



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

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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. The image filename begins with "nxos" (for example, nxos.9.2.1.bin). Only this image is required to load the Cisco NX-OS operating system.

The Cisco Nexus 9000 Series switches and the Cisco Nexus 3132C-Z, 3132Q-V, 3164Q, 3232C, 3264C-E, 3264Q, 31108PC-V, 31108TC-V, 31128PQ, and 34180YC switches support disruptive software upgrades and downgrades by default.



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**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-dk9.2.1.CSCab00001.gbin). For more information on SMUs, see the [Cisco Nexus 9000 Series NX-OS System Management Configuration Guide](#).

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**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](#).

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## About ISSU

An 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 in-service software upgrade (ISSU), also known as a nondisruptive upgrade, for some switches. (See the [Cisco NX-OS Software Upgrade Guidelines](#) 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 nondisruptive option helps ensure a nondisruptive 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 and the Cisco Nexus 3164Q, 31128PQ, 3132Q-V, 31108PC-V, and 31108TC-V switches.

The following ISSU scenarios are supported:

- Performing standard ISSU on Top-of-Rack (ToR) switches with a single supervisor
- Performing standard ISSU on End-of-Row (EoR) switches with two supervisors
- 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 and Cisco Nexus 3100 Series switches are the NX-OS switches with single supervisors. Performing ISSU on the Cisco Nexus 9000 and 3100 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 and 3100 Series switches do not see any traffic disruption. The control plane downtime during the ISSU process is approximately less than 120 seconds.

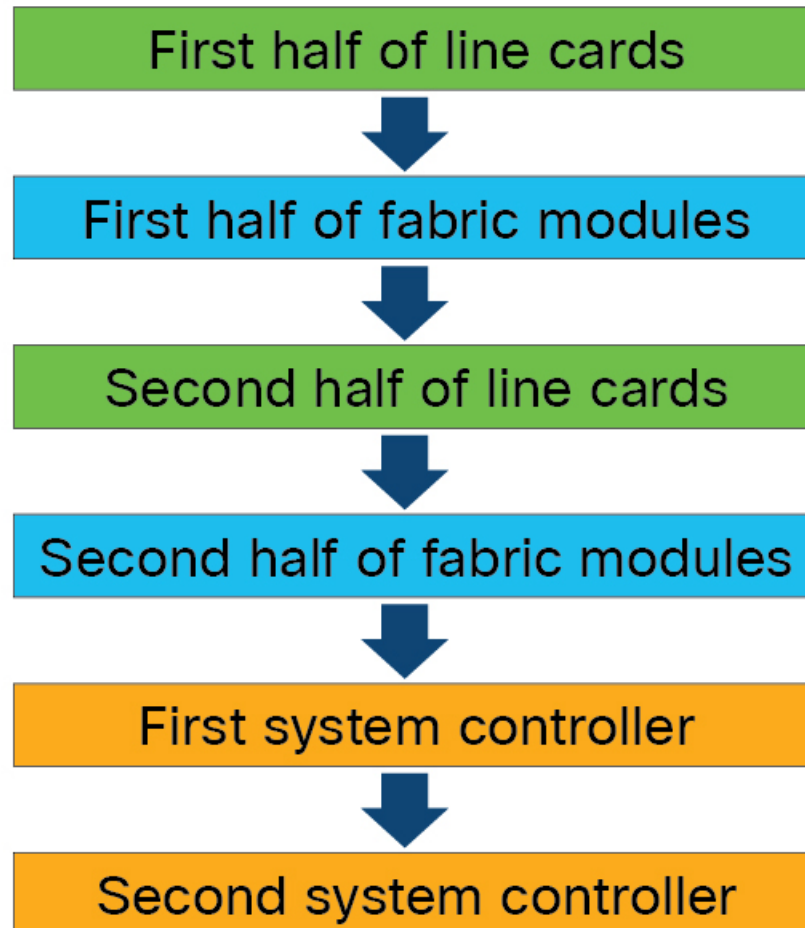
### Performing Standard ISSU on End-of-Row (EoR) Switches with Two Supervisors

Cisco Nexus 9500 Series switches are the modular EoR switches that require two supervisors for ISSU. The minimum configuration required is two system controllers and two fabric modules.

