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:

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.9.3.1.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.

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-dk9.3.1.**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 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.

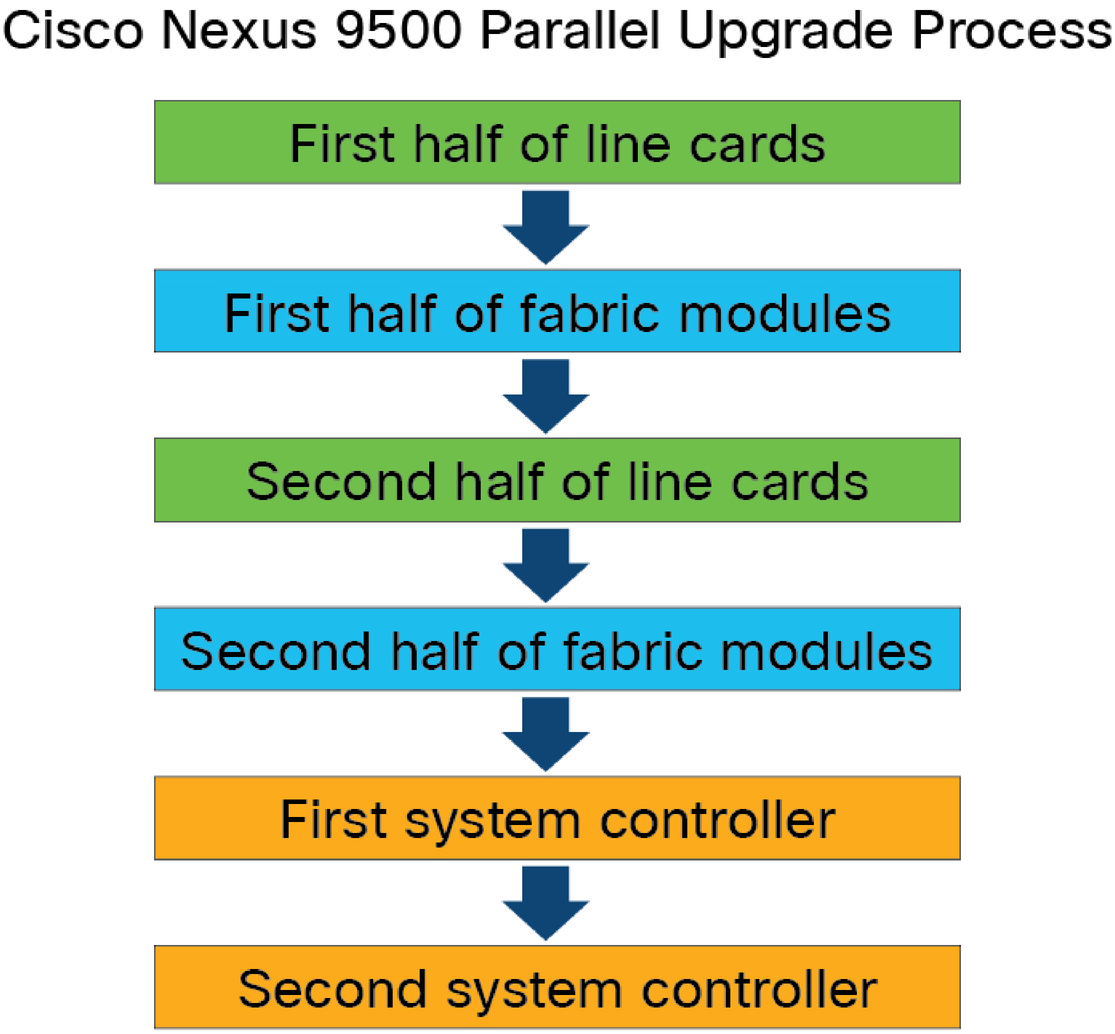
The data plane traffic is not disrupted during the ISSU process. In other words, the data plane forwards the packets while the control plane is being upgraded, any servers that are connected to the Cisco Nexus 9000 and 3100 Series switches do not see any traffic disruption. The control plane downtime 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
First half of line cards
First half of fabric modules
Second half of line cards
Second half of fabric modules
First system controller
Second system controller

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.

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.

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

Note Enhanced ISSU to Cisco NX-OS Release 9.3(1) is not supported as there are kernel fixes that cannot take effect without reloading the underlying kernel. Enhanced ISSU from Cisco NX-OS Release 9.3(1) to later releases is supported, even in cases of kernel incompatibility.

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 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 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:

- When upgrading from Cisco NX-OS Release 9.3(3) to Cisco NX-OS Release 9.3(6), 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 Cisco Nexus 9000 Series NX-OS VXLAN Configuration Guide, Release 9.3(x).

