Cisco Nexus 3000 Series NX-OS Software Upgrade and Downgrade Guide, Release 7.x

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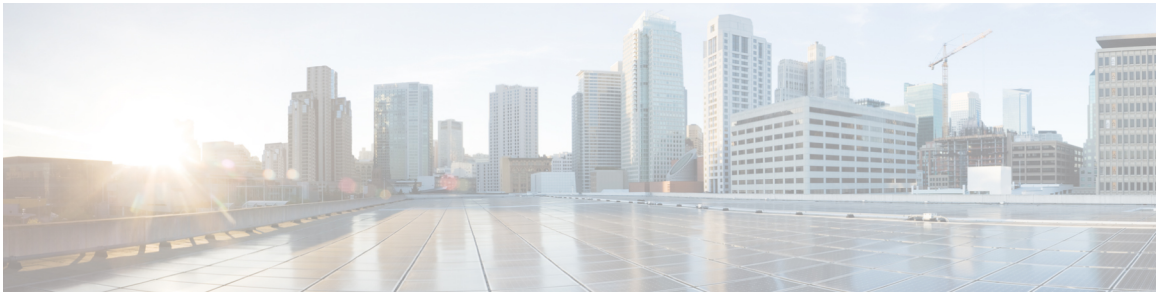

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Preface

This preface includes the following sections:

Audience

This publication is for network administrators who install, configure, and maintain Cisco Nexus switches.

Document Conventions

Command descriptions use the following conventions:

Convention	Description
bold	Bold text indicates the commands and keywords that you enter literally as shown.
Italic	Italic text indicates arguments for which the user supplies the values.
[x]	Square brackets enclose an optional element (keyword or argument).
[x | y]	Square brackets enclosing keywords or arguments separated by a vertical bar indicate an optional choice.
{x | y}	Braces enclosing keywords or arguments separated by a vertical bar indicate a required choice.
[x {y | z}]	Nested set of square brackets or braces indicate optional or required choices within optional or required elements. Braces and a vertical bar within square brackets indicate a required choice within an optional element.

Convention	Description
`variable`	Indicates a variable for which you supply values, in context where italics cannot be used.
string	A nonquoted set of characters. Do not use quotation marks around the string or the string will include the quotation marks.

Examples use the following conventions:

Convention	Description
`screen font`	Terminal sessions and information the switch displays are in screen font.
`boldface screen font`	Information you must enter is in boldface screen font.
italic screen font	Arguments for which you supply values are in italic screen font.
< >	Nonprinting characters, such as passwords, are in angle brackets.
[ ]	Default responses to system prompts are in square brackets.
!, #	An exclamation point (!) or a pound sign (#) at the beginning of a line of code indicates a comment line.

Related Documentation for Cisco Nexus 3000 Series Switches

The entire Cisco Nexus 3000 Series switch documentation set is available at the following URL:

https://www.cisco.com/c/en/us/support/switches/nexus-3000-series-switches/tsd-products-support-series-home.html

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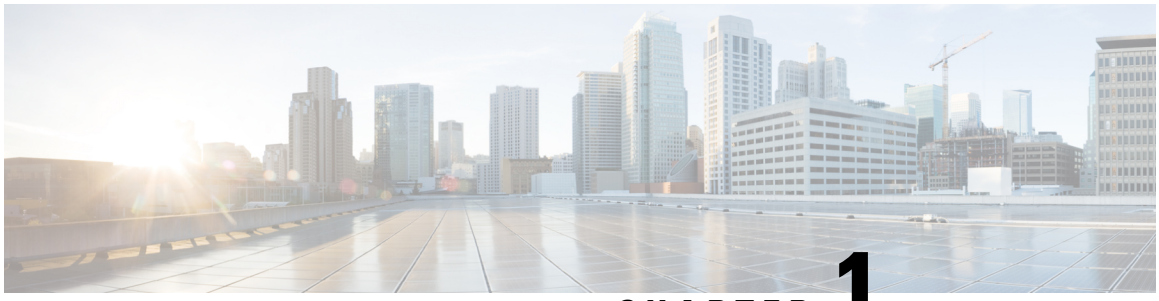
Cisco Bug Search Tool

Cisco Bug Search Tool (BST) is a web-based tool that acts as a gateway to the Cisco bug tracking system that maintains a comprehensive list of defects and vulnerabilities in Cisco products and software. BST provides you with detailed defect information about your products and software.

Preface



CHAPTER 1

Upgrading or Downgrading the Cisco Nexus 3000 Series NX-OS Software

Caution For the Cisco Nexus 3000 vPC topologies, an upgrade from Cisco NX-OS Release 6.0(2)U6(3a) to Release 7.0(3)I2(1) is not supported as the upgrade will cause a traffic disruption. An upcoming maintenance release will support the upgrades for the vPC topologies without traffic disruption

This document describes how to reboot the Cisco Nexus 3000 and Cisco Nexus 3100 Series switches, and upgrade or downgrade the Cisco NX-OS software on the Cisco Nexus 3000 and Cisco Nexus 3100 Series switches:

Information About Software Images

Cisco Nexus 3000 Series switches are shipped with the Cisco NX-OS software preinstalled on the switches. Before upgrading or downgrading from an existing image, you should read through the information in this document to understand the guidelines, prerequisites, and procedures for upgrading the software. For updated information about the Cisco NX-OS software for the Cisco Nexus 3000 Series switch, see the Cisco Nexus 3000 Series Release Notes.

The Cisco NX-OS software consists of one NXOS software image. The image filename begins with "nxos" [beginning with Cisco NX-OS Release 7.0(3)I2(1) and later releases]. Only this image is required to load the Cisco NX-OS operating system. This image runs on all the Cisco Nexus 3000 and Nexus 3100 Series switches. Using fast-reload after the BIOS upgrade or using **install all** commands are the only supported methods of upgrading to Release 7.0(3)I2(1) and later releases.

Note Starting with Release 7.0(3)I2(1) and later releases, there is a single image for booting the Cisco Nexus 3000 Series platforms. The kickstart and system images are not required anymore. The single image binary now boots up on both Cisco Nexus 3000 and 3100 Series platforms and Cisco Nexus 9000 Series platforms. Due to single image binary, the following commands are updated: -

- **boot nxos** *single_image_binary*
- **fast-reload nxos** *single_image_binary*
- **install all nxos** *single_image_binary*

Caution The fast-reload to Release 7.0(3)I2(1) is supported only from Release 6.0(2)U6(3a) or later releases, after the BIOS has been upgraded. Using fast-reload from Release 6.0(2)U6(3a) to Release 7.0(3)I2(1) without upgrading the BIOS will result in the switch not booting up.

Caution If the switch was ordered new with 7.0(3)I2.x code or has had init system performed while running 7.0(3)I2.x code, an install all downgrade to 6.0(2)U6.x code will result in the device being stuck in the loader prompt with no access to the files on bootflash.

Supported Hardware

Cisco Nexus 3000 and 3100 Series switches are shipped with the Cisco NX-OS software preinstalled. Cisco NX-OS upgrades and downgrades are supported on the hardware listed in the following sections:

Cisco Nexus 3000 Series Switches

- Cisco Nexus 3016 switches
- Cisco Nexus 3048 switches

- Cisco Nexus 3064 switches

Cisco Nexus 3100 Series Switches

- Cisco Nexus 3132Q and 3132Q-XL switches
- Cisco Nexus 3172 switches

Note For software upgrade and downgrade information for Cisco Nexus 3000 Series switches that operate in N9K mode, see the Cisco Nexus 9000 Series NX-OS Software Upgrade and Downgrade Guide.

About ISSU

Beginning with Cisco NX-OS Release 7.0(3)I3(1), you can perform an in-service software upgrade (ISSU), also known as a non-disruptive upgrade. An ISSU allows you to upgrade the device software while the switch continues to forward traffic. An ISSU reduces or eliminates the downtime typically caused by software upgrades.

ISSU Prerequisites

Follow the guidelines in the "Guidelines and Limitations for ISSU" section to ensure that the ISSU works smoothly.

Make sure that the network is stable and no changes are made while the ISSU is in progress.

Ensure feature compatibility between the current running release and the target release.

Make sure that interfaces are not in a spanning-tree designated forwarding state. Also, make sure that bridge assurance is not configured on any interface. The vPC peer-link is an exception to these requirements.

Verify that the current STP topology is consistent with the ISSU requirements. Use the **show spanning-tree issu-impact** command to display the STP configuration and whether or not there are potential STP issues.

Use the **show lacp issu-impact** command to display if a port or a peer switch is configured in the rate fast mode. The ISSU process is aborted if the system has any LACP fast timers configured.

