



# Cisco MDS 9000 Series Release Notes for Cisco MDS NX-OS Release 6.2(13)

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**First Published: July 02, 2015**

This document describes the caveats and limitations for switches in the Cisco MDS 9000 Series. Use this document in conjunction with documents listed in the “[Obtaining Documentation and Submitting a Service Request](#)” section on page 37.

Release notes are sometimes updated with new information on restrictions and caveats. Refer to the following website for the most recent version of the *Cisco MDS 9000 Series Release Notes*: [http://www.cisco.com/en/US/products/ps5989/prod\\_release\\_notes\\_list.html](http://www.cisco.com/en/US/products/ps5989/prod_release_notes_list.html)

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## Introduction

The Cisco MDS 9000 Series of Multilayer Directors and Fabric Switches provides industry-leading availability, scalability, security, and management, allowing you to deploy high-performance storage-area networks with lowest total cost of ownership. Layering a rich set of intelligent features onto a high-performance, protocol agnostic switch fabric, the Cisco MDS 9000 Series addresses the stringent requirements of large data center storage environments: uncompromising high availability, security, scalability, ease of management, and seamless integration of new technologies.

Cisco MDS 9000 NX-OS software powers the award-winning Cisco MDS 9000 Series Multilayer Switches. It is designed to create a strategic SAN platform with superior reliability, performance, scalability, and features. Formerly known as Cisco SAN-OS, Cisco MDS 9000 NX-OS software is fully interoperable with earlier Cisco SAN-OS versions and enhances hardware platform and module support.

## Components Supported

[Table 1](#) lists the NX-OS software part numbers and hardware components supported by the Cisco MDS 9000 Series.

**Table 1** *Cisco MDS 9000 Series Supported Software and Hardware Components*

Component	Part Number	Description	Applicable Product
Software	M93S5K9-6.2.13	MDS 9396S, NX-OS software	MDS 9396S Switch
	M97S3K9-6.2.13	MDS 9700, NX-OS software	MDS 9700 Series
	M95S2K9-6.2.13	MDS 9500, NX-OS software	MDS 9500 Series
	M92S5K9-6.2.13	MDS 9250i NX-OS software	MDS 9250i Switch
	M92S2K9-6.2.13	MDS 9222i, NX-OS software	MDS 9222i Switch
	M91S3K9-6.2.13	MDS 9148, NX-OS software	MDS 9148 Switch
	M91S5K9-6.2.13	MDS 9148S, NX-OS software	MDS 9148S Switch

**Table 1** *Cisco MDS 9000 Series Supported Software and Hardware Components (Continued)*

<b>Component</b>	<b>Part Number</b>	<b>Description</b>	<b>Applicable Product</b>
Licenses	DCNM-SAN-M97-K9	Cisco Prime Data Center Network Manager	MDS 9700 Series
	M97ENTK9	Enterprise Package for one Cisco MDS 9700 Series Multilayer Director	MDS 9700 Series
	M97FIC1K9	Cisco MDS 9700 Mainframe Package license for one MDS 9700 Switches	MDS 9700 Series
	M9500SSE184K9z	Storage Services Enabler License for one MSM-18/4 module	MDS 9500 Series
	M9300ENT1K9	Cisco MDS 9300 Series Enterprise Package	MDS 9396S Switch
	DCNM-SAN-M93-K9	Cisco Prime Data Center Network Manager	MDS 9396S Switch
	M9200ENT1K9	Cisco MDS 9200 Series Enterprise Package	MDS 9200 Series
	DCNM-SAN-M92-K9	Cisco Prime Data Center Network Manager	MDS 9200 Series
	M9250IIOA	Cisco MDS 9250i I/O Accelerator Services package	MDS 9250i Switch
	M9250IDMMK9	Cisco MDS 9250i Data Mobility Manager package	MDS 9250i Switch
	M9250IDMMT6M	Cisco MDS 9250i DMM License - 6-month period	MDS 9250i Switch

