



## **Upgrading the Cisco cBR Series Converged Broadband Routers for Cisco IOS XE Fuji 16.8.x**

**First Published:** 2018-03-30

**Last Modified:** 2018-11-30

### **Americas Headquarters**

Cisco Systems, Inc.  
170 West Tasman Drive  
San Jose, CA 95134-1706  
USA  
<http://www.cisco.com>  
Tel: 408 526-4000  
800 553-NETS (6387)  
Fax: 408 527-0883





## CONTENTS

---

### CHAPTER 1

#### **Upgrading the Cisco cBR-8 Router System to Cisco IOS XE Fuji 16.8.1e 1**

Upgrading from Cisco IOS-XE 3.18.1aSP to Cisco IOS XE Fuji 16.8.1e 2

Upgrading Manually 2

Upgrading with Ansible 6

Upgrading from Cisco IOS XE Everest 16.6.1 and Cisco IOS XE Fuji 16.7.1 to Cisco IOS XE Fuji 16.8.1e with ISSU 10

Upgrading to Cisco IOS XE 16.8.1e with Hardware Programmable Devices Package for Cisco IOS XE 16.8.1 13

Upgrading D-PIC 16

---

### CHAPTER 2

#### **Upgrading the Cisco cBR-8 Router System to Cisco IOS XE Fuji 16.8.1d 21**

Upgrading from Cisco IOS-XE 3.18.1aSP to Cisco IOS XE Fuji 16.8.1d 22

Upgrading Manually 22

Upgrading with Ansible 26

Upgrading from Cisco IOS XE Everest 16.6.1 and Cisco IOS XE Fuji 16.7.1 to Cisco IOS XE Fuji 16.8.1d with ISSU 30

Upgrading to Cisco IOS XE 16.8.1d with Hardware Programmable Devices Package for Cisco IOS XE 16.8.1 33

Upgrading D-PIC 36

---

### CHAPTER 3

#### **Upgrading the Cisco cBR-8 Router System to Cisco IOS XE Fuji 16.8.1 41**

Upgrading from Cisco IOS-XE 3.18.1aSP to Cisco IOS XE Fuji 16.8.1 42

Upgrading Manually 42

Upgrading with Ansible 46

Upgrading from Cisco IOS XE Everest 16.6.1 and Cisco IOS XE Fuji 16.7.1 to Cisco IOS XE Fuji 16.8.1 with ISSU 50

Upgrading to Cisco IOS XE 16.8.1 with Hardware Programmable Devices Package for Cisco IOS XE  
16.8.1 53

Upgrading D-PIC 56



# CHAPTER 1

## Upgrading the Cisco cBR-8 Router System to Cisco IOS XE Fuji 16.8.1e

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 16.8.1e. All other firmware versions are either not upgradable by the customer, or not required to be upgraded for 16.8.1e 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 Rommon CPLD	16052011	<b>show platform</b>
Supervisor ROMMON	CBR-CCAP-SUP-160G Rommon	16.7(1r)S	<b>show platform</b>
Linecard CPLD	CBR-CCAP-LC-40G CPLD	00000025	<b>show platform</b>
Linecard Uboot	CBR-CCAP-LC-40G Rommon	2011.03.18	<b>show platform</b>
Linecard PSOC	CBR-CCAP-LC-40G PSOC	4.6	<b>show platform diag</b>
Docsis 3.0 downstream module Micro	CBR-CCAP-LC-40G Gemin1 Micro	1.E	<b>show platform diag</b>
Docsis 3.0 downstream module FPGA	CBR-CCAP-LC-40G Gemin1 Apollo	2.F	<b>show platform diag</b>
Docsis 3.1 downstream module Micro	CBR-CCAP-LC-40G Gemin2 Micro	3.1A	<b>show platform diag</b>

Docsis 3.1 downstream module FPGA	CBR-CCAP-LC-40G Gemini2 Apollo	4.484C	<b>show platform diag</b>
DPIC Uboot and FPGA	CBR-DPIC-8X10G Firmware	00010001	<b>show platform diag</b>

- [Upgrading from Cisco IOS-XE 3.18.1aSP to Cisco IOS XE Fuji 16.8.1e, on page 2](#)
- [Upgrading from Cisco IOS XE Everest 16.6.1 and Cisco IOS XE Fuji 16.7.1 to Cisco IOS XE Fuji 16.8.1e with ISSU, on page 10](#)
- [Upgrading to Cisco IOS XE 16.8.1e with Hardware Programmable Devices Package for Cisco IOS XE 16.8.1, on page 13](#)
- [Upgrading D-PIC, on page 16](#)

# Upgrading from Cisco IOS-XE 3.18.1aSP to Cisco IOS XE Fuji 16.8.1e

## 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 [Firmware versions](#) table. 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 16.8.1e: **cbrsup-universalk9.16.08.01e.SPA.bin**
  - IOS XE Hardware Programmable Devices Version 16.8.1:  
**cbrsup-programmable\_firmware.16.08.01\_compat\_with\_3.18SP.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 Fuji 16.8.1e package to bootflash: and stby-bootflash:.

```
copy <location>/cbrsup-universalk9.16.08.01e.SPA.bin bootflash:
```

```
copy <location>/cbrsup-universalk9.16.08.01e.SPA.bin stby-bootflash:
```