Guidelines and Limitations for ISSU

The following is a list of important guidelines and limitations for ISSU:

- An ISSU can be performed only from a Cisco NX-OS 7.0(3)I3(1) or a later image to a later image.
- Beginning with Cisco NX-OS Release 7.0(3)I4(1), you can perform an ISSU for VXLAN.
- ISSUs for segment routing are supported on Cisco Nexus 3000 series switches from Cisco NX-OS Release 7.0(3)I4(1) onwards.
- ISSUs are supported on the following platforms:
  - Cisco Nexus 3172PQ, 3172TQ, 3172PQ-XL, and 3172TQ-XL switches

- Cisco Nexus 3132Q, 3132Q-X, and 3132Q-XL switches
- Cisco Nexus 3064, 3064-X, and 3064-T switches
- Cisco Nexus 3048 switches
- Cisco Nexus 3016 switches

- Beginning with Cisco NX-OS Release 7.0(3)I5(1), Cisco Nexus 3000 series platforms with 16 GB of memory or higher support enhanced ISSU. The upgrade will be disruptive.
- Beginning with Cisco NX-OS Release 7.0(3)I7(3), the minimum free bootflash space that is required to perform an ISSU is as follows:
  - For compact image: 200 MB
  - For non-compact image: 300 MB
- For Cisco NX-OS Release 7.0(3)I7(1) and Cisco NX-OS Release 7.0(3)I7(2), the minimum free bootflash space that is required to perform ISSU is 550 MB.
- Cisco Nexus 3048, 3064, 3132, and 3172 switches with a model number that does not end in **-XL** must run a compact NX-OS software image due to limited bootflash space. This compact image can be created using the NX-OS Compact Image procedure; alternatively, a compact NX-OS software image can be downloaded directly from Cisco's Software Download website. This requirement does not apply to any other model of Nexus 3000 or 3100 series switch.
  - The MD5/SHA512 checksum published on Cisco's Software Download website for a compact NX-OS software image may not match the MD5/SHA512 checksum of a compact image created through the NX-OS Compact Image procedure.

Configuring Enhanced ISSU

Beginning with Cisco NX-OS Release 7.0(3)I5(1), you can enable or disable enhanced (LXC) ISSU.

Note After you upgrade to Cisco NX-OS Release 7.0(3)I5(1) from an earlier release, you can enable enhanced ISSU for use with future upgrades.

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:**	Enables or disables enhanced (LXC) ISSU.

	Command or Action	Purpose

	`switch(config)# boot mode lxc`
	`Using LXC boot mode`
	Example:
	`switch(config)# no boot mode lxc`
	`Using normal native boot 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 to upgrade the Cisco NX-OS Software. Make sure to choose the non-disruptive option if you want to perform an enhanced ISSU or regular ISSU.

Compact Image for Cisco Nexus 3000, 3100, and 3500

Early models of Cisco Nexus 3000, 3100, and 3500 Series switches with a model number that does not end in **-XL** have 1.4 to 1.6 gigabytes of storage space allocated to the bootflash. Over time, the file size of NX-OS software images has steadily increased to be over 1 gigabyte. As a result, it is difficult for Nexus 3000, 3100, and 3500 Series switches with a model number that does not end in **-XL** to simultaneously store more than one full NX-OS binary image at a time. Therefore, administrators cannot follow the standard NX-OS software upgrade procedure on Nexus 3000, 3100, and 3500 Series switches with a model number that does not end in **-XL** that is used for other Nexus platforms, such as Nexus 5000, 6000, 7000, and 9000 Series switches.

Starting with NX-OS software release 7.0(3)I3(1), the file size of NX-OS software images can be reduced through the NX-OS Compact Image procedure. This is a non-disruptive procedure that does not affect the switch's control plane or ability to forward data plane traffic.

Compact NX-OS Software Images on Cisco's Software Download Website

Compact NX-OS software images are available for download on Cisco's Software Download website for a few NX-OS software releases. These compact images have a published MD5/SHA512 checksum that can be used to verify the integrity of the NX-OS binary image file. The compact NX-OS software images can be downloaded from Cisco's Software Download website for the following NX-OS software releases:

- 9.3(4) and later
- 9.2(4)
- 7.0(3)I7(8) and later

Note The MD5/SHA512 checksum published on Cisco's Software Download website for a compact NX-OS software image may not match the MD5/SHA512 checksum of a compact image created through the NX-OS Compact Image procedure.

Compact Image to be Run for Different Switch Models

The following table describes the appropriate compact image to be run for each applicable model of switch, using NX-OS software release 7.0(3)I7(8) as an example.

Table 1: Compact Image Table for Each Cisco Nexus 3000, 3100, and 3500 Series Platform

Switch Model Number	Compact NX-OS Software Image Filename
N3K-C3016Q-40GE	n3000-compact.7.0.3.I7.8.bin
N3K-C3048TP-1GE	n3000-compact.7.0.3.I7.8.bin
N3K-C3064PQ-10GX	n3000-compact.7.0.3.I7.8.bin
N3K-C3064TQ-10GT	n3000-compact.7.0.3.I7.8.bin
N3K-C3064TQ-32T	n3000-compact.7.0.3.I7.8.bin
N3K-C3132Q-40GE	n3100-compact.7.0.3.I7.8.bin
N3K-C3132Q-40GX	n3100-compact.7.0.3.I7.8.bin
N3K-C3172PQ-10GE	n3100-compact.7.0.3.I7.8.bin
N3K-C3172TQ-10GT	n3100-compact.7.0.3.I7.8.bin
N3K-C3172TQ-32T	n3100-compact.7.0.3.I7.8.bin
N3K-C3524P-10G	n3500-compact.7.0.3.I7.8.bin
N3K-C3524P-10GX	n3500-compact.7.0.3.I7.8.bin
N3K-C3548P-10G	n3500-compact.7.0.3.I7.8.bin
N3K-C3548P-10GX	n3500-compact.7.0.3.I7.8.bin

NX-OS Compact Image Procedure

There are two ways to initiate the NX-OS Compact Image procedure. The following subsections describe each option in further detail.

NX-OS Compact Image Procedure on Bootflash/USB

Starting with NX-OS software release 7.0(3)I3(1), you can use the install all command with the compact option to initiate the NX-OS Compact Image procedure on an image stored in the switch's bootflash or an attached USB drive. This can also be performed on an NX-OS software image that the switch is currently booted from - however, a minimum of 750MB of free space on the switch's bootflash is required to compact the currently booted image.

An example of how to initiate the NX-OS Compact Image procedure on an NX-OS software image stored on the switch's bootflash is as follows:

switch# **install all nxos booftflash:nxos.7.0.3.I7.8.bin compact**

NX-OS Compact Image Procedure Through SCP

Starting with NX-OS software release 7.0(3)I5(2), the NX-OS Compact Image procedure can be initiated while copying the image to the switch's bootflash or an attached USB drive with SCP (Secure Copy Protocol) using an additional option in the copy command. The compact option in the copy command overrides the bootflash space limitation as the image is compacted at the time of transferring the image to the switch's bootflash or an attached USB drive. This option is only supported with SCP - other protocols (such as SFTP [Secure File Transfer Protocol] and FTP [File Transfer Protocol]) are not supported.

An example of how to initiate the NX-OS Compact Image procedure while copying an NX-OS software image to the switch's bootflash through SCP is as follows:

switch# **copy scp://username@192.0.2.100/nxos.7.0.3.I7.8.bin bootflash:nxos.7.0.3.I7.8.bin compact vrf management**

NX-OS Compact Image Procedure Sequence

The sequence of compacting NX-OS software images is important. You cannot compact the currently loaded NX-OS software image if you have another NX-OS software image present on the bootflash due to the limited bootflash size of the switch.

First, you should compact the currently booted image on the bootflash using the NX-OS Compact Image Procedure on Bootflash/USB method previously described. Next, you should copy the desired NX-OS software image to the switch's bootflash using the NX-OS Compact Image Procedure through SCP method previously described, if possible. If this option is not possible, because you are upgrading to an NX-OS software release prior to 7.0(3)I5(2), you should copy the desired NX-OS software image to the switch's bootflash normally, then use the NX-OS Compact Image Procedure on Bootflash/USB method previously described to compact the image.

The minimum required free space to compact a non-booted image is 450MB of free space on the switch's bootflash. If the free space available on the switch's bootflash is less than 450MB after copying the target image, then the target image needs to be compacted using an attached USB drive or through the NX-OS Compact Image Procedure through SCP method previously described.

NX-OS Compact Image Platform Groups

The NX-OS Compact Image procedure described in this document is applicable to three separate platform groups:

- Nexus 3000 devices (N3K-C3048, N3K-C3064, and so on)
- Nexus 3100 devices (N3K-C3132, N3K-C3172, and so on)
- Nexus 3500 devices (N3K-C3524, N3K-C3548, and so on)

A compacted NX-OS binary image file can be re-used among other devices within the same platform group. However, a compact NX-OS binary image file cannot be used on devices that belong to a different platform group.

