



Upgrading or Downgrading the Cisco Nexus 9000 Series NX-OS Software

This chapter describes how to upgrade or downgrade the Cisco NX-OS software. It contains the following sections:

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About the Software Image

Each device is shipped with the Cisco NX-OS software preinstalled. The Cisco NX-OS software consists of one NX-OS software image. Only this image is required to load the Cisco NX-OS operating system.

In Cisco NX-OS Release 10.1(1), 10.1(2) and 10.2(1)F there are 32 and 64 bit images.

- The 32-bit Cisco NX-OS image file has the image filename that begins with "nxos" (for example, nxos.10.1.1.bin).
- The 64-bit Cisco NX-OS image file has the image filename that begins with "nxos64" (for example, nxos64.10.1.1.bin).



Note Beginning with Cisco NX-OS Release 10.1(x), only 9300-GX platforms support 64-bit image. Beginning with Cisco NX-OS Release 10.2(1)F, all platforms support 64-bit image.

Beginning with Cisco NX-OS Release 10.2(2)F all Cisco Nexus platforms will be operating on 64-bit images and there are two 64-bit images.

- The 64-bit Cisco NX-OS image file has the image filename that begins with "nxos64-cs" (for example, nxos64-cs.10.2.2.F.bin) : This image is supported on Cisco Nexus 9000 -EX, -FX, -GX, GX2 series modular switches and Nexus 9000 series fixed switches
- The 64-bit Cisco NX-OS image file has the image filename that begins with "nxos64-msll" (for example, nxos64-msll.10.2.2.F.bin) This image is supported on Cisco Nexus 9000 -R and -R2 series modular switches, Cisco Nexus 3600 series fixed switches and Cisco Nexus 3500-XL switches

For 32-bit or 64-bit image support on respective platforms, see the following documents:

- [Cisco Nexus 9000 Series NX-OS Release Notes, Release 10.2\(1\)F](#) .
- [Cisco Nexus 9000 Series NX-OS Release Notes, Release 10.1\(2\)](#)
- [Cisco Nexus 9000 Series NX-OS Release Notes, Release 10.1\(1\)](#)

The Cisco Nexus 9000 Series switches support disruptive software upgrades and downgrades by default.



Note Another type of binary file is the software maintenance upgrade (SMU) package file. SMUs contain fixes for specific defects. They are created to respond to immediate issues and do not include new features. SMU package files are available for download from Cisco.com and generally include the ID number of the resolved defect in the filename (for example, n9000-dk10.1.1.CSCab00001.gbin). For more information on SMUs, see the *Cisco Nexus 9000 Series NX-OS System Management Configuration Guide*.



Note Cisco also provides electronic programmable logic device (EPLD) image upgrades to enhance hardware functionality or to resolve known hardware issues. The EPLD image upgrades are independent from the Cisco NX-OS software upgrades. For more information on EPLD images and the upgrade process, see the [Cisco Nexus 9000 Series FPGA/EPLD Upgrade Release Notes](#).

About ISSU

An in-service software upgrade (ISSU) allows you to upgrade the device software while the switch continues to forward traffic. ISSU reduces or eliminates the downtime typically caused by software upgrades. You can perform an ISSU, also known as a non-disruptive upgrade, for some switches. (See the [ISSU Platform Support, on page 15](#) for a complete list of supported platforms.)

The default upgrade process is disruptive. Therefore, ISSU needs to be enabled using the command-line interface (CLI), as described in the configuration section of this document. Using the non-disruptive option

helps ensure a non-disruptive upgrade. The guest shell is disabled during the ISSU process and it is later reactivated after the upgrade.

Enhanced ISSUs are supported for some Cisco Nexus 9000 Series switches.

The following ISSU scenarios are supported:

- Performing standard ISSU on Top-of-Rack (ToR) switches with a single supervisor
- Performing enhanced ISSU on Top-of-Rack (ToR) switches with a single supervisor

Performing Standard ISSU on Top-of-Rack (ToR) Switches with a Single Supervisor

The ToR Cisco Nexus 9300 platform switches are the NX-OS switches with single supervisors. Performing ISSU on the Cisco Nexus 9000 Series switches causes the supervisor CPU to reset and to load the new software version. After the CPU loads the updated version of the Cisco NX-OS software, the system restores the control plane to the previous known configuration and the runtime state and it gets in-sync with the data plane, thereby completing the ISSU process.

The data plane traffic is not disrupted during the ISSU process. In other words, the data plane forwards the packets while the control plane is being upgraded, any servers that are connected to the Cisco Nexus 9000 Series switches do not see any traffic disruption. The control plane downtime during the ISSU process is approximately less than 120 seconds.

Performing Enhanced ISSU on Top-of-Rack (ToR) Switches with a Single Supervisor



Note Enhanced ISSU may not be supported if there are any underlying kernel differences. The system will prompt the following message:

```
Host kernel is not compatible with target image. Full ISSU will be performed and control plane will be impacted.
```

In effect, system will perform non-disruptive ISSU instead of enhanced ISSU.

The Cisco NX-OS software normally runs directly on the hardware. However, configuring enhanced or container-based ISSU on single supervisor ToRs is accomplished by creating virtual instances of the supervisor modules and the line cards. With enhanced ISSU, the software runs inside a separate Linux container (LXC) for the supervisors and the line cards. A third container is created as part of the ISSU procedure, and it is brought up as a standby supervisor.

The virtual instances (or the Linux containers) communicate with each other using an emulated Ethernet connection. In the normal state, only two Linux containers are instantiated: vSup1 (a virtual SUP container in an active role) and vLC (a virtual linecard container). Enhanced ISSU requires 16G memory on the switch.

To enable booting in the enhanced ISSU (LXC) mode, use the **[no] boot mode lxc** command. This command is executed in the config mode. See the following sample configuration for more information:

```
switch(config)# boot mode lxc
Using LXC boot mode
Please save the configuration and reload system to switch into the LXC mode.
switch(config)# copy r s
[#####] 100%
Copy complete.
```



Note When you are enabling enhanced ISSU for the first time, you have to reload the switch first.

During the software upgrade with enhanced ISSU, the supervisor control plane stays up with minimal switchover downtime disruption and the forwarding state of the network is maintained accurately during the upgrade. The supervisor is upgraded first and the line card is upgraded next.

The data plane traffic is not disrupted during the ISSU process. The control plane downtime is less than 6 seconds.



Note In-service software downgrades (ISSDs), also known as non-disruptive downgrades, are not supported.

For information on ISSU and high availability, see the [Cisco Nexus 9000 Series NX-OS High Availability and Redundancy Guide](#).

Recommendations for Upgrading the Cisco NX-OS Software

Cisco recommends performing a Nexus Health and Configuration Check before performing an upgrade. The benefits include identification of potential issues, susceptible Field Notices and Security Vulnerabilities, missing recommended configurations and so on. For more information about the procedure, see [Perform Nexus Health and Configuration Check](#).

Prerequisites for Upgrading the Cisco NX-OS Software

Upgrading the Cisco NX-OS software has the following prerequisites:

- For ISSU compatibility for all releases, see the [Cisco NX-OS ISSU Support Matrix](#).
- Ensure that everyone who has access to the device or the network is not configuring the device or the network during this time. You cannot configure a device during an upgrade. Use the **show configuration session summary** command to verify that you have no active configuration sessions.
- Save, commit, or discard any active configuration sessions before upgrading or downgrading the Cisco NX-OS software image on your device. On a device with dual supervisors, the active supervisor module cannot switch over to the standby supervisor module during the Cisco NX-OS software upgrade if you have an active configuration session.
- To transfer NX-OS software images to the Nexus switch through a file transfer protocol (such as TFTP, FTP, SFTP, SCP, etc.), verify that the Nexus switch can connect to the remote file server where the NX-OS software images are stored. If you do not have a router to route traffic between subnets, ensure that the Nexus switch and the remote file server are on the same subnetwork. To verify connectivity to the remote server, transfer a test file using a file transfer protocol of your choice or use the ping command if the remote file server is configured to respond to ICMP Echo Request packets. An example of using the **ping** command to verify connectivity to a remote file server 192.0.2.100 is shown below:

```
switch# ping 192.0.2.100 vrf management
PING 192.0.2.100 (192.0.2.100): 56 data bytes
64 bytes from 192.0.2.100: icmp_seq=0 ttl=239 time=106.647 ms
64 bytes from 192.0.2.100: icmp_seq=1 ttl=239 time=76.807 ms
```

```
64 bytes from 192.0.2.100: icmp_seq=2 ttl=239 time=76.593 ms
64 bytes from 192.0.2.100: icmp_seq=3 ttl=239 time=81.679 ms
64 bytes from 192.0.2.100: icmp_seq=4 ttl=239 time=76.5 ms

--- 192.0.2.100 ping statistics ---
5 packets transmitted, 5 packets received, 0.00% packet loss
round-trip min/avg/max = 76.5/83.645/106.647 ms
```

For more information on configuration sessions, see the *Cisco Nexus 9000 Series NX-OS System Management Configuration Guide* specific to your release.

Prerequisites for Downgrading the Cisco NX-OS Software

Downgrading the Cisco NX-OS software has the following prerequisites:

- Before you downgrade from a Cisco NX-OS release that supports the Control Plane Policing (CoPP) feature to an earlier Cisco NX-OS release that does not support the CoPP feature, you should verify compatibility using the **show incompatibility nxos bootflash:filename** command. If an incompatibility exists, disable any features that are incompatible with the downgrade image before downgrading the software.

Cisco NX-OS Software Upgrade Guidelines

Before attempting to upgrade to any software image, follow these guidelines:

- For a device that is running on Cisco Nexus Release 10.1(2), 10.2(1)F, and 10.2(2)F, ND-ISSU is not supported if L2 sub-interfaces are configured.
- Beginning with Cisco NX-OS Release 10.2(2)F, Cisco Nexus 9504 and 9508 platform switches, and Cisco Nexus 9508-R, R2, and RX line cards support Cisco NX-OS 64-bit images. Disruptive upgrade from earlier releases to 10.2(2)F 64-bit NX-OS image is supported. Cisco NX-OS 32-bit image is not supported on these platform switches anymore.
- Beginning with Cisco NX-OS Release 10.2(2)F, FCoE/FC NPV is supported on N9K-C9336C-FX2-E platform switches.

ISSU with with FCoE (Fiber Channel over Ethernet)/FC (Fiber Channel) NPV (N-port Virtualization) is supported on some Cisco Nexus 9000 switches. An ISSU allows you to upgrade the device software while the switch continues to forward traffic. You can perform an in-service software upgrade (ISSU), also known as a nondisruptive upgrade, for some Cisco Nexus 9000 switches. The default upgrade process is disruptive. Using the nondisruptive option helps ensure a nondisruptive upgrade.

Fibre Channel N-port Virtualization (NPV) can co-exist with VXLAN on different fabric uplinks but on same or different front panel ports on the Cisco Nexus 93180YC-FX, N9K-C9336C-FX2-E, and N9k-C93360YC-FX2 switches.

- Beginning with Cisco NX-OS Release 10.2(2)F, ND ISSU is supported for FEX and you need to re-adjust the BGP **graceful-restart restart time** command for the upgrade to work non-disruptively. This must be done for each FEX upgrade one-by-one.

The following example shows the time taken to re-adjust bgp-graceful restart-time for each non-disruptive FEX upgrade.

In the Non-disruptive upgrade with FEX, each FEX will upgrade taking about 90 seconds (1.5 minutes) sequentially (one-by-one and not a parallel upgrade).

Total non-disruptive upgrade time for all FEX = No. of fex * time taken per fex
 For 10 FEX = 10 * 90
 = 900 seconds or 15 minutes

- MPLS strip, GRE strip, and any underlying ACL configuration is not ISSU compatible when you perform ND ISSU to Cisco NX-OS Release 10.2(2)F from a previous release.

After ND ISSU to Cisco NX-OS Release 10.2(2)F or 10.2(3)F from a previous release, post GRE strip dot1q tunnel VLAN_tag might be missing. Workaround for this issue is to remove and add port ACL from L2 interfaces for GRE strip enabled interface.

- For ISSU compatibility for all releases, see the [ISSU Support Matrix](#).
- Beginning from Cisco NX-OS Release 10.2(1), Cisco Nexus 9300 and 9500 platform switches support 64-bit image, and non-disruptive upgrade is supported from Cisco NX-OS Release 9.3(9) onwards. Beginning from Cisco NX-OS Release 10.2(1) onwards, Cisco Nexus 9300-FX3 supports non-disruptive upgrade.
- Beginning with Cisco NX-OS Release 10.1(1), during the disruptive upgrade to the 64-bit image or a downgrade from 64-bit to 32-bit image, if feature ITD is enabled, refer to *Guidelines and Limitations for ITD* in the *Cisco Nexus 9000 Series NX-OS Intelligent Traffic Director Configuration Guide, Release 10.1(x)*, if the upgrade or downgrade proceeds with an ASCII reload.
- When you use **install all** with **no-reload** option, the saved configuration cannot be used before you reload the device. Saving configuration in this state can result in incorrect startup configuration once you reload the device with new version of NX-OS.
- For switches that are in LXC boot mode, the enhanced LXC upgrade will fall back to standard ND ISSU as the target image kernels are likely be different than the current image.
- Beginning with Cisco NX-OS Release 10.2(3)F, for switches that are in LXC mode and for non-destructive upgrade, a new option **skip-kernel-upgrade** is added to **install** command.
- The following are the two methods by which the ND ISSU can be performed in LXC mode:
 - ND ISSU in LXC mode - Switchover-based ISSU that is similar to EOR. Second SUP is brought up in new container and switchover is done. The second SUP now becomes the new active. There is no change to the kernel.
 - Fallback ND LXC ISSU - This is only done when the above switchover-based ISSU cannot be done (SRG Kernel incompatible or less memory). The kernel is upgraded.
 - skip-kernel-upgrade option will force ND ISSU in LXC mode - Switchover-based ISSU (even in case when running) and target kernels are incompatible.
- When upgrading from Cisco NX-OS Release 9.3(3) to Cisco NX-OS Release 9.3(6) or later, if you do not retain configurations of the TRM enabled VRFs from Cisco NX-OS Release 9.3(3), or if you create new VRFs after the upgrade, the auto-generation of **ip multicast multipath s-g-hash next-hop-based** CLI, when feature **ngmvpn** is enabled, will not happen. You must enable the CLI manually for each TRM enabled VRF. For the configuration instructions, see the *Cisco Nexus 9000 Series NX-OS VXLAN Configuration Guide, Release 10.1(x)*.
- When you upgrade a Cisco Nexus 9000 device to Cisco NX-OS Release 10.1(x), if a QSFP port is configured with the manual breakout command and is using a QSA, the configuration of the interface

Ethernet 1/50/1 is no longer supported and must be removed. To restore the configuration, you must manually configure the interface Ethernet 1/50 on the device.

