



Upgrading the Cisco cBR-8 Router System to Cisco IOS XE Gibraltar 16.10.1f



Note Due to the performance impact, it is recommended to deploy Cisco IOS XE Gibraltar 16.10.1d or a release later than Cisco IOS XE Gibraltar 16.10.1f for RPHY applications.

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

The following table encompasses all versions that customers are required to update to support 16.10.1f. All other firmware versions are either not upgradable by the customer, or not required to be upgraded for 16.10.1f support. Use the commands in the tables to verify the firmware versions.

Table 1: Firmware Versions

Internal Name	Component Name	Required Minimum Version	Command
Supervisor CPLD	CBR-CCAP-SUP-160G CPLD	16052011	show platform
Supervisor CPLD	CBR-CCAP-SUP-250G CPLD	170724E0	show platform
Supervisor ROMMON	CBR-CCAP-SUP-160G Rommon and CBR-CCAP-SUP-250G Rommon	16.7(3r)S	show platform
Docsis 3.1 downstream module Micro	CBR-CCAP-LC-40G Gemin2 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

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- [Upgrading from Cisco IOS-XE 3.18.1aSP to Cisco IOS XE Gibraltar 16.10.1f, on page 3](#)
- [Upgrading from Cisco IOS XE 16.x to Cisco IOS XE Gibraltar 16.10.1f, on page 11](#)
- [Upgrading cBR CCAP 8x10G Remote PHY Digital Physical Interface Card, on page 18](#)

Verify max-carrier value

Currently, 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 128
  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 IOS XE Fuji 16.9.1 to IOS XE Gibraltar 16.12.1, 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 3.18.1aSP to Cisco IOS XE Gibraltar 16.10.1f

Upgrading Manually

Before you begin

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

- The firmware versions are not lower than the ones listed in [Table 1: Firmware Versions, on page 1](#). Otherwise upgrade the firmware versions, see [Upgrading the Cisco cBR-8 Router Firmware](#).
- Download two files from the following Cisco.com Software Center URL:
<https://software.cisco.com/download/type.html?mdfid=286283913&flowid=73842>
 - IOS XE Software Version 16.10.1f: **cbrsup-universalk9.16.10.01f.SPA.bin**
 - IOS XE Hardware Programmable Devices Version 16.10.1f:
cbrsup-programmable_firmware.16.10.01f_compat_with_318SP.SSA.pkg
- Console access for both SUPs are required.
- Ability to power cycle the chassis. Power cycle chassis is required to upgrade Supervisor CPLD.



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

Step 1 Copy Cisco IOS XE Gibraltar 16.10.1f package to bootflash: and stby-bootflash:.

```
copy <location>/cbrsup-universalk9.16.10.01f.SPA.bin bootflash:
copy <location>/cbrsup-universalk9.16.10.01f.SPA.bin stby-bootflash:
```

Step 2 Verify Cisco IOS XE Gibraltar 16.10.1f package against the md5 hash as provided in the Cisco.com Software center.

```
verify /md5 bootflash:cbrsup-universalk9.16.10.01f.SPA.bin
verify /md5 stby-bootflash:cbrsup-universalk9.16.10.01f.SPA.bin
```

Step 3 Copy the special firmware programming package to harddisk: and stby-harddisk:

```
copy <location>/cbrsup-programmable_firmware.16.10.01f_compat_with_318SP.SSA.pkg
harddisk:
copy <location>/cbrsup-programmable_firmware.16.10.01f_compat_with_318SP.SSA.pkg
stby-harddisk:
```

Step 4 Verify the special firmware programming package against the md5 hash as provided in the Cisco.com Software center.

```
verify /md5
harddisk:cbrsup-programmable_firmware.16.10.01f_compat_with_318SP.SSA.pkg
verify /md5
stby-harddisk:cbrsup-programmable_firmware.16.10.01f_compat_with_318SP.SSA.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 Configure the chassis to boot the system with Cisco IOS XE Gibraltar 16.10.1f image (Consolidated Mode).

```
Configure terminal
no boot system
boot system bootflash:cbrsup-universalk9.16.10.01f.SPA.bin
end
write mem
```

Step 7 Configure config-register to manual boot. Dropping to ROMMON later on is a requirement to ensure no IOS processes are running while the Supervisor CPLD is upgraded.

```
Configure terminal
config-register 0x0
end
```

Step 8 Check line card CPLD version via **show platform**. If it is not the latest version 00000025, upgrade line card CPLD following the sub steps below. Otherwise skip this step.

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.16.10.01f_compat_with_318SP.SSA.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 00000025:
- 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-37 : Booted from upgradable Image-1
```

Step 9 Upgrade supervisor ROMMON.

