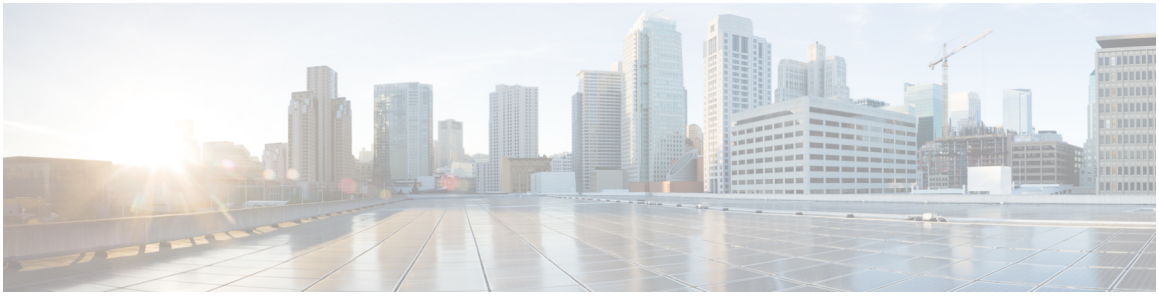


Cisco MDS 9000 NX-OS Software and Firmware Upgrade and Downgrade Guide, Release 9.x

First Published: 2021-08-25

Last Modified: 2026-04-30

Americas Headquarters
Cisco Systems, Inc.
170 West Tasman Drive
San Jose, CA 95134-1706
USA
http://www.cisco.com
Tel: 408 526-4000
800 553-NETS (6387)
Fax: 408 527-0883



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Preface

This preface describes the audience, organization of, and conventions used in the Cisco MDS 9000 Series Configuration Guides. It also provides information on how to obtain related documentation, and contains the following sections:

- Audience, on page vii
- Document Conventions, on page vii
- Documentation Feedback, on page ix
- Related Documentation, on page ix
- Communications, Services, and Additional Information, on page ix

Audience

This publication is for network administrators who install, configure, and maintain Cisco MDS 9000 Series Switches.

Document Conventions

Command descriptions use these 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.

Convention	Description
[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.
`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 these 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.

This document uses the following conventions:



Note Means *reader take note*. Notes contain helpful suggestions or references to material not covered in the manual.



Caution Means *reader be careful*. In this situation, you might do something that could result in equipment damage or loss of data.



Warning IMPORTANT SAFETY INSTRUCTIONS

This warning symbol means danger. You are in a situation that could cause bodily injury. Before you work on any equipment, be aware of the hazards involved with electrical circuitry and be familiar with standard practices for preventing accidents. Use the statement number provided at the end of each warning to locate its translation in the translated safety warnings that accompanied this device.

SAVE THESE INSTRUCTIONS

Documentation Feedback

To provide technical feedback on this document, or to report an error or omission, please send your comments to mds-docfeedback@cisco.com. We appreciate your feedback.

Related Documentation

The entire Cisco MDS 9000 Series switches documentation set is available at the following URL:

https://www.cisco.com/c/en/us/support/storage-networking/mds-9000-nx-os-san-os-software/series.html

Documentation Roadmap

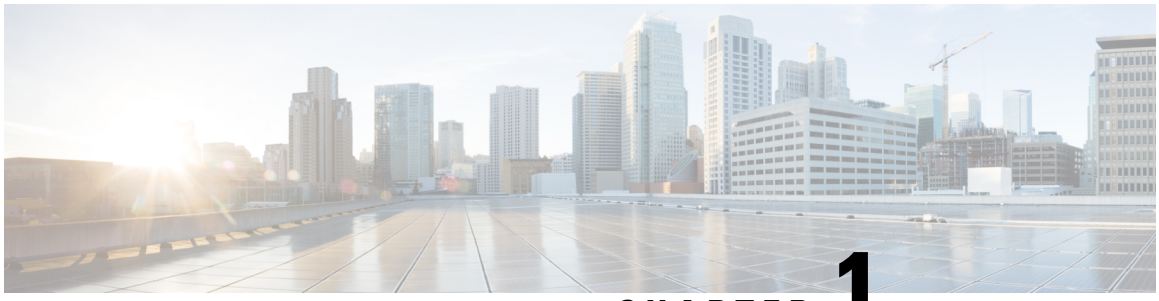
https://www.cisco.com/c/en/us/td/docs/storage/san_switches/mds9000/roadmaps/rel90.html

Communications, Services, and Additional Information

- To receive timely, relevant information from Cisco, sign up at Cisco Profile Manager.
- To get the business results you're looking for with the technologies that matter, visit Cisco Services.
- To submit a service request, visit Cisco Support.
- To discover and browse secure, validated enterprise-class apps, products, solutions and services, visit Cisco Marketplace.
- To obtain general networking, training, and certification titles, visit Cisco Press.
- To find warranty information for a specific product or product family, access Cisco Warranty Finder.

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.



CHAPTER 1

New and Changed Information

• New and Changed Information, on page 1

New and Changed Information

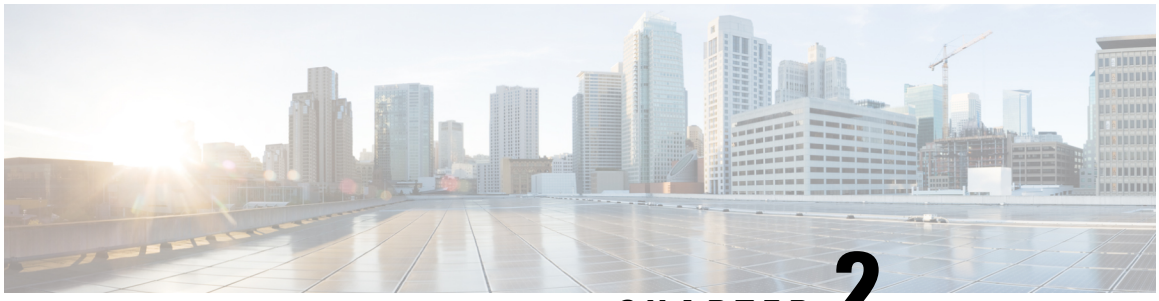
Table 1: New and Changed Features

Feature	Description	Changed in Release	Where Documented
Upgrade and Downgrade to FICON-qualified 9.4(3b)	Added for FICON qualification on 9.4(5)	9.4(5)	FICON Nondisruptive Upgrade Paths to Cisco MDS NX-OS Release 9.4(5), on page 34 FICON Nondisruptive Downgrade Paths from Cisco MDS NX-OS Release 9.4(5), on page 75
Upgrade Requirements for 32G and 64G Switches	After an upgrade, additional actions are required depending on the platform. 32G switches require a manual reload after ISSU, unless a disruptive ISSU is performed. 64G switches require an EPLD upgrade, which involves a one-time reload.	9.4(5)	Cisco MDS NX-OS Software Upgrade Guidelines
Upgrade to 9.x releases	Updated upgrade paths to 9.x releases	--	Supported Cisco MDS NX-OS Software Nondisruptive Upgrade Paths, on page 19

Feature	Description	Changed in Release	Where Documented
Upgrade and Downgrade to FICON-qualified 9.4(3b)	Added for FICON qualification on 9.4(3b)	9.4(3b)	FICON Nondisruptive Upgrade Paths to Cisco MDS NX-OS Release 9.4(3b), on page 34 FICON Nondisruptive Downgrade Paths from Cisco MDS NX-OS Release 9.4(3b), on page 76
Upgrade and Downgrade to 9.4(4)	Added for 9.4(4) release	9.4(4)	Nondisruptive Upgrade Paths to Cisco MDS NX-OS Release 9.4(4), on page 22 Nondisruptive Downgrade Paths from Cisco MDS NX-OS Release 9.4(4), on page 67
Preventing SAN Analytics corruption	Added for CSCwo03706.	9.4(4)	Preventing Hardware Forwarding Corruption during ISSU, on page 40
Upgrade and Downgrade to 9.4(3b)	Added for 9.4(3b) release	9.4(3b)	Nondisruptive Upgrade Paths to Cisco MDS NX-OS Release 9.4(3b), on page 23 Nondisruptive Downgrade Paths from Cisco MDS NX-OS Release 9.4(3b), on page 67
Upgrade and Downgrade to 9.4(3a)	Added for 9.4(3a) release	9.4(3a)	Supported Cisco MDS NX-OS Software Nondisruptive Upgrade Paths, on page 19 Supported Cisco MDS NX-OS Software Nondisruptive Downgrade Paths, on page 65

Feature	Description	Changed in Release	Where Documented
Upgrade and Downgrade to 9.4(3)	Added for 9.4(3) release	9.4(3)	Supported Cisco MDS NX-OS Software Nondisruptive Upgrade Paths, on page 19 Supported Cisco MDS NX-OS Software Nondisruptive Downgrade Paths, on page 65
Upgrade and Downgrade to 9.4(2a)	Added for 9.4(2a) release	9.4(2a)	Supported Cisco MDS NX-OS Software Nondisruptive Upgrade Paths, on page 19 Supported Cisco MDS NX-OS Software Nondisruptive Downgrade Paths, on page 65
Transceivers Firmware Upgrade	This chapter is added.	9.4(2)	Upgrading Transceiver Firmware , on page 87

New and Changed Information



CHAPTER 2

Overview

This document describes how to upgrade or downgrade the Cisco MDS NX-OS software and firmware for Cisco MDS 9000 Series Multilayer Switches.

- Introduction, on page 5
- About Software Images, on page 5
- About Transceiver Firmware Bundles, on page 6
- Software Image for a Cisco MDS Switch, on page 7
- No Payload Encryption Software Images, on page 7
- Downloading NX-OS Software and Firmware, on page 8
- Related Resources, on page 9

Introduction

This document describes how to upgrade and downgrade the Cisco MDS NX-OS software and firmware for Cisco MDS 9000 Series Multilayer Switches.

Note All the CLI session examples that are provided in this document are intended only for reference. The actual switch output differs based on your switch model.

About Software Images

Cisco MDS switch is shipped with the Cisco MDS NX-OS operating system for the Cisco MDS 9000 Series Multilayer Directors and Fabric Switches. The Cisco MDS NX-OS software consists of two images: the kickstart image and the system image.

- To select the kickstart image, use the KICKSTART variable.
- To select the system image, use the SYSTEM variable.

The images and variables are important factors in any install procedure. Specify the variable and the respective image to upgrade or downgrade your switch. You do not always need both the kickstart and system images for installing the operating system.

Note Do not rename the standard image filenames.

Release notes are sometimes updated with the new information on restrictions and caveats. Refer to the following website for the most recent version of the Cisco MDS 9000 Series Release Notes.

Dependent Factors for Software Installation

The software image install procedure depends on the following factors:

- Software images — The kickstart and system image files reside in directories or folders that can be accessed from the Cisco MDS 9000 Series Multilayer switch prompt.
- Image version — Each image file has a version.
- Flash disks on the switch — The bootflash: resides on the supervisor module, and the CompactFlash disk is inserted into the slot0: device.
- Supervisor modules — Either single or dual supervisor modules are present.

Supported Components

For information on supported software and hardware components, see the Cisco MDS 9000 Series Compatibility Matrix.

Determining Compatibility of New Software with Existing Software

To determine the version of the Cisco MDS NX-OS software that is currently running on a Cisco MDS 9000 switch using the CLI, log in to the switch and run the **show version** command in privileged EXEC mode.

To determine the version of the Cisco MDS NX-OS software currently running on a Cisco MDS 9000 switch using Cisco DCNM for SAN, click the Switches tab in the Information pane, locate the relevant switch using the corresponding IP address, logical name, or worldwide name (WWN), and check its version in the Release column.

Use the **show incompatibility-all system bootflash** : *system image filename* command to determine which features are incompatible with the destination upgrade release.

```
switch(config)# show incompatibility-all system bootflash:m9700-sf4ek9-mz.9.2.1.bin

Checking incompatible configuration(s):
No incompatible configurations

Checking dynamic incompatibilities:
No incompatible configurations
```

About Transceiver Firmware Bundles

Some transceiver models contain firmware that supports updating. The update for each transceiver is bundled together as a single file which you can download from Cisco. When the upgrade process is run on the switch, NX-OS extracts the update for each type of transceiver and applies it to the corresponding transceiver type if the installed version is lower than the upgrade version.

Note These updates are disruptive to install and usually not required. Do not install them unless directed by Cisco support.

Software Image for a Cisco MDS Switch

The following table lists the system and kickstart image that you can use for a Cisco MDS switch.

Table 2: Software Images for Cisco MDS Switches

Cisco MDS Switch	Naming Convention
Cisco MDS 9396T	Filenames begin with m9300-s2ek9
Cisco MDS 9148T	Filenames begin with m9148-s6ek9
Cisco MDS 9132T	Filenames begin with m9100-s6ek9
Cisco MDS 9148S	Filenames begin with m9100-s5ek9
Cisco MDS 9220i	Filenames begin with m9220-s7ek9
Cisco MDS 9250i	Filenames begin with m9250-s5ek9
Cisco MDS 9396S	Filenames begin with m9300-s1ek9
Cisco MDS 9718, 9710, and 9706	Filenames begin with m9700-sf3ek9 [1] Filenames begin with m9700-sf4ek9 [2]
Cisco MDS 9124V	Filenames begin with m9124v-s8ek9
Cisco MDS 9148V	Filenames begin with m9148v-s8ek9
Cisco MDS 9396V	Filenames begin with m9396v-s3ek9

1 The m9700-sf3ek9 filename images are supported only on Cisco MDS 9700 Series Supervisor-1 Module on Cisco MDS 9710 and 9706 Director Switches, and Cisco MDS 9700 Series Supervisor-1E Module on Cisco MDS 9718 Director Switches.

2 The m9700-sf4ek9 filename images are supported only on Cisco MDS 9700 Series Supervisor-4 Module on Cisco MDS 9718, 9710, and 9706 Director Switches.

No Payload Encryption Software Images

No payload encryption (NPE) versions of Cisco MDS NX-OS software are available. These images have encryption code removed and can be used in countries that have import restrictions on products that encrypt payload data.

To differentiate an NPE image from a standard software image, the letters npe are included in the image name as follows:

- m9100-s6ek9-kickstart-mz-npe.9.3.2.bin
- m9100-s6ek9-mz-npe.9.3.2.bin
- m9100-s5ek9-kickstart-mz-npe.9.3.2.bin
- m9100-s5ek9-mz-npe.9.3.2.bin
- m9148-s6ek9-kickstart-mz-npe.9.3.2.bin
- m9148-s6ek9-mz-npe.9.3.2.bin
- m9300-s1ek9-kickstart-mz-npe.9.3.2.bin
- m9300-s1ek9-mz-npe.9.3.2.bin
- m9300-s2ek9-kickstart-mz-npe.9.3.2.bin
- m9300-s2ek9-mz-npe.9.3.2.bin
- m9396v-s3ek9-kickstart-mz-npe.9.4.1.bin
- m9396v-s3ek9-mz-npe.9.4.1.bin
- m9220-s7ek9-kickstart-mz-npe.9.3.2.bin
- m9220-s7ek9-mz-npe.9.3.2.bin
- m9700-sf4ek9-kickstart-mz-npe.9.3.2.bin
- m9700-sf4ek9-mz-npe.9.3.2.bin
- m9700-sf3ek9-kickstart-mz-npe.9.3.2.bin
- m9700-sf3ek9-mz-npe.9.3.2.bin
- m9700-sf4ek9-kickstart-mz-npe.9.3.2.bin
- m9700-sf4ek9-mz-npe.9.3.2.bin

Note When downloading software, ensure that you select the correct software image for your Cisco MDS 9000 Series Multilayer switch. Nondisruptive software upgrades or downgrades between NPE images and non-NPE images are not supported.

Downloading NX-OS Software and Firmware

The Cisco MDS NX-OS software is designed for mission-critical high-availability environments. To realize the benefits of nondisruptive upgrade on the Cisco MDS 9700 Series Multilayer Directors, we recommend that you install dual supervisor modules. See Cisco MDS 9700 Series Supervisor-4 Module Data Sheet.

To download the latest Cisco MDS NX-OS software, access the Software Center.

To request a copy of the source code under the terms of either GPL (General Public License) or LGPL (Lesser General Public License), email mds-software-disclosure@cisco.com.

Related Resources

The documentation set for the Cisco MDS 9000 Series includes the documents that are listed in this section. To find a document online, access the following URL:

https://www.cisco.com/en/US/products/ps5989/tsd_products_support_series_home.html

Release Notes

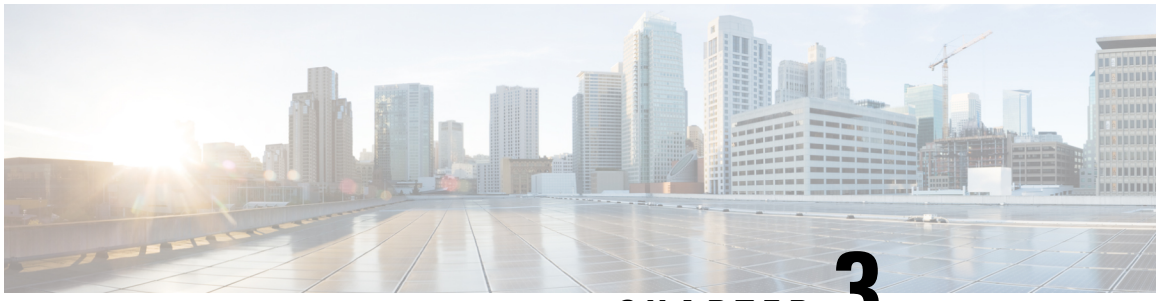
http://www.cisco.com/c/en/us/support/storage-networking/mds-9000-nx-os-san-os-software/products-release-notes-list.html

Compatibility Matrix

Cisco MDS 9000 Series Compatibility Matrix, Release 9.x

Configuration Examples TechNotes

Perform an MDS 9000 Series Switch Non-Disruptive NX-OS Upgrade



CHAPTER 3

Installing Cisco MDS NX-OS Release Software on a Cisco MDS Switch

• Initial Configuration of Cisco MDS NX-OS Software on a Cisco MDS Switch, on page 11

Initial Configuration of Cisco MDS NX-OS Software on a Cisco MDS Switch

To install the latest Cisco MDS NX-OS Release 9.x software images on a new Cisco MDS 9000 Series Multilayer switch, perform the following steps:

Procedure

Step 1 Verify the following physical connections for the new Cisco MDS 9000 Series Multilayer switch:

- The console port is physically connected to a computer terminal (or terminal server).
- The management 10/100/1000 Ethernet port (mgmt0) is connected to an external hub, switch, or a router.

For more information about physical connections, see the Cisco MDS 9000 Series Hardware Installation guides.

Note
On switches with dual supervisor modules, both the supervisor modules must have Ethernet connections on the management interfaces (mgmt 0) to maintain connectivity when switchovers occur during upgrades and downgrades.

Note
If the management 10/100/1000 Ethernet port (mgmt0) interface of the Cisco MDS 9700 Series Multilayer Directors has a preconfigured "/0" IPv6 address that cannot be removed, use the **write erase boot** command to clear the complete configuration of the device and reload the device using the **reload** command. Perform this process before commissioning the device into production, because this process is disruptive to the user traffic if it is applied to the active supervisor of a system. Ensure that there is an active console connection to the supervisor, because this process removes the IPv4 address of the mgmt0 interface.

Tip
Save the host ID information for future use, for example, to enable licensed features. The host ID information is provided in the Proof of Purchase document that accompanies the switch.

Step 2 Verify that the default console port parameters listed below are identical to the parameters of the computer terminal (or terminal server) attached to the switch console port:

- 9600 baud
- 8 data bits
- 1 stop bit
- No parity

See the Configuring Terminal Settings and Sessions chapter in the *Cisco MDS 9000 Series NX-OS Fundamentals Configuration Guide*.

Step 3 Power up the Cisco MDS 9000 Series Multilayer switch. The switch boots up automatically after powering on the switch.

Step 4 Obtain the IP address, subnet mask, and default gateway information that is required for the Cisco MDS 9000 Series Multilayer switch to communicate over the supervisor module Ethernet interface. This information is required to configure and manage the switch.

See the Using the Cisco NX-OS Setup Utility chapter in the *Cisco MDS 9000 Series NX-OS Fundamentals Configuration Guide*.

Step 5 Complete the System Admin Account Setup process.

If you create a short, easy-to-decipher password, your password will be rejected. Configure a strong password, as shown in the sample configuration. Passwords are case-sensitive. Explicitly create a password that meets the requirements that are listed in the Characteristics of Strong Passwords in the *Cisco MDS 9000 Series NX-OS Security Configuration Guide*.

Note
You can change the default password during the initial setup process. All Cisco MDS 9000 Series Multilayer switches have the network administrator as the default user (admin) with a default password (admin). You cannot change the default user.

```
---- System Admin Account Setup ----

Do you want to enforce secure password standard (yes/no) [y]: no

Enter the password for "admin":

Confirm the password for "admin":
```

Step 6 Enter **yes** to when prompted, to set up a mode and assign the information that is obtained in Step 5, on page 12.

See the Using the Cisco NX-OS Setup Utility chapter in the *Cisco MDS 9000 Series NX-OS Fundamentals Configuration Guide*.

Press **Ctrl-C** at prompts to skip the remaining configuration options and proceed with what is configured until that point.

Tip
If you do not want to answer a previously configured question, or if you want to skip answers to any questions, press **Enter**. If a default answer is not available (for example, a switch name), the switch uses the previously configured settings and moves to the next question.

The CLI configuration step (using factory defaults) is as follows:

```
---- Basic System Configuration Dialog ----

This setup utility will guide you through the basic configuration of
the system. Setup configures only enough connectivity for management
of the system.

Press Enter incase you want to skip any dialog. Use ctrl-c at anytime
to skip remaining dialogs.

Would you like to enter the basic configuration dialog (yes/no): yes
```

By default, two roles exist in all the switches:

- Network operator (network-operator) — Has permission to view only the configuration. The operator cannot make any configuration changes.
- Network administrator (network-admin) — Has permission to execute all commands and make configuration changes. The administrator can also create and customize up to 64 additional roles. One of these 64 additional roles can be configured during the initial setup process.

```
 Create another login account (yes/no) [n]: yes
```

Note
While configuring your initial setup, you can create an additional user account (if you are in the network-admin role) besides the administrator's account. The username must contain only non-numeric characters. See the Configuring User Accounts in the *Cisco MDS 9000 Series NX-OS Security Configuration Guide*.

```
Enter the user login ID: test

Enter the password for "test":
Confirm the password for "test":
Enter the user role [network-operator]:
```

Note
If you use SNMPv3, do not configure the SNMPv2 community string. Refer to the Configuring SMNP chapter in the *Cisco MDS 9000 Series NX-OS System Management Configuration Guide*.

```
Configure read-only SNMP community string (yes/no) [n]: yes

SNMP community string: admin
```

Note
The switch name is limited to 32 alphanumeric characters.

```
Enter the switch name: switch

Continue with Out-of-band (mgmt0) management configuration? [yes/no]: yes
```

Note
IPv6 is supported in Cisco MDS NX-OS Release 4.1(x) and later. However, the setup script supports only IPv4 for the management interface. For information about configuring IPv6 in the management interface, see the Cisco MDS 9000 Series NX-OS IP Services Configuration Guide.

```
Mgmt0 IPv4 address: ip_address
Mgmt0 IPv4 netmask: subnet_mask
Configure the default gateway? (yes/no) [y]: yes
IPv4 address of the default gateway : 10.104.122.1
Configure advanced IP options? (yes/no) [n]: yes
Continue with In-band (vsan1) management configuration? (yes/no) [n]: yes
Enable IP routing? (yes/no) [n]: yes
Configure static route? (yes/no) [n]: n
```

Note
Ensure that you have configured the IP route, IP default network address, and IP default gateway address to enable the SNMP access. If IP routing is enabled, the switch uses the IP route and the default network IP address. If IP routing is disabled, the switch uses the default gateway IP address.

```
Configure the default-network: (yes/no) [y]: yes
```

Note
The default network address is Destination prefix: dest_prefix provided in Mgmt0 IPv4 netmask: subnet_mask.

```
Default network IPv4 address: dest_prefix
Configure the DNS IPv4 address? (yes/no) [y]: yes
DNS IP address: name_server_ip_address
Configure the default domain name? (yes/no) [n]: yes
Default domain name: domain_name
Enable the ssh service? (yes/no) [y]:
Type of ssh key you would like to generate (dsa/rsa) [rsa]:
Number of rsa key bits <1024-4096> [1024]:
Enable the telnet service? (yes/no) [n]: y
Configure congestion/no_credit drop for fc interfaces? (yes/no) [y]: n
Enable the http-server? (yes/no) [y]:
Configure clock? (yes/no) [n]:
Configure timezone? (yes/no) [n]: yes
Enter timezone config [PST/MST/CST/EST] :PST
Enter Hrs offset from UTC [-23:+23] :
Enter Minutes offset from UTC [0-59] :+23
Configure summertime? (yes/no) [n]: yes
summer-time config :PDT 2 sunday march 02:00 1 sunday november 02:00 59
Configure NTP server? (yes/no) [n]: yes
NTP server IP address: ntp_server_IP_address
Configure default switchport interface state (shut/noshut) [shut]: shut
```

Note
The mgmt0 interface is not shut down at this point. Only the Fibre Channel, iSCSI, FCIP, and Gigabit Ethernet interfaces are shut down.

```
Configure default switchport trunk mode (on/off/auto) [on]: on
Configure default switchport port mode F (yes/no) [n]: yes
Configure default zone policy (permit/deny) [deny]: deny
Enable full zoneset distribution (yes/no) [n]: yes
Configure default zone mode (basic/enhanced) [basic]: basic
```

See the Configuring and Managing Zones chapter in the *Cisco MDS 9000 Series NX-OS Fabric Configuration Guide*.

```
The following configuration is applied:
username admin password admin_pass role network-admin
username user_name password user_pass role network-admin
snmp-server community snmp_community role
switchname switch
interface mgmt0
ip address ip_address subnet_mask
no shutdown
ip routing
ip route dest_prefix dest_mask dest_address
ip default-network dest_prefix
ip default-gateway default_gateway
ip name-server name_server
ip domain-name domain_name
telnet server disable
ssh key rsa 2048 force
ssh server enable
ntp server ipaddr ntp_server
```

```
system default switchport shutdown
system default switchport trunk mode on
system default switchport mode F
system default port-channel auto-create
zone default-zone permit vsan 1-4093
zoneset distribute full vsan 1-4093
system default zone mode enhanced

Would you like to edit the configuration? (yes/no) [n]: no
Would you like to edit the configuration? (yes/no) [n]: no
Use this configuration and save it? (yes/no) [y]: yes
```

Caution

If you do not save the configuration at this point, your changes will not be updated the next time the switch is rebooted. Type **yes** in order to save the new configuration. This process ensures that the kickstart and system boot images are also automatically configured.

