

Dell Connectrix[®] Cisco

MDS-9000 NX-OS

Version 9.4(1)

Release Notes

Rev 07
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The Dell Connectrix Cisco MDS 9000 NX-OS Family of multilayer directors and fabric switches offers intelligent fabric-switching services that realize maximum performance while ensuring high reliability levels. These release notes provide the most up-to-date information and changes. Topics include:

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Revision history

The following table presents the revision history of this document.

Revision	Release	Date	Description
Rev 07	9.4(1)	10/16/2023	New platform support, feature, enhancement and bug fixes
Rev 06	9.3(2a)	6/26/2023	Maintenance Release
Rev 05	9.3(2)	3/27/2023	Maintenance Release
Rev 04	9.3(1)	3/6/2023	Added information about the switch 9148V
Rev 03	9.3(1)	10/10/2022	New platform support, features, enhancements, and bug fixes.
Rev 02	9.2(2)	03/28/2022	Maintenance Release
Rev 01	9.2(1)	02/07/2022	New platform support, features, enhancements, and bug fixes.

Product description

Thank you for purchasing an MDS 9000 multilayer fabric director or switch. The information contained in this document is a supplement to the MDS 9000 documentation that can be found on <https://www.cisco.com>. Readers familiar with standard Dell® release notes may notice that the organization of this document is somewhat different than they are used to. Take the time to familiarize yourself with the information provided.

Readers will find information from the original Cisco release notes for NX-OS and annotations in the technical section including Call Home capability, zoning and configuration parameters.

As always in an Dell environment, refer to the *Dell Support Matrix* available through E-Lab™ Interoperability Navigator at: <https://elabnavigator.dell.com/elab/modernHomeSSM> for the latest information on supported configurations.

The answers to many MDS 9000 related questions can be found in the Dell Knowledgebase located on Dell Online Support on <https://Dell.com/support>.

The Connectrix® MDS 9000 Family of multilayer directors and fabric switches offers intelligent fabric-switching services that realize maximum performance while ensuring high reliability levels. They combine robust and flexible hardware architecture with multiple layers of network and storage management intelligence. This powerful combination enables highly available, scalable storage networks that provide advanced security and unified management features. These release notes provide the most up-to-date information on new features and changes.

New features and changes

New Hardware Support in Cisco MDS NX-OS Release 9.4(1)

Cisco MDS NX-OS release 9.4(1) supports the following new hardware:

- ◆ Cisco MDS 9396V Fibre Channel switch (DS-C9396V-K9)

Note: This hardware has not yet been released by Dell technologies. The hardware will only be supported by Dell technologies after the RTS is completed.

New Software Features in Cisco MDS NX-OS Release 9.4(1)

Table 1 New Software Features (page 1 of 2)

Product Impact	Feature	Description
Diagnostics and Serviceability	System reset reasons	The show nvram hardware-log command has been implemented to display the logs of hardware initiated switch reset of the following Fabric Switches: • MDS 9124V • MDS 9132T • MDS 9148T • MDS 9148V • MDS 9220i • MDS 9396T • MDS 9396V
	Interface information	The ShowIntStats command has been implemented to display the statistics of FC interfaces, port channels, and transceiver details in tabular format.
Ease of Use	Link Layer Discovery Protocol (LLDP)	Support for LLDP reception and advertisement on the active management interface has been added for all platforms, excluding MDS 9250i, MDS 9148S, and MDS 9396S. For more information, see the Cisco MDS 9000 Series Fundamentals Configuration Guide .

Table 1 New Software Features (page 2 of 2)

Product Impact	Feature	Description
Feature Set	Smart Monitoring and Alerting (SMA)	The SMA feature has been introduced. SMA provides unified monitoring and timely detection of important events or conditions. It generates proactive notifications and helps in maintaining the health of the system. SMA provides flexibility to configure custom thresholds based on your requirements. For more information, see Smart Monitoring and Alerting. SMA is a beta feature in Release 9.4(1). Beta features are intended to be used in lab environments, not in production environments.
Security	TLS Cipher Algorithms	Support for configuring TLS security algorithms, message authentication codes (MACs), key types, and ciphers has been added. For more information, see the Cisco MDS 9000 Series Security Configuration Guide.
	TLS v1.3	Support for TLS version 1.3 on Cisco MDS Fabric Switches has been added. For more information, see the Cisco MDS 9000 Series Programmability Guide.

The following table describes the enhancements done in Cisco MDS NX-OS Release 9.4(1).

Table 2 Enhanced Software Features (page 1 of 2)

Product Impact	Feature	Description
Ease of Use	Device Connector	The show intersight command has been renamed to show system device-connector command.
	FSPF	FSPF now includes the specific member link protocol when the link is a port-channel. This will appear in the FSPF link state database. For more information see the Cisco MDS 9000 Series Fabric Configuration Guide, Release 9.x.
	Smart Licensing using Policy (SLP)	The show license brief command to display a concise summary of the license status has been added. For more information, see the Cisco MDS 9000 Series Licensing Guide.