- When redistributing static routes, Cisco NX-OS requires the **default-information originate** command to successfully redistribute the default static route starting in 7.0(3)I7(6).
- To perform an EPLD upgrade after an ISSU upgrade from Cisco NX-OS Release 7.x to Cisco NX-OS Release 9.3(x), before starting the EPLD upgrade, add the copy run start command.
- When upgrading from Cisco NX-OS Release 9.2(4) or earlier releases to Cisco NX-OS Release 9.3(4) or later, running configuration contains extra TCAM configuration lines. You can ignore these extra lines as they do not have an effect on the upgrade and configuration.
- When performing an ISSU from Cisco NX-OS Release 9.3(1) or 9.3(2) to Cisco NX-OS Release 9.3(3) or later, ensure that the features with user-defined ports, such as **<ssh port>**, are within the prescribed port range. If the port range is incorrect, follow the syslog message recommendation. For more information about the port range, see *Cisco Nexus 9000 Series NX-OS IP SLAs Configuration Guide, Release 10.1(x)*.
- When upgrading from Cisco NX-OS Release 9.2(2) or earlier releases to Cisco NX-OS Release 10.1(x), you need to make sure that ingress RACL TCAM region is not more than 50% full. Otherwise, the atomic update feature will be enabled after the upgrade and interfaces with RACLs that exceed 50% of TCAM allocation will remain down.
- Beginning with Cisco NX-OS Release 10.1(1), ISSU is supported on FC/FCoE switch mode on Cisco Nexus 93360YC-FX2. For more information about the FC/FCoE switch mode and supported hardware, see *Cisco Nexus 9000 Series NX-OS SAN Switching Configuration Guide, Release 10.1(x)*.
- Beginning with Cisco NX-OS Release 10.1(1), Enhanced ISSU is supported on FC/FCoE switch mode for Cisco Nexus 93180YC-FX and 93360YC-FX2 switches. For more information about the FC/FCoE switch mode and supported hardware, see *Cisco Nexus 9000 Series NX-OS SAN Switching Configuration Guide, Release 10.1(x)*.
- Beginning with Cisco NX-OS Release 10.1(1), Enhanced ISSU is supported on FC/FCoE NPV mode for Cisco Nexus 93180YC-FX and 93360YC-FX2 switches. For more information about the FC/FCoE NPV mode and supported hardware, see *Cisco Nexus 9000 Series NX-OS FC-NPV and FCoE NPV Configuration Guide, Release 10.1(x)*.
- The compressed image of Cisco Nexus 3000-series is hardware dependent and can only be used on the same device that it got compressed or downloaded from CCO. Do not use the Nexus 3000-series compressed image on Nexus 9000-series
- The following limitation applies to software upgrades from 7.0(3)I5 to 10.1(x) or 9.2(3) to 10.1(x):
If you have the same NetFlow configuration in both VLAN and SVI, you must remove the NetFlow flow monitor from the VLAN configuration prior to the upgrade. Once upgraded, reconfigure NetFlow by creating a new flow monitor and adding it to the VLAN configuration. Failure to perform these steps results in error messages and the inability to modify the VLAN NetFlow configuration in the upgraded software.
- When upgrading from Cisco NX-OS Releases 7.0(3)I4(8), 7.0(3)I5(3), and 7.0(3)I6(1) to Cisco NX-OS Release 10.1(x) results in a disruptive upgrade. If syncing images to standby SUP failed during the disruptive upgrade from Cisco NX-OS Releases 7.0(3)I4(8), 7.0(3)I5(3), or 7.0(3)I6(1) to 10.1(x), you should manually copy the image to the standby SUP and perform the disruptive upgrade.
- When upgrading directly to Cisco NX-OS Release 10.1(x) from any release prior to 7.0(x), the upgrade will be disruptive. For a non-disruptive upgrade, an intermediate upgrade to Cisco NX-OS Release 9.x

is required. We recommend upgrading to the latest release of Cisco NX-OS Release 9.3(x) as an intermediate hop for the upgrade. For information about the supported upgrade paths, see the [ISSU Support Matrix](#).

- When upgrading from Cisco NX-OS Release 7.0(3)I6(1) or 7.0(3)I7(1) to Cisco NX-OS Release 10.1(x), if the Cisco Nexus 9000 Series switches are running vPC and they are connected to an IOS-based switch via Layer 2 vPC, there is a likelihood that the Layer 2 port channel on the IOS side will become error disabled. The workaround is to disable the spanning-tree etherchannel guard misconfig command on the IOS switch before starting the upgrade process.

Once both the Cisco Nexus 9000 Series switches are upgraded, you can re-enable the command.

- If you are upgrading from Cisco NX-OS Release 7.0(3)I5(2) to Cisco NX-OS Release 10.1(x) by using the **install all** command, BIOS will not be upgraded due to CSCve24965. When the upgrade to Cisco NX-OS Release 10.1(x) is complete, use the **install all** command again to complete the BIOS upgrade, if applicable.
- An upgrade that is performed via the **install all** command for Cisco NX-OS Release 7.0(3)I2(2b) to Release 10.1(x) might result in the VLANs being unable to be added to the existing FEX HIF trunk ports. To recover from this, the following steps should be performed after all FEXs have come online and the HIFs are operationally up:
 1. Enter the copy run bootflash:fex_config_restore.cfg command at the prompt.
 2. Enter the copy bootflash:fex_config_restore.cfg running-config echo-commands command at the prompt.
- In Cisco NX-OS Release 7.0(3)I6(1) and earlier, performing an ASCII replay or running the copy file run command on a FEX HIF configuration requires manually reapplying the FEX configuration after the FEX comes back up.
- When upgrading to Cisco NX-OS Release 10.1(x) from 7.0(3)I2(x) or before and running EVPN VXLAN configuration, an intermediate upgrade to 7.0(3)I4(x) or 7.0(3)I5(x) or 7.0(3)I6(x) is required.
- Before enabling the FHS on the interface, we recommend that you carve the ifacl TCAM region on Cisco Nexus 9300 and 9500 platform switches. If you carved the ifacl TCAM region in a previous release, you must reload the system after upgrading to Cisco NX-OS Release 10.1(x). Uploading the system creates the required match qualifiers for the FHS TCAM region, ifacl.
- Before enabling the FHS, we recommend that you carve the ing-redirect TCAM region on Cisco Nexus 9200 and 9300-EX platform switches. If you carved the ing-redirect TCAM region in a previous release, you must reload the system after upgrading to Cisco NX-OS Release 10.1(x). Uploading the system creates the required match qualifiers for the FHS TCAM region, ing-redirect.
- Upgrading from Cisco NX-OS Release 9.3(1), 9.3(2) or 9.3(3) to a higher release, with Embedded Event Manager (EEM) configurations that are saved to the running configuration, may cause a DME error to be presented. The error is in the output of the **show consistency-checker dme running-config enhanced** command, specifically, the event manager commands. If this error occurs, delete all EEM applet configurations after completing the ISSU, then reapply the EEM configurations.
- For any prior release version upgrading to Cisco NX-OS Release 9.3(5) using ISSU, if the following logging level commands are configured, they are missing in the upgraded version and must be reconfigured:
 - **logging level evmc value**

- **logging level mvsh** *value*
 - **logging level fs-daemon** *value*
- For any prior release version upgrading to Cisco NX-OS Release 9.3(6) using ISSU, if the following logging level commands are configured, they are missing in the upgraded version and must be reconfigured:
 - **logging level evmc** *value*
 - **logging level mvsh** *value*
 - An error occurs when you try to perform an ISSU if you changed the reserved VLAN without entering the copy running-config save-config and reload commands.
 - The install all command is the recommended method for software upgrades and downgrades because it performs configuration compatibility checks and BIOS upgrades automatically. In contrast, changing the boot variables and reloading the device bypasses these checks and the BIOS upgrade and therefore it is not recommended.
 - Upgrading from Cisco NX-OS Release 7.0(3)I1(2), Release 7.0(3)I1(3), or Release 7.0(3)I1(3a) requires installing a patch for Cisco Nexus 9500 platform switches only. For more information on the upgrade patch, see Patch Upgrade Instructions.
 - An ISSU can be performed only from a Cisco NX-OS Release 7.0(3)I4(1) to a later image.
 - While performing an ISSU, VRRP and VRRPv3 displays the following messages:
 - If VRRPv3 is enabled:


```
2015 Dec 29 20:41:44 MDP-N9K-6 %$ VDC-1 %$ %USER-0-SYSTEM_MSG: ISSU ERROR: Service
"vrrpv3" has sent the following message: Feature vrrpv3 is configured. User can
change
vrrpv3 timers to 120 seconds or fine tune these timers based on upgrade time on all
Vrrp
Peers to avoid Vrrp State transitions. - sysmgr
```
 - If VRRP is enabled:


```
2015 Dec 29 20:45:10 MDP-N9K-6 %$ VDC-1 %$ %USER-0-SYSTEM_MSG: ISSU ERROR: Service
"vrrp-
eng" has sent the following message: Feature vrrp is configured. User can change
vrrp
timers to 120 seconds or fine tune these timers based on upgrade time on all Vrrp
Peers to
avoid Vrrp State transitions. - sysmgr
```
 - Guest Shell is disabled during an ISSU and reactivated after the upgrade. Any application running in the Guest Shell is affected.
 - If you have ITD probes configured, you must disable the ITD service (using the **shutdown** command) before upgrading to Cisco NX-OS Release 10.1(x). After the upgrade, enter the **feature sla sender** command to enable IP SLA for ITD probes and then the **no shutdown** command to re-enable the ITD service. (If you upgrade without shutting down the service, you can enter the **feature sla sender** command after the upgrade.)
 - Schedule the upgrade when your network is stable and steady.
 - Avoid any power interruption, which could corrupt the software image, during the installation procedure.

- On devices with dual supervisor modules, both supervisor modules must have connections on the console ports to maintain connectivity when switchovers occur during a software upgrade. See the [Hardware Installation Guide](#) for your specific chassis.
- Perform the installation on the active supervisor module, not the standby supervisor module.
- The **install all** command is the recommended method for software upgrades because it performs configuration compatibility checks and BIOS upgrades automatically. In contrast, changing the boot variables and reloading the device bypasses these checks and the BIOS upgrade and therefore is not recommended.



Note For Cisco Nexus 9500 platform switches with -R line cards, you must save the configuration and reload the device to upgrade from Cisco NX-OS Release 7.0(3)F3(5) to 9.3(1). To upgrade from Cisco NX-OS Release 9.2(2) or 9.2(3), we recommend that you use the **install all** command.

- You can detect an incomplete or corrupt NX-OS software image prior to performing an upgrade by verifying the MD5, SHA256 or SHA512 checksum of the software image. To verify the MD5 checksum of the software image, run the **show file bootflash:<IMAGE-NAME>md5sum** command and compare the resulting value to the published MD5 checksum for the software image on [Cisco's Software Download](#) website. To verify the SHA512 checksum of the software image, run the **show file bootflash:<IMAGE-NAME>sha512sum** command and compare the resulting value to the published SHA512 checksum for the software image on [Cisco's Software Download](#) website.
- When upgrading from Cisco Nexus 94xx, 95xx, and 96xx line cards to Cisco Nexus 9732C-EX line cards and their fabric modules, upgrade the Cisco NX-OS software before inserting the line cards and fabric modules. Failure to do so can cause a diagnostic failure on the line card and no TCAM space to be allocated. You must use the **write_erase** command followed by the **reload** command.
- If you upgrade from a Cisco NX-OS release that supports the CoPP feature to a Cisco NX-OS release that supports the CoPP feature with additional classes for new protocols, you must either run the setup utility using the **setup** command or use the **copp profile** command for the new CoPP classes to be available. For more information on these commands, see the "Configuring Control Plane Policing" chapter in the *Cisco Nexus 9000 Series NX-OS Security Configuration Guide, Release 10.1(x)*.
- For secure POAP, ensure that DHCP snooping is enabled and set firewall rules to block unintended or malicious DHCP servers. For more information on POAP, see the *Cisco Nexus 9000 Series Fundamentals Configuration Guide, Release 10.1(x)*.
- When you upgrade from an earlier release to a Cisco NX-OS release that supports switch profiles, you have the option to move some of the running-configuration commands to a switch profile. For more information, see the *Cisco Nexus 9000 Series NX-OS System Management Configuration Guide, Release 10.1(x)*.
- By default, the software upgrade process is disruptive.
- OpenFlow and LACP fast timer rate configurations are not supported for ISSU.
- Guest Shell is disabled during an ISSU and reactivated after the upgrade.
- ISSU supports only default hold timers for BGP peers.

- During an ISSU on a Cisco Nexus 9300 Series switch, all First-Hop Redundancy Protocols (FHRPs) will cause the other peer to become active if the node undergoing the ISSU is active.
- Make sure that both vPC peers are in the same mode (regular mode or enhanced mode) before performing a nondisruptive upgrade.



Note vPC peering between an enhanced ISSU mode (boot mode lxc) configured switch and a non-enhanced ISSU mode switch is not supported.

- During an ISSU, the software reload process on the first vPC device locks its vPC peer device by using CFS messaging over the vPC communications channel. Only one device at a time is upgraded. When the first device completes its upgrade, it unlocks its peer device. The second device then performs the upgrade process, locking the first device as it does so. During the upgrade, the two vPC devices temporarily run different releases of Cisco NX-OS; however, the system functions correctly because of its backward compatibility support.
- ISSU is not supported when onePK is enabled. You can run the **show feature | include onep** command to verify that this feature is disabled before performing an ISSU or enhanced ISSU.
- In general, ISSUs are supported for the following:
 - From a major release to any associated maintenance release.
 - From the last two maintenance releases to the next two major releases.
 - From an earlier maintenance release to the next two major releases.



Note For a list of specific releases from which you can perform a disruptive upgrade or a nondisruptive ISSU, see the [Cisco Nexus 9000 Series NX-OS Release Notes](#) for your particular release.

- Occasionally, while the switch is operationally Up and running, the Device not found logs are displayed on the console. This issue is observed because the switch attempts to find an older ASIC version and the error messages for the PCI probe failure are enabled in the code. There is no functionality impact or traffic loss due to this issue.
- ISSU is not supported if EPLD is not at Cisco NX-OS Release 7.0(3)I3(1) or later.
- ISSU supports EPLD image upgrades using **install all nxos <nxos-image> epld <epld-image>** command, during disruptive system (NX-OS) upgrade.
- A simplified NX-OS numbering format is used for platforms that are supported in Cisco NX-OS 10.1(x) releases. In order to support a software upgrade from releases prior to Cisco NX-OS Release 7.0(3)I7(4) that have the old release format, an installer feature supplies an I9(x) label as a suffix to the actual release during the **install all** operation. This label is printed as part of the image during the install operation from any release prior to Cisco NX-OS Release 7.0(3)I7(4) to 10.1(x), and it can be ignored. See the following example.

```
switch# install all nxos bootflash:nxos.9.3.1.bin
Installer will perform compatibility check first. Please wait.
Installer is forced disruptive
```

```

Verifying image bootflash:/nxos.9.3.1.bin for boot variable "nxos".
[#####] 100% -- SUCCESS

Verifying image type.
[#####] 100% -- SUCCESS

Preparing "nxos" version info using image bootflash:/nxos.9.3.1.bin.
[#####] 100% -- SUCCESS

Preparing "bios" version info using image bootflash:/nxos.9.3.1.bin.
[#####] 100% -- SUCCESS

Performing module support checks.
[#####] 100% -- SUCCESS

Notifying services about system upgrade.
[#####] 100% -- SUCCESS

Compatibility check is done:
Module  bootable   Impact      Install-type Reason
-----  -
      1         yes       disruptive   reset       Incompatible image for ISSU

Images will be upgraded according to following table:
Module  Image          Running-Version (pri:alt)  New-Version          Upg-Required
-----  -
      1         nxos          7.0(3)I7(3)              9.3(1)I9(1)
yes
      1         bios         v07.61(04/06/2017):v07.61(04/06/2017)  v05.33(09/08/2018)
yes

Switch will be reloaded for disruptive upgrade.
Do you want to continue with the installation (y/n)? [n] y

```

- Beginning with Cisco NX-OS Release 9.3(5), standard, nondisruptive ISSU, **on switches that are configured with uRPF**, is supported on the following:

- Cisco Nexus 9300-EX platform switches
- Cisco Nexus 9300-FX/FX2 platform switches
- Cisco Nexus 9300-GX platform switches



Note Prior to Cisco NX-OS Release 9.3(5), if any of the above switches were configured with uRPF, standard, nondisruptive ISSU was not supported.