Tip

Up to this point, you can only configure the switch using the CLI. Post this point, continue to configure the switch using either the CLI or the Cisco DCNM application. For more information on using the Cisco DCNM application to configure a switch, see the *Cisco DCNM Fundamentals Configuration Guide*.

```
Would you like to save the running-config to startup-config? (yes/no) [n]: y
[########################################] 100%
Copy complete.
```

If you continue to use the CLI, the login prompt is automatically displayed on your terminal.

Step 7 Log in to the switch using the new username and password.

Step 8 Verify that the required licenses are installed in the switch using the **show license** command.

The switch is initially shipped with the required licenses installed in the system. However, the initial license file does not cover unlicensed features that may be used during the grace period. For more information on licensing, see the *Cisco MDS 9000 Series NX-OS Licensing Guide*.

The following example shows the CLI output for a valid license:

```
switch# show license
license.lic:
SERVER this_host ANY
VENDOR cisco
INCREMENT ENTERPRISE_PKG cisco 1.0 permanent uncounted \
VENDOR_STRING=MDS HOSTID=VDH=REG070201 \
NOTICE="<LicFileID>ent_ips_main_fm.lic</LicFileID><LicLineID>0</LicLineI
D> \
<PAK>dummyPak</PAK>" SIGN=FB454F0A0D40
INCREMENT MAINFRAME_PKG cisco 1.0 permanent uncounted \
VENDOR_STRING=MDS HOSTID=VDH=REG070201 \
NOTICE="<LicFileID>ent_ips_main_fm.lic</LicFileID><LicLineID>1</LicLineI
D> \
<PAK>dummyPak</PAK>" SIGN=0DAE1B086D9E
INCREMENT SAN_EXTN_OVER_IP cisco 1.0 permanent 7 VENDOR_STRING=MDS \
HOSTID=VDH=REG070201 \
NOTICE="<LicFileID>ent_ips_main_fm.lic</LicFileID><LicLineID>2</LicLineI
D> \
<PAK>dummyPak</PAK>" SIGN=D336330C76A6
INCREMENT FM_SERVER_PKG cisco 1.0 permanent uncounted \
VENDOR_STRING=MDS HOSTID=VDH=REG070201 \
NOTICE="<LicFileID>ent_ips_main_fm.lic</LicFileID><LicLineID>3</LicLineI
D> \
<PAK>dummyPak</PAK>" SIGN=AEAEA04629E8
```

Step 9 Verify that the switch is running the desired Cisco MDS NX-OS Release 9.x software, depending on which version you have installed, by using the show version command:

```
switch# show version

Cisco Nexus Operating System (NX-OS) Software
TAC support: http://www.cisco.com/tac
Documents: http://www.cisco.com/en/US/products/ps9372/tsd_products_support_series_home.html
Copyright (c) 2002-2019, Cisco Systems, Inc. All rights reserved.
The copyrights to certain works contained in this software are
owned by other third parties and used and distributed under
license. Certain components of this software are licensed under
the GNU General Public License (GPL) version 2.0 or the GNU
Lesser General Public License (LGPL) Version 2.1. A copy of each
such license is available at
http://www.opensource.org/licenses/gpl-2.0.php and
http://www.opensource.org/licenses/lgpl-2.1.php

Software
BIOS: version 3.2.0
kickstart: version 9.3(2) [build 9.3(2)]
system: version 9.3(2) [build 9.3(2)]
BIOS compile time: 09/27/2022
kickstart image file is: bootflash:///m9700-sf4ek9-kickstart-mz.9.3.2.bin
kickstart compile time: 5/31/2022 12:00:00 [03/20/2022 12:14:26]

system image file is: bootflash:///m9700-sf4ek9-mz.9.3.2.bin
system compile time: 5/31/2022 12:00:00 [03/20/2022 13:49:56]


Hardware
cisco MDS 9710 (10 Slot) Chassis ("Supervisor Module-3")
Intel(R) Xeon(R) CPU with 8167260 kB of memory.
Processor Board ID JAE17050AU2

Device name: switch
bootflash: 3915776 kB
slot0: 0 kB (expansion flash)

Kernel uptime is 0 day(s), 0 hour(s), 48 minute(s), 25 second(s)

Last reset
Reason: Unknown
System version: 8.4(1)
Service:

plugin
Core Plugin, Ethernet Plugin
3:22 PM
```

If the desired Cisco MDS NX-OS Release 9.x software version is displayed, you can continue configuring the switch using one of the following options:

- Configure other Cisco MDS NX-OS features using the CLI. For more information about this, see Cisco MDS 9000 NX-OS and SAN-OS Configuration guides.
- Use Cisco DCNM-SAN to configure your switch. For more information, see the Cisco DCNM for SAN Configuration guides.

If the latest Cisco MDS NX-OS Release 9.x software is not displayed, continue upgrading or downgrading the switch, as required, to install the correct version.

Step 10 Verify the status of the modules on the switch, using the **show module** command.

```
switch# show module

Mod  Ports  Module-Type                        Model              Status
---  -----  ---------------------------------- ------------------ ----------
1    48     4/8/16/32 Gbps Advanced FC Module  DS-X9648-1536K9    ok
2    48     4/8/16/32 Gbps Advanced FC Module  DS-X9648-1536K9    ok
3    48     2/4/8/10/16 Gbps Advanced FC Module DS-X9448-768K9     ok
4    48     4/8/16/32 Gbps Advanced FC Module  DS-X9648-1536K9    ok
5    0      Supervisor Module-4                DS-X97-SF4-K9      active *
6    0      Supervisor Module-4                DS-X97-SF4-K9      ha-standby
7    48     2/4/8/10/16 Gbps Advanced FC Module DS-X9448-768K9     ok
8    48     1/10 Gbps Ethernet Module          DS-X9848-480K9     ok
10   34     1/10/40G IPS,2/4/8/10/16G FC Module DS-X9334-K9        ok

Mod  Sw               Hw
---  ---------------  ------
1    8.4(1)           1.0
2    8.4(1)           1.0
3    8.4(1)           2.0
4    8.4(1)           1.0
5    8.4(1)           1.0
6    8.4(1)           1.4
7    8.4(1)           2.0
8    8.4(1)           1.1
10   8.4(1)           1.0

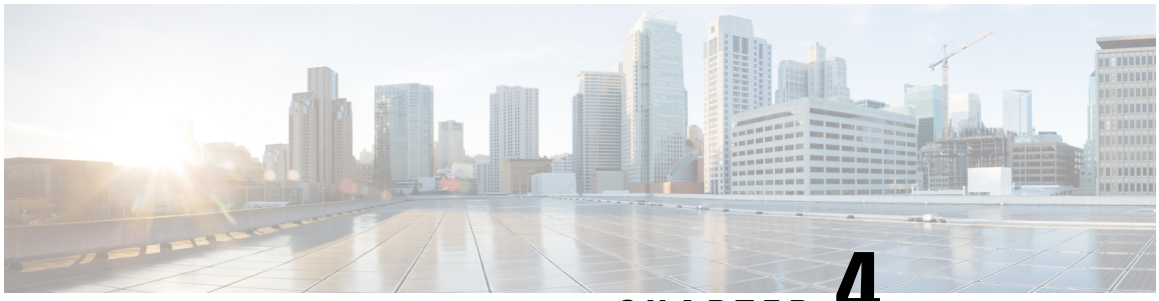

Mod  MAC-Address(es)                         Serial-Num
---  --------------------------------------  ----------
1    2c-31-24-50-59-d4 to 2c-31-24-50-5a-08  JAE205202WW
2    00-b8-b3-ee-03-38 to 00-b8-b3-ee-03-6c  JAE223403BK
3    00-d6-fe-b0-4b-88 to 00-d6-fe-b0-4b-8b  JAE223003C1
4    00-76-86-be-41-79 to 00-76-86-be-41-ad  JAE2039020M
5    00-2f-5c-fc-81-dc to 00-2f-5c-fc-81-ef  JAE22490XKR
6    70-18-a7-7e-f8-94 to 70-18-a7-7e-f8-a7  JAE22440CB0
7    3c-0e-23-c4-9c-84 to 3c-0e-23-c4-9c-87  JAE18030477
8    0c-68-03-29-90-4c to 0c-68-03-29-90-7f  JAE173000Q4
10   00-8e-73-39-81-50 to 00-8e-73-39-81-5f  JAE200504DK

Mod  Online Diag Status
---  ------------------
1    Pass
2    Pass
3    Pass
4    Pass
5    Pass
6    Pass
7    Pass
8    Pass
10   Pass

Xbar Ports  Module-Type                        Model              Status
---  -----  ---------------------------------- ------------------ ----------
1    0      Fabric Module 3                    DS-X9710-FAB3      ok
2    0      Fabric Module 3                    DS-X9710-FAB3      ok
3    0      Fabric Module 3                    DS-X9710-FAB3      ok
4    0      Fabric Module 3                    DS-X9710-FAB3      ok

Xbar Sw               Hw
---  ---------------  ------
1    NA               1.1
2    NA               1.1
3    NA               1.1
4    NA               1.1
```

```
Xbar MAC-Address(es)                         Serial-Num
---  --------------------------------------  ----------
1    NA                                      JAE222305V6
2    NA                                      JAE222305VA
3    NA                                      JAE22170963
4    NA                                      JAE2217096Z
```



CHAPTER 4

Supported Cisco MDS NX-OS Software Nondisruptive Upgrade Paths

This section provides information on nondisruptive upgrade paths that are supported for Cisco MDS NX-OS software Release 9.x. It includes the following topics:

- Nondisruptive Upgrade Paths to Cisco MDS NX-OS Release 9.4(5a), on page 19
- Nondisruptive Upgrade Paths to Cisco MDS NX-OS Release 9.4(5), on page 21
- Nondisruptive Upgrade Paths to Cisco MDS NX-OS Release 9.4(4), on page 22
- Nondisruptive Upgrade Paths to Cisco MDS NX-OS Release 9.4(3b), on page 23
- Nondisruptive Upgrade Paths to Cisco MDS NX-OS Release 9.4(3a), on page 24
- Nondisruptive Upgrade Paths to Cisco MDS NX-OS Release 9.4(3), on page 25
- Nondisruptive Upgrade Paths to Cisco MDS NX-OS Release 9.4(2a), on page 27
- Nondisruptive Upgrade Paths to Cisco MDS NX-OS Release 9.4(2), on page 28
- Nondisruptive Upgrade Paths to Cisco MDS NX-OS Release 9.4(1a), on page 29
- Nondisruptive Upgrade Paths to Cisco MDS NX-OS Release 9.4(1), on page 29
- Nondisruptive Upgrade Paths to Cisco MDS NX-OS Release 9.3(2a), on page 30
- Nondisruptive Upgrade Paths to Cisco MDS NX-OS Release 9.3(2), on page 30
- Nondisruptive Upgrade Paths to Cisco MDS NX-OS Release 9.3(1), on page 31
- Nondisruptive Upgrade Paths to Cisco MDS NX-OS Release 9.2(2), on page 32
- Nondisruptive Upgrade Paths to Cisco MDS NX-OS Release 9.2(1a), on page 32
- Nondisruptive Upgrade Paths to Cisco MDS NX-OS Release 9.2(1), on page 33
- FICON Nondisruptive Upgrade Paths to Cisco MDS NX-OS Release 9.4(5), on page 34
- FICON Nondisruptive Upgrade Paths to Cisco MDS NX-OS Release 9.4(3b), on page 34
- FICON Nondisruptive Upgrade Paths to Cisco MDS NX-OS Release 9.4(1a), on page 35

Nondisruptive Upgrade Paths to Cisco MDS NX-OS Release 9.4(5a)

Current Release	Nondisruptive Upgrade Path and Ordered Upgrade Steps
9.4.5(a)	Upgrade directly to MDS NX-OS Release 9.4(5a)
9.4(4)	Upgrade directly to MDS NX-OS Release 9.4(5a)

Current Release	Nondisruptive Upgrade Path and Ordered Upgrade Steps
9.4(3b)	Upgrade directly to MDS NX-OS Release 9.4(5a)
9.4(3a)	Upgrade directly to MDS NX-OS Release 9.4(5a)
9.4(3)	Upgrade directly to MDS NX-OS Release 9.4(5a)
9.4(2a)	Upgrade directly to MDS NX-OS Release 9.4(5a)
9.4(2)	**1.** Upgrade to MDS NX-OS Release 9.4(2a) **2.** Upgrade to MDS NX-OS Release 9.4(5a)
9.4(1a)	Upgrade directly to MDS NX-OS Release 9.4(5a)
9.4(1)	**1.** Upgrade to MDS NX-OS Release 9.4(1a) **2.** Upgrade to MDS NX-OS Release 9.4(5a)
9.3(x)	**1.** Upgrade to MDS NX-OS Release 9.4(1a) **2.** Upgrade to MDS NX-OS Release 9.4(5a)
9.2(x)	**1.** Upgrade to MDS NX-OS Release 9.4(1a) **2.** Upgrade to MDS NX-OS Release 9.4(5a)
8.5(1)	**1.** Upgrade to MDS NX-OS Release 9.4(1a) **2.** Upgrade to MDS NX-OS Release 9.4(5a)
8.4(2c), 8.4(2d), 8.4(2e), 8.4(2f)	**1.** Upgrade to MDS NX-OS Release 9.4(1a) **2.** Upgrade to MDS NX-OS Release 9.4(5a)
Any 8.x prior to 8.4(2c)	**1.** Upgrade to MDS NX-OS Release 8.4(2c) or 8.4(2d) or 8.4(2e) or 8.4(2f) **2.** Upgrade to MDS NX-OS Release 9.4(1a) **3.** Upgrade to MDS NX-OS Release 9.4(5a)
7.3(1)DY	**1.** Upgrade to MDS NX-OS Release 8.1(1b) **2.** Upgrade to MDS NX-OS Release 8.4(c) **3.** Upgrade to MDS NX-OS Release 9.4(1a) **4.** Upgrade to MDS NX-OS Release 9.4(5a)
6.2(29), 6.2(31), 6.2(33)	**1.** Upgrade to MDS NX-OS Release 8.4(2c) or 8.4(2d) **2.** Upgrade to MDS NX-OS Release 9.4(1a) **3.** Upgrade to MDS NX-OS Release 9.4(5a)

Nondisruptive Upgrade Paths to Cisco MDS NX-OS Release 9.4(5)

Current Release	Nondisruptive Upgrade Path and Ordered Upgrade Steps
9.4(4)	Upgrade directly to MDS NX-OS Release 9.4(5)
9.4(3b)	Upgrade directly to MDS NX-OS Release 9.4(5)
9.4(3a)	Upgrade directly to MDS NX-OS Release 9.4(5)
9.4(3)	Upgrade directly to MDS NX-OS Release 9.4(5)
9.4(2a)	Upgrade directly to MDS NX-OS Release 9.4(5)
9.4(2)	**1.** Upgrade to MDS NX-OS Release 9.4(2a) **2.** Upgrade to MDS NX-OS Release 9.4(5)
9.4(1a)	Upgrade directly to MDS NX-OS Release 9.4(5)
9.4(1)	**1.** Upgrade to MDS NX-OS Release 9.4(1a) **2.** Upgrade to MDS NX-OS Release 9.4(5)
9.3(x)	**1.** Upgrade to MDS NX-OS Release 9.4(1a) **2.** Upgrade to MDS NX-OS Release 9.4(5)
9.2(x)	**1.** Upgrade to MDS NX-OS Release 9.4(1a) **2.** Upgrade to MDS NX-OS Release 9.4(5)
8.5(1)	**1.** Upgrade to MDS NX-OS Release 9.4(1a) **2.** Upgrade to MDS NX-OS Release 9.4(5)
8.4(2c), 8.4(2d), 8.4(2e), 8.4(2f)	**1.** Upgrade to MDS NX-OS Release 9.4(1a) **2.** Upgrade to MDS NX-OS Release 9.4(5)
Any 8.x prior to 8.4(2c)	**1.** Upgrade to MDS NX-OS Release 8.4(2c) or 8.4(2d) or 8.4(2e) or 8.4(2f) **2.** Upgrade to MDS NX-OS Release 9.4(1a) **3.** Upgrade to MDS NX-OS Release 9.4(5)

Current Release	Nondisruptive Upgrade Path and Ordered Upgrade Steps
7.3(1)DY	1. Upgrade to MDS NX-OS Release 8.1(1b) 2. Upgrade to MDS NX-OS Release 8.4(c) 3. Upgrade to MDS NX-OS Release 9.4(1a) 4. Upgrade to MDS NX-OS Release 9.4(5)
6.2(29), 6.2(31), 6.2(33)	1. Upgrade to MDS NX-OS Release 8.4(2c) or 8.4(2d) 2. Upgrade to MDS NX-OS Release 9.4(1a) 3. Upgrade to MDS NX-OS Release 9.4(5)

Nondisruptive Upgrade Paths to Cisco MDS NX-OS Release 9.4(4)



Important MDS NX-OS Release 9.4(4) is supported on MDS 9700 Series Director Switches only, due to CSCws09730.

Current Release	Nondisruptive Upgrade Path and Ordered Upgrade Steps
9.4(3b)	Upgrade directly to MDS NX-OS Release 9.4(4)
9.4(3a)	Upgrade directly to MDS NX-OS Release 9.4(4)
9.4(3)	Upgrade directly to MDS NX-OS Release 9.4(4)
9.4(2a)	Upgrade directly to MDS NX-OS Release 9.4(4)
9.4(2)	1. Upgrade to MDS NX-OS Release 9.4(2a) 2. Upgrade to MDS NX-OS Release 9.4(4)
9.4(1a)	Upgrade directly to MDS NX-OS Release 9.4(4)
9.4(1)	1. Upgrade to MDS NX-OS Release 9.4(1a) 2. Upgrade to MDS NX-OS Release 9.4(4)
9.3(x)	1. Upgrade to MDS NX-OS Release 9.4(1a) 2. Upgrade to MDS NX-OS Release 9.4(4)
9.2(x)	1. Upgrade to MDS NX-OS Release 9.4(1a) 2. Upgrade to MDS NX-OS Release 9.4(4)

Current Release	Nondisruptive Upgrade Path and Ordered Upgrade Steps
8.5(1)	**1.** Upgrade to MDS NX-OS Release 9.4(1a) **2.** Upgrade to MDS NX-OS Release 9.4(4)
8.4(2c), 8.4(2d), 8.4(2e), 8.4(2f)	**1.** Upgrade to MDS NX-OS Release 9.4(1a) **2.** Upgrade to MDS NX-OS Release 9.4(4)
Any 8.x prior to 8.4(2c)	**1.** Upgrade to MDS NX-OS Release 8.4(2c) or 8.4(2d) or 8.4(2e) or 8.4(2f) **2.** Upgrade to MDS NX-OS Release 9.4(1a) **3.** Upgrade to MDS NX-OS Release 9.4(4)
7.3(1)DY	**1.** Upgrade to MDS NX-OS Release 8.1(1b) **2.** Upgrade to MDS NX-OS Release 8.4(c) **3.** Upgrade to MDS NX-OS Release 9.4(1a) **4.** Upgrade to MDS NX-OS Release 9.4(4)
6.2(29), 6.2(31), 6.2(33)	**1.** Upgrade to MDS NX-OS Release 8.4(2c) or 8.4(2d) **2.** Upgrade to MDS NX-OS Release 9.4(1a) **3.** Upgrade to MDS NX-OS Release 9.4(4)

Nondisruptive Upgrade Paths to Cisco MDS NX-OS Release 9.4(3b)

Current Release	Nondisruptive Upgrade Path and Ordered Upgrade Steps
9.4(3a)	Upgrade directly to MDS NX-OS Release 9.4(3b)
9.4(3)	Upgrade directly to MDS NX-OS Release 9.4(3b)
9.4(2a)	Upgrade directly to MDS NX-OS Release 9.4(3b)
9.4(2)	**1.** Upgrade to MDS NX-OS Release 9.4(2a) **2.** Upgrade to MDS NX-OS Release 9.4(3b)
9.4(1a)	Upgrade directly to MDS NX-OS Release 9.4(3b)
9.4(1)	**1.** Upgrade to MDS NX-OS Release 9.4(1a) **2.** Upgrade to MDS NX-OS Release 9.4(3b)

Current Release	Nondisruptive Upgrade Path and Ordered Upgrade Steps
9.3(x)	**1.** Upgrade to MDS NX-OS Release 9.4(1a) **2.** Upgrade to MDS NX-OS Release 9.4(3b)
9.2(x)	**1.** Upgrade to MDS NX-OS Release 9.4(1a) **2.** Upgrade to MDS NX-OS Release 9.4(3b)
8.5(1)	**1.** Upgrade to MDS NX-OS Release 9.4(1a) **2.** Upgrade to MDS NX-OS Release 9.4(3b)
8.4(2c), 8.4(2d), 8.4(2e), 8.4(2f)	**1.** Upgrade to MDS NX-OS Release 9.4(1a) **2.** Upgrade to MDS NX-OS Release 9.4(3b)
Any 8.x prior to 8.4(2c)	**1.** Upgrade to MDS NX-OS Release 8.4(2c) or 8.4(2d) or 8.4(2e) or 8.4(2f) **2.** Upgrade to MDS NX-OS Release 9.4(1a) **3.** Upgrade to MDS NX-OS Release 9.4(3b)
7.3(1)DY	**1.** Upgrade to MDS NX-OS Release 8.1(1b) **2.** Upgrade to MDS NX-OS Release 8.4(c) **3.** Upgrade to MDS NX-OS Release 9.4(1a) **4.** Upgrade to MDS NX-OS Release 9.4(3b)
6.2(29), 6.2(31), 6.2(33)	**1.** Upgrade to MDS NX-OS Release 8.4(2c) or 8.4(2d) **2.** Upgrade to MDS NX-OS Release 9.4(1a) **3.** Upgrade to MDS NX-OS Release 9.4(3b)

Nondisruptive Upgrade Paths to Cisco MDS NX-OS Release 9.4(3a)

Current Release	Nondisruptive Upgrade Path and Ordered Upgrade Steps
9.4(3)	Upgrade directly to MDS NX-OS Release 9.4(3a)
9.4(2a)	Upgrade directly to MDS NX-OS Release 9.4(3a)
9.4(2)	**1.** Upgrade to MDS NX-OS Release 9.4(2a) **2.** Upgrade to MDS NX-OS Release 9.4(3a)

Current Release	Nondisruptive Upgrade Path and Ordered Upgrade Steps
9.4(1a)	Upgrade directly to MDS NX-OS Release 9.4(3a)
9.4(1)	**1.** Upgrade to MDS NX-OS Release 9.4(1a) **2.** Upgrade to MDS NX-OS Release 9.4(3a)
9.3(x)	**1.** Upgrade to MDS NX-OS Release 9.4(1a) **2.** Upgrade to MDS NX-OS Release 9.4(3a)
9.2(x)	**1.** Upgrade to MDS NX-OS Release 9.4(1a) **2.** Upgrade to MDS NX-OS Release 9.4(3a)
8.5(1)	**1.** Upgrade to MDS NX-OS Release 9.4(1a) **2.** Upgrade to MDS NX-OS Release 9.4(3a)
8.4(2c), 8.4(2d), 8.4(2e), 8.4(2f)	**1.** Upgrade to MDS NX-OS Release 9.4(1a) **2.** Upgrade to MDS NX-OS Release 9.4(3a)
Any 8.x prior to 8.4(2c)	**1.** Upgrade to MDS NX-OS Release 8.4(2c) or 8.4(2d) or 8.4(2e) or 8.4(2f) **2.** Upgrade to MDS NX-OS Release 9.4(1a) **3.** Upgrade to MDS NX-OS Release 9.4(3a)
7.3(1)DY	**1.** Upgrade to MDS NX-OS Release 8.1(1b) **2.** Upgrade to MDS NX-OS Release 8.4(c) **3.** Upgrade to MDS NX-OS Release 9.4(1a) **4.** Upgrade to MDS NX-OS Release 9.4(3a)
6.2(29), 6.2(31), 6.2(33)	**1.** Upgrade to MDS NX-OS Release 8.4(2c) or 8.4(2d) **2.** Upgrade to MDS NX-OS Release 9.4(1a) **3.** Upgrade to MDS NX-OS Release 9.4(3a)

Nondisruptive Upgrade Paths to Cisco MDS NX-OS Release 9.4(3)

Current Release	Nondisruptive Upgrade Path and Ordered Upgrade Steps
9.4(2a)	Upgrade directly to MDS NX-OS Release 9.4(3)