- 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 start-up configuration once you reload the device with new version of NX-OS.

- When you upgrade a Cisco Nexus 9000 device to Cisco NX-OS Release 9.3(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.

- Enhanced ISSU: Non-disruptive enhanced ISSU to Cisco NX-OS Release 9.3(x) is not supported as there are kernel fixes that cannot take effect without reloading the underlying kernel. The upgrade will be disruptive. However, a non-disruptive enhanced ISSU from Cisco NX-OS Release 9.3(x) to later releases is supported in fallback mode only, even in cases of kernel incompatibility.

- When upgrading from Cisco NX-OS Release 9.2(2) or earlier releases to Cisco NX-OS Release 9.3(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.

- 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 9.3(x).
- Before upgrading from Cisco NX-OS Release 7.0(3)I7(5) to Cisco NX-OS Release 9.3(5), make sure that you configure TCAM region Egress Layer3/VLAN QOS [egr-l3-vlan-qos].
- Beginning with Cisco NX-OS Release 9.3(5), ISSU is supported on FC/FCoE switch mode on N9K-C93180YC-FX. For more information about the FC/FCoE switch mode and supported hardware, see Cisco Nexus 9000 Series NX-OS SAN Switching Configuration Guide, Release 9.3(x)
- Beginning with Cisco NX-OS Release 9.3(5), ISSU is supported with FC/FCoE NPV mode on N9K-C93180YC-FX and N9K-C93360YC-FX2. 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
- Software image compaction is only supported on Cisco Nexus 9300-series platform switches.
- 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 9.3(x) or 9.2(3) to 9.3(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 9.3(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 9.3(x), you should manually copy the image to the standby SUP and perform the disruptive upgrade.
- When upgrading to Cisco NX-OS Release to 9.3(x) from any release prior to 7.0(3)I2(3) an intermediate upgrade to 7.0(3)I4(x), 7.0(3)I5(x), 7.0(3)I6(x), or 7.0(3)I7(x) is required. We recommend using Cisco NX-OS Release 7.0(3)I4(8) or 7.0(3)I7(4) as the interim release to aid in a smooth migration.
- When upgrading from Cisco NX-OS Release 7.0(3)I6(1) or 7.0(3)I7(1) to Cisco NX-OS Release 9.3(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 9.3(x) using the install all command, BIOS will not be upgraded due to CSCve24965. When the upgrade to Cisco NX-OS Release 9.3(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 9.3(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 9.3(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.
- 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.
- 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 9.3(x). Uploading the system creates the required match qualifiers for the FHS TCAM region, ifacl.
- 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).
- 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 9.3(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.

- During an ISSU, there is a drop for all traffic to and from 100-Mb ports 65–66 on the Cisco Nexus 92304QC switch.
- 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.
- When upgrading to Cisco NX-OS Release 9.3(x), Guest Shell automatically upgrades from 1.0 to 2.0. In the process, the contents of the guest shell 1.0 root filesystem are lost. To keep from losing important content, copy any needed files to /bootflash or an off-box location before upgrading to Cisco NX-OS Release 9.3(x).
- 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 9.3(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 or SHA256 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 SHA256 checksum of the software image, run the **show file bootflash:**<*IMAGE-NAME*> **sha256sum** command and compare the resulting value to the published SHA256 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 9.3(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 9.3(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 9.3(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 3164Q, 31128PQ, or 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.

