0          1.0
=====

```

Step 3 Upgrade D-PIC.

```
upgrade hw-module subslot x/1 fpd bundled reload
```

Example:

```
Router#upgrade hw-module subslot 9/1 fpd bundled reload
```

```
% The following FPD will be upgraded for CBR-DPIC-8X10G (H/W ver = 1.0) in subslot 9/1:
```

```

=====
Field Programmable   Current   Upgrade   Estimated
Device: "ID-Name"   Version   Version   Upgrade Time
=====
46-CBR DIGI PIC     1.0      1.1      00:05:00
=====

```

```
% NOTES:
```

- Use 'show upgrade fpd progress' command to view the progress of the FPD upgrade.
- The target card will be automatically reloaded after the upgrade operation. This reload will interrupt normal operation of the card. If necessary, ensure that appropriate actions have been taken to redirect card traffic before starting the FPD upgrade.

```
% Are you sure that you want to perform this operation? [no]: yes
```

```
% Initiating the upgrade operation on the target card ...
```

```
(Use "show upgrade fpd progress" command to see upgrade progress)
```

Step 4 Check if the upgrade process is finished. Upgrade progress will take about 1 to 2 minutes.

```
show upgrade fpd progress
```

Example:

```
Upgrade still ongoing:
```

```
Router#show upgrade fpd progress
```

```
FPD Image Upgrade Progress Table:
```

```

=====
Slot Card Type          Field Programmable   Approx.   Elapsed
                        Device : "ID-Name"   Time      Time     State
=====
9/1 CBR-DPIC-8X10G     46-CBR DIGI PIC     00:05:00  00:00:13  Updating...
=====

```

```
Router# show upgrade fpd progress
```

```
FPD Image Upgrade Progress Table:
```

```

=====
Slot Card Type          Field Programmable   Approx.   Elapsed
                        Device : "ID-Name"   Time      Time     State
=====

```



```

9/1 CBR-DPIC-8X10G      46-CBR DIGI PIC      00:05:00   00:00:26   Updating...
=====

```

Upgrade finished:

```
Router#show upgrade fpd progress
```

```
% There is no FPD image upgrade in progress.
```

Step 5 Check if the D-PIC status is ready.

```
show platform
```

Example:

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

Slot	Type	State	Insert time (ago)
2/1	CBR-RF-PROT-PIC	ok	00:08:48
3	CBR-CCAP-LC-40G	ok	00:12:46
3/1	CBR-RF-PIC	ok	00:08:48
8/1	CBR-DPIC-8X10G	ok	00:07:56
9	CBR-CCAP-LC-40G	ok	00:12:46
9/1	CBR-DPIC-8X10G	ok	00:07:54
SUP0	CBR-CCAP-SUP-160G	inserted	00:12:46
R0		ok, active	
F0		ok, active	
4		ok, active	
4/1	CBR-SUP-8X10G-PIC	ok	00:07:55
SUP1	CBR-CCAP-SUP-160G	inserted	00:12:22
R1		ok, standby	
F1		ok, standby	
5		ok, standby	
5/1	CBR-SUP-8X10G-PIC	ok	00:07:54
P0	PWR-3KW-AC-V2	ok	00:09:49
P1	PWR-3KW-AC-V2	ok	00:09:49
P2	PWR-3KW-AC-V2	ps, fail	00:09:49
P3	Unknown	N/A	never
P4	Unknown	N/A	never
P5	PWR-3KW-AC-V2	ok	00:09:49
P10	CBR-FAN-ASSEMBLY	ok	00:09:39
P11	CBR-FAN-ASSEMBLY	ok	00:09:39
P12	CBR-FAN-ASSEMBLY	ok	00:09:39
P13	CBR-FAN-ASSEMBLY	ok	00:09:39
P14	CBR-FAN-ASSEMBLY	ok	00:09:39

Slot	CPLD Version	Rommon Version
3	00000025	2011.03.18
9	00000025	2011.03.18
SUP0	16052011	16.7(3r)S
SUP1	16052011	16.7(3r)S

Step 6 Check if the new version works.

```
show hw-module subslot x/1 fpd
```

Example:

```
Router#show hw-module subslot 9/1 fpd
```

```

=====
Slot Card Type                H/W   Field Programmable   Current   Min. Required
Ver.   Device: "ID-Name"     Version   Version             Version

```

```
==== =====  
9/1 CBR-DPIC-8X10G      1.0  46-CBR DIGI PIC      1.1      1.0  
==== =====
```



CHAPTER 3

Upgrading the Cisco cBR-8 Router System to Cisco IOS XE Bengaluru 17.6.1x



Note Starting from Cisco IOS XE Bengaluru 17.6.1a, CBR-CCAP-LC-G2-R can only protect CBR-CCAP-LC-G2-R for linecard HA.



Note If you are using TACACS authentication, the TACACS configuration will be automatically updated to the new version after upgrading to Cisco IOS XE Bengaluru 17.6.1x. This is a fix to [CSCvu62273](#) and you do not need to take any action regarding the TACACS configuration in the cBR-8 prior to the upgrade.

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

By default, telnet is disabled on Cisco cBR-8. If you are going to use telnet to access the device, make sure the value of line **vtty transport** is correct and save the configuration in order to enable telnet.

```
Router# show run | begin line vty
line vty 0 4
  exec-timeout 0 0
  privilege level 15
  password 7 104D081B094410055F
  exec prompt timestamp
  transport input all
line vty 5 98
  exec-timeout 0 0
  privilege level 15
  password 7 02050D480809
  transport input all
line vty 99
  transport input all
!
```

The following table encompasses all versions that customers are required to update to support Cisco IOS XE Bengaluru 17.6.1x. All other firmware versions are either not upgradable by the customer, or not required to be upgraded for Cisco IOS XE Bengaluru 17.6.1x support. Use the commands in the tables to verify the firmware versions. If you need to upgrade firmware first, refer to the steps in [Upgrading the Cisco cBR-8 Router Firmware](#).



Note If you want to upgrade Supervisor CPLD firmware, refer to [Upgrading Supervisor CPLD Firmware](#), on page 60.

Table 3: Firmware Versions

Internal Name	Component Name	Required Minimum Version	Command
Supervisor CPLD	CBR-CCAP-SUP-160G CPLD	16052011/19071712	show platform
	CBR-CCAP-SUP-250G CPLD	170724E0/190717E1	show platform
Supervisor ROMMON	CBR-CCAP-SUP-160G ROMMON and CBR-CCAP-SUP-250G ROMMON	16.7(8r)S	show platform
Line Card CPLD	CBR-CCAP-LC-40G CPLD	00000026	show platform diag
Docsis 3.1 downstream module Micro	CBR-CCAP-LC-40G Gemini2 Micro	3.1A	show platform diag
Docsis 3.1 downstream module FPGA	CBR-CCAP-LC-40G Gemini2 Apollo	4.484F	show platform diag
DPIC Uboot and FPGA	CBR-DPIC-8X10G Firmware	00010001	show platform diag
DPIC 100G Uboot and FPGA	CBR-DPIC-2X100G Firmware	00020006	show platform diag



Note If the user wants to upgrade Supervisor CPLD to version 19071712 and 190717E1, the chassis must be running with Cisco IOS XE Gibraltar 16.12.1w or later releases.



Note Cisco recommends that operators upgrade their On-Premise SSM Satellite software versions to v7.x or later releases, to ensure the compatibility with cBR-8.

- [Verify max-carrier value](#), on page 49
- [Upgrading from Cisco IOS XE 16.x and later releases to Cisco IOS XE Bengaluru 17.6.1x](#), on page 50
- [Upgrading Supervisor CPLD Firmware](#), on page 60

- [Upgrading cBR CCAP 8x10G Remote PHY Digital Physical Interface Card, on page 65](#)

Verify max-carrier value

Currently in Remote PHY system, max-carrier value can be configured in the downstream controller profile as well as in RPD configuration for Cisco Remote PHY Shelf 300/600/7200. This may lead to inconsistent max-carrier value configurations.

Starting from Cisco IOS XE Gibraltar 16.10.1f, max-carrier value configured in the **cable rpd** mode is removed and RPD will use the max-carrier value configured in the **controller-profile** mode for the power calculation.

Before upgrading to Cisco IOS XE Gibraltar 16.10.1f or later releases, verify if the max-carrier values configured in the RPD shelf configuration and downstream controller profile(s) associated to RPD downstream port are the same. If they are different, update the cBR-8 configuration prior to upgrade.

Below is an example of correct configuration before upgrade.

```
cable downstream controller-profile 1
  max-carrier 128
  max-ofdm-spectrum 384000000
  rf-chan 0 3
    type DOCSIS
    qam-profile 1
    frequency 381000000
    rf-output NORMAL
    docsis-channel-id 1

cable downstream controller-profile 2
  max-carrier 158
  max-ofdm-spectrum 384000000
  rf-chan 158
    docsis-channel-id 159
    ofdm channel-profile 20 start-frequency 579000000 width 48000000 plc 600000000

cable rpd test
  identifier 0001.0001.0001
  type shelf
  rpd-ds 0 max-carrier 128
  rpd-ds 0 base-power 33
  rpd-ds 1 max-carrier 158
  rpd-ds 1 base-power 25
  core-interface Te9/1/0
    rpd-ds 0 downstream-cable 9/0/3 profile 1
    rpd-ds 0 downstream-cable 9/0/4 profile 2
    rpd-us 0 upstream-cable 9/0/3 profile 1
  r-dti 1
  rpd-event profile 0
  rpd-55d1-us-event profile 0
```



Note It is highly recommended to follow this example to check and update configuration if necessary because max-carrier value is used to compute the base power. Otherwise, after upgrade the expected base power value can be different which may affect cable modem coming online.



Note If you upgrade from a version lower than Cisco IOS XE Fuji 16.9.1, base power range may be changed on the port with OFDM channel configured. So be aware of the potential base power change before and after the upgrade.

Upgrading from Cisco IOS XE 16.x and later releases to Cisco IOS XE Bengaluru 17.6.1x

If you are upgrading from Cisco IOS XE Everest 16.6.x or Cisco IOS XE Fuji 16.7.x to Cisco IOS XE Bengaluru 17.6.1x, perform the following steps to upgrade SUP ROMMON manually. Otherwise proceed with the IOS upgrade.

1. Download hardware programmable devices upgrade package file **cbrsup-programmable_firmware.17.06.01x.SPA.pkg** from the following Cisco.com Software Center URL: <https://software.cisco.com/download/home/286283913/type>

2. Copy the package file to harddisk:

```
copy <location>/cbrsup-programmable_firmware.17.06.01x.SPA.pkg harddisk:
```

3. Verify the hardware programmable devices upgrade package against the md5 hash as provided in the Cisco.com Software center.

```
verify /md5 harddisk:cbrsup-programmable_firmware.17.06.01x.SPA.pkg
```

4. Upgrade SUP ROMMON.

```
Router#Upgrade rom-mon file harddisk:cbrsup-programmable_firmware.17.06.01x.SPA.pkg r0
Wait for the following output on the console:
ROMMON upgrade complete.
To make the new ROMMON permanent, you must restart the RP
```

```
Router#Upgrade rom-mon file harddisk:cbrsup-programmable_firmware.17.06.01x.SPA.pkg r1
Wait for the following output on the console:
ROMMON upgrade complete.
To make the new ROMMON permanent, you must restart the RP
```



Note Do not restart the SUPs currently, you can combine reloading the SUP with the IOS upgrade process.

If you are using cBR CCAP 8x10G Remote PHY Digital Physical Interface Card (D-PIC) with CBR-CCAP-LC-G2-R linecards, before upgrading to Cisco IOS XE Bengaluru 17.6.1x, contact your local Cisco representative to get the python tool and perform the following steps in order to predict and avoid downtime. This python tool is developed by Cisco, it is used to analyze the cBR-8 configuration file to determine if the configuration file includes non-compliant TenGigabitEthernet interface to downstream controller mappings, and update the configuration file to be compliant with the latest Cisco IOS XE Bengaluru 17.6.1x.

1. Collect the following information from the target cBR-8 to upgrade.

```
Router#show cable rpd sum
Router#show cable modem sum
Router#show cable video session all sum
```

2. Save the running configuration to the harddisk of the cBR-8.

```
Router#copy running-config harddisk:SavedConfig.txt
```

3. Copy the saved running configuration from harddisk: to an offline server for editing using SCP.

```
Router#copy harddisk:SavedConfig.txt scp:<path>
```

4. Run the python tool to modify the controllers in the saved configuration.

- Option 1 - Renumber Downstream-Cable controllers only

- a. Execute python script **kobol_ph2_controller_migration.py**. This script is intended for customers who do not immediately intend to take advantage of the Downstream-Video controllers and expanded SG capacity on CBR-CCAP-LC-G2-R.

```
$ python kobol_ph2_controller_migration.py
Enter the name of the configuration file: SavedConfig.txt
```

- b. Output file appends **_remap_controller** to the file name.

```
Output file name: SavedConfig.txt_remap_controller
```

- c. Check to ensure that the script completed successfully. If no output file is created or the size of the output file is 0 byte, then check script output for error messages.

- Option 2 - Renumber Downstream-Cable and utilize Downstream-Video controllers

- a. Execute python script **kobol_ph2_controller_migration_video.py**. This script is intended for customers who wish to utilize the new Downstream-Video controllers to free up existing Downstream-Cable controllers for expanded DOCSIS service groups.

```
$ python kobol_ph2_controller_migration_video.py
Enter the name of the configuration file: SavedConfig.txt
```

- b. Output file appends **_remap_controller_video** to the file name.

```
Output file name: SavedConfig.txt_remap_controller_video
```

- c. Check to ensure that the script completed successfully. If no output file is created or the size of the output file is 0 byte, then check script output for error messages.

5. **Modify the remapped configuration file to specify the Cisco IOS XE Bengaluru 17.6.1x image in the boot parameter.**

```
boot system harddisk:cbrsup-universalk9.17.06.01x.SPA.bin
```

6. Copy the final remapped configuration file back to the cBR-8 harddisk.

```
Router#copy scp:<path>/SavedConfig.txt_remap_controller harddisk:
```

or

```
Router#copy scp:<path>/SavedConfig.txt_remap_controller_video harddisk:
```

7. Copy remapped configuration file to startup of the cBR-8.