For example, consider a scenario where you have four Nexus 3000 devices of the following models:

- N3K-C3048TP-1GE
- N3K-C3064PQ-10GE
- N3K-C3172PQ-40GX
- N3K-C3548P-10G

An NX-OS binary image file compacted on the N3K-C3048TP-1GE can be transferred directly to the bootflash of the N3K-C3064PQ-10GE through a file transfer protocol of your choice (provided there is enough room on the N3K-C3064PQ-10GE). Furthermore, the N3K-C3064PQ-10GE can be upgraded with the use of this compact NX-OS binary image file through a supported method. However, the same compact NX-OS binary image file cannot be used to upgrade the N3K-C3172PQ-40GX and N3K-C3548P-10G devices. The NX-OS Compact Image procedure must be executed on both N3K-C3172PQ-40GX and N3K-C3548P-10G devices separately.

This compatibility between Nexus devices within the same platform group can be used to optimize the NX-OS software upgrade of a large number of devices. For example, if you have 100 N3K-C3048TP-1GE devices, you can use the NX-OS Compact Image procedure on a single device, then transfer the compact NX-OS binary image file to the resulting 99 devices. There is no need to perform the NX-OS Compact Image procedure on all 100 devices.

Booting the Switch from the USB

Starting from Release 7.0(3)I3(1), an option is provided to boot the switch from the USB using a loader prompt. For example:

```
loader> boot usb1:nxos.7.0.3.I3.1.bin
```

For Cisco Nexus 3500 Series switches, you must compact the image before you upgrade from Cisco NX-OS Release 6.0(2)A8(x) to Cisco NX-OS Release 7.0(3)I7(2).

Note In Cisco NX-OS Release 6.0(2)A8(7a), only scp image compaction is supported.

Upgrading the BIOS and Power Sequencer Images

Changes to BIOS and power sequencers are rare; however, when they occur, they are included in the Cisco NX-OS image, and the BIOS and power sequencer are upgraded. The summary displayed by the installer during the installation process indicates the current version of the BIOS and power sequencer and the target version.

Note After a successful power sequence upgrade, you must switch off the power to the system and then power it up.

BIOS Upgrade for Release 7.0(3)I2(1) and Later Releases

See the following guidelines for the BIOS upgrade for Release 7.0(3)I2(1) and later releases:

Cisco Nexus 3000 Series platforms require a BIOS upgrade to load Release 7.0(3)I2(1) or later images. Only BIOS versions 3.x.x are compatible with Release 7.0(3)I2(1) and later releases on all Cisco Nexus 3000 Series switches. This is taken care in the regular **install all** method of upgrade but it needs to be explicitly upgraded prior to the fast-reload upgrade.

In Release 6.0(2)U6(3a), an additional CLI option is introduced to upgrade only the BIOS:

switch# **install all nxos**: *image_name* **bios**

This step needs to be run from Release 6.0(2)U6(3a) and it upgrades only the BIOS image from Release 7.0(3)I2(1) image; it does not reload the switch.

Note During the BIOS upgrade, the system warns that the install is disruptive, but it is actually not disruptive and the device will not be reloaded. You can proceed with the BIOS upgrade.

Only after the BIOS upgrade is complete, it allows the system to perform fast-reload to Release 7.0(3)I2(1) or later releases.

Note If you have a release prior to Release 7.0(3)I2(1), upgrade to Cisco Nexus 3000 Release 6.0.2.U6(3) first. Use the **install all nxos bootflash**:*image_name* **bios** command in Release 6.0.2.U6(3) to upgrade the BIOS version to version 3.x.x. Next, fast reload from Release 6.0.2.U6(3) to Release 7.0(3)I2(1) and later releases. On fast reload to Release 7.0(3)I2(1), the new BIOS is effective.

BIOS Versions for Each Cisco Nexus 3000 Series Platform

See the following BIOS versions for each Cisco Nexus 3000 Series platform.

Table 2: BIOS Versions Table for Each Cisco Nexus 3000 Series Platform

Sr.No.	Switch Name	Switch Model	Latest BIOS version
1.	Cisco Nexus 3132Q switch	C3132Q-40GE	5.2.0
2.	Cisco Nexus 3132Q-X switch	C3132Q-40GX	5.2.0
3.	Cisco Nexus 3172PQ switch	C3172PQ-10GE	5.2.0
4.	Cisco Nexus 3172CR switch	C3172PQ-10GE	5.2.0
5.	Cisco Nexus 3064-X switch	C3064PQ-10GX	5.2.0
6.	Cisco Nexus 3064-TQ switch	C3064TQ-10GT	5.0.0
7.	Cisco Nexus 3016Q switch	C3016Q-40GE	5.0.0
8.	Cisco Nexus 3064-E switch	C3064PQ-10GE	5.0.0
9.	Cisco Nexus 3064PQ switch	C3064PQ-FA	5.0.0
10.	Cisco Nexus 3048TP switch	C3048TP-1GE	5.0.0

Guidelines for Upgrading in Fast-Reload Scenarios

If you have a Cisco Nexus 3000 release prior to Release 7.0(3)I2(1), upgrade to Cisco Nexus 3000 Release 6.0.2.U6(3) first. Complete the following steps in the given sequence to upgrade to Release 7.0(3)I3(1) when you are using fast-reload:

Note If you are performing a fast reload upgrade from Cisco Nexus 3000 release 6.x to Cisco Nexus 3000 release 7.x, you must first upgrade the BIOS to version 3.x.

Procedure

Step 1 If you have a Cisco Nexus 3000 release prior to Release 7.0(3)I2(1), upgrade to Cisco Nexus 3000 Release 6.0.2.U6(3) first as displayed in the following example:

```
switch# install all system n3000-uk9.6.0.2.U6.3.bin kickstart
n3000-uk9-kickstart.6.0.2.U6.3.bin
```

```
switch# install all system n3000-uk9.6.0.2.U6.3.bin kickstart
n3000-uk9-kickstart.6.0.2.U6.3.bin
Installer is forced disruptive

Verifying image bootflash:/n3000-uk9-kickstart.6.0.2.U6.3.bin for boot variable "kickstart".
[####################################] 100% -- SUCCESS

Verifying image bootflash:/n3000-uk9.6.0.2.U6.3.bin for boot variable "system".
[####################################] 100% -- SUCCESS
```

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

Extracting "system" version from image bootflash:/n3000-uk9.6.0.2.U6.3.bin.
[####################################] 100% -- SUCCESS

Extracting "kickstart" version from image bootflash:/n3000-uk9-kickstart.6.0.2.U6.3.bin.
[####################################] 100% -- SUCCESS

Extracting "bios" version from image bootflash:/n3000-uk9.6.0.2.U6.3.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 Forced by the user



Images will be upgraded according to following table:
Module Image Running-Version New-Version Upg-Required
------ ---------------- ---------------------- ---------------------- ------------
1 system 6.0(2)U3(7) 6.0(2)U6(3) yes
1 kickstart 6.0(2)U3(7) 6.0(2)U6(3) yes
1 bios v2.6.0(08/06/2014) v2.6.0(08/06/2014) no
1 power-seq v1.0 v1.0 no
1 SFP-uC v2.12 v2.12 no


Switch will be reloaded for disruptive upgrade.
Time Stamp: Fri Sep 4 18:02:23 2015


Install is in progress, please wait.

Performing runtime checks.
[####################################] 100% -- SUCCESS

Setting boot variables.
[####################################] 100% -- SUCCESS

Performing configuration copy.
[####################################] 100% -- SUCCESS
Time Stamp: Fri Sep 4 18:03:11 2015


Finishing the upgrade, switch will reboot in 10 seconds.
```

Step 2 When you upgrade to Release 6.0.2.U6(3), the BIOS upgrade CLI will be available. In Release 6.0(2)U6(3a), an additional CLI option is introduced to upgrade only the BIOS:

switch# **install all nxos**: *image_name* **bios**

Note Step 2 needs to be run only if you plan to fast-reload to Release 7.0(3)I2(1). This CLI needs to be run from Release 6.0(2)U6(3a) and it upgrades the BIOS image for Release 7.0(3)I2(1) image; it does not reload the switch. Do not attempt a fast-reload without upgrading the BIOS first.

Using **install all** command from Release 6.0.2.U6(3) or newer to Release 7.0(3)I2(1) will automatically upgrade the BIOS.

Note During the BIOS upgrade, the system warns that the install is disruptive, but it is actually not disruptive and the device will not be reloaded. You can proceed with the BIOS upgrade.

The "Unsupported in new image, module needs to be powered off" message displays during a disruptive upgrade. It explains that the device automatically reloads to complete the upgrade.

