Upgrading the Switch Software

Finding the Software Version

The package files for the Cisco IOS XE software are stored on the system board flash device (flash:).

You can use the **show version** privileged EXEC command to see the software version that is running on your switch.

Note Although the **show version** output always shows the software image running on the switch, the model name shown at the end of this display is the factory configuration and does not change if you upgrade the software license.

You can also use the **dir** *filesystem:* privileged EXEC command to see the directory names of other software images that you might have stored in flash memory.

Software Images

Release	Image Type	File Name
Cisco IOS XE Dublin 17.12.3	CAT9K_IOSXE	cat9k_iosxe.17.12.03.SPA.bin
	No Payload Encryption (NPE)	cat9k_iosxe_npe.17.12.03.SPA.bin
Cisco IOS XE Dublin 17.12.2	CAT9K_IOSXE	cat9k_iosxe.17.12.02.SPA.bin
	No Payload Encryption (NPE)	cat9k_iosxe_npe.17.12.02.SPA.bin

Release	Image Type	File Name
Cisco IOS XE Dublin 17.12.1	CAT9K_IOSXE	cat9k_iosxe.17.12.01.SPA.bin
	No Payload Encryption (NPE)	cat9k_iosxe_npe.17.12.01.SPA.bin

Upgrading the ROMMON

To know the ROMMON or bootloader version that applies to every major and maintenance release, see ROMMON Versions.

You can upgrade the ROMMON before, or, after upgrading the software version. If a new ROMMON version is available for the software version you are upgrading to, proceed as follows:

- Upgrading the ROMMON in the primary SPI flash device

  This ROMMON is upgraded automatically. When you upgrade from an existing release on your switch to a later or newer release for the first time, and there is a new ROMMON version in the new release, the system automatically upgrades the ROMMON in the primary SPI flash device, based on the hardware version of the switch.

- Upgrading the ROMMON in the golden SPI flash device

  You must manually upgrade this ROMMON. Enter the **upgrade rom-monitor capsule golden switch** command in privileged EXEC mode.

> **Note**
> - In case of a switch stack, perform the upgrade on the active switch and all members of the stack.

After the ROMMON is upgraded, it will take effect on the next reload. If you go back to an older release after this, the ROMMON is not downgraded. The updated ROMMON supports all previous releases.

Software Installation Commands

Summary of Software Installation Commands	
Supported starting from Cisco IOS XE Everest 16.6.2 and later releases	
To install and activate the specified file, and to commit changes to be persistent across reloads: **install add file** *filename* [**activate commit**] To separately install, activate, commit, cancel, or remove the installation file: **install ?**	
add file tftp: *filename*	Copies the install file package from a remote location to the device and performs a compatibility check for the platform and image versions.
activate [**auto-abort-timer**]	Activates the file, and reloads the device. The **auto-abort-timer** keyword automatically rolls back image activation.

Summary of Software Installation Commands	
Supported starting from Cisco IOS XE Everest 16.6.2 and later releases	
commit	Makes changes persistent over reloads.
rollback to committed	Rolls back the update to the last committed version.
abort	Cancels file activation, and rolls back to the version that was running before the current installation procedure started.
remove	Deletes all unused and inactive software installation files.

Note The **request platform software** commands are deprecated starting from Cisco IOS XE Gibraltar 16.10.1. The commands are visible on the CLI in this release and you can configure them, but we recommend that you use the **install** commands to upgrade or downgrade.

Summary of request platform software Commands	
`Device# request platform software package ?`	
clean	Cleans unnecessary package files from media
copy	Copies package to media
describe	Describes package content
expand	Expands all-in-one package to media
install	Installs the package
uninstall	Uninstalls the package
verify	Verifies In Service Software Upgrade (ISSU) software package compatibility

Upgrading in Install Mode

Follow these instructions to upgrade from one release to another, in install mode. To perform a software image upgrade, you must be booted into IOS through **boot flash:packages.conf**.

Before you begin

Note that you can use this procedure for the following upgrade scenarios:

When upgrading from ...	Use these commands...	To upgrade to...
Cisco IOS XE Everest 16.5.1a or Cisco IOS XE Everest 16.6.1	Only **request platform software** commands	Cisco IOS XE Dublin 17.12.x
Cisco IOS XE Everest 16.6.2 and all later releases	Either **install** commands or **request platform software** commands[1].	

[1] The **request platform software** commands are deprecated. So although they are still visible on the CLI, we recommend that you use **install** commands.

The sample output in this section displays upgrade from Cisco IOS XE Dublin 17.11.1 to Cisco IOS XE Dublin 17.12.1 using **install** commands only.

Procedure

Step 1   Clean-up

install remove inactive

Use this command to clean-up old installation files in case of insufficient space and to ensure that you have at least 1GB of space in flash, to expand a new image.