Example:

```
Router# upgrade rom-mon file harddisk:cbrsup-programmable_firmware.16.10.01f_compat_with_318SP.SSA.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.16.10.01f_compat_with_318SP.SSA.pkg
r1
```

Wait for the following output on the console:

```
ROMMON upgrade complete.
```

To make the new ROMMON permanent, you must restart the RP

Step 10 Check Docsis 3.1 downstream module FPGA and Micro versions via **show platform diag**. If it is not the latest version (See [Table 1: Firmware Versions, on page 1](#)), upgrade them following the sub steps below. Otherwise skip this step.

- a) Run the following command for each installed line card that requires Micro upgrade.

Example:

```
Router# upgrade hw-programmable cable 0 dsphy micro pkg_name
/harddisk/cbrsup-programmable_firmware.16.10.01f_compat_with_318SP.SSA.pkg
Please wait - firmware download may take up to 5 minutes to complete.
```

- b) Wait for log message similar to the following for each line card.

Example:

```
CLC0: cdman: Suggest reload the line card for new FW to take effect using CLI: hw slot <slot-id>
reload
```

- c) Reload the line card. Execute the command **hw slot <x> reload** for each line card x in this step.

```
hw slot <x> reload
```

- d) Run the following command for each installed line card that requires FPGA upgrade.

Example:

```
Router# upgrade hw-programmable cable 0 dsphy fpga pkg_name
/harddisk/cbrsup-programmable_firmware.16.10.01f_compat_with_318SP.SSA.pkg
Please wait - firmware download may take up to 5 minutes to complete.
```

- e) Wait for log message similar to the following for each line card.

Example:

```
CLC0: cdman: Suggest reload the line card for new FW to take effect using CLI: hw slot 0 reload
```

Note To reduce the time taken for upgrade, reloading line card in this step is combined with the powercycle of the chassis. So it is not necessary to execute the command **hw slot x reload** for each line card x in this step.

Step 11

Check Supervisor 0/1 CPLD version via **show platform**. If it is not the latest version (See [Table 1: Firmware Versions, on page 1](#)), upgrade Supervisor CPLD using the command shown below. Otherwise skip this step. While the upgrade is in progress, DO NOT reload the system.

```
Router#upgrade hw-programmable cable r0 viper pkg_name
/harddisk/cbrsup-programmable_firmware.16.10.01f_compat_with_318SP.SSA.pkg
Wait for the following output on the console:
Upgrade successfully. Please make sure Rommon version is matched.
Please power cycle the chassis to let the new firmware take effect
```

```
Router#upgrade hw-programmable cable r1 viper pkg_name
/harddisk/cbrsup-programmable_firmware.16.10.01f_compat_with_318SP.SSA.pkg
Wait for the following output on the console:
Upgrade successfully. Please make sure Rommon version is matched.
Please power cycle the chassis to let the new firmware take effect
```

Note If there is any failure during this step, refer to [Upgrading the Cisco cBR-8 Router Firmware](#) to upgrade Supervisor CPLD after loading Cisco IOS XE Gibraltar 16.10.1f package.

Step 12

Reload the cBR-8 router. Answer **no** to not save the configuration.

```
cBR8#reload
System configuration has been modified. Save? [yes/no]: no
Proceed with reload? [confirm]
cBR8#
```

Step 13

Configure to automatic boot by typing following command in **rommon >** prompt on both Supervisors.

```
rommon 1 > confreg 0x2102
rommon 2 > sync
```

```
rommon 3 >
```

Step 14 Power cycle chassis, wait for both SUPs to auto boot to 16.10.1f image.

```
rommon 1 >  
Initializing Hardware ...  
..  
..
```

Step 15 After cBR-8 bootup, verify the supervisor CPLD, linecard CPLD and downstream module FGPA and Micro are successfully upgraded.

Step 16 Check system status after upgrade. Compare the information against the system status prior to upgrade. For the commands to use to check the status, see the **show** commands at the end of this section.