```
switch# install all nxos nxos.7.0.3.I2.1.bin bios
Installer is forced disruptive

Verifying image bootflash:/nxos.7.0.3.I2.1.bin for boot variable "nxos".
[####################################] 100% -- SUCCESS

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

Extracting "nxos" version from image bootflash:/nxos.7.0.3.I2.1.bin.
[####################################] 100% -- SUCCESS

Extracting "bios" version from image bootflash:/nxos.7.0.3.I2.1.bin.
[####################################] 100% -- SUCCESS

Performing runtime checks.
[####################################] 100% -- SUCCESS

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



Compatibility check is done:
Module bootable Impact Install-type Reason
------ -------- -------------- ------------ ------
1 yes disruptive reset Unsupported in new image, module needs to be powered off



Images will be upgraded according to following table:
Module Image Running-Version New-Version Upg-Required
------ ---------------- ---------------------- ---------------------- ------------
1 bios v2.6.0(12/05/2013) v3.5.0(08/07/2015) yes


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

Time Stamp: Fri Sep 4 19:19:32 2015


Install is in progress, please wait.


Performing runtime checks.
[####################################] 100% -- SUCCESS

Module 1: Refreshing compact flash and upgrading bios/loader/bootrom/power-seq.
Warning: please do not remove or power off the module at this time.
Note: Power-seq upgrade needs a power-cycle to take into effect.
On success of power-seq upgrade, SWITCH OFF THE POWER to the system and then, power it up.
[####################################] 100% -- SUCCESS
```

```
Time Stamp: Fri Sep 4 19:22:56 2015


Install has been successful.
switch#
```

Step 3 Next, upgrade to Release 7.0(3)I3(1) using fast-reload. Using fast-reload after the BIOS upgrade or using **install all** are the only supported methods of upgrading to Release 7.0(3)I3(1). For example, use the following command:

```
switch#fast-reload nxos bootflash:nxos.7.0.3.I3.1.bin
```

Example:

```
switch# fast-reload nxos bootflash:nxos.7.0.3.I3.1.bin
...
uri is: /nxos.7.0.3.I3.1.bin
..
..
Notifying services about fast-reload.
fast-reload can proceed!!
Do you want to continue with the installation (y/n)? [n] y
Install is in progress, please wait.
.....
[33492.924958] [1426413334] writing reset reason 133, (null)
[33493.242369] [1426413334] Starting new kernel
INIT: version 2Loading IGB driver...
Installing SSE module... done
Creating the sse device node... done
Installing CCTRL driver for card_type 11...
Checking SSD firmware...
Model=Micron_M550_MTFDDAT064MAY, FwRev=MU01, SerialNo=MSA182202S9
Checking all filesystems.......
Installing SPROM driver...
Installing default sprom values...
done.Configuring network...
Installing veobc...
Installing OBFL driver...
blogger: nothing to do.
..done Sun Aug 23 09:55:51 UTC 2015
tune2fs 1.35 (28-Feb-2004)
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...
Sun Aug 23 09:55:54 UTC 2015
blogger: nothing to do.
..done Sun Aug 23 09:55:56 UTC 2015
Load plugins that defined in image conf: /isan/plugin_img/img.conf
Initialize Patching Repository during load
Loading plugin 0: core_plugin...
num srgs 1
0: swid-core-inseor, swid-core-inseor
num srgs 1
0: swid-inseor-ks, swid-inseor-ks
Creating /dev/mcelog
Starting mcelog daemon
INIT: Entering runlevel: 3
Populating conf files for hybrid sysmgr...
Starting hybrid sysmgr...
```

Note The configuration must be backed up prior to upgrading to a new release as the configuration is required for the downgrade later.

Guidelines for Upgrading in Non-Fast Reload Scenarios

Complete the following steps in the given sequence to upgrade to Release 7.x when you are not using fast-reload:

Procedure

Perform **install all** to upgrade the BIOS and also upgrade the NX-OS image to Release 7.x. Upgrade the Cisco NX-OS software using the **install all nxos bootflash:***filename* [**no-reload** | **non-disruptive** | **non-interruptive** | **serial**]

Example:

```
switch# install all nxos bootflash:nxos.7.0.3.I3.1.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.)

Note The non-disruptive option is supported only from Release 7.0(3)I3(1) to the later releases of Cisco Nexus 3000 Series switches.

- non-interruptive—Upgrades the software without any prompts. This option skips all error and sanity checks.
- serial—Upgrades the line cards in the system one at a time. (By default, the line cards are upgraded in batches to save time.)

The "Unsupported in new image, module needs to be powered off" message displays during a disruptive upgrade. It explains that the device automatically reloads to complete the upgrade.

```
Installer is forced disruptive

Verifying image bootflash:/nxos.7.0.3.I3.1.bin for boot variable "nxos".
[########################################] 100% -- SUCCESS

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

Extracting "nxos" version from image bootflash:/nxos.7.0.3.I3.1.bin.
[########################################] 100% -- SUCCESS

Extracting "bios" version from image bootflash:/nxos.7.0.3.I3.1.bin.
[########################################] 100% -- SUCCESS

Performing runtime checks.
```

```
[########################################] 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 Unsupported in new image, module needs to be powered off



Images will be upgraded according to following table:
Module Image Running-Version New-Version Upg-Required
------ ---------------- ---------------------- ---------------------- ------------
1 kickstart 6.0(2)U6(3) 7.0(3)I3(1) yes
1 bios v2.7.0(04/01/2014) v3.2.0(08/06/2015) yes


Switch will be reloaded for disruptive upgrade.

Time Stamp: Wed Sep 2 17:28:22 2015


Install is in progress, please wait.

Performing runtime checks.
[########################################] 100% -- SUCCESS

Setting boot variables.
[########################################] 100% -- SUCCESS

Performing configuration copy.
[########################################] 100% -- SUCCESS

Module 1: Refreshing compact flash and upgrading bios/loader/bootrom/power-seq.
Warning: please do not remove or power off the module at this time.
Note: Power-seq upgrade needs a power-cycle to take into effect.
On success of power-seq upgrade, SWITCH OFF THE POWER to the system and then, power it up.
[########################################] 100% -- SUCCESS

Time Stamp: Wed Sep 2 17:32:08 2015
Finishing the upgrade, switch will reboot in 10 seconds
```

The configuration must be backed up prior to upgrading to a new release as the configuration is required for the downgrade later.

Caution For Cisco Nexus 3000 vPC topologies, a non-disruptive upgrade from Cisco NX-OS Release 6.0(3)U6(3) to 7.0(3)I2(1) is not supported as the upgrade will cause a traffic disruption. An upcoming maintenance release will support non-disruptive upgrades for vPC topologies. It is highly recommended that customers with vPC topologies wait for the next maintenance release of 7.0(3)I2(x), to avoid traffic disruption.

Upgrade Prerequisites

- Ensure that the network is stable and no changes are made while an upgrade is in progress.
- Ensure that you check for feature compatibility between the current running release and the target release.

Management Services After an Upgrade

Before the switch is reset for an upgrade, inband and management ports are brought down and are brought back up after the upgrade completes. Services that depend on the inband and management ports are impacted during this time.

Table 3: Inband and Management Ports Services Impacted During Upgrade Reset

Service	Description
Telnet/SSH	When an upgrade resets the system to load the target Cisco NX-OS version, all Telnet/SSH sessions are disconnected and need to be reestablished after the upgrade completes.
AAA/RADIUS	Applications that leverage the AAA Service (such as login) are disabled during an upgrade, because all Network Management services are disabled during this time, this behavior is consistent.
HTTP	HTTP sessions to the switch are disconnected during an upgrade reboot. After the reboot, the HTTP is restarted and the switch will accept an HTTP sessions.
NTP	NTP sessions to and from the switch are disrupted during an upgrade reboot. After the reboot, NTP session are reestablished based on the saved startup configuration.

Layer-2 Protocols Impact

The following table lists the upgrade impacts to Layer 2 protocols.

Table 4: Upgrade Impact to Layer 2 Protocols

Protocol	Description
LACP	IEEE 802.3ad provides for the default slow aging timers to be transmitted once every 30 seconds in steady state and to expire after 90 seconds. Upgrade should not impact peers that rely on LACP because the recovery time is less than 90 seconds.
IGMP	IGMP does not disrupt existing flows of multicast traffic that are already present, but new flows are not learned (and are dropped) until an upgrade completes. New router ports or changes to router ports are not detected during this time.

Protocol	Description
DCBX and LLDP	DCBX uses LLDP to exchange parameters between peer devices. Because DCBX is a link-local protocol, when the switch undergoes an upgrade, the age time is increased on all ports on the switches that are being upgraded. Manual configurations are ignored during this time.
CDP	During an upgrade, the time-to-live value is increased (180 seconds) if it is less than the recommended timeout value. The configuration is ignored if manually specified.
L2MP IS-IS	Before a switch reboots for an upgrade, the switch transmits L2 IS-IS hellos on all interfaces to prevent neighbor switches from marking routes to the upgrade switch as down. Any topology changes during this time are also not acted upon until the upgrade completes.