```
Router#copy harddisk:SavedConfig.txt_remap_controller startup-config
```

or

```
Router#copy harddisk:SavedConfig.txt_remap_controller_video startup-config
```

Upgrading using reload

Before you begin



Note If you are upgrading from Cisco IOS XE Everest 16.6.x or Cisco IOS XE Fuji 16.7.x to Cisco IOS XE Bengaluru 17.6.1x, perform [pre-upgrade steps 1 to 4](#) to upgrade SUP ROMMON manually before proceeding with IOS upgrading.

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

- Download two files from the following Cisco.com Software Center URL:

<https://software.cisco.com/download/home/286283913/type>

- IOS XE Software Version 17.6.1x: **cbrsup-universalk9.17.06.01x.SPA.bin**
- IOS XE Hardware Programmable Devices Version 17.6.1x: **cbrsup-programmable_firmware.17.06.01x.SPA.pkg**

Step 1 Copy Cisco IOS XE Bengaluru 17.6.1x package to harddisk: and stby-harddisk:.

```
copy <location>/cbrsup-universalk9.17.06.01x.SPA.bin harddisk:
copy <location>/cbrsup-universalk9.17.06.01x.SPA.bin stby-harddisk:
```

Step 2 Verify Cisco IOS XE Bengaluru 17.6.1x package against the md5 hash as provided in the Cisco.com Software center.

```
verify /md5 harddisk:cbrsup-universalk9.17.06.01x.SPA.bin
verify /md5 stby-harddisk:cbrsup-universalk9.17.06.01x.SPA.bin
```

Step 3 Copy the hardware programmable devices upgrade package to harddisk: if the file has not been copied already.

```
copy <location>/cbrsup-programmable_firmware.17.06.01x.SPA.pkg harddisk:
```

Step 4 Verify the hardware programmable devices upgrade package against the md5 hash as provided in the Cisco.com Software center.

```
verify /md5 harddisk:cbrsup-programmable_firmware.17.06.01x.SPA.pkg
```

Step 5 Configure the chassis to boot the system with Cisco IOS XE Bengaluru 17.6.1x image.

- a. Use the following steps if you do not use cBR CCAP 8x10G Remote PHY Digital Physical Interface Card (D-PIC) with CBR-CCAP-LC-40G-R linecards.


```

configure terminal
no boot system
boot system harddisk:cbrsup-universalk9.17.06.01x.SPA.bin
config-register 0x2102
end
write mem

```

- b. Use the following steps if you use cBR CCAP 8x10G Remote PHY Digital Physical Interface Card (D-PIC) with CBR-CCAP-LC-40G-R linecards.

```

configure terminal
config-register 0x2102
end

```

Step 6

Check line card CPLD version via **show platform**. If it is not the minimum version 00000026, upgrade line card CPLD following the sub steps below. Otherwise skip this step.

Note To upgrade the line card CPLD to version 00000026, the cBR-8 must be running Cisco IOS XE Gibraltar 16.12.1 or later releases.

This procedure will trigger a reload of the linecard and will cause an outage if the system is not backed up with LCHA.

Do not power cycle the cBR-8 router during the firmware upgrade process. Power cycling the chassis may corrupt the ROMMON/Uboot image.

- a) 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 0
Daggit pre-upgrade successful

```

- b) Upgrade the line card CPLD 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:

```

Router# upgrade hw-programmable cable 0 daggit pkg_name
/harddisk/cbrsup-programmable_firmware.17.06.01x.SPA.pkg

```

- c) 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 0

```

- d) The line card moves from **booting** to **active** state. Check the version of the line card using the **show platform** command to make sure version is changed to 00000026.

Example:

```
Router#show platform
.....
Slot          CPLD Version          Rommon Version
-----
0             00000026             2011.03.18
...
```

- e) 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 0
SUCCESS: Daggit_ver-38 : Booted from upgradable Image-1
```

- Step 7** Check the firmware version of the Docsis 3.1 downstream modules in all slots, if it is different with the version listed in [Table 3: Firmware Versions, on page 48](#), update the firmware using the following command. Otherwise skip this step.

```
upgrade hw-programmable cable slot dsphy all pkg_name firmware_pkg_location_path
```

Example:

```
Router# upgrade hw-programmable cable 0 dsphy all pkg_name
/harddisk/cbrsup-programmable_firmware.17.06.01x.SPA.pkg
```

Wait for the system log message asking the user to reload the line card that was upgraded.

```
001860: Jun 15 19:05:05.904 PDT: %IOSXE-5-PLATFORM: CLC0: cdman: Suggest reload the line card for
new FW to take effect using CLI: hw slot <slot-id> reload
```

- Step 8** Reload the system.

```
Router#reload
```

During reload, monitor the chassis for any of the following errors, and update the configuration accordingly.

```
Mismatches TE interface. DS controller should be */*/0~7, configuration failed.
Mismatches TE interface. DS controller should be */*/8~15, configuration failed.
Mismatches TE interface. DS controller should be */*/16~23, configuration failed.
Mismatches TE interface. DS controller should be */*/24~31, configuration failed.
```

- Step 9** If the system is running with SUP250, perform **no shut** on 100G interface after the system comes up for the first time.

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.
- 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 ospf neighbor**
- **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 inventory**

Upgrading with ISSU for I-CCAP Systems

Before you begin



Note ISSU is not supported for Remote PHY systems.



Note ISSU to Cisco IOS XE Bengaluru 17.6.1x is supported only from Cisco IOS XE Gibraltar 16.10.1g and later releases. If you are upgrading from an earlier release, you must upgrade the cBR-8 system following the steps in [Upgrading using reload, on page 52](#).

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

- The cBR-8 has two SUPs installed.

```
Router# show redundancy | include Location|state
      Active Location = slot 4
      Current Software state = ACTIVE
      Uptime in current state = 2 days, 21 hours, 37 minutes
      Standby Location = slot 5
      Current Software state = STANDBY HOT
      Uptime in current state = 2 days, 21 hours, 30 minutes
```

- Standby SUP must be in hot standby state.

```
Router# show redundancy | include Location|state
      Active Location = slot 4
      Current Software state = ACTIVE
      Uptime in current state = 2 days, 21 hours, 37 minutes
      Standby Location = slot 5
      Current Software state = STANDBY HOT
      Uptime in current state = 2 days, 21 hours, 30 minutes
```

- Line card redundancy is in stable state with state Active and Stdby warm.

```
Router# show redundancy linecard all
Load for five secs: 14%/1%; one minute: 8%; five minutes: 8%
Time source is NTP, 15:23:26.697 PST Thu Jan 17 2019
```

Slot	Subslot	LC Group	My State	Peer State	Peer Slot	Peer Subslot	Role	Mode
1	-	0	Active	Stdby Warm	0	-	Active	Primary
2	-	0	Active	Stdby Warm	0	-	Active	Primary
3	-	0	Active	Stdby Warm	0	-	Active	Primary
6	-	0	Active	Stdby Warm	0	-	Active	Primary
0	-	0	-	-	Multiple	None	Standby	Secondary

- Auto-boot is enabled.

```
Router# show bootvar
Load for five secs: 14%/0%; one minute: 14%; five minutes: 10%
Time source is NTP, 15:46:59.837 PST Thu Jan 17 2019
```

```
BOOT variable = harddisk:IOSXE/packages.conf,12;
CONFIG_FILE variable =
BOOTLDR variable does not exist
Configuration register is 0x2102
```

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

- Both SUPs are in the sub-package mode, running the same image from the same path.

```
Router# show bootvar
Load for five secs: 14%/0%; one minute: 14%; five minutes: 10%
Time source is NTP, 15:46:59.837 PST Thu Jan 17 2019
```

```
BOOT variable = harddisk:IOSXE/packages.conf,12;
CONFIG_FILE variable =
BOOTLDR variable does not exist
Configuration register is 0x2102
```

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

- The free space on boot device on both SUPs must be greater than 2GB.

```
Router# dir harddisk: | include bytes total

7804653568 bytes total (5691174912 bytes free)
```

- Download two files from the following Cisco.com Software Center URL:

<https://software.cisco.com/download/home/286283913/type>

- IOS XE Software Version 17.6.1x: **cbrrsup-universalk9.17.06.01x.SPA.bin**

- IOS XE Hardware Programmable Devices Version 17.6.1x:
cbrrsup-programmable_firmware.17.06.01x.SPA.pkg

- Copy the target consolidated image **cbrrsup-universalk9.17.06.01x.SPA.bin** to the active SUP in the same directory of the **packages.conf** file that the system is booted up with.

Step 1 Copy Cisco IOS XE Bengaluru 17.6.1x package to harddisk:

```
copy <location>/cbrrsup-universalk9.17.06.01x.SPA.bin harddisk:<sub-pkg-dir>/
```

Step 2 Verify Cisco IOS XE Bengaluru 17.6.1x package against the md5 hash as provided in the Cisco.com Software center.

```
verify /md5 harddisk:<sub-pkg-dir>/cbrrsup-universalk9.17.06.01x.SPA.bin
```

Step 3 Copy the hardware programmable devices upgrade package to harddisk: if the file has not been copied already.

```
copy <location>/cbrrsup-programmable_firmware.17.06.01x.SPA.pkg harddisk:
```

Step 4 Verify the hardware programmable devices upgrade package against the md5 hash as provided in the Cisco.com Software center.

```
verify /md5 harddisk:cbrrsup-programmable_firmware.17.06.01x.SPA.pkg
```

Step 5 Check system status prior to upgrade. Save the information to compare against the system status after upgrade. For the commands to use to check the status, see the **show** commands at the end of this section.

Step 6 Check line card CPLD version via **show platform**. If it is not the minimum version 00000026, upgrade line card CPLD following the sub steps below. Otherwise skip this step.

Note To upgrade the line card CPLD to version 00000026, the cBR-8 must be running Cisco IOS XE Gibraltar 16.12.1 or later releases.

This procedure will trigger a reload of the linecard and will cause an outage if the system is not backed up with LCHA.

Do not power cycle the cBR-8 router during the firmware upgrade process. Power cycling the chassis may corrupt the ROMMON/Uboot image.

a) 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 0
Daggits pre-upgrade successful
```

b) Upgrade the line card CPLD 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:

```
Router# upgrade hw-programmable cable 0 daggit pkg_name
/harddisk/cbrsup-programmable_firmware.17.06.01x.SPA.pkg
```

c) 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 0
```

d) The line card moves from **booting** to **active** state. Check the version of the line card using the **show platform** command to make sure version is changed to 00000026.

Example:

```
cBR8#show platform
.....
Slot      CPLD Version      Rommon Version
-----
0         00000026         2011.03.18
...
```

e) 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 0
SUCCESS: Daggit_ver-38 : Booted from upgradable Image-1
```

Step 7

Check the firmware version of the Docsis 3.1 downstream modules in all slots, if it is different with the version listed in [Table 3: Firmware Versions, on page 48](#), update the firmware using the following command. Otherwise skip this step.

```
upgrade hw-programmable cable slot dsphy all pkg_name firmware_pkg_location_path
```

Example:

```
Router# upgrade hw-programmable cable 0 dsphy all pkg_name
/harddisk/cbrsup-programmable_firmware.17.06.01x.SPA.pkg
```

Wait for the system log message asking the user to reload the line card that was upgraded. But do not reload the line card at this time.

```
001860: Jun 15 19:05:05.904 PDT: %IOSXE-5-PLATFORM: CLC0: cdman: Suggest reload the line card for
new FW to take effect using CLI: hw slot <slot-id> reload
```

Step 8

Perform ISSU.

```
request platform software package install node file harddisk:cbrsup-universalk9.17.06.01x.SPA.bin
```

Step 9

To monitor the ISSU progress, use the command below.

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

Step 10

Use these CLI to check status after ISSU.

```
show version
show version r0 running
show version r1 running
show version r0 provisioned
show version r1 provisioned
```

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.
- 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 ospf neighbor**
- **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 inventory**

Upgrading Supervisor CPLD Firmware

Before you begin



Note If the supervisor SO CPLD version is lower than 1511_1401 (SUP 160) or 15111401 (SUP 250), or, if the supervisor SIO CPLD version is lower than 1511_1301 (SUP 160) or 15111301 (SUP 250), physically power cycle the chassis when upgrading the supervisor CPLD.

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

- Cisco cBR-8 router is running with Cisco IOS XE Gibraltar 16.12.1w or later releases.
- 2 supervisors are running in the Cisco cBR-8 router and the redundancy is enabled.
- Download the file from the following Cisco.com Software Center URL:

<https://software.cisco.com/download/home/286283913/type>

- IOS XE Hardware Programmable Devices Version 17.6.1x:
cbrsup-programmable_firmware.17.06.01x.SPA.pkg

- Console access for both supervisors are required.
- Copy the new firmware package to the cBR-8 using FTP.

```
copy ftp://<location>/cbrsup-programmable_firmware.17.06.01x.SPA.pkg harddisk:
copy ftp://<location>/cbrsup-programmable_firmware.17.06.01x.SPA.pkg stby-harddisk:
```



Note When upgrading SUP0, run the CLI with the R0 setting while controlling SUP0. And when upgrading SUP1, run the CLI with the R1 setting.



Note This guide assumes SUP0 is in active state and SUP1 is in standby hot state at the beginning.

Perform step 1 to 4 using console connection of active SUP0:

Step 1 Set the config register.

```
configure terminal
config-register 0x2102
end
write memory
```

Step 2 Run the following command to prepare for R0 upgrade.