Cisco Nexus 9500 Series switches support parallel upgrade as the default method. The parallel method upgrades the modules in the batches (as outlined in the following illustration) instead of upgrading the modules one after the other.

Figure 1: Parallel Upgrade Process for Cisco Nexus 9500 Series Switches

## Cisco Nexus 9500 Parallel Upgrade Process



The steps for the parallel upgrade process on Cisco Nexus 9500 Series switches are:

- First the supervisors are upgraded (This procedure requires a switchover). Then the line cards, the fabric modules, the system controllers, and the FEX are upgraded.
- After the switchover is performed in a parallel upgrade, the secondary supervisor takes over. The installer determines the current line cards and the fabric modules.
- The installer then divides the components into the buckets. It places the first half of the line cards in the first bucket, the first half of the fabric modules in the second bucket, the second half of line cards in the third bucket, the second half of the fabric modules in the fourth bucket, the first system controller in the fifth bucket, and the second system controller in the sixth bucket.
- Each bucket is upgraded successfully before an upgrade process starts for the next bucket.
- The console displays the modules with the bucket assignments and the status of the upgrade.

The user also has the option to choose a serial upgrade using the CLI.

While performing standard ISSU for the modular switches, the data plane traffic is not disrupted. The control plane downtime is approximately less than 6 Seconds.




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**Note** The minimum requirement for a modular Cisco Nexus 9000 Series switch undergoing ISSU is two supervisors, two system controllers, and two fabric modules. The Cisco Nexus 9400 line cards can have a partially connected fabric module. In this case, if only two fabric modules are used with the Cisco Nexus 9400 line cards, the fabric modules should not be in slots 21 and 25. They should be in slots 22, 23, 24, or 26. This allows for the system to maintain high availability during ISSU.

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




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**Note** Enhanced ISSU to Cisco NX-OS Release 9.2(x) is not supported as there are kernel fixes that cannot take effect without reloading the underlying kernel.

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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.




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**Note** 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.
```

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

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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 nondisruptive 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 subnet. 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




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**Note** The [Cisco Nexus 9000 Series NX-OS Release Notes](#) contain specific upgrade guidelines for each release. See the Release Notes for the target upgrade release before starting the upgrade.

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- 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

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

- 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.




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**Note** For Cisco Nexus 9500 platform switches with -R line cards, you must perform a write erase and reload the device to upgrade from any release prior to Cisco NX-OS Release 7.0(3)F3(4). To upgrade from Cisco NX-OS Release 7.0(3)F3(4) or 9.2(x) to any later release, we recommend that you use the **install all** command.

iCAM must be disabled before upgrading from Release 7.0(3)I7(1) → Release 9.2(x) or Release 9.3(x). Only Release 9.2(4) → Release 9.3(1) can be performed if iCAM is enabled.

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- Detect a bad software image before performing an ISSU upgrade from an old release to a new release by checking the md5sum after downloading the new image (with seg6).
- 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 9.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](#).
- 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 9.x](#).
- 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.
- 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 3164Q, 31128PQ, or 9300 platform 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.



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

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- 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.
- 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).

- 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 an ISSU, see the [Cisco Nexus 9000 Series NX-OS Release Notes](#) for your particular release.

- After performing ISSU on Cisco Nexus 9300 platform switches and the Cisco Nexus 3164Q switches, you may see the MTS\_OPC\_CLISH message on the vPC peers. MTS\_OPC\_CLISH is the last MTS code that is sent from the back-end component to the VSH to specify the end of the show command output.

If the user executes a show command that produces more output and keeps the session on for more than 3 minutes, the following warning message may be displayed on the console. As a workaround, you can set the terminal length as 0 using the **terminal length 0** command or the **show <command> | no-more** option.