**Table 1 Cisco MDS 9000 Series Supported Software and Hardware Components (Continued)**

<b>Component</b>	<b>Part Number</b>	<b>Description</b>	<b>Applicable Product</b>
	M9200FIC1K9	Cisco MDS 9200 Series Mainframe Package	MDS 9200 Series
	M9200XRC	Cisco MDS 9200 XRC Acceleration Package for IBM series z, spare	MDS 9200 Series
	M9222ISSE1K9	Storage Services Enabler License	MDS 9222i Switch
	M9200SSE184K9	Storage Services Enabler License for one MSM-18/4 module	MDS 9222i Switch
	M95DMM184K9	Data Mobility Manager License for one MSM-18/4 module	MDS 9500 Series
	M9222IDMMK9	Data Mobility Manager License for Cisco MDS 9222i	MDS 9222i Switch
	M92DMM184K9	Data Mobility Manager License for one MSM-18/4 module	MDS 9222i Switch
	M95DMM184TSK9	Data Mobility Manager for one MSM-18/4 module — Time limited to 180 days only	MDS 9500 Series
	M9222IDMMTSK9	Data Mobility Manager — Time limited to 180 days only	MDS 9222i Switch
	M92DMM184TSK9	Data Mobility Manager for one MSM-18/4 module — Time limited to 180 days only	MDS 9222i Switch
	M92SSESSNK9	Cisco Storage Services Enabler License for SSN-16 (1 engine)	MDS 9222i Switch
	M95SSESSNK9	Cisco Storage Services Enabler License for SSN-16 (1 engine)	MDS 9500 Series
	M92SMESSNK9	Cisco Storage Media Encryption License for SSN-16 (1 engine)	MDS 9222i Switch
	M95SMESSNK9	Cisco Storage Media Encryption License for SSN-16 (1 engine)	MDS 9500 Series
	M92IOASSN	Cisco I/O Accelerator License for SSN-16 (1 engine)	MDS 9222i Switch
	M95IOASSN	Cisco I/O Accelerator License for SSN-16 (1 engine)	MDS 9500 Series
	M92IOA184	Cisco I/O Accelerator License for MSM-18/4	MDS 9222i Switch
	M95IOA184	Cisco I/O Accelerator License for MSM-18/4	MDS 9500 Series
	M9222IIOA	Cisco I/O Accelerator License for Cisco MDS 9222i base switch	MDS 9222i Switch
	M92EXTSSNK9	Cisco SAN Extension License for SSN-16 (1 engine)	MDS 9222i Switch
	M95EXTSSNK9	Cisco SAN Extension License for SSN-16 (1 engine)	MDS 9500 Series
	M9200XRC	Cisco XRC Acceleration	MDS 9200 Series
	M9500XRC	Cisco XRC Acceleration	MDS 9500 Series

**Table 1 Cisco MDS 9000 Series Supported Software and Hardware Components (Continued)**

<b>Component</b>	<b>Part Number</b>	<b>Description</b>	<b>Applicable Product</b>
Chassis	DS-C9710	Cisco MDS 9710 Multilayer Director (10-slot multilayer director with 2 half-width slots for Supervisor modules, with 8 slots available for switching modules — SFPs sold separately)	MDS 9710 Switch
	DS-C9706	Cisco MDS 9706 Multilayer Director (6-slot multilayer director with 2 half-width slots for Supervisor modules, with 4 slots available for switching modules — SFPs sold separately)	MDS 9706 Switch
	DS-C9513	Cisco MDS 9513 Multilayer Director (13-slot multilayer director with 2 slots for Supervisor modules, with 11 slots available for switching modules — SFPs sold separately)	MDS 9513 Switch
	DS-C9509	Cisco MDS 9509 Multilayer Director (9-slot multilayer director with 2 slots for Supervisor modules, with 7 slots available for switching modules — SFPs sold separately)	MDS 9509 Switch
	DS-C9506	Cisco MDS 9506 Multilayer Director (6-slot multilayer director with 2 slots for Supervisor modules, with 4 slots available for switching modules — SFPs sold separately)	MDS 9506 Switch
	DS-C9396S-K9	Cisco MDS 9396S 96-Port Multilayer Fabric Switch (2RU fixed-configuration multilayer fabric switch with 96 16-Gbps Fibre Channel ports)	MDS 9396S Switch
	DS-C9250I-K9	The Cisco MDS 9250i offers up to forty 16-Gbps Fibre Channel ports, two 10 Gigabit Ethernet IP storage services ports, and eight 10 Gigabit Ethernet Fibre Channel over Ethernet (FCoE) ports in a fixed two-rack-unit (2RU) form factor.	MDS 9250i Switch
	DS-C9222i-K9	Cisco MDS 9222i Multilayer Fabric Switch (3-rack-unit (3RU) semimodular multilayer fabric switch with 18 4-Gbps Fibre Channel ports, 4 Gigabit Ethernet ports, and a modular expansion slot for Cisco MDS 9000 Series Switching and Services modules)	MDS 9222i Switch
	DS-C9148S-K9	Cisco MDS 9148S 48-Port Multilayer Fabric Switch (1RU fixed-configuration multilayer fabric switch with 48 16-Gbps Fibre Channel ports)	MDS 9148S Switch
DS-C9148-K9	Cisco MDS 9148 48-Port Multilayer Fabric Switch (1RU fixed-configuration multilayer fabric switch with 48 8-Gbps Fibre Channel ports)	MDS 9148 Switch	
Supervisor Modules	DS-X97-SF1-K9	Cisco MDS 9700 Series Supervisor-1 Module	MDS 9700 Series
	DS-X9530-SF2-K9	Cisco MDS 9500 Series Supervisor-2 Module	MDS 9500 Series
	DS-X9530-SF2A-K9	Cisco MDS 9500 Series Supervisor-2A Module	MDS 9500 Series