```
upgrade hw-programmable cable R0 viper pkg_name
/harddisk/cbrsup-programmable_firmware.17.06.01x.SPA.pkg
```

On SUP 250, you will see one of the following outputs:

- It takes 10~20 minutes to upgrade. Console would hung. Please don't do any operation during the upgrade.
You are upgrading Viper firmware using harddisk/cbrsup-programmable_firmware.17.06.01x.SPA.pkg image on SUP0, SUP0 is active.
Upgrade from assigned pkg file harddisk/cbrsup-programmable_firmware.17.06.01x.SPA.pkg
Using viper firmware /tmp/viper/mount/supve_viper_fpga_psirt.bin
Size of Viper Upgrade image: 16777216 bytes
No.of parts: 65536
Upgrading golden image...
65536+0 records in
65536+0 records out
16777216 bytes (17 MB, 16 MiB) copied, 688.873 s, 24.4 kB/s
Upgrading primary image...
65536+0 records in
65536+0 records out
16777216 bytes (17 MB, 16 MiB) copied, 675.19 s, 24.8 kB/s
Viper upgrade clean up 0

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

- It takes 10~20 minutes to upgrade. Console would hung. Please don't do any operation during the upgrade.
You are upgrading Viper firmware using harddisk/cbrsup-programmable_firmware.17.06.01x.SPA.pkg image on SUP0, SUP0 is active.
Upgrade from assigned pkg file harddisk/cbrsup-programmable_firmware.17.06.01x.SPA.pkg
The golden viper is not compatible with assigned firmware
/tmp/viper/mount/supve_viper_fpga_psirt.bin, no upgrade will be performed
Viper upgrade clean up 2

Note This output means the SUP already has the latest version it can support, skip the rest of the steps.

On SUP 160, you will see one of the following outputs:

- It takes about 10 minutes to upgrade. Console would hung. Please don't do any operation during the upgrade.
You are upgrading Viper firmware using harddisk/cbrsup-programmable_firmware.17.06.01x.SPA.pkg image
Upgrade from assigned pkg file /harddisk/cbrsup-programmable_firmware.17.06.01x.SPA.pkg
Using viper firmware /tmp/viper/mount/viper_fpga.bin
Size of Viper Upgrade image: 16777216 bytes
No.of parts: 65536
65536+0 records in
65536+0 records out
Viper upgrade clean up 0
Upgrade successfully. Please make sure Rommon version is matched.
Please power cycle the chassis to let the new firmware take effect
- It takes 10~20 minutes to upgrade. Console would hung. Please don't do any operation during the upgrade.
You are upgrading Viper firmware using harddisk/cbrsup-programmable_firmware.17.06.01x.SPA.pkg image on SUP0, SUP0 is active.
Upgrade from assigned pkg file harddisk/cbrsup-programmable_firmware.17.06.01x.SPA.pkg
The golden viper is not compatible with assigned firmware
/tmp/viper/mount/supve_viper_fpga_psirt.bin, no upgrade will be performed
Viper upgrade clean up 2

Note This output means the SUP already has the latest version it can support, skip the rest of the steps.

Note Do not power cycle the chassis in this step.

Step 3 Run the following command to prepare for R1 upgrade.

```
upgrade hw-programmable cable R1 viper pkg_name
/harddisk/cbrsup-programmable_firmware.17.06.01x.SPA.pkg
```

You will see the similar output as the one in Step 2.

Note Do not power cycle the chassis in this step.

Step 4 If the supervisor ViperSO CPLD version is 15111401 and the supervisor ViperSIO CPLD version is 15111301 on both supervisors, follow step 5 - 11 to do the upgrade. Otherwise proceed to step 12.

```
Router#show platform diag
Load for five secs: 6%/1%; one minute: 7%; five minutes: 8%
Time source is NTP, 16:05:43.546 PST Thu Feb 8 2018
Chassis type: CBR-8-CCAP-CHASS
```

```

<SNIP>
Slot: SUP0, CBR-CCAP-SUP-160G
  Physical insert detect time : 00:01:58 (1d03h ago)
  CPLD version                : 16052011
  ViperSO CPLD version       : 15111401
  ViperSIO CPLD version     : 15111301
  Rommon version              : 16.7(1r)S
  Blackbird version           : 00000112
  Raptor ESI version          : 0001003b
  Raptor MAC version          : 00010031
  SUP-PIC CPLD version        : 14071504
  SUP-DC CPLD version         : 14072207
  DTI Client FPGA version     : 00000005
  DTI Firmware version        : 00000A03
  Cortina PHY version         : 201402061607
  SUP PSOC 0 version          : v4.0.9
  SUP PSOC 1 version          : v4.0.8
  SUP PSOC 2 version          : v4.1.0_IVB
  SUP PSOC 3 version          : v4.0.6
  SUP-DC PSOC 0 version       : v4.0.8
  SUP-DC PSOC 1 version       : v4.0.5
  SUP-PIC PSOC 0 version      : V2.0.6
  SUP-PIC PSOC 1 version      : V2.0.6

<SNIP>
Slot: SUP1, CBR-CCAP-SUP-160G
  Physical insert detect time : 00:02:26 (1d03h ago)
  CPLD version                : 16052011
  ViperSO CPLD version       : 15111401
  ViperSIO CPLD version     : 15111301
  Rommon version              : 16.7(1r)S
  Blackbird version           : 00000112
  Raptor ESI version          : 0001003b
  Raptor MAC version          : 00010031
  SUP-PIC CPLD version        : 14071504
  SUP-DC CPLD version         : 14072207
  DTI Client FPGA version     : 00000005
  DTI Firmware version        : 00000A03
  Cortina PHY version         : 201402061607
  SUP PSOC 0 version          : v4.0.9
  SUP PSOC 1 version          : v4.0.8
  SUP PSOC 2 version          : v4.1.0_IVB
  SUP PSOC 3 version          : v4.0.6
  SUP-DC PSOC 0 version       : v4.0.9
  SUP-DC PSOC 1 version       : v4.0.5
  SUP-PIC PSOC 0 version      : V3.0.0
  SUP-PIC PSOC 1 version      : V3.0.0

<SNIP>

```

Step 5 Set SUP0 to ROMMON using the following command.

```
redundancy force-switchover
```

Perform the following steps 6 to 7 using console connection of current active SUP1.

Step 6 Power cycle the SUP0 to set it to ROMMON.

```
test platform hardware slot R0 oir power-cycle
```

This command will reset and re-initialize the ROMMON. The new version of the supervisor CPLD will now take effect. Verify if it matches the following new version.

SUP 160 new version: 0x19071712

SUP 250 new version: 0x190717E1

Step 7 Boot SUP0 into IOS XE using SUP0 console connection.

```
dir harddisk:
boot harddisk:cbrsup-universalk9.17.06.01x.SPA.bin
```

Wait until SUP0 is in standby hot.

Step 8 Set SUP1 to ROMMON using the following command.

```
redundancy force-switchover
```

Perform the following steps 9 to 11 using console connection of current active SUP0.

Step 9 Power cycle the SUP1 to set it to ROMMON.

```
test platform hardware slot R1 oir power-cycle
```

This command will reset and re-initialize the ROMMON. The new version of the supervisor CPLD will now take effect. Verify if it matches the following new version.

SUP 160 new version: 0x19071712

SUP 250 new version: 0x190717E1

Step 10 Boot SUP1 into IOS XE using SUP1 console connection.

```
dir harddisk:
boot harddisk:cbrsup-universalk9.17.06.01x.SPA.bin
```

Wait until SUP1 is in standby hot.

Step 11 Wait for the chassis to become SSO and settled down. Then go to step 16. If you skipped step 5 to 10, perform step 12 to 15.

Note You need physical access to the chassis to power cycle the chassis.

Step 12 Reload the system by issuing **reload** command on the active SUP.

```
Router#reload
```

Step 13 Power cycle both supervisors.

Step 14 Verify if the new version matches the following on both SUPs.

SUP 160 new version: 0x19071712

SUP 250 new version: 0x190717E1

Step 15 Boot both SUP0 and SUP1 into IOS XE using SUP0 and SUP1 console.

```
dir harddisk:
boot harddisk:cbrsup-universalk9.17.06.01x.SPA.bin
```

Wait till SUP0 become standby hot.

Step 16 Once the system is up and running, perform the following checks.

- Set config register to normal boot.

```
configure terminal
config-register 0x2102
end
write memory
```

- Execute **show redundancy** command to ensure both SUPs are listed, one is active and the other is standby hot.
- Execute **show proc CPU sorted | ex 0.00** command.
- Execute **show platform diag** command.

Upgrading cBR CCAP 8x10G Remote PHY Digital Physical Interface Card

Before you begin

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

- Make sure the latest available IOS XE version is active in Cisco cBR-8 router.
- There are at least 20MB free space on the harddisk.



Note To make use of the new features, it is recommended to upgrade the cBR CCAP 8x10G Remote PHY Digital Physical Interface Card (D-PIC) to the latest version 1.1.

Step 1 Boot up system, wait until IOS is ready.

Step 2 Check current D-PIC version.

```
show hw-module subslot x/1 fpd
```

Note x/1 is D-PIC subslot number which needs upgrade.

Example:

```
Router#show hw-module subslot 9/1 fpd
```

```
==== =====
Slot Card Type                H/W   Field Programmable   Current   Min. Required
                               Ver.   Device: "ID-Name"    Version   Version
==== =====
 9/1 CBR-DPIC-8X10G           1.0   46-CBR DIGI PIC     1.0      1.0
==== =====
```

Step 3 Upgrade D-PIC.

```
upgrade hw-module subslot x/1 fpd bundled reload
```

Example:

```
Router#upgrade hw-module subslot 9/1 fpd bundled reload
```

```
% The following FPD will be upgraded for CBR-DPIC-8X10G (H/W ver = 1.0) in subslot 9/1:
```

```
=====
Field Programmable   Current   Upgrade   Estimated
Device: "ID-Name"   Version   Version   Upgrade Time
=====
46-CBR DIGI PIC     1.0      1.1      00:05:00
=====
```

```
% NOTES:
```

- Use 'show upgrade fpd progress' command to view the progress of the FPD upgrade.
- The target card will be automatically reloaded after the upgrade operation. This reload will interrupt normal operation of the card. If necessary, ensure that appropriate actions have been taken to redirect card traffic before starting the FPD upgrade.

```
% Are you sure that you want to perform this operation? [no]: yes
```

```
% Initiating the upgrade operation on the target card ...
```

```
(Use "show upgrade fpd progress" command to see upgrade progress)
```

Step 4 Check if the upgrade process is finished. Upgrade progress will take about 1 to 2 minutes.

```
show upgrade fpd progress
```

Example:

Upgrade still ongoing:

```
Router#show upgrade fpd progress
```

```
FPD Image Upgrade Progress Table:
```

```
====
Slot Card Type           Field Programmable   Approx.
                        Device : "ID-Name"   Time      Elapsed
                        :                   Needed    Time     State
====
 9/1 CBR-DPIC-8X10G     46-CBR DIGI PIC     00:05:00  00:00:13  Updating...
====
```

```
sj-104-cbr-13#show upgrade fpd progress
```

```
FPD Image Upgrade Progress Table:
```

```
====
Slot Card Type           Field Programmable   Approx.
                        Device : "ID-Name"   Time      Elapsed
                        :                   Needed    Time     State
====
 9/1 CBR-DPIC-8X10G     46-CBR DIGI PIC     00:05:00  00:00:26  Updating...
====
```

Upgrade finished:

```
Router#show upgrade fpd progress
```

```
% There is no FPD image upgrade in progress.
```

Step 5 Check if the D-PIC status is ready.

```
show platform
```

Example:

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

Slot	Type	State	Insert time (ago)
2/1	CBR-RF-PROT-PIC	ok	00:08:48
3	CBR-CCAP-LC-40G	ok	00:12:46
3/1	CBR-RF-PIC	ok	00:08:48
8/1	CBR-DPIC-8X10G	ok	00:07:56
9	CBR-CCAP-LC-40G	ok	00:12:46
9/1	CBR-DPIC-8X10G	ok	00:07:54
SUP0	CBR-CCAP-SUP-160G	inserted	00:12:46
R0		ok, active	
F0		ok, active	
4		ok, active	
4/1	CBR-SUP-8X10G-PIC	ok	00:07:55
SUP1	CBR-CCAP-SUP-160G	inserted	00:12:22
R1		ok, standby	
F1		ok, standby	
5		ok, standby	
5/1	CBR-SUP-8X10G-PIC	ok	00:07:54
P0	PWR-3KW-AC-V2	ok	00:09:49
P1	PWR-3KW-AC-V2	ok	00:09:49
P2	PWR-3KW-AC-V2	ps, fail	00:09:49
P3	Unknown	N/A	never
P4	Unknown	N/A	never
P5	PWR-3KW-AC-V2	ok	00:09:49
P10	CBR-FAN-ASSEMBLY	ok	00:09:39
P11	CBR-FAN-ASSEMBLY	ok	00:09:39
P12	CBR-FAN-ASSEMBLY	ok	00:09:39
P13	CBR-FAN-ASSEMBLY	ok	00:09:39
P14	CBR-FAN-ASSEMBLY	ok	00:09:39

Slot	CPLD Version	Rommon Version
3	00000025	2011.03.18
9	00000025	2011.03.18
SUP0	16052011	16.7(3r)S
SUP1	16052011	16.7(3r)S

Step 6 Check if the new version works.

```
show hw-module subslot x/1 fpd
```

Example:

```
Router#show hw-module subslot 9/1 fpd
```

```
==== =====
```

Slot	Card Type	H/W Ver.	Field Programmable Device: "ID-Name"	Current Version	Min. Required Version
====	=====	=====	=====	=====	=====

```
9/1 CBR-DPIC-8X10G      1.0  46-CBR DIGI PIC      1.1      1.0
=====
```



CHAPTER 4

Upgrading the Cisco cBR-8 Router System to Cisco IOS XE Bengaluru 17.6.1w



Note Starting from Cisco IOS XE Bengaluru 17.6.1a, CBR-CCAP-LC-G2-R can only protect CBR-CCAP-LC-G2-R for linecard HA.



Note If you are using TACACS authentication, the TACACS configuration will be automatically updated to the new version after upgrading to Cisco IOS XE Bengaluru 17.6.1w. This is a fix to [CSCvu62273](#) and you do not need to take any action regarding the TACACS configuration in the cBR-8 prior to the upgrade.

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

By default, telnet is disabled on Cisco cBR-8. If you are going to use telnet to access the device, make sure the value of line **vtty transport** is correct and save the configuration in order to enable telnet.