Current Release	Nondisruptive Upgrade Path and Ordered Upgrade Steps
9.4(2)	**1.** Upgrade to MDS NX-OS Release 9.4(2a) **2.** Upgrade to MDS NX-OS Release 9.4(3)
9.4(1a)	Upgrade directly to MDS NX-OS Release 9.4(3)
9.4(1)	**1.** Upgrade to MDS NX-OS Release 9.4(1a) **2.** Upgrade to MDS NX-OS Release 9.4(3)
9.3(x)	**1.** Upgrade to MDS NX-OS Release 9.4(1a) **2.** Upgrade to MDS NX-OS Release 9.4(3)
9.2(x)	**1.** Upgrade to MDS NX-OS Release 9.4(1a) **2.** Upgrade to MDS NX-OS Release 9.4(3)
8.5(1)	**1.** Upgrade to MDS NX-OS Release 9.4(1a) **2.** Upgrade to MDS NX-OS Release 9.4(3)
8.4(2c), 8.4(2d), 8.4(2e), 8.4(2f)	**1.** Upgrade to MDS NX-OS Release 9.4(1a) **2.** Upgrade to MDS NX-OS Release 9.4(3)
Any 8.x prior to 8.4(2c)	**1.** Upgrade to MDS NX-OS Release 8.4(2c) or 8.4(2d) or 8.4(2e) or 8.4(2f). **2.** Upgrade to MDS NX-OS Release 9.4(1a) **3.** Upgrade to MDS NX-OS Release 9.4(3)
7.3(1)DY	**1.** Upgrade to MDS NX-OS Release 8.1(1b) **2.** Upgrade to MDS NX-OS Release 8.4(c) **3.** Upgrade to MDS NX-OS Release 9.4(1a) **4.** Upgrade to MDS NX-OS Release 9.4(3)
6.2(29), 6.2(31), 6.2(33)	**1.** Upgrade to MDS NX-OS Release 8.4(2c) or 8.4(2d) **2.** Upgrade to MDS NX-OS Release 9.4(1a) **3.** Upgrade to MDS NX-OS Release 9.4(3)

Nondisruptive Upgrade Paths to Cisco MDS NX-OS Release 9.4(2a)

Current Release	Nondisruptive Upgrade Path and Ordered Upgrade Steps
9.4(2)	Upgrade directly to MDS NX-OS Release 9.4(2a)
9.4(1a)	Upgrade directly to MDS NX-OS Release 9.4(2a)
9.4(1)	**1.** Upgrade to MDS NX-OS Release 9.4(1a) **2.** Upgrade to MDS NX-OS Release 9.4(2a)
9.3(x)	**1.** Upgrade to MDS NX-OS Release 9.4(1a) **2.** Upgrade to MDS NX-OS Release 9.4(2a)
9.2(x)	**1.** Upgrade to MDS NX-OS Release 9.4(1a) **2.** Upgrade to MDS NX-OS Release 9.4(2a)
8.5(1)	**1.** Upgrade to MDS NX-OS Release 9.4(1a) **2.** Upgrade to MDS NX-OS Release 9.4(2a)
8.4(2c), 8.4(2d), 8.4(2e), 8.4(2f)	**1.** Upgrade to MDS NX-OS Release 9.4(1a) **2.** Upgrade to MDS NX-OS Release 9.4(2a)
Any 8.x prior to 8.4(2c)	**1.** Upgrade to MDS NX-OS Release 8.4(2c) or 8.4(2d) or 8.4(2e) or 8.4(2f). **2.** Upgrade to MDS NX-OS Release 9.4(1a) **3.** Upgrade to MDS NX-OS Release 9.4(2a)
7.3(1)DY	**1.** Upgrade to MDS NX-OS Release 8.1(1b) **2.** Upgrade to MDS NX-OS Release 8.4(c) **3.** Upgrade to MDS NX-OS Release 9.4(1a) **4.** Upgrade to MDS NX-OS Release 9.4(2a)
6.2(29), 6.2(31), 6.2(33)	**1.** Upgrade to MDS NX-OS Release 8.4(2c) or 8.4(2d) **2.** Upgrade to MDS NX-OS Release 9.4(1a) **3.** Upgrade to MDS NX-OS Release 9.4(2a)

Nondisruptive Upgrade Paths to Cisco MDS NX-OS Release 9.4(2)

Current Release	Nondisruptive Upgrade Path and Ordered Upgrade Steps
9.4(1a)	Upgrade directly to MDS NX-OS Release 9.4(2)
9.4(1)	**1.** Upgrade to MDS NX-OS Release 9.4(1a) **2.** Upgrade to MDS NX-OS Release 9.4(2)
9.3(x)	**1.** Upgrade to MDS NX-OS Release 9.4(1a) **2.** Upgrade to MDS NX-OS Release 9.4(2)
9.2(x)	**1.** Upgrade to MDS NX-OS Release 9.4(1a) **2.** Upgrade to MDS NX-OS Release 9.4(2)
8.5(1)	**1.** Upgrade to MDS NX-OS Release 9.4(1a) **2.** Upgrade to MDS NX-OS Release 9.4(2)
8.4(2c), 8.4(2d), 8.4(2e), 8.4(2f)	**1.** Upgrade to MDS NX-OS Release 9.4(1a) **2.** Upgrade to MDS NX-OS Release 9.4(2)
Any 8.x prior to 8.4(2c)	**1.** Upgrade to MDS NX-OS Release 8.4(2c) or 8.4(2d) or 8.4(2e) or 8.4(2f). **2.** Upgrade to MDS NX-OS Release 9.4(1a) **3.** Upgrade to MDS NX-OS Release 9.4(2)
7.3(1)DY	**1.** Upgrade to MDS NX-OS Release 8.1(1b) **2.** Upgrade to MDS NX-OS Release 8.4(c) **3.** Upgrade to MDS NX-OS Release 9.4(1a) **4.** Upgrade to MDS NX-OS Release 9.4(2)
6.2(29), 6.2(31), 6.2(33)	**1.** Upgrade to MDS NX-OS Release 8.4(2c) or 8.4(2d) **2.** Upgrade to MDS NX-OS Release 9.4(1a) **3.** Upgrade to MDS NX-OS Release 9.4(2)

Nondisruptive Upgrade Paths to Cisco MDS NX-OS Release 9.4(1a)

Current Release	Nondisruptive Upgrade Path and Ordered Upgrade Steps
9.4(1)	Upgrade directly to MDS NX-OS Release 9.4(1a)
9.3(x)	Upgrade directly to MDS NX-OS Release 9.4(1a)
9.2(x)	Upgrade directly to MDS NX-OS Release 9.4(1a)
8.5(1)	Upgrade directly to MDS NX-OS Release 9.4(1a)
8.4(2c), 8.4(2d), 8.4(2e), 8.4(2f)	Upgrade directly to MDS NX-OS Release 9.4(1a)
Any 8.x prior to 8.4(2c)	**1.** Upgrade to MDS NX-OS Release 8.4(2c) or 8.4(2d) or 8.4(2e) or 8.4(2f) **2.** Upgrade to MDS NX-OS Release 9.4(1a)
7.3(1)DY	**1.** Upgrade to MDS NX-OS Release 8.1(1b) **2.** Upgrade to MDS NX-OS Release 8.4(c) **3.** Upgrade to MDS NX-OS Release 9.4(1a)
6.2(29), 6.2(31), 6.2(33)	**1.** Upgrade to MDS NX-OS Release 8.4(2c) or 8.4(2d) **2.** Upgrade to MDS NX-OS Release 9.4(1a)

Nondisruptive Upgrade Paths to Cisco MDS NX-OS Release 9.4(1)

Current Release	Nondisruptive Upgrade Path and Ordered Upgrade Steps
9.(x)	Upgrade directly to MDS NX-OS Release 9.4(1)
8.5(1)	Upgrade directly to MDS NX-OS Release 9.4(1)
8.4(2f), 8.4(2e), 8.4(2d), and 8.4(2c)	Upgrade directly to MDS NX-OS Release 9.4(1)
8.4(2b) and prior releases	**1.** Upgrade to MDS NX-OS Release 8.4(2c), 8.4(2d), 8.4(2e) and 8.4(2f) **2.** Upgrade to MDS NX-OS Release 9.4(1)
All 7.3(x) releases	**1.** Upgrade to MDS NX-OS Release 8.4(2c) or 8.1(1b) **2.** Upgrade to MDS NX-OS Release 9.4(1)

Current Release	Nondisruptive Upgrade Path and Ordered Upgrade Steps
6.2(29) and above releases	**1.** Upgrade to MDS NX-OS Release 8.4(2c) or 8.1(1b) **2.** Upgrade to MDS NX-OS Release 9.4(1)

Nondisruptive Upgrade Paths to Cisco MDS NX-OS Release 9.3(2a)

Current Release	Nondisruptive Upgrade Path and Ordered Upgrade Steps
9.3(x)	Upgrade directly to MDS NX-OS Release 9.3(2a)
9.2(x)	Upgrade directly to MDS NX-OS Release 9.3(2a)
8.1(x) and above releases	Upgrade directly to MDS NX-OS Release 9.3(2a)
All 7.3(x) releases	**1.** Upgrade directly to MDS NX-OS Release 8.1(1b) **2.** Upgrade to MDS NX-OS Release 9.3(2a)
6.2(29) and above releases	**1.** Upgrade directly to MDS NX-OS Release 8.4(2c) **2.** Upgrade to MDS NX-OS Release 9.3(2a)
6.2(13a) until 6.2(27)	**1.** Upgrade directly to MDS NX-OS Release 6.2(29) **2.** Upgrade directly to MDS NX-OS Release 8.4(2c) **3.** Upgrade to MDS NX-OS Release 9.3(2a)
All 6.2(x) releases prior to 6.2(13a)	**1.** Upgrade directly to MDS NX-OS Release 6.2(13a) **2.** Upgrade directly to MDS NX-OS Release 6.2(29) **3.** Upgrade to MDS NX-OS Release 8.4(2c) **4.** Upgrade to MDS NX-OS Release 9.3(2a)

Nondisruptive Upgrade Paths to Cisco MDS NX-OS Release 9.3(2)

Current Release	Nondisruptive Upgrade Path and Ordered Upgrade Steps
9.3(1)	Upgrade directly to MDS NX-OS Release 9.3(2)
9.2(x)	Upgrade directly to MDS NX-OS Release 9.3(2)
8.1(x) and above releases	Upgrade directly to MDS NX-OS Release 9.3(2)

Current Release	Nondisruptive Upgrade Path and Ordered Upgrade Steps
All 7.3(x) releases	1. Upgrade directly to MDS NX-OS Release 8.1(1b) 2. Upgrade to MDS NX-OS Release 9.3(2)
6.2(29) and above releases	1. Upgrade directly to MDS NX-OS Release 8.4(2c) 2. Upgrade to MDS NX-OS Release 9.3(2)
6.2(13a) until 6.2(27)	1. Upgrade directly to MDS NX-OS Release 6.2(29) 2. Upgrade directly to MDS NX-OS Release 8.4(2c) 3. Upgrade to MDS NX-OS Release 9.3(2)
All 6.2(x) releases prior to 6.2(13a)	1. Upgrade directly to MDS NX-OS Release 6.2(13a) 2. Upgrade directly to MDS NX-OS Release 6.2(29) 3. Upgrade to MDS NX-OS Release 8.4(2c) 4. Upgrade to MDS NX-OS Release 9.3(2)

Nondisruptive Upgrade Paths to Cisco MDS NX-OS Release 9.3(1)

Current Release	Nondisruptive Upgrade Path and Ordered Upgrade Steps
9.2(x)	Upgrade directly to MDS NX-OS Release 9.3(1)
8.1(x) and above releases	Upgrade directly to MDS NX-OS Release 9.3(1)
All 7.3(x) releases	1. Upgrade directly to MDS NX-OS Release 8.1(1b) 2. Upgrade to MDS NX-OS Release 9.3(1)
6.2(29) and above releases	1. Upgrade directly to MDS NX-OS Release 8.4(2c) 2. Upgrade to MDS NX-OS Release 9.3(1)
6.2(13a) until 6.2(27)	1. Upgrade directly to MDS NX-OS Release 6.2(29) 2. Upgrade directly to MDS NX-OS Release 8.4(2c) 3. Upgrade to MDS NX-OS Release 9.3(1)

Current Release	Nondisruptive Upgrade Path and Ordered Upgrade Steps
All 6.2(x) releases prior to 6.2(13a)	**1.** Upgrade directly to MDS NX-OS Release 6.2(13a) **2.** Upgrade directly to MDS NX-OS Release 6.2(29) **3.** Upgrade to MDS NX-OS Release 8.4(2c) **4.** Upgrade to MDS NX-OS Release 9.3(1)

Nondisruptive Upgrade Paths to Cisco MDS NX-OS Release 9.2(2)

Current Release	Nondisruptive Upgrade Path and Ordered Upgrade Steps
9.2(1)	Upgrade directly to MDS NX-OS Release 9.2(2)
8.1(x) and above releases	Upgrade directly to MDS NX-OS Release 9.2(2)
All 7.3(x) releases	**1.** Upgrade to MDS NX-OS Release 8.1(1b) **2.** Upgrade to MDS NX-OS Release 9.2(2)
6.2(29) and above releases	**1.** Upgrade to MDS NX-OS Release 8.4(2c) **2.** Upgrade to MDS NX-OS Release 9.2(2)
6.2(13a) until 6.2(27)	**1.** Upgrade to MDS NX-OS Release 6.2(29) **2.** Upgrade to MDS NX-OS Release 8.4(2c) **3.** Upgrade to MDS NX-OS Release 9.2(2)
All 6.2(x) releases prior to 6.2(13a)	**1.** Upgrade directly to MDS NX-OS Release 6.2(13a) **2.** Upgrade directly to MDS NX-OS Release 6.2(29) **3.** Upgrade to MDS NX-OS Release 8.4(2c) **4.** Upgrade to MDS NX-OS Release 9.2(2)

Nondisruptive Upgrade Paths to Cisco MDS NX-OS Release 9.2(1a)

Current Release	Nondisruptive Upgrade Path and Ordered Upgrade Steps
9.2(1)	Upgrade directly to MDS NX-OS Release 9.2(1a)
All 8.x releases	Upgrade directly to MDS NX-OS Release 9.2(1a)

Current Release	Nondisruptive Upgrade Path and Ordered Upgrade Steps
All 7.3(x) releases	1. Upgrade to MDS NX-OS Release 8.1(1b) 2. Upgrade to MDS NX-OS Release 9.2(1a)
6.2(29) and above releases	1. Upgrade to MDS NX-OS Release 8.4(2c) 2. Upgrade to MDS NX-OS Release 9.2(1a)
6.2(13a) until 6.2(27)	1. Upgrade to MDS NX-OS Release 6.2(29) 2. Upgrade to MDS NX-OS Release 8.4(2c) 3. Upgrade to MDS NX-OS Release 9.2(1a)
All 6.2(x) releases prior to 6.2(13a)	1. Upgrade to MDS NX-OS Release 6.2(13a) 2. Upgrade to MDS NX-OS Release 6.2(29) 3. Upgrade to MDS NX-OS Release 8.4(2c) 4. Upgrade to MDS NX-OS Release 9.2(1a)

Nondisruptive Upgrade Paths to Cisco MDS NX-OS Release 9.2(1)

Current Release	Nondisruptive Upgrade Path and Ordered Upgrade Steps
8.1(x) and above releases	Upgrade to MDS NX-OS Release 9.2(1)
All 7.3(x) releases	1. Upgrade to MDS NX-OS Release 8.1(1b) 2. Upgrade to MDS NX-OS Release 9.2(1)
6.2(29) and above releases	1. Upgrade to MDS NX-OS Release 8.4(2c) 2. Upgrade to MDS NX-OS Release 9.2(1)
6.2(13a) until 6.2(27)	1. Upgrade to MDS NX-OS Release 6.2(29) 2. Upgrade to MDS NX-OS Release 8.4(2c) 3. Upgrade to MDS NX-OS Release 9.2(1)
All 6.2(x) releases prior to 6.2(13a)	1. Upgrade to MDS NX-OS Release 6.2(13a) 2. Upgrade to MDS NX-OS Release 6.2(29) 3. Upgrade to MDS NX-OS Release 8.4(2c) 4. Upgrade to MDS NX-OS Release 9.2(1)

FICON Nondisruptive Upgrade Paths to Cisco MDS NX-OS Release 9.4(5)

Current FICON-qualified Release	Nondisruptive Upgrade Paths
9.4(3b)	Upgrade directly to MDS NX-OS Release 9.4(5)
9.4(1a)	Upgrade directly to MDS NX-OS Release 9.4(5)
8.4(2e)	**1.** Upgrade to MDS NX-OS Release 9.4(1a) **2.** Upgrade to MDS NX-OS Release 9.4(5)
8.4(2c)	**1.** Upgrade to MDS NX-OS Release 9.4(1a) **2.** Upgrade to MDS NX-OS Release 9.4(5)
8.4(2b)	**1.** Upgrade to MDS NX-OS Release 8.4(2c) **2.** Upgrade to MDS NX-OS Release 9.4(1a) **3.** Upgrade to MDS NX-OS Release 9.4(5)
8.4(1a)	**1.** Upgrade to MDS NX-OS Release 8.4(2c) **2.** Upgrade to MDS NX-OS Release 9.4(1a) **3.** Upgrade to MDS NX-OS Release 9.4(5)
8.1(1b)	**1.** Upgrade to MDS NX-OS Release 8.4(2c) **2.** Upgrade to MDS NX-OS Release 9.4(1a) **3.** Upgrade to MDS NX-OS Release 9.4(5)
8.1(1a)	**1.** Upgrade to MDS NX-OS Release 8.1(1b) **2.** Upgrade to MDS NX-OS Release 8.4(2c) **3.** Upgrade to MDS NX-OS Release 9.4(1a) **4.** Upgrade to MDS NX-OS Release 9.4(5)

FICON Nondisruptive Upgrade Paths to Cisco MDS NX-OS Release 9.4(3b)

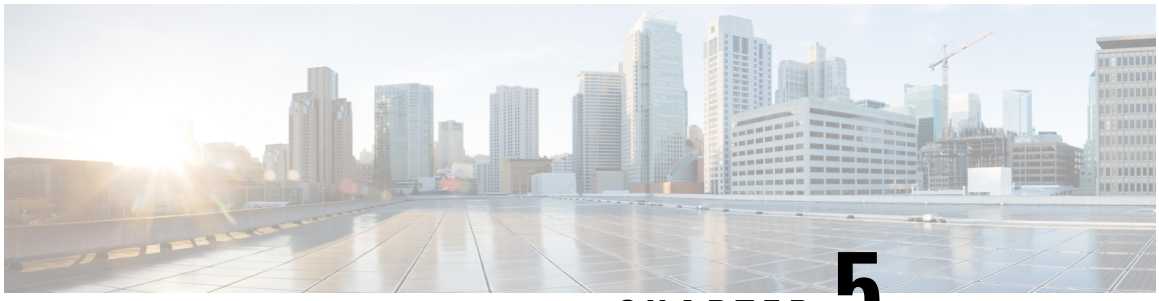
Current FICON-qualified Release	Nondisruptive Upgrade Paths
9.4(1a)	Upgrade directly to MDS NX-OS Release 9.4(3b)

Current FICON-qualified Release	Nondisruptive Upgrade Paths
8.4(2e)	1. Upgrade to MDS NX-OS Release 9.4(1a) 2. Upgrade to MDS NX-OS Release 9.4(3b)
8.4(2c)	1. Upgrade to MDS NX-OS Release 9.4(1a) 2. Upgrade to MDS NX-OS Release 9.4(3b)
8.4(2b)	1. Upgrade to MDS NX-OS Release 8.4(2c) 2. Upgrade to MDS NX-OS Release 9.4(1a) 3. Upgrade to MDS NX-OS Release 9.4(3b)
8.4(1a)	1. Upgrade to MDS NX-OS Release 8.4(2c) 2. Upgrade to MDS NX-OS Release 9.4(1a) 3. Upgrade to MDS NX-OS Release 9.4(3b)
8.1(1b)	1. Upgrade to MDS NX-OS Release 8.4(2c) 2. Upgrade to MDS NX-OS Release 9.4(1a) 3. Upgrade to MDS NX-OS Release 9.4(3b)
8.1(1a)	1. Upgrade to MDS NX-OS Release 8.1(1b) 2. Upgrade to MDS NX-OS Release 8.4(2c) 3. Upgrade to MDS NX-OS Release 9.4(1a) 4. Upgrade to MDS NX-OS Release 9.4(3b)

FICON Nondisruptive Upgrade Paths to Cisco MDS NX-OS Release 9.4(1a)

Current FICON-qualified Release	Nondisruptive Upgrade Path and Ordered Upgrade Steps
8.4(2e)	Upgrade directly to MDS NX-OS Release 9.4(1a)
8.4(2c)	Upgrade directly to MDS NX-OS Release 9.4(1a)
8.4(2b)	1. Upgrade to MDS NX-OS Release 8.4(2c) 2. Upgrade to MDS NX-OS Release 9.4(1a)
8.4(1a)	1. Upgrade to MDS NX-OS Release 8.4(2c) 2. Upgrade to MDS NX-OS Release 9.4(1a)

Current FICON-qualified Release	Nondisruptive Upgrade Path and Ordered Upgrade Steps
8.1(1b)	**1.** Upgrade to MDS NX-OS Release 8.4(2c) **2.** Upgrade to MDS NX-OS Release 9.4(1a)
8.1(1a)	**1.** Upgrade to MDS NX-OS Release 8.1(1b) **2.** Upgrade to MDS NX-OS Release 8.4(2c) **3.** Upgrade to MDS NX-OS Release 9.4(1a)
6.2(11e)	**1.** Upgrade to MDS NX-OS Release 8.1(1a) **2.** Upgrade to MDS NX-OS Release 8.1(1b) **3.** Upgrade to MDS NX-OS Release 8.4(2c) **4.** Upgrade to MDS NX-OS Release 9.4(1a)



CHAPTER 5

Upgrading Cisco MDS NX-OS Release 9.x

This section provides information on upgrading your Cisco MDS NX-OS software to Cisco MDS NX-OS Release 9.x. It includes the following topics:

- Cisco MDS NX-OS Software Upgrade Guidelines, on page 37
- Preventing Hardware Forwarding Corruption during ISSU, on page 40
- Upgrading MDS NX-OS in Cisco MDS 9700 Series Multilayer Director Switches, on page 42
- Upgrading to Cisco MDS NX-OS Release 9.x on a Cisco MDS 9700 Series Multilayer Director, on page 43
- Upgrading Cisco MDS NX-OS on Cisco MDS Fabric Switches, on page 52
- Guidelines and Limitations for a Nondisruptive Software Upgrade, on page 52
- Upgrading to Cisco MDS NX-OS Release 9.x on a Cisco MDS Fabric Switch, on page 53
- Troubleshooting a Nondisruptive Upgrade on a Fabric Switch, on page 59
- Moving From an NPE Image to a non-NPE Image and Vice Versa, on page 60

Cisco MDS NX-OS Software Upgrade Guidelines

The following upgrade guidelines are applicable for all switches.

- If Fibre Channel ports on the switches are connected to non-Cisco products, ensure that these are operating as individual Fibre Channel links and are not aggregated into a port channel. Fibre Channel port channels are not compatible with non-Cisco technology.
- When you upgrade to Cisco MDS NX-OS 9.4(2) ensure that you apply the workaround provided in CSCwk14579 before upgrading to Cisco NX-OS 9.4(2). We recommend that you upgrade to Cisco MDS NX-OS 9.4(2a) directly from all the releases before Cisco MDS NX-OS 9.4(2) and not upgrade to NX-OS 9.4(2) because of this issue.
- We recommend that you do not perform an In-Service Software Upgrade (ISSU) concurrently on switches that are connected via FCIP ISLs. Rather perform the ISSU on one switch and after the ISSU is complete perform the ISSU on the adjacent switch. However, you can perform ISSUs concurrently on switches that are connected via Fibre Channel ISLs.
- To upgrade or downgrade to a Cisco MDS NX-OS release version, the same release version of the kickstart and system images in the **install all** command must be used.
- If you transfer firmware using SFTP or SCP after enabling the **feature scp-server** or **feature sftp-server** commands on the switch, close all SFTP or SCP connections completely by disabling the feature using **no feature scp-server** or **no feature sftp-server** commands before starting ISSU.

ISSU will fail if there are any ungracefully terminated WinSCP or SFTP sessions. To resolve this issue and continue with the switch upgrade, connect to the switch using Telnet or the console and execute the no feature ssh command. After the sessions are cleared, you can re-enable SSH using the feature ssh command.

To prevent this issue, we recommend transferring files to the switch using the copy command or the DCNM client instead.