- ISSU is blocked if **boot poap enable** is configured.
- When you upgrade from Cisco NX-OS Release 7.0(3)I7(1), 7.0(3)I7(2) or 7.0(3)I7(3) to Cisco NX-OS Release 10.2(x), the upgrade fails with below error message:

```

switch(config)# install all nxos bootflash:nxos64-cs.10.2.3.F.bin
Installer will perform compatibility check first. Please wait.
Installer is forced disruptive
Verifying image bootflash:/nxos64-cs.10.2.3.F.bin for boot variable "nxos".
[#####] 100% -- SUCCESS
Verifying image type.
[#####] 100% -- SUCCESS

```

```
Preparing "nxos" version info using image bootflash:/nxos64-cs.10.2.3.F.bin.
[#####] 100% -- SUCCESS
Preparing "bios" version info using image bootflash:/nxos64-cs.10.2.3.F.bin.
[#####] 100% -- SUCCESS
Pre-upgrade check failed. Return code 0x40930076 (Parallel downgrade to target version
is not supported). <<<<<
```

- Make sure that you follow below procedure to upgrade to 10.2(x) release:
 - Upgrade from 7.0(3)I7(1), 7.0(3)I7(2) or 7.0(3)I7(3) to 7.0(3)I7(5) and above code or 9.x code
 - Upgrade from 7.0(3)I7(5) or 9.x code to 10.2(x) code
- On performing a non-disruptive ISSU from Cisco NX-OS Release 7.0(3)I6(1) to any higher version, a traffic loss might occur based on the number of VLANs configured. To avoid traffic loss, it is recommended to increase the routing protocol's graceful restart timer to higher value. The recommended value of the graceful restart timer is 600 seconds. You can further increase or decrease this value based on the scale of the configuration.
- Beginning with Cisco NX-OS Release 10.1(1), **Fs_daemon** does not support **snmpwalk** on devices with more than 5000 files. When performing snmpwalk on a device with more than 5000 files, the error **resourceUnavailable (This is likely a out-of-memory failure within the agent)** is an expected behaviour.
- Beginning with Cisco NX-OS Release 10.1(2), CoPP is supported on N9K-X9624D-R2 and N9K-C9508-FM-R2 platform switches.
- Beginning with Cisco NX-OS Release 10.1(2), RACL is supported on N9K-X9624D-R2 and N9K-C9508-FM-R2 platform switches.
- While performing an ISSU from Cisco NX-OS Release 9.3(5), 9.3(6), 9.3(7), 10.1(1), or 10.1(2) to Cisco NX-OS Release 10.2(1) or higher release, ISSU will be blocked.
- ISSU is blocked when the delay config is present in track list Boolean/weight.
- If the IPv6 ND timeouts during ISSU, then the IPv6 BFD session may flap after the ISSU.
- Beginning with Cisco NX-OS Release 10.2(3)F, non-disruptive ISSU is supported for VPC fabric peering on all Cisco Nexus 9300-X TORs. Both standard and enhanced non-disruptive upgrades are supported. Note that ISSU should be started or triggered when there is no failure. An example for failure would be one of the VPC legs is down.
- The recommended routing protocol graceful restart timer is 600 seconds and nve source-interface hold-down-time is 400 seconds.
- It is recommended to set **disable-fka** on VFC interfaces in E or F mode, when invoking ND native ISSU on switch mode testbed. If not, it can be disruptive.
- If there is a VRF scale, for a non-disruptive ISSU under each VRF, you must configure graceful restart timer to 300 seconds.
- For platforms that need to be upgraded from any release to nxos64-cs.10.3(1)F or higher release, use nxos.9.3.10.bin or nxos64-cs.10.2(3)F or higher release as an interim hop. This restriction is applicable to both disruptive and non-disruptive upgrades. The nxos64-msll.10.3(1)F does not have this restriction.
- Loading an unsupported image on Cisco Nexus 9800 platform switches cause the switch to be stuck. Only a power cycle can reset it.

- Disruptive upgrade from any version before 9.3(10) or 10.2(3)F may fail due to [CSCwb63451](#). You must upgrade to 9.3(10) or 10.2(3)F first, before upgrading to 10.3(1)F or later.
- Beginning with Cisco NX-OS Release 10.3(2)F, 2xSFP Eth10/1-2 are not supported on N9K-C9400-SW-GX2A. However, from Cisco NX-OS Release 10.4(2)F onwards, N9K-C9400-SW-GX2A Sup card ports 2xSFP Eth10/1-2 are supported.
- While performing an ISSU on the L2 switch in a vPC complex or a LAN scenario, the IGMP group timeout must be configured with higher value as the L2 switch will not be able to forward the reports/queries during the control plane down time. The L2 snooping querier interval must also be matched to the L3 querier interval.
- When upgrading from earlier release to Cisco NX-OS Release 10.3(3)F and later, if the **hardware rate-limiter span-egress** command is configured then it must be removed and reapplied after the upgrade/ISSU is complete.
- ASIC SFP+ ports Eth10/1-2 are not supported in Cisco NX-OS Releases 10.3(2)F, 10.3(3)F, and 10.4(1)F. Beginning with Cisco NX-OS Release 10.4(2)F, these ports are supported. However, note that after reloading the system, these ASIC SFP+ Eth10/1-2 ports can take up to 3 minutes to link up.
- Beginning with Cisco NX-OS Release 10.3(3)F, only the LXC mode is supported on Cisco Nexus 9300-FX3 and 9300-GX switches, which allows you to perform enhanced non-disruptive ISSU with minimal downtime.
- Beginning with Cisco NX-OS Release 10.4(1)F, only the LXC mode is supported on Cisco Nexus 9300-FX and 9300-FX2 switches, in addition to Cisco Nexus 9300-FX3 and 9300-GX switches. This allows you to perform enhanced non-disruptive ISSU with minimal downtime. However, on the rest of the Cisco Nexus 9000 switches, you have an option to perform a non-disruptive ISSU in the enhanced LXC mode with minimal downtime.
- Beginning with Cisco NX-OS Release 10.4(1)F, only the enhanced LXC mode is supported on Cisco Nexus N9K-C9332D-H2R, N9K-C9348GC-FX3, and N9K-C9348GC-FX3PH switches by default. This allows you to perform a non-disruptive ISSU with minimal downtime.
- Beginning with Cisco NX-OS Release 10.4(2)F, SR ISSU is not supported with underlay ISIS.
- Beginning with Cisco NX-OS Release 10.4(2)F, nondisruptive ISSU is supported for segment routing traffic engineering (SR-TE) features with BGP as underlay on Cisco Nexus 9300 and 92348GC-X platform switches; and on 9300-HX platform switches from Cisco NX-OS Release 10.4(3)F. However, the following features are not supported on nondisruptive ISSU:
 - SR L2EVPN
 - ISIS and OSPF underlay
 - vPC configuration with segment-routing
 - Egress Peer engineering
 - Segment routing and GRE co existence
- Beginning with Cisco NX-OS Release 10.4(2)F, for Nexus 9300-R platforms, to upgrade bios to the latest version you should first upgrade to nxos image. This release onwards, the install all nxos command only upgrades the nxos sw to the latest version but the bios image will be upgraded to the last bios released prior to 10.4(2)F version.

To upgrade to bios released with 10.4(2)F or higher version, first upgrade the nxos image and then use bios-force option to upgrade the bios. For example,

1. Install all nxos bootflash:nxos64-msll.10.4.2.F.bin.

The system reloads and boots up with 10.4(2)F image.

2. Install all nxos bios-force.



Note The switch reloads twice, once for nxos upgrade and then again for bios upgrade.

- Beginning with Cisco NX-OS Release 10.4(3)F, non-disruptive ISSU is not supported on Cisco Nexus 92348GC-X.
- While performing ND ISSU, if a router is configured with BGP prefix peers, prefix-peer-timeout (default value - 30s) should be greater than GR timer (default value - 120s), to allow the prefix peers to resume the connection after ISSU.

ISSU Platform Support

The following tables identify the platforms supporting standard and enhanced ISSU, and the release when the support was introduced.



Note Enhanced ISSU cannot be supported if there is kernel update in the target release without reloading the container. The system will prompt the following message:

```
Host kernel is not compatible with target image. Full ISSU will be performed and control plane will be impacted.
```

In effect, system will perform non-disruptive ISSU instead of enhanced ISSU.

ISSU for Cisco Nexus 9200 Platform Switches

ISSU Type	Release/Supported Platforms	Features Not Supported with Non-disruptive ISSU
Standard	Beginning with Cisco NX-OS Release 7.0(3)I6(1): Cisco Nexus 92300YC Beginning with Cisco NX-OS Release 9.3(3): Cisco Nexus 92348GC-X	Both ISSU types are disruptive for Cisco Nexus 9200 platform switches configured with the following features: <ul style="list-style-type: none"> • Segment routing • Tetration
Enhanced	Cisco Nexus 92300YC	<p>Note Beginning with Cisco NX-OS Release 10.4(2)F, non-disruptive ISSU is supported for segment routing traffic engineering (SR-TE) features with BGP as underlay only on Cisco Nexus 92348GC-X platform switches. For more information about the features that are not supported, see Cisco NX-OS Software Upgrade Guidelines, on page 5.</p> <p>Note Beginning with Cisco NX-OS Release 10.4(3)F, non-disruptive ISSU is not supported on Cisco Nexus 92348GC-X. For more information about the features that are not supported, see Cisco NX-OS Software Upgrade Guidelines, on page 5.</p>

ISSU for Cisco Nexus 9300 Platform Switches

ISSU Type	Release/Supported Platforms	Features Not Supported with Non-disruptive ISSU
Standard	Beginning with Cisco NX-OS Release 9.3(3): Cisco Nexus 9332C Cisco Nexus 9364C Note ISSU on Cisco Nexus 9300 platform switches is supported when the switch is the spanning tree root. You can use the show spanning-tree issu-impact command to verify if the switch meets this criteria.	Both ISSU types are disruptive for Cisco Nexus 9300 platform switches configured with the following features: <ul style="list-style-type: none"> • Dual-homed FEX • Segment routing Note Beginning with Cisco NX-OS Release 10.4(2)F, non-disruptive ISSU is supported for segment routing traffic engineering (SR-TE) features with BGP as underlay only on Cisco Nexus 9300 platform switches. For more information about the features that are not supported, see Cisco NX-OS Software Upgrade Guidelines, on page 5 .
Enhanced	Beginning with Cisco NX-OS Release 9.3(5): Cisco Nexus 9332C Cisco Nexus 9364C Note ISSU on Cisco Nexus 9300 platform switches is supported when the switch is the spanning tree root. You can use the show spanning-tree issu-impact command to verify if the switch meets this criteria.	

ISSU for Cisco Nexus 9300-X Platform Switches

ISSU Type	Release/Supported Platforms	Features Not Supported with Non-disruptive ISSU
Standard	Beginning with Cisco NX-OS Release 10.2(3)F, VPC Fabric peering is supported on Cisco Nexus 9300-X TORs.	Beginning with Cisco NX-OS Release 10.2(3)F, the following VXLAN/ VPC features are not supported during non- disruptive ISSU for VPC Fabric Peering:
Enhanced	Beginning with Cisco NX-OS Release 10.2(3)F, VPC Fabric peering is supported on Cisco Nexus 9300-X TORs.	<ul style="list-style-type: none"> • TRM • VXLAN IPv6 underlay • Proportional Multipath for VNF • VXLAN Flood-and-learn • HSRP and VRRP • VXLAN Cloudsec • VXLAN to SR Handoff and all Handoff features • Multi-Site <p>Note Beginning with Cisco NX-OS Release 10.4(2)F, non-disruptive ISSU is supported for VXLAN to SR Handoff with BGP as underlay on Cisco Nexus 9300-X platform switches.</p>

ISSU for Cisco Nexus 9300-EX Platform Switches

ISSU Type	Release/Supported Platforms	Features Not Supported with Non-disruptive ISSU
Standard	Beginning with Cisco NX-OS Release 7.0(3)I6(1): Cisco Nexus 93108TC-EX Cisco Nexus 93180YC-EX	Both ISSU types are disruptive for Cisco Nexus 9300-EX platform switches configured with the following features: <ul style="list-style-type: none"> • Segment routing • Tetration <p>Note Beginning with Cisco NX-OS Release 10.2(1), both ISSU types are non-disruptive for Cisco Nexus 9300-EX platform switches configured with Straight-Through FEX and Dual-Homed FEX.</p>
Enhanced	Beginning with Cisco NX-OS Release 7.0(3)I7(3): Cisco Nexus 93108TC-EX Cisco Nexus 93180YC-EX	

ISSU for Cisco Nexus 9300-FX Platform Switches

ISSU Type	Release/Supported Platforms	Features Not Supported with Non-disruptive ISSU
Standard	Cisco NX-OS Release 9.3(1) and 9.3(2): None Beginning with Cisco NX-OS Release 9.3(3): Cisco Nexus 9336C-FX2 Cisco Nexus 93240YC-FX2 Cisco Nexus 93240YC-FX2Z Cisco Nexus 9348GC-FXP Cisco Nexus 93108TC-FX Cisco Nexus 93180YC-FX Beginning with Cisco NX-OS Release 10.2(1)F: Cisco Nexus 93180YC-FX3 Cisco Nexus 93180YC-FX3S	

ISSU Type	Release/Supported Platforms	Features Not Supported with Non-disruptive ISSU
		<p>Standard ISSU is disruptive for Cisco Nexus 9300-FX platform switches configured with the following features:</p> <ul style="list-style-type: none"> • Segment Routing • TRM Feature <p>Note Beginning with Cisco NX-OS Release 10.2(1), Standard ISSU is non-disruptive for Cisco Nexus 9300-FX platform switches configured with Straight-Through FEX and Dual-Homed FEX.</p> <p>Beginning with Cisco NX-OS Release 10.3(3)F, standard ISSU is not supported on Cisco Nexus 93180YC-FX3 and FX3S platform switches.</p> <p>Beginning with Cisco NX-OS Release 10.4(1)F, standard ISSU is not supported on Cisco Nexus 9300-FX and 9300-FX2 platform switches.</p> <p>Note Beginning with Cisco NX-OS Release 10.4(2)F, non-disruptive ISSU is supported for segment routing traffic engineering (SR-TE) features with BGP as underlay only on Cisco Nexus</p>

ISSU Type	Release/Supported Platforms	Features Not Supported with Non-disruptive ISSU
		9300 platform switches. For more information about the features that are not supported, see Cisco NX-OS Software Upgrade Guidelines , on page 5.