```
Router# show run | begin line vty
line vty 0 4
  exec-timeout 0 0
  privilege level 15
  password 7 104D081B094410055F
  exec prompt timestamp
  transport input all
line vty 5 98
  exec-timeout 0 0
  privilege level 15
  password 7 02050D480809
  transport input all
line vty 99
  transport input all
!
```

The following table encompasses all versions that customers are required to update to support Cisco IOS XE Bengaluru 17.6.1w. All other firmware versions are either not upgradable by the customer, or not required to be upgraded for Cisco IOS XE Bengaluru 17.6.1w support. Use the commands in the tables to verify the firmware versions. If you need to upgrade firmware first, refer to the steps in [Upgrading the Cisco cBR-8 Router Firmware](#).



Note If you want to upgrade Supervisor CPLD firmware, refer to [Upgrading Supervisor CPLD Firmware](#), on page 82.

Table 4: Firmware Versions

Internal Name	Component Name	Required Minimum Version	Command
Supervisor CPLD	CBR-CCAP-SUP-160G CPLD	16052011/19071712	show platform
	CBR-CCAP-SUP-250G CPLD	170724E0/190717E1	show platform
Supervisor ROMMON	CBR-CCAP-SUP-160G ROMMON and CBR-CCAP-SUP-250G ROMMON	16.7(8r)S	show platform
Line Card CPLD	CBR-CCAP-LC-40G CPLD	00000026	show platform diag
Docsis 3.1 downstream module Micro	CBR-CCAP-LC-40G Gemini2 Micro	3.1A	show platform diag
Docsis 3.1 downstream module FPGA	CBR-CCAP-LC-40G Gemini2 Apollo	4.484F	show platform diag
DPIC Uboot and FPGA	CBR-DPIC-8X10G Firmware	00010001	show platform diag
DPIC 100G Uboot and FPGA	CBR-DPIC-2X100G Firmware	00020006	show platform diag



Note If the user wants to upgrade Supervisor CPLD to version 19071712 and 190717E1, the chassis must be running with Cisco IOS XE Gibraltar 16.12.1w or later releases.



Note Cisco recommends that operators upgrade their On-Premise SSM Satellite software versions to v7.x or later releases, to ensure the compatibility with cBR-8.

- [Verify max-carrier value](#), on page 71
- [Upgrading from Cisco IOS XE 16.x and later releases to Cisco IOS XE Bengaluru 17.6.1w](#), on page 72
- [Upgrading Supervisor CPLD Firmware](#), on page 82

- [Upgrading cBR CCAP 8x10G Remote PHY Digital Physical Interface Card, on page 87](#)

Verify max-carrier value

Currently in Remote PHY system, max-carrier value can be configured in the downstream controller profile as well as in RPD configuration for Cisco Remote PHY Shelf 300/600/7200. This may lead to inconsistent max-carrier value configurations.

Starting from Cisco IOS XE Gibraltar 16.10.1f, max-carrier value configured in the **cable rpd** mode is removed and RPD will use the max-carrier value configured in the **controller-profile** mode for the power calculation.

Before upgrading to Cisco IOS XE Gibraltar 16.10.1f or later releases, verify if the max-carrier values configured in the RPD shelf configuration and downstream controller profile(s) associated to RPD downstream port are the same. If they are different, update the cBR-8 configuration prior to upgrade.

Below is an example of correct configuration before upgrade.

```
cable downstream controller-profile 1
  max-carrier 128
  max-ofdm-spectrum 384000000
  rf-chan 0 3
    type DOCSIS
    qam-profile 1
    frequency 381000000
    rf-output NORMAL
    docsis-channel-id 1

cable downstream controller-profile 2
  max-carrier 158
  max-ofdm-spectrum 384000000
  rf-chan 158
    docsis-channel-id 159
    ofdm channel-profile 20 start-frequency 579000000 width 48000000 plc 600000000

cable rpd test
  identifier 0001.0001.0001
  type shelf
  rpd-ds 0 max-carrier 128
  rpd-ds 0 base-power 33
  rpd-ds 1 max-carrier 158
  rpd-ds 1 base-power 25
  core-interface Te9/1/0
    rpd-ds 0 downstream-cable 9/0/3 profile 1
    rpd-ds 0 downstream-cable 9/0/4 profile 2
    rpd-us 0 upstream-cable 9/0/3 profile 1
  r-dti 1
  rpd-event profile 0
  rpd-55d1-us-event profile 0
```



Note It is highly recommended to follow this example to check and update configuration if necessary because max-carrier value is used to compute the base power. Otherwise, after upgrade the expected base power value can be different which may affect cable modem coming online.



Note If you upgrade from a version lower than Cisco IOS XE Fuji 16.9.1, base power range may be changed on the port with OFDM channel configured. So be aware of the potential base power change before and after the upgrade.

Upgrading from Cisco IOS XE 16.x and later releases to Cisco IOS XE Bengaluru 17.6.1w

If you are upgrading from Cisco IOS XE Everest 16.6.x or Cisco IOS XE Fuji 16.7.x to Cisco IOS XE Bengaluru 17.6.1w, perform the following steps to upgrade SUP ROMMON manually. Otherwise proceed with the IOS upgrade.

1. Download hardware programmable devices upgrade package file **cbrsup-programmable_firmware.17.06.01w.SPA.pkg** from the following Cisco.com Software Center URL: <https://software.cisco.com/download/home/286283913/type>

2. Copy the package file to harddisk:

```
copy <location>/cbrsup-programmable_firmware.17.06.01w.SPA.pkg harddisk:
```

3. Verify the hardware programmable devices upgrade package against the md5 hash as provided in the Cisco.com Software center.

```
verify /md5 harddisk:cbrsup-programmable_firmware.17.06.01w.SPA.pkg
```

4. Upgrade SUP ROMMON.

```
Router#Upgrade rom-mon file harddisk:cbrsup-programmable_firmware.17.06.01w.SPA.pkg r0
Wait for the following output on the console:
ROMMON upgrade complete.
To make the new ROMMON permanent, you must restart the RP
```

```
Router#Upgrade rom-mon file harddisk:cbrsup-programmable_firmware.17.06.01w.SPA.pkg r1
Wait for the following output on the console:
ROMMON upgrade complete.
To make the new ROMMON permanent, you must restart the RP
```



Note Do not restart the SUPs currently, you can combine reloading the SUP with the IOS upgrade process.

If you are using cBR CCAP 8x10G Remote PHY Digital Physical Interface Card (D-PIC) with CBR-CCAP-LC-G2-R linecards, before upgrading to Cisco IOS XE Bengaluru 17.6.1w, contact your local Cisco representative to get the python tool and perform the following steps in order to predict and avoid downtime. This python tool is developed by Cisco, it is used to analyze the cBR-8 configuration file to determine if the configuration file includes non-compliant TenGigabitEthernet interface to downstream controller mappings, and update the configuration file to be compliant with the latest Cisco IOS XE Bengaluru 17.6.1w.

1. Collect the following information from the target cBR-8 to upgrade.

```
Router#show cable rpd sum
Router#show cable modem sum
Router#show cable video session all sum
```

2. Save the running configuration to the harddisk of the cBR-8.

```
Router#copy running-config harddisk:SavedConfig.txt
```

3. Copy the saved running configuration from harddisk: to an offline server for editing using SCP.

```
Router#copy harddisk:SavedConfig.txt scp:<path>
```

4. Run the python tool to modify the controllers in the saved configuration.

- Option 1 - Renumber Downstream-Cable controllers only

- a. Execute python script **kobol_ph2_controller_migration.py**. This script is intended for customers who do not immediately intend to take advantage of the Downstream-Video controllers and expanded SG capacity on CBR-CCAP-LC-G2-R.

```
$ python kobol_ph2_controller_migration.py
Enter the name of the configuration file: SavedConfig.txt
```

- b. Output file appends **_remap_controller** to the file name.

```
Output file name: SavedConfig.txt_remap_controller
```

- c. Check to ensure that the script completed successfully. If no output file is created or the size of the output file is 0 byte, then check script output for error messages.

- Option 2 - Renumber Downstream-Cable and utilize Downstream-Video controllers

- a. Execute python script **kobol_ph2_controller_migration_video.py**. This script is intended for customers who wish to utilize the new Downstream-Video controllers to free up existing Downstream-Cable controllers for expanded DOCSIS service groups.

```
$ python kobol_ph2_controller_migration_video.py
Enter the name of the configuration file: SavedConfig.txt
```

- b. Output file appends **_remap_controller_video** to the file name.

```
Output file name: SavedConfig.txt_remap_controller_video
```

- c. Check to ensure that the script completed successfully. If no output file is created or the size of the output file is 0 byte, then check script output for error messages.

5. **Modify the remapped configuration file to specify the Cisco IOS XE Bengaluru 17.6.1w image in the boot parameter.**

```
boot system harddisk:cbrsup-universalk9.17.06.01w.SPA.bin
```

6. Copy the final remapped configuration file back to the cBR-8 harddisk.

```
Router#copy scp:<path>/SavedConfig.txt_remap_controller harddisk:
```

or

```
Router#copy scp:<path>/SavedConfig.txt_remap_controller_video harddisk:
```

7. Copy remapped configuration file to startup of the cBR-8.

```
Router#copy harddisk:SavedConfig.txt_remap_controller startup-config
```

or

```
Router#copy harddisk:SavedConfig.txt_remap_controller_video startup-config
```

Upgrading using reload

Before you begin



Note If you are upgrading from Cisco IOS XE Everest 16.6.x or Cisco IOS XE Fuji 16.7.x to Cisco IOS XE Bengaluru 17.6.1w, perform [pre-upgrade steps 1 to 4](#) to upgrade SUP ROMMON manually before proceeding with IOS upgrading.

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

- Download two files from the following Cisco.com Software Center URL:

<https://software.cisco.com/download/home/286283913/type>

- IOS XE Software Version 17.6.1w: **cbrsup-universalk9.17.06.01w.SPA.bin**
- IOS XE Hardware Programmable Devices Version 17.6.1w: **cbrsup-programmable_firmware.17.06.01w.SPA.pkg**

Step 1 Copy Cisco IOS XE Bengaluru 17.6.1w package to harddisk: and stby-harddisk:.

```
copy <location>/cbrsup-universalk9.17.06.01w.SPA.bin harddisk:
copy <location>/cbrsup-universalk9.17.06.01w.SPA.bin stby-harddisk:
```

Step 2 Verify Cisco IOS XE Bengaluru 17.6.1w package against the md5 hash as provided in the Cisco.com Software center.

```
verify /md5 harddisk:cbrsup-universalk9.17.06.01w.SPA.bin
verify /md5 stby-harddisk:cbrsup-universalk9.17.06.01w.SPA.bin
```

Step 3 Copy the hardware programmable devices upgrade package to harddisk: if the file has not been copied already.

```
copy <location>/cbrsup-programmable_firmware.17.06.01w.SPA.pkg harddisk:
```

Step 4 Verify the hardware programmable devices upgrade package against the md5 hash as provided in the Cisco.com Software center.

```
verify /md5 harddisk:cbrsup-programmable_firmware.17.06.01w.SPA.pkg
```

Step 5 Configure the chassis to boot the system with Cisco IOS XE Bengaluru 17.6.1w image.

- Use the following steps if you do not use cBR CCAP 8x10G Remote PHY Digital Physical Interface Card (D-PIC) with CBR-CCAP-LC-40G-R linecards.

```

configure terminal
no boot system
boot system harddisk:cbrsup-universalk9.17.06.01w.SPA.bin
config-register 0x2102
end
write mem

```

- b. Use the following steps if you use cBR CCAP 8x10G Remote PHY Digital Physical Interface Card (D-PIC) with CBR-CCAP-LC-40G-R linecards.

```

configure terminal
config-register 0x2102
end

```

Step 6

Check line card CPLD version via **show platform**. If it is not the minimum version 00000026, upgrade line card CPLD following the sub steps below. Otherwise skip this step.

Note To upgrade the line card CPLD to version 00000026, the cBR-8 must be running Cisco IOS XE Gibraltar 16.12.1 or later releases.

This procedure will trigger a reload of the linecard and will cause an outage if the system is not backed up with LCHA.

Do not power cycle the cBR-8 router during the firmware upgrade process. Power cycling the chassis may corrupt the ROMMON/Uboot image.

- a) 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 0
Daggit's pre-upgrade successful

```

- b) Upgrade the line card CPLD 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:

```

Router# upgrade hw-programmable cable 0 daggit pkg_name
/harddisk/cbrsup-programmable_firmware.17.06.01w.SPA.pkg

```

- c) 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 0

```

- d) The line card moves from **booting** to **active** state. Check the version of the line card using the **show platform** command to make sure version is changed to 00000026.

Example:

```
Router#show platform
.....
Slot      CPLD Version      Rommon Version
-----
0         00000026         2011.03.18
...
```

- e) 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 0
SUCCESS: Daggit_ver-38 : Booted from upgradable Image-1
```

Step 7

Check the firmware version of the Docsis 3.1 downstream modules in all slots, if it is different with the version listed in [Table 4: Firmware Versions, on page 70](#), update the firmware using the following command. Otherwise skip this step.

```
upgrade hw-programmable cable slot dsphy all pkg_name firmware_pkg_location_path
```

Example:

```
Router# upgrade hw-programmable cable 0 dsphy all pkg_name
/harddisk/cbrsup-programmable_firmware.17.06.01w.SPA.pkg
```

Step 8

Wait for the system log message asking the user to reload the line card that was upgraded.

```
001860: Jun 15 19:05:05.904 PDT: %IOSXE-5-PLATFORM: CLC0: cdman: Suggest reload the line card for
new FW to take effect using CLI: hw slot <slot-id> reload
```

Step 9

Reload the system.

```
Router#reload
```

During reload, monitor the chassis for any of the following errors, and update the configuration accordingly.

```
Mismatches TE interface. DS controller should be */*/0~7, configuration failed.
Mismatches TE interface. DS controller should be */*/8~15, configuration failed.
Mismatches TE interface. DS controller should be */*/16~23, configuration failed.
Mismatches TE interface. DS controller should be */*/24~31, configuration failed.
```

Step 10

If the system is running with SUP250, perform **no shut** on 100G interface after the system comes up for the first time.

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.
- 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 ospf neighbor**
- **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 inventory**

Upgrading with ISSU for I-CCAP Systems

Before you begin



Note ISSU is not supported for Remote PHY systems.



Note ISSU to Cisco IOS XE Bengaluru 17.6.1w is supported only from Cisco IOS XE Gibraltar 16.10.1g and later releases. If you are upgrading from an earlier release, you must upgrade the cBR-8 system following the steps in [Upgrading using reload, on page 74](#).