- If you are upgrading from a release prior to Cisco MDS NX-OS Release 9.2(1), ensure that you use the **clear logging onboard txwait** command after upgrading. Otherwise, the file will be automatically deleted and recreated at the new file size when the file size exceeds 512 KB. For more information, see the Cisco MDS 9000 Series Interfaces Configuration Guide, Release 9.x.
- If you are upgrading from Cisco MDS NX-OS Release 8.5(1) to Release 9.2(1) or later, ensure that you disable the Fabric Performance Monitor (FPM) feature using the **no feature fpm** command before upgrading. After the switch is upgraded to Release 9.2(1) or later, FPM can be enabled again via the **feature fpm** command.
- FCIP traffic will be affected when you upgrade Cisco MDS 24/10-Port SAN Extension Module from Cisco MDS NX-OS Release 8.5(1) to Release 9.2(1). To recover from this situation, reload the module.
- You will be unable to upgrade to Cisco MDS NX-OS Release 9.2(2) or later releases if you have configured any device-alias names using 64 alphanumeric characters. The following system message will be displayed:

```
ISSU blocked because device-alias names > 63 characters exist.They
can be displayed using 'show file upg_blocking_dev_al_cfg.txt'. Reduce  the size of the
device-alias names to 63 characters or less and try  again.
```

- As part of the fix for CSCvz09012, the *cardclient* service is deliberately stopped during the upgrade and the following syslog message is displayed. No action is required.

```
%SYSMGR-2-SERVICE_CRASHED: Service "cardclient" (PID 4941) hasn't
caught signal 9 (no core)
```

- As part of the fix for CSCwr55967, the *rlir* service is deliberately stopped during the upgrade following syslog message. No action is required.

```
2026 Feb 5 00:02:45.336173 cup1-bottom %SYSMGR-3-BASIC_TRACE: core_copy: PID 6293 has
the following message Core not generated by system for rlir(0). WCOREDUMP(9) returned
zero . 2026 Feb 5 00:02:45.336246 cup1-bottom %SYSMGR-2-SERVICE_CRASHED: Service "rlir"
 (PID 8618) hasn't caught signal 9 (no core).
```

- We recommend that if all of the following conditions are true that the Cisco MDS 48-Port 64-Gbps Fibre Channel Switching Module (DS-X9748-3072K9) NOT be inserted in the chassis:
  - Cisco MDS 9706, MDS 9710, or MDS 9718
  - Cisco MDS NX-OS Release 9.2(1)
  - Non-default FCoE FCMAP is configured. This can be checked by issuing the **show fcoe | i FC-MAP** command. The default value of FCMAP is 0x0e:fc:00.
- For the switches running Cisco MDS NX-OS Release 9.2(1) and equipped with Cisco MDS 48-Port 64-Gbps Fibre Channel Switching Module (DS-X9748-3072K9), the FCMAP should NOT be changed to non-default value. However, after the switch has been upgraded to Cisco MDS NX-OS Release 9.2(2) or later, the FCoE FCMAP can be configured to a non-default value. For more information, see CSCwa34016.
- Specific Guidelines for 32 Gbps Fabric Switches:

- 32 Gbps fabric switches must be disruptively reloaded after an ISSU if any Supervisor CPU BIOS upgrade was included in the new NX-OS release.

  Starting with NX-OS 9.4(5), the mechanism for activating Supervisor CPU BIOS updates on 32 Gbps fabric switches has changed. By default, BIOS updates are installed but not loaded by the CPU unless the switch is disruptively reloaded. The ISSU **install all** command has been enhanced with a **disruptive** option to allow the disruptive reload to be automatically executed at the end of the ISSU. Alternatively, the disruptive reload can be done after the ISSU as a later and separate operation using the **reload module 1** command without the **nondisruptive** option.

- For switches running NX-OS versions lower than NX-OS 9.4(5), the mechanism for activating Supervisor CPU BIOS during ISSU is not reliable. Only if the new NX-OS version includes a BIOS update, the BIOS in the new NX-OS should be installed with the hidden **install module 1 bios system** *newNxosImage* command. Then, the switch should be disruptively reloaded using the **reload module 1** CLI command without the **nondisruptive** option. Subsequently, the ISSU of NX-OS can be executed nondisruptively as the ISSU will detect that the BIOS has already been upgraded.

- Specific Guidelines for 64 Gbps Fabric Switches:
  - The mechanism for activating BIOS updates on 64 Gbps fabric switches has changed. The new mechanism requires a one-time disruptive switch EPLD upgrade to the following IO FPGA versions or higher:
  - IO FPGA Versions for Nondisruptive BIOS Updates:

Table 3: IO FPGA Versions for Nondisruptive BIOS Updates:

Switch	Minimum IO FPGA Version
MDS 9124V	0.18
MDS 9148V	0.18
MDS 9396V	0.16

  - These versions are released as part of NX-OS 9.4(5) and can be installed while the switch is running NX-OS 9.4(5). The EPLD is upgraded using the **install all EPLD** CLI command. This includes an automatic disruptive reload of the switch to activate the EPLD update. If the EPLD is not upgraded, then the old reload mechanism will be used which may result in the switch hanging during an ISSU which includes a BIOS update. This capability does not exist on 16 Gbps and 32 Gbps fabric switches. Once the EPLD has been updated, subsequent ISSUs can activate any new BIOS versions contained in the image without any disruptive reloads.

    For further information about EPLD installation and updates refer to the NX-OS EPLD release note

- Disable transceiver power control feature. If enabled, to upgrade your software from Cisco MDS NX-OS 9.4(2a) to 9.4(3) or later releases:
  - Disable the transceiver power control feature if it is enabled before starting the upgrade using the command: Use the command: `switch(config)# no system transceiver power-control`
  - Verify the transceiver power control feature is disabled using the command `switch(config)# show system transceiver power-control`

- After the upgrade is complete, you can re-enable the feature with the command: `switch(config)# system transceiver power-control`

During BIOS upgrade on Cisco MDS 9700 Series Supervisor-4 modules, the message *[ME HECI] Unable to read HMRFPO_MERESET_CMD_ID response - Time out* may occasionally be displayed. This message can be safely ignored as the BIOS upgrade completes successfully.

Preventing Hardware Forwarding Corruption during ISSU

Beginning with MDS 9000 Release 8.5(1), a change in the internal ACL programming format will lead to SAN analytics ACL entry corruption if the feature remains enabled during upgrade from Release 8.x to Release 8.5(1) or Release 9.x. This issue arises from a mix of old and new hardware entry formats, causing a silent corruption that may not be immediately apparent and cannot be reliably detected by the ACL consistency checker in the affected releases.

To prevent this analytics ACL corruption during an ISSU, SAN Analytics must be disabled prior to the upgrade. It can safely be reconfigured after the upgrade is completed. For more information, see CSCwo03706.

Note Beginning with Release 9.4(3a), if an ISSU is performed with analytics enabled, the ISSU will fail unless the analytics feature is disabled beforehand.

This procedure should be performed if all of the following are true:

- if **feature analytics** is configured.
- if an In Service Software Upgrade (ISSU) is being performed.
- if the current release is prior to Release 8.5(1) and the target release is Release 8.5(1) or 9.2(1) or later.
- is one of the following products:

Cisco Product Name	IBM Product Name
MDS 9148T Fabric Switch	SAN48C-6
MDS 9396T Fabric Switch	SAN96C-6
MDS 9132T Fabric Switch	SAN32C-6
32 Gb Module (DS-X9648-1536K9)	32 Gb Module (01FT644)

If an ISSU has already been done with analytics enabled that met the previous conditions, analytics ACL corruption occurs. Perform a disruptive reload of the fabric switch or 32 Gb module.

- For MDS 9000 Series Fabric Switches, perform the disruptive reload using the **reload system** command.

Note Do not specify the **non-disruptive** parameter

.

- For MDS 9000 Series Director Switches with 32 Gb modules, perform the disruptive reload using the **reload module x** command.

Note Execute this command for modules that have interfaces with SAN Analytics configured.

Note Analytics data will not be collected or transported via telemetry when analytics is disabled. This will not affect NDFC SAN Insights.

To prevent the issue, perform the following procedure:

Procedure

Step 1 Log in to the switch with **network-admin** user privileges.

Step 2 Save the current SAN Analytics configuration to a backup file on bootflash.

```
switch# echo "configure terminal" > bootflash:before_issu_analytics.cfg
switch# show running-config analytics >> bootflash:before_issu_analytics.cfg
```

Step 3 Verify the analytics interface configuration as a backup on bootflash.

```
switch# show file bootflash:before_issu_analytics.cfg
```

Step 4 Save the entire switch configuration as a backup on bootflash.

```
switch# copy running-config bootflash:backup_config.txt
```

For more information, see Using the Cisco NX-OS Setup Utility chapter in the *Cisco MDS 9000 Series NX-OS Fundamentals Configuration Guide*.

Step 5 In the Global Configuration mode, disable the SAN Analytics feature.

```
switch# configure terminal
switch(config)# no feature analytics
```

Validate that the SAN Analytics is disabled.

```
switch# show feature | include analytics
analytics            1        disabled
```

Step 6 Upgrade the Cisco MDS switch to the target Release 9.x.

For upgrade instructions, see Upgrading Cisco MDS NX-OS Release 9.x.

Step 7 After successful upgrade, restore the SAN Analytics running configuration in the Global Configuration mode.

```
switch(config)# copy bootflash:before_issu_analytics.cfg running-config
Copy complete.
```

Step 8 Verify SAN analytics feature is now enabled.

```
switch# show feature | include analytics
analytics            1        enabled
```

Step 9 Verify analytics is enabled on the same set of interfaces as in Step 3, on page 41.

```
switch# show running-config analytics
```

Step 10 Save the updated running configuration to startup configuration.

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

Step 11 Remove the backup configuration files to free up space.

```
switch# delete bootflash:backup_config.txt
Do you want to delete "/backup_config.txt"? (yes/no/abort) [y] y

switch# delete bootflash:before_issu_analytics.cfg
Do you want to delete "/before_issu_analytics.cfg"? (yes/no/abort) [y] y
```

This process ensures that SAN Analytics entries do not become corrupted during the upgrade. For further details, refer to CSCwo03706.

Upgrading MDS NX-OS in Cisco MDS 9700 Series Multilayer Director Switches

On a Cisco MDS 9700 Series Multilayer Director, the high-level process to upgrade to Cisco MDS NX-OS Release 9.x is as follows:

Procedure

Step 1 Upgrade to Cisco MDS NX-OS Release 9.x, as described in Upgrading to Cisco MDS NX-OS Release 9.x on a Cisco MDS 9700 Series Multilayer Director, on page 43.

Step 2 Install the Cisco MDS 48-port 16-Gbps Fibre Channel Switching module in the Cisco MDS 9700 chassis or install the Cisco MDS 48-port 10-Gigabit Ethernet module in the Cisco MDS 9700 chassis.

For additional information, see the Cisco MDS 9700 Series Hardware Installation Guide.

Step 3 If needed, reload the switch.

Upgrading to Cisco MDS NX-OS Release 9.x on a Cisco MDS 9700 Series Multilayer Director

Note You can use both console connections or telnet/SSH connections via management interfaces for firmware upgrades.

Ensure that there is a working connection to both supervisors if you are upgrading through the console interfaces. As this process causes a switchover and the current standby supervisor becomes active after the upgrade.

Ensure that both mgmt0 interfaces are up if you are upgrading via telnet/SSH through the management interfaces, . To determine the status of the *mgmt0* interface on the active supervisor use the **show interface mgmt0** command. To determine the status of the mgmt0 interface on the standby supervisor use the **show interface mgmt0 standby** command. Once the switchover has occurred the telnet/SSH session must be reestablished.

Note When the **system auto-collect tech-support** command is enabled, there is a delay of 600 seconds for the standby switch to reload and become HA-Standby in Cisco MDS 9700 Series Multilayer Directors.

To upgrade a Cisco MDS 9700 Series Multilayer Director from an earlier NX-OS release to an NX-OS 9.x release perform the following steps:

Procedure

Step 1 Go to http://www.cisco.com/ and click **Log In** at the top of the page. Enter your Cisco Systems username and password.

Note
Unregistered Cisco.com users cannot access secure links that are provided in this document.

Step 2 Verify the following physical connections for the new Cisco MDS 9700 Series Multilayer switch:

If upgrading via the console interfaces:

- Both console ports are physically connected to a computer terminal (or terminal server). If upgrading via telnet/SSH.
- Both management 10/100/1000 Ethernet port (mgmt0) interfaces are connected to an external hub, switch, or router. Verify both connections via the **show interface mgmt0** and **show interface mgmt0 standby** commands.

To verify the physical connections, see the hardware installation guide for your product. For more information, see the Cisco MDS 9700 Director Hardware Installation Guide.

Step 3 Log in to the switch.

Step 4 Run the **copy running-config startup-config** command to store your current running configuration.

You can also create a backup of your existing configuration in a file by running the **copy running-config bootflash:backup_config.txt** command. See the Using the Cisco NX-OS Setup Utility chapter in the *Cisco MDS 9000 Series NX-OS Fundamentals Configuration Guide*.

Step 5 Step 5 Save a copy of the **show tech-support details** command output of the switch.

For more information, see the Collecting Logs from Cisco MDS 9000 Switches and DCNM.

Step 6 Verify that the requested license files installed in the switch are displayed, using the **show license usage** command.

Note
The switch is initially shipped with the required licenses installed in the system. However, the initial license file does not cover the unlicensed features that may be used during the grace period. See the Cisco MDS 9000 Series NX-OS Licensing Guide.

If no license is displayed at this point, go to Step 7 and Step 8 to install the required licenses.

If the required licenses are displayed at this point, skip Step 7 and Step 8. Go to Step 9.

The following is a sample CLI output for a valid license:

```
switch# show license usage
Feature             Ins       Lic       Status       Expiry Date    Comments
FM_SERVER_PKG        No        -        Unused        -                -
MAINFRAME_PKG        No        -        Unused        -                -
ENTERPRISE_PKG       Yes       -        Unused        Never            -
```

Step 7 Install licenses, if necessary, to ensure that the required features are available on the switch.

Perform the following steps:

a) Use the **show license host-id** command to obtain the serial number of your switch. The host ID is also referred to as the switch serial number.

```
switch# show license host-id
License hostid: VDH=JAF1721AEQG
```

Tip
Use the entire ID that appears after the colon (:). In this example, the host ID is VDH=JAF1721AEQG.

b) Obtain your Claim Certificate or Proof of Purchase document. This document accompanies every Cisco MDS switch.
c) Locate the Product Authorization Key (PAK) from the Claim Certificate or Proof of Purchase document.
d) A URL is provided in the Claim Certificate or Proof of Purchase document for your product.
e) Locate and access the specified URL that applies to your switch's and enter the switch serial number and PAK.

The license key file is sent to you by email. The license key file is digitally signed to be used only on the switch for which it was requested. The requested features are also enabled after the Cisco MDS NX-OS software on the specified switch accesses the license key file.

Note
Install the license file in the specified Cisco MDS 9000 Series Multilayer switch without modifying the key.

For more information on licensing, see the Cisco MDS 9000 Series NX-OS Licensing Guide.

Step 8 Install the license key file when you receive it by email.

Perform the following steps:

a) Copy the license file to bootflash using TFTP or SCP.
b) Install the license file by running the **install license** command on the active supervisor module, from the switch console.

```
switch# install license bootflash:license_file.lic
Installing license..done
```

Note
If you provide a target name for the license key file, the file is installed with the specified name. Otherwise, the filename specified in the license key file is used to install the license.

c) Exit the switch console.

For more information on licensing, see the Cisco MDS 9000 Series NX-OS Licensing Guide.

Step 9 Ensure that the required space is available in the bootflash: directory for the image files to be copied using the **dir bootflash:** command.

Use the **delete bootflash:***filename* command to remove unnecessary files.

```
switch# dir bootflash:

4096 Nov 23 10:47:46 2018.patch/
68230 Dec 10 11:27:20 2018 backup_10_12_2018
4096 Dec 12 10:23:54 2018 bootflash/
52692992 Aug 24 06:18:35 2018 diag-bz-npu-F26
82725888 Aug 24 06:18:24 2018 diag-sup3dc3-bz-F26.bin
1048576 Aug 24 05:47:10 2018 diag_test_file
34646 Jan 28 14:45:50 2019 ethpm_act_logs.log
270463 Jan 28 14:47:51 2019 ethpm_im_tech.log
30627 Jan 28 14:46:50 2019 ethpm_mts_details.log
73 Jan 28 14:46:50 2019 ethpm_syslogs.log
1935271 Jan 28 14:47:50 2019 ethpm_tech.log
12831 Dec 07 15:57:20 2018 log1
4096 Feb 07 13:13:47 2019 lost+found/
4421896 May 02 19:32:22 2019 m9700-sf4ek9-dplug-mz.9.2.1.bin
4421857 May 07 12:18:16 2019 m9700-sf4ek9-dplug-mz.9.2.1.bin
60380672 Apr 29 16:15:25 2019 m9700-sf4ek9-kickstart-mz.9.2.1.bin
60380672 May 02 19:32:34 2019 m9700-sf4ek9-kickstart-mz.9.2.1.bin
60380672 May 07 12:19:05 2019 m9700-sf4ek9-kickstart-mz.9.2.1.bin
433279746 Apr 29 16:32:42 2019 m9700-sf4ek9-mz.9.2.1.bin
433304076 May 02 19:47:52 2019 m9700-sf4ek9-mz.9.2.1.bin
1548886 May 02 19:47:58 2019 m9700-sf4ek9-mz.9.2.1.tar.gz
433423429 May 07 12:33:27 2019 m9700-sf4ek9-mz.9.2.1.bin
1548937 May 07 12:33:35 2019 m9700-sf4ek9-mz.9.2.1.tar.gz
4096 Mar 26 09:54:14 2019 scripts/
1286622 Mar 21 15:53:25 2019 sysmgrconfig
11082 Aug 24 06:14:41 2018 temp.log
Usage for bootflash://sup-local
3213733888 bytes used
500277248 bytes free
3714011136 bytes total
```

Note
Before downloading and installing Cisco MDS NX-OS software, verify that the release is supported by your Cisco MDS reseller. If you purchased support from a Cisco reseller, contact them directly for more information. Otherwise, contact Cisco Technical support.

Step 10 If you need more space on the active supervisor module bootflash, delete the files that are not required to make space available:

```
switch# delete bootflash:m9700-sf3ek9-kickstart-mz.8.3.1.bin
switch# delete bootflash:m9700-sf3ek9-mz.8.3.1.bin
```

Step 11 Verify that there is space available on the standby supervisor module bootflash on a Cisco MDS 9700 Series Multilayer switch:

```
switch# dir bootflash://sup-standby/
       4096    Jan 06 05:17:36 2020  .patch/
       4096    Sep 21 23:50:31 2023  .rpmstore/
          0    Oct 26 10:04:12 2023  F241-15-09-9710-1_show_tech_det_9_4_1.log
       4096    Jan 09 12:45:21 2025  intersight/
       4096    Mar 05 13:52:27 2025  lost+found/
    4857978    Jan 20 12:07:30 2025  m9700-sf4ek9-dplug-mzg.9.4.3.bin
   60695552    Mar 05 16:38:23 2025  m9700-sf4ek9-kickstart-mz.8.4.2f.bin
   63588352    Mar 12 09:21:59 2025  m9700-sf4ek9-kickstart-mz.9.2.1a.bin
   79246336    Aug 20 07:52:04 2024  m9700-sf4ek9-kickstart-mz.9.4.2a.bin
   79637504    Dec 10 16:42:04 2024  m9700-sf4ek9-kickstart-mz.9.4.3.bin
  480722931    Feb 11 13:26:55 2025  m9700-sf4ek9-mz.8.4.2f.bin
  579615401    Mar 12 09:20:53 2025  m9700-sf4ek9-mz.9.2.1a.bin
  539330088    Aug 20 07:52:38 2024  m9700-sf4ek9-mz.9.4.2a.bin
  540745273    Dec 11 14:39:59 2024  m9700-sf4ek9-mz.9.4.3.bin
    5854582    Sep 11 14:49:52 2023  m9700-sf4ek9-udplug-811941.bin
      42859    Feb 26 18:27:19 2025  show_int_tabular.py

Usage for bootflash://sup-standby
 2684067840 bytes used
 1112522752 bytes free
 3796590592 bytes total
switch#
```

Step 12 If you need more space on the standby supervisor module bootflash on a Cisco MDS 9700 Series Multilayer switch, delete the files that are not required to make space available:

```
switch# delete bootflash://sup-standby/m9700-sf4ek9-kickstart-mz.9.2.1a.bin
switch# delete bootflash://sup-standby/m9700-sf4ek9-mz.9.2.1a.bin
```

Step 13 Access the Software Download Center using this URL: http://www.cisco.com/cisco/software/navigator.html

You are prompted to log in, use your Cisco username and password.

Step 14 Select the required Cisco MDS NX-OS Release 9.x image, depending on the release you are installing.

The Technical Support Encryption Software Export Distribution Authorization form is displayed.

Step 15 Enter the relevant details in this form, to obtain authorization.

Step 16 After obtaining the authorization, download the files to an FTP or TFTP server.

Note
Ensure that you have configured an FTP or TFTP server where the files can be downloaded.

Step 17 Copy the Cisco MDS NX-OS kickstart and system images from the FTP or TFTP server to the active supervisor module bootflash.

When you download an image file, change your TFTP environment's IP address or Domain Name System (DNS) name to the path where the files are located.

```
switch# copy tftp://tftpserver.cisco.com/MDS/m9700-sf4ek9-kickstart-mz.9.2.1.bin
bootflash:m9700-sf4ek9-kickstart-mz.9.2.1.bin
switch# copy tftp://tftpserver.cisco.com/MDS/m9700-sf4ek9-mz.9.2.1.bin
bootflash:m9700-sf4ek9-mz.9.2.1.bin
```

Step 18 To verify the current software version that the switch is running, using the **show version** command:

The following example displays the current version of the software running:

```
switch# show version

Cisco Nexus Operating System (NX-OS) Software
TAC support: http://www.cisco.com/tac
Documents: http://www.cisco.com/en/US/products/ps9372/tsd_products_support_serie
s_home.html
Copyright (c) 2002-2018, Cisco Systems, Inc. All rights reserved.
The copyrights to certain works contained in this software are
owned by other third parties and used and distributed under
license. Certain components of this software are licensed under
the GNU General Public License (GPL) version 2.0 or the GNU
Lesser General Public License (LGPL) Version 2.1. A copy of each
such license is available at
http://www.opensource.org/licenses/gpl-2.0.php and
http://www.opensource.org/licenses/lgpl-2.1.php
Software
BIOS: version 3.2.0
kickstart: version 9.2(1)
system: version 9.2(1)
BIOS compile time: 08/9/2021
kickstart image file is: bootflash:///m9700-sf3ek9-kickstart-mz.9.2.1.bin
kickstart compile time: 11/30/2018 12:00:00 [11/30/2018 23:18:49]
system image file is: bootflash:///m9700-sf3ek9-mz.9.2.1.bin
system compile time: 11/30/2018 12:00:00 [12/01/2018 00:45:13]
Hardware
cisco MDS 9706 (6 Slot) Chassis ("Supervisor Module-3")
Intel(R) Xeon(R) CPU with 8167760 kB of memory.
Processor Board ID JAE17440HVW
Device name: sw-9706-213
bootflash: 3915776 kB
slot0: 0 kB (expansion flash)
Kernel uptime is 0 day(s), 0 hour(s), 57 minute(s), 19 second(s)
Last reset at 818200 usecs after Mon Aug 9 13:49:17 2021
Reason: Reset triggered due to Switchover
************************************************************
```

Step 19 Verify that your switch is running compatible hardware. For more information, see the corresponding version of the Cisco MDS 9000 Series Release Notes.

Step 20 Use the **show interface mgmt***0* **standby** command to verify that the standby supervisor's mgmt0 link is up.

Step 21 Check for incompatibilities between NX-OS releases using the **show incompatibility system**<*target system image name*> command.

This command checks for incompatibilities between NX-OS releases, and any switch events that would interrupt the upgrade process. This will also ensure the `/var/volatile/tmp` file system has sufficient space to continue.

```
switch# show incompatibility system m9124v-s8ek9-mz.9.4.3a.bin
Checking incompatible configuration(s):
No incompatible configurations

Checking dynamic incompatibilities:
No incompatible configurations
switch#
```

Step 22 Verify if the `/var/volatile/tmp` file system has no more than 9% in use: using the **show system internal flash** command.

```
switch# show  system internal flash  | inc Mount|/var/volatile/tmp
Mount-on                 1K-blocks      Used   Available   Use%  Filesystem
/var/volatile/tmp           614400       104      614296      1   none
```

```
switch#
```

Note
The above example shows that the filesystem is used 1% only. Therefore, it is safe to proceed further. If the `/var/volatile/tmp` file system is utilized more than 9% , do not continue with the upgrade procedure. Contact Cisco TAC.

Step 23 Perform the upgrade by running the install all command.