ISSU Type	Release/Supported Platforms	Features Not Supported with Non-disruptive ISSU
Enhanced	<p>Cisco NX-OS Release 9.3(1), 9.3(2), and 9.3(3): None</p> <p>Beginning with Cisco NX-OS Release 9.3(5):</p> <p>Cisco Nexus 9336C-FX2</p> <p>Cisco Nexus 93240YC-FX2</p> <p>Cisco Nexus 93216TC-FX2</p> <p>Cisco Nexus 93360YC-FX2</p> <p>Cisco Nexus 93240YC-FX2Z</p> <p>Cisco Nexus 9348GC-FXP</p> <p>Cisco Nexus 93108TC-FX</p> <p>Cisco Nexus 93180YC-FX</p> <p>Beginning with Cisco NX-OS Release 10.1(1), Enhanced ISSU is supported on the following platforms with FC/FCoE features:</p> <p>Cisco Nexus 93360YC-FX2</p> <p>Cisco Nexus 93180YC-FX</p> <p>Beginning with Cisco NX-OS Release 10.2(1)F, Enhanced ISSU is supported on the following platforms:</p> <p>Cisco Nexus 93180YC-FX3</p> <p>Cisco Nexus 93180YC-FX3S</p> <p>Beginning with Cisco NX-OS Release 10.2(2)F, Enhanced ISSU is supported on the following platform with FC/FCoE features:</p> <p>N9K-C9336C-FX2-E</p>	

ISSU Type	Release/Supported Platforms	Features Not Supported with Non-disruptive ISSU
		<p>Enhanced ISSU is disruptive for Cisco Nexus 9300-FX platform switches configured with the following features:</p> <ul style="list-style-type: none"> • Segment Routing • TRM Feature <p>Note In Cisco NX-OS Releases 9.3(x), Enhanced ISSU on Cisco Nexus 93360YC-FX2 and Cisco Nexus 93180YC-FX with FC/FCoE features will be disruptive.</p> <p>Note Beginning with Cisco NX-OS Release 10.2(1), Enhanced ISSU is non-disruptive for Cisco Nexus 9300-FX platform switches configured with Straight-Through FEX and Dual-Homed FEX.</p> <p>Beginning with Cisco NX-OS Release 10.3(3)F, only the LXC mode is supported on Cisco Nexus 9300-FX3 and 9300-FX3S switches, which allows you to perform enhanced non-disruptive ISSU with minimal downtime.</p> <p>Beginning with Cisco NX-OS Release 10.4(1)F, only the LXC mode is supported on Cisco</p>

ISSU Type	Release/Supported Platforms	Features Not Supported with Non-disruptive ISSU
		<p>Nexus 9300-FX and 9300-FX2 switches, which allows you to perform enhanced non-disruptive ISSU with minimal downtime.</p> <p>Note Beginning with Cisco NX-OS Release 10.4(2)F, non-disruptive ISSU is supported for segment routing traffic engineering (SR-TE) features with BGP as underlay only on Cisco Nexus 9300 platform switches. For more information about the features that are not supported, see Cisco NX-OS Software Upgrade Guidelines, on page 5.</p>

ISSU for Cisco Nexus 9300-GX Platform Switches

ISSU Type	Release/Supported Platforms	Features Not Supported with Non-disruptive ISSU
Standard	Beginning with Cisco NX-OS Release 10.1(1): Cisco Nexus 9364C-GX Cisco Nexus 9316D-GX Cisco Nexus 93600CD-GX Note Beginning with Cisco NX-OS Release 10.3(3)F, standard ISSU is not supported on Cisco Nexus 9300-GX platform switches.	<ul style="list-style-type: none"> • TRM Feature • Segment Routing <p>Note Beginning with Cisco NX-OS Release 10.3(3)F, standard ISSU is not supported on Cisco Nexus 9300-GX platform switches.</p> <p>Note Beginning with Cisco NX-OS Release 10.4(2)F, non-disruptive ISSU is supported for segment routing traffic engineering (SR-TE) features with BGP as underlay only on Cisco Nexus 9300 platform switches. For more information about the features that are not supported, see Cisco NX-OS Software Upgrade Guidelines, on page 5.</p>

ISSU Type	Release/Supported Platforms	Features Not Supported with Non-disruptive ISSU
Enhanced	<p>Beginning with Cisco NX-OS Release 10.1(1):</p> <p>Cisco Nexus 9364C-GX</p> <p>Cisco Nexus 9316D-GX</p> <p>Cisco Nexus 93600CD-GX</p> <p>Beginning with Cisco NX-OS Release 10.2(2)F, Enhanced ISSU is supported on Cisco Nexus 9300-GX2B platform switches.</p> <p>Beginning with Cisco NX-OS Release 10.2(3)F, Enhanced ISSU is supported on Cisco Nexus 9300-GX2A platform switches.</p> <p>Beginning with Cisco NX-OS Release 10.3(3)F, only the LXC mode is supported on Cisco Nexus 9300-GX switches, which allows you to perform enhanced non-disruptive ISSU with minimal downtime.</p>	<ul style="list-style-type: none"> • TRM Feature • Segment Routing <p>Note Beginning with Cisco NX-OS Release 10.4(2)F, non-disruptive ISSU is supported for segment routing traffic engineering (SR-TE) features with BGP as underlay only on Cisco Nexus 9300 platform switches. For more information about the features that are not supported, see Cisco NX-OS Software Upgrade Guidelines, on page 5.</p>

ISSU for Cisco Nexus 9400 Platform Switches

ISSU Type	Release/Supported Platforms	Features Not Supported with Non-disruptive ISSU
Enhanced	<p>Beginning with Cisco NX-OS Release 10.4(1)F, Enhanced ISSU is supported on Cisco Nexus C9408 platform switch.</p>	<ul style="list-style-type: none"> • TRM Feature • Segment Routing

Cisco NX-OS Software Downgrade Guidelines

Before attempting to downgrade to an earlier software release, follow these guidelines:

- The only supported method of downgrading a Cisco Nexus 9000 Series switch is to utilize the install all command. Changing the boot variables, saving the configuration, and reloading the switch is not a supported method to downgrade the switch.

Disable the Guest Shell if you need to downgrade from Cisco NX-OS Release 9.3(x) to an earlier release.

- Performing an ISSU downgrade from Cisco NX-OS Release 9.3(x) to Release 7.0(3)I4(1) with an FCoE (Fiber Channel over Ethernet) NPV (N-port Virtualization) configuration causes the port channel to crash with a core file:

```
[##### ] 38%2016 Apr 18 20:52:35 n93-ns1 %$ VDC-1 %$ %SYSMGR-2-
SERVICE_CRASHED: Service "port-channel" (PID 14976) hasn't caught signal 11 (core
```

```
will
be saved)
```

- ISSU (non-disruptive) downgrade is not supported

- When downgrading from the Cisco NX-OS Release 9.3(x) to earlier releases, any ACL with the statistics per-entry command enabled and applied as RACL needs the statistics per-entry command removed from the running configuration before downgrading. Otherwise, the interfaces on which this ACL is applied as a RACL will be error disabled after the downgrade.
- Prior to downgrading a Cisco Nexus 9500-series switch, with -FX or -FX+EX line cards, from Cisco NX-OS Release 10.1(x) to earlier releases (9.2(x) or 7.x), the TCAM region that applies to NetFlow (ing-netflow) should be carved to zero (0) using the following command:

hardware access-list tcam region ing-netflow 0

The configuration change is required because the default ing-netflow TCAM region in 9.3(1) and onwards is 512 while the default in 9.2(x) and earlier is 0.

- When downgrading from the Cisco NX-OS Release 10.1(x) to a release prior to 9.3(x), make sure that the ACL TCAM usage for ingress features does not exceed the allocated TCAM space in the absence of the label sharing feature. Label sharing is a new feature in Cisco NX-OS Release 9.3(x). Otherwise, interfaces with RACLs that could not fit in the TCAM will be disabled after the downgrade.
- Software downgrades should be performed using the **install all** command. Changing the boot variables, saving the configuration, and reloading the switch is not a supported method to downgrade the switch.
- The following limitation applies to Cisco Nexus platform switches that support Trust Anchor Module (TAM):

The TACACS global key cannot be restored when downgrading from Cisco NX-OS Release 9.3(3) and higher to any earlier version. TAM was updated to version-7 in 9.3(3), but earlier NX-OS versions used TAM version-3.
- iCAM must be disabled before downgrading from Release 9.2(x) or Release 9.3(x) → 7.0(3)I7(1). Only Release 9.3(1) → Release 9.2(4) can be performed if iCAM is enabled.
- Beginning with Cisco NX-OS Release 9.3(3), new configuration commands exist for SRAPP (with sub-mode options for MPLS and SRTE). The SRAPP configuration on the switch running release 9.3(3) (or later) will not be present if the switch is downgraded to an earlier release.
- On devices with dual supervisor modules, both supervisor modules must have connections on the console ports to maintain connectivity when switchovers occur during a software downgrade. See the [Hardware Installation Guide](#) for your specific chassis.
- Cisco NX-OS automatically installs and enables the guest shell by default. However, if the device is reloaded with a Cisco NX-OS image that does not provide guest shell support, the existing guest shell is automatically removed and a %VMAN-2-INVALID_PACKAGE message is issued. As a best practice, remove the guest shell with the **guestshell destroy** command before downgrading to an earlier Cisco NX-OS image.
- You must delete the switch profile (if configured) when downgrading from a Cisco NX-OS release that supports switch profiles to a release that does not. For more information, see the *Cisco Nexus 9000 Series NX-OS System Management Configuration Guide, Release 10.1(x)*.
- Software downgrades are disruptive. In-service software downgrades (ISSDs), also known as nondisruptive downgrades, are not supported.

- While downgrading from the Cisco NX-OS Release 10.2(1)F or higher to an earlier release, the **install all** command is blocked when the delay config is present in track list Boolean/weight.
- While performing ISSD from Cisco NX-OS Release 10.2(3)F to Cisco NX-OS Release 10.2(2)F with **epbr L2** applied on interfaces, remove the policies from interfaces before performing ISSD to avoid the duplicate tracks issue.
- Beginning with Cisco NX-OS Release 10.2(3)F, if you have configured the **lldp chassis-id switch** command, then you must disable the command before performing ISSD.
- Beginning with 10.2(3)F, although application of ePBR policy to access ports is supported, downgrading with this configuration is not recommended.
- When feature ngmvpn is enabled and a disruptive downgrade is performed from Cisco NX-OS Release 10.3(2)F to Cisco NX-OS Release 10.3(1)F, although a few VRFs are missing from the show run output, this is only a display issue, and has no functional impact.
- When a switch is downgraded from Cisco NX-OS Release 10.3(3)F or 10.4(1)F to a version that supports both Native and LXC modes, the switch always goes to Native mode even if the upgrade was done from LXC mode. To keep the mode persistent after a downgrade, ensure that you perform the downgrade in the following sequence:

**Note**

- The following sections are applicable only to Cisco Nexus 9300-FX3 and 9300-GX platform switches.
- When system comes up in native mode on downgrade, boot mode lxc is removed from configuration.

- LXC mode upgrade/downgrade: For example,
 1. The switch is running on Cisco NX-OS Release 10.3(2)F in LXC mode.
 2. Upgrade the version to Cisco NX-OS Release 10.3(3)F (LXC mode).
 3. Downgrade the version to Cisco NX-OS Release 10.3(2)F to the Native mode.
 4. Execute the boot mode lxc configuration command, save the configuration, and reload the switch.
 5. The switch comes up in Cisco NX-OS Release 10.3(2)F LXC mode.
- Native mode upgrade/downgrade:

Example 1

1. The switch (9300-FX3 or 9300-GX) is running on Cisco NX-OS Release 10.3(2)F in the Native mode.
2. Upgrade the version to Cisco NX-OS Release 10.3(3)F (LXC mode), as these (9300-FX3 or 9300-GX) switches support only LXC mode.
3. Downgrade to any earlier Cisco NX-OS Release [for example, 10.3(2)].
4. The switch comes up in Cisco NX-OS Release 10.3(2)F in Native mode.

Example 2

1. The switch (Cisco Nexus 9300-FX or 9300-FX2) is running on Cisco NX-OS Release 10.3(2)F in the Native mode.
 2. Upgrade the version to Cisco NX-OS Release 10.4(1)F (LXC mode), as these switches support only LXC mode.
 3. Downgrade to any earlier Cisco NX-OS Release [for example, 10.3(2)].
 4. The switch comes up in Cisco NX-OS Release 10.3(2)F in Native mode.
- When you downgrade from Cisco NX-OS Release 10.4(2)F to any earlier releases until 10.3(2)F (included), N9K-C9400-SW-GX2A Sup card ports 2xSFP Eth10/1-2 are not supported.

Upgrade Paths

For ISSU compatibility for all release and information about the upgrade paths, see the [Cisco NX-OS ISSU Support Matrix](#).

Upgrade Patch Instructions

On Cisco Nexus 9500 series switches only, a software upgrade from Cisco NX-OS Release 7.0(3)I1(2), 7.0(3)I1(3), or 7.0(3)I1(3a) to any other Cisco NX-OS release requires installing two patches prior to upgrading using the **install all** command. These patches are available for each respective release and can be downloaded using the links below.



Caution Failing to follow this procedure could require console access in order to recover the switch after the upgrade.



Note These patches are only for upgrading. After the upgrade, the patch is automatically removed. If you decide not to upgrade after installing the patches, do not deactivate it. Deactivating the patch may cause a bios_daemon crash.