The following sample output displays the cleaning up of unused files, by using the **install remove inactive** command:

```
Switch# install remove inactive

install_remove: START Wed Jul 24 10:02:31 PDT 2023
install_remove: Removing IMG
Cleaning up unnecessary package files
No path specified, will use booted path /flash/packages.conf

Cleaning /flash
Scanning boot directory for packages ... done.
Preparing packages list to delete ...
[R0]: /flash/packages.conf File is in use, will not delete.
[R1]: /flash/packages.conf File is in use, will not delete.
[R0]: /flash/cat9k-cc_srdriver.17.11.01.SPA.pkg File is in use, will not delete.
[R1]: /flash/cat9k-cc_srdriver.17.11.01.SPA.pkg File is in use, will not delete.
[R0]: /flash/cat9k-espbase.17.11.01.SPA.pkg File is in use, will not delete.
[R1]: /flash/cat9k-espbase.17.11.01.SPA.pkg File is in use, will not delete.
[R0]: /flash/cat9k-guestshell.17.11.01.SPA.pkg File is in use, will not delete.
[R1]: /flash/cat9k-guestshell.17.11.01.SPA.pkg File is in use, will not delete.
[R0]: /flash/cat9k-lni.17.11.01.SPA.pkg File is in use, will not delete.
[R1]: /flash/cat9k-lni.17.11.01.SPA.pkg File is in use, will not delete.
[R0]: /flash/cat9k-rpbase.17.11.01.SPA.pkg File is in use, will not delete.
[R1]: /flash/cat9k-rpbase.17.11.01.SPA.pkg File is in use, will not delete.
[R0]: /flash/cat9k-sipbase.17.11.01.SPA.pkg File is in use, will not delete.
[R1]: /flash/cat9k-sipbase.17.11.01.SPA.pkg File is in use, will not delete.
[R0]: /flash/cat9k-sipspa.17.11.01.SPA.pkg File is in use, will not delete.
[R1]: /flash/cat9k-sipspa.17.11.01.SPA.pkg File is in use, will not delete.
[R0]: /flash/cat9k-srdriver.17.11.01.SPA.pkg File is in use, will not delete.
[R1]: /flash/cat9k-srdriver.17.11.01.SPA.pkg File is in use, will not delete.
[R0]: /flash/cat9k-webui.17.11.01.SPA.pkg File is in use, will not delete.
[R1]: /flash/cat9k-webui.17.11.01.SPA.pkg File is in use, will not delete.
[R0]: /flash/cat9k-wlc.17.11.01.SPA.pkg File is in use, will not delete.
[R1]: /flash/cat9k-wlc.17.11.01.SPA.pkg File is in use, will not delete.
[R0]: /flash/cat9k_iosxe.17.11.01.SPA.conf File is in use, will not delete.
[R1]: /flash/cat9k_iosxe.17.11.01.SPA.conf File is in use, will not delete.
```

```
[R0]: /flash/cat9k-rpboot.17.11.01.SPA.pkg File is in use, will not delete.
[R1]: /flash/cat9k-rpboot.17.11.01.SPA.pkg File is in use, will not delete.

The following files will be deleted:
[R0]: /flash/cat9k_iosxe.17.11.01.SPA.bin
[R1]: /flash/cat9k_iosxe.17.11.01.SPA.bin
[R0]: /flash/cat9k-cc_srdriver.17.09.02.SPA.pkg
[R1]: /flash/cat9k-cc_srdriver.17.09.02.SPA.pkg
[R0]: /flash/cat9k-espbase.17.09.02.SPA.pkg
[R1]: /flash/cat9k-espbase.17.09.02.SPA.pkg
[R0]: /flash/cat9k-guestshell.17.09.02.SPA.pkg
[R1]: /flash/cat9k-guestshell.17.09.02.SPA.pkg
[R0]: /flash/cat9k-lni.17.09.02.SPA.pkg
[R1]: /flash/cat9k-lni.17.09.02.SPA.pkg
[R0]: /flash/cat9k-rpbase.17.09.02.SPA.pkg
[R1]: /flash/cat9k-rpbase.17.09.02.SPA.pkg
[R0]: /flash/cat9k-sipbase.17.09.02.SPA.pkg
[R1]: /flash/cat9k-sipbase.17.09.02.SPA.pkg
[R0]: /flash/cat9k-sipspa.17.09.02.SPA.pkg
[R1]: /flash/cat9k-sipspa.17.09.02.SPA.pkg
[R0]: /flash/cat9k-srdriver.17.09.02.SPA.pkg
[R1]: /flash/cat9k-srdriver.17.09.02.SPA.pkg
[R0]: /flash/cat9k-webui.17.09.02.SPA.pkg
[R1]: /flash/cat9k-webui.17.09.02.SPA.pkg
[R0]: /flash/cat9k-wlc.17.09.02.SPA.pkg
[R1]: /flash/cat9k-wlc.17.09.02.SPA.pkg
[R0]: /flash/cat9k_iosxe.17.09.02.SPA.conf
[R1]: /flash/cat9k_iosxe.17.09.02.SPA.conf
[R0]: /flash/cat9k-rpboot.17.09.02.SPA.pkg
[R1]: /flash/cat9k-rpboot.17.09.02.SPA.pkg

Do you want to remove the above files? [y/n]y

Deleting file /flash/cat9k_iosxe.17.11.01.SPA.bin ... done.
Deleting file /flash/cat9k-cc_srdriver.17.09.02.SPA.pkg ... done.
Deleting file /flash/cat9k-espbase.17.09.02.SPA.pkg ... done.
Deleting file /flash/cat9k-guestshell.17.09.02.SPA.pkg ... done.
Deleting file /flash/cat9k-lni.17.09.02.SPA.pkg ... done.
Deleting file /flash/cat9k-rpbase.17.09.02.SPA.pkg ... done.
Deleting file /flash/cat9k-sipbase.17.09.02.SPA.pkg ... done.
Deleting file /flash/cat9k-sipspa.17.09.02.SPA.pkg ... done.
Deleting file /flash/cat9k-srdriver.17.09.02.SPA.pkg ... done.
Deleting file /flash/cat9k-webui.17.09.02.SPA.pkg ... done.
Deleting file /flash/cat9k-wlc.17.09.02.SPA.pkg ... done.
Deleting file /flash/cat9k_iosxe.17.09.02.SPA.conf ... done.
Deleting file /flash/cat9k-rpboot.17.09.02.SPA.pkg ... done.
Deleting /flash/.images/17.11.01.0.1444.1669767962 ... done.
SUCCESS: Files deleted.

--- Starting Post_Remove_Cleanup ---
Performing REMOVE_POSTCHECK on all members
Finished Post_Remove_Cleanup
SUCCESS: install_remove Wed Jul 24 10:02:36 PDT 2023
Switch#
<output truncated>
```

