Upgrade Catalyst 9300 Switches

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Introduction

This document describes the methods for upgrading Catalyst 9300 switches.

Prerequisites

Requirements

There are no specific requirements for this document.

Components Used

The information in this document is based on C9300.

The information in this document was created from the devices in a specific lab environment. All of the devices used in this document started with a cleared (default) configuration. If your network is live, ensure that you understand the potential impact of any command.

Background Information

This document covers new and old upgrade procedures for Catalyst 9300 switches that use either BUNDLE or INSTALL modes. ISSU upgrade method is not supported on Catalyst 9300 switches.

Recommended Releases

For the recommended software versions based on the downloads page, please consult this link:

Recommended Releases for Catalyst 9000 Switches

Software Download

To download the software, please visitCisco Software Downloadand select your product.

Essential Criteria for Upgrade

1. A maintenance window of 2-3 hours can be sufficient for upgrading to the target version or rolling back to the previous version if any issues arise.

2. Ensure you have a 4GB or 8GB USB drive with the .bin files of both the current and target IOS versions. USB drive can be formatted in FAT32 to copy the IOS image.

3. Verify that TFTP is set up with both the current and target IOS versions and is reachable to download these versions to the switch if needed.

4. Confirm that console access to the device is available in case any issues occur.

5. Ensure there is at least 1GB to 1.5GB of available space in the flash memory for the expansion of the new image. If there is insufficient space, remove old installation files.

ROMMON Upgrade and Bootloader Upgrade

For 16.x.x, when you upgrade from the existing release on your switch to a later or newer release for the first time, the boot loader can be automatically upgraded, based on the hardware version of the switch. If the boot loader is automatically upgraded, it can take effect on the next reload. If you go back to the older release after this, the boot loader is not downgraded. The updated boot loader supports all previous releases. For subsequentCisco IOS® XE Everest 16.x.x, orCisco IOS® XE Fuji 16.x.xreleases, if there is a new bootloader in that release, it can be automatically upgraded based on the hardware version of the switch when you boot up your switch with the new image for the first time.

For 17.x.x, To know the ROMMON or bootloader version that applies to every major and maintenance release, see ROMMON Versions for Cisco Catalyst 9300 Series Switches..

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:

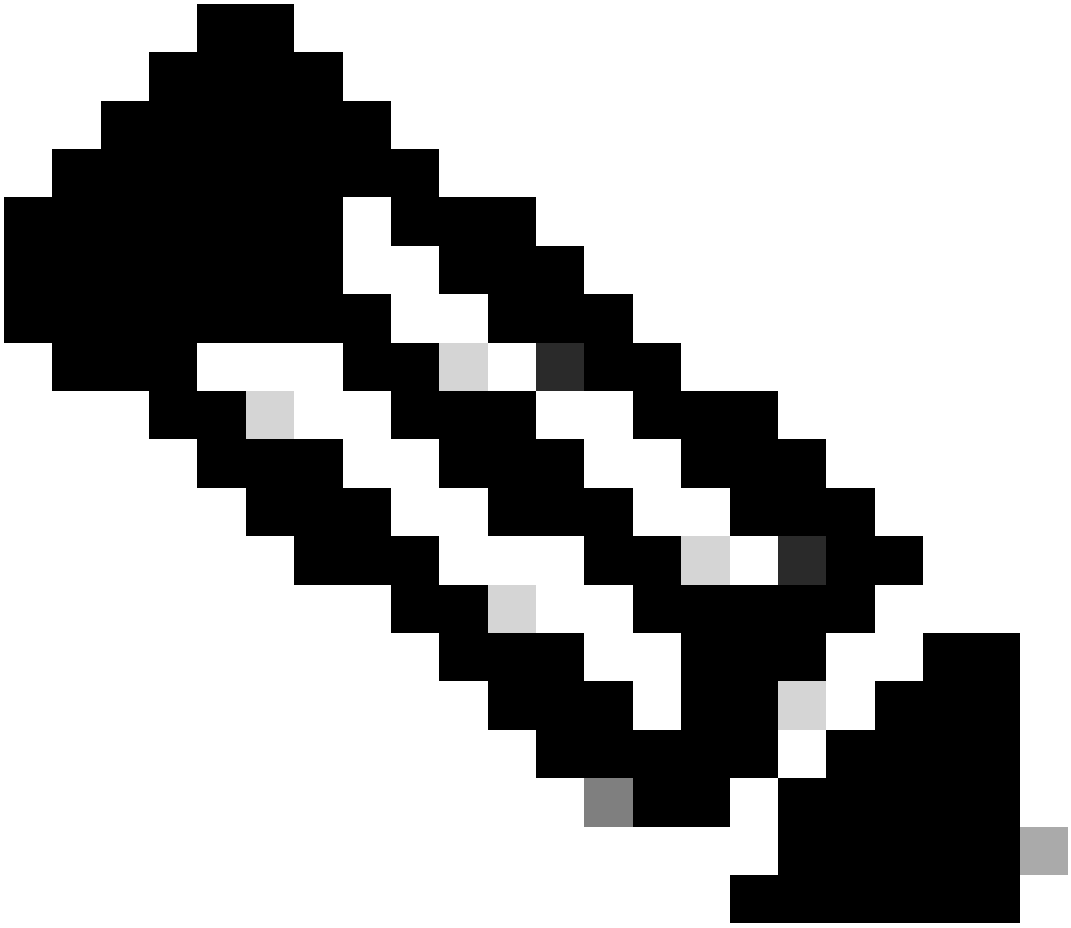
- Upgrading the ROMMON in the primary SPI flash device:

  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.

After the ROMMON is upgraded, it takes 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.



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

Upgrade Methods

This document covers new and old upgrade procedures for Catalyst 9300 switch that uses either BUNDLE or INSTALL modes.

Install Mode

An install mode upgrade on a Cisco Catalyst 9300 switch is a method of upgrading the switch's software that involves using individual software packages rather than a single monolithic image file.

When upgrading from Cisco IOS XE Everest 16.5.1a or Cisco IOS XE Everest 16.6.1 to any newer version in INSTALL mode, the `request platform software` commands are utilized.

Please follow the outlined steps for an upgrade in Install mode.

1. Cleanup

Remove any inactive installations with the command:

```
Switch#request platform software package clean switch all
```

2. Copy the New Image.

Transfer the new .bin image file to the active switch's flash storage using one of these methods:

Via TFTP:

```
Switch#copy tftp://Location/directory/<file_name>.bin flash:
```

Via USB:

```
Switch#copy usbflash0:<file_name>.bin flash:
```

Confirm the available file systems with:

```
Switch#show file systems
```

3. Verification

After transferring the IOS to the active switch, check if the image is correctly copied with:

```
Switch#dir flash:
```

(Optional) To verify the MD5 checksum, use the command:

```
Switch#verify /md5 flash:<file_name>.bin
```

Make sure this checksum matches the one provided on the Software Download page.

4. Set the Boot Variable.

Set the boot variable to point to the packages.conf file with these commands:

```
Switch#configure t
Switch(config)#no boot system
Switch(config)#boot system flash:packages.conf
Switch(config)#end
```

5. Autoboot Configuration.

Configure the switch to autoboot by executing:

```
Switch#configure t
Switch(config)#no boot manual
Switch(config)#end
```