[Cisco NX-OS Release 7.0\(3\)I1\(2\) Upgrade Patch](#)

[Cisco NX-OS Release 7.0\(3\)I1\(3\) Upgrade Patch](#)

[Cisco NX-OS Release 7.0\(3\)I1\(3a\) Upgrade Patch](#)

To install these patches prior to upgrading using the install all command, follow the instructions shown below. An example is demonstrated below with an NX-OS software patch and upgrade from 7.0(3)I1(2) to 7.0(3)I7(1):

1. Add both patches with the **install add bootflash: {patch-file.bin}** command.

```
switch(config)# install add bootflash:n9000-dk9.7.0.3.I1.2.CSCuy16604.bin
Install operation 16 completed successfully at Thu Mar  3 04:24:13 2016
switch(config)# install add bootflash:n9000-dk9.7.0.3.I1.2.CSCuy16606.bin
Install operation 17 completed successfully at Thu Mar  3 04:24:43 2016
```

2. Activate both patches with the **install activate** *{patch-file.bin}* command.

```
switch(config)# install activate n9000-dk9.7.0.3.I1.2.CSCuy16604.bin
Install operation 18 completed successfully at Thu Mar  3 04:28:38 2016
switch (config)# install activate n9000-dk9.7.0.3.I1.2.CSCuy16606.bin
Install operation 19 completed successfully at Thu Mar  3 04:29:08 2016
```

3. Commit both patches with the **install commit** *{patch-file.bin}* command.

```
switch(config)# install commit n9000-dk9.7.0.3.I1.2.CSCuy16604.bin
Install operation 20 completed successfully at Thu Mar  3 04:30:38 2016
switch (config)# install commit n9000-dk9.7.0.3.I1.2.CSCuy16606.bin
Install operation 21 completed successfully at Thu Mar  3 04:31:16 2016
```

4. Proceed with an NX-OS software upgrade to the desired target release with the **install all** command.

```
switch (config)# install all nxos bootflash:nxos.7.0.3.I7.1.bin
Installer will perform compatibility check first. Please wait.
uri is: /nxos.7.0.3.I7.1.bin
Installer is forced disruptive

Verifying image bootflash:/nxos.7.0.3.I7.1.bin for boot variable "nxos".
[#####] 100% -- SUCCESS

Verifying image type.
[#####] 100% -- SUCCESS

Preparing "lcn9k" version info using image bootflash:/nxos.7.0.3.I7.1.bin.
[#####] 100% -- SUCCESS

Preparing "bios" version info using image bootflash:/nxos.7.0.3.I7.1.bin.
[#####] 100% -- SUCCESS

Preparing "lcn9k" version info using image bootflash:/nxos.7.0.3.I7.1.bin.
[#####] 100% -- SUCCESS

Preparing "lcn9k" version info using image bootflash:/nxos.7.0.3.I7.1.bin.
[#####] 100% -- SUCCESS

Preparing "lcn9k" version info using image bootflash:/nxos.7.0.3.I7.1.bin.
[#####] 100% -- SUCCESS

Preparing "lcn9k" version info using image bootflash:/nxos.7.0.3.I7.1.bin.
[#####] 100% -- SUCCESS

Preparing "lcn9k" version info using image bootflash:/nxos.7.0.3.I7.1.bin.
[#####] 100% -- SUCCESS

Preparing "lcn9k" version info using image bootflash:/nxos.7.0.3.I7.1.bin.
[#####] 100% -- SUCCESS

Preparing "lcn9k" version info using image bootflash:/nxos.7.0.3.I7.1.bin.
[#####] 100% -- SUCCESS

Preparing "lcn9k" version info using image bootflash:/nxos.7.0.3.I7.1.bin.
[#####] 100% -- SUCCESS

Preparing "lcn9k" version info using image bootflash:/nxos.7.0.3.I7.1.bin.
[#####] 100% -- SUCCESS

Preparing "lcn9k" version info using image bootflash:/nxos.7.0.3.I7.1.bin.
[#####] 100% -- SUCCESS

Preparing "lcn9k" version info using image bootflash:/nxos.7.0.3.I7.1.bin.
[#####] 100% -- SUCCESS
```

```

Preparing "lcn9k" version info using image bootflash:/nxos.7.0.3.I7.1.bin.
[#####] 100% -- SUCCESS

Preparing "lcn9k" version info using image bootflash:/nxos.7.0.3.I7.1.bin.
[#####] 100% -- SUCCESS

Preparing "lcn9k" version info using image bootflash:/nxos.7.0.3.I7.1.bin.
[#####] 100% -- SUCCESS

Preparing "nxos" version info using image bootflash:/nxos.7.0.3.I7.1.bin.
[#####] 100% -- SUCCESS

Preparing "lcn9k" version info using image bootflash:/nxos.7.0.3.I7.1.bin.
[#####] 100% -- SUCCESS

Preparing "lcn9k" version info using image bootflash:/nxos.7.0.3.I7.1.bin.
[#####] 100% -- SUCCESS

Performing module support checks.
[#####] 100% -- SUCCESS

Notifying services about system upgrade.
[#####] 100% -- SUCCESS
    
```

Compatibility check is done:

Module	bootable	Impact	Install-type	Reason
1	yes	disruptive	reset	Incompatible image
6	yes	disruptive	reset	Incompatible image
8	yes	disruptive	reset	Incompatible image
9	yes	disruptive	reset	Incompatible image
10	yes	disruptive	reset	Incompatible image
11	yes	disruptive	reset	Incompatible image
14	yes	disruptive	reset	Incompatible image
15	yes	disruptive	reset	Incompatible image
16	yes	disruptive	reset	Incompatible image
21	yes	disruptive	reset	Incompatible image
22	yes	disruptive	reset	Incompatible image
23	yes	disruptive	reset	Incompatible image
24	yes	disruptive	reset	Incompatible image
25	yes	disruptive	reset	Incompatible image
26	yes	disruptive	reset	Incompatible image
27	yes	disruptive	reset	Incompatible image
28	yes	disruptive	reset	Incompatible image
29	yes	disruptive	reset	Incompatible image
30	yes	disruptive	reset	Incompatible image

Images will be upgraded according to following table:

Module	Image	Running-Version (pri:alt)	New-Version	Upg-Required
1	lcn9k	7.0(3)I1(2)	7.0(3)I7(1)	yes
1	bios	v01.42(00:v01.42(00	v01.48(00	yes
6	lcn9k	7.0(3)I1(2)	7.0(3)I7(1)	yes
6	bios	v01.48(00:v01.48(00	v01.48(00	no
8	lcn9k	7.0(3)I1(2)	7.0(3)I7(1)	yes
8	bios	v01.48(00:v01.29(00	v01.48(00	no
9	lcn9k	7.0(3)I1(2)	7.0(3)I7(1)	yes
9	bios	v01.48(00:v01.35(00	v01.48(00	no
10	lcn9k	7.0(3)I1(2)	7.0(3)I7(1)	yes
10	bios	v01.48(00:v01.42(00	v01.48(00	no
11	lcn9k	7.0(3)I1(2)	7.0(3)I7(1)	yes
11	bios	v01.48(00:v01.52(00	v01.48(00	no
14	lcn9k	7.0(3)I1(2)	7.0(3)I7(1)	yes

14	bios	v01.48(00:v01.48(00	v01.48(00	no
15	lcn9k	7.0(3)I1(2)	7.0(3)I7(1)	yes
15	bios	v01.48(00:v01.40(00	v01.48(00	no
16	lcn9k	7.0(3)I1(2)	7.0(3)I7(1)	yes
16	bios	v01.48(00:v01.42(00	v01.48(00	no
21	lcn9k	7.0(3)I1(2)	7.0(3)I7(1)	yes
21	bios	v01.48(00:v01.42(00	v01.48(00	no
22	lcn9k	7.0(3)I1(2)	7.0(3)I7(1)	yes
22	bios	v01.48(00:v01.40(00	v01.48(00	no
23	lcn9k	7.0(3)I1(2)	7.0(3)I7(1)	yes
23	bios	v01.48(00:v01.40(00	v01.48(00	no
24	lcn9k	7.0(3)I1(2)	7.0(3)I7(1)	yes
24	bios	v01.48(00:v01.40(00	v01.48(00	no
25	lcn9k	7.0(3)I1(2)	7.0(3)I7(1)	yes
25	bios	v01.48(00:v01.40(00	v01.48(00	no
26	lcn9k	7.0(3)I1(2)	7.0(3)I7(1)	yes
26	bios	v01.48(00:v01.40(00	v01.48(00	no
27	nxos	7.0(3)I1(2)	7.0(3)I7(1)	yes
27	bios	v08.06(09/10/2014):v08.18(08/11/2015)	v08.26(01/12/2016)	yes
28	nxos	7.0(3)I1(2)	7.0(3)I7(1)	yes
28	bios	v08.06(09/10/2014):v08.26(01/12/2016)	v08.26(01/12/2016)	yes
29	lcn9k	7.0(3)I1(2)	7.0(3)I7(1)	yes
29	bios	v01.48(00:v01.35(00	v01.48(00	no
30	lcn9k	7.0(3)I1(2)	7.0(3)I7(1)	yes
30	bios	v01.48(00:v01.35(00	v01.48(00	no

Switch will be reloaded for disruptive upgrade.

Do you want to continue with the installation (y/n)? [n] y

Install is in progress, please wait.

Performing runtime checks.

[#####] 100% -- SUCCESS

Syncing image bootflash:/nxos.7.0.3.I7.1.bin to standby.

[#####] 100% -- SUCCESS

Setting boot variables.

[#####] 100% -- SUCCESS

Performing configuration copy.

[#####] 100% -- SUCCESS

Module 1: Refreshing compact flash and upgrading bios/loader/bootrom.

Warning: please do not remove or power off the module at this time.

[#####] 100% -- SUCCESS

Module 6: Refreshing compact flash and upgrading bios/loader/bootrom.

Warning: please do not remove or power off the module at this time.

[#####] 100% -- SUCCESS

Module 8: Refreshing compact flash and upgrading bios/loader/bootrom.

Warning: please do not remove or power off the module at this time.

[#####] 100% -- SUCCESS

Module 9: Refreshing compact flash and upgrading bios/loader/bootrom.

Warning: please do not remove or power off the module at this time.

[#####] 100% -- SUCCESS

Module 10: Refreshing compact flash and upgrading bios/loader/bootrom.

Warning: please do not remove or power off the module at this time.

[#####] 100% -- SUCCESS

Module 11: Refreshing compact flash and upgrading bios/loader/bootrom.

```

Warning: please do not remove or power off the module at this time.
[#####] 100% -- SUCCESS

Module 14: Refreshing compact flash and upgrading bios/loader/bootrom.
Warning: please do not remove or power off the module at this time.
[#####] 100% -- SUCCESS

Module 15: Refreshing compact flash and upgrading bios/loader/bootrom.
Warning: please do not remove or power off the module at this time.
[#####] 100% -- SUCCESS

Module 16: Refreshing compact flash and upgrading bios/loader/bootrom.
Warning: please do not remove or power off the module at this time.
[#####] 100% -- SUCCESS

Module 21: Refreshing compact flash and upgrading bios/loader/bootrom.
Warning: please do not remove or power off the module at this time.
[#####] 100% -- SUCCESS

Module 22: Refreshing compact flash and upgrading bios/loader/bootrom.
Warning: please do not remove or power off the module at this time.
[#####] 100% -- SUCCESS

Module 23: Refreshing compact flash and upgrading bios/loader/bootrom.
Warning: please do not remove or power off the module at this time.
[#####] 100% -- SUCCESS

Module 24: Refreshing compact flash and upgrading bios/loader/bootrom.
Warning: please do not remove or power off the module at this time.
[#####] 100% -- SUCCESS

Module 25: Refreshing compact flash and upgrading bios/loader/bootrom.
Warning: please do not remove or power off the module at this time.
[#####] 100% -- SUCCESS

Module 26: Refreshing compact flash and upgrading bios/loader/bootrom.
Warning: please do not remove or power off the module at this time.
[#####] 100% -- SUCCESS

Module 27: Refreshing compact flash and upgrading bios/loader/bootrom.
Warning: please do not remove or power off the module at this time.
[#####] 100% -- SUCCESS

Module 28: Refreshing compact flash and upgrading bios/loader/bootrom.
Warning: please do not remove or power off the module at this time.
[#####] 100% -- SUCCESS

Module 29: Refreshing compact flash and upgrading bios/loader/bootrom.
Warning: please do not remove or power off the module at this time.
[#####] 100% -- SUCCESS

Module 30: Refreshing compact flash and upgrading bios/loader/bootrom.
Warning: please do not remove or power off the module at this time.
[#####] 100% -- SUCCESS
Finishing the upgrade, switch will reboot in 10 seconds.
switch(config)#
User Access Verification

switch login:
[ 2644.917727] [1456980048] writing reset reason 88,

CISCO SWITCH Ver 8.26

CISCO SWITCH Ver 8.26