The following example displays the result of the **install all** command if the system and kickstart files are specified locally. The example shows the command issued on a Cisco MDS 9700 Series Multilayer switch.

```
switch# install all kickstart m9700-sf4ek9-kickstart-mz.9.2.1.bin system m9700-sf4ek9-mz.9.2.1.bin
Installer will perform compatibility check first. Please wait.
Verifying image bootflash:/m9700-sf4ek9-kickstart-mz.9.2.1.bin for boot variable "kickstart".
[####################] 100% -- SUCCESS
Verifying image bootflash:/m9700-sf4ek9-mz.9.2.1.bin for boot variable "system".
[####################] 100% -- SUCCESS
Performing module support checks.
[####################] 100% -- SUCCESS
Verifying image type.
[####################] 100% -- SUCCESS
Extracting "lctsh" version from image bootflash:/m9700-sf4ek9-mz.9.2.1.bin
[####################] 100% -- SUCCESS
Extracting "bios" version from image bootflash:/m9700-sf4ek9-mz.9.2.1.bin
[####################] 100% -- SUCCESS
Extracting "lc2dce-mds" version from image bootflash:/m9700-sf4ek9-mz.9.2.1.bin
[####################] 100% -- SUCCESS
Extracting "slc4xb" version from image bootflash:/m9700-sf4ek9-mz.9.2.1.bin
[####################] 100% -- SUCCESS
Extracting "system" version from image bootflash:/m9700-sf4ek9-mz.9.2.1.bin
[####################] 100% -- SUCCESS
Extracting "kickstart" version from image bootflash:/m9700-sf4ek9-kickstart-mz.9.2.1.bin
[####################] 100% -- SUCCESS
Extracting "slcf32" version from image bootflash:/m9700-sf4ek9-mz.9.2.1.bin
[####################] 100% -- SUCCESS
Notifying services about system upgrade.
[####################] 100% -- SUCCESS
Compatibility check is done:
Module bootable Impact Install-type Reason
------ -------- -------------- ------------ ------
2 yes non-disruptive rolling
3 yes non-disruptive rolling
4 yes non-disruptive rolling
5 yes non-disruptive reset
6 yes non-disruptive reset
10 yes non-disruptive rolling
Other miscellaneous information for installation:
Module info
------ ---------------------------------
2 FC ports 1-24 are hitless, IPS 1-8 are hitful, and Intelligent Applications running are hitful
Images will be upgraded according to following table:
Module Image Running-Version (pri:alt) New-Version Upg-Required
------ ---------- ---------------------------------------- --------------------
2 lctsh 8.3(2) 8.4(1) yes
2 bios v4.2.14(03/30/2018):v4.2.14(03/30/2018) no
3 lc2dce-mds 8.3(2) 8.4(1) yes
3 bios v2.0.32(12/16/13) v2.0.32(12/16/13) no
4 slc4xb 8.3(2) 8.4(1) yes
4 bios v1.10.21(11/26/12) v1.10.21(11/26/12) no
5 system 8.3(2) 8.4(1) yes
5 kickstart 8.3(2) 8.4(1) yes
```

```
5 bios v3.1.0(02/27/2013) v3.2.0(09/27/2018) yes
6 system 8.3(2) 8.4(1) yes
6 kickstart 8.3(2) 8.4(1) yes
6 bios v3.1.0(02/27/2013) v3.2.0(09/27/2018) yes
10 slcf32 8.3(2) 8.4(1) yes
10 bios v4.1.49(01/29/2017)v4.1.49(01/29/2017) no

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:/m9700-sf4ek9-kickstart-mz.9.2.1.bin to standby.
[####################] 100% -- SUCCESS
Syncing image bootflash:/m9700-sf4ek9-mz.9.2.1.bin to standby.
[####################] 100% -- SUCCESS
Setting boot variables.
[####################] 100% -- SUCCESS
Performing configuration copy.
[####################] 100% -- SUCCESS
Module 2: Upgrading bios/loader/bootrom/power-seq.
Warning: please do not remove or power off the module at this time.
[####################] 100% -- SUCCESS
Module 3: Upgrading bios/loader/bootrom/power-seq.
Warning: please do not remove or power off the module at this time.
[####################] 100% -- SUCCESS
Module 4: Upgrading bios/loader/bootrom/power-seq.
Warning: please do not remove or power off the module at this time.
[####################] 100% -- SUCCESS
Module 5: Upgrading bios/loader/bootrom/power-seq.
Warning: please do not remove or power off the module at this time.
[####################] 100% -- SUCCESS
Module 6: Upgrading bios/loader/bootrom/power-seq.
Warning: please do not remove or power off the module at this time.
[####################] 100% -- SUCCESS
Module 10: Upgrading bios/loader/bootrom/power-seq.
Warning: please do not remove or power off the module at this time.
[####################] 100% -- SUCCESS
2019 Mar 23 15:38:37 switch %PLATFORM-2-MOD_REMOVE: Module 6 removed (Serial number JAE17480AL1)
2019 Mar 23 15:40:58 switch %USBHSD-STANDBY-2-MOUNT: logflash: online
2019 Mar 23 15:42:06 switch %PLATFORM-1-PFM_ALERT: Disabling ejector based shutdown on sup in slot
 6
Module 6: Waiting for module online.
-- SUCCESS
2019 Mar 23 15:42:30 switch %PLATFORM-1-PFM_ALERT: Enabling ejector based shutdown on sup in slot
5
Notifying services about the switchover.
[####################] 100% -- SUCCESS
"Switching over onto standby".
>>>
>>>
>>>
NX7k SUP BIOS version ( 3.02) : Build - 03/23/2019 02:38:22
PM FPGA Version : 0x00000014
Power sequence microcode revision - 0x00000001 : card type - f10156EEA0
Booting Spi Flash : Primary
CPU Signature - 0x000106e4: Version - 0x000106e0
CPU - 1 : Cores - 4 : HTEn - 1 : HT - 2 : Features - 0xbfebfbff
FSB Clk - 532 Mhz : Freq - 2152 Mhz - 2128 Mhz
MicroCode Version : 0x00000005
Memory - 8192 MB : Frequency - 1067 MHZ
Loading Bootloader: Done
IO FPGA Version : 0x10001
PLX Version : 861910b5
Bios digital signature verification - Passed
```

```
Reset Reason Registers: 0x1 0x0
Filesystem type is ext2fs, partition type 0x83
GNU GRUB version 0.97
Autobooting bootflash:/m9700-sf4ek9-kickstart-mz.9.2.1.bin bootflash:/m9700-
sf4ek9-mz.9.2.1.bin..
Filesystem type is ext2fs, partition type 0x83
Booting kickstart image: bootflash:/m9700-sf4ek9-kickstart-mz.9.2.1.bin...
.....................................................................
.....................................................................
.............................................................
Kickstart digital signature verification Successful
Image verification OK
INIT: version 2
boot device node /dev/sda
obfl flash device node /dev/sdb
USB log flash device not found...
Checking obfl filesystem.
Checking all filesystems..r.r.r.R. done.
fdisk: cannot open /dev/hd-log: No such file or directory
No partition found for LOG
LOG partition is less than 1G, size found = 0
mounting Log 1
Starting mcelog daemon
cat: /var/log/log_flash_node: No such file or directory
Initializing the LOG flash
LOG Partitioning result code = 0
rrCreating logflash directories
Loading system software
/bootflash//m9700-sf3ek9-mz.9.2.1.bin read done
System image digital signature verification successful.
Uncompressing system image: bootflash:/m9700-sf4ek9-mz.9.2.1.bin Fri Mar 23 15:46:29 IST 2019
blogger: nothing to do.
C
..done Fri Mar 23 15:46:34 IST 2019
INIT: Entering runlevel: 3
Starting portmap daemon...
starting statd: done
starting 8 nfsd kernel threads: done
starting mountd: done
System is coming up... Please wait...
2019 Mar 23 15:48:10 switch %LICMGR-2-LOG_LIC_NO_LIC: No license(s) present for feature
ENTERPRISE_PKG. Application(s) shut down in 96 days.
>>>
>>>
NX7k SUP BIOS version ( 3.02) : Build - 03/23/2019 02:38:22
PM FPGA Version : 0x00000014
Power sequence microcode revision - 0x00000001 : card type - f10156EEA0
Booting Spi Flash : Primary
CPU Signature - 0x000106e4: Version - 0x000106e0
CPU - 1 : Cores - 4 : HTEn - 1 : HT - 2 : Features - 0xbfebfbff
FSB Clk - 532 Mhz : Freq - 2153 Mhz - 2128 Mhz
MicroCode Version : 0x00000005
Memory - 8192 MB : Frequency - 1067 MHZ
Loading Bootloader: Done
IO FPGA Version : 0x10001
PLX Version : 861910b5
Bios digital signature verification - Passed
Reset Reason Registers: 0x0 0x8
Filesystem type is ext2fs, partition type 0x83
GNU GRUB version 0.97
Autobooting bootflash:/m9700-sf4ek9-kickstart-mz.9.2.1.bin bootflash:/m9700-
sf3ek9-mz.9.2.1.bin..
Filesystem type is ext2fs, partition type 0x83
Booting kickstart image: bootflash:/m9700-sf4ek9-kickstart-mz.9.2.1.bin...
```

```
.....................................................................
.....................................................................
.....................................................
Kickstart digital signature verification Successful
Image verification OK
INIT: version 2
boot device node /dev/sda
obfl flash device node /dev/sdb
log flash device node /dev/sdc
Checking obfl filesystem.
Checking all filesystems..r.r.r..r done.
Mounting Log Dir /logflash
mounting Log 0
Starting mcelog daemon
reCreating logflash directories
Loading system software
/bootflash//m9700-sf4ek9-mz.9.2.1.bin read done
System image digital signature verification successful.
Uncompressing system image: bootflash:/m9700-sf4ek9-mz.9.2.1.bin Fri Mar 23 15:40:22 IST 2019
blogger: nothing to do.
C
..done Fri Mar 23 15:40:27 IST 2019
INIT: Entering runlevel: 3
Starting portmap daemon...
starting statd: done
starting 8 nfsd kernel threads: done
starting mountd: done
2019 Mar 23 15:40:58 switch %USBHSD-2-MOUNT: logflash: online
2019 Mar 23 15:41:12 switch %LICMGR-2-LOG_LIC_NO_LIC: No license(s) present for feature
ENTERPRISE_PKG. Application(s) shut down in 96 days.
Continuing with installation, please wait
Module 6: Waiting for module online.
-- SUCCESS
2019 Mar 23 15:42:35 switch %KERN-2-SYSTEM_MSG: [ 203.622504] Switchover started by redundancy
driver - kernel
2019 Mar 23 15:42:36 switch %SYSMGR-2-HASWITCHOVER_PRE_START: This supervisor is becoming active
(pre-start phase).
2019 Mar 23 15:42:36 switch %SYSMGR-2-HASWITCHOVER_START: Supervisor 6 is becoming active.
2019 Mar 23 15:42:36 switch %SYSMGR-2-SWITCHOVER_OVER: Switchover completed.
2019 Mar 23 15:42:37 switch %PLATFORM-1-PFM_ALERT: Disabling ejector based shutdown on sup in slot
 6
2019 Mar 23 15:42:41 switch %LICMGR-2-LOG_LIC_NO_LIC: No license(s) present for feature
ENTERPRISE_PKG. Application(s) shut down in 96 days.
2019 Mar 23 15:42:41 switch %LICMGR-2-LOG_LIC_NO_LIC: No license(s) present for feature MAINFRAME_PKG.
 Application(s) shut down in 120 days.
2019 Mar 23 15:42:41 switch %LICMGR-2-LOG_LICAPP_NO_LIC: Application Fabric Binding running without
 MAINFRAME_PKG license, shutdown in 120 days
2019 Mar 23 15:42:42 switch %CALLHOME-2-EVENT: LICENSE_ALERT
Module 2: Non-disruptive upgrading.
[# ] 0%2019 Mar 23 15:49:27 switch %PLATFORM-1-PFM_ALERT: Enabling ejector based shutdown on sup
in slot 6
2019 Mar 23 15:52:05 switch %PMON-SLOT2-2-PMON_CRIT_INFO: Port Monitor Critical Information: Config
 download success.
[####################] 100% -- SUCCESS
Module 3: Non-disruptive upgrading.
[####################] 100% -- SUCCESS
Module 4: Non-disruptive upgrading.
[# ] 0%2019 Mar 23 15:57:44 switch %PMON-SLOT4-2-PMON_CRIT_INFO: Port Monitor Critical Information:
 Config download success.
[####################] 100% -- SUCCESS
Module 10: Non-disruptive upgrading.
[# ] 0%2019 Mar 23 16:00:00 switch %PMON-SLOT10-2-PMON_CRIT_INFO: Port Monitor Critical Information:
 Config download success.
[####################] 100% -- SUCCESS
```

```
Install has been successful.
You have now upgraded the Cisco NX-OS software in your switch.
switch#
```

Upgrading Cisco MDS NX-OS on Cisco MDS Fabric Switches

This section describes how to perform nondisruptive upgrades on the following Cisco MDS fabric switches:

- Cisco MDS 9124V Fibre Channel Switch
- Cisco MDS 9132T Multilayer Fabric Switch
- Cisco MDS 9148T Multilayer Fabric Switch
- Cisco MDS 9148S Multilayer Fabric Switch
- Cisco MDS 9148V Fibre Channel Switch
- Cisco MDS 9220i Multilayer Fabric Switch
- Cisco MDS 9250i Multiservice Fabric Switch
- Cisco MDS 9396S Multilayer Fabric Switch
- Cisco MDS 9396T Multilayer Fabric Switch
- Cisco MDS 9396V Fibre Channel Switch

This section contains the following topics:

Guidelines and Limitations for a Nondisruptive Software Upgrade

Before attempting to upgrade software images, follow these guidelines:

- During the upgrade, the fabric must be stable. That is, no devices should be logging in and an out of the fabric during the time of the NX-OS upgrade.
- Do not perform any configuration activities during an upgrade.
- Configure the Fabric Shortest Path First (FSPF) hello-interval timers to the default value of 20 seconds.
- Configure the Fabric Shortest Path First (FSPF) dead-interval timers to the default value of 80 seconds.
- If Cisco Fabric Services commits are pending in the fabric, the upgrade is aborted. Issue *show cfs lock* to see if there are any pending commits.
- If a zone server merge is in progress, the upgrade is aborted.
- If the upgrade is aborted due to a service not being ready for an upgrade, you are prompted to enter the **show install all failure-reason** command to identify the reason.

- Prior to upgrade or downgrade, reset the switch's logging levels to the system defaults via the **no logging level all** configuration command. If this is not done, the upgrade or downgrade may be disruptive due to excessive logging causing control plane downtime exceeding 80 seconds.

  Before entering the **no logging level all** command, ensure that the switch's current logging configuration is saved. This will need to restored after the upgrade or downgrade.

  Follow these steps:

  1. Enter the **show running-config | i "logging level"** command and save the output. These are the switch's current settings.
  2. Enter the **no logging level all** command in configuration mode.
  3. Perform upgrade or downgrade.
  4. Restore logging level configuration using the output that was saved from Step 1.

- When the installation is completed, the supervisor kickstart image, supervisor system image, module image, and the system BIOS are all updated.
- Nondisruptive upgrades on fabric switches disrupt the control plane for about 80 seconds. The software upgrade can be disruptive if the upgrade process exceeds the designated period or if a failure occurs, at which point it can be halted without disruption.
- Upgrades may be performed from the console port or via telnet/SSH. Performing the upgrade process by using the console port allows logging of the entire upgrade and bootup process. This may be useful for later troubleshooting. When upgrading on MDS 9700 directors there should be connections to both supervisors to get a complete log of the upgrade. Telnet/SSH sessions are lost when the switch or supervisor is rebooted and must be reestablished.
- Before performing an upgrade, use the **show install all impact system** *target system image name* command to view the effect of updating the system from the running image to another specified image.
- For 32G switches, after performing an ISSU to Release 9.4(5), you must manually reload the switch for the changes to take effect. As an alternative, you can perform a disruptive ISSU to apply the changes without a manual reload.
- For 64G switches, after upgrading to Release 9.4(5), you must upgrade the EPLD for the changes to take effect. This EPLD upgrade requires a one-time reload. No additional reload is required after the ISSU.

You can find the latest non-disruptive upgrade path in the Release Notes for the target NX-OS version. For more information see MDS Release Notes

Upgrading to Cisco MDS NX-OS Release 9.x on a Cisco MDS Fabric Switch

To upgrade a Cisco MDS fabric switch from an earlier NX-OS release to an NX-OS 9.x release perform the following steps:

Before you begin

- For 32G switches, after performing an ISSU to Release 9.4(5), you must manually reload the switch for the changes to take effect. As an alternative, you can perform a disruptive ISSU to apply the changes without a manual reload.
- For 64G switches, after upgrading to Release 9.4(5), you must upgrade the EPLD for the changes to take effect. This EPLD upgrade requires a one-time reload. No additional reload is required after the ISSU.

Procedure

Step 1 Verify that the system image files for the upgrade are present on the active supervisor module bootflash:

```
switch# dir bootflash:

25863680 Sep 23 12:02:16 2021 m9250-s5ek9-kickstart-mz.9.2.1.bin
25864704 Jan 05 12:21:26 2022 m9250-s5ek9-kickstart-mz.9.2.2.bin

Usage for bootflash://sup-local

2838728704 bytes used
520916992 bytes free
3359645696 bytes total
```

Step 2 If the software image file is not present, download it from an FTP or TFTP server to bootflash.

You can obtain the software image file from the Cisco.com Software Download Center at http://www.cisco.com/cisco/software/navigator.html.

```
switch# copy tftp://tftpserver.cisco.com/MDS/m9250-s5ek9-kickstart-mz.9.2.2.bin
bootflash:m9250-s5ek9-kickstart-mz.9.2.2.bin
switch# copy tftp://tftpserver.cisco.com/MDS/m9250-s5ek9-mz.9.2.2.bin
bootflash:m9250-s5ek9-mz.9.2.2.bin
```

Step 3 Ensure that the required space is available on the switch:

```
switch# dir bootflash:
25863680 Sep 23 12:02:16 2017 m9250-s5ek9-kickstart-mz.9.2.1.bin
25864704 Sep 05 12:21:26 2018 m9250-s5ek9-kickstart-mz.9.2.2.bin
25864704 Sep 05 12:21:50 2018 m9250-s5ek9-mz.9.2.2.bin

Usage for bootflash://sup-local
120695976 bytes used
63863640 bytes free
184559616 bytes total
```

Step 4 If you need more space on the switch, delete the files that are not required:

```
switch# delete bootflash:m9250-s5ek9-kickstart-mz.9.2.1.bin
```

Step 5 Save the configuration using the **copy running-config startup-config** command:

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

You can also back up your existing configuration to a file, using the **copy running-config bootflash:backup_config.txt** command. You can add a date reference to the.txt filename to identify the file later.

Step 6 Save a copy of the **show tech-support** command output of the switch. For more information, see https://www.cisco.com/c/en/us/td/docs/dcn/whitepapers/how-to-collect-logs-cisco-mds.html#Theshowtechsupportcommand.

Step 7 Check for incompatibilities between NX-OS releases using the **show incompatibility system**<*target system image name*> command.

This command checks for incompatibilities between NX-OS releases, and any switch events that would interrupt the upgrade process. This will also ensure the `/var/volatile/tmp` file system has sufficient space to continue.

```
switch# show incompatibility system m9124v-s8ek9-mz.9.4.3a.bin
Checking incompatible configuration(s):
No incompatible configurations

Checking dynamic incompatibilities:
No incompatible configurations
switch#
```

Step 8 Verify if the `/var/volatile/tmp` file system has no more than 9% in use: using the **show system internal flash** command.

```
switch# show  system internal flash  | inc Mount|/var/volatile/tmp
Mount-on                 1K-blocks      Used   Available   Use%  Filesystem
/var/volatile/tmp           614400       104      614296      1   none

switch#
```

Note
The above example shows that the filesystem is used 1% only. Therefore, it is safe to proceed further. If the `/var/volatile/tmp` file system is utilized more than 9% , do not continue with the upgrade procedure. Contact Cisco TAC.

Step 9 Perform the upgrade by running the **install all** command:

```
switch# install all kickstart m9250-s5ek9-kickstart-mz.9.2.2.bin system m9250-s5ek9-mz.9.2.2.bin
Installer will perform compatibility check first. Please wait.
y
Verifying image bootflash:/m9250-s5ek9-kickstart-mz.9.2.2.bin for boot variable "kickstart".
[# ] 0%
[####################] 100% -- SUCCESS
Verifying image bootflash:/m9250-s5ek9-mz.9.2.2.bin for boot variable "system".
[####################] 100% -- SUCCESS
Performing module support checks.
[####################] 100% -- SUCCESS
Verifying image type.
[####################] 100% -- SUCCESS
Extracting "system" version from image bootflash:/m9250-s5ek9-mz.9.2.2.bin
[####################] 100% -- SUCCESS
Extracting "kickstart" version from image bootflash:/m9250-s5ek9-kickstart-mz.9.2.2.bin
[####################] 100% -- SUCCESS
Extracting "bios" version from image bootflash:/m9250-s5ek9-mz.9.2.2.bin
[####################] 100% -- SUCCESS
Performing Compact Flash and TCAM sanity test.
[####################] 100% -- SUCCESS
Notifying services about system upgrade.
[####################] 100% -- SUCCESS
Compatibility check is done:
Module bootable Impact Install-type Reason
------ -------- -------------- ------------ ------
1 yes non-disruptive reset
Other miscellaneous information for installation:
Module info
------ ---------------------------------
1 FC ports 1-40 and FCoE ports 1-8 are hitless, IPS 1-2 are hitful, and Intelligent Applications
running are hitful
Images will be upgraded according to following table:
Module Image Running-Version New-Version Upg-Required
```

```
------ ---------- ---------------------------------------- -------------------- -----
1 system 9.2(1) 9.2(2) yes
1 kickstart 9.2(1) 9.2(2) yes
1 bios v2.1.17(01/08/14):v2.1.17(01/08/14) v2.1.17(01/08/14) no
Do you want to continue with the installation (y/n)? [n] y
Install is in progress, please wait.
Performing runtime checks.
[####################] 100% -- SUCCESS
Notifying services about the upgrade.
[####################] 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.
[####################] 100% -- SUCCESS
Upgrade can no longer be aborted, any failure will result in a disruptive upgrade.
Freeing memory in the file system.
[####################] 100% -- SUCCESS
Loading images into memory.
[####################] 100% -- SUCCESS
Saving linecard runtime state.
[####################] 100% -- SUCCESS
Saving supervisor runtime state.
[####################] 100% -- SUCCESS
Saving mts state.
[####################] 100% -- SUCCESS
Reloading the kernel to proceed with the upgrade.
All telnet and ssh connections will now be temporarily terminated.
>> NX7--LC-loader-02.01.17 (June 8 2019 - 16:30:41), Build: 02.01.17
CPU0: 8572E, Version: 2.2, (0x80e80022)
Core: E500, Version: 3.0, (0x80210030)
Clock Configuration:
CPU:1066.672 MHz, CCB:533.336 MHz,
DDR:266.668 MHz (533.336 MT/s data rate), LBC:33.334 MHz
L1: D-cache 32 kB enabled
I-cache 32 kB enabled
Board: 9044, IOFPGA: 0x0000001A, SPROM: 0xAB
Boot flash : Primary
I2C: ready
DRAM: Initializing
DDR: dimm type 10, registered 1
DDR: dimm type 10, registered 1
DDR: 4 GB
L2: 1024 KB enabled
Using default environment
In: serial
Out: serial
Err: serial
Net: INFO: Net boot mode = 1
INFO: Net boot mode = 1
INFO: Board will come up MGMT interface
INFO: MAC address is: b8:38:61:4a:24:40
eTSEC2 board phy 3
INFO: Net boot mode = 1
eTSEC2
IDE: Bus 0: OK
Device 0: Model: UGB30STC4000Z4-EBY-ASD Firm: FW100511 Ser#: UNIGEN3 30021309
Type: Hard Disk
Capacity: 3907.9 MB = 3.8 GB (8003520 x 512)
Booting image bootflash://m9250-s5ek9-kickstart-mz.9.2.2.bin
25968640 bytes read
NBI at 08000000 size 134217728
```

```
Booting image at addr 0x00800000...
Memory <- <0x0 0x0 0x1 0x0> (4096MB)
ethernet0: local-mac-address <- b8:38:61:4a:24:40
ethernet1: local-mac-address <- 00:e0:0c:00:01:fd
ethernet2: local-mac-address <- 00:e0:0c:00:02:fd
CPU clock-frequency <- 0x3f941f80 (1067MHz)
CPU timebase-frequency <- 0x3f941f8 (67MHz)
CPU bus-frequency <- 0x1fca0fc0 (533MHz)
Image starting: loaded at 0x00800000 (sp: 0x7fedc4c0)
Allocating 0x620d88 bytes for kernel...
unzipping (0x00000000 <- 0x00817000:0x00de3838)...done 0x5bc060 bytes
Using loader supplied ramdisk at 0x2800000-0x3ddaa00
initrd head: 0x1f8b0808
Linux/PowerPC load: rw root=/dev/ram0 rdbase=0x7000000 card_index=9044 maxcpus=2 ip=off
ramdisk_size=262144 noquiet obfl_type_ide=1 kgdboc=ttyS0,9600,B isanimg_loc=0x6000000
isanimg_size=0x400 console=ttyS0,9600n8nn loader_ver="02.01.17" card_index=9044 quiet bootdev=ide0
 server_ip=171.69.21.28 ksimg=/m9250-s5ek9-kickstart-mz.9.2.2.bin isanimg=/m9700-sf4ek9-mz.9.2.1.bin
 Finalizing device tree... flat tree at 0xdf0140
ï¿½setup_arch: bootmem
mpc85xx_ds_setup_arch()
arch: exit
[ 0.060041] Host controller irq 26
[ 0.134631] Assign root port irq 26
[ 0.755227] physmap-flash physmap-flash.0: Could not reserve memory region
[ 1.032812] Enabling all PCI devices
INIT: Checking all filesystems.....retval=[0]
done.
Loading system software
Uncompressing system image: bootflash:///m9250-s5ek9-kickstart-mz.9.2.2.bin
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
Load plugins that defined in image conf: /isan/plugin_img/img.conf
No Patching support on this platform
Loading plugin 0: core_plugin...
No Patching support on this platform
Enter pboot_chk_compatibility
num srgs 1
0: swid-core-s5ek9, swid-core-s5ek9
num srgs 1
0: swid-sup-ali-ks, swid-sup-ali-ks
INIT: Entering runlevel: 3
[ 127.215099] clpk_hw_init_1:Post ISSU instance 0 status 0x00000736 GOOD
[ 127.293946] clpk_hw_init_1:Post ISSU instance 1 status 0x00000536 GOOD
System is coming up... Please wait...
System is coming up... Please wait...
System is coming up... Please wait...
System is coming up... Please wait...
System is coming up... Please wait...
System is coming up... Please wait...
System is coming up... Please wait...
System is coming up... Please wait...
System is coming up... Please wait...
System is coming up... Please wait...
System is coming up... Please wait...
System is coming up... Please wait...
System is coming up... Please wait...
Continuing with installation process, please wait.
The login will be disabled until the installation is completed.
Status for linecard upgrade.
[####################] 100% -- SUCCESS
Performing supervisor state verification.
[####################] 100% -- SUCCESS
Supervisor non-disruptive upgrade successful.
Install has been successful.
```

Step 10 Log in to the switch:

```
MDS Switch
x.x.x.x login: admin
Cisco Nexus Operating System (NX-OS) Software
TAC support: http://www.cisco.com/tac
Copyright (c) 2002-2014, Cisco Systems, Inc. All rights reserved.
The copyrights to certain works contained in this software are
owned by other third parties and used and distributed under
license. Certain components of this software are licensed under
the GNU General Public License (GPL) version 2.0 or the GNU
Lesser General Public License (LGPL) Version 2.1. A copy of each
such license is available at
http://www.opensource.org/licenses/gpl-2.0.php and
http://www.opensource.org/licenses/lgpl-2.1.php
```

Step 11 Run the **show version** command:

```
switch# show version

Cisco Nexus Operating System (NX-OS) Software
TAC support: http://www.cisco.com/tac
Documents: http://www.cisco.com/en/US/products/ps9372/tsd_products_support_serie
s_home.html
Copyright (c) 2002-2019, Cisco Systems, Inc. All rights reserved.
The copyrights to certain works contained herein are owned by
other third parties and are used and distributed under license.
Some parts of this software are covered under the GNU Public
License. A copy of the license is available at
http://www.gnu.org/licenses/gpl.html.
Software
BIOS: version 2.1.17
loader: version N/A
kickstart: version 9.2(2) [build 9.2(2)]
system: version 9.2(2) [build 9.2(2)]
BIOS compile time: 01/08/14
kickstart image file is: bootflash:///m9250-s5ek9-kickstart-mz.9.2.2.bin
kickstart compile time: 8/9/2021 23:00:00 [08/09/2021 04:18:10]
system image file is: bootflash:///m9250-s5ek9-kickstart-mz.9.2.2.bin
system compile time: 8/9/2019 23:00:00 [08/09/2021 07:09:57]
Hardware
cisco MDS 9250i 40 FC 2 IPS 8 FCoE (2 RU) Chassis ("40FC+8FCoE+2IPS Supervisor
")
Motorola, e500v2 with 4088636 kB of memory.
Processor Board ID JAF1804AAFG
Device name: MDS9250i
bootflash: 4001760 kB
Kernel uptime is 0 day(s), 0 hour(s), 7 minute(s), 42 second(s)
Last reset at 288238 usecs after Mon Aug 9 11:40:56 2021
Reason: Reset due to upgrade
System version: 9.2(1)
Service:
plugin
Core Plugin
```

Step 12 Verify the status of the modules on the switch, using the **show module** command:

```
switch# show module
Mod  Ports  Module-Type             Model                          Status
---  -----  --------------------    ----------------------------   ------
1    50     40FC+8FCoE+2IPS         Supervisor DS-C9250I-K9-SUP    active*


Mod  Sw              Hw            World-Wide-Name(s) (WWN)
```

```
---  --------------  ------        -------------------
1    8.4(1)          1.0           20:01:00:2a:6a:1b:64:d0 to 20:28:00:2a:6a:1b:64:d0


Mod  MAC-Address(es)                         Serial-Num
---  --------------------------------------  ----------
1    b8-38-61-4a-25-c0 to b8-38-61-4a-25-cf  JAF1804AAFG
```

Step 13 To display the status of a nondisruptive upgrade on a fabric switch, use the **show install all status** command.