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

- The cBR-8 has two SUPs installed.

```
Router# show redundancy | include Location|state
      Active Location = slot 4
      Current Software state = ACTIVE
      Uptime in current state = 2 days, 21 hours, 37 minutes
      Standby Location = slot 5
      Current Software state = STANDBY HOT
      Uptime in current state = 2 days, 21 hours, 30 minutes
```

- Standby SUP must be in hot standby state.

```
Router# show redundancy | include Location|state
      Active Location = slot 4
      Current Software state = ACTIVE
      Uptime in current state = 2 days, 21 hours, 37 minutes
      Standby Location = slot 5
      Current Software state = STANDBY HOT
      Uptime in current state = 2 days, 21 hours, 30 minutes
```

- Line card redundancy is in stable state with state Active and Stdbby warm.

```
Router# show redundancy linecard all
Load for five secs: 14%/1%; one minute: 8%; five minutes: 8%
Time source is NTP, 15:23:26.697 PST Thu Jan 17 2019
```

Slot	Subslot	LC Group	My State	Peer State	Peer Slot	Peer Subslot	Role	Mode
1	-	0	Active	Stdbby Warm	0	-	Active	Primary
2	-	0	Active	Stdbby Warm	0	-	Active	Primary
3	-	0	Active	Stdbby Warm	0	-	Active	Primary
6	-	0	Active	Stdbby Warm	0	-	Active	Primary
0	-	0	-	-	Multiple	None	Standby	Secondary

- Auto-boot is enabled.

```
Router# show bootvar
Load for five secs: 14%/0%; one minute: 14%; five minutes: 10%
Time source is NTP, 15:46:59.837 PST Thu Jan 17 2019
```

```
BOOT variable = harddisk:IOSXE/packages.conf,12;
CONFIG_FILE variable =
BOOTLDR variable does not exist
Configuration register is 0x2102
```

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

- Both SUPs are in the sub-package mode, running the same image from the same path.

```
Router# show bootvar
Load for five secs: 14%/0%; one minute: 14%; five minutes: 10%
Time source is NTP, 15:46:59.837 PST Thu Jan 17 2019
```

```
BOOT variable = harddisk:IOSXE/packages.conf,12;
CONFIG_FILE variable =
BOOTLDR variable does not exist
Configuration register is 0x2102
```

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

- The free space on boot device on both SUPs must be greater than 2GB.

```
Router# dir harddisk: | include bytes total

7804653568 bytes total (5691174912 bytes free)
```

- Download two files from the following Cisco.com Software Center URL:

<https://software.cisco.com/download/home/286283913/type>

- IOS XE Software Version 17.6.1w: **cbrrsup-universalk9.17.06.01w.SPA.bin**
- IOS XE Hardware Programmable Devices Version 17.6.1w:
cbrrsup-programmable_firmware.17.06.01w.SPA.pkg

- Copy the target consolidated image **cbrrsup-universalk9.17.06.01w.SPA.bin** to the active SUP in the same directory of the **packages.conf** file that the system is booted up with.

Step 1 Copy Cisco IOS XE Bengaluru 17.6.1w package to harddisk:.

```
copy <location>/cbrrsup-universalk9.17.06.01w.SPA.bin harddisk:<sub-pkg-dir>/
```

Step 2 Verify Cisco IOS XE Bengaluru 17.6.1w package against the md5 hash as provided in the Cisco.com Software center.

```
verify /md5 harddisk:<sub-pkg-dir>/cbrrsup-universalk9.17.06.01w.SPA.bin
```

Step 3 Copy the hardware programmable devices upgrade package to harddisk: if the file has not been copied already.

```
copy <location>/cbrrsup-programmable_firmware.17.06.01w.SPA.pkg harddisk:
```

Step 4 Verify the hardware programmable devices upgrade package against the md5 hash as provided in the Cisco.com Software center.

```
verify /md5 harddisk:cbrrsup-programmable_firmware.17.06.01w.SPA.pkg
```

Step 5 Check system status prior to upgrade. Save the information to compare against the system status after upgrade. For the commands to use to check the status, see the **show** commands at the end of this section.

Step 6 Check line card CPLD version via **show platform**. If it is not the minimum version 00000026, upgrade line card CPLD following the sub steps below. Otherwise skip this step.

Note To upgrade the line card CPLD to version 00000026, the cBR-8 must be running Cisco IOS XE Gibraltar 16.12.1 or later releases.

This procedure will trigger a reload of the linecard and will cause an outage if the system is not backed up with LCHA.

Do not power cycle the cBR-8 router during the firmware upgrade process. Power cycling the chassis may corrupt the ROMMON/Uboot image.

- a) 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 0
Daggits pre-upgrade successful
```

- b) Upgrade the line card CPLD 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:

```
Router# upgrade hw-programmable cable 0 daggit pkg_name
/harddisk/cbrsup-programmable_firmware.17.06.01w.SPA.pkg
```

- c) 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 0
```

- d) The line card moves from **booting** to **active** state. Check the version of the line card using the **show platform** command to make sure version is changed to 00000026.

Example:

```
cBR8#show platform
.....
Slot      CPLD Version      Rommon Version
-----
0         00000026         2011.03.18
...
```

e) 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 0
SUCCESS: Daggit_ver-38 : Booted from upgradable Image-1
```

Step 7

Check the firmware version of the Docsis 3.1 downstream modules in all slots, if it is different with the version listed in [Table 4: Firmware Versions, on page 70](#), update the firmware using the following command. Otherwise skip this step.

```
upgrade hw-programmable cable slot dsphy all pkg_name firmware_pkg_location_path
```

Example:

```
Router# upgrade hw-programmable cable 0 dsphy all pkg_name
/harddisk/cbrsup-programmable_firmware.17.06.01w.SPA.pkg
```

Step 8

Wait for the system log message asking the user to reload the line card that was upgraded. But do not reload the line card at this time.

```
001860: Jun 15 19:05:05.904 PDT: %IOSXE-5-PLATFORM: CLC0: cdman: Suggest reload the line card for
new FW to take effect using CLI: hw slot <slot-id> reload
```

Step 9

Perform ISSU.

```
request platform software package install node file harddisk:cbrsup-universalk9.17.06.01w.SPA.bin
```

Step 10

To monitor the ISSU progress, use the command below.

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

Step 11

Use these CLI to check status after ISSU.

```
show version
show version r0 running
show version r1 running
show version r0 provisioned
show version r1 provisioned
```

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.
- 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 ospf neighbor**
- **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 inventory**

Upgrading Supervisor CPLD Firmware

Before you begin



Note If the supervisor SO CPLD version is lower than 1511_1401 (SUP 160) or 15111401 (SUP 250), or, if the supervisor SIO CPLD version is lower than 1511_1301 (SUP 160) or 15111301 (SUP 250), physically power cycle the chassis when upgrading the supervisor CPLD.

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

- Cisco cBR-8 router is running with Cisco IOS XE Gibraltar 16.12.1w or later releases.
- 2 supervisors are running in the Cisco cBR-8 router and the redundancy is enabled.
- Download the file from the following Cisco.com Software Center URL:

<https://software.cisco.com/download/home/286283913/type>

- IOS XE Hardware Programmable Devices Version 17.6.1w:
cbrsup-programmable_firmware.17.06.01w.SPA.pkg
- Console access for both supervisors are required.
- Copy the new firmware package to the cBR-8 using FTP.

```
copy ftp://<location>/cbrsup-programmable_firmware.17.06.01w.SPA.pkg harddisk:
copy ftp://<location>/cbrsup-programmable_firmware.17.06.01w.SPA.pkg stby-harddisk:
```



Note When upgrading SUP0, run the CLI with the R0 setting while controlling SUP0. And when upgrading SUP1, run the CLI with the R1 setting.



Note This guide assumes SUP0 is in active state and SUP1 is in standby hot state at the beginning.

Perform step 1 to 4 using console connection of active SUP0:

Step 1 Set the config register.

```
configure terminal
config-register 0x2102
end
write memory
```

Step 2 Run the following command to prepare for R0 upgrade.

```
upgrade hw-programmable cable R0 viper pkg_name
/harddisk/cbrsup-programmable_firmware.17.06.01w.SPA.pkg
```

On SUP 250, you will see one of the following outputs:

- It takes 10~20 minutes to upgrade. Console would hung. Please don't do any operation during the upgrade.
You are upgrading Viper firmware using harddisk/cbrsup-programmable_firmware.17.06.01w.SPA.pkg image on SUP0, SUP0 is active.
Upgrade from assigned pkg file harddisk/cbrsup-programmable_firmware.17.06.01w.SPA.pkg
Using viper firmware /tmp/viper/mount/supve_viper_fpga_psirt.bin
Size of Viper Upgrade image: 16777216 bytes
No.of parts: 65536
Upgrading golden image...
65536+0 records in
65536+0 records out
16777216 bytes (17 MB, 16 MiB) copied, 688.873 s, 24.4 kB/s
Upgrading primary image...
65536+0 records in
65536+0 records out
16777216 bytes (17 MB, 16 MiB) copied, 675.19 s, 24.8 kB/s

```
Viper upgrade clean up 0
Upgrade successfully. Please make sure Rommon version is matched.
Please power cycle the chassis to let the new firmware take effect
```

- It takes 10~20 minutes to upgrade. Console would hung. Please don't do any operation during the upgrade.
You are upgrading Viper firmware using `harddisk/cbrsup-programmable_firmware.17.06.01w.SPA.pkg` image on SUP0, SUP0 is active.
Upgrade from assigned pkg file `harddisk/cbrsup-programmable_firmware.17.06.01w.SPA.pkg`
The golden viper is not compatible with assigned firmware
`/tmp/viper/mount/supve_viper_fpga_psirt.bin`, no upgrade will be performed
Viper upgrade clean up 2

Note This output means the SUP already has the latest version it can support, skip the rest of the steps.

On SUP 160, you will see one of the following outputs:

- It takes about 10 minutes to upgrade. Console would hung. Please don't do any operation during the upgrade.
You are upgrading Viper firmware using `harddisk/cbrsup-programmable_firmware.17.06.01w.SPA.pkg` image
Upgrade from assigned pkg file `/harddisk/cbrsup-programmable_firmware.17.06.01w.SPA.pkg`
Using viper firmware `/tmp/viper/mount/viper_fpga.bin`
Size of Viper Upgrade image: 16777216 bytes
No.of parts: 65536
65536+0 records in
65536+0 records out
Viper upgrade clean up 0
Upgrade successfully. Please make sure Rommon version is matched.
Please power cycle the chassis to let the new firmware take effect
- It takes 10~20 minutes to upgrade. Console would hung. Please don't do any operation during the upgrade.
You are upgrading Viper firmware using `harddisk/cbrsup-programmable_firmware.17.06.01w.SPA.pkg` image on SUP0, SUP0 is active.
Upgrade from assigned pkg file `harddisk/cbrsup-programmable_firmware.17.06.01w.SPA.pkg`
The golden viper is not compatible with assigned firmware
`/tmp/viper/mount/supve_viper_fpga_psirt.bin`, no upgrade will be performed
Viper upgrade clean up 2

Note This output means the SUP already has the latest version it can support, skip the rest of the steps.

Note Do not power cycle the chassis in this step.

Step 3 Run the following command to prepare for R1 upgrade.

```
upgrade hw-programmable cable R1 viper pkg_name
/harddisk/cbrsup-programmable_firmware.17.06.01w.SPA.pkg
```

You will see the similar output as the one in Step 2.

Note Do not power cycle the chassis in this step.

Step 4 If the supervisor ViperSO CPLD version is 15111401 and the supervisor ViperSIO CPLD version is 15111301 on both supervisors, follow step 5 - 11 to do the upgrade. Otherwise proceed to step 12.

```
Router#show platform diag
Load for five secs: 6%/1%; one minute: 7%; five minutes: 8%
Time source is NTP, 16:05:43.546 PST Thu Feb 8 2018
```



```

Chassis type: CBR-8-CCAP-CHASS
<SNIP>
Slot: SUP0, CBR-CCAP-SUP-160G
  Physical insert detect time : 00:01:58 (1d03h ago)
  CPLD version                 : 16052011
  ViperSO CPLD version       : 15111401
  ViperSIO CPLD version     : 15111301
  Rommon version               : 16.7(1r)S
  Blackbird version            : 00000112
  Raptor ESI version           : 0001003b
  Raptor MAC version           : 00010031
  SUP-PIC CPLD version         : 14071504
  SUP-DC CPLD version          : 14072207
  DTI Client FPGA version      : 00000005
  DTI Firmware version         : 00000A03
  Cortina PHY version          : 201402061607
  SUP PSOC 0 version           : v4.0.9
  SUP PSOC 1 version           : v4.0.8
  SUP PSOC 2 version           : v4.1.0_IVB
  SUP PSOC 3 version           : v4.0.6
  SUP-DC PSOC 0 version        : v4.0.8
  SUP-DC PSOC 1 version        : v4.0.5
  SUP-PIC PSOC 0 version       : V2.0.6
  SUP-PIC PSOC 1 version       : V2.0.6
<SNIP>
Slot: SUP1, CBR-CCAP-SUP-160G
  Physical insert detect time : 00:02:26 (1d03h ago)
  CPLD version                 : 16052011
  ViperSO CPLD version       : 15111401
  ViperSIO CPLD version     : 15111301
  Rommon version               : 16.7(1r)S
  Blackbird version            : 00000112
  Raptor ESI version           : 0001003b
  Raptor MAC version           : 00010031
  SUP-PIC CPLD version         : 14071504
  SUP-DC CPLD version          : 14072207
  DTI Client FPGA version      : 00000005
  DTI Firmware version         : 00000A03
  Cortina PHY version          : 201402061607
  SUP PSOC 0 version           : v4.0.9
  SUP PSOC 1 version           : v4.0.8
  SUP PSOC 2 version           : v4.1.0_IVB
  SUP PSOC 3 version           : v4.0.6
  SUP-DC PSOC 0 version        : v4.0.9
  SUP-DC PSOC 1 version        : v4.0.5
  SUP-PIC PSOC 0 version       : V3.0.0
  SUP-PIC PSOC 1 version       : V3.0.0
<SNIP>

```

Step 5 Set SUP0 to ROMMON using the following command.

```
redundancy force-switchover
```

Perform the following steps 6 to 7 using console connection of current active SUP1.

Step 6 Power cycle the SUP0 to set it to ROMMON.

```
test platform hardware slot R0 oir power-cycle
```

This command will reset and re-initialize the ROMMON. The new version of the supervisor CPLD will now take effect. Verify if it matches the following new version.

```
SUP 160 new version: 0x19071712
```

SUP 250 new version: 0x190717E1

Step 7 Boot SUP0 into IOS XE using SUP0 console connection.

```
dir harddisk:
boot harddisk:cbrsup-universalk9.17.06.01w.SPA.bin
```

Wait until SUP0 is in standby hot.

Step 8 Set SUP1 to ROMMON using the following command.

```
redundancy force-switchover
```

Perform the following steps 9 to 11 using console connection of current active SUP0.

Step 9 Power cycle the SUP1 to set it to ROMMON.

```
test platform hardware slot R1 oir power-cycle
```

This command will reset and re-initialize the ROMMON. The new version of the supervisor CPLD will now take effect. Verify if it matches the following new version.

SUP 160 new version: 0x19071712

SUP 250 new version: 0x190717E1

Step 10 Boot SUP1 into IOS XE using SUP1 console connection.