**Step 2** Verify Cisco IOS-XE Fuji 16.8.1e package against the md5 hash as provided in the Cisco.com Software center.

```
verify /md5 bootflash:cbrsup-universalk9.16.08.01e.SPA.bin
verify /md5 stby-bootflash:cbrsup-universalk9.16.08.01e.SPA.bin
```

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

```
copy <location>/cbrsup-programmable_firmware.16.08.01_compat_with_3.18SP.SSA.pkg
harddisk:
copy <location>/cbrsup-programmable_firmware.16.08.01_compat_with_3.18SP.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.16.08.01_compat_with_3.18SP.SSA.pkg
verify /md5
stby-harddisk:cbrsup-programmable_firmware.16.08.01_compat_with_3.18SP.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 Fuji 16.8.1e image (Consolidated Mode).

```
Configure terminal
no boot system
boot system bootflash:cbrsup-universalk9.16.08.01e.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.16.08.01_compat_with_3.18SP.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

Check Docsis 3.0 downstream module and Docsis 3.1 downstream module FPGA and Micro versions via **show platform diag**. If it is not the latest version (See [Table 2: Firmware Versions, on page 21](#)), 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.16.08.01_compat_with_3.18SP.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.16.08.01_compat_with_3.18SP.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 10** Check Supervisor 0/1 CPLD version via **show platform**. If it is not the latest version (See [Table 2: Firmware Versions, on page 21](#)), upgrade Supervisor CPLD using the command shown below. Otherwise skip this step.

```
upgrade hw-programmable cable r0 viper pkg_name
/harddisk/cbrsup-programmable_firmware.16.08.01_compat_with_3.18SP.SSA.pkg
upgrade hw-programmable cable r1 viper pkg_name
/harddisk/cbrsup-programmable_firmware.16.08.01_compat_with_3.18SP.SSA.pkg
```

**Note** If there is any failure during this step, please see [Upgrading to Cisco IOS XE 16.8.1d with Hardware Programmable Devices Package for Cisco IOS XE 16.8.1, on page 33](#) to upgrade Supervisor CPLD after loading Cisco IOS XE Fuji 16.8.1e package.

**Step 11** 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 12** Configure to automatic boot by typing following command in **rommon >** prompt on both Supervisors.

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

**Step 13** Power cycle chassis, wait for both SUPs to auto boot to 16.8.1e image.

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

**Step 14** After cBR-8 bootup, verify the supervisor CPLD, linecard CPLD and downstream module FGPA and Micro are successfully upgraded.

**Step 15** 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 16.8.1e: **cbrsup-universalk9.16.08.01e.SPA.bin**
- IOS XE Hardware Programmable Devices Version 16.8.1:  
**cbrsup-programmable\_firmware.16.08.01\_compat\_with\_3.18SP.SSA.pkg**
- Ansible upgrade script: **cbr-8\_upgrade\_ansible\_16.8.1\_v1.2.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_16.8.1_v1.2.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_16.8.1_v1.2.tar
```

**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-universalk9.16.08.01d.SPA.bin
  pkg_name: cbrsup-programmable_firmware.16.08.01_compat_with_3.18SP.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.16.08.01_compat_with_3.18SP.SSA.pkg:
c68da8be5dfe933df03389f741163191
image_md5: cbrsup-universalk9.16.08.01d.SPA.bin: 62153fc67cf78371703388e406b79e19
```

**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 16.8.1e image.

```
rommon 1>
Initializing Hardware ...

?

System Bootstrap, Version 16.6(2r)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 Everest 16.6.1 and Cisco IOS XE Fuji 16.7.1 to Cisco IOS XE Fuji 16.8.1e with ISSU

### Before you begin

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 16.8.1e: **cbrsup-universalk9.16.08.01e.SPA.bin**
- IOS XE Hardware Programmable Devices Version 16.8.1: **cbrsup-programmable\_firmware.16.08.01.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 Fuji 16.8.1e package to bootflash: and stby-bootflash:.

```
copy <location>/cbrsup-universalk9.16.08.01e.SPA.bin bootflash:
copy <location>/cbrsup-universalk9.16.08.01e.SPA.bin stby-bootflash:
```

**Step 2** Verify Cisco IOS XE Fuji 16.8.1e package against the md5 hash as provided in the Cisco.com Software center.