Step 2   Copy new image to flash

   a) **copy tftp:**[*[//location]/directory]/filename***flash:**

   Use this command to copy the new image from a TFTP server to flash memory. The location is either an IP address or a host name. The filename is specified relative to the directory used for file transfers. Skip this step if you want to use the new image from a TFTP server.

```
Switch# copy tftp://10.8.0.6/image/cat9k_iosxe.17.12.01.SPA.bin flash:

destination filename [cat9k_iosxe.17.12.01.SPA.bin]?
Accessing tftp://10.8.0.6/image/cat9k_iosxe.17.12.01.SPA.bin...
Loading /cat9k_iosxe.17.12.01.SPA.bin from 10.8.0.6 (via GigabitEthernet0/0):
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
[OK - 601216545 bytes]

601216545 bytes copied in 50.649 secs (11870255 bytes/sec)
```

b) **dir flash:**

Use this command to confirm that the image has been successfully copied to flash.

```
Switch# dir flash:*.bin

Directory of flash:/*.bin

Directory of flash:/

434184 -rw- 601216545    Jul 24 2023 10:18:11 -07:00 cat9k_iosxe.17.12.01.SPA.bin
11353194496 bytes total (8976625664 bytes free)
```

Step 3 Set boot variable

a) **no boot system**

Use this command to reset the boot variable. This command removes the startup system image specification. Otherwise, the switch may boot a previously configured boot image.

```
Switch(config)# no boot system
```

b) **boot system flash:packages.conf**

Use this command to set the boot variable to **flash:packages.conf**.

```
Switch(config)# boot system flash:packages.conf
```

c) **no boot manual**

Use this command to configure the switch to auto-boot.

```
Switch(config)# no boot manual
Switch(config)# exit
```

d) **write memory**

Use this command to save boot settings.

```
Switch# write memory
```

e) **show boot**

Use this command to verify the boot variable (packages.conf) and manual boot setting (no):

```
Switch# show boot
Current Boot Variables:
BOOT variable = flash:packages.conf;

Boot Variables on next reload:
BOOT variable = flash:packages.conf;
Manual Boot = no
Enable Break = yes
```

```
          Boot Mode = DEVICE
          iPXE Timeout = 0
```

Step 4   Install image to flash

install add file activate commit

Use this command to install the image.

We recommend that you point to the source image on your TFTP server or the flash drive of the *active* switch, if you have copied the image to flash memory. If you point to an image on the flash or USB drive of a member switch (instead of the active), you must specify the exact flash or USB drive - otherwise installation fails. For example, if the image is on the flash drive of member switch 3 (flash-3): Switch# **install add file flash-3:cat9k_iosxe.17.12.01.SPA.bin activate commit**.