Table 2 Enhanced Software Features (page 2 of 2)

Product Impact	Feature	Description
Feature Set	HBA ER_RDY	HBA ER_RDY support is extended to the following switches: • MDS 9124V • MDS 9148V • MDS 9396V For more information, see the Cisco MDS 9000 Series Interfaces Configuration Guide.
	SAN Analytics	Support for SAN Analytics and SAN Telemetry Streaming on the following switches has been added: • MDS 9124V • MDS 9148V For more information, see the Cisco MDS 9000 Series SAN Analytics and SAN Telemetry Streaming Configuration Guide.
Power Efficiency	Manageability of PSUs in MDS 9700 directors	Support to shut down unneeded PSUs in the following switches has been added: • MDS 9706 • MDS 9710 • MDS 9718 This can be used when there are PSUs in the chassis that are not used based on the power requirements of the switch. It prevents unnecessary alarms in system management software, such as NDFC. For more information, see the Cisco MDS 9000 Series Fundamentals Configuration Guide.
	Reduced fan power consumption	The power allocated to each fan tray has been reduced by optimizing the nominal fan speed on the following switches: • MDS9706 - 50 Watts reduction per fan tray on allocated power • MDS9710 - 100 Watts reduction per fan tray on allocated power • MDS9718 - 150 Watts reduction per fan tray on allocated power For more information, see the Cisco MDS 9700 Series Hardware Installation Guide.

Unsupported features

The following features are not currently supported in Dell environments. This list is inclusive of past releases:

- ◆ Fabric-Device Management Interface
- ◆ Slow Drain Detection and Isolation Enhancement
- ◆ FICON tape Acceleration
- ◆ Tunneling (IPv4 and v6) is not supported on the same interface

- ◆ Data Encryption Standard (DES) Encryption for SNMP
- ◆ TACACS is not supported for switch-to-switch authentication

Note: To obtain the most up-to-date information on Dell supported configurations, reference the most current release notes available at <https://Dell.com/support>, and the *Dell Support Matrix*, available through E-Lab Interoperability Navigator at <https://elabnavigator.dell.com/elab/modernHomeSSM>

Fixed problems

Cisco-specific caveats for resolved problems can be found in the Cisco release-noted documentation with the equivalent firmware level at the following Cisco website:

http://www.cisco.com/en/US/products/ps5989/prod_release_notes_list.html

Note: Cisco makes all release notes, past and present, available on this web site.

Environment and system requirements

This section describes the system requirements for MDS NX-OS Release 9.4(1) and includes the following information:

- ◆ Hardware and software requirements
- ◆ Software selection and upgrade considerations
- ◆ Downgrading your Cisco MDS NX-OS software Image

Nexus Dashboard Fabric Controller

Take note that NX-OS 9.4(1) requires the use of Nexus Dashboard Fabric Controller 12.0.1 or higher.

Note: From 12.0x version, DCNM is renamed to Nexus Dashboard Fabric Controller (NDFC).

Telco 2 post racks

Note that the MDS 9718, MDS 9710 and MDS 9706 should not be used in a 2 post Telco rack due to weight considerations. Refer to the *Cisco MDS 9000 Hardware Installation Guides* on <http://www.cisco.com> for more information.

EC-1700 configuration information

Configuration information appears in the *Connectrix EC-1700 Cabinet Installation and Setup Manual* on <https://Dell.com/support>.

Note: Currently, only the MDS 9710 and MDS 9706 are supported in the EC-1700-C cabinet.

8Gb power requirements

Even though Cisco director class models may operate at 100 to 240 VAC, in configurations consisting of 8 Gb modules, 200-240 VAC is highly recommended. Operating at lower voltages will decrease the number of modules that may be installed in your chassis.

For more information on power requirements, please refer to Appendix C of the *Cisco MDS 9500 Series Hardware Installation Guide*.

Hardware and software components

Dell supported hardware and software modules are listed in Cisco NX-OS 9.4(1) release notes located on the Cisco web site.

Note: [Table 1](#) lists the MDS 9000 Family software and hardware components that are **not** supported by Dell as well as the comparable NX-OS part numbers.

For older NX-OS part numbers, see prior existing versions of release notes.

Table 1 MDS 9000 Family software and hardware modules not supported

Component	Dell part number	Description	Applicable products
Service modules	DS-X9304-18FK9	18-port Fibre Channel/4-port Gigabit Ethernet Multiservice FIPS (MSFM-18/4) module.	MDS 9500 Series and 9200 Series
Optics	DS-X2-FC10G-ER	X2/SC optics, 10-Gbps Fibre Channel for Extended Reach (40 km).	MDS 9500 Series and 9200 Series, except for the MDS 9216
	DS-X2-E10G-SR	X2/SC optics, 10-Gbps Ethernet for Short Reach	
	DS-X2-FC10G_CX4	X2/CX-4 optics, 10-Gbps Fibre Channel, copper	
LC-type fiber-optic SFP	DS-SFP-GE-T	1-Gbps Ethernet SFP.	MDS 9000 Family
Port analyzer adapter	DS-PAA-2, DS-PAA	A standalone Fibre Channel-to-Ethernet adapter that allows for simple, transparent analysis of Fibre Channel traffic in a switched fabric.	MDS 9000 Family

Deprecated and Changed Features

Traditional and Smart Licensing Version 1.0 Licenses

Cisco MDS NX-OS Release 9.2(2) and later releases do not support installation of Product Authorization Key (PAK) or Smart Licensing version 1.0 licenses.

For more information such as how to migrate licenses software updates, see the “Smart Licensing Using Policy” chapter in the [Cisco MDS 9000 Series Licensing Guide, Release 9.x](#).

Python 2

From Cisco MDS NX-OS Release 9.2.x and later, Python 2 is deprecated. Python 3 continues to be supported instead. Python 2 scripts should be checked for compatibility with Python 3 to ensure they continue to function as expected.

For more information, see the 'Python API' chapter in the [Cisco MDS 9000 Series Programmability Guide](#),

Zoning Features

LUN zoning, read-only zones, and broadcast zones are no longer supported.