```
--More--2018 Jun 5 19:11:21 Th-aggr1 %$ VDC-1 %$ Jun 5 19:11:20 %KERN-2-SYSTEM_MSG:
[12633.219113]
App vsh.bin on slot 1 vdc 1 SUP sap 64098(cli_api queue) did not drop MTS_OPC_CLISH
with
msg_id 0x675ecf from sender sap 64132(NULL) in 180 sec, contact app owner - kernel

(config)# show ip mroute detail
IP Multicast Routing Table for VRF "default"

Total number of routes: 4801
Total number of (*,G) routes: 2400
Total number of (S,G) routes: 2400
Total number of (*,G-prefix) routes: 1

(*, 225.0.0.1/32), uptime: 00:09:32, igmp(1) pim(0) ip(0)
RPF-Source: 10.10.10.3 [11/110]
Data Created: No
VPC Flags
  RPF-Source Forwarder
Stats: 15/720 [Packets/Bytes], 0.000 bps
Stats: Inactive Flow
Incoming interface: Ethernet1/1, RPF nbr: 12.0.0.2
LISP dest context id: 0 Outgoing interface list: (count: 1) (bridge-only: 0)
  Vlan2001, uptime: 00:09:32, igmp (vpc-svi)

(60.60.60.2/32, 225.0.0.1/32), uptime: 00:09:31, ip(0) mrib(1) pim(0)
RPF-Source: 60.60.60.2 [20/110]
Data Created: Yes
VPC Flags
--More--2018 Jun 5 19:11:21 Th-aggr1 %$ VDC-1 %$ Jun 5 19:11:20 %KERN-2-SYSTEM_MSG:
[12633.219113] App vsh.bin on slot 1 vdc 1 SUP
sap 64098(cli_api queue) did not drop MTS_OPC_CLISH with msg_id 0x675ecf from sender
```



```
sap 64132(NULL) in 180 sec,
contact app owner - kernel
```

There is no functionality impact or traffic loss due to this issue. All the MTS messages are drained once the show command displays the complete output, the user enters CTRL+c, or the session gets closed.

- Occasionally, while the switch is operationally Up and running, the Device not found logs are displayed on the console. These logs were disabled in releases prior to 9.2(1). 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.
- Beginning with Cisco NX-OS Release 9.2(1), a simplified NX-OS numbering format is used for the platforms that are supported in the release. 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 9.2(x), and it can be ignored. See the following example.

```
switch# install all nxos bootflash:nxos.9.2.1.bin
Installer will perform compatibility check first. Please wait.
Installer is forced disruptive

Verifying image bootflash:/nxos.9.2.1.bin for boot variable "nxos".
[#####] 100% -- SUCCESS

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

Preparing "nxos" version info using image bootflash:/nxos.9.2.1.bin.
[#####] 100% -- SUCCESS

Preparing "bios" version info using image bootflash:/nxos.9.2.1.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)              9.2(1)I9(1)
yes
      1      bios          v05.31(05/17/2018):v05.26(11/06/2017)  v05.31(05/17/2018)
no

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

- 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.

- ISSUs are supported on the following platforms:



**Note** An enhanced ISSU can be performed only from a Cisco NX-OS Release 7.0(3)I5(1) to a later image. The upgrade will be disruptive.

A non-disruptive standard ISSU is supported from Cisco NX-OS Release 7.0(3)I7(4), 7.0(3)I7(5), or 9.2(x) to a Cisco NX-OS 9.2(x) release. A non-disruptive enhanced ISSU to a Cisco NX-OS 9.2(x) release is not supported as there are kernel fixes that cannot take effect without reloading the underlying kernel. The upgrade will be disruptive. For more information, see the [ISSU Support Matrix](#).

Series	Supported Platforms	Initial Release That Supports ISSU <sup>1</sup>	Features Not Supported with ISSU <sup>2</sup>
Cisco Nexus 9200	Standard and enhanced ISSU: Cisco Nexus 9236C, 9272Q, 92160YC-X, 92300YC, and 92304QC	Standard ISSU: 7.0(3)I6(1) Enhanced ISSU: 7.0(3)I7(3)	Segment routing, and Tetration
Cisco Nexus 9300	Standard and enhanced ISSU: Cisco Nexus 9332PQ, 9372PX, 9372PX-E, 9372TX, 9372TX-E, 9396PX, 9396TX, 93120TX, and 93128TX  <b>Note</b> ISSU on one of these Cisco Nexus 9300 platform switches is supported when the switch is the spanning tree root. You can use the <b>show spanning-tree issu-impact</b> command to verify if the switch meets this criteria.	Standard ISSU: 7.0(3)I3(1) Enhanced ISSU: 7.0(3)I5(1)	Dual-homed FEX, segment routing, and VXLAN  <b>Note</b> Straight-through FEX is supported on Cisco Nexus 9372PX and 9396PX switches starting with Cisco NX-OS Release 7.0(3)I4(1).