The command output displays the status only after the switch has rebooted with the new image. All the actions preceding the reboot are not captured in this output because when you enter the **install all** command using a Telnet session, the session is disconnected when the switch reboots. When you reconnect to the switch through a Telnet session, the upgrade may already be complete, in which case, the output displays the status of the upgrade.

```
switch# show install all status

This is the log of last installation.

Continuing with installation process, please wait.
The login will be disabled until the installation is completed.

Status for linecard upgrade.
-- SUCCESS

Performing supervisor state verification.
-- SUCCESS

Install has been successful
```

Troubleshooting a Nondisruptive Upgrade on a Fabric Switch

When a nondisruptive upgrade begins, the system notifies all the services that an upgrade is about to start, and finds out whether the upgrade can proceed. If a service cannot allow the upgrade to proceed immediately, for example, if Fabric Shortest Path First (FSPF) timers are not configured to the default value, or a Cisco Fabric Services operation is in progress, the service terminates the upgrade. If such a situation occurs, you are prompted to enter the **show install all failure-reason** command to determine the reason why the upgrade cannot proceed.

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

Install is in progress, please wait.

Notifying services about the upgrade.
[# ] 0% -- FAIL. Return code 0x401E0066 (request timed out).

Please issue "show install all failure-reason" to find the cause of the failure.<---system
 prompt to enter the show all failure-reason command.

Install has failed. Return code 0x401E0066 (request timed out).
Please identify the cause of the failure, and try 'install all' again.

switch# show install all failure-reason
Service: "cfs" failed to respond within the given time period.
```

When the upgrade is in progress, if any failures occur, for example, if a save runtime state failure or module upgrade failure occurs, the switch is rebooted disruptively because the changes cannot be rolled back. In this case, the upgrade fails, but you are not prompted to enter the **show install all failure-reason** command because the command does not yield any useful information.

If you need additional information to determine why an upgrade is unsuccessful, you can obtain the details by using the **show tech-support** command output, and from the console output from the installation, if available.

Moving From an NPE Image to a non-NPE Image and Vice Versa

The following section describes how to upgrade from a no payload encryption (NPE) image to a non-NPE image and vice versa.



Note

- If the image file name includes *npe* text, the image is an NPE image. If the image file name does not include *npe* text, the image is a non-NPE image.
- To move from using an NPE image to a non-NPE image or from a non-NPE image to an NPE image, Cisco recommends that NX-OS version of the new image should be the same as the NX-OS version currently running on the switch. To upgrade from one release of Cisco MDS NX-OS to a newer release, Cisco recommends that the switch is first changed from an NPE image to a non-NPE image or from a non-NPE image to an NPE image at the same NX-OS version and then upgraded to the desired NX-OS version.
- Use the console connection for firmware upgrades. Be aware that if you are upgrading through the management interface, you must have a working connection to both supervisors, as this process causes a switchover and the current standby supervisor will be active after the upgrade. To check the status of the mgmt0 interface on the standby supervisor, use the command:

  ```
  show interface mgmt0 standby
  ```

  .

Procedure

Step 1 Log in to Cisco.com to access the links provided in this document. To log in to Cisco.com, go to the URL http://www.cisco.com/ and click Log In at the top of the page. Enter your Cisco Systems user name and password.

Note
Unregistered Cisco.com users cannot access the links provided in this document.

Step 2 Verify the following physical connections for the switch:

- The console port is physically connected to a computer terminal (or terminal server).
- The management 10/100/1000 Ethernet port (mgmt0) is connected to an external hub, switch, or router.
- On switches with dual supervisor modules, both supervisor modules must have the management 10/100/1000 Ethernet ports (mgmt0) connected to an external hub, switch, or router.

These procedures are specified in the hardware installation guide for the required product.

Step 3 Log in to the switch.

Step 4 Issue the **copy running-config startup-config** command to store your current running configuration.

You can also create a backup of your existing configuration to a file by issuing the **copy running-config bootflash:backup_config.txt** command.

Step 5 Verify that the requested license files installed in the switch are displayed in response to the **show license usage** command.

Note
The switch is initially shipped with the required licenses installed in the system; however, the initial license file will not cover unlicensed features that may be used during the grace period. If no license is displayed at this point, perform Step 6 and Step 7 to install the required licenses. If the required licenses are displayed at this point, skip Step 6 and Step 7 and move to Step 8.

The example CLI output for a valid license follows:

```
switch# show license usage
Feature             Ins       Lic       Status       Expiry Date    Comments
FM_SERVER_PKG        No        -        Unused        -                -
MAINFRAME_PKG        No        -        Unused        -                -
ENTERPRISE_PKG       Yes       -        Unused        Never            -
```

Step 6 Install licenses (if necessary) to ensure that the required features are available on the switch.

Perform the following steps:

a) Use the **show license host-id** command to obtain the serial number for your switch. The host ID is also referred to as the switch serial number.

```
switch# show license host-id
License hostid: VDH=JAF1721AEQG
```

Tip
Use the entire ID that appears after the colon (:) sign. In this example, the host ID is VDH=JAF1721AEQG.

b) Obtain your Claim Certificate or the Proof of Purchase document. This document accompanies every Cisco MDS switch.
c) Locate the Product Authorization Key (PAK) from the Claim Certificate or Proof of Purchase document.
d) Locate the website URL from the Claim Certificate or Proof of Purchase document.
e) Access the specified URL that applies to your switch and enter the switch serial number and the PAK.

The license key file is sent to you by email. The license key file is digitally signed to authorize its use only on the switch for which it was requested. The requested features are also enabled once the NX-OS software on the specified switch accesses the license key file.

Caution
Install the license file in the specified Cisco MDS 9000 Family switch without making any modifications.

Step 7 Verify the validity if the license.

the following example shows the validity of the license:

```
switch# show license usage
```

If the required licenses are displayed, skip steps 8 and 9 and Go to Step 10

Step 8 Install the license key file when you receive it by email.

Perform the following steps:

a) Install the license key file when you receive it by email.
b) Perform the installation by issuing the **install license** command on the active supervisor module from the switch console.

```
switch# install license bootflash:license_file.lic
Installing license..done
```

Note
If you provide a target name for the license key file, the file is installed with the specified name. Otherwise, the file name specified in the license key file is used to install the license.

c) Exit the switch console.

Step 9 Ensure that the required space is available in the bootflash: directory for the image file(s) to be copied using the **dir bootflash:** command.

Use the **delete bootflash:***filename* command to remove unnecessary files.

Note
Before downloading and installing Cisco NX-OS software, verify that the release is supported by your Cisco System MDS reseller. If you purchased support through a Cisco Systems reseller, contact them directly for more information. Otherwise, contact Cisco Technical support.

```
switch# dir bootflash:
37011968 Apr 30 16:10:28 2014 m9700-sf4ek9-kickstart-mz-npe.8.4.2a.bin
195875124 Apr 30 12:55:14 2014 m9700-sf4ek9-mz-npe.8.4.2a.bin
Usage for bootflash://sup-local
819736576 bytes used
75313152 bytes free
895049728 bytes total
```

Step 10 If you need more space on the active supervisor module bootflash, delete unnecessary files to make space available.

```
switch# delete m9700-sf4ek9-kickstart-mz-npe.8.4.2a.bin
switch# delete m9700-sf4ek9-mz-npe.8.4.2a.bin
```

Step 11 For switches with dual supervisor modules, verify that there is space available on the standby supervisor module bootflash on a switch.

```
switch# attach module x /*where x is the module number of the standby supervisor*/
switch(standby)# dir bootflash:
12288 Aug 26 19:06:14 2011 lost+found/
16206848 Jul 01 10:54:49 2011 m9700-sf4ek9-kickstart-mz-npe.8.4.2a.bin
78337129 Jul 01 10:33:52 2011 m9700-sf4ek9-mz-npe.8.4.2a.bin

Usage for bootflash://sup-local
122811392 bytes used
61748224 bytes free
184559616 bytes total

switch(standby)# exit /*to return to the active supervisor*/
```

Step 12 For switches with dual supervisor modules, if you need more space on the standby supervisor module bootflash on a switch, delete unnecessary files to make space available.

```
switch(standby)# delete bootflash:m9700-sf4ek9-kickstart-mz-npe.8.4.2a.bin
switch(standby)# delete m9700-sf4ek9-mz-npe.8.4.2a.bin
```

Step 13 Access the Software Download Center using this URL: http://www.cisco.com/cisco/software/navigator.html.

If prompted to log in, use your Cisco system user ID and password.

Step 14 Select the same version of the NPE image file or non-NPE image file that the switch is currently running.

You see the Technical Support Encryption Software Export Distribution Authorization form.

Step 15 Complete the required forms to obtain authorization.

Step 16 Download the files to an FTP or TFTP server.

Step 17 Copy the Cisco MDS NX-OS kickstart and system images to the active supervisor module bootflash using FTP or TFTP.

Note
When you download an image file, change to your FTP environment IP address or DNS name and the path where the files are located.

```
switch# copy tftp://tftpserver.cisco.com/MDS/m9700-sf4ek9-kickstart-mz.9.2.1.bin
bootflash:m9700-sf4ek9-kickstart-mz.9.2.1.bin
switch# copy tftp://tftpserver.cisco.com/MDS/m9700-sf4ek9-mz-npe.9.2.1.bin
bootflash:m9700-sf4ek9-mz-npe.9.2.1.bin
```

Step 18 Issue the **boot kickstart bootflash** : *filename* and **boot system bootflash** : *filename* commands to change the boot variables to point to the new image.

```
switch# configure terminal
switch(config)# boot kickstart bootflash:m9700-sf4ek9-kickstart-mz.9.2.1.bin
Performing image verification and compatibility check, please wait....
switch(config)# boot system bootflash:m9700-sf4ek9-mz-npe.9.2.1.bin
Performing image verification and compatibility check, please wait....
```

Step 19 Issue the **show incompatibility-all system** *filename* command to verify any incompatible hardware.

```
switch(config-if)# show incompatibility-all system m9700-sf4ek9-mz-npe.9.2.1.bin
Checking incompatible configuration(s)
No incompatible configurations

Checking dynamic incompatibilities:
-----------------------------------
No incompatible configurations
```

Step 20 Save the current running configuration to the startup configuration by issuing the **copy running-config startup-config** command.

```
switch(config)# copy running-config startup-config
[########################################] 100%
Copy complete.
```

Step 21 Issue the **show boot** command to check the current boot variable.

```
switch(config)# show boot

Current Boot Variables:

sup-1
kickstart variable = bootflash:/ m9700-sf4ek9-kickstart-mz.9.2.1.bin
system variable = bootflash:/ m9700-sf4ek9-mz-npe.9.2.1.bin
sup-2
kickstart variable = bootflash:/ m9700-sf4ek9-kickstart-mz.9.2.1.bin
system variable = bootflash:/ m9700-sf4ek9-mz-npe.9.2.1.bin
No module boot variable set

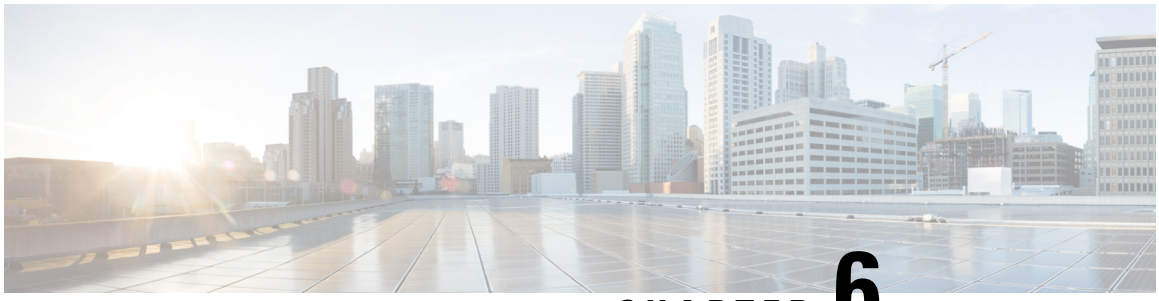
Boot Variables on next reload:
```

```
sup-1
kickstart variable = bootflash:/ m9700-sf4ek9-kickstart-mz.9.2.1.bin
system variable = bootflash:/ m9700-sf4ek9-mz-npe.9.2.1.bin
sup-2
kickstart variable = bootflash:/ m9700-sf4ek9-kickstart-mz.9.2.1.bin
system variable = bootflash:/ m9700-sf4ek9-mz-npe.9.2.1.bin
No module boot variable set
```

Step 22 Reload the switch by issuing the **reload** command.