```
verify /md5 bootflash:cbrsup-universalk9.16.08.01e.SPA.bin
verify /md5 stby-bootflash:cbrsup-universalk9.16.08.01e.SPA.bin
```

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

```
copy <location>/cbrsup-programmable_firmware.16.08.01.SPA.pkg harddisk:
copy <location>/cbrsup-programmable_firmware.16.08.01.SPA.pkg stby-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.16.08.01.SPA.pkg
verify /md5 stby-harddisk:cbrsup-programmable_firmware.16.08.01.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 the slots.

```
upgrade hw-programmable cable <slot> dsphy all
pkg_name/harddisk/cbrsup-programmable_firmware.16.08.01.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** Before the ISSU upgrade please check and make sure:

- The cBR-8 is in Subpackage mode.
- Both SUPs are running same image from same path.
- Autoboot is enabled.
- The cBR-8 has two SUP and in SSO mode, standby SUP is in standby hot mode.
- All linecards are in normal state in LCHA group. Use **show redundancy linecard all** command, active cards should be in **Stdy Warm** state.
- There is enough bootflash disk space on both SUP.

**Step 9** Copy 16.8.1e image in the same folder of current boot package on active SUP.

**Step 10** Perform ISSU.

```
request platform software package install node file bootflash:cbrsup-universalk9.16.08.01e.SPA.bin
```

**Step 11** To monitor the ISSU progress, use the command below.

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

**Step 12** 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
end
```

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
end
```

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 to Cisco IOS XE 16.8.1e with Hardware Programmable Devices Package for Cisco IOS XE 16.8.1

### Before you begin

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

- Make sure Line Card CPLD version is 00000025. If the value is lower than 00000025, follow this procedure to upgrade the Line Card CPLD to version 00000025 first:

[http://www.cisco.com/c/en/us/td/docs/cable/cbr/upgrade/guide/b\\_cbr\\_upgrade-3-18s/b\\_cbr\\_upgrade\\_hardware.html#task\\_E0B78DCCC88A41749DA2783736CE37A6](http://www.cisco.com/c/en/us/td/docs/cable/cbr/upgrade/guide/b_cbr_upgrade-3-18s/b_cbr_upgrade_hardware.html#task_E0B78DCCC88A41749DA2783736CE37A6)

- 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 16.8.1e: **cbrsup-universalk9.16.08.01e.SPA.bin**
- IOS XE Hardware Programmable Devices Version 16.8.1:  
**cbrsup-programmable\_firmware.16.08.01.SPA.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 Fuji 16.8.1e package to bootflash: and stby-bootflash:.

```
copy <location>/cbrsup-universalk9.16.08.01e.SPA.bin bootflash:
```

```
copy <location>/cbrsup-universalk9.16.08.01e.SPA.bin stby-bootflash:
```

**Step 2** Verify Cisco IOS XE Fuji 16.8.1e package against the md5 hash as provided in the Cisco.com Software center.

```
verify /md5 bootflash:cbrsup-universalk9.16.08.01e.SPA.bin
verify /md5 stby-bootflash:cbrsup-universalk9.16.08.01e.SPA.bin
```

**Step 3** Copy the hardware programmable devices upgrade package to harddisk: and stby-harddisk:

```
copy <location>/cbrsup-programmable_firmware.16.08.01.SPA.pkg harddisk:
copy <location>/cbrsup-programmable_firmware.16.08.01.SPA.pkg stby-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.16.08.01.SPA.pkg
verify /md5 stby-harddisk:cbrsup-programmable_firmware.16.08.01.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** Configure the chassis to boot the system with Cisco IOS XE Fuji 16.8.1e image.

```
Configure terminal
no boot system
boot system bootflash:cbrsup-universalk9.16.08.01e.SPA.bin
end
write mem
```

**Step 7** Reload the cBR-8 router.

```
Reload
```

**Note** The system will reload twice.

**Step 8** Remove the secondary line card from line card redundancy group if redundancy is configured.

```
Configure terminal
redundancy
linecard-group 0 internal-switch
no member slot 0 secondary
end
```

**Step 9** Configure config-register to manual boot.

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

**Step 10** Upgrade Docsis 3.1 downstream modules in all the slots.

```
upgrade hw-programmable cable <slot> dsphy all
pkg_name/harddisk/cbrsup-programmable_firmware.16.08.01.SPA.pkg
```

**Step 11** Upgrade Supervisor 0/1 CPLD.

```
upgrade hw-programmable cable r0 viper pkg_name
/harddisk/cbrsup-programmable_firmware.16.08.01.SPA.pkg
upgrade hw-programmable cable r1 viper pkg_name
/harddisk/cbrsup-programmable_firmware.16.08.01.SPA.pkg
```