If these features are already configured, completely remove all the configurations that include these features before attempting to boot any module. In addition, you cannot configure these features after you bring up any module.

SDV feature

Cisco MDS NX-OS Release 9.3(2) and/or later does not support Cisco SAN device virtualization (SDV).

Slow Drain Detection and Congestion Isolation Enhancements

ER_RDY is not supported on FC interfaces running at 10 Gbps.

XRC Acceleration License

Starting from Cisco MDS NX-OS Release 8.1(1a), the Cisco Extended Remote Copy (XRC) acceleration license is obsoleted on Cisco MDS 9000 Series Switches due to improvements in the mainframe XRC feature.

Virtual Router Redundancy Protocol (VRRP)

From Cisco MDS NX-OS Release 8.3(1) and later, the VRRP feature is not supported on Cisco MDS 9000 Series Switches.

Data Encryption Standard (DES) Encryption for SNMP

From Cisco MDS NX-OS Release 8.5(1), AES-128 is the default encryption mechanism for SNMPv3. DES encryption for SNMP is supported only for DES users who upgrade from previous releases to Cisco MDS NX-OS Release 8.5(1). Ensure that you delete all the SNMPv3 users configured with DES encryption before upgrading to Cisco MDS NX-OS Release 8.5(1) and later releases. Any downgrades from Cisco MDS NX-OS Release 8.5(1) will be restricted if any of the SNMPv3 users have DES encryption configured as the privacy protocol. All such users will either need to be deleted or reconfigured to use no privacy protocol or AES128 encryption before downgrading.

Data Mobility Manager

From Cisco MDS NX-OS Release 8.1(1), the Cisco MDS Data Mobility Manager is not supported on Cisco MDS 9000 Series Switches.

Deprecated Hardware

Cisco NX-OS 9.4(1) does not support the following hardware:

- ◆ Cisco MDS 9134 Fabric Switch
- ◆ Cisco MDS 9124 Fabric Switch
- ◆ Cisco MDS 9222i Fabric Switch
- ◆ Cisco MDS 9148 Fabric Switch
- ◆ Cisco MDS 9509 Fabric Switch
- ◆ Cisco MDS 9506 Fabric Switch
- ◆ Cisco MDS 9513 Fabric Module ¹
- ◆ Cisco MDS 9500 Series Supervisor-2 Module
- ◆ Cisco MDS 4-Port 10-Gbps Fibre Channel Switching Module
- ◆ Cisco MDS 8-port 10-Gbps Fibre Channel over Ethernet (FCoE) Module
- ◆ Cisco MDS 12-port 4-Gbps Fibre Channel Switching Module
- ◆ Cisco MDS 24-port 4-Gbps Fibre Channel Switching Module
- ◆ Cisco MDS 48-port 4-Gbps Fibre Channel Switching Module
- ◆ Cisco MDS 4-Gbps Fabric Switch for HP c-Class BladeSystem
- ◆ Cisco MDS 4-Gbps Fabric Switch for IBM BladeCenter
- ◆ Cisco MDS 24-Port 8-Gbps Fibre Channel Switching Module
- ◆ Cisco MDS 48-Port 8-Gbps Fibre Channel Switching Module
- ◆ Cisco MDS 32-Port 8-Gbps Advanced Fibre Channel Switching Module
- ◆ Cisco MDS 48-Port 8-Gbps Advanced Fibre Channel Switching Module

MDS 9000 chassis and module support in Cisco MDS NX-OS 9.4

[Table 2](#) lists the MDS hardware chassis supported by Cisco MDS NX-OS 9.4.

Table 2 Cisco MDS NX-OS 9.4 chassis support matrix (page 1 of 2)

Switch	NX-OS 9.4.x support
MDS 9396V	Yes ¹¹
MDS 9124V	Yes ¹⁰
MDS 9148V	Yes ¹⁰
MDS 9220i	Yes ⁹
MDS 9148T	Yes ⁶
MDS 9396T	Yes ⁶
MDS 9132T	Yes
MDS 9718	Yes ⁵

Table 2 Cisco MDS NX-OS 9.4 chassis support matrix (page 2 of 2)

Switch	NX-OS 9.4.x support
MDS 9710	Yes ¹
MDS 9706	Yes ²
MDS 9718-V3	Yes ⁷
MDS 9710-V2	Yes ⁸
MDS 9706-V2	Yes ⁸
MDS-9396S-48-1 (Port Side intake)	Yes ⁴
MDS 9396S-48	Yes ³
MDS 9250i	Yes
MDS 9148s	Yes ²

¹ Requires NX-OS 6.2(1) or higher.

² Requires NX-OS 6.2(9) or higher.

³ Requires NX-OS 6.2(13) or higher.

⁴ Requires 6.2(15) or NX-OS 7.3.1(D1) or higher

⁵ Requires NX-OS 7.3(0)D1(1) or higher.

⁶ Requires NX-OS 8.3(1) or higher.