The following sample output displays installation of the Cisco IOS XE Dublin 17.12.1 software image in the flash memory:

```
Switch# install add file flash:cat9k_iosxe.17.12.01.SPA.bin activate commit

install_add_activate_commit: START Wed Jul 24 10:15:02 PDT 2023
install_add: START Wed Jul 24 10:15:02 PDT 2023
install_add: Adding IMG
--- Starting initial file syncing ---
Copying flash:cat9k_iosxe.17.12.01.SPA.bin from Switch 1 to Switch 1 2
Info: Finished copying to the selected Switch
Finished initial file syncing

--- Starting Add ---
Performing Add on all members
 [1] Finished Add package(s) on Switch 1
 [2] Finished Add package(s) on Switch 2
Checking status of Add on [1 2]
Add: Passed on [1 2]
Finished Add

Image added. Version: 17.12.01.0

    Warning: ISSU compatibility check failed for 17.12.01.0
install_activate: START Wed Jul 24 10:17:34 PDT 2023
install_activate: Activating IMG
Following packages shall be activated:
/flash/cat9k-cc_srdriver.17.12.01.SPA.pkg
/flash/cat9k-espbase.17.12.01.SPA.pkg
/flash/cat9k-guestshell.17.12.01.SPA.pkg
/flash/cat9k-lni.17.12.01.SPA.pkg
/flash/cat9k-rpbase.17.12.01.SPA.pkg
/flash/cat9k-sipbase.17.12.01.SPA.pkg
/flash/cat9k-sipspa.17.12.01.SPA.pkg
/flash/cat9k-srdriver.17.12.01.SPA.pkg
/flash/cat9k-webui.17.12.01.SPA.pkg
/flash/cat9k-wlc.17.12.01.SPA.pkg
/flash/cat9k-rpboot.17.12.01.SPA.pkg

This operation may require a reload of the system. Do you want to proceed? [y/n]y

--- Starting Activate ---
Performing Activate on all members
 [1] Activate package(s) on Switch 1
 [2] Activate package(s) on Switch 2
 [2] Finished Activate on Switch 2
 [1] Finished Activate on Switch 1
Checking status of Activate on [1 2]
Activate: Passed on [1 2]
```

```
Finished Activate

--- Starting Commit ---
Performing Commit on all members
 [1] Commit package(s) on Switch 1
 [2] Commit package(s) on Switch 2
 [1] Finished Commit on Switch 1
 [2] Finished Commit on Switch 2
Checking status of Commit on [1 2]
Commit: Passed on [1 2]
Finished Commit operation

*Jul 24 10:22:00.934: %IOSXEBOOT-4-BOOTLOADER_UPGRADE: (rp/0): Starting boot preupgrade
*Jul 24 10:22:00.937: %IOSXEBOOT-4-BOOTLOADER_UPGRADE: (rp/0): ### Wed Jul 24 10:22:00 PDT
 2023 PLEASE DO NOT POWER CYCLE ### BOOT LOADER UPGRADING
*Jul 24 10:22:50.808: %IOSXEBOOT-4-flashcp: (rp/0): polaris_adelphi_rommon_sb.bin
*Jul 24 10:22:56.093: %IOSXEBOOT-4-BOOTLOADER_UPGRADE: (rp/0): boot loader upgrade successful


        SUCCESS: install_add_activate_commit Wed Jul 24 10:22:59 PDT 2023
stack-nyqcr3#
Chassis 1 reloading, reason - Reload command
Jul 24 10:23:05.604: %PMAN-5-EXITACTION: F0/0: pvp: Process manager is exiting: reload fp
action requested
Jul 24 10:23:07.295: %PMAN-5-EXITACTION: R0/0: pvp: Process manager is exiting: rp processes
 exit with reload switch code


Initializing Hardware......

System Bootstrap, Version 17.12.1r[FC1], RELEASE SOFTWARE (P)
Compiled Wed 02/07/2023 14:36:07.63 by rel

Current ROMMON image : Primary
Last reset cause     : SoftwareReload
C9300-48UXM platform with 8388608 Kbytes of main memory

Preparing to autoboot. [Press Ctrl-C to interrupt]  0
boot: attempting to boot from [flash:packages.conf]
boot: reading file packages.conf
######################################################################################################################
######################################################################################################################


Waiting for 120 seconds for other switches to boot

Switch number is 1
All switches in the stack have been discovered. Accelerating discovery
<output truncated>
```

Note   The system reloads automatically after executing the **install add file activate commit** command. You do not have to manually reload the system.

Step 5   Verify installation

After the software has been successfully installed, use the **dir flash:** command to verify that the flash partition has ten new .pkg files and two .conf files.