```
dir harddisk:
boot harddisk:cbrsup-universalk9.17.06.01w.SPA.bin
```

Wait until SUP1 is in standby hot.

Step 11 Wait for the chassis to become SSO and settled down. Then go to step 16. If you skipped step 5 to 10, perform step 12 to 15.

Note You need physical access to the chassis to power cycle the chassis.

Step 12 Reload the system by issuing **reload** command on the active SUP.

```
Router#reload
```

Step 13 Power cycle both supervisors.

Step 14 Verify if the new version matches the following on both SUPs.

SUP 160 new version: 0x19071712

SUP 250 new version: 0x190717E1

Step 15 Boot both SUP0 and SUP1 into IOS XE using SUP0 and SUP1 console.

```
dir harddisk:
boot harddisk:cbrsup-universalk9.17.06.01w.SPA.bin
```

Wait till SUP0 become standby hot.

Step 16 Once the system is up and running, perform the following checks.

- Set config register to normal boot.

```
configure terminal
config-register 0x2102
end
write memory
```

- Execute **show redundancy** command to ensure both SUPs are listed, one is active and the other is standby hot.
- Execute **show proc CPU sorted | ex 0.00** command.
- Execute **show platform diag** command.

Upgrading cBR CCAP 8x10G Remote PHY Digital Physical Interface Card

Before you begin

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

- Make sure the latest available IOS XE version is active in Cisco cBR-8 router.
- There are at least 20MB free space on the harddisk.



Note To make use of the new features, it is recommended to upgrade the cBR CCAP 8x10G Remote PHY Digital Physical Interface Card (D-PIC) to the latest version 1.1.

Step 1 Boot up system, wait until IOS is ready.

Step 2 Check current D-PIC version.

```
show hw-module subslot x/1 fpd
```

Note x/1 is D-PIC subslot number which needs upgrade.

Example:

```
Router#show hw-module subslot 9/1 fpd
```

```
==== =====
Slot Card Type          H/W   Field Programmable   Current   Min. Required
Ver.   Device: "ID-Name"   Version   Version
==== =====
```

```

9/1 CBR-DPIC-8X10G          1.0  46-CBR DIGI PIC          1.0          1.0
=====

```

Step 3 Upgrade D-PIC.

```
upgrade hw-module subslot x/1 fpd bundled reload
```

Example:

```
Router#upgrade hw-module subslot 9/1 fpd bundled reload
```

```
% The following FPD will be upgraded for CBR-DPIC-8X10G (H/W ver = 1.0) in subslot 9/1:
```

```

=====
Field Programmable   Current   Upgrade   Estimated
Device: "ID-Name"   Version   Version   Upgrade Time
=====
46-CBR DIGI PIC     1.0      1.1      00:05:00
=====

```

```
% NOTES:
```

- Use 'show upgrade fpd progress' command to view the progress of the FPD upgrade.
- The target card will be automatically reloaded after the upgrade operation. This reload will interrupt normal operation of the card. If necessary, ensure that appropriate actions have been taken to redirect card traffic before starting the FPD upgrade.

```
% Are you sure that you want to perform this operation? [no]: yes
```

```
% Initiating the upgrade operation on the target card ...
```

```
(Use "show upgrade fpd progress" command to see upgrade progress)
```

Step 4 Check if the upgrade process is finished. Upgrade progress will take about 1 to 2 minutes.

```
show upgrade fpd progress
```

Example:

```
Upgrade still ongoing:
```

```
Router#show upgrade fpd progress
```

```
FPD Image Upgrade Progress Table:
```

```

=====
Slot Card Type          Field Programmable   Approx.   Elapsed
                        Device : "ID-Name"   Time     Time     State
=====
9/1 CBR-DPIC-8X10G     46-CBR DIGI PIC     00:05:00  00:00:13  Updating...
=====

```

```
sj-104-cbr-13#show upgrade fpd progress
```

```
FPD Image Upgrade Progress Table:
```

```

=====
Slot Card Type          Field Programmable   Approx.   Elapsed
                        Device : "ID-Name"   Time     Time     State
=====

```

```

9/1 CBR-DPIC-8X10G      46-CBR DIGI PIC      00:05:00   00:00:26   Updating...
=====

```

Upgrade finished:

```
Router#show upgrade fpd progress
```

```
% There is no FPD image upgrade in progress.
```

Step 5 Check if the D-PIC status is ready.

```
show platform
```

Example:

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

Slot	Type	State	Insert time (ago)
2/1	CBR-RF-PROT-PIC	ok	00:08:48
3	CBR-CCAP-LC-40G	ok	00:12:46
3/1	CBR-RF-PIC	ok	00:08:48
8/1	CBR-DPIC-8X10G	ok	00:07:56
9	CBR-CCAP-LC-40G	ok	00:12:46
9/1	CBR-DPIC-8X10G	ok	00:07:54
SUP0	CBR-CCAP-SUP-160G	inserted	00:12:46
R0		ok, active	
F0		ok, active	
4		ok, active	
4/1	CBR-SUP-8X10G-PIC	ok	00:07:55
SUP1	CBR-CCAP-SUP-160G	inserted	00:12:22
R1		ok, standby	
F1		ok, standby	
5		ok, standby	
5/1	CBR-SUP-8X10G-PIC	ok	00:07:54
P0	PWR-3KW-AC-V2	ok	00:09:49
P1	PWR-3KW-AC-V2	ok	00:09:49
P2	PWR-3KW-AC-V2	ps, fail	00:09:49
P3	Unknown	N/A	never
P4	Unknown	N/A	never
P5	PWR-3KW-AC-V2	ok	00:09:49
P10	CBR-FAN-ASSEMBLY	ok	00:09:39
P11	CBR-FAN-ASSEMBLY	ok	00:09:39
P12	CBR-FAN-ASSEMBLY	ok	00:09:39
P13	CBR-FAN-ASSEMBLY	ok	00:09:39
P14	CBR-FAN-ASSEMBLY	ok	00:09:39

Slot	CPLD Version	Rommon Version
3	00000025	2011.03.18
9	00000025	2011.03.18
SUP0	16052011	16.7(3r)S
SUP1	16052011	16.7(3r)S

Step 6 Check if the new version works.

```
show hw-module subslot x/1 fpd
```

Example:

```
Router#show hw-module subslot 9/1 fpd
```

```

=====
Slot Card Type                H/W   Field Programmable   Current   Min. Required
Ver.   Device: "ID-Name"     Version  Version              Version

```

```
==== =====  
9/1 CBR-DPIC-8X10G      1.0  46-CBR DIGI PIC      1.1      1.0  
==== =====
```



CHAPTER 5

Upgrading the Cisco cBR-8 Router System to Cisco IOS XE Bengaluru 17.6.1a



Note Starting from Cisco IOS XE Bengaluru 17.6.1a, CBR-CCAP-LC-G2-R can only protect CBR-CCAP-LC-G2-R for linecard HA.



Note If you are using TACACS authentication, the TACACS configuration will be automatically updated to the new version after upgrading to Cisco IOS XE Bengaluru 17.6.1a. This is a fix to [CSCvu62273](#) and you do not need to take any action regarding the TACACS configuration in the cBR-8 prior to the upgrade.

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

By default, telnet is disabled on Cisco cBR-8. If you are going to use telnet to access the device, make sure the value of line **vtty transport** is correct and save the configuration in order to enable telnet.

```
Router# show run | begin line vty
line vty 0 4
  exec-timeout 0 0
  privilege level 15
  password 7 104D081B094410055F
  exec prompt timestamp
  transport input all
line vty 5 98
  exec-timeout 0 0
  privilege level 15
  password 7 02050D480809
  transport input all
line vty 99
  transport input all
!
```

The following table encompasses all versions that customers are required to update to support Cisco IOS XE Bengaluru 17.6.1a. All other firmware versions are either not upgradable by the customer, or not required to be upgraded for Cisco IOS XE Bengaluru 17.6.1a support. Use the commands in the tables to verify the firmware versions. If you need to upgrade firmware first, refer to the steps in [Upgrading the Cisco cBR-8 Router Firmware](#).



Note If you want to upgrade Supervisor CPLD firmware, refer to [Upgrading Supervisor CPLD Firmware](#), on page 104.

Table 5: Firmware Versions

Internal Name	Component Name	Required Minimum Version	Command
Supervisor CPLD	CBR-CCAP-SUP-160G CPLD	16052011/19071712	show platform
	CBR-CCAP-SUP-250G CPLD	170724E0/190717E1	show platform
Supervisor ROMMON	CBR-CCAP-SUP-160G ROMMON and CBR-CCAP-SUP-250G ROMMON	16.7(2r)S	show platform
Line Card CPLD	CBR-CCAP-LC-40G CPLD	00000026	show platform diag
Docsis 3.1 downstream module Micro	CBR-CCAP-LC-40G Gemini2 Micro	3.1A	show platform diag
Docsis 3.1 downstream module FPGA	CBR-CCAP-LC-40G Gemini2 Apollo	4.484F	show platform diag
DPIC Uboot and FPGA	CBR-DPIC-8X10G Firmware	00010001	show platform diag
DPIC 100G Uboot and FPGA	CBR-DPIC-2X100G Firmware	00020005	show platform diag



Note If the user wants to upgrade Supervisor CPLD to version 19071712 and 190717E1, the chassis must be running with Cisco IOS XE Gibraltar 16.12.1w or later releases.



Note Cisco recommends that operators upgrade their On-Premise SSM Satellite software versions to v7.x or later releases, to ensure the compatibility with cBR-8.

- [Verify max-carrier value](#), on page 93
- [Upgrading from Cisco IOS XE 16.x and later releases to Cisco IOS XE Bengaluru 17.6.1a](#), on page 94
- [Upgrading Supervisor CPLD Firmware](#), on page 104

- [Upgrading cBR CCAP 8x10G Remote PHY Digital Physical Interface Card, on page 109](#)

Verify max-carrier value

Currently in Remote PHY system, max-carrier value can be configured in the downstream controller profile as well as in RPD configuration for Cisco Remote PHY Shelf 300/600/7200. This may lead to inconsistent max-carrier value configurations.

Starting from Cisco IOS XE Gibraltar 16.10.1f, max-carrier value configured in the **cable rpd** mode is removed and RPD will use the max-carrier value configured in the **controller-profile** mode for the power calculation.

Before upgrading to Cisco IOS XE Gibraltar 16.10.1f or later releases, verify if the max-carrier values configured in the RPD shelf configuration and downstream controller profile(s) associated to RPD downstream port are the same. If they are different, update the cBR-8 configuration prior to upgrade.

Below is an example of correct configuration before upgrade.

```
cable downstream controller-profile 1
  max-carrier 128
  max-ofdm-spectrum 384000000
  rf-chan 0 3
    type DOCSIS
    qam-profile 1
    frequency 381000000
    rf-output NORMAL
    docsis-channel-id 1

cable downstream controller-profile 2
  max-carrier 158
  max-ofdm-spectrum 384000000
  rf-chan 158
    docsis-channel-id 159
  ofdm channel-profile 20 start-frequency 579000000 width 48000000 plc 600000000

cable rpd test
  identifier 0001.0001.0001
  type shelf
  rpd-ds 0 max-carrier 128
  rpd-ds 0 base-power 33
  rpd-ds 1 max-carrier 158
  rpd-ds 1 base-power 25
  core-interface Te9/1/0
    rpd-ds 0 downstream-cable 9/0/3 profile 1
    rpd-ds 0 downstream-cable 9/0/4 profile 2
    rpd-us 0 upstream-cable 9/0/3 profile 1
  r-dti 1
  rpd-event profile 0
  rpd-55d1-us-event profile 0
```



Note It is highly recommended to follow this example to check and update configuration if necessary because max-carrier value is used to compute the base power. Otherwise, after upgrade the expected base power value can be different which may affect cable modem coming online.



Note If you upgrade from a version lower than Cisco IOS XE Fuji 16.9.1, base power range may be changed on the port with OFDM channel configured. So be aware of the potential base power change before and after the upgrade.

Upgrading from Cisco IOS XE 16.x and later releases to Cisco IOS XE Bengaluru 17.6.1a

If you are upgrading from Cisco IOS XE Everest 16.6.x or Cisco IOS XE Fuji 16.7.x to Cisco IOS XE Bengaluru 17.6.1a, perform the following steps to upgrade SUP ROMMON manually. Otherwise proceed with the IOS upgrade.

1. Download hardware programmable devices upgrade package file **cbrsup-programmable_firmware.17.06.01a.SPA.pkg** from the following Cisco.com Software Center URL: <https://software.cisco.com/download/home/286283913/type>

2. Copy the package file to harddisk:

```
copy <location>/cbrsup-programmable_firmware.17.06.01a.SPA.pkg harddisk:
```

3. Verify the hardware programmable devices upgrade package against the md5 hash as provided in the Cisco.com Software center.

```
verify /md5 harddisk:cbrsup-programmable_firmware.17.06.01a.SPA.pkg
```

4. Upgrade SUP ROMMON.

```
Router#Upgrade rom-mon file harddisk:cbrsup-programmable_firmware.17.06.01a.SPA.pkg r0
Wait for the following output on the console:
ROMMON upgrade complete.
To make the new ROMMON permanent, you must restart the RP
```

```
Router#Upgrade rom-mon file harddisk:cbrsup-programmable_firmware.17.06.01a.SPA.pkg r1
Wait for the following output on the console:
ROMMON upgrade complete.
To make the new ROMMON permanent, you must restart the RP
```



Note Do not restart the SUPs currently, you can combine reloading the SUP with the IOS upgrade process.

If you are using cBR CCAP 8x10G Remote PHY Digital Physical Interface Card (D-PIC) with CBR-CCAP-LC-G2-R linecards, before upgrading to Cisco IOS XE Bengaluru 17.6.1a, contact your local Cisco representative to get the python tool and perform the following steps in order to predict and avoid downtime. This python tool is developed by Cisco, it is used to analyze the cBR-8 configuration file to determine if the configuration file includes non-compliant TenGigabitEthernet interface to downstream controller mappings, and update the configuration file to be compliant with the latest Cisco IOS XE Bengaluru 17.6.1a.

1. Collect the following information from the target cBR-8 to upgrade.

```
Router#show cable rpd sum
Router#show cable modem sum
Router#show cable video session all sum
```

2. Save the running configuration to the harddisk of the cBR-8.

```
Router#copy running-config harddisk:SavedConfig.txt
```

3. Copy the saved running configuration from harddisk: to an offline server for editing using SCP.

```
Router#copy harddisk:SavedConfig.txt scp:<path>
```

4. Run the python tool to modify the controllers in the saved configuration.

- Option 1 - Renumber Downstream-Cable controllers only

- a. Execute python script **kobol_ph2_controller_migration.py**. This script is intended for customers who do not immediately intend to take advantage of the Downstream-Video controllers and expanded SG capacity on CBR-CCAP-LC-G2-R.