```

```
Memory Size (Bytes): 0x0000000080000000 + 0x00000000380000000
  Relocated to memory
Time: 6/3/2016 4:41:8
Detected CISCO IOFPGA
Booting from Primary Bios
Code Signing Results: 0x0
Using Upgrade FPGA
FPGA Revision      : 0x27
FPGA ID            : 0x1168153
FPGA Date          : 0x20160111
Reset Cause Register: 0x22
Boot Ctrl Register : 0x60ff
EventLog Register1 : 0x2000000
EventLog Register2 : 0xfbe77fff
Version 2.16.1240. Copyright (C) 2013 American Megatrends, Inc.
Board type 1
IOFPGA @ 0xe8000000
SLOT_ID @ 0x1b
Standalone chassis
check_bootmode: grub: Continue grub
Trying to read config file /boot/grub/menu.lst.local from (hd0,4)
  Filesystem type is ext2fs, partition type 0x83

Booting bootflash:/nxos.7.0.3.I7.1.bin ...
Booting bootflash:/nxos.7.0.3.I7.1.bin
Trying diskboot
  Filesystem type is ext2fs, partition type 0x83
IOFPGA ID: 1168153
Image valid

Image Signature verification was Successful.

Boot Time: 3/3/2016 4:41:44
INIT: version 2.88 booting
Unsquashing rootfs ...

Loading IGB driver ...
Installing SSE module ... done
Creating the sse device node ... done
Loading I2C driver ...
Installing CTRL driver for card_type 3 ...
CTRL driver for card_index 21000 ...
old data: 4000004 new data: 1
Not Micron SSD...

Checking all filesystems.....
Installing default sprop values ...
  done.Configuring network ...
Installing LC netdev ...
Installing psdev ...
Installing veobc ...
Installing OBFL driver ...
mounting plog for N9k!
tune2fs 1.42.1 (17-Feb-2012)
Setting reserved blocks percentage to 0% (0 blocks)
Starting portmap daemon...
creating NFS state directory: done
starting 8 nfsd kernel threads: done
starting mountd: done
starting statd: done
Saving image for img-sync ...
Loading system software
Installing local RPMS
```

```

Patch Repository Setup completed successfully
dealing with default shell..
file /proc/cmdline found, look for shell
unset shelltype, nothing to do..
user add file found..edit it
Uncompressing system image: Thu Jun 3 04:42:11 UTC 2016
blogger: nothing to do.

..done Thu Mar 3 04:42:11 UTC 2016
Creating /dev/mcelog
Starting mcelog daemon
Overwriting dme stub lib
Replaced dme stub lib
INIT: Entering runlevel: 3
Running S93thirdparty-script...

2016 Mar 3 04:42:37 switch%$ VDC-1 %$ %USER-2-SYSTEM_MSG: <<%USBHSD-2-MOUNT>> logflash:
online - usbhsd
2016 Mar 3 04:42:37 switch%$ VDC-1 %$ Mar 3 04:42:37 %KERN-2-SYSTEM_MSG: [ 12.509615]
hwport mode=6 - kernel
2016 Mar 3 04:42:40 switch%$ VDC-1 %$ %VMAN-2-INSTALL_STATE: Installing virtual service
'guestshell+'
2016 Mar 3 04:42:40 switch%$ VDC-1 %$ %DAEMON-2-SYSTEM_MSG:
<<%ASCII-CFG-2-CONF_CONTROL>> Binary restore - ascii-cfg[13904]
2016 Mar 3 04:42:40 switch%$ VDC-1 %$ %DAEMON-2-SYSTEM_MSG:
<<%ASCII-CFG-2-CONF_CONTROL>> Restore DME database - ascii-cfg[13904]
2016 Mar 3 04:42:42 switch%$ VDC-1 %$ netstack: Registration with cli server complete
2016 Mar 3 04:43:00 switch%$ VDC-1 %$ %USER-2-SYSTEM_MSG: ssnmgr_app_init called on
ssnmgr up - aclmgr
2016 Mar 3 04:43:09 switch%$ VDC-1 %$ %USER-0-SYSTEM_MSG: end of default policer - copp
2016 Mar 3 04:43:10 switch%$ VDC-1 %$ %VMAN-2-INSTALL_STATE: Install success virtual
service 'guestshell+'; Activating
2016 Mar 3 04:43:10 switch%$ VDC-1 %$ %VMAN-2-ACTIVATION_STATE: Activating virtual
service 'guestshell+'
2016 Mar 3 04:43:13 switch%$ VDC-1 %$ %CARDCLIENT-2-FPGA_BOOT_PRIMARY: IOFPGA booted
from Primary
2016 Mar 3 04:43:18 switch%$ VDC-1 %$ %USER-2-SYSTEM_MSG: IPV6 Netlink thread init
successful - icmpv6
2016 Mar 3 04:43:19 switch%$ VDC-1 %$ %VDC_MGR-2-VDC_ONLINE: vdc 1 has come online

User Access Verification
switchlogin:
2016 Mar 3 04:43:52 switch%$ VDC-1 %$ %PLATFORM-2-MOD_PRESENT: Detected the presence
of Module 1
2016 Mar 3 04:43:52 switch%$ VDC-1 %$ %PLATFORM-2-MOD_PRESENT: Detected the presence
of Module 6
2016 Mar 3 04:43:52 switch%$ VDC-1 %$ %PLATFORM-2-MOD_PRESENT: Detected the presence
of Module 8
2016 Mar 3 04:43:52 switch%$ VDC-1 %$ %PLATFORM-2-MOD_PRESENT: Detected the presence
of Module 9
2016 Mar 3 04:43:52 switch%$ VDC-1 %$ %PLATFORM-2-MOD_PRESENT: Detected the presence
of Module 10
2016 Mar 3 04:43:52 switch%$ VDC-1 %$ %PLATFORM-2-MOD_PRESENT: Detected the presence
of Module 11
2016 Mar 3 04:43:52 switch%$ VDC-1 %$ %PLATFORM-2-MOD_PRESENT: Detected the presence
of Module 14
2016 Mar 3 04:43:52 switch%$ VDC-1 %$ %PLATFORM-2-MOD_PRESENT: Detected the presence
of Module 15
2016 Mar 3 04:43:52 switch%$ VDC-1 %$ %PLATFORM-2-MOD_PRESENT: Detected the presence
of Module 16
2016 Mar 3 04:43:52 switch%$ VDC-1 %$ %PLATFORM-2-MOD_PRESENT: Detected the presence
of Module 21
2016 Mar 3 04:43:52 switch%$ VDC-1 %$ %PLATFORM-2-MOD_PRESENT: Detected the presence

```

```

of Module 22
2016 Mar  3 04:43:52 switch%$ VDC-1  $$ %PLATFORM-2-MOD_PRESENT: Detected the presence
of Module 23
2016 Mar  3 04:43:52 switch%$ VDC-1  $$ %PLATFORM-2-MOD_PRESENT: Detected the presence
of Module 24
2016 Mar  3 04:43:52 switch%$ VDC-1  $$ %PLATFORM-2-MOD_PRESENT: Detected the presence
of Module 25
2016 Mar  3 04:43:52 switch%$ VDC-1  $$ %PLATFORM-2-MOD_PRESENT: Detected the presence
of Module 26
2016 Mar  3 04:43:52 switch%$ VDC-1  $$ %PLATFORM-2-MOD_PRESENT: Detected the presence
of Module 28
2016 Mar  3 04:43:52 switch%$ VDC-1  $$ %PLATFORM-2-MOD_PRESENT: Detected the presence
of Module 29
2016 Mar  3 04:43:52 switch%$ VDC-1  $$ %PLATFORM-2-MOD_PRESENT: Detected the presence
of Module 30
2016 Mar  3 04:43:52 switch%$ VDC-1  $$ %PLATFORM-2-PS_OK: Power supply 1 ok (Serial
number XYZ284014RR)
2016 Mar  3 04:43:52 switch%$ VDC-1  $$ %PLATFORM-2-PS_FANOK: Fan in Power supply 1 ok
2016 Mar  3 04:43:52 switch%$ VDC-1  $$ %PLATFORM-2-PS_OK: Power supply 2 ok (Serial
number XYZ285111TC)
2016 Mar  3 04:43:52 switch%$ VDC-1  $$ %PLATFORM-2-PS_FANOK: Fan in Power supply 2 ok
2016 Mar  3 04:43:52 switch%$ VDC-1  $$ %PLATFORM-2-PS_OK: Power supply 3 ok (Serial
number XYZ285111QQ)
2016 Mar  3 04:43:52 switch%$ VDC-1  $$ %PLATFORM-2-PS_FANOK: Fan in Power supply 3 ok
2016 Mar  3 04:43:52 switch%$ VDC-1  $$ %PLATFORM-2-PS_OK: Power supply 4 ok (Serial
number XYZ284014TI)
2016 Mar  3 04:43:52 switch%$ VDC-1  $$ %PLATFORM-2-PS_FANOK: Fan in Power supply 4 ok
2016 Mar  3 04:43:52 switch%$ VDC-1  $$ %PLATFORM-2-PS_OK: Power supply 5 ok (Serial
number XYZ284014TS)
2016 Mar  3 04:43:52 switch%$ VDC-1  $$ %PLATFORM-2-PS_FANOK: Fan in Power supply 5 ok
2016 Mar  3 04:43:52 switch%$ VDC-1  $$ %PLATFORM-2-FANMOD_FAN_OK: Fan module 1
(Fan1(sys_fan1) fan) ok
2016 Mar  3 04:43:52 switch%$ VDC-1  $$ %PLATFORM-2-FANMOD_FAN_OK: Fan module 2
(Fan2(sys_fan2) fan) ok
2016 Mar  3 04:43:52 switch%$ VDC-1  $$ %PLATFORM-2-FANMOD_FAN_OK: Fan module 3
(Fan3(sys_fan3) fan) ok
2016 Mar  3 04:43:52 switch%$ VDC-1  $$ %PLATFORM-2-MOD_DETECT: Module 30 detected (Serial
number ABC1234DE56) Module-Type System Controller Model N9K-SC-A
2016 Mar  3 04:43:52 switch%$ VDC-1  $$ %PLATFORM-2-MOD_PWRUP: Module 30 powered up (Serial
number ABC1234DE56)
2016 Mar  3 04:43:52 switch%$ VDC-1  $$ %PLATFORM-2-MOD_DETECT: Module 28 detected (Serial
number :unavailable) Module-Type Supervisor Module Model :unavailable
2016 Mar  3 04:43:58 switch%$ VDC-1  $$ %PLATFORM-2-MOD_DETECT: Module 29 detected (Serial
number ABC1234DEFG) Module-Type System Controller Model N9K-SC-A
2016 Mar  3 04:43:58 switch%$ VDC-1  $$ %PLATFORM-2-MOD_PWRUP: Module 29 powered up (Serial
number ABC1234DEFG)
2016 Mar  3 04:44:01 switch%$ VDC-1  $$ %PLATFORM-2-MOD_DETECT: Module 21 detected (Serial
number ABC1213DEFG) Module-Type Fabric Module Model N9K-C9516-FM
2016 Mar  3 04:44:01 switch%$ VDC-1  $$ %PLATFORM-2-MOD_DETECT: Module 22 detected (Serial
number ABC1211DEFG) Module-Type Fabric Module Model N9K-C9516-FM
2016 Mar  3 04:44:01 switch%$ VDC-1  $$ %PLATFORM-2-MOD_PWRUP: Module 21 powered up (Serial
number ABC1213DEFG)
2016 Mar  3 04:44:01 switch%$ VDC-1  $$ %PLATFORM-2-MOD_PWRUP: Module 22 powered up (Serial
number ABC1211DEFG)
2016 Mar  3 04:44:01 switch%$ VDC-1  $$ %PLATFORM-2-MOD_DETECT: Module 23 detected (Serial
number ABC1234D5EF) Module-Type Fabric Module Model N9K-C9516-FM
2016 Mar  3 04:44:01 switch%$ VDC-1  $$ %PLATFORM-2-MOD_PWRUP: Module 23 powered up (Serial
number ABC1234D5EF)
2016 Mar  3 04:44:01 switch%$ VDC-1  $$ %PLATFORM-2-MOD_DETECT: Module 24 detected (Serial
number ABC1211DE3F) Module-Type Fabric Module Model N9K-C9516-FM
2016 Mar  3 04:44:01 switch%$ VDC-1  $$ %PLATFORM-2-MOD_PWRUP: Module 24 powered up (Serial
number ABC1211DE3F)
2016 Mar  3 04:44:01 switch%$ VDC-1  $$ %PLATFORM-2-MOD_DETECT: Module 25 detected (Serial
number ABC1213DEFG) Module-Type Fabric Module Model N9K-C9516-FM

```

```

2016 Mar  3 04:44:01 switch%$ VDC-1 %$ %PLATFORM-2-MOD_PWRUP: Module 25 powered up (Serial
number ABC1213DEFG)
2016 Mar  3 04:44:01 switch%$ VDC-1 %$ %PLATFORM-2-MOD_DETECT: Module 26 detected (Serial
number ABC1211DE34) Module-Type Fabric Module Model N9K-C9516-FM
2016 Mar  3 04:44:01 switch%$ VDC-1 %$ %PLATFORM-2-MOD_PWRUP: Module 26 powered up (Serial
number ABC1211DE34)
2016 Mar  3 04:44:01 switch%$ VDC-1 %$ %PLATFORM-2-MODULE_EJECTOR_POLICY_ENABLED: All
Ejectors closed for module 1. Ejector based shutdown enabled
2016 Mar  3 04:44:01 switch%$ VDC-1 %$ %PLATFORM-2-MOD_DETECT: Module 1 detected (Serial
number ABC1217DEFG) Module-Type 32p 40G Ethernet Module Model N9K-X9432PQ
2016 Mar  3 04:44:01 switch%$ VDC-1 %$ %PLATFORM-2-MOD_PWRUP: Module 1 powered up (Serial
number ABC1217DEFG)
2016 Mar  3 04:44:01 switch%$ VDC-1 %$ %PLATFORM-2-MODULE_EJECTOR_POLICY_ENABLED: All
Ejectors closed for module 9. Ejector based shutdown enabled
2016 Mar  3 04:44:01 switch%$ VDC-1 %$ %PLATFORM-2-MOD_DETECT: Module 9 detected (Serial
number ABC1236D4E5) Module-Type 48x1/10G-T 4x40G Ethernet Module Model N9K-X9564TX
2016 Mar  3 04:44:01 switch%$ VDC-1 %$ %PLATFORM-2-MOD_PWRUP: Module 9 powered up (Serial
number ABC1236D4E5)
2016 Mar  3 04:44:01 switch%$ VDC-1 %$ %PLATFORM-2-MODULE_EJECTOR_POLICY_ENABLED: All
Ejectors closed for module 10. Ejector based shutdown enabled
2016 Mar  3 04:44:01 switch%$ VDC-1 %$ %PLATFORM-2-MOD_DETECT: Module 10 detected (Serial
number ABC1217EFGH) Module-Type 32p 40G Ethernet Module Model N9K-X9432PQ
2016 Mar  3 04:44:01 switch%$ VDC-1 %$ %PLATFORM-2-MOD_PWRUP: Module 10 powered up (Serial
number ABC1217EFGH)
2016 Mar  3 04:44:01 switch%$ VDC-1 %$ %PLATFORM-2-MODULE_EJECTOR_POLICY_ENABLED: All
Ejectors closed for module 11. Ejector based shutdown enabled
2016 Mar  3 04:44:02 switch%$ VDC-1 %$ %PLATFORM-2-MOD_DETECT: Module 11 detected (Serial
number ABC123DEF4) Module-Type 36p 40G Ethernet Module Model N9K-X9536PQ
2016 Mar  3 04:44:02 switch%$ VDC-1 %$ %PLATFORM-2-MOD_PWRUP: Module 11 powered up (Serial
number ABC123DEF4)
2016 Mar  3 04:44:02 switch%$ VDC-1 %$ %PLATFORM-2-MODULE_EJECTOR_POLICY_ENABLED: All
Ejectors closed for module 15. Ejector based shutdown enabled
2016 Mar  3 04:44:02 switch%$ VDC-1 %$ %PLATFORM-2-MOD_DETECT: Module 15 detected (Serial
number ABC1212DEFG) Module-Type 36p 40G Ethernet Module Model N9K-X9536PQ
2016 Mar  3 04:44:02 switch%$ VDC-1 %$ %PLATFORM-2-MOD_PWRUP: Module 15 powered up (Serial
number ABC1212DEFG)
2016 Mar  3 04:44:02 switch%$ VDC-1 %$ %PLATFORM-2-MODULE_EJECTOR_POLICY_ENABLED: All
Ejectors closed for module 16. Ejector based shutdown enabled
2016 Mar  3 04:44:02 switch%$ VDC-1 %$ %PLATFORM-2-MOD_DETECT: Module 16 detected (Serial
number ABCD1235DEFG) Module-Type 48x1/10G SFP+ 4x40G Ethernet Module Model N9K-X9464PX
2016 Mar  3 04:44:02 switch%$ VDC-1 %$ %PLATFORM-2-MOD_PWRUP: Module 16 powered up (Serial
number ABCD1235DEFG)
2016 Mar  3 04:44:08 switch%$ VDC-1 %$ %PLATFORM-2-MODULE_EJECTOR_POLICY_ENABLED: All
Ejectors closed for module 14. Ejector based shutdown enabled
2016 Mar  3 04:44:08 switch%$ VDC-1 %$ %PLATFORM-2-MOD_DETECT: Module 14 detected (Serial
number ABC9876DE5F) Module-Type 8p 100G Ethernet Module Model N9K-X9408PC-CFP2
2016 Mar  3 04:44:08 switch%$ VDC-1 %$ %PLATFORM-2-MOD_PWRUP: Module 14 powered up (Serial
number ABC9876DE5F)
2016 Mar  3 04:44:09 switch%$ VDC-1 %$ %PLATFORM-2-MODULE_EJECTOR_POLICY_ENABLED: All
Ejectors closed for module 6. Ejector based shutdown enabled
2016 Mar  3 04:44:09 switch%$ VDC-1 %$ %PLATFORM-2-MOD_DETECT: Module 6 detected (Serial
number ABC9876DE3F) Module-Type 8p 100G Ethernet Module Model N9K-X9408PC-CFP2
2016 Mar  3 04:44:09 switch%$ VDC-1 %$ %PLATFORM-2-MOD_PWRUP: Module 6 powered up (Serial
number ABC9876DE3F)
2016 Mar  3 04:44:10 switch%$ VDC-1 %$ %PLATFORM-2-MODULE_EJECTOR_POLICY_ENABLED: All
Ejectors closed for module 8. Ejector based shutdown enabled
2016 Mar  3 04:44:10 switch%$ VDC-1 %$ %PLATFORM-2-MOD_DETECT: Module 8 detected (Serial
number ABC3456D7E8) Module-Type 48x1/10G-T 4x40G Ethernet Module Model N9K-X9564TX
2016 Mar  3 04:44:10 switch%$ VDC-1 %$ %PLATFORM-2-MOD_PWRUP: Module 8 powered up (Serial
number ABC3456D7E8)
2016 Mar  3 04:44:56 switch%$ VDC-1 %$ %USBHSD-STANDBY-2-MOUNT: logflash: online
2016 Mar  3 04:47:31 switch%$ VDC-1 %$ %ASCII-CFG-2-CONF_CONTROL: System ready
2016 Mar  3 04:47:51 switch%$ VDC-1 %$ %VMAN-2-ACTIVATION_STATE: Successfully activated
virtual service 'guestshell+'