a) **dir flash:*.pkg**

The following is sample output of the **dir flash:*.pkg** command:

```
Switch# dir flash:*.pkg

Directory of flash:/
75140  -rw- 2012104     Mar 9 2023 09:52:41 -07:00 cat9k-cc_srdriver.17.11.01.SPA.pkg
475141 -rw- 70333380    Mar 9 2023 09:52:44 -07:00 cat9k-espbase.17.11.01.SPA.pkg
475142 -rw- 13256       Mar 9 2023 09:52:44 -07:00 cat9k-guestshell.17.11.01.SPA.pkg
475143 -rw- 349635524   Mar 9 2023 09:52:54 -07:00 cat9k-rpbase.17.11.01.SPA.pkg
475149 -rw- 24248187    Mar 9 2023 09:53:02 -07:00 cat9k-rpboot.17.11.01.SPA.pkg
475144 -rw- 25285572    Mar 9 2023 09:52:55 -07:00 cat9k-sipbase.17.11.01.SPA.pkg
475145 -rw- 20947908    Mar 9 2023 09:52:55 -07:00 cat9k-sipspa.17.11.01.SPA.pkg
475146 -rw- 2962372     Mar 9 2023 09:52:56 -07:00 cat9k-srdriver.17.11.01.SPA.pkg
475147 -rw- 13284288    Mar 9 2023 09:52:56 -07:00 cat9k-webui.17.11.01.SPA.pkg
475148 -rw- 13248       Mar 9 2023 09:52:56 -07:00 cat9k-wlc.17.11.01.SPA.pkg

491524 -rw- 25711568    Jul 24 2023 11:49:33 -07:00 cat9k-cc_srdriver.17.12.01.SPA.pkg
491525 -rw- 78484428    Jul 24 2023 11:49:35 -07:00 cat9k-espbase.17.12.01.SPA.pkg
491526 -rw- 1598412     Jul 24 2023 11:49:35 -07:00 cat9k-guestshell.17.12.01.SPA.pkg
491527 -rw- 404153288   Jul 24 2023 11:49:47 -07:00 cat9k-rpbase.17.12.01.SPA.pkg
491533 -rw- 31657374    Jul 24 2023 11:50:09 -07:00 cat9k-rpboot.17.12.01.SPA.pkg
491528 -rw- 27681740    Jul 24 2023 11:49:48 -07:00 cat9k-sipbase.17.12.01.SPA.pkg
491529 -rw- 52224968    Jul 24 2023 11:49:49 -07:00 cat9k-sipspa.17.12.01.SPA.pkg
491530 -rw- 31130572    Jul 24 2023 11:49:50 -07:00 cat9k-srdriver.17.12.01.SPA.pkg
491531 -rw- 14783432    Jul 24 2023 11:49:51 -07:00 cat9k-webui.17.12.01.SPA.pkg
491532 -rw- 9160        Jul 24 2023 11:49:51 -07:00 cat9k-wlc.17.12.01.SPA.pkg


11353194496 bytes total (9544245248 bytes free)
Switch#
```

b) **dir flash:*.conf**

The following is sample output of the **dir flash:*.conf** command. It displays the .conf files in the flash partition; note the two .conf files:

- `packages.conf`—the file that has been re-written with the newly installed .pkg files

- `cat9k_iosxe.17.12.01.SPA.conf`— a backup copy of the newly installed packages.conf file

```
Switch# dir flash:*.conf

Directory of flash:/*.conf
Directory of flash:/

434197 -rw- 7406 Jul 24 2023 10:59:16 -07:00 packages.conf
516098 -rw- 7406 Jul 24 2023 10:58:08 -07:00 cat9k_iosxe.17.12.01.SPA.conf
11353194496 bytes total (8963174400 bytes free)
```

Step 6   **show version**

After the image boots up, use this command to verify the version of the new image.

The following sample output of the **show version** command displays the Cisco IOS XE Dublin 17.12.1 image on the device:

```
Switch# show version

Cisco IOS XE Software, Version 17.12.01
Cisco IOS Software [Dublin], Catalyst L3 Switch Software (CAT9K_IOSXE), Version 17.12.1,
RELEASE SOFTWARE (fc1)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2023 by Cisco Systems, Inc.
<output truncated>
```

Downgrading in Install Mode

Follow these instructions to downgrade from one release to another, in install mode. To perform a software image downgrade, you must be booted into IOS through **boot flash:packages.conf**.

Before you begin

Note that you can use this procedure for the following downgrade scenarios:

When downgrading from ...	Use these commands...	To downgrade to...
Cisco IOS XE Dublin 17.12.x	Either **install** commands or **request platform software** command[2].	Cisco IOS XE Dublin 17.11.x or earlier releases.

> [2] The **request platform software** commands are deprecated. So although they are still visible on the CLI, we recommend that you use **install** commands.

> **Note**
>
> New switch models that are introduced in a release cannot be downgraded. The release in which a switch model is introduced is the minimum software version for that model.

The sample output in this section shows downgrade from Cisco IOS XE Dublin 17.12.1 to Cisco IOS XE Dublin 17.11.1, using **install** commands.

Microcode Downgrade Prerequisite:

Starting from Cisco IOS XE Gibraltar 16.12.1, a new microcode is introduced to support IEEE 802.3bt Type 3 standard for UPOE switches in the series (C9300-24U, C9300-48U, C9300-24UX, C9300-48UXM, C9300-48UN). The new microcode is not backward-compatible with some releases, because of which you must also downgrade the microcode when you downgrade to one of these releases. If the microcode is not downgraded, PoE features will be impacted after the downgrade.