- 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-agg1 %$ 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-agg1 %$ 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. 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.
- A simplified NX-OS numbering format is used for platforms that are supported in Cisco NX-OS 9.3(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 9.3(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
```

- A nondisruptive standard ISSU is supported from Cisco NX-OS Release 7.0(3)I7(4), 7.0(3)I7(5), 7.0(3)I7(6), or 9.2(x) to Cisco NX-OS Release 9.3(1). For more information, see the ISSU Support Matrix.

- 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.

- 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 9.3(13), for Nexus 9300-R platform, 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 9.3(13) version.

  To upgrade to bios released with 9.3(13) 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.9.3.13.bin.

     The system reloads and boots up with 9.3(13) image.

  2. Install all nxos bios-force.

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

ISSU Platform Support

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

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.

Non-disruptive enhanced ISSU to Cisco NX-OS Release 9.3(1) is not supported as there are kernel fixes that cannot take effect without reloading the underlying kernel. The upgrade will be disruptive.

A non-disruptive enhanced ISSU from Cisco NX-OS Release 9.3(1) to later releases is supported in fallback mode only, even in cases of kernel incompatibility.

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 9236C Cisco Nexus 9272Q Cisco Nexus 92160YC-X Cisco Nexus 92300YC Cisco Nexus 92304QC 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: • Segment routing • Tetration
Enhanced	Beginning with Cisco NX-OS Release 7.0(3)I7(3): Cisco Nexus 9236C Cisco Nexus 9272Q Cisco Nexus 92160YC-X Cisco Nexus 92300YC Cisco Nexus 92304QC	

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 7.0(3)I3(1): Cisco Nexus 9332PQ Cisco Nexus 9372PX Cisco Nexus 9372PX-E Cisco Nexus 9372TX Cisco Nexus 9372TX-E Cisco Nexus 9396PX Cisco Nexus 9396TX Cisco Nexus 93120TX Cisco Nexus 93128TX 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: • Dual-homed FEX • Segment routing • VXLAN **Note** Straight-through FEX is supported on Cisco Nexus 9372PX and 9396PX switches starting with Cisco NX-OS Release 7.0(3)I4(1).
Enhanced		

ISSU Type	Release/Supported Platforms	Features Not Supported with Non-disruptive ISSU
	Beginning with Cisco NX-OS Release 7.0(3)I5(1): Cisco Nexus 9332PQ Cisco Nexus 9372PX Cisco Nexus 9372PX-E Cisco Nexus 9372TX Cisco Nexus 9372TX-E Cisco Nexus 9396PX Cisco Nexus 9396TX Cisco Nexus 93120TX Cisco Nexus 93128TX 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-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 Beginning with Cisco NX-OS Release 7.0(3)I7(1): Cisco Nexus 93180LC-EX	Both ISSU types are disruptive for Cisco Nexus 9300-EX platform switches configured with the following features: • Straight-through FEX • Dual-homed FEX • Segment routing • Tetration
Enhanced	Beginning with Cisco NX-OS Release 7.0(3)I7(3): Cisco Nexus 93108TC-EX Cisco Nexus 93180YC-EX Cisco Nexus 93180LC-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	Standard ISSU is disruptive for Cisco Nexus 9300-FX platform switches configured with the following features: • Straight-through FEX • Dual-homed FEX
Enhanced	Cisco NX-OS Release 9.3(1), 9.3(2), and 9.3(3): None Beginning with Cisco NX-OS Release 9.3(5): Cisco Nexus 9336C-FX2 Cisco Nexus 93240YC-FX2 Cisco Nexus 93216TC-FX2 Cisco Nexus 93360YC-FX2 Cisco Nexus 93240YC-FX2Z Cisco Nexus 9348GC-FXP Cisco Nexus 93108TC-FX Cisco Nexus 93180YC-FX	Enhanced ISSU is disruptive for Cisco Nexus 9300-FX platform switches configured with the following features: • Straight-through FEX • Dual-homed FEX Enhanced ISSU is not supported for Cisco Nexus 93180YC-FX and 93360YC-FX2 with FCoE features.

ISSU for Cisco Nexus 9500 Platform Switches

ISSU Type	Release/Supported Platforms	Features Not Supported with Non-disruptive ISSU
Standard	Beginning with Cisco NX-OS Release 7.0(3)I3(1): Cisco Nexus 9504, 9508, and 9516 with dual supervisor modules, a minimum of two system controllers, two fabric modules, and any of the following line cards: • Cisco Nexus 9432PQ • Cisco Nexus 9464PX • Cisco Nexus 9464TX • Cisco Nexus 9536PQ • Cisco Nexus 9564PX • Cisco Nexus 9564TX • Cisco Nexus 9636PQ **Note** Cisco Nexus 9500 platform switches with -R, -EX, or -FX line cards do not support ISSU.	Standard ISSU is disruptive for Cisco Nexus 9500 platform switches configured with the following features: • Dual-homed FEX • Segment routing • VXLAN **Note** 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).
Enhanced	None	

ISSU for Cisco Nexus 3000 Platform Switches Running Cisco Nexus 9000 Series NX-OS Software

ISSU Type	Release/Supported Platforms	Features Not Supported with Non-disruptive ISSU
Standard	Beginning with Cisco NX-OS Release 7.0(3)I3(1): Cisco Nexus 3164Q Cisco Nexus 31128PQ Beginning with Cisco NX-OS Release 7.0(3)I6(1): Cisco Nexus 3132Q-V Cisco Nexus 31108PC-V Cisco Nexus 31108TC-V Cisco Nexus 3232C Cisco Nexus 3264Q	Standard ISSU is disruptive for Cisco Nexus 3000 patform switches running Cisco Nexus 9000 Series NX-OS Software configured with the following features: • Segment routing on Cisco Nexus 3164Q, 31128PQ, 3232C, and 3264Q • VXLAN on Cisco Nexus 3164Q and 31128PQ