**Table 1 Cisco MDS 9000 Series Supported Software and Hardware Components (Continued)**

<b>Component</b>	<b>Part Number</b>	<b>Description</b>	<b>Applicable Product</b>
Switching Modules	DS-X9448-768K9	Cisco MDS 9000 48-port 16-Gbps Fibre Channel Switching Module with SFP LC connectors	MDS 9700 Series
	DS-X9848-480K9	Cisco MDS 48-Port 10-Gigabit Fibre Channel over Ethernet (FCoE) Module with SFP LC connectors	MDS 9700 Series
	DS-X9112 <sup>a</sup>	Cisco MDS 9000 12-port 4-Gbps Fibre Channel Switching Module with SFP LC connectors	MDS 9500 Series MDS 9200 Series
	DS-X9124 <sup>1</sup>	Cisco 24-port 4-Gbps Fibre Channel Switching Module with SFP LC connectors	MDS 9500 Series MDS 9200 Series
	DS-X9148 <sup>1</sup>	Cisco MDS 9000 48-port 4-Gbps Fibre Channel Switching Module with SFP LC	MDS 9500 Series MDS 9200 Series
	DS-X9704	Cisco MDS 9000 Series 4-Port 10-Gbps Fibre Channel Switching Module with SFP LC	MDS 9500 Series MDS 9200 Series
	DS-X9224-96K9	Cisco MDS 9000 24-Port 8-Gbps Fibre Channel Switching Module with SFP and SFP+ LC connectors	MDS 9500 Series
	DS-X9248-96K9	Cisco MDS 9000 48-Port 8-Gbps Fibre Channel Switching Module with SFP and SFP+ LC connectors	MDS 9500 Series
	DS-X9248-48K9	Cisco MDS 9000 4/44-Port Host-Optimized 8-Gbps Fibre Channel Switching Module with SFP and SFP+ LC connectors	MDS 9500 Series MDS 9222i Switch
	DS-X9708-K9	Cisco MDS 9000 8-port 10-Gbps Fibre Channel over Ethernet (FCoE) Module	MDS 9500 Series
	DS-X9232-256K9	Cisco MDS 9000 32-port 8-Gbps Advanced Fibre Channel Switching Module	MDS 9500 Series
	DS-X9248-256K9	Cisco MDS 9000 48-port 8-Gbps Advanced Fibre Channel Switching Module	MDS 9500 Series
Services Modules	DS-X9316-SSNK9	Cisco MDS 9000 Series 16-Port Storage Services Node (SSN-16) — 16 fixed 1-Gbps Ethernet ports, plus 4 service engines that support 16-Gigabit Ethernet IP storage services ports.	MDS 9500 Series MDS 9222i Switch
	DS-X9304-18K9	Cisco MDS 9000 18/4-Port Multiservice Module (MSM-18/4) — 18-port, 4-Gbps Fibre Channel plus 4-port Gigabit Ethernet IP services and switching module with SFP LC connectors	MDS 9500 Series MDS 9200 Series
External crossbar module	DS-X9710-FAB1	Cisco MDS 9710 Crossbar Switching Fabric 1 Module	MDS 9710 Switch
	DS-X9706-FAB1	Cisco MDS 9706 Crossbar Switching Fabric 1 Module	MDS 9706 Switch
	DS-13SLT-FAB2	Cisco MDS 9513 Switching Fabric 2 Module	MDS 9513 Switch
	DS-13SLT-FAB3	Cisco MDS 9513 Switching Fabric 3 Module	MDS 9513 Switch

**Table 1 Cisco MDS 9000 Series Supported Software and Hardware Components (Continued)**

Component	Part Number	Description	Applicable Product
Power Supplies	DS-CAC-300W	300W AC power supply	MDS 9124 Switch MDS 9148 Switch
	DS-C24-300AC	300W AC power supply	MDS 9124 Switch
	DS-C48-300AC	300W AC power supply	MDS 9148 Switch
	DS-C48S-300AC	300W AC power supply	MDS 9148S Switch
	DS-CAC-845W	845W AC power supply for Cisco MDS 9200 Series	MDS9200 Series
	DS-C50I-300AC	300W AC power supply	MDS 9250i Switch
	DS-CAC-1200W-E	1200W AC power supply	MDS 9396S Switch
	DS-CAC-3000W	3000W AC power supply for Cisco MDS 9509	MDS 9509 Switch
	DS-CAC-2500W	2500W AC power supply	MDS 9509 Switch
	DS-CDC-2500W	2500W DC power supply	MDS 9509 Switch
	DS-CAC-6000W	6000W AC power supply for Cisco MDS 9513	MDS 9513 Switch
	DS-CAC-1900W	1900W AC power supply for Cisco MDS 9506	MDS 9506 Switch
	DS-CAC97-3KW	3000W AC power supply for Cisco MDS 9700 Series	MDS 9700 Series
	DS-CDC97-3KW	3000W DC power supply for Cisco MDS 9700 Series	MDS 9700 Series
CompactFlash	MEM-MDS-FLD512M	External 512-MB CompactFlash memory for supervisor module	MDS 9500 Series
Smart Card Reader	DS-SCR-K9	Storage Media Encryption (SME) Smart Card Reader	MDS 9000 Series
Smart Card	DS-SC-K9	SME Smart Card	MDS 9000 Series

a. This product has reached End of Support as of February 28, 2015.

Table 2 lists the part numbers and optical components supported by the Cisco MDS 9000 Series.