Series	Supported Platforms	Initial Release That Supports ISSU <sup>1</sup>	Features Not Supported with ISSU <sup>2</sup>
Cisco Nexus 9300-EX	Standard and enhanced ISSU: Cisco Nexus 93108TC-EX, 93180LC-EX, and 93180YC-EX	Standard ISSU for Cisco Nexus 93108TC-EX and 93180YC-EX: 7.0(3)I6(1) Standard ISSU for Cisco Nexus 93180LC-EX: 7.0(3)I7(1) Enhanced ISSU: 7.0(3)I7(3)	Straight-through and dual-homed FEX, segment routing, and Tetration
Cisco Nexus 9300-FX	Standard ISSU: None Enhanced ISSU: None		
Cisco Nexus 9500	Standard ISSU: Cisco Nexus 9504, 9508, and 9516 with 9432PQ, 9464PX, 9464TX, 9536PQ, 9564PX, 9564TX, or 9636PQ line cards, dual supervisor modules, and a minimum of two system controllers and two fabric modules  <b>Note</b> Cisco Nexus 9500 platform switches with -R, -EX, and -FX line cards do not support ISSU.  Enhanced ISSU: None	Standard ISSU: 7.0(3)I3(1)	Dual-homed FEX, segment routing, and VXLAN  <b>Note</b> Straight-through FEX is supported on Cisco Nexus 9500 platform switches with a Cisco Nexus 9464PX or 9564PX line card starting with Cisco NX-OS Release 7.0(3)I4(1).

Series	Supported Platforms	Initial Release That Supports ISSU <sup>1</sup>	Features Not Supported with ISSU <sup>2</sup>
Cisco Nexus 3000 that run Cisco Nexus 9000 NX-OS software	Standard ISSU: Cisco Nexus 3164Q, 31128PQ, 3132Q-V, 31108PC-V, 31108TC-V, 3232C, and 3264Q  Enhanced ISSU: 3164Q, 31128PQ, 3132Q-V, 31108PC-V, and 31108TC-V	Standard ISSU for Cisco Nexus 3164Q and 31128PQ: 7.0(3)I3(1)  Standard ISSU for 3132Q-V, 31108PC-V, 31108TC-V, 3232C, and 3264Q: 7.0(3)I6(1)  Enhanced ISSU for 3164Q, 31128PQ, 3132Q-V, 31108PC-V, and 31108TC-V: 7.0(3)I5(1)	Segment routing, and VXLAN for Cisco Nexus 3164Q and 31128PQ  Segment routing for Cisco Nexus 3232C and 3264Q

<sup>1</sup> Enhanced ISSU is disruptive.

<sup>2</sup> ISSU is disruptive for these features.

- Segment list configuration fails to apply after you cold boot upgrade from Cisco NX-OS 9.2x Releases. It is recommended to upgrade using "**install all**" command.

## 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 7.0(3)I7(7) to an earlier release.
- 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.
- iCAM must be disabled before downgrading from Release 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.
- 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](#).
- Software downgrades are disruptive. In-service software downgrades (ISSDs), also known as nondisruptive downgrades, are not supported.
- Downgrading with PVLANS (Private VLANs) configured is only supported with Cisco NX-OS 6.1(2)I3(4x) releases.
- For a boot-variable change and reload to Cisco NX-OS Release 7.0(3)I1(1x), the PVLAN process is not brought up, and the PVLAN ports are kept down. For a boot-variable change to the Cisco NX-OS Release 6.1(2)I3(3) and earlier, an ASCII replay will be tried, but feature PVLANS and other PVLAN configurations will fail.

## ISSU Upgrade Compatibility

For ISSU compatibility for all releases, 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.



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

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**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.