6. Save Configuration.

Save your current configuration with:

```
Switch#write memory
```

Confirm the boot settings with the command:

```
Switch#show boot system
```

7. Installation of the Image.

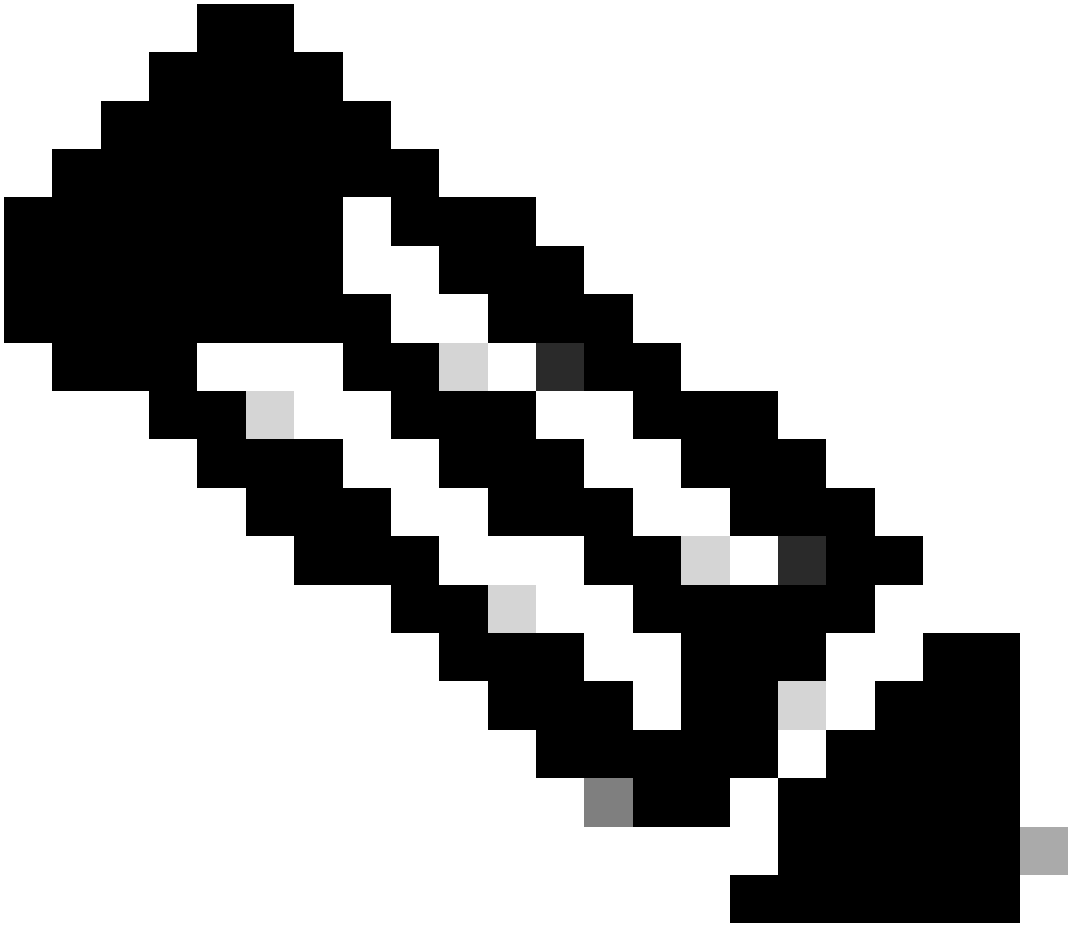
To install the image, use the command:

```
Switch#request platform software package install switch all file flash-x:<file_name>.bin auto-copy
```

The system can auto reload.

8. Verification of the successful upgrade.

```
Switch#show version
```



Note: Replace with the actual name of your IOS image file throughout the steps.

It is recommended 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#request platform software package install switch all file flash-3:<file_name> auto-copy
```

When upgrading from Cisco IOS XE Everest 16.6.2 and all later releases to any newer version in INSTALL mode, the **install**commands are utilized.

Please follow the outlined steps for an upgrade in Install mode:

1. Cleanup
Remove any inactive installations with the command:

```
Switch#install remove inactive
```

2. Copy the New Image.

Transfer the new .bin image file to the active switch's flash storage using one of these methods:

Via TFTP:

```
Switch#copy tftp://Location/directory/<file_name>.bin flash:
```

Via USB:

```
Switch#copy usbflash0:<file_name>.bin flash:
```

Confirm the available file systems with: **show file systems**

3. Verification

After transferring the IOS to the active switch, check if the image is correctly copied with:

```
Switch#dir flash:
```

(Optional) To verify the MD5 checksum, use the command:

```
Switch#verify /md5 flash:<file_name>.bin
```

Ensure this checksum matches the one provided on the Software Download page.

4. Set the Boot Variable

Set the boot variable to point to the packages.conf file with these commands:

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

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

Switch(config)#end
```

5. Autoboot Configuration

Configure the switch to autoboot by executing:

```
Switch#configure t

Switch(config)#no boot manual

Switch(config)#end
```