**Note**

For the latest information about supported transceivers (SFPs), see the [Cisco MDS 9000 Family Pluggable Transceivers](#) data sheet.

**Table 2 Cisco MDS 9000 Series Supported Optics and Transceivers**

<b>Component</b>	<b>Part Number</b>	<b>Description</b>	<b>Applicable Product</b>
Optics	SFP-10G-SR / DS-SFP-10GE-SR	10GBASE-SR SFP+ Module	MDS 9700 Series, MDS 9500 Series, 8-port 10-Gbps FCoE Module (DS-X9708-K9), MDS 9250i, MDS 9396S
	SFP-10G-LR / DS-SFP-10GE-LR	10GBASE-LR SFP+ Module	MDS 9700 Series, MDS 9500 Series, 8-port 10-Gbps FCoE Module (DS-X9708-K9), MDS 9250i, MDS 9396S
	SFP-10G-ER	10GBASE-ER SFP+ Module	MDS 9700 Series, MDS 9500 Series, 8-port 10-Gbps FCoE Module (DS-X9708-K9), MDS 9250i, MDS 9396S
	SFP-H10GB-CU1M	10GBASE-CU SFP+ cable 1 meter	MDS 9700 Series, DS-X9848-480K9, MDS 9500 Series, 8-port 10-Gbps FCoE Module (DS-X9708-K9), MDS 9250i
	SFP-H10GB-CU3M	10GBASE-CU SFP+ cable 3 meter	MDS 9700 Series, DS-X9848-480K9, MDS 9500 Series, 8-port 10-Gbps FCoE Module (DS-X9708-K9), MDS 9250i
	SFP-H10GB-CU5M	10GBASE-CU SFP+ cable 5 meter	MDS 9700 Series, DS-X9848-480K9, MDS 9500 Series, 8-port 10-Gbps FCoE Module (DS-X9708-K9), MDS 9250i
	SFP-H10GB-ACU7M	10GBASE-CU SFP+ active copper cable 7 meter	MDS 9700 Series, DS-X9848-480K9, MDS 9500 Series, 8-port 10-Gbps FCoE Module (DS-X9708-K9), MDS 9250i
	SFP-H10GB-ACU10M	10GBASE-CU SFP+ active copper cable 10 meter	MDS 9700 Series, DS-X9848-480K9, MDS 9500 Series, 8-port 10-Gbps FCoE Module (DS-X9708-K9), MDS 9250i



**Table 2 Cisco MDS 9000 Series Supported Optics and Transceivers (Continued)**

<b>Component</b>	<b>Part Number</b>	<b>Description</b>	<b>Applicable Product</b>
LC-type fiber-optic SFP	DS-SFP-FC16G-SW	SFP+ optics (LC type) for 16-Gbps Fibre Channel for shortwave mode	MDS 9700 Series, 48-port 16-Gbps Fibre Channel Switching Module (DS-X9448-768K9), MDS 9250i, MDS 9148S, MDS 9396S
	DS-SFP-FC16G-LW	SFP+ optics (LC type) for 16-Gbps Fibre Channel for longwave mode (10km reach)	MDS 9700 Series, 48-port 16-Gbps Fibre Channel Switching Module (DS-X9448-768K9), MDS 9250i, MDS 9148S, MDS 9396S
	DS-SFP-FC16GELW=	SFP+ optics (LC type) for 16-Gbps Fibre channel for longwave mode; (25km reach).	48-port 16-Gbps Fibre Channel Switching Module (DS-X9448-768K9), MDS 9250i, MDS 9148S, MDS 9396S
	DS-SFP-FC10G-SW	SFP+ optics (LC type) for 10-Gbps Fibre Channel for shortwave mode	48-port 16-Gbps Fibre Channel Switching Module (DS-X9448-768K9), 32-port 8-Gbps Advanced Fibre Channel Module (DS-X9232-256K9), 48-port 8-Gbps Advanced Fibre Channel Module (DS-X9248-256-K9), MDS 9396S
	DS-SFP-FC10G-LW	SFP+ optics (LC type) for 10-Gbps Fibre Channel for longwave mode (10km reach)	48-port 16-Gbps Fibre Channel Switching Module (DS-X9448-768K9), 32-port 8-Gbps Advanced Fibre Channel Module (DS-X9232-256K9), 48-port 8-Gbps Advanced Fibre Channel Module (DS-X9248-256-K9), MDS 9396S
	DS-SFP-FC8G-ER	SFP+ optics (LC type) for 2-, 4-, or 8-Gbps Fibre Channel for extended reach (40 km reach)	MDS DS-X9200 Series switching modules, 48-port 16-Gbps Fibre Channel Switching Module (DS-X9448-768K9) MDS 9148 MDS 9250i, MDS 9148S, MDS 9396S
	DS-SFP-FC8G-SW	SFP+ optics (LC type) for 2-, 4-, or 8-Gbps Fibre Channel for shortwave mode	MDS 9700 Series, MDS 9500 Series, MDS DS-X9200 Series switching modules, MDS 9250i, MDS 9148, MDS 9148S, MDS 9396S
	DS-SFP-FC8G-LW	SFP+ optics (LC type) for 2-, 4-, or 8-Gbps Fibre Channel for longwave mode; supports distances up to 10 km	MDS 9700 Series, MDS 9500 Series, MDS DS-X9200 Series switching modules, MDS 9250i, MDS 9148, MDS 9148S, MDS 9396S
	DS-SFP-FC4G-SW	SFP optics (LC type) for 1-, 2-, or 4-Gbps Fibre Channel for shortwave mode	MDS 9124, MDS 9134, MDS 9148, MDS 9222i, DS-X9100, and DS-X9200 Series switching modules
DS-SFP-FC4G-MR	SFP optics (LC type) for 1-, 2-, or 4-Gbps Fibre Channel for longwave mode; supports distances up to 4 km	MDS 9124, MDS 9134, MDS 9222i, DS-X9100, and DS-X9200 Series switching modules	