⁷ Requires NX-OS 8.4(2a) or higher

⁸ Requires NX-OS 8.4(1) or higher

⁹ Requires NX-OS 8.5(1) or higher

¹⁰ Requires NX-OS 9.3(1) or higher

¹¹ Requires NX-OS 9.4(1) or higher

Table 3. lists the MDS hardware modules supported by Cisco MDS NX-OS 9.4

Table 3 Module support matrix for Cisco MDS NX-OS release 9.4

Module	Description	MDS 9700 Series	MDS 9500 Series	MDS 9200 Series
DS-X97-SF4-K9	Cisco MDS 9700 Series Supervisor-4 Module	Yes	No	No
DS-X9710-FAB3	Cisco MDS 9710 Crossbar Fabric-3 Switching Module	Yes ¹	No	No
DS-X9748-3072K9	Cisco MDS 48-Port 64-Gbps Fibre Channel Switching Module	Yes	No	No
DS-X9706-FAB3	Cisco MDS 9706 Crossbar Fabric-3 Switching Module	Yes ²	No	No
DS-X9718-FAB3	Cisco MDS 9718 Crossbar Fabric-3 switching module	Yes ³	No	No
DS-9396T	MDS 9396T Fabric Module	No	No	No
DS-9396V	MDS 9396V Fabric Module	No	No	No
DS-9220i	MDS 9220i Fabric Module	No	No	Yes
DS-9148V	MDS 9148V Fabric Module	No	No	No
DS-9148T	MDS 9148T Fabric Module	No	No	No
DS-9132T	MDS 9132T Fabric Module	No	No	No

Table 3 Module support matrix for Cisco MDS NX-OS release 9.4

Module	Description	MDS 9700 Series	MDS 9500 Series	MDS 9200 Series
DS-X9448-768K9	MDS 48-Port 16-Gbps Fibre Channel Switching Module	Yes	No	No
DS-X9448-768K9	48 Port 16 Gbps Fibre Channel Switching Module	Yes	No	No
DS-X97-SF1E-K9	MDS 9700 Supervisor-1E Module	Yes		
DS-X9718-FAB1	MDS 9718 Fabric1 Module	Yes ³	No	No
DS-X9710-FAB1	MDS 9710 Fabric1 Module	Yes ¹	No	No
DS-X9706-FAB1	MDS 9706 Fabric1 Module	Yes ²	No	No
DS-X9824-960K9	MDS 24 Port 40 Gbps FCoE Module	Yes	No	No
DS-X9648-1536K9	MDS 9700 48-Port 32-Gbps Fibre Channel Switching Module	Yes	No	No
DS-X9848-480K9	48-Port 10-Gigabit FCoE Module	Yes	No	No
DS-X9334-K9	Cisco MDS 9000 Family 24/10 SAN Extension Module	Yes	No	No
DS-X9530-SF2A-K9	MDS 9500 Supervisor-2 A Module	No	No	No
DS-13SLT-FAB3	MDS 9513 Fabric Module 3	No	No	No
DS-13SLT-FAB2	MDS 9513 Fabric Module 2	No	No	No
DS-X9232-256K9	32-port 8-Gbps Advanced Fibre Channel Switching Module	No	No	No
DS-X9248-256K9	48-port 8-Gbps Advanced Fibre Channel Switching Module	No	No	No
DS-X9224-96K9	24-port 8-Gbps Fibre Channel Switching Module	No	No	No
DS-X9248-96K9	48-port 8-Gbps Fibre Channel Switching Module	No	No	No
DS-X9248-48K9	4/44-port Host Optimized 8-Gbps Fibre Channel Switching Module	No	Yes	Yes
DS-X9316-SSNK9	16-port Storage Services Node (SSN-16)	No	Yes	Yes
DS-X9304-18K9	18/4-port Multiprotocol Services Module (MSM-18/4)	No	Yes	Yes

¹ Supported on Cisco MDS 9710 Director only.

² Supported on Cisco MDS 9706 Director only.

³ Supported on 9718 director only.

Software download process

Use the software download procedure to upgrade to a later version, or downgrade to an earlier version, of an operating system. This section describes the software download process for the Cisco MDS NX-OS software and includes the following topics.

- ◆ [“Determining the software version” on page 12.](#)
- ◆ [“Downloading software” on page 12.](#)
- ◆ [“Selecting the correct software image for an MDS 9148s switch” on page 13](#)
- ◆ [“Selecting the correct software image for an MDS 9250i switch” on page 13](#)

- ◆ “Selecting the software image for an MDS 9700 Series switch” on page 13
- ◆ “Software images for MDS 9396s switches” on page 13.
- ◆ “Software images for MDS 9132T switch” on page 14
- ◆ “Selecting the software image for an MDS 9396T switch” on page 14.
- ◆ “Selecting the software image for an MDS 9148T switch” on page 14.
- ◆ “Selecting the correct software image for an MDS 9220i switch” on page 14
- ◆ “Selecting the correct software image for an MDS 9148V switch” on page 15
- ◆ “Selecting the correct software image for an MDS 9124V switch” on page 15

Determining the software version

To determine the version of Cisco MDS NX-OS or SAN-OS software currently running on a Cisco MDS 9000 Family switch using the CLI, log in to the switch and enter the **show version EXEC** command.

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

Note: Dell strongly recommends that you use the current target software release for all MDS 9000 Family products. Refer to the *Dell Support Matrix*, available through E-Lab Interoperability Navigator (ELN) at <https://elabnavigator.dell.com/elab/modernHomeSSM> for the latest information on qualified and target firmware revisions.

Downloading software

The Cisco MDS NX-OS software is designed for mission-critical high availability environments.

Before performing upgrades, submit all requested changes to the Dell Global Services CCA change control process so that any potential operating environment impacts can be analyzed beforehand.

Firmware upgrade instructions, prerequisites, and other caveats can be found in the Dell Connectrix Procedure Generator. The Connectrix Procedure Generator can be downloaded from Dell EMC Online Support at <https://Dell.com/support>. Search for **Connectrix Procedure Generator**.