6. Save Configuration

Save your current configuration with:

```
Switch#write memory
```

Confirm the boot settings with the command:

```
Switch#show boot system
```

7. Installation of the Image

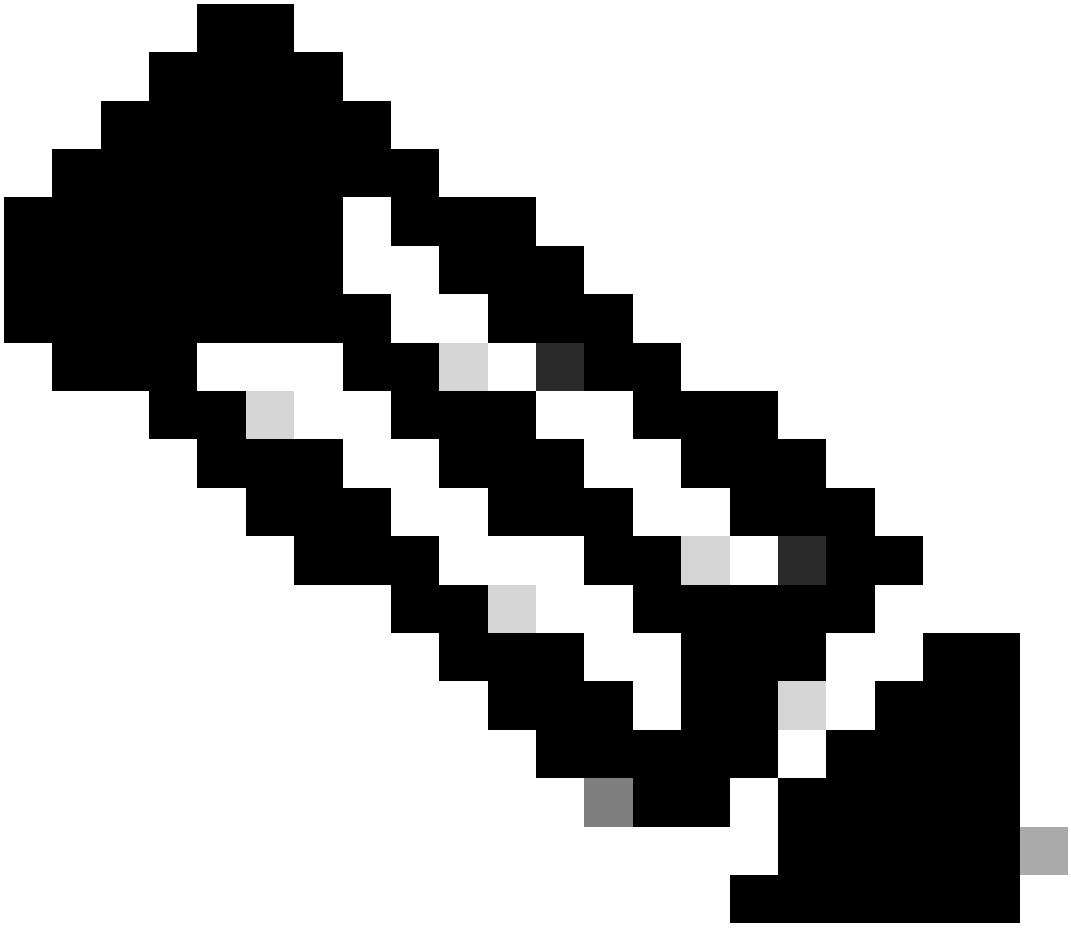
To install the image, use the command:

```
Switch#install add file flash:<file_name>.bin activate commit
```

When prompted with "This operation requires a reload of the system. Do you want to proceed? [y/n]," respond with **y** to proceed.

8. Verification of the successful upgrade.

```
Switch#show version
```



Note: Replace with the actual name of your IOS image file throughout the steps.

Bundle Mode

A bundle mode upgrade on a Cisco Catalyst 9300 switch refers to a method of upgrading the switch's software where the entire software image is bundled into a single file. This file includes all the necessary components such as the operating system, device drivers, and other essential software required for the switch to operate. The upgrade involves a single software image file, typically with a .bin extension. This contrasts with other methods, such as install mode, which can involve multiple files and packages.

For C9300 we can upgrade directly from 16.x.x to 17.x.x train or within 17.x.x train in INSTALL mode. Please refer to release note of target IOS which is found externally for more understanding.

While upgrading in BUNDLE mode from 16.x.x to 17.x.x it is recommended to go for an intermediate IOS version because of Cisco bug ID CSCwh54386 : Bug Search Tool (cisco.com)

For example, 16.8.x (older) -> 17.3.x (middle one) -> 17.9.X (newer)

Please follow the outlined steps for an upgrade in Bundle mode:

1. Transfer the new image (.bin file) to the flash memory of each stack member in the standalone switch or stack using one of these methods

Via TFTP:

```
Switch#copy tftp://location/directory/<file_name>.bin flash-x: (Replace 'x' with the respective switch
```

Via USB:

```
Switch#copy usbflash0:<file_name>.bin flash-x: (Replace 'x' with the respective switch number in the st
```

2. Confirm the available file systems by using the command

```
Switch#show file systems
```

3. After copying the IOS to all member switches, verify that the image has been correctly copied with:

```
Switch#dir flash-x: (Replace 'x' with the respective switch number in the stack)
```

4. (Optional) Verify the MD5 checksum with the command:

```
Switch#verify /md5 flash-x:<file_name>.bin
```

Ensure that the output matches the MD5 checksum value provided on the Software Download page.