```
switch(config)# reload
This command will reboot the system. (y/n)? [n]
```

You have now upgraded the Cisco MDS NX-OS software in your existing switch.



CHAPTER 6

Supported Cisco MDS NX-OS Software Nondisruptive Downgrade Paths

The following section describes how to downgrade from Cisco MDS NX-OS Release 9.x to an earlier Cisco MDS NX-OS Release.

- Nondisruptive Downgrade Paths from Cisco MDS NX-OS Release 9.4(5a), on page 65
- Nondisruptive Downgrade Paths from Cisco MDS NX-OS Release 9.4(5), on page 66
- Nondisruptive Downgrade Paths from Cisco MDS NX-OS Release 9.4(4), on page 67
- Nondisruptive Downgrade Paths from Cisco MDS NX-OS Release 9.4(3b), on page 67
- Nondisruptive Downgrade Paths from Cisco MDS NX-OS Release 9.4(3a), on page 68
- Nondisruptive Downgrade Paths from Cisco MDS NX-OS Release 9.4(3), on page 68
- Nondisruptive Downgrade Paths from Cisco MDS NX-OS Release 9.4(2a), on page 69
- Nondisruptive Downgrade Paths from Cisco MDS NX-OS Release 9.4(2), on page 70
- Nondisruptive Downgrade Paths from Cisco MDS NX-OS Release 9.4(1a), on page 70
- Nondisruptive Downgrade Paths from Cisco MDS NX-OS Release 9.4(1), on page 71
- Nondisruptive Downgrade Paths from Cisco MDS NX-OS Release 9.3(2a), on page 72
- Nondisruptive Downgrade Paths from Cisco MDS NX-OS Release 9.3(2), on page 72
- Nondisruptive Downgrade Paths from Cisco MDS NX-OS Release 9.3(1), on page 73
- Nondisruptive Downgrade Paths from Cisco MDS NX-OS Release 9.2(2), on page 73
- Nondisruptive Downgrade Paths from Cisco MDS NX-OS Release 9.2(1a), on page 74
- Nondisruptive Downgrade Paths from Cisco MDS NX-OS Release 9.2(1), on page 75
- FICON Nondisruptive Downgrade Paths from Cisco MDS NX-OS Release 9.4(5), on page 75
- FICON Nondisruptive Downgrade Paths from Cisco MDS NX-OS Release 9.4(3b), on page 76
- FICON Nondisruptive Downgrade Paths from Cisco MDS NX-OS Release 9.4(1a), on page 77

Nondisruptive Downgrade Paths from Cisco MDS NX-OS Release 9.4(5a)

Target MDS NX-OS Release	Nondisruptive Downgrade Paths and Ordered Downgrade Steps
9.4(x)	Downgrade directly to the target release
9.3(x)	Downgrade directly to the target release

Target MDS NX-OS Release	Nondisruptive Downgrade Paths and Ordered Downgrade Steps
9.2(x)	Downgrade directly to the target release
8.5(1)	Downgrade directly to the target release
8.4(2c), 8.4(2d), 8.4(2e), 8.4(2f)	Downgrade directly to the target release
Any 8.x prior to 8.4(2c)	**1.** Downgrade to MDS NX-OS Release 8.4(2c) **2.** Downgrade to the target release
7.3(1)DY	**1.** Downgrade to MDS NX-OS Release 8.4(2c) **2.** Downgrade to MDS NX-OS Release 8.1(1b) **3.** Downgrade to the target release
6.2(29), 6.2(31), 6.2(33)	**1.** Downgrade to MDS NX-OS Release 8.4(2c) **2.** Downgrade to the target release

Nondisruptive Downgrade Paths from Cisco MDS NX-OS Release 9.4(5)

Target MDS NX-OS Release	Nondisruptive Downgrade Paths and Ordered Downgrade Steps
9.4(x)	Downgrade directly to the target release
9.3(x)	Downgrade directly to the target release
9.2(x)	Downgrade directly to the target release
8.5(1)	Downgrade directly to the target release
8.4(2c), 8.4(2d), 8.4(2e), 8.4(2f)	Downgrade directly to the target release
Any 8.x prior to 8.4(2c)	**1.** Downgrade to MDS NX-OS Release 8.4(2c) **2.** Downgrade to the target release
7.3(1)DY	**1.** Downgrade to MDS NX-OS Release 8.4(2c) **2.** Downgrade to MDS NX-OS Release 8.1(1b) **3.** Downgrade to the target release
6.2(29), 6.2(31), 6.2(33)	**1.** Downgrade to MDS NX-OS Release 8.4(2c) **2.** Downgrade to the target release

Nondisruptive Downgrade Paths from Cisco MDS NX-OS Release 9.4(4)

Target MDS NX-OS Release	Nondisruptive Downgrade Paths and Ordered Downgrade Steps
9.4(x)	Downgrade directly to the target release
9.3(x)	Downgrade directly to the target release
9.2(x)	Downgrade directly to the target release
8.5(1)	Downgrade directly to the target release
8.4(2c), 8.4(2d), 8.4(2e), 8.4(2f)	Downgrade directly to the target release
Any 8.x prior to 8.4(2c)	**1.** Downgrade to MDS NX-OS Release 8.4(2c) **2.** Downgrade to the target release
7.3(1)DY	**1.** Downgrade to MDS NX-OS Release 8.4(2c) **2.** Downgrade to MDS NX-OS Release 8.1(1b) **3.** Downgrade to the target release
6.2(29), 6.2(31), 6.2(33)	**1.** Downgrade to MDS NX-OS Release 8.4(2c) **2.** Downgrade to the target release

Nondisruptive Downgrade Paths from Cisco MDS NX-OS Release 9.4(3b)

Target MDS NX-OS Release	Nondisruptive Downgrade Paths and Ordered Downgrade Steps
9.4(x)	Downgrade directly to the target release
9.3(x)	Downgrade directly to the target release
9.2(x)	Downgrade directly to the target release
8.5(1)	Downgrade directly to the target release
8.4(2c), 8.4(2d), 8.4(2e), 8.4(2f)	Downgrade directly to the target release
Any 8.x prior to 8.4(2c)	**1.** Downgrade to MDS NX-OS Release 8.4(2c) **2.** Downgrade to the target release

Target MDS NX-OS Release	Nondisruptive Downgrade Paths and Ordered Downgrade Steps
7.3(1)DY	**1.** Downgrade to MDS NX-OS Release 8.4(2c) **2.** Downgrade to MDS NX-OS Release 8.1(1b) **3.** Downgrade to the target release
6.2(29), 6.2(31), 6.2(33)	**1.** Downgrade to MDS NX-OS Release 8.4(2c) **2.** Downgrade to the target release

Nondisruptive Downgrade Paths from Cisco MDS NX-OS Release 9.4(3a)

Target MDS NX-OS Release	Nondisruptive Downgrade Paths and Ordered Downgrade Steps
9.4(x)	Downgrade directly to the target release
9.3(x)	Downgrade directly to the target release
9.2(x)	Downgrade directly to the target release
8.5(1)	Downgrade directly to the target release
8.4(2c), 8.4(2d), 8.4(2e), 8.4(2f)	Downgrade directly to the target release
Any 8.x prior to 8.4(2c)	**1.** Downgrade to MDS NX-OS Release 8.4(2c) **2.** Downgrade to the target release
7.3(1)DY	**1.** Downgrade to MDS NX-OS Release 8.4(2c) **2.** Downgrade to MDS NX-OS Release 8.1(1b) **3.** Downgrade to the target release
6.2(29), 6.2(31), 6.2(33)	**1.** Downgrade to MDS NX-OS Release 8.4(2c) **2.** Downgrade to the target release

Nondisruptive Downgrade Paths from Cisco MDS NX-OS Release 9.4(3)

Target MDS NX-OS Release	Nondisruptive Downgrade Paths and Ordered Downgrade Steps
9.4(x)	Downgrade directly to the target release
9.3(x)	Downgrade directly to the target release

Target MDS NX-OS Release	Nondisruptive Downgrade Paths and Ordered Downgrade Steps
9.2(x)	Downgrade directly to the target release
8.5(1)	Downgrade directly to the target release
8.4(2c), 8.4(2d), 8.4(2e), 8.4(2f)	Downgrade directly to the target release
Any 8.x prior to 8.4(2c)	**1.** Downgrade to MDS NX-OS Release 8.4(2c) **2.** Downgrade to the target release
7.3(1)DY	**1.** Downgrade to MDS NX-OS Release 8.4(2c) **2.** Downgrade to MDS NX-OS Release 8.1(1b) **3.** Downgrade to the target release
6.2(29), 6.2(31), 6.2(33)	**1.** Downgrade to MDS NX-OS Release 8.4(2c) **2.** Downgrade to the target release

Nondisruptive Downgrade Paths from Cisco MDS NX-OS Release 9.4(2a)

Target MDS NX-OS Release	Nondisruptive Downgrade Paths and Ordered Downgrade Steps
9.4(2a)	Downgrade directly to the target release
9.4(1)	Downgrade directly to the target release
9.3(x)	Downgrade directly to the target release
9.2(x)	Downgrade directly to the target release
8.5(1)	Downgrade directly to the target release
8.4(2c), 8.4(2d), 8.4(2e), 8.4(2f)	Downgrade directly to the target release
Any 8.x prior to 8.4(2c)	**1.** Downgrade to MDS NX-OS Release 8.4(2c) **2.** Downgrade to the target release
7.3(1)DY	**1.** Downgrade to MDS NX-OS Release 8.4(2c) **2.** Downgrade to MDS NX-OS Release 8.1(1b) **3.** Downgrade to the target release
6.2(29), 6.2(31), 6.2(33)	**1.** Downgrade to MDS NX-OS Release 8.4(2c) **2.** Downgrade to the target release

Note Downgrading directly from Cisco MDS NX-OS Release 9.4(2a) to Cisco MDS NX-OS Release 9.4(2) is not recommended.

Nondisruptive Downgrade Paths from Cisco MDS NX-OS Release 9.4(2)

Target MDS NX-OS Release	Nondisruptive Downgrade Paths and Ordered Downgrade Steps
9.4(2)	Downgrade directly to the target release
9.4(1)	Downgrade directly to the target release
9.3(x)	Downgrade directly to the target release
9.2(x)	Downgrade directly to the target release
8.5(1)	Downgrade directly to the target release
8.4(2c), 8.4(2d), 8.4(2e), 8.4(2f)	Downgrade directly to the target release
Any 8.x prior to 8.4(2c)	**1.** Downgrade to MDS NX-OS Release 8.4(2c) **2.** Downgrade to the target release
7.3(1)DY	**1.** Downgrade to MDS NX-OS Release 8.4(2c) **2.** Downgrade to MDS NX-OS Release 8.1(1b) **3.** Downgrade to the target release
6.2(29), 6.2(31), 6.2(33)	**1.** Downgrade to MDS NX-OS Release 8.4(2c) **2.** Downgrade to the target release

Nondisruptive Downgrade Paths from Cisco MDS NX-OS Release 9.4(1a)

Target MDS NX-OS Release	Nondisruptive Downgrade Paths and Ordered Downgrade Steps
9.4(1)	Downgrade directly to the target release
9.3(x)	Downgrade directly to the target release
9.2(x)	Downgrade directly to the target release
8.5(1)	Downgrade directly to the target release
8.4(2c), 8.4(2d), 8.4(2e), 8.4(2f)	Downgrade directly to the target release

Target MDS NX-OS Release	Nondisruptive Downgrade Paths and Ordered Downgrade Steps
Any 8.x prior to 8.4(2c)	1. Downgrade to MDS NX-OS Release 8.4(2c) 2. Downgrade to the target release
7.3(1)DY	1. Downgrade to MDS NX-OS Release 8.4(2c) 2. Downgrade to MDS NX-OS Release 8.1(1b) 3. Downgrade to the target release
6.2(29), 6.2(31), 6.2(33)	1. Downgrade to MDS NX-OS Release 8.4(2c) 2. Downgrade to the target release

Nondisruptive Downgrade Paths from Cisco MDS NX-OS Release 9.4(1)

To MDS NX-OS Release	Nondisruptive Downgrade Paths and Ordered Downgrade Steps
9.(x)	Downgrade directly to the target release
8.1(x) and above releases	Downgrade directly to the target release
All 7.3(x) releases	1. Downgrade to MDS NX-OS Release 8.1(1b) 2. Downgrade to the target release
6.2(29) and above releases	1. Downgrade to MDS NX-OS Release 8.4(2c) 2. Downgrade to the target release
6.2(13a) until 6.2(27)	1. Downgrade to MDS NX-OS Release 8.1(1b) 2. Downgrade to the target release
All 6.2(x) releases prior to 6.2(13a)	1. Downgrade to MDS NX-OS Release 8.1(1b) 2. Downgrade to MDS NX-OS Release 6.2(13a) 3. Downgrade to the target release

Nondisruptive Downgrade Paths from Cisco MDS NX-OS Release 9.3(2a)

Target MDS NX-OS Release	Nondisruptive Downgrade Paths and Ordered Downgrade Steps
9.3(x)	Downgrade directly to the target release
9.2(x)	Downgrade directly to the target release
8.1(x) and above releases	Downgrade directly to the target release
All 7.3(x) releases	**1.** Downgrade to MDS NX-OS Release 8.1(1b) **2.** Downgrade to the target release
6.2(29) and above releases	**1.** Downgrade to MDS NX-OS Release 8.4(2c) **2.** Downgrade to the target release
6.2(13a) until 6.2(27)	**1.** Downgrade to MDS NX-OS Release 8.1(1b) **2.** Downgrade to the target release
All 6.2(x) releases prior to 6.2(13a)	**1.** Downgrade to MDS NX-OS Release 8.1(1b) **2.** Downgrade to MDS NX-OS Release 6.2(13a) **3.** Downgrade to the target release

Nondisruptive Downgrade Paths from Cisco MDS NX-OS Release 9.3(2)

Target MDS NX-OS Release	Nondisruptive Downgrade Paths and Ordered Downgrade Steps
9.3(1)	Downgrade directly to the target release
9.2(x)	Downgrade directly to the target release
8.1(x) and above releases	Downgrade directly to the target release
All 7.3(x) releases	**1.** Downgrade to MDS NX-OS Release 8.1(1b) **2.** Downgrade to the target release
6.2(29) and above releases	**1.** Downgrade to MDS NX-OS Release 8.4(2c) **2.** Downgrade to the target release

Target MDS NX-OS Release	Nondisruptive Downgrade Paths and Ordered Downgrade Steps
6.2(13a) until 6.2(27)	1. Downgrade to MDS NX-OS Release 8.1(1b) 2. Downgrade to the target release
All 6.2(x) releases prior to 6.2(13a)	1. Downgrade to MDS NX-OS Release 8.1(1b) 2. Downgrade to MDS NX-OS Release 6.2(13a) 3. Downgrade to the target release

Nondisruptive Downgrade Paths from Cisco MDS NX-OS Release 9.3(1)

Target MDS NX-OS Release	Nondisruptive Downgrade Paths and Ordered Downgrade Steps
9.2(x)	Downgrade directly to the target release
8.1(x) and above releases	Downgrade directly to the target release
All 7.3(x) releases	1. Downgrade to MDS NX-OS Release 8.1(1b) 2. Downgrade to the target release
6.2(29) and above releases	1. Downgrade to MDS NX-OS Release 8.4(2c) 2. Downgrade to the target release
6.2(13a) until 6.2(27)	1. Downgrade to MDS NX-OS Release 8.1(1b) 2. Downgrade to the target release
All 6.2(x) releases prior to 6.2(13a)	1. Downgrade to MDS NX-OS Release 8.1(1b) 2. Downgrade to MDS NX-OS Release 6.2(13a) 3. Downgrade to the target release

Nondisruptive Downgrade Paths from Cisco MDS NX-OS Release 9.2(2)

Target MDS NX-OS Release	Nondisruptive Downgrade Paths and Ordered Downgrade Steps
9.2(1)	Downgrade directly to the target release
8.1(x) and above releases	Downgrade directly to the target release

Target MDS NX-OS Release	Nondisruptive Downgrade Paths and Ordered Downgrade Steps
All 7.3(x) releases	**1.** Downgrade to MDS NX-OS Release 8.1(1b) **2.** Downgrade to the target release
6.2(29) and above releases	**1.** Downgrade to MDS NX-OS Release 8.4(2c) **2.** Downgrade to the target release
6.2(13a) until 6.2(27)	**1.** Downgrade to MDS NX-OS Release 8.1(1b) **2.** Downgrade to the target release
All 6.2(x) releases prior to 6.2(13a)	**1.** Downgrade to MDS NX-OS Release 8.1(1b) **2.** Downgrade to MDS NX-OS Release 6.2(13a) **3.** Downgrade to the target release

Nondisruptive Downgrade Paths from Cisco MDS NX-OS Release 9.2(1a)

Target MDS NX-OS Release	Nondisruptive Downgrade Paths and Ordered Downgrade Steps
All 9.2(x) releases	Downgrade directly to the target release
8.1(x) and above releases	Downgrade directly to the target release
All 7.3(x) releases	**1.** Downgrade to MDS NX-OS Release 8.1(1b) **2.** Downgrade to the target release
6.2(29) and above releases	**1.** Downgrade to MDS NX-OS Release 8.4(2c) **2.** Downgrade to the target release
6.2(13a) until 6.2(27)	**1.** Downgrade to MDS NX-OS Release 8.1(1b) **2.** Downgrade to the target release
All 6.2(x) releases prior to 6.2(13a)	**1.** Downgrade to MDS NX-OS Release 8.1(1b) **2.** Downgrade to MDS NX-OS Release 6.2(13a) **3.** Downgrade to the target release

Nondisruptive Downgrade Paths from Cisco MDS NX-OS Release 9.2(1)

Target MDS NX-OS Release	Nondisruptive Downgrade Paths and Ordered Downgrade Steps
8.1(x) and above releases	Downgrade directly to the target release
All 7.3(x) releases	**1.** Downgrade to MDS NX-OS Release 8.1(1b) **2.** Downgrade to the target release
6.2(29) and above releases	**1.** Downgrade to MDS NX-OS Release 8.4(2c) **2.** Downgrade to the target release
6.2(13a) until 6.2(27)	**1.** Downgrade to MDS NX-OS Release 8.1(1b) **2.** Downgrade to the target release
All 6.2(x) releases prior to 6.2(13a)	**1.** Downgrade to MDS NX-OS Release 8.1(1b) **2.** Downgrade to MDS NX-OS Release 6.2(13a) **3.** Downgrade to the target release

FICON Nondisruptive Downgrade Paths from Cisco MDS NX-OS Release 9.4(5)

Target FICON-qualified Release	Nondisruptive Downgrade Paths
9.4(3b)	Downgrade directly to the target Release
9.4(1a)	Downgrade directly to the target Release
8.4(2e)	**1.** Downgrade to MDS NX-OS Release 9.4(1a) **2.** Downgrade to the target Release
8.4(2c)	**1.** Downgrade to MDS NX-OS Release 9.4(1a) **2.** Downgrade to the target Release

Target FICON-qualified Release	Nondisruptive Downgrade Paths
8.4(2b)	1. Downgrade to MDS NX-OS Release 9.4(1a) 2. Downgrade to MDS NX-OS Release 8.4(2c) 3. Downgrade to the target Release
8.4(1a)	1. Downgrade to MDS NX-OS Release 9.4(1a) 2. Downgrade to MDS NX-OS Release 8.4(2c) 3. Downgrade to the target Release
8.1(1b)	1. Downgrade to MDS NX-OS Release 9.4(1a) 2. Downgrade to MDS NX-OS Release 8.4(2c) 3. Downgrade to the target Release
8.1(1a)	1. Downgrade to MDS NX-OS Release 9.4(1a) 2. Downgrade to MDS NX-OS Release 8.4(2c) 3. Downgrade to MDS NX-OS Release 8.1(1b) 4. Downgrade to the target Release

FICON Nondisruptive Downgrade Paths from Cisco MDS NX-OS Release 9.4(3b)

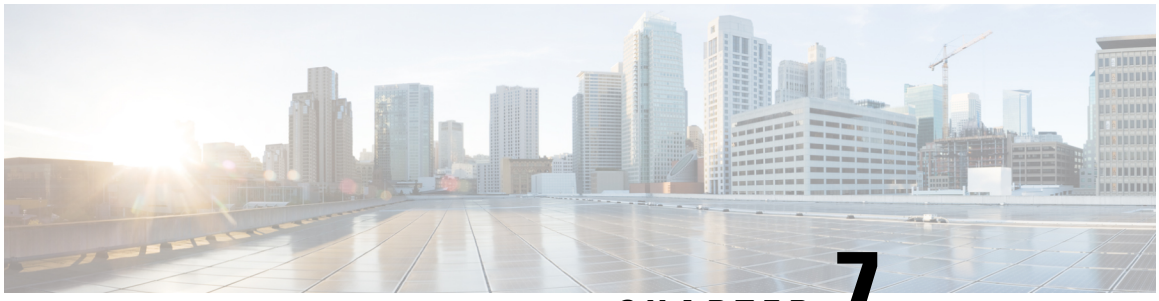
Target FICON-qualified Release	Nondisruptive Downgrade Paths
9.4(1a)	Downgrade directly to the target Release
8.4(2e)	1. Downgrade to MDS NX-OS Release 9.4(1a) 2. Downgrade to the target Release

Target FICON-qualified Release	Nondisruptive Downgrade Paths
8.4(2c)	1. Downgrade to MDS NX-OS Release 9.4(1a) 2. Downgrade to the target Release
8.4(2b)	1. Downgrade to MDS NX-OS Release 9.4(1a) 2. Downgrade to MDS NX-OS Release 8.4(2c) 3. Downgrade to the target Release
8.4(1a)	1. Downgrade to MDS NX-OS Release 9.4(1a) 2. Downgrade to MDS NX-OS Release 8.4(2c) 3. Downgrade to the target Release
8.1(1b)	1. Downgrade to MDS NX-OS Release 9.4(1a) 2. Downgrade to MDS NX-OS Release 8.4(2c) 3. Downgrade to the target Release
8.1(1a)	1. Downgrade to MDS NX-OS Release 9.4(1a) 2. Downgrade to MDS NX-OS Release 8.4(2c) 3. Downgrade to MDS NX-OS Release 8.1(1b) 4. Downgrade to the target Release

FICON Nondisruptive Downgrade Paths from Cisco MDS NX-OS Release 9.4(1a)

Current FICON-qualified Release	Nondisruptive Downgrade Paths and Ordered Downgrade Steps
8.4(2e)	Downgrade directly to the target release
8.4(2c)	Downgrade directly to the target release

Current FICON-qualified Release	Nondisruptive Downgrade Paths and Ordered Downgrade Steps
8.4(2b)	**1.** Downgrade to MDS NX-OS Release 8.4(2c) **2.** Downgrade to the target release
8.4(1a)	**1.** Downgrade to MDS NX-OS Release 8.4(2c) **2.** Downgrade to the target release
8.1(1b)	**1.** Downgrade to MDS NX-OS Release 8.4(2c) **2.** Downgrade to the target release
8.1(1a)	**1.** Downgrade to MDS NX-OS Release 8.4(2c) **2.** Downgrade to MDS NX-OS Release 8.1(1b) **3.** Downgrade to the target release
6.2(11e)	**1.** Downgrade to MDS NX-OS Release 8.4(2c) **2.** Downgrade to MDS NX-OS Release 8.1(1b) **3.** Downgrade to MDS NX-OS Release 8.1(1a) **4.** Downgrade to the target release



CHAPTER 7

Downgrading from Cisco MDS NX-OS Release 9.x

This section includes the following topics:

- Cisco MDS NX-OS Software Downgrade Guidelines, on page 79
- Downgrade Guidelines for Cisco MDS 9396S Switch, on page 80
- Downgrade Guidelines for Cisco MDS 9250i Switch, on page 81
- Downgrading from Cisco MDS NX-OS Release 9.x to Cisco MDS NX-OS Release 8.x, on page 81

Cisco MDS NX-OS Software Downgrade Guidelines

- Downgrading directly from Cisco MDS NX-OS Release 9.4(2a) to Cisco MDS NX-OS Release 9.4(2) is not recommended.
- Downgrading directly from Cisco MDS NX-OS Release 9.x to unsupported releases are disruptive.
- Downgrading directly from Cisco MDS NX-OS Release 9.x to releases before Cisco MDS NX-OS Release 6.2(9) is not supported. In such a scenario, we recommend that you first downgrade to Cisco MDS NX-OS Release 6.2(13a) or higher and then downgrade to the required release.
- Downgrading directly from Cisco MDS NX-OS Release 9.x to Cisco MDS NX-OS Release 7.3(0)DY(1) is not supported. In such a scenario, we recommend that you first downgrade to Cisco MDS NX-OS Release 7.3(0)D1(1) and then upgrade to 7.3(0)DY(1).
- Downgrading directly from Cisco MDS NX-OS Release 9.x to Cisco MDS NX-OS Release 7.3(1)DY(1) is not supported. In such a scenario, we recommend that you first downgrade to Cisco MDS NX-OS Release 7.3(0)D1(1) and then upgrade to 7.3(1)DY(1).
- Downgrading from Cisco MDS NX-OS Release 9.x is not supported if the FLOGI Scale Optimization feature is enabled on Cisco MDS 9718 Switches.
- We do not recommend parallel In-Service Software Downgrade (ISSD) on Cisco MDS 9148S, Cisco MDS 9250i, and Cisco MDS 9396S fabric switches when these fabric switches are each other's peers.
- If you are downgrading from Cisco MDS NX-OS Release 9.x to a release prior to Cisco MDS NX-OS Release 9.2(1), ensure that you use the **clear logging onboard txwait** command after downgrading. Otherwise, logging to the OBFL TxWait file may cease with an error. For more information, see the Cisco MDS 9000 Series Interfaces Configuration Guide, Release 9.x.

- If you copy firmware using the SFTP or SCP clients after enabling the **feature scp-server** or **feature sftp-server** command on your switch, ensure that you close the SFTP or SCP connection using the **no feature scp-server** or **no feature sftp-server** command before performing ISSD. Otherwise, ISSD will be disruptive. To avoid this issue, we recommend that you transfer files to the switch using the **copy** command instead or using the DCNM client.
- Prior to upgrade or downgrade, reset the switch's logging levels to the system defaults via the **no logging level all** configuration command. If this is not done, the upgrade or downgrade may be disruptive due to excessive logging causing control plane downtime exceeding 80 seconds.

  Before entering the **no logging level all** command, ensure that the switch's current logging configuration is saved. This will need to restored after the upgrade or downgrade.

  Follow these steps:

  1. Enter the **show running-config | i "logging level"** command and save the output. These are the switch's current settings.
  2. Enter the **no logging level all** command in configuration mode.
  3. Perform upgrade or downgrade.
  4. Restore logging level configuration using the output that was saved from Step 1.

- To determine if high-bandwidth capability is enabled, use the **show hardware fabric-mode** command. The following example shows that the higher bandwidth capability is not activated:

```
switch# show hardware fabric-mode
Fabric mode supports only one configuration of 8G FC modules - 4/44 Host-Optimized 8G
FC module.
switch#
```

  The following example shows that the higher bandwidth capability is activated:

```
switch# show hardware fabric-mode
fabric mode supports FCoE, Gen2 and above linecards
switch#
```

For information on supported chassis and modules, see the Cisco MDS 9000 Series Compatibility Matrix. For information on the procedures for installing and upgrading software for Intelligent Storage Services on the Cisco MDS 9000 Series Storage Services Module (SSM), see the Cisco MDS 9000 Series Storage Services Module Software Installation and Upgrade Guide.

Downgrade Guidelines for Cisco MDS 9396S Switch

- Downgrading from Cisco MDS NX-OS Release 9.x to Cisco MDS NX-OS Release 7.3(0)D1(1) or Cisco MDS NX-OS Release 6.2(13a) is not supported on a Cisco MDS 9396S Switch which has DS-CAC-1200W as a power supply unit (PSU) and DS-C96S-FAN-I as port side intake fan tray.
- Downgrading from Cisco MDS NX-OS Release 9.x to Cisco MDS NX-OS Release 6.2(13) is not supported on the Cisco MDS 9396S Multilayer Fabric Switch. The minimum recommended image for Cisco MDS 9396S Multilayer Fabric Switch is 6.2(13a).
- To downgrade from Cisco MDS NX-OS Release 9.x to Cisco MDS NX-OS Release 7.3(x) on a Cisco MDS 9396S Series switch, you must first disable the extended receive BB_credit configuration using

the **no feature fcrxbbcredit extended** command. After the downgrade process is complete, enable the extended receive BB_credit configuration using the **feature fcrxbbcredit extended** command.

Downgrade Guidelines for Cisco MDS 9250i Switch

- Downgrading from Cisco MDS NX-OS Release 9.x to Cisco MDS NX-OS Release 7.3(0)D1(1), or 6.2(13a) and lower is not supported on a Cisco MDS 9250i Switch which has only one online PSU.
- Downgrading from Cisco MDS NX-OS Release 9.x to Cisco MDS NX-OS Release 7.3(0)D1(1), or 6.2(13a) and lower on a Cisco MDS 9250i Switch with two online PSUs results in loss of N:N grid redundancy. The switch will run in non-redundant mode.
- Downgrading from Cisco MDS NX-OS Release 9.x to Cisco MDS NX-OS Release 7.3(0)D1(1), or 6.2(13a) and lower on a Cisco MDS 9250i Switch with three online PSUs results in loss of N:N grid redundancy. The switch will run in N+1 power redundant mode.

Downgrading from Cisco MDS NX-OS Release 9.x to Cisco MDS NX-OS Release 8.x

To downgrade from Cisco MDS NX-OS Release 9.x to Cisco MDS NX-OS Release 8.x or an earlier release, perform the following steps:

Procedure

Step 1 Verify that the system image files for the downgrade are present in the active supervisor module bootflash:

```
switch# dir bootflash:

26126848 May 07 11:51:20 2021 m9700-sf4ek9-kickstart-mz.9.2.1.bin
20090368 Apr 06 05:25:31 2018 m9700-sf4ek9-kickstart-mz.8.3.1
20044800 Mar 30 15:42:05 2014 m9700-sf4ek9-kickstart-mz.6.2.7.bin
107197681 Apr 06 05:26:53 2001 m9700-sf4ek9-mz.6.2.5.bin.S68
107587249 Mar 30 15:42:52 2014 m9700-sf4ek9-mz.6.2.7.bin
```

Step 2 If the software image file is not present, download it from an FTP or TFTP server to the active supervisor module bootflash.

You can obtain the software image file from the Cisco.com Software Download Center: http://www.cisco.com/cisco/software/navigator.html

Note
If you need more space in the active supervisor module bootflash, use the **delete** command to remove the files that are not necessary, and perform Step 3, on page 81 and Step 4, on page 82.

```
switch# copy tftp://tftpserver.cisco.com/MDS/m9700-sf4ek9-kickstart-mz.8.3.1.bin
bootflash:m9700-sf4ek9-kickstart-mz.8.3.1.bin
switch# copy tftp://tftpserver.cisco.com/MDS/m9700-sf4ek9-kickstart-mz.8.3.1.bin
bootflash:m9700-sf4ek9-kickstart-mz.8.3.1.bin
```

Step 3 Ensure that the required space is available in the active supervisor:

```
switch# dir bootflash:

26126848 May 07 11:51:20 2021 m9700-sf4ek9-kickstart-mz.9.2.1.bin
12288 Aug 26 19:06:14 2011 lost+found/
18939904 Jul 01 10:54:49 2011 m9700-sf4ek9-kickstart-mz.6.2.5.bin
101756072 Jul 01 10:33:52 2011 m9700-sf4ek9-mz.6.2.5.bin

Usage for bootflash://sup-local
120695976 bytes used
63863640 bytes free
184559616 bytes total
```

Step 4 If you need more space in the active supervisor module bootflash, delete the files that are not required, to make space available:

```
switch# delete bootflash: m9700-sf4ek9-kickstart-mz.6.2.5.bin
```

Step 5 Run the **show incompatibility system** *image-filename* command to determine if you must disable the features not supported by a release earlier than release to be installed.

```
switch# show incompatibility system bootflash: system m9700-sf4ek9-mz.8.3.1.bin
Checking incompatible configuration(s):
.
..
...
no incompatible configurations
switch#
```

Step 6 Save the configuration using the **copy running-config startup-config** command:

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

Step 7 Run the **install all** command to downgrade the software:

```
switch# install all kickstart m9700-sf4ek9-kickstart-mz.8.3.1.bin
system m9700-sf4ek9-mz.8.3.1.bin
install all kickstart m9700-sf4ek9-kickstart-mz.8.3.1.bin system m9700-sf4ek9-mz.8.3.1.
bin
Installer will perform compatibility check first. Please wait.