See the following sections in this release note for details on how you can nondisruptively upgrade your Cisco MDS 9000 switch. Issuing the **install all** command from the CLI, or using Cisco DCNM for SAN to perform the downgrade, enables the compatibility check. The check indicates if the upgrade can happen nondisruptively or disruptively depending on the current configuration of your switch and the reason.

Compatibility check is done:

Module	bootable	Impact	Install-type	Reason
1	yes	non-disruptive	rolling	
2	yes	disruptive	rolling	Hitless upgrade is not supported
3	yes	disruptive	rolling	Hitless upgrade is not supported
4	yes	non-disruptive	rolling	
5	yes	non-disruptive	reset	
6	yes	non-disruptive	reset	

At a minimum, you need to disable the default device alias distribution feature using the **no device-alias distribute** command in global configuration mode. The **show incompatibility system bootflash: system image filename** command determines which additional features need to be disabled.

Selecting the correct software image for an MDS 9148s switch

The system and kickstart image that you use for an MDS 9148s switch is shown in [Table 4](#).

Table 4 Software Images for MDS 9148s Switches

Cisco MDS 9148s Series switch type	Naming convention
9148s	Filename begins with m9100-s5ek9

Selecting the correct software image for an MDS 9250i switch

The system and kickstart image that you use for an MDS 9250i is shown in [Table 5](#).

Table 5 Software images for MDS 9250i switches

Cisco MDS 9250i switch type	Naming convention
9250i	Filename begins with m9250-s5ek9

Selecting the correct software image for an MDS 9396s switch

The system and kickstart image that you use for an MDS 9396s is shown in [Table 6](#).

Table 6 Software images for MDS 9396s switches

Cisco MDS 9396s switch type	Naming convention
9396s	Filename begins with m9300-s1ek9

Selecting the software image for an MDS 9700 Series switch

The system and kickstart image that you use for an MDS 9700 series switch is shown in [Table 7](#).

Table 7 Software images for MDS 9700 Series switch with SUPervisor-1 Module

Cisco MDS 9700 Series Switch Type	Switching naming conventions
9706, 9710 and 9718	Filename begins with m9700-sf3ek9

Selecting the software image for an MDS 9132T switch

The system and kickstart image that you use for an MDS 9132T switch is shown in [Table 8](#).

Table 8 Software images for MDS 9132T switch

Cisco MDS 9132 switch type	Switch Naming convention
9132T	Filename begins with m9100-s6ek9

Selecting the software image for an MDS 9396T switch

The system and kickstart image that you use for an MDS 9396T switch is shown in [Table 9](#).

Table 9 Software images for MDS 9396T switch

Cisco MDS 9396T switch Type	Switching naming conventions
9396T	Filename begins with m9300-s2ek9

Selecting the software image for an MDS 9148T switch

The system and kickstart image that you use for an MDS 9148T switch is shown in [Table 10](#).

Table 10 Software images for MDS 9148T switch

Cisco MDS 9148T switch Type	Switching naming conventions
9148T	Filename begins with m9148-s6ek9

Selecting the software image for an MDS 9700 series switches with Supervisor-4 Module

The system and kickstart image that you use for MDS 9700 series switches with Supervisor-4 Module is shown in [Table 11](#).

Table 11 Software Image for MDS 9700 series switches with Supervisor-4 Module

Cisco MDS 9700 Series Switch Type	Module Naming Conventions
9710-V2, 9706-V2 and 9718-V3	Filename begins with m9700-sf4ek9

Selecting the correct software image for an MDS 9220i switch

The system and kickstart image that you use for an MDS 9220i is shown in [Table 12](#)

Table 12 Software Image for Cisco MDS 9220i switch

Cisco MDS 9220i switch type	Naming convention
9220i	Filename begins with m9220-s7ek9

Selecting the correct software image for an MDS 9148V switch

The system and kickstart image that you use for an MDS 9148V is shown in [Table 13](#)

Table 13 Software Image for Cisco MDS 9148V switch

Cisco MDS 9148V switch type	Naming convention
9148V	Filename begins with m9148v-s8ek9

Selecting the correct software image for an MDS 9124V switch

The system and kickstart image that you use for an MDS 9124V is shown in [Table 14](#)

Table 14 Software Image for a Cisco MDS 9124V switch

Cisco MDS 9124V switch type	Naming convention
9124V	Filename begins with m9124v-s8ek9

Selecting the correct software image for an MDS 9396V switch

The system and kickstart image that you use for an MDS 9396V is shown in [Table 15](#)

Table 15 Software Image for a Cisco MDS 9396V switch

Cisco MDS 9396V switch type	Naming convention
9396V	Filename begins with m9396v-s3ek9

Upgrading Your Cisco MDS NX-OS Software Image

This section lists the guidelines recommended for upgrading your Cisco MDS NX-OS software image and includes the following topics:

- ◆ [“General upgrading guidelines” on page 16](#)

Note: Before you begin the upgrade process, review the list of chassis and modules that NX-OS Release 9.4(1) supports. See the [“Table 2 Cisco MDS NX-OS 9.4 chassis support matrix” on page 9](#).

Note: For detailed instructions for performing a software upgrade using Cisco NDFC, see the *Cisco NDFC Fundamentals Guide*, on the list of Cisco Nexus Dashboard Fabric Controller Guides at <http://www.cisco.com>.

General upgrading guidelines

Upgrade directly non-disruptively to NX-OS 9.4(1) code from 8.4(2c) and above code release.