Ethernet Interfaces on the Switch

To avoid link down to link up transitions during the control plane outage time, the laser is turned off for administratively up ports that are operationally down. This situation occurs during the upgrade reboot starting state. After the upgrade reboot and a stateful restart, the laser is turned back on. This action prevents the link state from transitioning from down to up during an upgrade.

Pre-Installation Checks

You should do certain sanity checks to ensure that the system is ready for an upgrade and to understand the impact of the upgrade:

- Enter the **show incompatibility** command to verify that the target image is feature-wise compatible with the current image.
- Enter the **show logging level** command to ensure that the severity level for all processes is set to 5 or below.
- Enter the **show install all impact** command to identify the upgrade impact.
- A BIOS incompatibility issue has been discovered on specific Cisco Nexus 3000 and 3100 Series switches. When you upgrade these switches from Cisco NX-OS Release 6.0(2)U6(8) or an earlier release to Cisco NX-OS Release 7.0(x), an MD5 mismatch error might occur and leave the switch at the loader prompt. We recommend that you view the field notice for this release to see if your software or hardware platforms are affected. You can find the field notice at the following URL http://www.cisco.com/c/en/us/support/docs/field-notices/642/fn64233.html
- Enter the **install all** command to update to the latest Cisco NX-OS software.
- Review the installer impact analysis and choose to continue.

Note The switch might reload at this time and cause a traffic disruption.

- Monitor the installation progress.
- Verify the upgrade.
- Enter the **show install all status** command to verify the status of the installation

The following table lists the show commands that identify the impact or potential problems that may occur when performing an upgrade.

Table 5: Upgrade show Commands

Command	Definition
show incompatibility system	Displays incompatible configurations on the current system that will impact the upgrade version.
show logging level	Displays the facility logging severity level configuration. Logging levels for all processes must be set at 5 or below when performing an upgrade. Processes with a logging level greater than 5 are not displayed when you enter the show install all impact command.
show install all impact	Displays information that describes the impact of the upgrade. This command also displays if the upgrade is disruptive or not and if the switch needs to be rebooted and the reason why.

You can also perform the following tasks to identify potential problems before they occur:

- Ensure that you have enough space to store the images on bootflash:
- Display incompatible configurations on the current system that will impact the upgrade version.

```
switch# show incompatibility system pcco.s
No incompatible configurations
```

- Verify the impact of the upgrade.

```
switch# show install all impact nxos bootflash:nxos.7.0.3.I2.1.bin
```

Information About Fast Reboot

Fast reboot is supported only with limited configurations and topologies on the following switches:

- Cisco Nexus 3064-X
- Cisco Nexus 3064-E
- Cisco Nexus 3132Q
- Cisco Nexus 3172PQ
- Cisco Nexus 3132Q-X

During fast reboot, the image that runs on the CPU reloads the new image and runs it without a CPU or firmware reset. Although there is a brief disruption in traffic during fast reboot, it enables a switch to reload faster than during cold reboot.

Cisco NX-OS software allows you to use fast reboot in a non-interruptive mode. In this mode, fast reboot begins the installation process without any prompts. In this release, fast reboot also supports BGP graceful restart (GR) for compatible peers. You can trigger a fast reboot with graceful restart by using the **trigger-gr** option.

Fast Reboot Timing Requirements

Fast reboot has the following timing requirements for the configurations that it supports:

- Time taken to reset the ASIC and disrupt the data plane after control plane disruption—Less than 90 seconds, when the control plane is disrupted.
- Time taken to resume forwarding traffic—Less than 30 seconds from ASIC reset.

Fast Reboot Guidelines

Currently, fast reboot is supported only with limited configurations and topologies. Some of supported configurations and guidelines are listed in this section. When reloading system software by using the **fast-reload** command, use the supported follow these guidelines:

- Configuration changes—You cannot enter configuration mode during a reload or an upgrade. You should save, commit, or discard any active configuration sessions before upgrading or downgrading the Cisco NX-OS software image. The active configuration session is deleted without a warning during a reload.

  Use the **show configuration session summary** command to verify that there are no active configuration sessions.

  ```
  switch# show configuration session summary
  There are no active configuration sessions
  ```

  Ensure that you check the compatibility of configurations before using the **fast-reload** command.

  Note Do not use the **fast-reload** command for upgrades that may lead to kernel or BIOS changes.

  For more information on configuration sessions, see the Cisco Nexus 3000 Series NX-OS System Management Configuration Guide.

  Note The CLI and SNMP configuration change requests are denied.

- Topology—You should make topology changes such as Spanning Tree Protocol (STP) before you perform an upgrade. You should perform module installations or removals only before or after an upgrade. However, you should not make changes to the Layer 2 and routing topologies, and the default root bridge should not be configured.
- Scheduling—You should upgrade when your network is stable and steady. Ensure that everyone who has access to the switch or the network is not configuring the switch or the network during this time. You cannot configure a switch during an upgrade.

- Space—Verify that sufficient space is available in the location where you are copying the images. The internal bootflash requires a minimum of 700 MB of free space to perform a fast-reload upgrade from Cisco NX-OS Release 6.0(2)U6(x) to 7.0(3)I7(x) on Cisco Nexus 3064 and 3132 platform switches.
- Hardware—Avoid power interruptions during an installation procedure. Power interruptions can corrupt the software image.
- Connectivity to remote servers—Configure the IPv4 address or IPv6 address for the 10/100/1000 BASE-T Ethernet port connection (interface mgmt0). Ensure that the switch has a route to the remote server. The switch and the remote server must be in the same subnetwork if you do not have a router to route traffic between subnets.
- Link Aggregation Control Protocol (LACP) fast timers—To allow fast-reload, ensure that LACP fast timers are not configured.
- Retrieve compatible images in one of two ways:
  - Locally—Images are locally available on the switch.
  - Remotely—Images are in a remote location and you specify the destination using the remote server parameters and the filename to be used locally.
- Command—Use the following commands to prepare for and install the new software:
  - Use the **ping** command to verify connectivity to the remote server.
  - Use the **dir** command to verify the required space is available for the image files to be copied.
  - Use the **show install all impact** command to identify the upgrade impact. This command also displays whether the upgrade is disruptive or the reason why the upgrade is disruptive, whether the switch needs to be rebooted, and the reason why it needs to be rebooted.

Note We recommended that you log in to the console port to begin the upgrade process.

- Between control plane disruption and data plane disruption, the CPU stops responding.
- Configuration—Fast reboot currently supports the following configuration:
  - BGP v4 and v6
  - 16-way ECMP
  - 48 downlink L2 ports
  - 4 SVIs
  - Less than 10 VLANs
  - 2000 v4 routes and 2000 v6 routes
  - RACLs
  - ARPs
  - STP edge port configuration

- Repaved fast-reload also supports the change in configurations that earlier required a complete reload, for example, portmode profile, URPF enable/disable, and TCAM re-carving.
- The fast-reload from releases prior to Release 6.0(2)U6(3a) to Release 7.0(3)I2(1) does not work, as the earlier releases do not have the BIOS upgrade option.
- Do not use the **fast-reload** option for upgrade to/from a version that has reached EOL.
- Fast reload is supported on the Cisco Nexus 3172 platform switches.
- The fast reload feature also supports the change in the configurations that earlier required a complete reload, for example, portmode profile, URPF enable/disable, and TCAM re-carving.
- Fast reload does not upgrade the BIOS.
- If you upgrade from a Cisco NX-OS release that does not support the CoPP feature to a release that does support the CoPP feature, you must run the setup utility after the upgrade to enable CoPP on the device.
- If you downgrade to a release lower than Cisco NXOS release 6.0(2)U2(1) using the **install-all** command, fast reload does not work.

Using the Fast-Reload Command

The **fast-reload** command reloads Cisco Nexus 3000 or Nexus 3100 Series switches faster than the **reload** command.

ASCII configuration based fast-reload is also supported in addition to the PSS/binary configuration based fast-reload. The Cisco Nexus 3000 Series switches do not go through a complete reset with fast reload. The boards of Cisco Nexus 3000 and 3100 Series switches have two reset domains. The reset domain 1 contains the CPU, the Platform Controller Hub (PCH), the Management Ethernet controller, the PCI bridge, the OBFL, the USB, and the Fan Controller. The reset domain 2 contains the ASIC, the PHY retimers, the SFP+ modules, and the QSFP modules. Fast reload resets only the reset domain 2 and there is no reset of CPU, reload of BIOS, and firmware.