**Table 2 Cisco MDS 9000 Series Supported Optics and Transceivers (Continued)**

<b>Component</b>	<b>Part Number</b>	<b>Description</b>	<b>Applicable Product</b>
	DS-SFP-FC4G-LW	SFP optics (LC type) for 1-, 2-, or 4-Gbps Fibre Channel for longwave mode; supports distances up to 10 km	MDS 9124, MDS 9134, MDS 9222i, DS-X9100, and DS-X9200 Series switching modules
	DS-SFP-FCGE-SW	SFP optics (LC type) for 1-Gbps Ethernet and 1- or 2-Gbps Fibre Channel for shortwave mode; not for use in 4-Gbps-capable ports	DS-X9316-SSNK9, DS-X9304-18K9, MDS 9222i, MDS 9250i
	DS-SFP-FCGE-LW	SFP optics (LC type) for 1-Gbps Ethernet and 1- or 2-Gbps Fibre Channel for longwave mode; not for use in 4-Gbps-capable ports	DS-X9316-SSNK9, DS-X9304-18K9, MDS 9222i, MDS 9250i
	DS-SFP-GE-T	SFP (RJ-45 connector) for Gigabit Ethernet over copper	DS-X9316-SSNK9, DS-X9304-18K9, MDS 9222i, MDS 9250i
Cisco Coarse Wavelength-Division Multiplexing (CWDM)	DS-CWDM-xxxx	CWDM Gigabit Ethernet and 1- or 2-Gbps Fibre Channel SFP LC type, where product number xxxx = 1470, 1490, 1510, 1530, 1550, 1570, 1590, or 1610 nm	MDS 9000 Series
	DS-CWDM4Gxxxx	CWDM 4-Gbps Fibre Channel SFP LC type, where product number xxxx = 1470, 1490, 1510, 1530, 1550, 1570, 1590, or 1610 nm	MDS 9000 Series
	CWDM8G1490	1490 nm CWDM 2/4/8-Gbps Fibre Channel SFP+	DS-X9200 Series switching modules, MDS 9700 Series, 48-port 16-Gbps Fibre Channel Switching Module (DS-X9448-768K9), MDS 9148, MDS 9250i, MDS 9148S, MDS 9396S

**Table 2 Cisco MDS 9000 Series Supported Optics and Transceivers (Continued)**

Component	Part Number	Description	Applicable Product
Dense Wavelength-Division Multiplexing (DWDM)	DWDM-X2-xx.xx	DWDM X2 SC optics for 10-Gbps Fibre Channel connectivity to an existing Ethernet DWDM infrastructure, with 15xx.xx nm wavelength, where xx.xx = 60.61, 59.79, 58.98, 58.17, 56.55, 55.75, 54.94, 54.13, 52.52, 51.72, 50.92, 50.12, 48.51, 47.72, 46.92, 46.12, 44.53, 43.73, 42.94, 42.14, 40.56, 39.77, 38.98, 38.19, 36.61, 35.82, 35.04, 34.25, 32.68, 31.90, 31.12, or 30.33	MDS 9500 Series MDS 9200 Series
	DWDM-SFP-xxxx	DWDM Gigabit Ethernet and 1- or 2-Gbps Fibre Channel SFP LC type, where product number xxxx = 3033, 3112, 3190, 3268, 3425, 3504, 3582, 3661, 3819, 3898, 3977, 4056, 4214, 4294, 4373, 4453, 4612, 4692, 4772, 4851, 5012, 5092, 5172, 5252, 5413, 5494, 5575, 5655, 5817, 5898, 5979, or 6061nm	MDS 9000 Series
	DWDM-SFP10G-xx.xx	10GBASE-DWDM SFP+	MDS 9710, DS-X9848-480K9, MDS 9250i
Add/Drop Multiplexer (ADM)	DS-CWDMOADM4A	4-channel CWDM optical ADM (OADM) module (Cisco CWDM 1470, 1490, 1510, or 1530 NM Add/Drop Module)	MDS 9000 Series
	DS-CWDMOADM4B	4-channel CWDM OADM module (Cisco CWDM 1550, 1570, 1590, or 1610 NM Add/Drop Module)	MDS 9000 Series
	DS-CWDM-MUX8A	ADM for 8 CWDM wavelengths	MDS 9000 Series
CWDM Multiplexer Chassis	DS-CWDMCHASSIS	2-slot chassis for CWDM ADMs	MDS 9000 Series

## MDS 9000 Chassis and Module Support

Table 3 lists the MDS hardware chassis supported by Cisco MDS NX-OS Release 6.2(x).