```
$ python kobol_ph2_controller_migration.py
Enter the name of the configuration file: SavedConfig.txt
```

- b. Output file appends **_remap_controller** to the file name.

```
Output file name: SavedConfig.txt_remap_controller
```

- c. Check to ensure that the script completed successfully. If no output file is created or the size of the output file is 0 byte, then check script output for error messages.

- Option 2 - Renumber Downstream-Cable and utilize Downstream-Video controllers

- a. Execute python script **kobol_ph2_controller_migration_video.py**. This script is intended for customers who wish to utilize the new Downstream-Video controllers to free up existing Downstream-Cable controllers for expanded DOCSIS service groups.

```
$ python kobol_ph2_controller_migration_video.py
Enter the name of the configuration file: SavedConfig.txt
```

- b. Output file appends **_remap_controller_video** to the file name.

```
Output file name: SavedConfig.txt_remap_controller_video
```

- c. Check to ensure that the script completed successfully. If no output file is created or the size of the output file is 0 byte, then check script output for error messages.

5. **Modify the remapped configuration file to specify the Cisco IOS XE Bengaluru 17.6.1a image in the boot parameter.**

```
boot system harddisk:cbrsup-universalk9.17.06.01a.SPA.bin
```

6. Copy the final remapped configuration file back to the cBR-8 harddisk.

```
Router#copy scp:<path>/SavedConfig.txt_remap_controller harddisk:
```

or

```
Router#copy scp:<path>/SavedConfig.txt_remap_controller_video harddisk:
```

7. Copy remapped configuration file to startup of the cBR-8.

```
Router#copy harddisk:SavedConfig.txt_remap_controller startup-config
```

or

```
Router#copy harddisk:SavedConfig.txt_remap_controller_video startup-config
```

Upgrading using reload

Before you begin



Note If you are upgrading from Cisco IOS XE Everest 16.6.x or Cisco IOS XE Fuji 16.7.x to Cisco IOS XE Bengaluru 17.6.1a, perform [pre-upgrade steps 1 to 4](#) to upgrade SUP ROMMON manually before proceeding with IOS upgrading.

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

- Download two files from the following Cisco.com Software Center URL:

<https://software.cisco.com/download/home/286283913/type>

- IOS XE Software Version 17.6.1a: **cbrsup-universalk9.17.06.01a.SPA.bin**
- IOS XE Hardware Programmable Devices Version 17.6.1a: **cbrsup-programmable_firmware.17.06.01a.SPA.pkg**

Step 1 Copy Cisco IOS XE Bengaluru 17.6.1a package to harddisk: and stby-harddisk:

```
copy <location>/cbrsup-universalk9.17.06.01a.SPA.bin harddisk:
copy <location>/cbrsup-universalk9.17.06.01a.SPA.bin stby-harddisk:
```

Step 2 Verify Cisco IOS XE Bengaluru 17.6.1a package against the md5 hash as provided in the Cisco.com Software center.

```
verify /md5 harddisk:cbrsup-universalk9.17.06.01a.SPA.bin
verify /md5 stby-harddisk:cbrsup-universalk9.17.06.01a.SPA.bin
```

Step 3 Copy the hardware programmable devices upgrade package to harddisk: if the file has not been copied already.

```
copy <location>/cbrsup-programmable_firmware.17.06.01a.SPA.pkg harddisk:
```

Step 4 Verify the hardware programmable devices upgrade package against the md5 hash as provided in the Cisco.com Software center.

```
verify /md5 harddisk:cbrsup-programmable_firmware.17.06.01a.SPA.pkg
```

Step 5 Configure the chassis to boot the system with Cisco IOS XE Bengaluru 17.6.1a image.

- Use the following steps if you do not use cBR CCAP 8x10G Remote PHY Digital Physical Interface Card (D-PIC) with CBR-CCAP-LC-40G-R linecards.

```

configure terminal
no boot system
boot system harddisk:cbrsup-universalk9.17.06.01a.SPA.bin
config-register 0x2102
end
write mem

```

- b. Use the following steps if you use cBR CCAP 8x10G Remote PHY Digital Physical Interface Card (D-PIC) with CBR-CCAP-LC-40G-R linecards.

```

configure terminal
config-register 0x2102
end

```

Step 6

Check line card CPLD version via **show platform**. If it is not the minimum version 00000026, upgrade line card CPLD following the sub steps below. Otherwise skip this step.

Note To upgrade the line card CPLD to version 00000026, the cBR-8 must be running Cisco IOS XE Gibraltar 16.12.1 or later releases.

This procedure will trigger a reload of the linecard and will cause an outage if the system is not backed up with LCHA.

Do not power cycle the cBR-8 router during the firmware upgrade process. Power cycling the chassis may corrupt the ROMMON/Uboot image.

- a) 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 0
Daggit's pre-upgrade successful

```

- b) Upgrade the line card CPLD 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:

```

Router# upgrade hw-programmable cable 0 daggit pkg_name
/harddisk/cbrsup-programmable_firmware.17.06.01a.SPA.pkg

```

- c) 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 0

```

- d) The line card moves from **booting** to **active** state. Check the version of the line card using the **show platform** command to make sure version is changed to 00000026.

Example:

```
Router#show platform
.....
Slot      CPLD Version      Rommon Version
-----
0         00000026         2011.03.18
...
```

- e) 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 0
SUCCESS: Daggit_ver-38 : Booted from upgradable Image-1
```

Step 7

Check the firmware version of the Docsis 3.1 downstream modules in all slots, if it is different with the version listed in [Table 5: Firmware Versions, on page 92](#), update the firmware using the following command. Otherwise skip this step.

```
upgrade hw-programmable cable slot dsphy all pkg_name firmware_pkg_location_path
```

Example:

```
Router# upgrade hw-programmable cable 0 dsphy all pkg_name
/harddisk/cbrsup-programmable_firmware.17.06.01a.SPA.pkg
```

Step 8

Wait for the system log message asking the user to reload the line card that was upgraded.

```
001860: Jun 15 19:05:05.904 PDT: %IOSXE-5-PLATFORM: CLC0: cdman: Suggest reload the line card for
new FW to take effect using CLI: hw slot <slot-id> reload
```

Step 9

Reload the system.

```
Router#reload
```

During reload, monitor the chassis for any of the following errors, and update the configuration accordingly.

```
Mismatches TE interface. DS controller should be */*/0~7, configuration failed.
Mismatches TE interface. DS controller should be */*/8~15, configuration failed.
Mismatches TE interface. DS controller should be */*/16~23, configuration failed.
Mismatches TE interface. DS controller should be */*/24~31, configuration failed.
```

Step 10

If the system is running with SUP250, perform **no shut** on 100G interface after the system comes up for the first time.

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.
- 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 ospf neighbor**
- **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 inventory**

Upgrading with ISSU for I-CCAP Systems

Before you begin



Note ISSU is not supported for Remote PHY systems.



Note ISSU to Cisco IOS XE Bengaluru 17.6.1a is supported only from Cisco IOS XE Gibraltar 16.10.1g and later releases. If you are upgrading from an earlier release, you must upgrade the cBR-8 system following the steps in [Upgrading using reload, on page 96](#).

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

- The cBR-8 has two SUPs installed.

```
Router# show redundancy | include Location|state
      Active Location = slot 4
      Current Software state = ACTIVE
      Uptime in current state = 2 days, 21 hours, 37 minutes
      Standby Location = slot 5
      Current Software state = STANDBY HOT
      Uptime in current state = 2 days, 21 hours, 30 minutes
```

- Standby SUP must be in hot standby state.

```
Router# show redundancy | include Location|state
      Active Location = slot 4
      Current Software state = ACTIVE
      Uptime in current state = 2 days, 21 hours, 37 minutes
      Standby Location = slot 5
      Current Software state = STANDBY HOT
      Uptime in current state = 2 days, 21 hours, 30 minutes
```

- Line card redundancy is in stable state with state Active and Stdby warm.

```
Router# show redundancy linecard all
Load for five secs: 14%/1%; one minute: 8%; five minutes: 8%
Time source is NTP, 15:23:26.697 PST Thu Jan 17 2019
```

Slot	Subslot	LC Group	My State	Peer State	Peer Slot	Peer Subslot	Role	Mode
1	-	0	Active	Stdby Warm	0	-	Active	Primary
2	-	0	Active	Stdby Warm	0	-	Active	Primary
3	-	0	Active	Stdby Warm	0	-	Active	Primary
6	-	0	Active	Stdby Warm	0	-	Active	Primary
0	-	0	-	-	Multiple	None	Standby	Secondary

- Auto-boot is enabled.

```
Router# show bootvar
Load for five secs: 14%/0%; one minute: 14%; five minutes: 10%
Time source is NTP, 15:46:59.837 PST Thu Jan 17 2019
```

```
BOOT variable = harddisk:IOSXE/packages.conf,12;
CONFIG_FILE variable =
BOOTLDR variable does not exist
Configuration register is 0x2102
```

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


- Both SUPs are in the sub-package mode, running the same image from the same path.

```
Router# show bootvar
Load for five secs: 14%/0%; one minute: 14%; five minutes: 10%
Time source is NTP, 15:46:59.837 PST Thu Jan 17 2019
```

```
BOOT variable = harddisk:IOSXE/packages.conf,12;
CONFIG_FILE variable =
BOOTLDR variable does not exist
Configuration register is 0x2102
```

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

- The free space on boot device on both SUPs must be greater than 2GB.

```
Router# dir harddisk: | include bytes total

7804653568 bytes total (5691174912 bytes free)
```

- Download two files from the following Cisco.com Software Center URL:

<https://software.cisco.com/download/home/286283913/type>

- IOS XE Software Version 17.6.1a: **cbrsup-universalk9.17.06.01a.SPA.bin**
- IOS XE Hardware Programmable Devices Version 17.6.1a:
cbrsup-programmable_firmware.17.06.01a.SPA.pkg

- Copy the target consolidated image **cbrsup-universalk9.17.06.01a.SPA.bin** to the active SUP in the same directory of the **packages.conf** file that the system is booted up with.

Step 1 Copy Cisco IOS XE Bengaluru 17.6.1a package to harddisk:

```
copy <location>/cbrsup-universalk9.17.06.01a.SPA.bin harddisk:<sub-pkg-dir>/
```

Step 2 Verify Cisco IOS XE Bengaluru 17.6.1a package against the md5 hash as provided in the Cisco.com Software center.

```
verify /md5 harddisk:<sub-pkg-dir>/cbrsup-universalk9.17.06.01a.SPA.bin
```

Step 3 Copy the hardware programmable devices upgrade package to harddisk: if the file has not been copied already.

```
copy <location>/cbrsup-programmable_firmware.17.06.01a.SPA.pkg harddisk:
```

Step 4 Verify the hardware programmable devices upgrade package against the md5 hash as provided in the Cisco.com Software center.

```
verify /md5 harddisk:cbrsup-programmable_firmware.17.06.01a.SPA.pkg
```

Step 5 Check system status prior to upgrade. Save the information to compare against the system status after upgrade. For the commands to use to check the status, see the **show** commands at the end of this section.

Step 6 Check line card CPLD version via **show platform**. If it is not the minimum version 00000026, upgrade line card CPLD following the sub steps below. Otherwise skip this step.

Note To upgrade the line card CPLD to version 00000026, the cBR-8 must be running Cisco IOS XE Gibraltar 16.12.1 or later releases.

This procedure will trigger a reload of the linecard and will cause an outage if the system is not backed up with LCHA.

Do not power cycle the cBR-8 router during the firmware upgrade process. Power cycling the chassis may corrupt the ROMMON/Uboot image.

a) 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 0
Daggits pre-upgrade successful
```

b) Upgrade the line card CPLD 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:

```
Router# upgrade hw-programmable cable 0 daggit pkg_name
/harddisk/cbrsup-programmable_firmware.17.06.01a.SPA.pkg
```

c) 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 0
```

d) The line card moves from **booting** to **active** state. Check the version of the line card using the **show platform** command to make sure version is changed to 00000026.

Example:

```
cBR8#show platform
.....
Slot      CPLD Version      Rommon Version
-----
0         00000026         2011.03.18
...
```

e) 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 0
SUCCESS: Daggit_ver-38 : Booted from upgradable Image-1
```

Step 7

Check the firmware version of the Docsis 3.1 downstream modules in all slots, if it is different with the version listed in [Table 5: Firmware Versions, on page 92](#), update the firmware using the following command. Otherwise skip this step.

```
upgrade hw-programmable cable slot dsphy all pkg_name firmware_pkg_location_path
```

Example:

```
Router# upgrade hw-programmable cable 0 dsphy all pkg_name
/harddisk/cbrsup-programmable_firmware.17.06.01a.SPA.pkg
```

Step 8

Wait for the system log message asking the user to reload the line card that was upgraded. But do not reload the line card at this time.

```
001860: Jun 15 19:05:05.904 PDT: %IOSXE-5-PLATFORM: CLC0: cdman: Suggest reload the line card for
new FW to take effect using CLI: hw slot <slot-id> reload
```

Step 9

Perform ISSU.

```
request platform software package install node file harddisk:cbrsup-universalk9.17.06.01a.SPA.bin
```

Step 10

To monitor the ISSU progress, use the command below.

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

Step 11

Use these CLI to check status after ISSU.

```
show version
show version r0 running
show version r1 running
show version r0 provisioned
show version r1 provisioned
```

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.
- 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 ospf neighbor**
- **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 inventory**

Upgrading Supervisor CPLD Firmware

Before you begin



Note If the supervisor SO CPLD version is lower than 1511_1401 (SUP 160) or 15111401 (SUP 250), or, if the supervisor SIO CPLD version is lower than 1511_1301 (SUP 160) or 15111301 (SUP 250), physically power cycle the chassis when upgrading the supervisor CPLD.

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

- Cisco cBR-8 router is running with Cisco IOS XE Gibraltar 16.12.1w or later releases.
- 2 supervisors are running in the Cisco cBR-8 router and the redundancy is enabled.
- Download the file from the following Cisco.com Software Center URL:

<https://software.cisco.com/download/home/286283913/type>

- IOS XE Hardware Programmable Devices Version 17.6.1a:
cbrsup-programmable_firmware.17.06.01a.SPA.pkg
- Console access for both supervisors are required.
- Copy the new firmware package to the cBR-8 using FTP.