5. Configure the boot variable to point to the new image file with these commands:

```
Switch#conf t
Switch(config)#no boot system
Switch(config)#boot system flash:<file_name>.bin
Switch(config)#end
```

6. Save the configuration.

```
Switch#write memory
```

7. Verify the boot settings using:

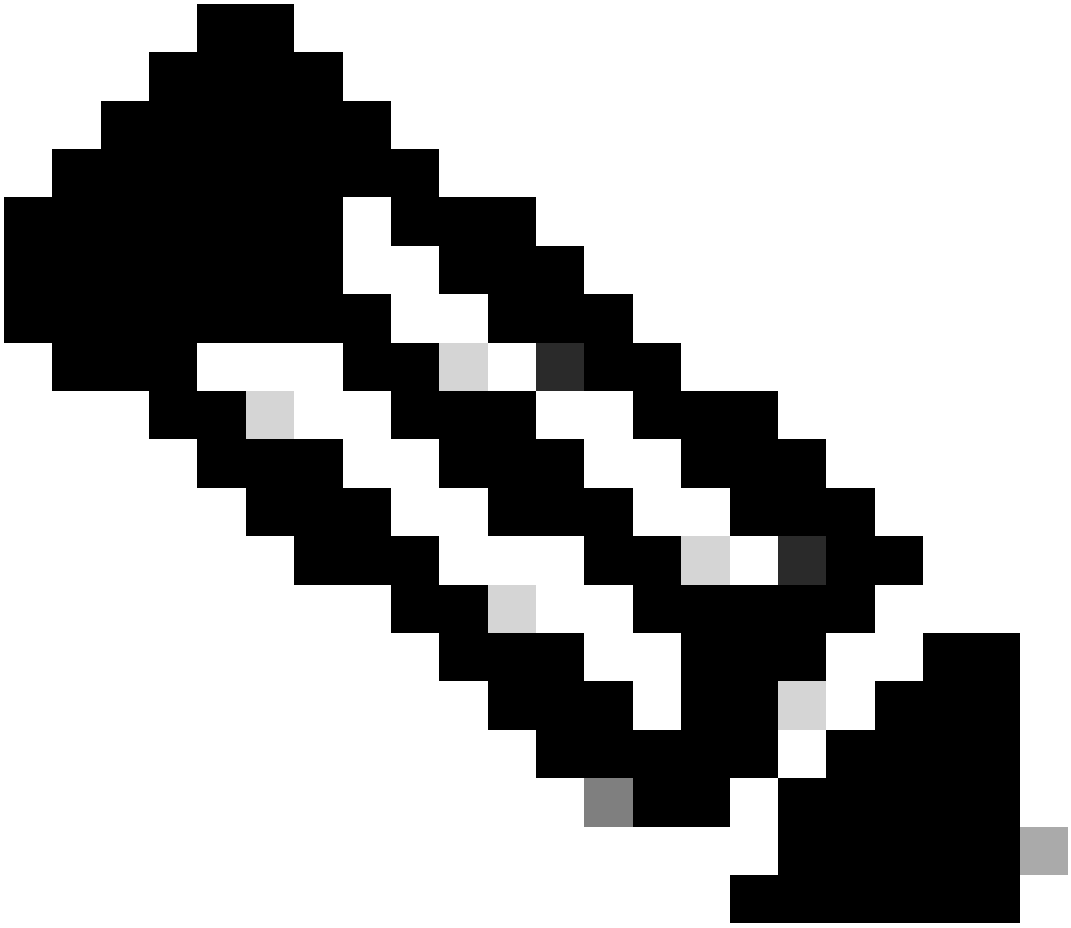
```
Switch#show boot
```

8. Reload the switch to apply the new IOS:

```
Switch#reload
```

9. Verification of the successful upgrade:

```
Switch#show version
```



Note: Replace with the actual name of your IOS image file throughout the steps.