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 Ansible

Before you begin

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

1. Prepare Ansible Server, operating system can be Linux/Windows/Mac, with docker service pre-installed.

For docker installation guide, please check following link:

<https://docs.docker.com/engine/installation/>

2. Check if the chassis supports AAA or local authentication with username & password. If not configured, use following CLI to enable local authentication, for example:

```
Cbr8#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
cBR8(config)#username cisco privilege 15 password 0 cisco
cBR8(config)#enable secret cisco
cBR8(config)#line vty 0 15
cBR8(config)#login local
cBR8(config)#exec-timeout 0 0
cBR8(config)#session-timeout 0
cBR8(config)#exit
```

3. If SSH is not enabled, use following CLI to enable SSH on cBR8, skip the domain name configuration if already configured.

```
cBR8(config)# ip domain-name domain.com
cBR8(config)#crypto key generate rsa
The name for the keys will be: cbr8.domain.com
Choose the size of the key modulus in the range of 360 to 4096 for your
General Purpose Keys. Choosing a key modulus greater than 512 may take
a few minutes.

How many bits in the modulus [512]: 1024
% Generating 1024 bit RSA keys, keys will be non-exportable...
[OK] (elapsed time was 0 seconds)

cBR8(config)#end
cBR8#copy running-config startup-config
cBR8#show ip ssh
SSH Enabled - version 1.99
```

4. Check if there is enough bootflash disk space on both SUP (>1.8GB).
5. Verify if the Ansible server can access cBR-8 using SSH.

```
[ansible@server ~]$ ssh cisco@100.0.0.1
The authenticity of host '100.0.0.1 (100.0.0.1)' can't be established.
RSA key fingerprint is c3:be:8f:cf:76:f4:31:4b:80:d8:2e:f0:76:6d:ff:bf.
Are you sure you want to continue connecting (yes/no)? yes
Warning: Permanently added '100.0.0.1' (RSA) to the list of known hosts.
Password:
cBR8#
```


6. Download three files from the following Cisco.com Software Center URL:
<https://software.cisco.com/download/type.html?mdfid=286283913&flowid=73842>
 - IOS XE Software Version 16.10.1f: **cbrsup-universalk9.16.10.01f.SPA.bin**
 - IOS XE Hardware Programmable Devices Version 16.10.1f:
cbrsup-programmable_firmware.16.10.01f_compat_with_318SP.SSA.pkg
 - Ansible upgrade script: **cbr-8_upgrade_ansible_16.10.1f_v1.tar**
7. Copy IOS XE Software package and IOS XE Hardware Programmable Devices package to TFTP/FTP/SCP server or usb disk. Upload Ansible upgrade script to Ansible server.
8. Console access for both SUPs are required.
9. Ability to power cycle the chassis. Power cycle chassis is required to upgrade Supervisor CPLD.

Step 1 Run following CLI on the Ansible server to create the docker image.

```
docker import cbr-8_upgrade_ansible_16.10.1f_v1.tar ansible_mop
```

Step 2 Start docker container with the image and enter the container shell.

```
docker run -it --name=mop ansible_mop /bin/bash
```

Step 3 Change current directory to the playbook folder for this software and firmware upgrade.

```
cd /opt/cbr-8_upgrade_ansible
```

Step 4 Modify hosts file to add target cBR-8 ip addresses, can be multiple lines if customer wants to upgrade firmware on multiple cBR8 routers simultaneously, sample file is as below:

```
[cbr]
100.110.110.110
100.185.185.185
```

Step 5 Modify secrets.yaml file, change the username/password/enable password to reflect the real username/password/enable configuration for target cBR. If no enable password is set, just keep the sample **cisco** for **auth_pass**.

```
creds:
  username: cisco
  password: cisco
  auth_pass: cisco
```

Step 6 Modify upgrade_vars.yaml file to indicate the firmware package name, IOS image name and source (Optional if the package files are already on cbr-8 harddisk:).

```
file_info:
  image_name: cbrsup-universalk9.16.10.01f.SPA.bin
  pkg_name: cbrsup-programmable_firmware.16.10.01f_compat_with_318SP.SSA.pkg
  #if the pkg file in the TB, just modify dst_dir to the pkg location
```

```

#the four examples shows the usage
#example1
#src_dir: "ftp://username:password@20.11.0.42:~/ "
#example2
#src_dir: "tftp://192.168.3.47/ "
#example3
#src_dir: "usb0:"
#example4
src_dir: "harddisk:"

slot_info:
#slot_to_upgrade: [2,3,6,7,8,9]
slot_to_upgrade: "ALL"

```

Step 7 Modify md5_map.yaml file in the folder **version_file** to add new image label and md5 value.

```

pkg_md5: cbrsup-programmable_firmware.16.10.01f_compat_with_318SP.SSA.pkg: xxx
image_md5: cbrsup-universalk9.16.10.01f.SPA.bin: xxx

```

Step 8 Execute following command to start the playbook to upgrade firmware.

```
./run_mop_upgrade_from_318SP
```