**Step 12** Make sure the line card Docsis 3.1 downstream modules upgrade has completed successfully by examining the system log:

```
Show logging | include slot-id
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 13** 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 14** Configure to automatic boot by typing following command in **rommon** > prompt.

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

**Step 15** Power cycle chassis, wait for both SUPs to auto boot to 16.8.1e image.

---

### 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 D-PIC

### Before you begin

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

- Make sure the active IOS XE version is 16.8.1e.
- There are at least 20MB free space on the harddisk.



---

**Note** To make use of the new features, it is recommended to upgrade the 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 Ver.	Field Programmable Device: "ID-Name"	Current Version	Min. Required 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 Device: "ID-Name"	Current Version	Upgrade Version	Estimated 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:**

Still ongoing:

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

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

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

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

---







## CHAPTER 2

# Upgrading the Cisco cBR-8 Router System to Cisco IOS XE Fuji 16.8.1d

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 16.8.1d. All other firmware versions are either not upgradable by the customer, or not required to be upgraded for 16.8.1d support. Use the commands in the tables to verify the firmware versions.

**Table 2: Firmware Versions**

Internal Name	Component Name	Required Minimum Version	Command
Supervisor CPLD	CBR-CCAP-SUP-160G Rommon CPLD	16052011	<b>show platform</b>
Supervisor ROMMON	CBR-CCAP-SUP-160G Rommon	16.7(1r)S	<b>show platform</b>
Linecard CPLD	CBR-CCAP-LC-40G CPLD	00000025	<b>show platform</b>
Linecard Uboot	CBR-CCAP-LC-40G Rommon	2011.03.18	<b>show platform</b>
Linecard PSOC	CBR-CCAP-LC-40G PSOC	4.6	<b>show platform diag</b>
Docsis 3.0 downstream module Micro	CBR-CCAP-LC-40G Gemin1 Micro	1.E	<b>show platform diag</b>
Docsis 3.0 downstream module FPGA	CBR-CCAP-LC-40G Gemin1 Apollo	2.F	<b>show platform diag</b>
Docsis 3.1 downstream module Micro	CBR-CCAP-LC-40G Gemin2 Micro	3.1A	<b>show platform diag</b>

Docsis 3.1 downstream module FPGA	CBR-CCAP-LC-40G Gemini2 Apollo	4.484C	<b>show platform diag</b>
DPIC Uboot and FPGA	CBR-DPIC-8X10G Firmware	00010001	<b>show platform diag</b>

- [Upgrading from Cisco IOS-XE 3.18.1aSP to Cisco IOS XE Fuji 16.8.1d, on page 22](#)
- [Upgrading from Cisco IOS XE Everest 16.6.1 and Cisco IOS XE Fuji 16.7.1 to Cisco IOS XE Fuji 16.8.1d with ISSU, on page 30](#)
- [Upgrading to Cisco IOS XE 16.8.1d with Hardware Programmable Devices Package for Cisco IOS XE 16.8.1, on page 33](#)
- [Upgrading D-PIC, on page 36](#)

# Upgrading from Cisco IOS-XE 3.18.1aSP to Cisco IOS XE Fuji 16.8.1d

## 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 [Firmware versions](#) table. 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 16.8.1d: **cbrsup-universalk9.16.08.01d.SPA.bin**
  - IOS XE Hardware Programmable Devices Version 16.8.1:  
**cbrsup-programmable\_firmware.16.08.01\_compat\_with\_3.18SP.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 Fuji 16.8.1d package to bootflash: and stby-bootflash:.

```
copy <location>/cbrsup-universalk9.16.08.01d.SPA.bin bootflash:
```

```
copy <location>/cbrsup-universalk9.16.08.01d.SPA.bin stby-bootflash:
```

**Step 2** Verify Cisco IOS-XE Fuji 16.8.1d package against the md5 hash as provided in the Cisco.com Software center.

```
verify /md5 bootflash:cbrsup-universalk9.16.08.01d.SPA.bin
verify /md5 stby-bootflash:cbrsup-universalk9.16.08.01d.SPA.bin
```

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

```
copy <location>/cbrsup-programmable_firmware.16.08.01_compat_with_3.18SP.SSA.pkg
harddisk:
copy <location>/cbrsup-programmable_firmware.16.08.01_compat_with_3.18SP.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.16.08.01_compat_with_3.18SP.SSA.pkg
verify /md5
stby-harddisk:cbrsup-programmable_firmware.16.08.01_compat_with_3.18SP.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 Fuji 16.8.1d image (Consolidated Mode).

```
Configure terminal
no boot system
boot system bootflash:cbrsup-universalk9.16.08.01d.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.16.08.01_compat_with_3.18SP.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

Check Docsis 3.0 downstream module and Docsis 3.1 downstream module FPGA and Micro versions via **show platform diag**. If it is not the latest version (See [Table 2: Firmware Versions, on page 21](#)), 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.16.08.01_compat_with_3.18SP.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.16.08.01_compat_with_3.18SP.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 10** Check Supervisor 0/1 CPLD version via **show platform**. If it is not the latest version (See [Table 2: Firmware Versions, on page 21](#)), upgrade Supervisor CPLD using the command shown below. Otherwise skip this step.

```
upgrade hw-programmable cable r0 viper pkg_name
/harddisk/cbrsup-programmable_firmware.16.08.01_compat_with_3.18SP.SSA.pkg
upgrade hw-programmable cable r1 viper pkg_name
/harddisk/cbrsup-programmable_firmware.16.08.01_compat_with_3.18SP.SSA.pkg
```

**Note** If there is any failure during this step, please see [Upgrading to Cisco IOS XE 16.8.1d with Hardware Programmable Devices Package for Cisco IOS XE 16.8.1, on page 33](#) to upgrade Supervisor CPLD after loading Cisco IOS XE Fuji 16.8.1d package.

**Step 11** 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 12** Configure to automatic boot by typing following command in **rommon >** prompt on both Supervisors.

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

**Step 13** Power cycle chassis, wait for both SUPs to auto boot to 16.8.1d image.

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

**Step 14** After cBR-8 bootup, verify the supervisor CPLD, linecard CPLD and downstream module FGPA and Micro are successfully upgraded.

**Step 15** 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 16.8.1d: **cbrsup-universalk9.16.08.01d.SPA.bin**
- IOS XE Hardware Programmable Devices Version 16.8.1:  
**cbrsup-programmable\_firmware.16.08.01\_compat\_with\_3.18SP.SSA.pkg**
- Ansible upgrade script: **cbr-8\_upgrade\_ansible\_16.8.1\_v1.2.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_16.8.1_v1.2.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_16.8.1_v1.2.tar
```