ISSU Type	Release/Supported Platforms	Features Not Supported with Non-disruptive ISSU
Enhanced	Beginning with Cisco NX-OS Release 7.0(3)I5(1): Cisco Nexus 3164Q Cisco Nexus 31128PQ Cisco Nexus 3132Q-V Cisco Nexus 31108PC-V Cisco Nexus 31108TC-V	Enhanced ISSU is disruptive for Cisco Nexus 3000 platform switches running Cisco Nexus 9000 Series NX-OS Software configured with the following features: • Segment routing on Cisco Nexus 3164Q and 31128PQ • VXLAN on Cisco Nexus 3164Q and 31128PQ

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

  - 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.

- 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 9.3(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 9.3(x) to earlier releases, make sure that the ACL TCAM usage for ingress features does 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.
- Software downgrades are disruptive. In-service software downgrades (ISSDs), also known as nondisruptive downgrades, are not supported.

ISSU Upgrade Compatibility

For ISSU compatibility for all releases, see the Cisco NX-OS ISSU Support Matrix.

Upgrade Paths

Upgrading from a 7.x release to a 9.3(x) release may require more than a single hop. The following section describe the upgrade paths required.

Upgrade Paths to Release 9.3(x) from 7.0(3)F3(x) Releases

The following are the upgrade paths from previous 7.0(3)F3(x) releases:

- Release 7.0(3)F3(x) -> Release 7.0(3)F3(4) -> Release 9.3(x)

Note This upgrade is disruptive.

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 + 0x0000000380000000
 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 sprom 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
```

```
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otherwise stated, there is no warranty, express or implied, including but not
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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 Cisco NX-OS Release 9.3(1) is not supported as there are kernel fixes that cannot take effect without reloading the underlying kernel. Enhanced ISSU from Cisco NX-OS Release 9.3(1) to later releases is supported, even in cases of kernel incompatibility.

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

Step 1	**configure terminal**
	Example:
	`switch# configure terminal`
	`switch(config#)`
		Enters global configuration mode.

Step 2	[**no**] **boot mode lxc**
	Example:
	`switch(config)# boot mode lxc`
	`Using LXC boot mode`
	Example:
	`switch(config)# no boot mode lxc`
	`Using normal native boot mode`
		Enables or disables enhanced (LXC) ISSU.
		Note In order to perform a nondisruptive enhanced ISSU, you must first boot the switch in LXC mode.

Step 3	(Optional) **show boot mode**
	Example:
	`switch(config)# show boot mode`
	`LXC boot mode is enabled`
	Example:
	`switch(config)# show boot mode`
	`LXC boot mode is disabled`
		Shows whether enhanced (LXC) ISSU is enabled or disabled.

Step 4	**copy running-config startup-config** **Example:** `switch(config)# copy running-config startup-config`	Saves the running configuration to the startup configuration.

Step 5	**reload**
	Example:
	`switch(config)# reload`
	`This command will reboot the system.`
	`(y/n)?  [n] Y`
	`loader>`
		Reloads the device. When prompted, press **Y** to confirm the reboot.

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 9.3(x) release.

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.

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.

Before you begin

Before performing a nondisruptive ISSU to Cisco NX-OS Release 9.3(1), you must configure the BGP graceful restart timer to 180 seconds for Cisco Nexus 3132Q-V platform switches.

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 2018 lost+found/
80850712 Dec 10 15:57:44 2018 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 2018 lost+found/
80850712 Dec 10 15:57:44 2018 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.9.3.1.bin bootflash:nxos.9.3.1.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/nxos.9.3.5.bin
bootflash:nxos.9.3.5.bin compact vrf management use-kstack

user1@10.65.42.196's password:
nxos.9.3.5.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 or SHA256 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 SHA256 checksum of the software image, run the **show file bootflash:**<*IMAGE-NAME*> **sha256sum** command and compare the resulting value to the published SHA256 checksum for the software image on Cisco's Software Download website.

```
switch# show file bootflash:nxos.9.3.1.bin sha256sum
5214d563b7985ddad67d52658af573d6c64e5a9792b35c458f5296f954bc53be

switch# show file bootflash:nxos.9.3.1.bin md5sum
e55f6496a0b445e2adf58fdfd856b5ec
```

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

```
switch# show install all impact nxos bootflash:nxos.9.3.1.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.

Reason Field Message	Description
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 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.9.3.1.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 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
```

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
```