```

```
2016 Mar  3 04:47:51 switch%$ VDC-1 %$ %VMAN-2-GUESTSHELL_ENABLED: The guest shell has
been enabled. The command 'guestshell' may be used to access it, 'guestshell destroy'
to remove it.
```

User Access Verification

```
switch# show version
Cisco Nexus Operating System (NX-OS) Software
TAC support: http://www.cisco.com/tac
Copyright (C) 2002-2016, Cisco and/or its affiliates.
All rights reserved.
The copyrights to certain works contained in this software are
owned by other third parties and used and distributed under their own
licenses, such as open source. This software is provided "as is," and unless
otherwise stated, there is no warranty, express or implied, including but not
limited to warranties of merchantability and fitness for a particular purpose.
Certain components of this software are licensed under
the GNU General Public License (GPL) version 2.0 or
GNU General Public License (GPL) version 3.0 or the GNU
Lesser General Public License (LGPL) Version 2.1 or
Lesser General Public License (LGPL) Version 2.0.
A copy of each such license is available at
http://www.opensource.org/licenses/gpl-2.0.php and
http://opensource.org/licenses/gpl-3.0.html and
http://www.opensource.org/licenses/lgpl-2.1.php and
http://www.gnu.org/licenses/old-licenses/library.txt.
```

Software

```
BIOS: version 08.26
NXOS: version 7.0(3)I7(1)
BIOS compile time: 06/12/2016
NXOS image file is: bootflash:///nxos.7.0.3.I7.1.bin
NXOS compile time: 2/8/2016 20:00:00 [02/09/2016 05:18:17]
```

Hardware

```
cisco Nexus9000 C9516 (16 Slot) Chassis ("Supervisor Module")
Intel(R) Xeon(R) CPU E5-2403 0 @ 1.80GHz with 16401664 kB of memory.
Processor Board ID SAL1745FTPW
```

```
Device name: switch
bootflash: 20971520 kB
Kernel uptime is 0 day(s), 0 hour(s), 8 minute(s), 13 second(s)
```

```
Last reset at 235176 usecs after Thu Mar  3 04:40:48 2016
```

```
Reason: Reset due to upgrade
System version: 7.0(3)I1(2)
Service:
```

plugin

```
Core Plugin, Ethernet Plugin
```

```
Active Package(s):
switch#
```

Enhanced ISSU

You can enable or disable enhanced (LXC) ISSU. Beginning with Cisco NX-OS Release 10.4(1)F, this section is applicable for N9364C and N9332C platforms only.

**Note**

- Enhanced ISSU cannot be supported without reloading the container if there are kernel updates in the target release. The system will prompt the following message:

```
Host kernel is not compatible with target image. Full ISSU will be performed and control
plane will be impacted.
```

In effect, system will perform nondisruptive ISSU instead of enhanced ISSU.

- For Cisco N9K-C9332D-GX2B [from Cisco NX-OS Release 10.2(2)F], and N9K-C9348D-GX2A and N9K-C9364D-GX2A [from Cisco NX-OS Release 10.2(3)F] platform switches, enhanced (LXC) ISSU is the default mode, so you cannot enable or disable this mode. Also, for these switches, `virtual supervisor module` is shown in the output of the **show module** command. Beginning with Cisco NX-OS Release 10.3(3)F, this is applicable to Cisco Nexus 9300-FX3, 9300-GX, and 9300-GX2 platform switches. Beginning with Cisco NX-OS Release 10.4(1)F, this is also applicable to Cisco Nexus 9300-FX and 9300-FX2 platform switches.
- It is recommended to set **disable-fka** on the FCF, when invoking Fallback ND LXC ISSU on the NPV from Cisco NX-OS Release 10.2(3)F to 10.3(2)F and higher versions. If not, it will be disruptive. Verify the output of the **show fcoe-npv issu-impact** command to know whether the **disable-fka** must be set.

Before you begin

Before you enable the LXC mode, ensure that the installed licenses do not include the 27000 string in the license file.

**Note**

Beginning with Cisco NX-OS Release 10.3(3)F, Cisco Nexus 9300-FX3 and 9300-GX switches always boot in LXC mode. This allows you to use Enhanced ISSU with minimal downtime. Beginning with Cisco NX-OS Release 10.4(1)F, Cisco Nexus 9300-FX and 9300-FX2 switches always boot in LXC mode.

SUMMARY STEPS

- configure terminal**
- [no] boot mode lxc**
- (Optional) **show boot mode**
- copy running-config startup-config**
- reload**
- (Optional) **show version**
- (Optional) **show boot mode**
- show module**

DETAILED STEPS

	Command or Action	Purpose
Step 1	configure terminal Example:	Enters global configuration mode.

	Command or Action	Purpose
	switch# configure terminal switch(config#)	
Step 2	<p>[no] boot mode lxc</p> <p>Example:</p> <pre>switch(config)# boot mode lxc Using LXC boot mode</pre> <p>Example:</p> <pre>switch(config)# no boot mode lxc Using normal native boot mode</pre>	<p>Enables or disables enhanced (LXC) ISSU.</p> <p>Note In order to perform a nondisruptive enhanced ISSU, you must first boot the switch in LXC mode.</p> <p>Beginning with Cisco NX-OS Release 10.3(3)F, boot mode lxc is enabled by default on Cisco Nexus 9300-FX3 and 9300-GX switches, and beginning with Cisco NX-OS Release 10.4(1)F, it is enabled by default on Cisco Nexus 9300-FX and 9300-FX2 switches. However, no boot mode lxc is not supported on these platforms.</p>
Step 3	<p>(Optional) show boot mode</p> <p>Example:</p> <pre>switch(config)# show boot mode LXC boot mode is enabled</pre> <p>Example:</p> <pre>switch(config)# show boot mode LXC boot mode is disabled</pre>	Shows whether enhanced (LXC) ISSU is enabled or disabled.
Step 4	<p>copy running-config startup-config</p> <p>Example:</p> <pre>switch(config)# copy running-config startup-config</pre>	Saves the running configuration to the startup configuration.
Step 5	<p>reload</p> <p>Example:</p> <pre>switch(config)# reload This command will reboot the system. (y/n)? [n] Y loader></pre>	Reloads the device. When prompted, press Y to confirm the reboot.
Step 6	<p>(Optional) show version</p> <p>Example:</p> <pre>switch(config)# show version i "boot mode" ..NXOS boot mode:LXC switch#</pre>	<p>Shows the version information of the Software and Hardware and also shows the mode in which the switch is.</p> <p>Note Beginning with Cisco NX-OS Release 10.3(3)F, this command is applicable to all platforms that support LXC mode, when the switch is in LXC mode. However, LXC is the only option for Cisco Nexus 9300-FX3 and 9300-GX switches. Beginning with Cisco NX-OS Release 10.4(1)F, this command is applicable to Cisco Nexus 9300-FX and 9300-FX2 switches.</p>

	Command or Action	Purpose
Step 7	<p>(Optional) show boot mode</p> <p>Example:</p> <pre>switch(config)# show boot mode Current mode is LXC.</pre>	Shows whether the current mode is enhanced (LXC) ISSU.
Step 8	<p>show module</p> <p>Example:</p> <pre>switch# show module Mod Ports Model Module-Type Status ---- ----- 1 64 64x100G/40G QSFP28 Ethernet Module N9K-C9364C-GX ok 27 0 Virtual Supervisor Module N9K-C9364C-GX active * Mod Sw Hw Slot --- 1 10.3(3) 1.0 NA 27 10.3(3) 1.0 VSUP Mod MAC-Address(es) Serial-Num ----- 1 c4-b2-39-95-18-d8 to c4-b2-39-95-19-63 FDO23480XTZ 27 c4-b2-39-95-18-d8 to c4-b2-39-95-19-63 FDO23480XTZ Mod Online Diag Status --- 1 Pass 27 Pass * this terminal session</pre>	<p>Shows the details about the module after the switch comes up.</p> <p>Note Beginning with Cisco NX-OS Release 10.3(3)F, this command is applicable to all platforms that support LXC mode, when the switch is in LXC mode. However, LXC is the only option for Cisco Nexus 9300-FX3 and 9300-GX switches. Beginning with Cisco NX-OS Release 10.4(1)F, this command is applicable to Cisco Nexus 9300-FX and 9300-FX2 switches.</p>

What to do next

Follow the instructions in Upgrading the Cisco NX-OS Software section. Make sure to choose the **non-disruptive** option if you want to perform an enhanced or regular ISSU.

Upgrading the Cisco NX-OS Software

Use this procedure to upgrade to a Cisco NX-OS 10.2(x) release.



Note Beginning with Cisco NX-OS Release 10.1(1), the Cisco Nexus -GX series platforms use the 64-bit Cisco NX-OS image file, which has the image filename that begins with "nxos64" (for example, nxos64.10.1.1.bin). The 64-bit software image, which supports software scalability, is available for the Cisco Nexus C9316D-GX, C93600CD-GX, C9364C-GX switches. The non-GX series platforms use the 32-bit Cisco NX-OS image file, which has the image filename that begins with "nxos" (for example, nxos.10.1.1.bin).



Note For Cisco Nexus 9500 platform switches with -R line cards, you must save the configuration and reload the device to upgrade from Cisco NX-OS Release 7.0(3)F3(5) to 10.1(1). To upgrade from Cisco NX-OS Release 9.2(2) or later, we recommend that you use the **install all** command.



Note If an error message appears during the upgrade, the upgrade will fail because of the reason indicated. See the *Cisco Nexus 9000 Series NX-OS Troubleshooting Guide, Release 10.1(x)* for a list of possible causes and solutions.

Before you begin

Before performing a nondisruptive ISSU to Cisco NX-OS Release 10.1(1), you must configure the BGP graceful restart timer to 180 seconds for Cisco Nexus 3132Q-V platform switches.

SUMMARY STEPS

1. **Read the release notes for the software image file for any exceptions to this upgrade procedure.** See the [Cisco Nexus 9000 Series NX-OS Release Notes](#).
2. Log in to the device on the console port connection.
3. Ensure that the required space is available for the image file to be copied.
4. If you need more space on the active supervisor module, delete unnecessary files to make space available.
5. Verify that there is space available on the standby supervisor module.
6. If you need more space on the standby supervisor module, delete any unnecessary files to make space available.
7. Log in to Cisco.com, choose the software image file for your device from the following URL, and download it to a file server: <http://software.cisco.com/download/navigator.html>.
8. Copy the software image to the active supervisor module using a transfer protocol. You can use FTP, TFTP, SCP, or SFTP.
9. You can detect an incomplete or corrupt NX-OS software image prior to performing an upgrade by verifying the MD5, SHA256 or SHA512 checksum of the software image. To verify the MD5 checksum of the software image, run the **show file bootflash:<IMAGE-NAME>md5sum** command and compare the resulting value to the published MD5 checksum for the software image on [Cisco's Software Download](#) website. To verify the SHA512 checksum of the software image, run the **show file bootflash:<IMAGE-NAME>sha512sum** command and compare the resulting value to the published SHA512 checksum for the software image on [Cisco's Software Download](#) website.
10. You can detect an incomplete or corrupt NX-OS software image prior to performing an upgrade by verifying the MD5, SHA256 or SHA512 checksum of the software image. To verify the MD5 checksum of the software image, run the **show file bootflash:<IMAGE-NAME>md5sum** command and compare

the resulting value to the published MD5 checksum for the software image on [Cisco's Software Download](#) website. To verify the SHA512 checksum of the software image, run the **show file bootflash:<IMAGE-NAME>sha512sum** command and compare the resulting value to the published SHA512 checksum for the software image on [Cisco's Software Download](#) website.

11. Check the impact of upgrading the software before actually performing the upgrade.
12. Save the running configuration to the startup configuration.
13. If required, upgrade the EPLD image using the **install all nxos <nxos-image> epld <epld-image>** command.
14. Upgrade the Cisco NX-OS software using the **install all nxos bootflash:filename [no-reload | non-disruptive | non-interruptive | serial]** command.
15. (Optional) Display the entire upgrade process.
16. (Optional) Log in and verify that the device is running the required software version.
17. (Optional) If necessary, install any licenses to ensure that the required features are available on the device. See the [Cisco NX-OS Licensing Guide](#).

DETAILED STEPS

Step 1 Read the release notes for the software image file for any exceptions to this upgrade procedure. See the [Cisco Nexus 9000 Series NX-OS Release Notes](#).

Step 2 Log in to the device on the console port connection.

Step 3 Ensure that the required space is available for the image file to be copied.

```
switch# dir bootflash:
16384   Oct 30 17:05:32 2020  lost+found/
1964291584   Dec 08 19:44:33 2020  nxos.10.1.1.bin
...
Usage for bootflash://sup-local
 4825743360 bytes used
16312102912 bytes free
21137846272 bytes total
```

Note We recommend that you have the image file for at least one previous release of the Cisco NX-OS software on the device to use if the new image file does not load successfully.

Step 4 If you need more space on the active supervisor module, delete unnecessary files to make space available.

```
switch# delete bootflash:nxos.9.2.1.bin
```

Step 5 Verify that there is space available on the standby supervisor module.

```
switch# dir bootflash://sup-standby/
16384   Oct 30 17:05:32 2020  lost+found/
1964291584   Dec 08 19:44:33 2020  nxos.10.1.1.bin
...
Usage for bootflash://sup-standby
 4825743360 bytes used
16312102912 bytes free
21137846272 bytes total
```

Step 6 If you need more space on the standby supervisor module, delete any unnecessary files to make space available.

```
switch# delete bootflash://sup-standby/nxos.9.2.1.bin
```

Step 7 Log in to Cisco.com, choose the software image file for your device from the following URL, and download it to a file server: <http://software.cisco.com/download/navigator.html>.