Note: To upgrade non-disruptively to NX-OS Release 9.4(1), you must be running NX-OS Release 8.4(2c) or higher. To upgrade to 9.4(1) from any 8.x prior to 8.4(2c) need a step upgrade to MDS NX-OS release 8.4(2c) or later before upgrading to 9.4(1) release. To upgrade to 9.4(1) from 7.x or 6.x need a step upgrade to 8.4(2f) prior to upgrade to 9.4(1).

Use the following guidelines when upgrading:

- ◆ Non disruptive upgrade and downgrade paths may be changed by Cisco at any time due to reported issues. Refer to their online release notes for the current paths. Those release notes can be found at the following Cisco web site:

http://www.cisco.com/en/US/products/ps5989/prod_release_notes_list.html

- ◆ Install and configure dual supervisor modules.
- ◆ Issue the **show install all impact upgrade-image** CLI command to determine if your upgrade will be nondisruptive.
- ◆ On switches with dual supervisor modules, ensure both modules are installed and functional. The show module command displays one with a status of “active *” and the other with a status of “ha-standby”.
- ◆ Redundant fabrics should be upgraded separately. Test and confirm all devices have connectivity prior to upgrading the redundant fabric.
- ◆ Be aware that some features impact whether an upgrade is disruptive or nondisruptive:
- ◆ **Fibre Channel Ports:** Traffic on Fibre Channel ports can be nondisruptively upgraded.
- ◆ **Fibre Channel over Ethernet (FCoE) Ports:** FCoE ports can be nondisruptively upgraded without affecting traffic on the ports.
- ◆ **IP Storage (IPS) Ports:** Traffic on IPS ports on Cisco MDS 9250i and Cisco MDS 24/10-Port SAN Extension Modules is disrupted during an upgrade or downgrade. Nodes that are members of VSANs traversing an FCIP ISL are impacted, and a fabric reconfiguration may occur. iSCSI initiators connected to the IPS ports lose connectivity to iSCSI targets while the upgrade is in progress.
- ◆ 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 are upgrading Cisco MDS 9700 Series Directors from Cisco MDS NX-OS Release 8.3(1), Release 8.3(2), Release 8.4(1), or Release 8.4(1a) to Release 8.4(2) or later, ensure that you perform a switchover before upgrading. For more information, see [CSCvt87216](#).
- ◆ If you are upgrading from a release prior to Cisco MDS NX-OS Release 9.4(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*.

<https://www.cisco.com/c/en/us/td/docs/dcn/mds9000/sw/9x/configuration/interfaces/cisco-mds-9000-nx-os-interfaces-configuration-guide-9x.html>

- ◆ If you are upgrading from Cisco MDS NX-OS Release 8.5(1) to Release 9.4(1), ensure that you disable the Fabric Performance Monitor (FPM) feature using the **no feature fpm** command before upgrading.

Note: In addition to these guidelines, you may want to review the information in “FICON Upgrade path” on page 17 prior to a software upgrade to determine if a feature may possibly behave differently following the upgrade.

FICON Upgrade path

Cisco NX-OS 9.4(1) is not a FICON qualified release.

Downgrading your Cisco MDS NX-OS software image

This section lists the guidelines recommended for downgrading your Cisco MDS NX-OS software image and includes the following topics:

- ◆ “Follow these general guidelines before you perform a firmware downgrade.” on page 17

General downgrading guidelines

Follow these general guidelines before you perform a firmware downgrade.

- ◆ Nondisruptive upgrade and downgrade paths may be changed by Cisco at any time due to reported issues. Refer to their online release notes for the current paths. Those release notes can be found at the following Cisco website:

http://www.cisco.com/en/US/products/ps5989/prod_release_notes_list.html

- ◆ Issue the system **no acl-adjacency-sharing** user EXEC command to disable ACL adjacency usage on Generation 2 modules (Cisco MDS 9500 Directors). Generation 2 modules or switches can have one or more ports in port groups that share common resources such as bandwidth and buffer credits. If this command fails, reduce the number of zones, IVR zones, TE ports, or a combination of these in the system and issue the command again.
- ◆ Disable all features not supported by the downgrade release. Use the **show incompatibility system downgrade-image** command to determine what you need to disable.
- ◆ Use the **show install all impact downgrade-image** command to determine if your downgrade will be non-disruptive.
- ◆ Be aware that some features impact whether a downgrade is disruptive or non-disruptive:
- ◆ **Fibre Channel Ports:** Traffic on Fibre Channel ports can be non-disruptively downgraded.
- ◆ **FCoE Port:** FCoE ports can be nondisruptively downgraded without affecting traffic on the ports.

- ◆ **IPS Ports:** Traffic on IPS ports on Cisco MDS 9250i and Cisco MDS 24/10-Port SAN Extension Modules is disrupted during an upgrade or downgrade. Nodes that are members of VSANs traversing an FCIP ISL are impacted, and a fabric reconfiguration may occur. iSCSI initiators connected to the IPS ports lose connectivity to iSCSI targets while the upgrade is in progress.
- ◆ If you are downgrading from Cisco MDS NX-OS Release 9.4(1) or later releases to a release prior to Cisco MDS NX-OS Release 9.4(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*.

FICON Downgrade Path

Cisco NX-OS 9.4(1) is not a FICON qualified release.

Known problems and limitations

For a list of problems with this release, please refer to the Cisco Release notes located at:

http://www.cisco.com/en/US/products/ps5989/prod_release_notes_list.html

This section lists the limitations and restrictions.

Fibre Channel Read Diagnostic Parameters

Fibre Channel RDP querying is not supported on NPV, Port Channel or FCoE links.