**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-universalk9.16.08.01d.SPA.bin
  pkg_name: cbrsup-programmable_firmware.16.08.01_compat_with_3.18SP.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.16.08.01_compat_with_3.18SP.SSA.pkg:
c68da8be5dfe933df03389f741163191
image_md5: cbrsup-universalk9.16.08.01d.SPA.bin: 62153fc67cf78371703388e406b79e19
```

**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 16.8.1d image.

```
rommon 1>
Initializing Hardware ...

?

System Bootstrap, Version 16.6(2r)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 Everest 16.6.1 and Cisco IOS XE Fuji 16.7.1 to Cisco IOS XE Fuji 16.8.1d with ISSU

### Before you begin

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 16.8.1d: **cbrsup-universalk9.16.08.01d.SPA.bin**
- IOS XE Hardware Programmable Devices Version 16.8.1:  
**cbrsup-programmable\_firmware.16.08.01.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 Fuji 16.8.1d package to bootflash: and stby-bootflash:.

```
copy <location>/cbrsup-universalk9.16.08.01d.SPA.bin bootflash:
copy <location>/cbrsup-universalk9.16.08.01d.SPA.bin stby-bootflash:
```

**Step 2** Verify Cisco IOS XE Fuji 16.8.1d package against the md5 hash as provided in the Cisco.com Software center.

```
verify /md5 bootflash:cbrsup-universalk9.16.08.01d.SPA.bin
verify /md5 stby-bootflash:cbrsup-universalk9.16.08.01d.SPA.bin
```

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

```
copy <location>/cbrsup-programmable_firmware.16.08.01.SPA.pkg harddisk:
copy <location>/cbrsup-programmable_firmware.16.08.01.SPA.pkg stby-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.16.08.01.SPA.pkg
verify /md5 stby-harddisk:cbrsup-programmable_firmware.16.08.01.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 the slots.

```
upgrade hw-programmable cable <slot> dsphy all
pkg_name/harddisk/cbrsup-programmable_firmware.16.08.01.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** Before the ISSU upgrade please check and make sure:

- The cBR-8 is in Subpackage mode.
- Both SUPs are running same image from same path.
- Autoboot is enabled.
- The cBR-8 has two SUP and in SSO mode, standby SUP is in standby hot mode.
- All linecards are in normal state in LCHA group. Use **show redundancy linecard all** command, active cards should be in **Stdby Warm** state.
- There is enough bootflash disk space on both SUP.

**Step 9** Copy 16.8.1d image in the same folder of current boot package on active SUP.

**Step 10** Perform ISSU.

```
request platform software package install node file bootflash:cbrsup-universalk9.16.08.01d.SPA.bin
```

**Step 11** To monitor the ISSU progress, use the command below.

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

**Step 12** 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
end
```

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
end
```

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 to Cisco IOS XE 16.8.1d with Hardware Programmable Devices Package for Cisco IOS XE 16.8.1

### Before you begin

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

- Make sure Line Card CPLD version is 00000025. If the value is lower than 00000025, follow this procedure to upgrade the Line Card CPLD to version 00000025 first:

[http://www.cisco.com/c/en/us/td/docs/cable/cbr/upgrade/guide/b\\_cbr\\_upgrade-3-18s/b\\_cbr\\_upgrade\\_hardware.html#task\\_E0B78DCCC88A41749DA2783736CE37A6](http://www.cisco.com/c/en/us/td/docs/cable/cbr/upgrade/guide/b_cbr_upgrade-3-18s/b_cbr_upgrade_hardware.html#task_E0B78DCCC88A41749DA2783736CE37A6)

- 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 16.8.1d: **cbrsup-universalk9.16.08.01d.SPA.bin**
- IOS XE Hardware Programmable Devices Version 16.8.1:  
**cbrsup-programmable\_firmware.16.08.01.SPA.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 Fuji 16.8.1d package to bootflash: and stby-bootflash:

```
copy <location>/cbrsup-universalk9.16.08.01d.SPA.bin bootflash:
```

```
copy <location>/cbrsup-universalk9.16.08.01d.SPA.bin stby-bootflash:
```

**Step 2** Verify Cisco IOS XE Fuji 16.8.1d package against the md5 hash as provided in the Cisco.com Software center.

```
verify /md5 bootflash:cbrsup-universalk9.16.08.01d.SPA.bin
verify /md5 stby-bootflash:cbrsup-universalk9.16.08.01d.SPA.bin
```

**Step 3** Copy the hardware programmable devices upgrade package to harddisk: and stby-harddisk:

```
copy <location>/cbrsup-programmable_firmware.16.08.01.SPA.pkg harddisk:
copy <location>/cbrsup-programmable_firmware.16.08.01.SPA.pkg stby-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.16.08.01.SPA.pkg
verify /md5 stby-harddisk:cbrsup-programmable_firmware.16.08.01.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** Configure the chassis to boot the system with Cisco IOS XE Fuji 16.8.1d image.