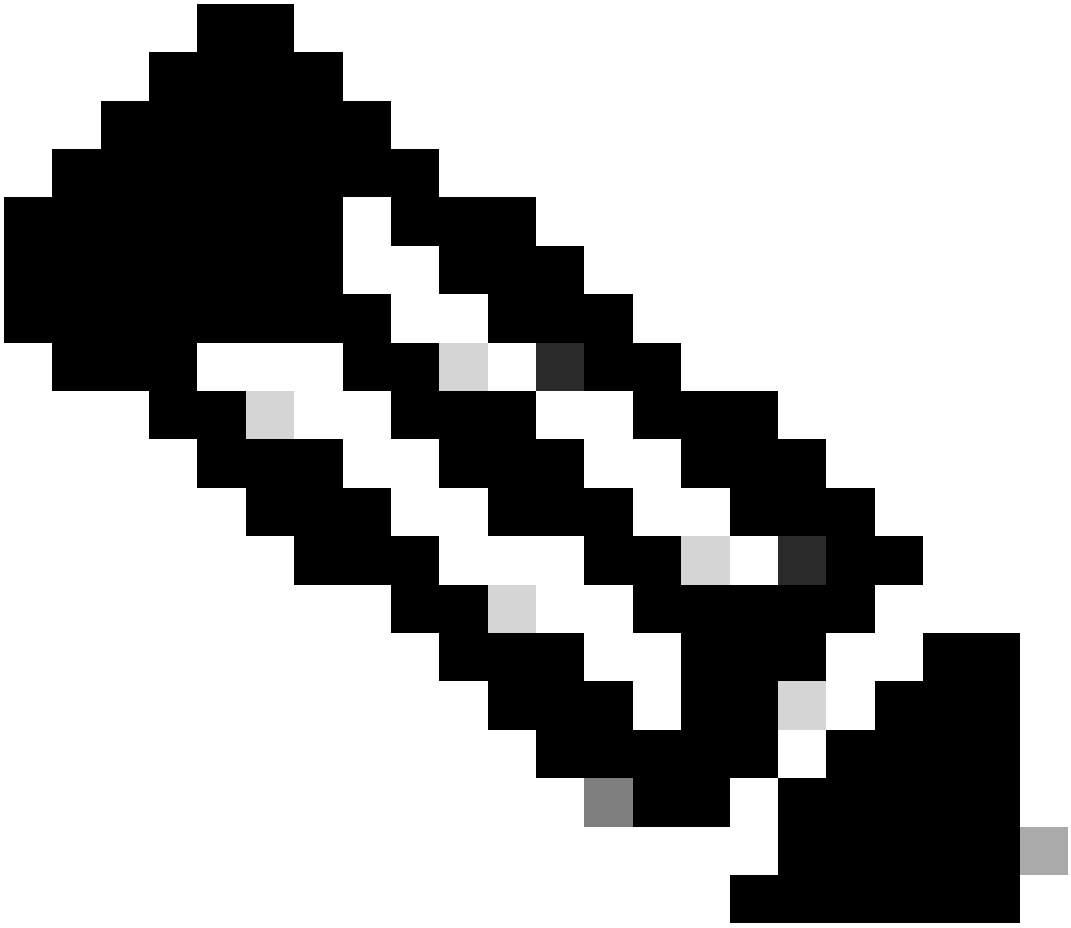
Extended Fast Software Upgrade (xFSU)

The Extended Fast Software Upgrade (xFSU) is a software enhancement process aimed to reduce traffic downtime during software reload or upgrade operations. xFSU is based on principles of graceful restart feature (also known as Cisco NSF).

The general idea behind this feature is to keep the data (forwarding) plane to continue to function, while the control plane is reloading as part of the software upgrade. The role of xFSU is to reconcile the forwarding state in ASIC with the new control plane and restore the forwarding state after a quick reset of forwarding ASIC as shown below.

For Catalyst 9300 switches without true redundant control and forwarding plane, down time/traffic loss during the reloads and upgrades are more than 3 to 4min.

- For access networks this downtime is critical for the likes of wifi access points, robots and so on..
- xFSU can help minimize the down time however restrictions apply as not all configurations are supported.



Note: For more information on 9300 xFSU see this document Understand Extended Fast Software Upgrade on Catalyst 9300 Series Switches