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[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
```

```
[#####] 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 CCTRL driver for card_type 3 ...
CCTRL driver for card_index 21000 ...
old data: 4000004 new data: 1
Not Micron SSD...

Checking all filesystems.....
Installing default sptom 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#

```

# Configuring Enhanced ISSU

You can enable or disable enhanced (LXC) ISSU.



**Note** Enhanced ISSU to a Cisco NX-OS 9.2(x) release is not supported as there are kernel fixes that cannot take effect without reloading the underlying kernel.

## Before you begin

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

## Procedure

	Command or Action	Purpose
<b>Step 1</b>	<b>configure terminal</b> <b>Example:</b> <pre>switch# configure terminal switch(config#)</pre>	Enters global configuration mode.
<b>Step 2</b>	<b>[no] boot mode lxc</b> <b>Example:</b> <pre>switch(config)# boot mode lxc Using LXC boot mode</pre> <b>Example:</b> <pre>switch(config)# no boot mode lxc Using normal native boot mode</pre>	Enables or disables enhanced (LXC) ISSU.
<b>Step 3</b>	(Optional) <b>show boot mode</b> <b>Example:</b> <pre>switch(config)# show boot mode LXC boot mode is enabled</pre> <b>Example:</b> <pre>switch(config)# show boot mode LXC boot mode is disabled</pre>	Shows whether enhanced (LXC) ISSU is enabled or disabled.
<b>Step 4</b>	<b>copy running-config startup-config</b> <b>Example:</b> <pre>switch(config)# copy running-config startup-config</pre>	Saves the running configuration to the startup configuration.
<b>Step 5</b>	<b>reload</b> <b>Example:</b> <pre>switch(config)# reload</pre> This command will reboot the system.	Reloads the device. When prompted, press <b>Y</b> to confirm the reboot.

	Command or Action	Purpose
	(y/n)? [n] Y loader>	

**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 9.2(x) release.



**Note** For Cisco Nexus 9500 platform switches with -R line cards, use this procedure to upgrade from a Cisco NX-OS 9.2(x) release to a later 9.2(x) release or from Cisco NX-OS Release 7.0(3)F3(4) to a Cisco NX-OS 9.2(x) release.



**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](#) for a list of possible causes and solutions.

**Procedure**

**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:
49152      Dec 10 14:43:39 2015 lost+found/
80850712  Dec 10 15:57:44 2015 n9000-dk9.9.2.1.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:n9000-dk9.9.2.1.bin
```

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



```
switch# dir bootflash://sup-standby/
49152   Dec 10 14:43:39 2015 lost+found/
80850712 Dec 10 15:57:44 2015 n9000-dk9.9.2.1.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/n9000-dk9.9.2.1.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/nxos.9.2.2.bin bootflash:nxos.9.2.2.bin
```

**Step 9** Display the SHA256 checksum for the file to verify the operating system integrity and ensure that the downloaded image is safe to install and use.

```
switch# show file bootflash://sup-1/nxos.9.2.2.bin sha256sum
5214d563b7985ddad67d52658af573d6c64e5a9792b35c458f5296f954bc53be
```

**Step 10** Check the impact of upgrading the software before actually performing the upgrade.

```
switch# show install all impact nxos bootflash:nxos.9.2.2.bin
```

During the compatibility check, the following ISSU-related messages might 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 <b>non-disruptive</b> option to perform an ISSU.

**Step 11** Save the running configuration to the startup configuration.

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

**Step 12** 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:nxos.9.2.2.bin
```

The following options are available:

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

- **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 NXOS software image that is currently running on the switch and upgrades the BIOS of various modules from the running image if required.

**Step 13** (Optional) Display the entire upgrade process.

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

**Step 14** (Optional) Log in and verify that the device is running the required software version.

```
switch# show version
```

**Step 15** (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](#) for a list of possible causes and solutions.

---

### Procedure

- 
- 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# copy scp://user@scpserver.cisco.com//download/n9000-dk9.9.2.1.bin
bootflash:n9000-dk9.9.2.1.bin
```

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

```
switch# show incompatibility-all nxos bootflash:n9000-dk9.9.2.1.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:n9000-dk9.9.2.1.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
```