**Table 3 Cisco MDS NX-OS 6.2(x) Chassis Support Matrix**

Switch	NX-OS Release 6.2(x) Support
MDS 9710	Yes
MDS 9706	Yes <sup>a</sup>

**Table 3 Cisco MDS NX-OS 6.2(x) Chassis Support Matrix**

Switch	NX-OS Release 6.2(x) Support
MDS 9513	Yes
MDS 9509	Yes
MDS 9506	Yes
MDS 9396S	Yes <sup>b</sup>
MDS 9250i	Yes <sup>c</sup>
MDS 9222i	Yes
MDS 9148S	Yes <sup>1</sup>
MDS 9148	Yes
Cisco MDS 8-Gb Fabric Switch for HP c-Class Blade System	Yes
MDS 9134	No
MDS 9124	No
Cisco MDS 4-Gbps Fabric Switch for HP c-Class BladeSystem	No
Cisco MDS 4-Gbps Fabric Switch for IBM BladeCenter	No

a. This switch supports Cisco MDS NX-OS Release supports Release 6.2(9) and later.

b. This switch supports Cisco MDS NX-OS Release supports Release 6.2(13) and later.

c. This switch supports Cisco MDS NX-OS Release supports Release 6.2(5) and later.

Table 4 lists the MDS hardware modules supported by Cisco MDS NX-OS Release 6.2(x).

**Table 4 Module Support Matrix for Cisco MDS NX-OS Release 6.2(x)**

Module	Description	MDS 9700 Series	MDS 9500 Series	MDS 9200 Series
DS-X97-SF1-K9	MDS 9700 Supervisor-1 Module	Yes	No	No
DS-X9710-FAB1	MDS 9710 Fabric1 Module	Yes <sup>a</sup>	No	No
DS-X9706-FAB1	MDS 9706 Fabric1 Module	Yes <sup>b</sup>	No	No
DS-X9448-768K9	48-Port 16-Gbps Fibre Channel Switching Module	Yes	No	No
DS-X9848-480K9	Cisco MDS 48-Port 10-Gigabit FCoE Module	Yes	No	No
DS-X9530-SF2-K9	MDS 9500 Supervisor-2 Module	No	Yes	No
DS-X9530-SF2A-K9	MDS 9500 Supervisor-2A Module	No	Yes	No
DS-13SLT-FAB3	MDS 9513 Fabric Module 3	No	Yes	No
DS-13SLT-FAB2	MDS 9513 Fabric Module 2	No	Yes	No
DS-13SLT-FAB1	MDS 9513 Fabric Module 1	No	Yes	No
DS-X9708-K9	8-port 10-Gbps FCoE Module	No	Yes <sup>c, d</sup>	No

**Table 4**      **Module Support Matrix for Cisco MDS NX-OS Release 6.2(x)**

<b>Module</b>	<b>Description</b>	<b>MDS 9700 Series</b>	<b>MDS 9500 Series</b>	<b>MDS 9200 Series</b>
DS-X9232-256K9	32-port 8-Gbps Advanced Fibre Channel Switching Module	No	Yes	No
DS-X9248-256K9	48-port 8-Gbps Advanced Fibre Channel Switching Module	No	Yes	No
DS-X9224-96K9	24-port 8-Gbps Fibre Channel Switching Module	No	Yes	No
DS-X9248-96K9	48-port 8-Gbps Fibre Channel Switching Module	No	Yes	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 Multiservice Module (MSM-18/4)	No	Yes	Yes
DS-X9112	12-port 4-Gbps Fibre Channel Switching Module	No	Yes	Yes
DS-X9124	24-port 4-Gbps Fibre Channel Switching Module	No	Yes	Yes
DS-X9148	48-port 4-Gbps Fibre Channel Switching Module	No	Yes	Yes
DS-X9704	4-port 10-Gbps Fibre Channel Switching Module	No	Yes	Yes

a.Supported on Cisco MDS 9710 Director only.

b.Supported on Cisco MDS 9706 Director only.

c.Requires DS-13SLT-FAB3 or DS-13SLT-FAB2 in the MDS 9513.

d.Requires the Supervisor-2A module.

## 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, page 14](#)
- [Determining Software Version Compatibility, page 14](#)
- [Downloading Software, page 14](#)
- [Selecting the Software Image for a Cisco MDS 9148 Switch, page 15](#)
- [Selecting the Software Image for a Cisco MDS 9148S Switch, page 15](#)
- [Selecting the Software Image for a Cisco MDS 9222i Switch, page 15](#)
- [Selecting the Software Image for a Cisco MDS 9250i Switch, page 15](#)
- [Selecting the Software Image for a Cisco MDS 9396S Switch, page 16](#)
- [Selecting the Software Image for a Cisco MDS 9500 Series Switch, page 16](#)

- [Selecting the Software Image for a Cisco MDS 9700 Series Switch, page 16](#)
- [NPE Software Images, page 16](#)

## Determining the Software Version

To determine the version of Cisco MDS NX-OS or SAN-OS software currently running on a Cisco MDS 9000 Series 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 Series 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.