After you run the **fast-reload** command, the following sequence of events take place:

1. The switch loads the NXOS software image and upgrades the kernel. All applications undergo a stateless cold reboot and they are restarted through the startup configuration.
2. The control plane is disrupted. During control plane disruption, all control protocol communication stops. Control plane disruption is always less than 90 seconds.
3. After the control plane disruption, all control plane applications undergo a stateless cold reboot and do not retain their state. The new configuration is applied when the switch reloads.
4. The data plane is disrupted. Data plane disruption is always less than 30 seconds.
5. On the forwarding plane, all links become unavailable and the data plane does not retain its state after reload. Traffic forwarding is resumed within less than 30 seconds.

Note Ensure that you have a working image and that you analyze the impact of the fast reboot operation before using this command.

Fast Reload in PSS/Binary Configuration

Procedure

Step 1 Log in to the switch.

Step 2 To perform fast reboot on Cisco Nexus 3000 and 3100 Series switches, use the following command: **fast-reload** [**save-config**] [**trigger-gr**] [**nxos bootflash:***nxos-image-name*] [**non-interruptive**] command to perform a fast reload.

Example:

```
switch# fast-reload nxos bootflash:nxos.7.0.3.I2.1.bin
```

```
switch# fast-reload nxos bootflash:nxos.7.0.3.I3.1.bin
uri is: /nxos.7.0.3.I3.1.bin
..
..
Notifying services about fast-reload.
fast-reload can proceed!!
Do you want to continue with the installation (y/n)? [n] y
Install is in progress, please wait.
.....
[33492.924958] [1426413334] writing reset reason 133, (null)
[33493.242369] [1426413334] Starting new kernel
INIT: version 2Loading IGB driver...
Installing SSE module... done
Creating the sse device node... done
Installing CCTRL driver for card_type 11...
Checking SSD firmware...
Model=Micron_M550_MTFDDAT064MAY, FwRev=MU01, SerialNo=MSA182202S9
Checking all filesystems.......
Installing SPROM driver...
Installing default sprom values...
done.Configuring network...
Installing veobc...
Installing OBFL driver...
blogger: nothing to do.
..done Sun Aug 23 09:55:51 UTC 2015
tune2fs 1.35 (28-Feb-2004)
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...
Sun Aug 23 09:55:54 UTC 2015
blogger: nothing to do.
..done Sun Aug 23 09:55:56 UTC 2015
Load plugins that defined in image conf: /isan/plugin_img/img.conf
Initialize Patching Repository during load
Loading plugin 0: core_plugin...
num srgs 1
0: swid-core-inseor, swid-core-inseor
num srgs 1
0: swid-inseor-ks, swid-inseor-ks
Creating /dev/mcelog
```

```
Starting mcelog daemon
INIT: Entering runlevel: 3
Populating conf files for hybrid sysmgr...
Starting hybrid sysmgr...
```

Fast Reload In ASCII Configuration

ASCII configuration based fast-reload is also supported in addition to the PSS/binary configuration based fast-reload.

Note The copy file startup and fast reload are supported only for specific configurations, namely Layer 3 ports with port channels, eBGP, and a few physical l2 ports having SVI only towards the hosts.

To use ASCII-file based fast reload, use the following command:

copy *configuration-file* **startup-config**

fast-reload nxos bootflash:*nxos-image-name*

The *configuration-file* is an ASCII file that contains the system configurations that fast reload uses on upgrade or fast reload. It can be copied from the remote location also. If the NXOS software image is not specified, the image existing on the switch is reloaded. If the NXOS software image provided is a higher version than the existing version, an upgrade is triggered.

Note To ensure that subsequent fast reboot operations, use the NXOS software image as the boot variables, specify the save-config option while running the fast-reload command. If the save-config option is not specified, the fast-reload command does not save the boot variables.

Fast Reload Upgrade

Note Starting with Cisco NX-OS Release 7.0(3)I4(1), the fast reload feature is not supported.

Starting with Release 7.0(3)I2(1) and later releases, you can perform a faster reload and upgrade to a newer release with minimal data downtime compared to install all command.

The feature is similar to existing fast-reload support on Cisco Nexus 3000 Series switches from Release 6.0(2)U2(1) onwards with a few additional steps to upgrade BIOS before upgrading to Release 7.0(3)I2(1) or later releases.

Caution The fast-reload to Release 7.0(3)I2(1) is supported only from Release 6.0(2)U6(3a) or later releases, after the BIOS has been upgraded. Using fast-reload from Release 6.0(2)U6(3a) to Release 7.0(3)I2(1) without upgrading the BIOS will result in the switch not booting up. See BIOS Upgrade for Release 7.0(3)I2(1) and Later Releases, on page 9 for more information.

Note If guest shell or any virtual-services are enabled, the **install all** command should be used. Use the **show virtual-service list** command to verify the presence or the state of the guest shell or any virtual services..

Enabling BGP Graceful Restart with Fast Reboot

Cisco NX-OS software allows you to enable BGP graceful restarts (GR) with fast reboot. You can now use the **fast-reload trigger-gr** command to enable BGP GR. Use this command only when all BGP peers are GR-capable.

To enable BGP GR with fast reboot on Cisco Nexus 3000 and 3100 Series switches, use the following command:

fast-reload [**save-config**] [**trigger-gr**] [**nxos bootflash**:*nxos-image-name*] [**non-interruptive**] command to perform a fast reload.

```
switch# fast-reload trigger-gr nxos bootflash:nxos.7.0.3.I3.1.bin non-interruptive
...
Notifying services about fast-reload.

fast-reload can proceed!!

Time Stamp: Tue Aug 26 14:21:10 2014


Install is in progress, please wait.
.......
Time Stamp: Tue Aug 26 14:21:29 2014


Rebooting the switch to proceed with the upgrade.
All telnet and ssh connections will now be temporarily terminated.
[ 734.744176] writing reset reason 133, <NULL>
2014 Aug 26 14:21:34 switch %$ VDC-1 %$ %USER-0-SYSTEM_MSG: Fastboot Begin - bcm_usd
[ 736.705384] Starting new kernel
[ 736.742862] Moving to new kernel
[ 0.000000] Fastboot Memory at 0c100000 of size 201326592
ÿUsage: init 0123POST INIT Starts at Tue Aug 26 14:21:42 UTC 2014
Loading System Software Tue Aug 26 14:21:57 UTC 2014
System Software(/isan-upgrade/isan.bin) Loaded Tue Aug 26 14:22:08 UTC 2014
ethernet switching mode
INIT: Entering runlevel: 3
Mounting other filesystems: [
Set name-type for VLAN subsystem. Should be visible in /proc/net/vlan/config
Added VLAN with VID == 4042 to IF -:muxif:-
2014 Aug 26 14:22:17 switch %$ VDC-1 %$ %BCM_USD-2-BCM_USD_NOTIFICATION_IMP: FAST REBOOT
ENABLED
2014 Aug 26 14:22:18 switch %$ VDC-1 %$ %USER-2-SYSTEM_MSG: CLIS: loading cmd files begin
- clis
2014 Aug 26 14:22:27 switch %$ VDC-1 %$ %USER-2-SYSTEM_MSG: CLIS: loading cmd files end -
clis
2014 Aug 26 14:22:27 switch %$ VDC-1 %$ %USER-2-SYSTEM_MSG: CLIS: init begin - clis
2014 Aug 26 14:22:48 switch %$ VDC-1 %$ %USER-0-SYSTEM_MSG: Before ASIC reset - bcm_usd
2014 Aug 26 14:22:49 switch %$ VDC-1 %$ %USER-0-SYSTEM_MSG: Starting bcm_attach - bcm_usd
2014 Aug 26 14:22:56 switch %$ VDC-1 %$ %USER-0-SYSTEM_MSG: Finished bcm_attach... - bcm_usd
2014 Aug 26 14:22:58 switch %$ VDC-1 %$ %BCM_USD-2-ASIC_DONE:
2014 Aug 26 14:23:00 switch %$ VDC-1 %$ %VDC_MGR-2-VDC_ONLINE: vdc 1 has come online
```

Upgrading and Downgrading Using Fast Reboot

Upgrading Using Fast Reboot

You can upgrade the software on a switch by using fast reboot. To upgrade, you must specify the NXOS software image.

Before You Begin

Ensure that the version of the NXOS software image specified in the fast-reload command is higher than the version of the image currently existing on the switch.

```
switch# fast-reload nxos bootflash:nxos.7.0.3.I3.1.bin
```

Downgrading Using Fast Reboot

Downgrading the system software by using fast reboot is not supported. To downgrade the image software, use the **install all** command instead of fast reboot.