```
copy ftp://<location>/cbrsup-programmable_firmware.17.06.01a.SPA.pkg harddisk:
copy ftp://<location>/cbrsup-programmable_firmware.17.06.01a.SPA.pkg stby-harddisk:
```



Note When upgrading SUP0, run the CLI with the R0 setting while controlling SUP0. And when upgrading SUP1, run the CLI with the R1 setting.



Note This guide assumes SUP0 is in active state and SUP1 is in standby hot state at the beginning.

Perform step 1 to 4 using console connection of active SUP0:

Step 1 Set the config register.

```
configure terminal
config-register 0x2102
end
write memory
```

Step 2 Run the following command to prepare for R0 upgrade.

```
upgrade hw-programmable cable R0 viper pkg_name
/harddisk/cbrsup-programmable_firmware.17.06.01a.SPA.pkg
```

On SUP 250, you will see one of the following outputs:

- It takes 10~20 minutes to upgrade. Console would hung. Please don't do any operation during the upgrade.
You are upgrading Viper firmware using harddisk/cbrsup-programmable_firmware.17.06.01a.SPA.pkg image on SUP0, SUP0 is active.
Upgrade from assigned pkg file harddisk/cbrsup-programmable_firmware.17.06.01a.SPA.pkg
Using viper firmware /tmp/viper/mount/supve_viper_fpga_psirt.bin
Size of Viper Upgrade image: 16777216 bytes
No.of parts: 65536
Upgrading golden image...
65536+0 records in
65536+0 records out
16777216 bytes (17 MB, 16 MiB) copied, 688.873 s, 24.4 kB/s
Upgrading primary image...
65536+0 records in
65536+0 records out
16777216 bytes (17 MB, 16 MiB) copied, 675.19 s, 24.8 kB/s

```
Viper upgrade clean up 0
Upgrade successfully. Please make sure Rommon version is matched.
Please power cycle the chassis to let the new firmware take effect
```

- It takes 10~20 minutes to upgrade. Console would hung. Please don't do any operation during the upgrade.
You are upgrading Viper firmware using `harddisk/cbrsup-programmable_firmware.17.06.01a.SPA.pkg` image on SUP0, SUP0 is active.
Upgrade from assigned pkg file `harddisk/cbrsup-programmable_firmware.17.06.01a.SPA.pkg`
The golden viper is not compatible with assigned firmware
`/tmp/viper/mount/supve_viper_fpga_psirt.bin`, no upgrade will be performed
Viper upgrade clean up 2

Note This output means the SUP already has the latest version it can support, skip the rest of the steps.

On SUP 160, you will see one of the following outputs:

- It takes about 10 minutes to upgrade. Console would hung. Please don't do any operation during the upgrade.
You are upgrading Viper firmware using `harddisk/cbrsup-programmable_firmware.17.06.01a.SPA.pkg` image
Upgrade from assigned pkg file `/harddisk/cbrsup-programmable_firmware.17.06.01a.SPA.pkg`
Using viper firmware `/tmp/viper/mount/viper_fpga.bin`
Size of Viper Upgrade image: 16777216 bytes
No.of parts: 65536
65536+0 records in
65536+0 records out
Viper upgrade clean up 0
Upgrade successfully. Please make sure Rommon version is matched.
Please power cycle the chassis to let the new firmware take effect
- It takes 10~20 minutes to upgrade. Console would hung. Please don't do any operation during the upgrade.
You are upgrading Viper firmware using `harddisk/cbrsup-programmable_firmware.17.06.01a.SPA.pkg` image on SUP0, SUP0 is active.
Upgrade from assigned pkg file `harddisk/cbrsup-programmable_firmware.17.06.01a.SPA.pkg`
The golden viper is not compatible with assigned firmware
`/tmp/viper/mount/supve_viper_fpga_psirt.bin`, no upgrade will be performed
Viper upgrade clean up 2

Note This output means the SUP already has the latest version it can support, skip the rest of the steps.

Note Do not power cycle the chassis in this step.

Step 3 Run the following command to prepare for R1 upgrade.

```
upgrade hw-programmable cable R1 viper pkg_name
/harddisk/cbrsup-programmable_firmware.17.06.01a.SPA.pkg
```

You will see the similar output as the one in Step 2.

Note Do not power cycle the chassis in this step.

Step 4 If the supervisor ViperSO CPLD version is 15111401 and the supervisor ViperSIO CPLD version is 15111301 on both supervisors, follow step 5 - 11 to do the upgrade. Otherwise proceed to step 12.

```
Router#show platform diag
Load for five secs: 6%/1%; one minute: 7%; five minutes: 8%
Time source is NTP, 16:05:43.546 PST Thu Feb 8 2018
```

```

Chassis type: CBR-8-CCAP-CHASS
<SNIP>
Slot: SUP0, CBR-CCAP-SUP-160G
  Physical insert detect time : 00:01:58 (1d03h ago)
  CPLD version                 : 16052011
  ViperSO CPLD version       : 15111401
  ViperSIO CPLD version     : 15111301
  Rommon version               : 16.7(1r)S
  Blackbird version           : 00000112
  Raptor ESI version          : 0001003b
  Raptor MAC version          : 00010031
  SUP-PIC CPLD version        : 14071504
  SUP-DC CPLD version         : 14072207
  DTI Client FPGA version     : 00000005
  DTI Firmware version        : 00000A03
  Cortina PHY version         : 201402061607
  SUP PSOC 0 version           : v4.0.9
  SUP PSOC 1 version           : v4.0.8
  SUP PSOC 2 version           : v4.1.0_IVB
  SUP PSOC 3 version           : v4.0.6
  SUP-DC PSOC 0 version        : v4.0.8
  SUP-DC PSOC 1 version        : v4.0.5
  SUP-PIC PSOC 0 version       : V2.0.6
  SUP-PIC PSOC 1 version       : V2.0.6
<SNIP>
Slot: SUP1, CBR-CCAP-SUP-160G
  Physical insert detect time : 00:02:26 (1d03h ago)
  CPLD version                 : 16052011
  ViperSO CPLD version       : 15111401
  ViperSIO CPLD version     : 15111301
  Rommon version               : 16.7(1r)S
  Blackbird version           : 00000112
  Raptor ESI version          : 0001003b
  Raptor MAC version          : 00010031
  SUP-PIC CPLD version        : 14071504
  SUP-DC CPLD version         : 14072207
  DTI Client FPGA version     : 00000005
  DTI Firmware version        : 00000A03
  Cortina PHY version         : 201402061607
  SUP PSOC 0 version           : v4.0.9
  SUP PSOC 1 version           : v4.0.8
  SUP PSOC 2 version           : v4.1.0_IVB
  SUP PSOC 3 version           : v4.0.6
  SUP-DC PSOC 0 version        : v4.0.9
  SUP-DC PSOC 1 version        : v4.0.5
  SUP-PIC PSOC 0 version       : V3.0.0
  SUP-PIC PSOC 1 version       : V3.0.0
<SNIP>

```

Step 5 Set SUP0 to ROMMON using the following command.

```
redundancy force-switchover
```

Perform the following steps 6 to 7 using console connection of current active SUP1.

Step 6 Power cycle the SUP0 to set it to ROMMON.

```
test platform hardware slot R0 oir power-cycle
```

This command will reset and re-initialize the ROMMON. The new version of the supervisor CPLD will now take effect. Verify if it matches the following new version.

```
SUP 160 new version: 0x19071712
```

SUP 250 new version: 0x190717E1

Step 7 Boot SUP0 into IOS XE using SUP0 console connection.

```
dir harddisk:
boot harddisk:cbrsup-universalk9.17.06.01a.SPA.bin
```

Wait until SUP0 is in standby hot.

Step 8 Set SUP1 to ROMMON using the following command.

```
redundancy force-switchover
```

Perform the following steps 9 to 11 using console connection of current active SUP0.

Step 9 Power cycle the SUP1 to set it to ROMMON.

```
test platform hardware slot R1 oir power-cycle
```

This command will reset and re-initialize the ROMMON. The new version of the supervisor CPLD will now take effect. Verify if it matches the following new version.

SUP 160 new version: 0x19071712

SUP 250 new version: 0x190717E1

Step 10 Boot SUP1 into IOS XE using SUP1 console connection.

```
dir harddisk:
boot harddisk:cbrsup-universalk9.17.06.01a.SPA.bin
```

Wait until SUP1 is in standby hot.

Step 11 Wait for the chassis to become SSO and settled down. Then go to step 16. If you skipped step 5 to 10, perform step 12 to 15.

Note You need physical access to the chassis to power cycle the chassis.

Step 12 Reload the system by issuing **reload** command on the active SUP.

```
Router#reload
```

Step 13 Power cycle both supervisors.

Step 14 Verify if the new version matches the following on both SUPs.

SUP 160 new version: 0x19071712

SUP 250 new version: 0x190717E1

Step 15 Boot both SUP0 and SUP1 into IOS XE using SUP0 and SUP1 console.

```
dir harddisk:
boot harddisk:cbrsup-universalk9.17.06.01a.SPA.bin
```

Wait till SUP0 become standby hot.

Step 16 Once the system is up and running, perform the following checks.

- Set config register to normal boot.

```
configure terminal
config-register 0x2102
end
write memory
```

- Execute **show redundancy** command to ensure both SUPs are listed, one is active and the other is standby hot.
- Execute **show proc CPU sorted | ex 0.00** command.
- Execute **show platform diag** command.

Upgrading cBR CCAP 8x10G Remote PHY Digital Physical Interface Card

Before you begin

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

- Make sure the latest available IOS XE version is active in Cisco cBR-8 router.
- There are at least 20MB free space on the harddisk.



Note To make use of the new features, it is recommended to upgrade the cBR CCAP 8x10G Remote PHY Digital Physical Interface Card (D-PIC) to the latest version 1.1.

Step 1 Boot up system, wait until IOS is ready.

Step 2 Check current D-PIC version.

```
show hw-module subslot x/1 fpd
```

Note x/1 is D-PIC subslot number which needs upgrade.

Example:

```
Router#show hw-module subslot 9/1 fpd
```

```
==== =====
Slot Card Type          H/W   Field Programmable   Current   Min. Required
Ver.   Device: "ID-Name"   Version   Version
==== =====
```

```

9/1 CBR-DPIC-8X10G          1.0  46-CBR DIGI PIC          1.0          1.0
=====

```

Step 3 Upgrade D-PIC.

upgrade hw-module subslot x/1 fpd bundled reload

Example:

```

Router#upgrade hw-module subslot 9/1 fpd bundled reload

% The following FPD will be upgraded for CBR-DPIC-8X10G (H/W ver = 1.0) in subslot 9/1:

=====
Field Programmable   Current   Upgrade   Estimated
Device: "ID-Name"   Version   Version   Upgrade Time
=====
46-CBR DIGI PIC     1.0      1.1      00:05:00
=====

% NOTES:
- Use 'show upgrade fpd progress' command to view the progress of the FPD
  upgrade.
- The target card will be automatically reloaded after the upgrade
  operation. This reload will interrupt normal operation of the card. If
  necessary, ensure that appropriate actions have been taken to redirect
  card traffic before starting the FPD upgrade.

% Are you sure that you want to perform this operation? [no]: yes
% Initiating the upgrade operation on the target card ...
  (Use "show upgrade fpd progress" command to see upgrade progress)

```

Step 4 Check if the upgrade process is finished. Upgrade progress will take about 1 to 2 minutes.

show upgrade fpd progress

Example:

Upgrade still ongoing:

```

Router#show upgrade fpd progress

FPD Image Upgrade Progress Table:

=====
Slot Card Type          Field Programmable   Approx.   Elapsed
Device : "ID-Name"     Time Needed         Time     State
=====
9/1 CBR-DPIC-8X10G     46-CBR DIGI PIC     00:05:00 00:00:13 Updating...
=====

```

```

sj-104-cbr-13#show upgrade fpd progress

FPD Image Upgrade Progress Table:

=====
Slot Card Type          Field Programmable   Approx.   Elapsed
Device : "ID-Name"     Time Needed         Time     State
=====

```

```

9/1 CBR-DPIC-8X10G      46-CBR DIGI PIC      00:05:00   00:00:26   Updating...
=====

```

Upgrade finished:

```
Router#show upgrade fpd progress
```

```
% There is no FPD image upgrade in progress.
```

Step 5 Check if the D-PIC status is ready.

```
show platform
```

Example:

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

Slot	Type	State	Insert time (ago)
2/1	CBR-RF-PROT-PIC	ok	00:08:48
3	CBR-CCAP-LC-40G	ok	00:12:46
3/1	CBR-RF-PIC	ok	00:08:48
8/1	CBR-DPIC-8X10G	ok	00:07:56
9	CBR-CCAP-LC-40G	ok	00:12:46
9/1	CBR-DPIC-8X10G	ok	00:07:54
SUP0	CBR-CCAP-SUP-160G	inserted	00:12:46
R0		ok, active	
F0		ok, active	
4		ok, active	
4/1	CBR-SUP-8X10G-PIC	ok	00:07:55
SUP1	CBR-CCAP-SUP-160G	inserted	00:12:22
R1		ok, standby	
F1		ok, standby	
5		ok, standby	
5/1	CBR-SUP-8X10G-PIC	ok	00:07:54
P0	PWR-3KW-AC-V2	ok	00:09:49
P1	PWR-3KW-AC-V2	ok	00:09:49
P2	PWR-3KW-AC-V2	ps, fail	00:09:49
P3	Unknown	N/A	never
P4	Unknown	N/A	never
P5	PWR-3KW-AC-V2	ok	00:09:49
P10	CBR-FAN-ASSEMBLY	ok	00:09:39
P11	CBR-FAN-ASSEMBLY	ok	00:09:39
P12	CBR-FAN-ASSEMBLY	ok	00:09:39
P13	CBR-FAN-ASSEMBLY	ok	00:09:39
P14	CBR-FAN-ASSEMBLY	ok	00:09:39

Slot	CPLD Version	Rommon Version
3	00000025	2011.03.18
9	00000025	2011.03.18
SUP0	16052011	16.7(3r)S
SUP1	16052011	16.7(3r)S

Step 6 Check if the new version works.

```
show hw-module subslot x/1 fpd
```

Example:

```
Router#show hw-module subslot 9/1 fpd
```

```

=====
Slot Card Type                H/W   Field Programmable   Current   Min. Required
Ver.   Device: "ID-Name"     Version   Version             Version

```

```
==== =====  
9/1 CBR-DPIC-8X10G      1.0  46-CBR DIGI PIC      1.1      1.0  
==== =====
```