SAN Extension Tuner

San Extension Tuner (SET) is not supported on Cisco MDS 9220i switches in Cisco MDS NX-OS Release 9.4(1).

DIRL and FPIN

DIRL and FPIN are not supported on switches that are operating in the Cisco NPV mode.

DIRL and FPIN are not supported on the following switches:

- ◆ Cisco MDS 9250i Switches
- ◆ Cisco MDS 9148S Switches

FCIP Support

In Cisco MDS NX-OS Release 9.4(1), FCIP Write Acceleration is not supported between 24/10 San Extension Module and Cisco 18+4 MSM and Cisco SSN16 Modules. In Cisco MDS NX-OS Release 9.4(1), FCIP Write Acceleration along with IVR is not supported on FCIP tunnels configured on Cisco MDS 9700 Series switches. FCIP tunnels using Cisco MDS 24/10 Port SAN Extension Module cannot be used across FSPF equal cost paths. On Cisco MDS 24/10 Port SAN Extension Module, configuring

multiple ECMP port channels with FCIP members in the same VSAN is not a valid configuration. If this is configured, then the traffic will flow through only one of the port channels.

iSCSI Support

iSCSI is not supported on Cisco MDS 9700 Directors with Cisco MDS 24/10 port SAN Extension Modules and Cisco MDS 9220i Fabric Switch.

HVDC PSU Support

The Cisco MDS 9700 HVDC PSU (DS-CHV-3.5KW) is not supported in Cisco MDS NX-OS Releases 8.1(1) and 8.1(1a). Do not attempt to load these releases on devices equipped with these PSUs or the systems will fail to power up.

Cisco TrustSec FC Link Encryption

Cisco TrustSec FC Link Encryption support for the following modules is available only on certain ports as mentioned below:

- ◆ 48-port 32-Gbps Fibre Channel Switching Module (DS-X9648-1536K9)—Support for Cisco TrustSec FC Link Encryption is available only on ports 9–12, 25–28, and 41–44.
- ◆ Cisco MDS 9132T Fibre Channel Switch—Support for Cisco TrustSec FC Link Encryption is available only on ports 9–12, 25–28.
- ◆ Cisco MDS 9148T Fibre Channel Switch—Support for Cisco TrustSec FC Link Encryption is available only on ports 9–12, 25–28, and 41–44.
- ◆ Cisco MDS 9396T Fibre Channel Switch—Support for Cisco TrustSec FC Link Encryption is available only on 9–12, 25–28, 41–44 base ports, and 57–60, 73–76, and 89–92 LEM ports as applicable.
- ◆ Cisco MDS 9396S 16-Gbps 96-Port Fibre Channel Fabric Switch
- ◆ Cisco MDS 9220i Fabric Switch
- ◆ Cisco MDS 9000 24/10-Port SAN Extension Module (DS-X9334-K9)

Fibre Channel Read Diagnostic Parameters

Fibre Channel RDP querying is not supported on NP, Port Channel, or FCoE links.

FPIN

FPIN is not supported on switches that are operating in the NPV mode.

HBA ER-RDY

The HBA ER-RDY feature is not supported on switches in NPV mode. In these scenarios, DIRM is the recommended congestion management solution.

Technical notes

The following sections provide further information on technical notes.

Best practices

Log messages are not saved across system reboots or power outages. Therefore, Dell recommends that customers configure a Syslog Server in order to redirect and capture all log messages on a remote server. For more information, please refer to *Cisco MDS 9000 Family Configuration Guide* on the Installation Configuration Guides list at <http://www.cisco.com>:

Maximum ports per chassis

Table 16 shows the maximum ports per chassis.

Table 16 Maximum ports per chassis

Chassis	Maximum number of ports
MDS9396V	96
MDS9396T	96
MDS9148T	48
MDS9124V	24
MDS 9148V	48
MDS9220i	20
MDS 9132T	32
MDS 9148S	48
MDS 9250i	50
MDS 9396S	96
MDS 9706 and MDS 9706-V2	192
MDS 9710 and MDS 9710-V2	384
MDS 9718 and MDS 9718-V3	768

SME configuration limits

Table 17 lists the SME configuration limits for this release.

Table 17 SME configuration limits (page 1 of 2)

Configuration	Limits
Number of switches in the fabric	10
Number of clusters per switch	1
Switches in a cluster	4
Fabrics in a cluster	2

Table 17 SME configuration limits (page 2 of 2)

Modules in a switch	11
Cisco MSM-18/4 modules in a cluster	32
Initiator-Target-LUNs (ITLs)	1024
LUNs behind a target	32
Host and target ports in a cluster	128
Number of hosts per target	128
Tape backup groups per cluster	2
Volume groups in a tape backup group	4
Cisco Key Management Center (# of keys)	32K
Targets per switch that can be FC-redirected	32

N_Port virtualization configuration limits

The NPV features have maximum configuration limits. [Table 18](#) shows the verified and maximum limits for the NPV switches running NX-OS Release 5.x.

Table 18 NPV features limitations

Feature	Verified limits	Maximum limits
FLOGIs or F Disc per NPV port group	114	114
NPV switches per NPV core switch	105	105
FLOGIs per line card on NPV core switch	400	400

Supported iSCSI sessions

For the most up-to-date supported iSCSI environment and parameters for Connectrix switches, refer to the iSCSI SAN Topologies Guide available at:

<https://elabnavigator.dell.com/vault/pdf/iSCSI.pdf?key=1442426704540>

For the most up-to-date information, refer to the Dell Support Matrix, available through E-Lab Interoperability Navigator at:

<https://elabnavigator.dell.com/elN/modernHomeSSM> and

<https://elabnavigator.dell.com/elN/extendedSupport> for the latest information on supported configurations.