Using the Install All Command

The **install all** command triggers a disruptive software install on Cisco Nexus 3000 and Nexus 3100 Series switches. The following images are upgraded during the installation:

- The NXOS software image
- System BIOS
- Power sequencers on the system

The **install all** command provides the following benefits:

- You can upgrade the Cisco Nexus 3000 Series switches by using just one command.
- You can receive descriptive information about the intended changes to your system before you continue with the installation. For example, it identifies potential disruptive upgrades.
- You can continue or cancel the upgrade when you see this question (the default is no):

  ```
  Do you want to continue (y/n) [n]: y
  ```

- You can also use the **install all non-interruptive** command to install a new image without any prompts.
- The command automatically checks the image integrity, which includes the NXOS software image.
- The command performs a platform validity check to verify that a wrong image is not used.
- Pressing Ctrl + C gracefully ends the **install all** command. The command sequence completes the update step in progress and returns to the EXEC prompt.
- After entering the **install all** command, if any step in the sequence fails, the upgrade ends.
- The following message appears to warn you about the impact of upgrading the power sequencer:

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

```
    Note: Power-seq upgrade needs a power-cycle to take into effect.
```

Note After a successful power sequence upgrade, you must switch off the power to the system and then power it up.

Using the Install All Non-Interruptive Command

Cisco NX-OS software supports the use of non-interruptive **install all** command. You can now use the **install all non-interruptive** command to install a new image without any prompts.

To perform a non-interruptive install all on Cisco Nexus 3000 and 3100 Series switches, use the following command:

install all nxos bootflash: [*nxos-image-name*] [**non-interruptive**]

The "Unsupported in new image, module needs to be powered off" message displays during a disruptive upgrade. It explains that the device automatically reloads to complete the upgrade.

```
switch# install all nxos bootflash:nxos.7.0.3.I3.1.bin
Installer is forced disruptive

Verifying image bootflash:/nxos.7.0.3.I3.1.bin for boot variable "nxos".
[####################################] 100% -- SUCCESS

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

Extracting "nxos" version from image bootflash:/nxos.7.0.3.I3.1.bin.
[####################################] 100% -- SUCCESS

Extracting "bios" version from image bootflash:/nxos.7.0.3.I3.1.bin.
[####################################] 100% -- SUCCESS

Performing runtime checks.
[####################################] 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 Unsupported in new image, module needs to be powered off



Images will be upgraded according to following table:
Module Image Running-Version New-Version Upg-Required
------ ---------------- ---------------------- ---------------------- ------------
1 kickstart 6.0(2)U6(3) 7.0(3)I3(1) yes
1 bios v2.7.0(04/01/2014) v3.2.0(08/06/2015) yes


Switch will be reloaded for disruptive upgrade.
```

```
Time Stamp: Wed Sep 2 17:28:22 2015


Install is in progress, please wait.

Performing runtime checks.
[####################################] 100% -- SUCCESS

Setting boot variables.
[####################################] 100% -- SUCCESS

Performing configuration copy.
[####################################] 100% -- SUCCESS

Module 1: Refreshing compact flash and upgrading bios/loader/bootrom/power-seq.
Warning: please do not remove or power off the module at this time.
Note: Power-seq upgrade needs a power-cycle to take into effect.
On success of power-seq upgrade, SWITCH OFF THE POWER to the system and then, power it up.
[####################################] 100% -- SUCCESS

Time Stamp: Wed Sep 2 17:32:08 2015


Finishing the upgrade, switch will reboot in 10 seconds.
```

Few Other Guidelines

- If you upgrade to Cisco NX-OS Release 6.0(2)U4(1), run the **copy r s** command to ensure that VRF information is not missing in the startup configuration.
- Cisco Nexus 3000 series switches that use software versions older than Cisco NX-OS Release 5.0(3)U5(1) need to be updated to Cisco NX-OS Release 5.0(3)U5(1) before they are upgraded to Cisco NX-OS Release 6.0(2).
- Cisco Nexus Cisco Nexus 3048TP-1GE-SUP switches that use software versions older than Cisco NX-OS Release 6.0(2)U6(2) need to be updated to Cisco NX-OS Release 6.0(2)U6(2a) before they are upgraded to Cisco NX-OS Release 6.0(2)U6(3) or later releases.
- Cisco NX-OS Release 5.0(3)U3(1) does not support a software upgrade from Cisco NX-OS Release 5.0(3)U2(2c). If you want to upgrade through this path, see CSCty75328 for details about how to work around this issue.
- In Cisco NX-OS Release 5.0(3)U3(1), support for IPv6 was added in Control Plane Policing (CoPP). To enable redirection of IPv6 control packets to the CPU, you must configure IPv6 CoPP on the system. Running the **write erase** command on a device that runs Release 5.0(3)U3(1) automatically applies CoPP on the device and ensures that all IPv4 and IPv6-related CoPP configuration is set up correctly.
- If you upgrade from a Cisco NX-OS release that does not support the CoPP feature to a release that does support the CoPP feature, you must run the setup utility after the upgrade to enable CoPP on the device.
- If you upgrade from Cisco NX-OS Release 5.0(3)U2(2), which supports the CoPP feature, to Cisco NX-OS Release 5.0(3)U3(1), which adds CoPP classes for IPv6 support, you must run the setup script to enable the IPv6 CoPP feature on the device.
- In Cisco NX-OS Release 6.0(2)U2(2), the default interface name in LLDP MIB is in short form. To make it long form, you must set lldp portid-subtype to 1. In Cisco NX-OS Release 6.0(2)U2(3), this behavior was reversed. The default interface name in LLDP MIB is now in long form. To make it short form, you must set lldp portid-subtype to 0.

- If you have set lldp port-subtype to 1 and you are upgrading to Cisco NX-OS Release 6.0(2)U2(4), ensure that you set lldp port-subtype to 0.

Upgrading Procedures

The upgrade process is triggered when you enter the **install all** command. This section describes the sequence of events that occur when you upgrade a single Cisco Nexus 3000 Series switch.

Note If you have a release prior to Release 7.0(3)I2(1), upgrade to Cisco Nexus 3000 Release 6.0.2.U6(3a) first and then upgrade to Release 7.0(3)I2(1) or later releases.

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

Table 6: ISSU- related messages

Reason Field Message — in Cisco NX-OS Release 7.0(3)I3(1)	Reason Field Message — in Cisco NX-OS Release 7.0(3)I4(1) or a Later Release	Description
Incompatible image	Incompatible image for ISSU	The Cisco NX-OS image to which you are attempting to upgrade does not support ISSU.
Hitless upgrade is not supported	Default upgrade is not hitless	By default, the software upgrade process is disruptive. You must configure the non-disruptive option to perform an ISSU.

Installation At-A-Glance

The following table shows an overview of the upgrade process.

Table 7: Upgrade Process At-A-Glance

Upgrade Preparation	**1.** Log into the first Cisco Nexus 3000 Series switch. We recommend that you log into the console port. In vPC topologies, the first upgrade can be performed on either the primary or secondary switch in the topology. **2.** Log into Cisco.com to access the Software Download Center. To log into Cisco.com, go to https://www.cisco.com and click Log In at the top of the page. Enter your Cisco username and password. **3.** Choose and download the software image to the server. **4.** Verify that the required space is available in the bootflash: directory for the image file(s) to be copied. **5.** If you need more space in the bootflash: directory, delete unnecessary files to make space available. **6.** Copy the Cisco NX-OS software image to the bootflash using a transfer protocol such as ftp:, http:, https:, tftp:, scp:, or sftp. Example: `switch# copy scp://user@scpserver.cisco.com//download/nxos.9.3.1.bin bootflash:nxos.9.3.1.bin` **7.** Compare the file sizes of the images that were transferred using the **dir bootflash** command. The file sizes of the images obtained from https://www.cisco.com and the image sizes of the transferred files should be the same. **8.** Complete these steps for each switch in the topology.
Pre-upgrade Checks	**1.** Enter the **show incompatibility** command to verify that the target image is feature-wise compatible with the current image. **2.** Enter the **show install all impact** command to identify the upgrade impact.
Upgrade Begins	**1.** Enter the **install all** command to update to the latest Cisco NX-OS software. **2.** Peruse the installer impact analysis and accept to proceed. **3.** The installer upgrades the software.
Upgrade Verification	**1.** Enter the **show install all status** command to verify the status of the installation.

Copying the Running Configuration from an External Flash Memory Device

You can copy configuration files from an external flash memory device.

Before you begin

Insert the external flash memory device into the active supervisor module.

Procedure

	Command or Action	Purpose
Step 1	(Optional) **dir**{**usb1**:|**usb2**:}[*directory/*] **Example:** `switch# dir usb1:`	Displays the files on the external flash memory device.
Step 2	**copy**{**usb1**:|**usb2**:}[*directory/*] *filename*{**bootflash:**}[*directory/*] *filename* **Example:** `switch# copy usb1:pcco.k bootflash:pcco.k`	Copies the image from an external flash memory device into the bootflash. The filename argument is case sensitive.
Step 3	**copy**{**usb1**:|**usb2**:}[*directory/*] *filename* **running-config** **Example:** `switch# copy usb1:dsn-config.cfg running-config`	Copies the running configuration from an external flash memory device. The filename argument is case sensitive.
Step 4	(Optional) **show running-config** **Example:** `switch# show running-config`	Displays the running configuration.
Step 5	(Optional) **copy running-config startup-config** **Example:** `switch# copy running-config startup-config`	Copies the running configuration to the startup configuration.