Verifying image bootflash:/m9700-sf4ek9-kickstart-mz.8.3.1.bin for boot variable "kickstart".
[####################] 100% -- SUCCESS

Verifying image bootflash:/m9700-sf4ek9-mz.8.3.1.bin for boot variable "system".
[####################] 100% -- SUCCESS

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

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

Extracting "system" version from image bootflash:/m9700-sf4ek9-mz.8.3.1.bin.
[####################] 100% -- SUCCESS

Extracting "kickstart" version from image bootflash:/m9700-sf4ek9-kickstart-mz.8.3.1.bin.
[####################] 100% -- SUCCESS

Extracting "bios" version from image bootflash:/m9700-sf4ek9-mz.8.3.1.bin.
[####################] 100% -- SUCCESS

Performing Compact Flash and TCAM sanity test.
[####################] 100% -- SUCCESS
```

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



Compatibility check is done:
Module  bootable          Impact  Install-type  Reason
------  --------  --------------  ------------  ------
     1       yes  non-disruptive         reset


Other miscellaneous information for installation:
Module  info
------  --------------------------------
1  FC ports 1-40 and FCoE ports 1-8 are hitless, IPS 1-2 are hitful, and Intelligent Applications
running are hitful


Images will be upgraded according to following table:
Module       Image         Running-Version(pri:alt)           New-Version  Upg-Required
------  ----------  ----------------------------------------  --------------------
     1      system                    9.2(1)               8.3(1)           yes
     1   kickstart                    9.2(1)               8.3(1)           yes
     1        bios v2.1.17(01/08/14):v2.1.17(01/08/14)     v2.1.17(01/08/14)  no

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

Install is in progress, please wait.

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

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

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

Upgrade can no longer be aborted, any failure will result in a disruptive upgrade.

Freeing memory in the file system.
[####################] 100% -- SUCCESS

Loading images into memory.
[####################] 100% -- SUCCESS

Saving linecard runtime state.
[####################] 100% -- SUCCESS

Saving supervisor runtime state.
[####################] 100% -- SUCCESS

Saving mts state.
[####################] 100% -- SUCCESS
```

```
Reloading the kernel to proceed with the upgrade.
All telnet and ssh connections will now be temporarily terminated.
alishan-241#

>> NX7--LC-loader-02.01.17 (Jan  8 2014 - 16:30:41), Build: 02.01.17

CPU0:  8572E, Version: 2.2, (0x80e80022)
Core:  E500, Version: 3.0, (0x80210030)
Clock Configuration:
       CPU:1066.672 MHz, CCB:533.336 MHz,
       DDR:266.668 MHz (533.336 MT/s data rate), LBC:33.334 MHz
L1:    D-cache 32 kB enabled
       I-cache 32 kB enabled
Board: 9044, IOFPGA: 0x0000001A, SPROM: 0xAB
Boot flash : Primary
I2C:   ready
DRAM:  Initializing
DDR: dimm type 10, registered 1
DDR: dimm type 10, registered 1
    DDR:  4 GB
L2:    1024 KB enabled
Using default environment

In:    serial
Out:   serial
Err:   serial
Net:   INFO: Net boot mode = 1
INFO: Net boot mode = 1
INFO: Board will come up MGMT interface
INFO: MAC address is: b8:38:61:4a:25:c0
eTSEC2 board phy 3
INFO: Net boot mode = 1
eTSEC2
IDE:   Bus 0: OK
  Device 0: Model: UGB30STC4000Z4-EBY-ASD Firm: FW100511 Ser#: UNIGEN3     30009652
            Type: Hard Disk
            Capacity: 3907.9 MB = 3.8 GB (8003520 x 512)

Booting image bootflash://m9700-sf4ek9-kickstart-mz.8.3.1.bin
25012224 bytes read
NBI at 08000000 size 134217728

Booting image at addr 0x00800000...
Memory <- <0x0 0x0 0x1 0x0> (4096MB)
ethernet0: local-mac-address <- b8:38:61:4a:25:c0
ethernet1: local-mac-address <- 00:e0:0c:00:01:fd
ethernet2: local-mac-address <- 00:e0:0c:00:02:fd
CPU clock-frequency <- 0x3f941f80 (1067MHz)
CPU timebase-frequency <- 0x3f941f8 (67MHz)
CPU bus-frequency <- 0x1fca0fc0 (533MHz)

zImage starting: loaded at 0x00800000 (sp: 0x7fedc4c0)
Allocating 0x620d88 bytes for kernel...
gunzipping (0x00000000 <- 0x00817000:0x00de3838)...done 0x5bc060 bytes
Using loader supplied ramdisk at 0x2800000-0x3cf1000
initrd head: 0x1f8b0808

Linux/PowerPC load: rw root=/dev/ram0 rdbase=0x7000000 card_index=9044 maxcpus=2 ip=off ramdisk_size
=262144 noquiet obfl_type_ide=1 kgdboc=ttyS0,9600,B isanimg_loc=0x6000000 isanimg_size=0x400 console
=ttyS0,9600n8nn loader_ver="02.01.17" card_index=9044 quiet bootdev=ide0 server_ip=171.69.21.28 ksim
g=/m9700-sf4ek9-kickstart-mz.8.1.1b.bin isanimg=/m9700-sf4ek9-mz.8.3.1.bin  Finalizing device tree...
flat tree at 0xdf0140
                                                ï¿½setup_arch: bootmem
```

```
mpc85xx_ds_setup_arch()
arch: exit

[    0.060042] Host controller irq 26
[    0.134632] Assign root port irq 26
[    0.753013] physmap-flash physmap-flash.0: Could not reserve memory region
[    1.032836] Enabling all PCI devices
INIT: version 2.88 booting
Checking all filesystems.....retval=[0]
done.
Loading system software
Uncompressing system image: bootflash:///m9700-sf4ek9-mz.8.3.1.bin
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
Load plugins that defined in image conf: /isan/plugin_img/img.conf
No Patching support on this platform
Loading plugin 0: core_plugin...
No Patching support on this platform
Enter pboot_chk_compatibility
num srgs 1
0: swid-core-s5ek9, swid-core-s5ek9
num srgs 1
0: swid-sup-ali-ks, swid-sup-ali-ks
INIT: Entering runlevel: 3

[   95.008144] clpk_hw_init_1:Post ISSU instance 0 status 0x00000736 GOOD
[   95.086952] clpk_hw_init_1:Post ISSU instance 1 status 0x00000536 GOOD
System is coming up... Please wait...
System is coming up... Please wait...
System is coming up... Please wait...
System is coming up... Please wait...
System is coming up... Please wait...
System is coming up... Please wait...
System is coming up... Please wait...
System is coming up... Please wait...
System is coming up... Please wait...

Continuing with installation process, please wait.
The login will be disabled until the installation is completed.

Status for linecard upgrade.
[####################] 100% -- SUCCESS

Performing supervisor state verification.
[####################] 100% -- SUCCESS

Supervisor non-disruptive upgrade successful.

Install has been successful.
```

Step 8 Run the **show version** command to verify the successful downgrade:

```
switch# show version

Cisco Nexus Operating System (NX-OS) Software
TAC support: http://www.cisco.com/tac
Documents: http://www.cisco.com/en/US/products/ps9372/tsd_products_support_serie
s_home.html
Copyright (c) 2002-2016, Cisco Systems, Inc. All rights reserved.
The copyrights to certain works contained herein are owned by
other third parties and are used and distributed under license.
Some parts of this software are covered under the GNU Public
License. A copy of the license is available at
http://www.gnu.org/licenses/gpl.html.
```

```
Software
BIOS: version 2.1.17
loader: version N/A
kickstart: version 8.3(1)
system: version 8.3(1)
BIOS compile time: 01/08/14
kickstart image file is: bootflash:///m9700-sf4ek9-kickstart-mz.8.3.1.bin.
S21
kickstart compile time: 1/11/2016 16:00:00 [02/11/2016 10:35:42]
system image file is: bootflash:///m9700-sf4ek9-mz.8.3.1.bin.S21
system compile time: 1/11/2016 16:00:00 [02/11/2016 13:08:53]


Hardware
cisco MDS 9250i 40 FC 2 IPS 8 FCoE (2 RU) Chassis ("40FC+8FCoE+2IPS Supervisor
")
Motorola, e500v2, core 0 with 4155752 kB of memory.
Processor Board ID JAF1626BCQH

Device name: alishan-dr
bootflash: 4013856 kB

Kernel uptime is 0 day(s), 17 hour(s), 18 minute(s), 58 second(s)

Last reset at 443194 usecs after Wed Aug 31 10:58:41 2016

Reason: Reset due to upgrade
System version: 8.3(1)
Service:

plugin
Core Plugin
switch#
```

Step 9 Verify the status of the modules in the switch, using the **show module** command:

```
switch# show module

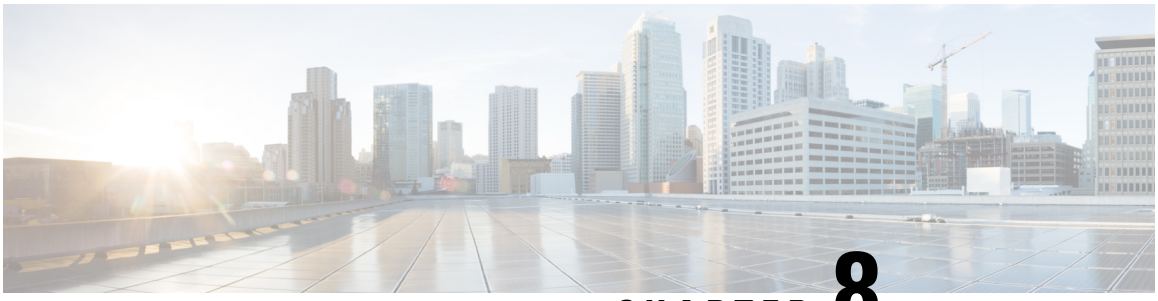
Mod Ports Module-Type Model Status
--- ----- -------------------------------- ------------------ ----------
1 50 40FC+8FCoE+2IPS Supervisor DS-C9250i-22PK9-SUP active *

Mod Sw Hw World-Wide-Name(s) (WWN)
--- --------------- ------ --------------------------------------------------
1 7.3(0)D1(1) 0.9 20:01:54:7f:ee:1b:14:a0 to 20:28:54:7f:ee:1b:14:a0


Mod MAC-Address(es) Serial-Num
--- -------------------------------------- ----------
1 f0-f7-55-29-50-60 to f0-f7-55-29-50-6f JAF1626BCQH

* this terminal session

switch#
```



CHAPTER 8

Upgrading Transceiver Firmware

Cisco MDS NX-OS Release 9.4(1) introduces transceiver firmware upgrade capability for supported transceivers on Cisco MDS 9000 platforms. The firmware upgrades are provided to enhance the performance of the transceivers and to resolve known issues. Transceiver firmware upgrade bundles are provided with each NX-OS release. For more information on list of the transceivers supported, the list of issues resolved and open as well as other important information pertaining to transceiver upgrades, see, Cisco MDS 9000 Series Transceiver Firmware Release Notes

A transceiver firmware bundle is a file containing updates for multiple transceiver types. Each transceiver firmware update bundle has its own version number. A transceiver firmware bundle may contain new updates for only some transceivers. Firmware for some transceivers may be the same version as the previous firmware bundle.

Optionally, a subset of modules to be upgraded can be specified by the user using the **module** keyword. Use comma (,) or range separator (-) to specify a subset of modules. If a specified module number is not present or not supported, it will be ignored and the remaining valid modules will be upgraded. To update firmware on all supported transceivers in a Fabric switch, use the command without the **module** keyword.

Save any pending configuration before starting a transceiver upgrade. The upgrade process may need to reload a Fabric switch after the transceiver upgrades are completed. This depends on which component of the transceiver firmware has been updated. Some transceiver hardware components will utilize the update immediately, however, other transceiver hardware components must be restarted to start using the update. If any of these are updated then the upgrade process will automatically reload the switch. The upgrade will not proceed if there is any pending configuration in the **show running-config diff** command output.

If none of the transceivers require upgrading, the command exits. Otherwise, any transceivers with firmware version lower than the packaged version will be listed in a table and a prompt. The table displays the following details:

- Interface number
- Current firmware version
- New firmware version
- If reload is required

If you choose to continue, all the interfaces in the corresponding modules are shut down, and all listed transceivers are upgraded in the listed order. The upgrade process may take several minutes to complete. After the upgrade, the status of each upgraded transceiver module is again displayed in a table. If any transceivers must be power cycled, on a Director switch the corresponding modules are reloaded automatically. For a

Fabric switch, the whole switch will reload automatically. After the modules or switch become online, the interfaces are left in the same state that they were in, prior to the firmware upgrade.

Transceiver firmware cannot be upgraded when transceiver power control feature is enabled as it is necessary for a transceiver to be powered on to be upgraded. If a transceiver upgrade is attempted with this feature enabled the user is notified and must confirm to proceed. Transceiver power control will be disabled during the upgrade and then re-enabled when the upgrade has completed.

For more information about transceiver power control feature refer to the Cisco MDS 9000 Series Interfaces Configuration Guide, Release 9.x.

- Guidelines and Limitations, on page 88
- Determining Transceiver Firmware Versions, on page 88
- Upgrading Transceivers in Director Switches, on page 89
- Updating the Transceiver Firmware on a Fabric Switch, on page 91
- Cleaning a Previously Terminated Upgrade, on page 93

Guidelines and Limitations

When you upgrade the transceiver firmware, consider the following guidelines and limitations:

- Transceiver firmware can only be upgraded. After the transceiver firmware is upgraded, it is compatible with all versions of Cisco MDS NX-OS.
- Transceiver firmware upgrade is supported only for the transceiver models that are listed in the transceiver firmware versions packaged in the transceiver firmware bundle table.
- Transceiver firmware upgrade is supported only on Cisco MDS 9000 platforms that are listed in the transceiver firmware Support Matrix table.
- Transceiver upgrade is a disruptive procedure. All interfaces, including those in the same module or fabric switch which are not undergoing upgrade will be shut down during the upgrade.
- Do not run interface commands or open another upgrade session on the module or switch while the transceiver is upgrading. This may result in permanent damage to the transceivers.
- Ensure the transceiver power control feature is disabled, so that all transceivers are powered up while the transceiver firmware upgrade proceeds. The status of this feature is automatically checked as part of the transceiver firmware upgrade process.

Determining Transceiver Firmware Versions

Use the **show interface fcx/y transceiver details** command to view the current version of firmware on a specific transceiver module. The version of firmware currently running on the transceiver is displayed on the `Firmware version is` line.

Example if displaying current version of transceiver firmware on a transceiver module:

```
switch# show interface fc1/1 transceiver details
fc1/1 sfp is present
    Name is CISCO-ACCELINK
    Manufacturer's part number is RTXM520-571-C99
    Hardware revision is 1.0
    Serial number is ACW27150L32
```

```
    Nominal bit rate is 57800 Mb/s
    Link length supported for 50/125um OM3 fiber is 70 m
    FC Transmitter type is short wave laser w/o OFC (SN)
    FC Transmitter supports short distance link length
    Transmission medium is multimode laser with 50 um aperture (M5)
    Supported speeds are - Min speed: 16000 Mb/s, Max speed: 64000 Mb/s
    Cisco extended id is none (0x0)
    Cisco vendor id is (0x1f)
    Cisco part number is 10-3538-01
    Cisco pid is DS-SFP-FC64G-SW
    Cisco version id is V01
    Firmware version is 1.1

    No tx fault, no rx loss, in sync state, diagnostic monitoring type is 0x68
    SFP Diagnostics Information:
-------------------------------------------------------------------------------
                                    Alarms                  Warnings
                                High        Low         High          Low
-------------------------------------------------------------------------------
  Temperature   46.80 C          75.00 C     -5.00 C     70.00 C        0.00 C
  Voltage        3.28 V           3.63 V      2.97 V      3.46 V        3.13 V
  Current        7.30 mA         12.00 mA     3.00 mA    11.20 mA       3.60 mA
  Tx Power      -0.16 dBm         7.00 dBm  -10.50 dBm    4.00 dBm     -7.50 dBm
  Rx Power       0.58 dBm         5.00 dBm  -10.00 dBm    4.00 dBm     -7.00 dBm
  Transmit Fault Count = 0
-------------------------------------------------------------------------------
  Note: ++  high-alarm; +  high-warning; --  low-alarm; -  low-warning
switch#
```

Upgrading Transceivers in Director Switches

Example: Upgrading transceiver firmware in specified line cards in a Cisco MDS 9700 Series Switch.

```
switch# install transceiver bootflash:nxos-transceiver-firmware.mds.9.4.1a.bin module 3-7,12

Locking current install transceiver session
2024 Jan 15 04:10:38 Starting transceiver firmware upgrade image file
/bootflash/nxos-transceiver-firmware.mds.9.4.1.bin
2024 Jan 15 04:10:38 Extracting transceiver firmware(s) from package
357+1 records in
357+1 records out
234649 bytes (235 kB) copied, 0.00379426 s, 61.8 MB/s

Version (CISCO-ACCELINK)    : 1.1
Version (CISCO-FINISAR)     : 1.1

Upgrading transceivers on module(s): [3, 6, 7, 12]
Collecting interface configuration and transceiver information, please wait.
Transceivers will be upgraded according to following table:
Interface    Transceiver Type   Running Version    New Version   Upg Required   Reload
Required
---------    ----------------   ---------------    -----------   ------------   ------------

fc6/18      CISCO-ACCELINK               1.0            1.1            yes
yes
fc7/3      CISCO-ACCELINK              1.0           1.1           yes               yes
-------------------------------------------------------------------------------------------
Transceiver firmware upgrade is a disruptive operation and all interfaces, including those
 interfaces that do not need upgrading in the respective line card(s), will be shutdown
during the process. This will take approximately 00 hrs 08 mins to complete.
```

```
Any module with transceivers upgraded will be reloaded after the upgrade is finished.
-------------------------------------------------------------------------------------------------
Do you want to proceed (y/n)?[n]: y

Proceeding with upgrade. Do not attempt any operations on the line card(s) where transceiver
 modules are undergoing upgrade.

Upgrading transceiver firmware on interface fc6/18.
Firmware upgrade of transceiver on interface fc6/18 is successful.

Upgrading transceiver firmware on interface fc7/3.
Firmware upgrade of transceiver on interface fc7/3 is successful.

Bringing up the interfaces after the upgrade.

Transceiver firmware upgrade status is as follows:
Interface    Transceiver Type   Old Version   Current Version             Result
---------    ----------------   -----------   ---------------   -----------------
   fc6/18      CISCO-ACCELINK           1.0               1.1           Success
    fc7/3      CISCO-ACCELINK           1.0               1.1           Success

Reloading module(s) [6, 7] to complete the upgrade process. Please check the module status
 using `show module` command.

2024 Jan 15 04:21:55 Transceiver firmware upgrade completed
switch#
```

To update transceiver firmware on all supported modules in a Director switch, use the install transceiver command without the module keyword.

Example: Updating the transceiver firmware on all supported transceivers in a Cisco MDS 9700 Series Switch

```
switch# install transceiver nxos-transceiver-firmware.mds.9.4.1a.bin
Locking current install transceiver session
2024 Jan 15 02:27:10 Starting transceiver firmware upgrade image file
/bootflash/nxos-transceiver-firmware.mds.9.4.1.bin
2024 Jan 15 02:27:10 Extracting transceiver firmware(s) from package
357+1 records in
357+1 records out
234660 bytes (235 kB) copied, 0.00289415 s, 81.1 MB/s

Version (CISCO-ACCELINK)    : 1.1
Version (CISCO-FINISAR)     : 1.1

Upgrading transceivers on module(s): [1, 8, 18]
Collecting interface configuration and transceiver information, please wait.
Transceivers will be upgraded according to following table:

Interface    Transceiver Type   Running Version    New Version   Upg Required   Reload
Required
---------    ----------------   ---------------    -----------   ------------   ------------
fc1/1       CISCO-FINISAR             0.126            1.1            yes               yes
fc1/15      CISCO-ACCELINK             0.188            1.1              yes
yes
fc8/4      CISCO-ACCELINK             0.188            1.1            yes               yes
fc18/31       CISCO-FINISAR             0.126              1.1              yes
yes
-------------------------------------------------------------------------------------------------
Transceiver firmware upgrade is a disruptive operation and all interfaces, including those
 interfaces that do not need upgrading in the respective line card(s), will be shutdown
during the process. This will take approximately 00 hrs 15 mins to complete.

Any module with transceivers upgraded will be reloaded after the upgrade is finished.
-------------------------------------------------------------------------------------------------
```

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

Proceeding with upgrade. Do not attempt any operations on the line card(s) where transceiver
 modules are undergoing upgrade.

Upgrading transceiver firmware on interface fc1/1.
Firmware upgrade of transceiver on interface fc1/1 is successful.

Upgrading transceiver firmware on interface fc1/15.
Firmware upgrade of transceiver on interface fc1/15 is successful.

Upgrading transceiver firmware on interface fc8/4.
Firmware upgrade of transceiver on interface fc8/4 is successful.

Upgrading transceiver firmware on interface fc18/31.
Firmware upgrade of transceiver on interface fc18/31 is successful.

Bringing up the interfaces after the upgrade.

Transceiver firmware upgrade status is as follows:
Interface    Transceiver Type   Old Version   Current Version             Result
---------    ----------------   -----------   ---------------   ----------------
    fc1/1       CISCO-FINISAR         0.126              1.1            Success
   fc1/15      CISCO-ACCELINK         0.188              1.1            Success
    fc8/4      CISCO-ACCELINK         0.188              1.1            Success
  fc18/31       CISCO-FINISAR         0.126              1.1            Success

Reloading module(s) [1, 8, 18] to complete the upgrade process. Please check the module
status using `show module` command.

2024 Jan 15 02:44:16 Transceiver firmware upgrade completed
switch#
```

Updating the Transceiver Firmware on a Fabric Switch

```
switch# install transceiver bootflash:nxos-transceiver-firmware.mds.9.4.1a.bin
Locking current install transceiver session
2024 Jan 15 01:57:26 Starting transceiver firmware upgrade image file
/bootflash/nxos-transceiver-firmware.mds.9.4.1a.bin
2024 Jan 15 01:57:26 Extracting transceiver firmware(s) from package
357+1 records in
357+1 records out
234649 bytes (235 kB, 229 KiB) copied, 0.00224521 s, 105 MB/s

Version (CISCO-ACCELINK)    : 1.1
Version (CISCO-FINISAR)     : 1.1

Upgrading transceivers on module(s): [1]
Collecting interface configuration and transceiver information, please wait.
Transceivers will be upgraded according to following table:

Interface    Transceiver Type   Running Version    New Version   Upg Required   Reload
Required
---------    ----------------   ---------------    -----------   ------------   ------------

fc1/18      CISCO-ACCELINK               1.0            1.1            yes
yes
fc1/19       CISCO-FINISAR             0.101            1.1            yes
yes
-----------------------------------------------------------------------------------------------
Transceiver firmware upgrade is a disruptive operation and all interfaces, including those
 interfaces that do not need upgrading in the switch, will be shutdown during the process.
```

```
 This will take approximately 00 hrs 04 mins to complete.

This switch will be reloaded after the upgrade is finished.
------------------------------------------------------------------------------------------
Do you want to proceed (y/n)?[n]: y

Proceeding with upgrade. Do not attempt any operations on the switch where transceiver
modules are undergoing upgrade.

Upgrading transceiver firmware on interface fc1/18.
Firmware upgrade of transceiver on interface fc1/18 is successful.

Upgrading transceiver firmware on interface fc1/19.
Firmware upgrade of transceiver on interface fc1/19 is successful.

Bringing up the interfaces after the upgrade.

Transceiver firmware upgrade status is as follows:
Interface    Transceiver Type   Old Version   Current Version             Result
---------    ----------------   -----------   ---------------   -----------------
   fc1/18      CISCO-ACCELINK           1.0               1.1            Success
   fc1/19       CISCO-FINISAR         0.101               1.1            Success

Reloading this switch to complete the upgrade process
switch#
```

Example: Upgrading transceiver firmware when the transceiver power control feature is enabled.

```
switch# install transceiver bootflash:nxos-transceiver-firmware.mds.9.4.2.bin module 7
Locking current install transceiver session
2024 May 06 14:32:53 Starting transceiver firmware upgrade image file
/bootflash/nxos-transceiver-firmware.mds.9.4.2.bin
2024 May 06 14:32:53 Extracting transceiver firmware(s) from package
613+1 records in
613+1 records out
402271 bytes (402 kB, 393 KiB) copied, 0.00298808 s, 135 MB/s
Version (CISCO-ACCELINK, DS-SFP-FC64G-SW)    : 1.2
Version (CISCO-FINISAR, DS-SFP-FC64G-SW)     : 1.1
Version (CISCO-INNOLIGHT, DS-SFP-FC64G-LW)   : 0.24
Upgrading transceivers on module(s): [7]
Transceiver power-control is ON, which will be turned OFF to perform firmware upgrade.
Do you want to proceed (y/n)?[n]: y
Collecting interface configuration and transceiver information, please wait.
Transceivers will be upgraded according to following table:
Interface    Transceiver Type   Running Version    New Version   Upg Required   Reload
Required
---------    ----------------   ---------------    -----------   ------------   ------------
fc7/1      CISCO-ACCELINK              1.1           1.2           yes              yes
fc7/17     CISCO-INNOLIGHT             0.23           0.24           yes
yes
------------------------------------------------------------------------------------------
Transceiver firmware upgrade is a disruptive operation and all interfaces, including those
 interfaces that do not need
upgrading in the respective line card(s), will be shutdown during the process. This will
take approximately 00 hrs 09
mins to complete.
Any module with transceivers upgraded will be reloaded after the upgrade is finished.
------------------------------------------------------------------------------------------
Do you want to proceed (y/n)?[n]: y
Proceeding with upgrade. Do not attempt any operations on the line card(s) where transceiver
 modules are undergoing
upgrade.
Upgrading transceiver firmware on interface fc7/1.
Firmware upgrade of transceiver on interface fc7/1 is successful.
Upgrading transceiver firmware on interface fc7/17.
```

```
Firmware upgrade of transceiver on interface fc7/17 is successful.
Bringing up the interfaces after the upgrade.
Transceiver firmware upgrade status is as follows:
Interface    Transceiver Type   Old Version   Current Version             Result
---------    ----------------   -----------   ---------------   ----------------
    fc7/1      CISCO-ACCELINK           1.1               1.2            Success
   fc7/17     CISCO-INNOLIGHT          0.23              0.24            Success

Reloading module(s) [7] to complete the upgrade process. Please check the module status
using `show module` command.
```

Cleaning a Previously Terminated Upgrade

Accessing transceivers during an upgrade can cause permanent damage to them. To prevent any damage, only one upgrade session is permitted at a time. The following message is displayed when an attempt is made to start parallel upgrades.

```
switch# install transceiver bootflash:nxos-transceiver-firmware.mds.9.4.1a.bin
Already one active install transceiver session is in progress. Running parallel install
transceiver session(s) are not allowed.
If you want to re-run install transceiver due to previously aborted session(if any), please
 run 'install transceiver clean' first to do clean up and try running install transceiver
again.
switch#
```

If there are no parallel upgrade sessions are running, and the above message is from a previously terminated upgrade, use the **install transceiver clean** command to clear the session and run the install command again.

Example: Cleaning previously terminated transceiver upgrade

```
switch# install transceiver clean
Warning: Running this command clears the lock on any ongoing upgrade. The original upgrade
 process is not stopped and a subsequent upgrade will then be allowed, making the upgrade
process likely to fail and cause transceiver damage. It is advised to use the install
transceiver clean command only after an upgrade fails or terminates.
If an upgrade is terminated, wait for a few minutes for any ongoing upgrade to complete
before attempting again. The approximate time required to complete each transceiver install
 session is displayed in the banner text before any upgrade process starts.
----------------------------------------------------------------------------------------
Transceiver firmware upgrade is a disruptive operation and all interfaces, including those
 interfaces that do not need upgrading in the respective line card(s), will be shutdown
during the process. This will take approximately 00 hrs 15 mins to complete.

Any module with transceivers upgraded will be reloaded after the upgrade is finished.
----------------------------------------------------------------------------------------
```