Depending on the *release* you are downgrading to and the *commands* you use to downgrade, review the table below for the action you may have to take:

When downgrading from ...	To one of These Releases	by Using...	Action For Microcode Downgrade
Cisco IOS XE Gibraltar 16.12.1 or a later release	Cisco IOS XE Everest 16.6.1 through Cisco IOS XE Everest 16.6.6	**install** commands	Microcode will roll back automatically as part of the software installation. No further action is required.
	Cisco IOS XE Fuji 16.9.1 through Cisco IOS XE Fuji 16.9.2	**request platform software** commands or or bundle boot	Manually downgrade the microcode before downgrading the software image. Enter the **hw-module mcu rollback** command in global configuration mode, to downgrade microcode.

Procedure

Step 1 Clean-up

install remove inactive

Use this command to clean-up old installation files in case of insufficient space and to ensure that you have at least 1GB of space in flash, to expand a new image.

The following sample output displays the cleaning up of unused files, by using the **install remove inactive** command:

```
Switch# install remove inactive

install_remove: START Mon Jul 24 10:34:24 PDT 2023
install_remove: Removing IMG
Cleaning up unnecessary package files
No path specified, will use booted path /flash/packages.conf

Cleaning /flash
Scanning boot directory for packages ... done.
Preparing packages list to delete ...
[R0]: /flash/packages.conf File is in use, will not delete.
[R1]: /flash/packages.conf File is in use, will not delete.
[R0]: /flash/cat9k-cc_srdriver.17.12.01.SPA.pkg File is in use, will not delete.
[R1]: /flash/cat9k-cc_srdriver.17.12.01.SPA.pkg File is in use, will not delete.
[R0]: /flash/cat9k-espbase.17.12.01.SPA.pkg File is in use, will not delete.
[R1]: /flash/cat9k-espbase.17.12.01.SPA.pkg File is in use, will not delete.
[R0]: /flash/cat9k-guestshell.17.12.01.SPA.pkg File is in use, will not delete.
[R1]: /flash/cat9k-guestshell.17.12.01.SPA.pkg File is in use, will not delete.
[R0]: /flash/cat9k-lni.17.12.01.SPA.pkg File is in use, will not delete.
[R1]: /flash/cat9k-lni.17.12.01.SPA.pkg File is in use, will not delete.
[R0]: /flash/cat9k-rpbase.17.12.01.SPA.pkg File is in use, will not delete.
[R1]: /flash/cat9k-rpbase.17.12.01.SPA.pkg File is in use, will not delete.
[R0]: /flash/cat9k-sipbase.17.12.01.SPA.pkg File is in use, will not delete.
[R1]: /flash/cat9k-sipbase.17.12.01.SPA.pkg File is in use, will not delete.
[R0]: /flash/cat9k-sipspa.17.12.01.SPA.pkg File is in use, will not delete.
[R1]: /flash/cat9k-sipspa.17.12.01.SPA.pkg File is in use, will not delete.
[R0]: /flash/cat9k-srdriver.17.12.01.SPA.pkg File is in use, will not delete.
[R1]: /flash/cat9k-srdriver.17.12.01.SPA.pkg File is in use, will not delete.
[R0]: /flash/cat9k-webui.17.12.01.SPA.pkg File is in use, will not delete.
[R1]: /flash/cat9k-webui.17.12.01.SPA.pkg File is in use, will not delete.
[R0]: /flash/cat9k-wlc.17.12.01.SPA.pkg File is in use, will not delete.
[R1]: /flash/cat9k-wlc.17.12.01.SPA.pkg File is in use, will not delete.
[R0]: /flash/cat9k_iosxe.17.12.01.SPA.conf File is in use, will not delete.
[R1]: /flash/cat9k_iosxe.17.12.01.SPA.conf File is in use, will not delete.
[R0]: /flash/cat9k-rpboot.17.12.01.SPA.pkg File is in use, will not delete.
[R1]: /flash/cat9k-rpboot.17.12.01.SPA.pkg File is in use, will not delete.

The following files will be deleted:
[R0]: /flash/cat9k_iosxe.17.12.01.SPA.bin
[R1]: /flash/cat9k_iosxe.17.12.01.SPA.bin
[R0]: /flash/cat9k-cc_srdriver.17.09.02.SPA.pkg
[R1]: /flash/cat9k-cc_srdriver.17.09.02.SPA.pkg
[R0]: /flash/cat9k-espbase.17.09.02.SPA.pkg
[R1]: /flash/cat9k-espbase.17.09.02.SPA.pkg
[R0]: /flash/cat9k-guestshell.17.09.02.SPA.pkg
[R1]: /flash/cat9k-guestshell.17.09.02.SPA.pkg
[R0]: /flash/cat9k-lni.17.09.02.SPA.pkg
[R1]: /flash/cat9k-lni.17.09.02.SPA.pkg
[R0]: /flash/cat9k-rpbase.17.09.02.SPA.pkg
[R1]: /flash/cat9k-rpbase.17.09.02.SPA.pkg
[R0]: /flash/cat9k-sipbase.17.09.02.SPA.pkg
```

```
[R1]: /flash/cat9k-sipbase.17.09.02.SPA.pkg
[R0]: /flash/cat9k-sipspa.17.09.02.SPA.pkg
[R1]: /flash/cat9k-sipspa.17.09.02.SPA.pkg
[R0]: /flash/cat9k-srdriver.17.09.02.SPA.pkg
[R1]: /flash/cat9k-srdriver.17.09.02.SPA.pkg
[R0]: /flash/cat9k-webui.17.09.02.SPA.pkg
[R1]: /flash/cat9k-webui.17.09.02.SPA.pkg
[R0]: /flash/cat9k-wlc.17.09.02.SPA.pkg
[R1]: /flash/cat9k-wlc.17.09.02.SPA.pkg
[R0]: /flash/cat9k_iosxe.17.09.02.SPA.conf
[R1]: /flash/cat9k_iosxe.17.09.02.SPA.conf
[R0]: /flash/cat9k-rpboot.17.09.02.SPA.pkg
[R1]: /flash/cat9k-rpboot.17.09.02.SPA.pkg

Do you want to remove the above files? [y/n]y

Deleting file /flash/cat9k_iosxe.17.12.01.SPA.bin ... done.
Deleting file /flash/cat9k-cc_srdriver.17.09.02.SPA.pkg ... done.
Deleting file /flash/cat9k-espbase.17.09.02.SPA.pkg ... done.
Deleting file /flash/cat9k-guestshell.17.09.02.SPA.pkg ... done.
Deleting file /flash/cat9k-lni.17.09.02.SPA.pkg ... done.
Deleting file /flash/cat9k-rpbase.17.09.02.SPA.pkg ... done.
Deleting file /flash/cat9k-sipbase.17.09.02.SPA.pkg ... done.
Deleting file /flash/cat9k-sipspa.17.09.02.SPA.pkg ... done.
Deleting file /flash/cat9k-srdriver.17.09.02.SPA.pkg ... done.
Deleting file /flash/cat9k-webui.17.09.02.SPA.pkg ... done.
Deleting file /flash/cat9k-wlc.17.09.02.SPA.pkg ... done.
Deleting file /flash/cat9k_iosxe.17.09.02.SPA.conf ... done.
Deleting file /flash/cat9k-rpboot.17.09.02.SPA.pkg ... done.
Deleting /flash/.images/17.12.01.0.172764.1674613814 ... done.
SUCCESS: Files deleted.

--- Starting Post_Remove_Cleanup ---
Performing REMOVE_POSTCHECK on all members
Finished Post_Remove_Cleanup
SUCCESS: install_remove Mon Jul 24 10:34:32 PDT 2023
```