```
Configure terminal
no boot system
boot system bootflash:cbrsup-universalk9.16.08.01d.SPA.bin
end
write mem
```

**Step 7** Reload the cBR-8 router.

```
Reload
```

**Note** The system will reload twice.

**Step 8** Remove the secondary line card from line card redundancy group if redundancy is configured.

```
Configure terminal
redundancy
linecard-group 0 internal-switch
no member slot 0 secondary
end
```

**Step 9** Configure config-register to manual boot.

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

**Step 10** Upgrade Docsis 3.1 downstream modules in all the slots.

```
upgrade hw-programmable cable <slot> dsphy all
pkg_name/harddisk/cbrsup-programmable_firmware.16.08.01.SPA.pkg
```

**Step 11** Upgrade Supervisor 0/1 CPLD.

```
upgrade hw-programmable cable r0 viper pkg_name
/harddisk/cbrsup-programmable_firmware.16.08.01.SPA.pkg
upgrade hw-programmable cable r1 viper pkg_name
/harddisk/cbrsup-programmable_firmware.16.08.01.SPA.pkg
```

**Step 12** Make sure the line card Docsis 3.1 downstream modules upgrade has completed successfully by examining the system log:

```
Show logging | include slot-id
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 13** 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 14** Configure to automatic boot by typing following command in **rommon** > prompt.

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

**Step 15** Power cycle chassis, wait for both SUPs to auto boot to 16.8.1d image.

---

### 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 D-PIC

### Before you begin

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

- Make sure the active IOS XE version is 16.8.1d.
- There are at least 20MB free space on the harddisk.



---

**Note** To make use of the new features, it is recommended to upgrade the 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            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:**

Still ongoing:

```
Router#show upgrade fpd progress
FPD Image Upgrade Progress Table:
=====
Slot Card Type                Field Programmable   Approx.   Elapsed
Device : "ID-Name"           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.
                        Device : "ID-Name"      Time
                        =====
                        Elapsed
                        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(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
==== =====
```

---





## CHAPTER 3

# Upgrading the Cisco cBR-8 Router System to Cisco IOS XE Fuji 16.8.1

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 16.8.1. All other firmware versions are either not upgradable by the customer, or not required to be upgraded for 16.8.1 support. Use the commands in the tables to verify the firmware versions.

**Table 3: Firmware Versions**

Internal Name	Component Name	Required Minimum Version	Command
Supervisor CPLD	CBR-CCAP-SUP-160G Rommon CPLD	16052011	<b>show platform</b>
Supervisor ROMMON	CBR-CCAP-SUP-160G Rommon	16.7(1r)S	<b>show platform</b>
Linecard CPLD	CBR-CCAP-LC-40G CPLD	00000025	<b>show platform</b>
Linecard Uboot	CBR-CCAP-LC-40G Rommon	2011.03.18	<b>show platform</b>
Linecard PSOC	CBR-CCAP-LC-40G PSOC	4.6	<b>show platform diag</b>
Docsis 3.0 downstream module Micro	CBR-CCAP-LC-40G Gemin1 Micro	1.E	<b>show platform diag</b>
Docsis 3.0 downstream module FPGA	CBR-CCAP-LC-40G Gemin1 Apollo	2.F	<b>show platform diag</b>
Docsis 3.1 downstream module Micro	CBR-CCAP-LC-40G Gemin2 Micro	3.1A	<b>show platform diag</b>

Docsis 3.1 downstream module FPGA	CBR-CCAP-LC-40G Gemini2 Apollo	4.484C	<b>show platform diag</b>
DPIC Uboot and FPGA	CBR-DPIC-8X10G Firmware	00010001	<b>show platform diag</b>

- [Upgrading from Cisco IOS-XE 3.18.1aSP to Cisco IOS XE Fuji 16.8.1, on page 42](#)
- [Upgrading from Cisco IOS XE Everest 16.6.1 and Cisco IOS XE Fuji 16.7.1 to Cisco IOS XE Fuji 16.8.1 with ISSU, on page 50](#)
- [Upgrading to Cisco IOS XE 16.8.1 with Hardware Programmable Devices Package for Cisco IOS XE 16.8.1, on page 53](#)
- [Upgrading D-PIC, on page 56](#)