Step 8 Copy the software image to the active supervisor module using a transfer protocol. You can use FTP, TFTP, SCP, or SFTP.

```
switch# copy scp://user@scpserver.cisco.com//download/nxos64.10.2.1.F.bin
bootflash:nxos64.10.2.1.F.bin
```

For software images requiring compaction, you must use SCP, HTTP, or HTTPS as the source and bootflash or USB as the destination. The following example uses SCP and bootflash:

```
switch# copy scp://user@scpserver.cisco.com//download/nxos64.10.2.1.F.bin
bootflash:nxos64.10.2.1.F.bin compact vrf management use-kstack
```

```
user1@10.65.42.196's password:
nxos64.10.2.1.F.bin 100% 1887MB 6.6MB/s 04:47
Copy complete, now saving to disk (please wait)...
Copy complete.
```

The **compact** keyword compacts the NX-OS image before copying the file to the supervisor module.

Note Software image compaction is only supported on SCP, HTTP, or HTTPS. If you attempt compaction with any other protocol, the system returns the following error:

```
Compact option is allowed only with source as scp/http/https and destination
as bootflash or usb
```

Note Compacted images are not supported with LXC boot mode.

Note Software image compaction is only supported on Cisco Nexus 9300-series platform switches.

Step 9 You can detect an incomplete or corrupt NX-OS software image prior to performing an upgrade by verifying the MD5, SHA256 or SHA512 checksum of the software image. To verify the MD5 checksum of the software image, run the **show file bootflash:<IMAGE-NAME>md5sum** command and compare the resulting value to the published MD5 checksum for the software image on [Cisco's Software Download](#) website. To verify the SHA512 checksum of the software image, run the **show file bootflash:<IMAGE-NAME>sha512sum** command and compare the resulting value to the published SHA512 checksum for the software image on [Cisco's Software Download](#) website.

```
switch# show file bootflash:nxos.10.1.1.bin md5sum
2242a7f876f1304118fd175c66f69b34
```

```
switch# show file bootflash:nxos.10.1.1.bin sha512sum
7f25c0e57ca137a79211fb3835338aae64acf9b021b75cec5d4156e873b4274ca4f98e9a74fe4c8961f5ace99ed65f3826650599369f84ab07265d7c5d61b57f
```

Step 10 You can detect an incomplete or corrupt NX-OS software image prior to performing an upgrade by verifying the MD5, SHA256 or SHA512 checksum of the software image. To verify the MD5 checksum of the software image, run the **show file bootflash:<IMAGE-NAME>md5sum** command and compare the resulting value to the published MD5 checksum for the software image on [Cisco's Software Download](#) website. To verify the SHA512 checksum of the software image, run the **show file bootflash:<IMAGE-NAME>sha512sum** command and compare the resulting value to the published SHA512 checksum for the software image on [Cisco's Software Download](#) website.

```
switch# show file bootflash:nxos64.10.2.1.F.bin md5sum
c49660952215822afd30bb7958a0765a
```

```
switch# show file bootflash:nxos64.10.2.1.F.bin sha256sum
2a64efbb381fabbb52054af74cf3efda1691772a49a70ddd35550431cadecf8e
```

```
switch# show file bootflash:nxos64.10.2.1.F.bin sha512sum
3bf6a771aa4a192a8e1383e348b26bb483356a9774d74ba39ecbf7718248483b3391942d8103de8104cbea8fda212266e70bd736220cff34943bd8e359432975
```

Step 11 Check the impact of upgrading the software before actually performing the upgrade.

```
switch# # show install all impact nxos bootflash:nxos64.10.2.1.F.bin
```

During the compatibility check, the following ISSU-related messages may appear in the Reason field:

Reason Field Message	Description
Incompatible image for ISSU	The Cisco NX-OS image to which you are attempting to upgrade does not support ISSU.
Default upgrade is not hitless	By default, the software upgrade process is disruptive. You must configure the non-disruptive option to perform an ISSU.

Step 12 Save the running configuration to the startup configuration.

```
switch# copy running-config startup-config
```

Step 13 If required, upgrade the EPLD image using the **install all nxos <nxos-image> epld <epld-image>** command.

The following is an example output of the **install all nxos <nxos-image> epld <epld-image>** command:

```
switch# install all nxos nxos.10.1.1.bin epld n9000-epld.10.1.1.img

Installer will perform compatibility check first. Please wait.
Installer is forced disruptive

Verifying image bootflash:/nxos.10.1.1.bin for boot variable "nxos".
[#####] 100% -- SUCCESS

Verifying EPLD image bootflash:/ n9000-epld.10.1.1.img.
[#####] 100% -- SUCCESS

Verifying image type.
[#####] 100% -- SUCCESS

Preparing "nxos" version info using image bootflash:/nxos.10.1.1.bin.
[#####] 100% -- SUCCESS

Preparing "bios" version info using image bootflash:/nxos.10.1.1.bin.
[#####] 100% -- SUCCESS

Performing module support checks.
[#####] 100% -- SUCCESS

Notifying services about system upgrade.
[#####] 100% -- SUCCESS

switch# install all nxos nxos.10.1.1.IJD9.0.59.bin epld n9000-epld.10.2.1.F.img

Installer will perform compatibility check first. Please wait.
Installer is forced disruptive

Verifying image bootflash:/nxos.10.1.1.IJD9.0.59.bin for boot variable "nxos".
[#####] 100% -- SUCCESS

Verifying EPLD image bootflash:/ n9000-epld.10.2.1.F.img.
[#####] 100% -- SUCCESS

Verifying image type.
```

```
[#####] 100% -- SUCCESS

Preparing "nxos" version info using image bootflash:/nxos.10.1.1.IJD9.0.59.bin.
[#####] 100% -- SUCCESS

Preparing "bios" version info using image bootflash:/nxos.10.1.1.IJD9.0.59.bin.
[#####] 100% -- SUCCESS

Performing module support checks.
[#####] 100% -- SUCCESS

Notifying services about system upgrade.
[#####] 100% -- SUCCESS
```

Step 14 Upgrade the Cisco NX-OS software using the **install all nxos bootflash:filename [no-reload | non-disruptive | non-interruptive | serial]** command.

```
switch# install all nxos bootflash:nxos64.10.2.1.F.bin
```

The following options are available:

- **no-reload**—Exits the software upgrade process before the device reloads.

Note When you use **install all** with **no-reload** option, the saved configuration cannot be used before you reload the device. Saving configuration in this state can result in incorrect startup configuration once you reload the device with new version of NX-OS.

- **non-disruptive**—Performs an in-service software upgrade (ISSU) to prevent the disruption of data traffic. (By default, the software upgrade process is disruptive.)
- **non-interruptive**—Upgrades the software without any prompts. This option skips all error and sanity checks.
- **serial**—Upgrades the I/O modules in Cisco Nexus 9500 Series switches one at a time. (By default, the I/O modules are upgraded in parallel, which reduces the overall upgrade time. Specifically, the I/O modules are upgraded in parallel in this order: the first half of the line cards and fabric modules, the second half of the line cards and fabric modules, the first system controller, the second system controller.)

Note If you enter the **install all** command without specifying a filename, the command performs a compatibility check, notifies you of the modules that will be upgraded, and confirms that you want to continue with the installation. If you choose to proceed, it installs the NX-OS software image that is currently running on the switch and upgrades the BIOS of various modules from the running image, if necessary.

Step 15 (Optional) Display the entire upgrade process.

```
switch# show install all status
```

Step 16 (Optional) Log in and verify that the device is running the required software version.

```
switch# show version
```

Step 17 (Optional) If necessary, install any licenses to ensure that the required features are available on the device. See the [Cisco NX-OS Licensing Guide](#).

Upgrade Process for vPCs

Upgrade Process for a vPC Topology on the Primary Switch

The following list summarizes the upgrade process on a switch in a vPC topology that holds either the Primary or Operational Primary vPC roles. Steps that differ from a switch upgrade in a non-vPC topology are in bold.



Note In vPC topologies, the two peer switches must be upgraded individually. An upgrade on one peer switch does not automatically update the vPC peer switch.

1. **The install all command issued on the vPC primary switch triggers the installation upgrade.**
2. The compatibility checks display the impact of the upgrade.
3. The installation proceeds or not based on the upgrade impact.
4. **The configuration is locked on both vPC peer switches.**
5. The current state is saved.
6. The system unloads and runs the new image.
7. The stateful restart of the system software and application occurs.
8. The installer resumes with the new image.
9. The installation is complete.

When the installation is complete, the vPC primary switch is upgraded.



Note The vPC primary switch is running the upgraded version, and the vPC secondary switch is running the original software version.

Upgrade Process for a vPC Topology on the Secondary Switch

The following list summarizes the upgrade process on a switch in a vPC topology that holds either the Secondary or Operational Secondary vPC roles. Steps that differ from a switch upgrade in a non-vPC topology are in bold.

1. **The install all command issued on the vPC secondary switch triggers the installation upgrade.**
2. The compatibility checks display the impact of the upgrade.
3. The installation proceeds or not based on the upgrade impact.
4. The current state is saved.
5. The system unloads and runs the new image.

6. The stateful restart of the system software and application occurs.
7. The installer resumes with the new image.
8. **The configuration is unlocked on the primary and secondary switches.**
9. The installation is complete.

Downgrading to an Earlier Software Release



Note If an error message appears during the downgrade, the downgrade will fail because of the reason indicated. See the *Cisco Nexus 9000 Series NX-OS Troubleshooting Guide, Release 10.2(x)* for a list of possible causes and solutions.

SUMMARY STEPS

1. **Read the release notes for the software image file for any exceptions to this downgrade procedure.** See the [Cisco Nexus 9000 Series NX-OS Release Notes](#).
2. Log in to the device on the console port connection.
3. Verify that the image file for the downgrade is present on the active supervisor module bootflash:.
4. If the software image file is not present, log in to Cisco.com, choose the software image file for your device from the following URL, and download it to a file server: <http://software.cisco.com/download/navigator.html>.
5. Copy the software image to the active supervisor module using a transfer protocol. You can use FTP, TFTP, SCP, or SFTP.
6. Check for any software incompatibilities.
7. Disable any features that are incompatible with the downgrade image.
8. Check for any hardware incompatibilities.
9. Power off any unsupported modules.
10. Save the running configuration to the startup configuration.
11. Downgrade the Cisco NX-OS software.
12. (Optional) Display the entire downgrade process.
13. (Optional) Log in and verify that the device is running the required software version.

DETAILED STEPS

-
- Step 1** **Read the release notes for the software image file for any exceptions to this downgrade procedure.** See the [Cisco Nexus 9000 Series NX-OS Release Notes](#).
- Step 2** Log in to the device on the console port connection.
- Step 3** Verify that the image file for the downgrade is present on the active supervisor module bootflash:.
- ```
switch# dir bootflash:
```
- Step 4** If the software image file is not present, log in to Cisco.com, choose the software image file for your device from the following URL, and download it to a file server: <http://software.cisco.com/download/navigator.html>.

**Note** If you need more space on the active or standby supervisor module bootflash:, use the **delete** command to remove unnecessary files.

**Step 5** Copy the software image to the active supervisor module using a transfer protocol. You can use FTP, TFTP, SCP, or SFTP.

```
switch# switch# copy scp://user@scpserver.cisco.com/download/nxos.9.2.1.bin
bootflash:nxos.9.2.1.bin
```

**Step 6** Check for any software incompatibilities.

```
switch# show incompatibility-all nxos bootflash:nxos.9.2.1.bin
Checking incompatible configuration(s)
No incompatible configurations
```

The resulting output displays any incompatibilities and remedies.

**Step 7** Disable any features that are incompatible with the downgrade image.

**Step 8** Check for any hardware incompatibilities.

```
switch# show install all impact nxos bootflash:nxos.9.2.1.bin
```

**Step 9** Power off any unsupported modules.

```
switch# poweroff module module-number
```

**Step 10** Save the running configuration to the startup configuration.

```
switch# copy running-config startup-config
```

**Step 11** Downgrade the Cisco NX-OS software.

**Note** If you enter the **install all** command without specifying a filename, the command performs a compatibility check, notifies you of the modules that will be upgraded, and confirms that you want to continue with the installation. If you choose to proceed, it installs the NXOS software image that is currently running on the switch and upgrades the BIOS of various modules from the running image if required.

**Step 12** (Optional) Display the entire downgrade process.

**Example:**

```
switch# show install all status
```

**Step 13** (Optional) Log in and verify that the device is running the required software version.

```
switch# show version
```

---

# Cisco NX-OS Upgrade History

During the life of a Cisco Nexus 9000 switch, many upgrade procedures can be performed. Upgrades can occur for maintenance purposes or to update the operating system to obtain new features. Over time, switches may be updated on numerous occasions. Viewing the types of upgrades and when they occurred can help in troubleshooting issues or simply understanding the history of the switch.

Beginning with Cisco NX-OS Release 9.3(5), Cisco Nexus 9000 switches log all upgrade activity performed over time providing a comprehensive history of these events. The stored upgrade history types are:

- Cisco NX-OS System Upgrades
- Electronic Programmable Logic Device (EPLD) Upgrades
- Software Maintenance Upgrade (SMU) Installations

View the Cisco NX-OS upgrade history by entering the **show upgrade history** command. The output displays any upgrade activity that previously occurred on the switch and defines the start and end times for each event. The following is an example output of the **show upgrade history** command:

```
switch# show upgrade history
TYPE VERSION DATE STATUS
NXOS EPLD n9000- 26 Apr 2020 11:37:16 EPLD Upgrade completed
 epld.9.3.4.img
NXOS EPLD n9000- 26 Apr 2020 11:32:41 EPLD Upgrade started
 epld.9.3.4.img
NXOS system image 9.3(5) 24 Mar 2020 20:09:10 Installation End
NXOS system image 9.3(5) 24 Mar 2020 20:05:29 Installation started
NXOS SMU 9.3(5) 03 Mar 2020 23:34:15 Patch activation ended for
 nxos.libnbproxycli_patch-n9k_
 ALL-1.0.0-9.3.5.lib32_n9000.rpm
NXOS SMU 9.3(5) 03 Mar 2020 23:34:03 Patch activation started for
 nxos.libnbproxycli_patch-n9k_
 ALL-1.0.0-9.3.5.lib32_n9000.rpm
```

Beginning with Cisco NX-OS Release 10.2(3)F, Cisco Nexus 9000 switches supports new cli "**show upgrade history details**" which displays login details (user name/session ID).

View the Cisco NX-OS upgrade history details by entering the **show upgrade history details** command. The output displays user login details (user name/session ID) under LOGIN column on the switch along with upgrade history. The following is an example output of the **show upgrade history details** command:

```
switch# sh upgrade history details
TYPE VERSION DATE LOGIN
 STATUS
NXOS system image 10.2(3) 21 Jan 2022 10:01:06 admin/10.30.216.212
 Installation End
NXOS system image 10.2(3) 21 Jan 2022 10:00:53 admin/10.30.216.212
 Installation started
NXOS system image 10.2(3) 21 Jan 2022 01:03:52 admin/10.30.216.212
 Installation End
```