Step 2   Copy new image to flash

a) **copy tftp:***[[//location]/directory]/filename***flash:**

Use this command to copy the new image from a TFTP server to flash memory. The location is either an IP address or a host name. The filename is specified relative to the directory used for file transfers. Skip this step if you want to use the new image from a TFTP server.

```
Switch# copy tftp://10.8.0.6/image/cat9k_iosxe.17.11.01.SPA.bin flash:
Destination filename [cat9k_iosxe.17.11.01.SPA.bin]?
Accessing tftp://10.8.0.6//cat9k_iosxe.17.11.01.SPA.bin...
Loading /cat9k_iosxe.17.11.01.SPA.bin from 10.8.0.6 (via GigabitEthernet0/0):
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
[OK - 508584771 bytes]
508584771 bytes copied in 101.005 secs (5035244 bytes/sec)
```

b) **dir flash:**

Use this command to confirm that the image has been successfully copied to flash.

```
Switch# dir flash:*.bin

Directory of flash:/*.bin

Directory of flash:/

434184 -rw- 508584771 Jul 24 2023 13:35:16 -07:00 cat9k_iosxe.17.11.01.SPA.bin
```

```
        11353194496 bytes total (9055866880 bytes free)
```

Step 3 Set boot variable

a) **boot system flash:packages.conf**

Use this command to set the boot variable to **flash:packages.conf**.

```
Switch(config)# boot system flash:packages.conf
```

b) **no boot manual**

Use this command to configure the switch to auto-boot.

```
Switch(config)# no boot manual
Switch(config)# exit
```

c) **write memory**

Use this command to save boot settings.

```
Switch# write memory
```

d) **show boot**

Use this command to verify the boot variable (packages.conf) and manual boot setting (no):

```
Switch# show boot

Current Boot Variables:
BOOT variable = flash:packages.conf;

Boot Variables on next reload:
BOOT variable = flash:packages.conf;
Manual Boot = no
Enable Break = yes
Boot Mode = DEVICE
iPXE Timeout = 0
```

Step 4 Downgrade software image

install add file activate commit

Use this command to install the image.

We recommend that you point to the source image on your TFTP server or the flash drive of the *active* switch, if you have copied the image to flash memory. If you point to an image on the flash or USB drive of a member switch (instead of the active), you must specify the exact flash or USB drive - otherwise installation fails. For example, if the image is on the flash drive of member switch 3 (flash-3): Switch# **install add file flash-3:cat9k_iosxe.17.11.01.SPA.bin activate commit**.