Copying the Startup Configuration from an External Flash Memory Device

You can recover the startup configuration on your Cisco NX-OS device by downloading a new startup configuration file saved on an external flash memory device.

Before you begin

Insert the external flash memory device into the active supervisor module.

Procedure

	Command or Action	Purpose
Step 1	(Optional) **dir**{**usb1**:|**usb2**:}[*directory/*] **Example:** `switch# dir usb1:`	Displays the files on the external flash memory device.
Step 2	**copy**{**usb1**:|**usb2**:}[*directory/*] *filename*{**bootflash:**}[*directory/*]*filename* **Example:**	Copies the image from an external flash memory device into the bootflash. The filename argument is case sensitive.

	Command or Action	Purpose
	`switch# copy usb1:pcco.k bootflash:pcco.k.`	
Step 3	**copy** {**usb1**:|**usb2**:} [*directory/*] *filename* **startup-config** **Example:** `switch# copy usb1:dsn-config.cfg startup-config`	Copies the startup configuration from an external flash memory device. The filename argument is case sensitive.
Step 4	(Optional) **show startup-config** **Example:** `switch# show startup-config`	Displays the startup configuration.
Step 5	(Optional) **copy running-config startup-config** **Example:** `switch# copy running-config startup-config`	Copies the running configuration to the startup configuration.

Upgrade Process in a Non-vPC Topology

The following list summarizes the upgrade process in a non-vPC topology:

1. The **install all** command 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 installation completes.

The following example displays the upgrade process:

```
switch# install all nxos bootflash:<nxos-image-name>
```

Guidelines for vPC Upgrades

- An upgrade from Cisco NX-OS Release 6.x to 7.x is disruptive for Cisco Nexus 3000 and 3100 Series switches in a vPC environment when the STP global port type is configured as network or edge. To work around this issue, disable the **spanning-tree port type** {**network** | **edge**} **default** command, perform the upgrade, and then re-enable this command on both switches in the vPC.
- For Cisco Nexus 3000 vPC topologies, an upgrade from Cisco NX-OS Release 6.0(2)U6(3a) to Release 7.0(3)I2(1) is not supported as the upgrade will cause a traffic disruption.

In the event that one of the vPC peers is upgraded to Cisco NX-OS Release 7.0(3)I2(1) first and it is reloaded, the vPC peer link does not come up on reload, and all vPC port channels are down on the device that was upgraded.

The other vPC peer that is running Cisco NX-OS Release 6.0(2)U6(3a) should continue to act as vPC primary and forward the traffic. This device also needs to be upgraded to Cisco NX-OS Release 7.0(3)I2(1) for the vPC peer link to come up and for both the devices to forward the traffic.

When the second vPC switch is reloaded, there is total traffic disruption until the second switch comes online and participates in the vPC peer negotiation. The traffic disruption is equivalent to the switch reboot time and the Layer 3/Layer 2 convergence depending on the scale. The downtime could be anywhere between 3 to 5 minutes.

For this reason, it is highly recommended to upgrade to Cisco NX-OS Release 7.0(3)I2(1) in vPC scenarios on the Cisco Nexus 3000 Series switches only under the following conditions:

- New/Greenfield deployments
- Installations where the maintenance window allows up to 5 minutes of traffic disruption time

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.

Monitoring the Upgrade Status

The following table lists the **show** commands that are used to monitor installation upgrades.

Command	Definition
show install all failure-reason	Displays the applications that failed during an installation and why the installation failed.
show install all status	Displays a high-level log of the installation.
show tech-support	Displays the system and configuration information that you can provide to the Cisco Technical Assistance Center when reporting a problem.

Downgrading from a Higher Release

The procedure for entering the **install all** command to downgrade the switch is identical to using the **install all** command for a switch upgrade, except that the image files to be loaded are for an earlier release than the image that is currently running on the switch. You can use the **show incompatibility system command** to ensure that there are no feature incompatibilities between the current release and the target release. Note that downgrades are disruptive.

Cisco NX-OS Release 6.0(2)U2(1) allows you to define an MTU value for each class in a policy map. However, in Cisco NX-OS Release 5.0(3), all classes in a policy map must have the same MTU value. Therefore, before you downgrade from Cisco NX-OS Release 6.0(2)U2(1) to Cisco NX-OS Release 5.0(3), ensure that you configure a single MTU value for all the classes in a policy map.

Note Before you downgrade to a specific release, check the release notes for the current release installed on the switch, to ensure that your hardware is compatible with the specific release. See the Cisco *Nexus 3000 Series Switch Release Notes* for details.

Downgrading from Release 7.x to Release 6.0(2)U6(x)

This section contains an example for downgrading from Cisco NX-OS Release 7.x to Release 6.0(2)U6(3a). Downgrading from Release 7.x to Release 6.0(2)U6(3a) with configuration is not officially supported via **install all** command.

Note While downgrading from Cisco NX-OS Release 7.x to Release 6.0(2)U6(x), you must first downgrade the system to Release 6.0(2)U6(3a), and then downgrade to any other Cisco NX-OS Release 6.0(2)U6(x) versions.

Caution Make sure that you store the pre-Release 7.x configuration file for later use.

Complete the following steps to downgrade from Release 7.x to Release 6.0(2)U6(3a):

Procedure

Step 1 Enter the **write erase** command

```
switch# wr erase
Warning: This command will erase the startup-configuration.
Do you wish to proceed anyway? (y/n) [n] y
switch#
```

Step 2 Enter the **write erase boot** command

```
switch# wr erase boot
Warning: This command will erase the boot variables and the ip-configuration of interface
management 0.
Do you wish to proceed anyway? (y/n) [n] y
switch#
```

Step 3 Enter the **copy** *Release 6.0(2)U6(3a)-config* **startup-config** command

```
switch# copy downgrade startup-config
```

Step 4 Enter the **install all kickstart** *img.kick* *system img.sys* **no-save bios-force** command

Note The no-save option is now required to downgrade from Release 7.x to Release 6.x. The bios-force is a hidden option that is only available on Cisco Nexus 3000 Series switches that are running 7.x releases.

```
switch# install all kickstart n3000-uk9-kickstart.6.0.2.U6.3.bin system
n3000-uk9.6.0.2.U6.3.bin no-save bios-force
Installer will perform compatibility check first. Please wait.
Installer is forced disruptive
```

```
Verifying image bootflash:/n3000-uk9-kickstart.6.0.2.U6.3.bin for boot variable "kickstart".
[####################] 100% -- SUCCESS

Verifying image bootflash:/n3000-uk9.6.0.2.U6.3.bin for boot variable "system".
[####################] 100% -- SUCCESS

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

Preparing "system" version info using image bootflash:/n3000-uk9.6.0.2.U6.3.bin.
[####################] 100% -- SUCCESS

Preparing "kickstart" version info using image bootflash:/n3000-uk9-kickstart.6.0.2.U6.3.bin.
[####################] 100% -- SUCCESS

Preparing "bios" version info using image.
[####################] 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 Hitless upgrade is not supported


Images will be upgraded according to following table:
Module Image Running-Version(pri:alt) New-Version Upg-Required
------ ---------- ---------------------------------------- -------------------- ------------
1 system 7.0(3)I3(1) 6.0(2)U6(3a) yes
1 kickstart 7.0(3)I3(1) 6.0(2)U6(3a) yes
1 bios v3.1.0(05/26/2015) v2.7.0(10/15/2013) no


Switch will be reloaded for disruptive upgrade.


Install is in progress, please wait.

Performing runtime checks.
[####################] 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

Converting startup config.
[####################] 100% -- SUCCESS


Finishing the upgrade, switch will reboot in 10 seconds.
switch#
```

The ASCII-replay of Release 6.0(2)U6(3a) configuration brings the switch up with the desired configuration and the Release 6.0(2)U6(3a) image.

Step 5 To verify whether the boot variables exist, enter the **show boot** command. If the boot variables do not exist, enter the following set of commands to update the boot variables manually:

```
switch# configure t
switch (config)# boot kickstart <img.kick>
switch (config)# boot system <img.sys>
switch (config)# write run start
```

Note If lockup occurs on the switch, do a tftp boot.

Troubleshooting Installations

Some common causes for upgrade failure are as follows:

- The bootflash: does not have enough space to accept the updated image.
- The hardware is installed or removed while the upgrade is in process.
- A power disruption occurs while an upgrade is in progress.
- The entire path for the remote server location is not specified accurately.