Step 9 Reload the system by typing **reload** on the active SUP and answering **no** to not save the configuration.

```

cBR8#reload
System configuration has been modified. Save? [yes/no]: no
Proceed with reload? [confirm]
cBR8#

```

Step 10 From ROMMON issue the following command on both SUPs.

```

rommon 1 > confreg 0x2102
rommon 2 > sync
rommon 3 >

```

Step 11 Power cycle chassis, wait for both SUPs to auto boot to 16.10.1f image.

```

rommon 1>
Initializing Hardware ...

?

System Bootstrap, Version 16.7(3r)S, RELEASE SOFTWARE
Copyright (c) 1994-2016 by cisco Systems, Inc.

Current image running: Boot ROM1

Last reset cause: PowerOn

Viper version register: 0x16052011
Set Chassis Type to 13RU
Cisco cBR-8 platform with 50331648 Kbytes of main memory

```

Step 12 After system bootup and stable, execute following command to start the playbook to check the upgrade result.

```
./run_mop_upgrade_post

...
TASK [debug] *****
Friday 17 March 2017  14:30:25 +0800 (0:00:00.014)          0:01:10.187 *****
ok: [100.185.185.185] => {
  "msg": "Mop upgrade passed!"
}
PLAY RECAP *****
100.185.185.185          : ok=120  changed=1    unreachable=0    failed=0
```

Step 13 Exit the container if finished upgrading this time to stop the container.

```
exit
```

Step 14 If user wants to start the container again, use following command to start the container and enter its shell.

```
docker start mop
docker attach mop
```

Step 15 All the file changes are kept in the container, user can run step 4-11 to upgrade again.

Upgrading from Cisco IOS XE 16.x to Cisco IOS XE Gibraltar 16.10.1f

If you are upgrading from Cisco IOS XE Everest 16.6.x and Cisco IOS XE Fuji 16.7.x to Cisco IOS XE Gibraltar 16.10.1f, perform the following steps before the upgrade:

1. Download hardware programmable devices upgrade package file **cbrrsup-programmable_firmware.16.10.01f.SPA.pkg** from the following Cisco.com Software Center URL: <https://software.cisco.com/download/type.html?mdfid=286283913&flowid=73842>

2. Copy the package file to harddisk:

```
copy <location>/cbrrsup-programmable_firmware.16.10.01f.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:cbrrsup-programmable_firmware.16.10.01f.SPA.pkg
```

4. Upgrade SUP ROMMON.

```
Router#Upgrade rom-mon file harddisk:cbrrsup-programmable_firmware.16.10.01f.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:cbrrsup-programmable_firmware.16.10.01f.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 To save time, we can combine reloading the SUP with the ISSU process.

Upgrading with ISSU

Before you begin



Note Due to the new SUP250 WAN FPGA firmware included in the Cisco IOS XE Gibraltar 16.10.1f package, it is recommended to upgrade the cBR-8 system following the steps in [Upgrading using reload](#), otherwise the new SUP250 WAN FPGA firmware will not take effect.



Note If you are upgrading from Cisco IOS XE Everest 16.6.x and Cisco IOS XE Fuji 16.7.x to Cisco IOS XE Gibraltar 16.10.1f, complete [pre-upgrade steps 1 to 4](#) before proceed.

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

- The cBR-8 has two SUPs setup.

```
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.

```
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	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 = bootflash:IOSXE/packages.conf,12;
CONFIG_FILE variable =
BOOTLDR variable does not exist
Configuration register is 0x2
```

```
Standby BOOT variable = bootflash:IOSXE/packages.conf,12;
Standby CONFIG_FILE variable =
Standby BOOTLDR variable does not exist
Standby Configuration register is 0x2
```

- 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 = bootflash:IOSXE/packages.conf,12;
CONFIG_FILE variable =
BOOTLDR variable does not exist
Configuration register is 0x2
```

```
Standby BOOT variable = bootflash:IOSXE/packages.conf,12;
Standby CONFIG_FILE variable =
Standby BOOTLDR variable does not exist
Standby Configuration register is 0x2
```

- Target consolidated image cbrsup-universalk9.16.10.01f.SPA.bin is copied to active SUP in the same directory of the packages.conf file that the system is booted up with.
- The free space on boot device on both SUPs must be greater than 1.8 GB.

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

7804653568 bytes total (1311854592 bytes free)
```

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

<https://software.cisco.com/download/type.html?mdfid=286283913&flowid=73842>

- IOS XE Software Version 16.10.1f: **cbrsup-universalk9.16.10.01f.SPA.bin**
- IOS XE Hardware Programmable Devices Version 16.10.1f: **cbrsup-programmable_firmware.16.10.01f.SPA.pkg**