The following example displays the installation of the Cisco IOS XE Dublin 17.11.1 software image to flash, by using the **install add file activate commit** command.

```
Switch# install add file flash:cat9k_iosxe.17.11.01.SPA.bin activate commit

install_add_activate_commit: START Mon Jul 24 10:55:53 PDT 2023
install_add: START Mon Jul 24 10:55:53 PDT 2023
install_add: Adding IMG
 [2] Switch 2 Warning!!! Image is being downgraded from 17.12.01.0.1186 to 17.11.01.0.1444.
--- Starting initial file syncing ---
Copying flash:cat9k_iosxe.17.11.01.SPA.bin from Switch 1 to Switch 1 2
Info: Finished copying to the selected Switch
Finished initial file syncing
```

```
--- Starting Add ---
Performing Add on all members
Checking status of Add on [1 2]
Add: Passed on [1 2]
Image added. Version: 17.11.01.0.1444

Finished Add

install_activate: START Mon Jul 24 10:57:32 PDT 2023
install_activate: Activating IMG
Following packages shall be activated:
/flash/cat9k-cc_srdriver.17.11.01.SPA.pkg
/flash/cat9k-espbase.17.11.01.SPA.pkg
/flash/cat9k-guestshell.17.11.01.SPA.pkg
/flash/cat9k-lni.17.11.01.SPA.pkg
/flash/cat9k-rpbase.17.11.01.SPA.pkg
/flash/cat9k-sipbase.17.11.01.SPA.pkg
/flash/cat9k-sipspa.17.11.01.SPA.pkg
/flash/cat9k-srdriver.17.11.01.SPA.pkg
/flash/cat9k-webui.17.11.01.SPA.pkg
/flash/cat9k-wlc.17.11.01.SPA.pkg
/flash/cat9k-rpboot.17.11.01.SPA.pkg

This operation may require a reload of the system. Do you want to proceed? [y/n]y

--- Starting Activate ---
Performing Activate on all members
 [1] Activate package(s) on Switch 1
 [2] Activate package(s) on Switch 2
 [2] Finished Activate on Switch 2
 [1] Finished Activate on Switch 1
Checking status of Activate on [1 2]
Activate: Passed on [1 2]
Finished Activate

--- Starting Commit ---
Performing Commit on all members
 [1] Commit package(s) on Switch 1
 [2] Commit package(s) on Switch 2
 [2] Finished Commit on Switch 2
 [1] Finished Commit on Switch 1
Checking status of Commit on [1 2]
Commit: Passed on [1 2]
Finished Commit operation

SUCCESS: install_add_activate_commit Mon Jul 24 11:00:19 PDT 2023
stack-nyqcr3#
Chassis 1 reloading, reason - Reload command
Jul 24 11:00:25.253: %PMAN-5-EXITACTION: F0/0: pvp: Process manager is exiting: reload fp
action requested
Jul 24 11:00:26.878: %PMAN-5-EXITACTION: R0/0: pvp: Process manager is exiting: rp processes
 exit with reload switch code



Initializing Hardware......

System Bootstrap, Version 17.12.1r[FC1], RELEASE SOFTWARE (P)
Compiled Wed 02/08/2023 14:36:07.63 by rel

Current ROMMON image : Primary
Last reset cause     : SoftwareReload
C9300-48UXM platform with 8388608 Kbytes of main memory
```

```
Preparing to autoboot. [Press Ctrl-C to interrupt]  0
boot: attempting to boot from [flash:packages.conf]
boot: reading file packages.conf
#
#########################################################################################################################################################
#########################################################################################################################################################
#########################################################################################################################################################


Waiting for 120 seconds for other switches to boot

Switch number is 1
All switches in the stack have been discovered. Accelerating discovery
```

Note　　　The system reloads automatically after executing the **install add file activate commit** command. You do not have to manually reload the system.

Step 5　　Verify version

show version

After the image boots up, use this command to verify the version of the new image.

Note　　　When you downgrade the software image, the ROMMON version does not downgrade. It remains updated.

The following sample output of the **show version** command displays the Cisco IOS XE Dublin 17.11.1 image on the device:

```
Switch# show version

Cisco IOS XE Software, Version 17.11.01
Cisco IOS Software [Dublin], Catalyst L3 Switch Software (CAT9K_IOSXE), Version 17.11.1,
RELEASE SOFTWARE (fc1)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2023 by Cisco Systems, Inc.
<output truncated>
```

Field-Programmable Gate Array Version Upgrade

A field-programmable gate array (FPGA) is a type of programmable memory device that exists on Cisco switches. They are re-configurable logic circuits that enable the creation of specific and dedicated functions.

To check the current FPGA version, enter the **version -v** command in ROMMON mode.

Note

- Not every software release has a change in the FPGA version.

- The version change occurs as part of the regular software upgrade and you do not have to perform any other additional steps.

Field-Programmable Gate Array Version Upgrade