# Upgrading from Cisco IOS-XE 3.18.1aSP to Cisco IOS XE Fuji 16.8.1

## 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 [Firmware versions](#) table. 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 16.8.1: **cbrsup-universalk9.16.08.01.SPA.bin**
  - IOS XE Hardware Programmable Devices Version 16.8.1:  
**cbrsup-programmable\_firmware.16.08.01\_compat\_with\_3.18SP.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 Fuji 16.8.1 package to bootflash: and stby-bootflash:.

```
copy <location>/cbrsup-universalk9.16.08.01.SPA.bin bootflash:
```

```
copy <location>/cbrsup-universalk9.16.08.01.SPA.bin stby-bootflash:
```

**Step 2** Verify Cisco IOS-XE Fuji 16.8.1 package against the md5 hash as provided in the Cisco.com Software center.

```
verify /md5 bootflash:cbrsup-universalk9.16.08.01.SPA.bin
verify /md5 stby-bootflash:cbrsup-universalk9.16.08.01.SPA.bin
```

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

```
copy <location>/cbrsup-programmable_firmware.16.08.01_compat_with_3.18SP.SSA.pkg
harddisk:
copy <location>/cbrsup-programmable_firmware.16.08.01_compat_with_3.18SP.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.16.08.01_compat_with_3.18SP.SSA.pkg
verify /md5
stby-harddisk:cbrsup-programmable_firmware.16.08.01_compat_with_3.18SP.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 Fuji 16.8.1 image (Consolidated Mode).

```
Configure terminal
no boot system
boot system bootflash:cbrsup-universalk9.16.08.01.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.16.08.01_compat_with_3.18SP.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

Check Docsis 3.0 downstream module and Docsis 3.1 downstream module FPGA and Micro versions via **show platform diag**. If it is not the latest version (See [Table 3: Firmware Versions, on page 41](#)), 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.16.08.01_compat_with_3.18SP.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.16.08.01_compat_with_3.18SP.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 10** Check Supervisor 0/1 CPLD version via **show platform**. If it is not the latest version (See [Table 3: Firmware Versions, on page 41](#)), upgrade Supervisor CPLD using the command shown below. Otherwise skip this step.

```
upgrade hw-programmable cable r0 viper pkg_name
/harddisk/cbrsup-programmable_firmware.16.08.01_compat_with_3.18SP.SSA.pkg
upgrade hw-programmable cable r1 viper pkg_name
/harddisk/cbrsup-programmable_firmware.16.08.01_compat_with_3.18SP.SSA.pkg
```

**Note** If there is any failure during this step, please see [Upgrading to Cisco IOS XE 16.8.1 with Hardware Programmable Devices Package for Cisco IOS XE 16.8.1, on page 53](#) to upgrade Supervisor CPLD after loading Cisco IOS XE Fuji 16.8.1 package.

**Step 11** 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 12** Configure to automatic boot by typing following command in **rommon >** prompt on both Supervisors.

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

**Step 13** Power cycle chassis, wait for both SUPs to auto boot to 16.8.1 image.

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

**Step 14** After cBR-8 bootup, verify the supervisor CPLD, linecard CPLD and downstream module FGPA and Micro are successfully upgraded.

**Step 15** 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 16.8.1: **cbrsup-universalk9.16.08.01.SPA.bin**
- IOS XE Hardware Programmable Devices Version 16.8.1:  
**cbrsup-programmable\_firmware.16.08.01\_compat\_with\_3.18SP.SSA.pkg**
- Ansible upgrade script: **cbr-8\_upgrade\_ansible.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.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.tar
```

**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-universalk9.16.08.01.SPA.bin
  pkg_name: cbrsup-programmable_firmware.16.08.01_compat_with_3.18SP.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** Execute following command to start the playbook to upgrade firmware.

```
./run_mop_upgrade_from_318SP
```

**Step 8** 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 9** From ROMMON issue the following command on both SUPs.

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

**Step 10** Power cycle chassis, wait for both SUPs to auto boot to 16.8.1 image.

```
rommon 1>
Initializing Hardware ...

?

System Bootstrap, Version 16.6(2r)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 11** 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 12** Exit the container if finished upgrading this time to stop the container.

```
exit
```

**Step 13** 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 14** All the file changes are kept in the container, user can run step 4-11 to upgrade again.

## Upgrading from Cisco IOS XE Everest 16.6.1 and Cisco IOS XE Fuji 16.7.1 to Cisco IOS XE Fuji 16.8.1 with ISSU

### Before you begin

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 16.8.1: **cbrsup-universalk9.16.08.01.SPA.bin**
- IOS XE Hardware Programmable Devices Version 16.8.1: **cbrsup-programmable\_firmware.16.08.01.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 Fuji 16.8.1 package to bootflash: and stby-bootflash:.

```
copy <location>/cbrsup-universalk9.16.08.01.SPA.bin bootflash:
copy <location>/cbrsup-universalk9.16.08.01.SPA.bin stby-bootflash:
```

**Step 2** Verify Cisco IOS XE Fuji 16.8.1 package against the md5 hash as provided in the Cisco.com Software center.

```
verify /md5 bootflash:cbrsup-universalk9.16.08.01.SPA.bin
verify /md5 stby-bootflash:cbrsup-universalk9.16.08.01.SPA.bin
```

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

```
copy <location>/cbrsup-programmable_firmware.16.08.01.SPA.pkg harddisk:
copy <location>/cbrsup-programmable_firmware.16.08.01.SPA.pkg stby-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.16.08.01.SPA.pkg
verify /md5 stby-harddisk:cbrsup-programmable_firmware.16.08.01.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 the slots.