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

-
- Step 1** Copy Cisco IOS XE Gibraltar 16.10.1f package to bootflash:
- ```
copy <location>/cbrsup-universalk9.16.10.01f.SPA.bin bootflash:<sub-pkg-dir>/
```
- Step 2** Verify Cisco IOS XE Gibraltar 16.10.1f package against the md5 hash as provided in the Cisco.com Software center.
- ```
verify /md5 bootflash:<sub-pkg-dir>/cbrsup-universalk9.16.10.01f.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.16.10.01f.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.16.10.01f.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** Upgrade Docsis 3.1 downstream modules in all slots.
- ```
Upgrade hw-programmable cable <slot> dsphy all
pkg_name/harddisk/cbrsup-programmable_firmware.16.10.01f.SPA.pkg
```
- Step 7** 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** Perform ISSU.
- ```
request platform software package install node file bootflash:cbrsup-universalk9.16.10.01f.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
```

**Note** If both Docsis 3.1 OFDM channels and downstream load balancing are configured, then Docsis 3.1 CMs will come up in a Docsis 3.0 bonding group after ISSU from Cisco IOS XE Everest 16.6.x. The workaround procedure is:

1. Admin shut all OFDM channels. This can be done from a script, or from cut and paste of the CLI. There is no need to have a delay between successive shuts. For example:

```
configure terminal
 controller Integrated-Cable 2/0/0
 rf-chan 158
 shut
```

2. Wait for 30 seconds.
3. Admin perform no-shut on all OFDM channels. This may be done from a script, or from cut and paste of the CLI. There is no need to have a delay between successive no-shuts. For example:

```
configure terminal
 controller Integrated-Cable 2/0/0
 rf-chan 158
 no shut
```

4. Reset all Docsis 31 CMs. For example:

```
clear cable modem d31-capable reset
```

---

### 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 using reload

### Before you begin



**Note** If you are upgrading from Cisco IOS XE Everest 16.6.x and Cisco IOS XE Fuji 16.7.x to Cisco IOS XE Gibraltar 16.10.1f, complete [pre-upgrade steps 1 to 4](#) before proceed.

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/type.html?mdfid=286283913&flowid=73842>
  - IOS XE Software Version 16.10.1f: **cbrsup-universalk9.16.10.01f.SPA.bin**
  - IOS XE Hardware Programmable Devices Version 16.10.1f:  
**cbrsup-programmable\_firmware.16.10.01f.SPA.pkg**

**Step 1** Copy Cisco IOS XE Gibraltar 16.10.1f package to bootflash: and stby-bootflash:.

```
copy <location>/cbrsup-universalk9.16.10.01f.SPA.bin bootflash:
copy <location>/cbrsup-universalk9.16.10.01f.SPA.bin stby-bootflash:
```

**Step 2** Verify Cisco IOS XE Gibraltar 16.10.1f package against the md5 hash as provided in the Cisco.com Software center.

```
verify /md5 bootflash:cbrsup-universalk9.16.10.01f.SPA.bin
verify /md5 stby-bootflash:cbrsup-universalk9.16.10.01f.SPA.bin
```

**Step 3** Copy the hardware programmable devices upgrade package to harddisk:.

```
copy <location>/cbrsup-programmable_firmware.16.10.01f.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.16.10.01f.SPA.pkg
```

**Step 5** Configure the chassis to boot the system with Cisco IOS XE Gibraltar 16.10.1f image.

```
Configure terminal
no boot system
boot system bootflash:cbrsup-universalk9.16.10.01f.SPA.bin
config-register 0x2
end
write mem
```

**Step 6** If you are upgrading from Cisco IOS XE Everest 16.6.x and Cisco IOS XE Fuji 16.7.x, and both SUP ROMMON versions are not 16.7(3r)S, upgrade SUP ROMMON.

```
Router#Upgrade rom-mon file harddisk:cbrsup-programmable_firmware.16.10.01f.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.16.10.01f.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
```

**Step 7** Upgrade Docsis 3.1 downstream modules in all slots.

```
Upgrade hw-programmable cable <slot> dsphy all
pkg_name/harddisk/cbrsup-programmable_firmware.16.10.01f.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
```

### 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 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 active IOS XE version is 16.10.1f.
- 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.

---



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

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

```
==== =====
Slot Card Type Field Programmable Approx.
 Device : "ID-Name" Time Elapsed
 ===== =====
 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
 ===== =====
 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(1r)S
SUP1 16052011 16.7(1r)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
==== =====
```