Smart Licensing

The Smart License feature is enabled by default in 9.3(1) and later. This feature does not require any additional or modified steps. Follow the *NX OS Upgrade Guide* and perform the upgrade from 8.x/9.2.1/9.2.1a to 9.4(1). All traditional licenses (PAK licenses) will convert to smart license, and you can see those using the **show license authorization** command in the switch.

If you want to install any additional licenses, connect your switch with Cisco smart license server using any of the topology mentioned on this page:

https://www.cisco.com/c/en/us/td/docs/dcn/mds9000/sw/9x/configuration/licensing/cisco-mds-9000-nx-os-licensing-guide-9x/smart-licensing-using-policy.html#concept_yfq_xkk_csb [cisco.com]

Supported zoning parameters

Refer to the **Topology Resource Center** for the most up-to-date information on supported zoning parameters at:

<https://elabnavigator.dell.com/eln/topologyResource?page=topology>.

Supported IVR parameters

- ◆ IVR zone members 4000 per physical fabric
- ◆ IVR zones 2000 per physical fabric
- ◆ IVR zone sets 32 per physical fabric

An RPQ can be submitted for any configurations that exceed this limit.

Managing zone changes in multiswitch fabrics

Zoning changes may be made through Fabric Manager or CLI. When accessing Fabric Manager or CLI, the user does so from the point of view of one switch. That is, Fabric Manager and CLI are accessed by entering the IP address of one switch in the fabric.

When zoning changes are made, the applicable VSAN and zone set data is propagated to the rest of the switches in the fabric via the ISLs.

When zoning changes are made to a VSAN, the zone set data is propagated to the rest of the switches in the fabric via the ISLs. By default, only the active zone set information is relayed to all switches in the VSAN. If the user accesses the Fabric Manager and CLI from another switch in the fabric, the new VSAN and zone set information will not be viewable. To view the active and inactive zone set on the other switches in the fabric, the user must log in to the CLI and issue a command from the EXEC prompt.

Example The following is an example of copying VSAN 1 through 20 zoning data:

```
CiscoMDS_name# zone copy active full vsan 1-20
```

```
CiscoMDS_name# conf t
```

Enter configuration commands, one per line. End with CNTL Z.

```
CiscoMDS_name(config)# zoneset distribute full vsan 1-20
```

```
CiscoMDS_name(config)#
```

Note: This command needs to be issued on all switches in the fabric one time only.

This is a nondisruptive command. After issuing the commands, the user will now see the active and inactive zone sets for the specified VSANs on any switch that is chosen from which to manage the fabric.

After a zoning change is made, save the running configuration to the startup configuration.

Documentation

Send documentation comments to mdsfeedback-doc.com.

Product documentation

As of NX-OS Release 4.2(1a), software configuration information is available in new feature-specific configuration guides for the following information:

- ◆ System management
- ◆ Interfaces
- ◆ Fabric
- ◆ Quality of service
- ◆ Security
- ◆ IP services
- ◆ High availability and redundancy

The information in these new guides previously existed in the *Cisco MDS 9000 Family CLI Configuration Guide*. That configuration guide remains available on Cisco.com and should be used for all software releases prior to NX-OS Release 4.2(1a). Configuration guides address the features introduced in or available in a particular release. Select and view the configuration guide that pertains to the software installed in your switch.

In addition, Data Center Network Manager (DCNM) information has been removed from the MDS NX-OS Release Notes (this document) and placed into standalone NDFC Release Notes that support both Cisco MDS 9000 Family switches and Cisco Nexus 5000 Series switches. The *Cisco Nexus Dashboard Fabric Controller Release Notes* (NDFC) are available on <https://Dell.com/support> or on the Nexus Dashboard Fabric Controller release notes list at <http://www.cisco.com>.

Technical support

These release notes complement a Cisco documentation set. Each Cisco document refers to where to get help. However, for any items supplied by Dell, see [“Troubleshooting and getting help” on page 24](#).

Software media, organization, and files

For information on related software environment and system requirements refer to the *Dell Support Matrix* located on E-Lab Interoperability Navigator at <https://elabnavigator.dell.com/eln/modernHomeSSM>, under the **PDFs and Guides** tab.

Installation

For hardware installation information refer to the *Cisco MDS HW Installation Guides* available at Cisco.com.

For Dell-specific installation information refer to [“Environment and system requirements” on page 6](#) in this document.

Troubleshooting and getting help

Dell support, product, and licensing information can be obtained on the Dell Online Support site as described next.

Note: To open a service request through the Dell Online Support site, you must have a valid support agreement. Contact your Dell sales representative for details about obtaining a valid support agreement or to answer any questions about your account.

Product information

For documentation, release notes, software updates, or for information about Dell products, licensing, and service, go to the Dell Online Support site (registration required) at:

<https://support.dell.com>

Technical support

Dell offers a variety of support options.

Support by Product — Dell offers consolidated, product-specific information on the Web at:

<https://support.dell.com/products>

The Support by Product web pages offer quick links to Documentation, White Papers, Advisories (such as frequently used Knowledgebase articles), and Downloads, as well as more dynamic content, such as presentations, discussion, relevant Customer Support Forum entries, and a link to Dell Live Chat.

Dell Live Chat — Open a Chat or instant message session with a Dell Support Engineer.

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