```
upgrade hw-programmable cable <slot> dsphy all
pkg_name/harddisk/cbrsup-programmable_firmware.16.08.01.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** Before the ISSU upgrade please check and make sure:

- The cBR-8 is in Subpackage mode.
- Both SUPs are running same image from same path.
- Autoboot is enabled.
- The cBR-8 has two SUP and in SSO mode, standby SUP is in standby hot mode.
- All linecards are in normal state in LCHA group. Use **show redundancy linecard all** command, active cards should be in **Stdy Warm** state.
- There is enough bootflash disk space on both SUP.

**Step 9** Copy 16.8.1 image in the same folder of current boot package on active SUP.

**Step 10** Perform ISSU.

```
request platform software package install node file bootflash:cbrsup-universalk9.16.08.01.SPA.bin
```

**Step 11** To monitor the ISSU progress, use the command below.

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

**Step 12** 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
end
```

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
end
```

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 to Cisco IOS XE 16.8.1 with Hardware Programmable Devices Package for Cisco IOS XE 16.8.1

### Before you begin

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

- Make sure Line Card CPLD version is 00000025. If the value is lower than 00000025, follow this procedure to upgrade the Line Card CPLD to version 00000025 first:

[http://www.cisco.com/c/en/us/td/docs/cable/cbr/upgrade/guide/b\\_cbr\\_upgrade-3-18s/b\\_cbr\\_upgrade\\_hardware.html#task\\_E0B78DCCC88A41749DA2783736CE37A6](http://www.cisco.com/c/en/us/td/docs/cable/cbr/upgrade/guide/b_cbr_upgrade-3-18s/b_cbr_upgrade_hardware.html#task_E0B78DCCC88A41749DA2783736CE37A6)

- 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 16.8.1: **cbrsup-universalk9.16.08.01.SPA.bin**
- IOS XE Hardware Programmable Devices Version 16.8.1:  
**cbrsup-programmable\_firmware.16.08.01.SPA.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 Fuji 16.8.1 package to bootflash: and stby-bootflash:.

```
copy <location>/cbrsup-universalk9.16.08.01.SPA.bin bootflash:
```

```
copy <location>/cbrsup-universalk9.16.08.01.SPA.bin stby-bootflash:
```

**Step 2** Verify Cisco IOS XE Fuji 16.8.1 package against the md5 hash as provided in the Cisco.com Software center.

```
verify /md5 bootflash:cbrsup-universalk9.16.08.01.SPA.bin
verify /md5 stby-bootflash:cbrsup-universalk9.16.08.01.SPA.bin
```

**Step 3** Copy the hardware programmable devices upgrade package to harddisk: and stby-harddisk:

```
copy <location>/cbrsup-programmable_firmware.16.08.01.SPA.pkg harddisk:
copy <location>/cbrsup-programmable_firmware.16.08.01.SPA.pkg stby-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.16.08.01.SPA.pkg
verify /md5 stby-harddisk:cbrsup-programmable_firmware.16.08.01.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** Configure the chassis to boot the system with Cisco IOS XE Fuji 16.8.1 image.

```
Configure terminal
no boot system
boot system bootflash:cbrsup-universalk9.16.08.01.SPA.bin
end
write mem
```

**Step 7** Reload the cBR-8 router.

```
Reload
```

**Note** The system will reload twice.

**Step 8** Remove the secondary line card from line card redundancy group if redundancy is configured.

```
Configure terminal
redundancy
linecard-group 0 internal-switch
no member slot 0 secondary
end
```

**Step 9** Configure config-register to manual boot.

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

**Step 10** Upgrade Docsis 3.1 downstream modules in all the slots.

```
upgrade hw-programmable cable <slot> dsphy all
pkg_name/harddisk/cbrsup-programmable_firmware.16.08.01.SPA.pkg
```

**Step 11** Upgrade Supervisor 0/1 CPLD.

```
upgrade hw-programmable cable r0 viper pkg_name
/harddisk/cbrsup-programmable_firmware.16.08.01.SPA.pkg
upgrade hw-programmable cable r1 viper pkg_name
/harddisk/cbrsup-programmable_firmware.16.08.01.SPA.pkg
```

**Step 12** Make sure the line card Docsis 3.1 downstream modules upgrade has completed successfully by examining the system log:

```
Show logging | include slot-id
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 13** 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 14** Configure to automatic boot by typing following command in **rommon** > prompt.

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

**Step 15** Power cycle chassis, wait for both SUPs to auto boot to 16.8.1 image.

---

### 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 D-PIC

### Before you begin

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

- Make sure the active IOS XE version is 16.8.1.
- There are at least 20MB free space on the harddisk.



---

**Note** To make use of the new features, it is recommended to upgrade the 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:

Still ongoing:

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

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

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

---