## Determining Software Version Compatibility

[Table 5](#) lists the software versions that are compatible in a mixed SAN environment, the minimum software versions that are supported, and the versions that have been tested. We recommend that you use the latest software release supported by your vendor for all Cisco MDS 9000 Series products.

**Table 5** *Software Release Compatibility*

Cisco NX-OS Software	Minimum NX-OS or SAN-OS Release	Tested NX-OS and SAN-OS Release
NX-OS Release 6.2(13)	NX-OS Release 6.2(1) and later	NX-OS Release 6.2(1) and later
	NX-OS Release 5.2(1) and later	NX-OS Release 5.2(1) and later
	NX-OS Release 5.0(1a) and later	NX-OS Release 5.0(1a) and later
	NX-OS Release 4.2(3) and later	NX-OS Release 4.2(3) and later
	SAN-OS Release 3.3(5) and later	SAN-OS Release 3.3(5) and later

## Downloading Software

The Cisco MDS NX-OS software is designed for mission-critical high-availability environments. To realize the benefits of nondisruptive upgrades on the Cisco MDS 9700 Directors, Cisco MDS 9500 Directors, we highly recommend that you install dual supervisor modules.

To download the latest Cisco MDS NX-OS software, access the Software Center at this URL:

<http://www.cisco.com/cisco/software/navigator.html?a=a&i=rpm>

See the following sections in this release notes for details on how you can nondisruptively upgrade your Cisco MDS 9000 switch. Using 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
```

The **show incompatibility system bootflash:**system image filename command determines which additional features need to be disabled.



**Note**

If you would like to request a copy of the source code under the terms of either GPL or LGPL, please send an e-mail to [mds-software-disclosure@cisco.com](mailto:mds-software-disclosure@cisco.com).

## Selecting the Software Image for a Cisco MDS 9148 Switch

The system and kickstart image that you use for a Cisco MDS 9148 switch is shown in [Table 6](#).

**Table 6** *Software Images for Cisco MDS 9148 Switches*

Cisco MDS 9148 Switch	Naming Convention
Cisco MDS 9148, Cisco MDS 8Gb Fabric Switch for HP c- Class BladeSystem	Filename begins with m9100-s3ek9

## Selecting the Software Image for a Cisco MDS 9148S Switch

The system and kickstart image that you use for a Cisco MDS 9148S switch is shown in [Table 7](#).

**Table 7** *Software Images for Cisco MDS 9148S Switches*

Cisco MDS 9148S Switch	Naming Convention
Cisco MDS 9148S	Filename begins with m9100-s5ek9

## Selecting the Software Image for a Cisco MDS 9222i Switch

The system and kickstart image that you use for a Cisco MDS 9222i switch is shown in [Table 8](#).

**Table 8** *Software Images for a Cisco MDS 9222i Switch*

Cisco MDS 9222i Switch	Naming Convention
Cisco MDS 9222i	Filename begins with m9200-s2ek9

## Selecting the Software Image for a Cisco MDS 9250i Switch

The system and kickstart image that you use for a Cisco MDS 9250i switch is shown in [Table 9](#).

**Table 9** *Software Images for a Cisco MDS 9250i Switch*

Cisco MDS 9250i Switch	Naming Convention
Cisco MDS 9250i	Filename begins with m9250-s5ek9

## Selecting the Software Image for a Cisco MDS 9396S Switch

The system and kickstart image that you use for a Cisco MDS 9396S switch is shown in [Table 10](#).

**Table 10** *Software Images for a Cisco MDS 9396S Switch*

Cisco MDS 9396S Switch	Naming Convention
MDS 9396S	Filename begins with m9300-s1ek9

## Selecting the Software Image for a Cisco MDS 9500 Series Switch

The system and kickstart image that you use for a Cisco MDS 9500 Series switch with a Supervisor-2 or Supervisor-2A module is shown in [Table 11](#). The Supervisor 1 module is not supported from NX-OS Release 4.2(1) and later releases.

**Table 11** *Software Images for Cisco MDS 9500 Series Switches*

Cisco MDS 9500 Series Switch Type	Naming Convention
Cisco MDS 9513, 9509, and 9506	Filename begins with m9500-sf2ek9

Use the **show module** command to display the type of supervisor module in the switch. The following is sample output from the **show module** command on a Supervisor-2 module:

```
switch# show module
Mod  Ports  Module-Type          Model          Status
---  -
7    0      Supervisor/Fabric-2  DS-X9530-SF2-K9  active *
8    0      Supervisor/Fabric-2  DS-X9530-SF2-K9  ha-standby
```

## Selecting the Software Image for a Cisco MDS 9700 Series Switch

The system and kickstart image that you use for a Cisco MDS 9700 Series switch is shown in [Table 12](#).

**Table 12** *Software Images for Cisco MDS 9700 Series Switch*

Cisco MDS 9710 Switch	Naming Convention
Cisco MDS 9710 and 9706	Filename begins with m9700-sf3ek9

## NPE Software Images

No payload encryption (NPE) images are available with Cisco MDS NX-OS Release 6.2(13) software. The NPE images are intended for countries who have import restrictions on products that encrypt payload data.

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

- m9100-s3ek9-kickstart-mz-npe.6.2.13.bin
- m9100-s3ek9-mz-npe.6.2.13.bin
- m9100-s5ek9-kickstart-mz-npe.6.2.13.bin
- m9100-s5ek9-mz-npe.6.2.13.bin
- m9200-s2ek9-kickstart-mz-npe.6.2.13.bin



- m9200-s2ek9-mz-npe.6.2.13.bin
- m9250-s5ek9-kickstart-mz-npe.6.2.13.bin
- m9250-s5ek9-mz-npe.6.2.13.bin
- m9300-s1ek9-kickstart-mz-npe.6.2.13.bin
- m9300-s1ek9-mz-npe.6.2.13.bin
- m9500-sf2ek9-kickstart-mz-npe.6.2.13.bin
- m9500-sf2ek9-mz-npe.6.2.13.bin
- m9700-sf3ek9-kickstart-mz-npe.6.2.13.bin
- m9700-sf3ek9-mz-npe.6.2.13.bin

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

## 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, page 17](#)
- [Nondisruptive Upgrade Paths, page 18](#)
- [FICON Supported Releases and Upgrade Paths, page 20](#)



### Note

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Before you begin the upgrade process, review the list of chassis and modules that Cisco MDS NX-OS Release 6.2(13) supports. See the [“MDS 9000 Chassis and Module Support” section on page 11](#).

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For detailed instructions for performing a software upgrade using Cisco DCNM, see the *Cisco DCNM Release Notes, Release 6.2*, which is available from the following website:

<http://www.cisco.com/c/en/us/support/cloud-systems-management/prime-data-center-network-manager/products-release-notes-list.html>

## General Upgrading Guidelines

Follow these general guidelines before performing a software upgrade:

- Review the nondisruptive upgrade path to Release 6.2(13) in [Table 13](#).
- Install and configure dual supervisor modules before the upgrade.
- Issue the **show install all impact upgrade-image** CLI command to determine if your upgrade will be nondisruptive.
- Be aware that some features impact whether an upgrade is disruptive or nondisruptive:
  - **Fibre Channel Ports:** Fibre Channel ports can be nondisruptively upgraded without affecting traffic on the ports. See [Table 13](#) for the nondisruptive upgrade path for all NX-OS and SAN-OS releases.

- **Gigabit Ethernet Ports:** Traffic on GigabitEthernet/IPStorage ports is disrupted during an upgrade or downgrade. This includes the Gigabit Ethernet ports on the MSM-18/4 module, the MDS 9222i switch, the MDS 9000 16-Port Storage Services Node (SSN-16), and the IPStorage ports in MDS 9250i. Those nodes that are members of VSANs traversing an FCIP ISL are impacted, and a fabric reconfiguration occurs. iSCSI initiators connected to the Gigabit Ethernet ports lose connectivity to iSCSI targets while the upgrade is in progress.
- **FICON:** If you have FICON enabled, the upgrade path is different. See the [“FICON Supported Releases and Upgrade Paths”](#) section on page 20.



**Note**

In addition to these guidelines, you may want to review the information in the [“Limitations and Restrictions”](#) section prior to a software upgrade to determine if a feature may possibly behave differently following the upgrade.



**Note**

Upgrading from Cisco MDS NX-OS Releases 6.2(9b) or 6.2(9c) to Cisco MDS NX-OS Releases 6.2(11), 6.2(11b), or 6.2(11c) is not supported due to the introduction of a new feature to support longer role names (a maximum of 64 characters) in the Cisco MDS NX-OS Releases 6.2(9b) and 6.2(9c).

## ISSU Guidelines for Cisco MDS 9250i Switch

- Upgrading from Cisco MDS NX-OS Release 6.2(11e) to Cisco MDS NX-OS Release 6.2(13) is not supported on a Cisco MDS 9250i Switch which has only one online PSU.
- Upgrading from Cisco MDS NX-OS Release 6.2(11e) to Cisco MDS NX-OS Release 6.2(13) 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.
- Upgrading from Cisco MDS NX-OS Release 6.2(11e) to Cisco MDS NX-OS Release 6.2(13) 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.

## Nondisruptive Upgrade Paths

Use [Table 13](#) to determine your nondisruptive upgrade path to Cisco MDS NX-OS Release 6.2(13). Find the image release number you are currently using in the “Current Release” column of the table and follow the steps in the order specified to perform the upgrade.



**Note**

The software upgrade information in [Table 13](#) applies only to Fibre Channel switching traffic. Upgrading system software disrupts IP traffic and intelligent services traffic.

**Table 13** *Nondisruptive Upgrade Path to Cisco MDS NX-OS Release 6.2(13)*

Current Release	Nondisruptive Upgrade Path and Ordered Upgrade Steps
<b>NX-OS:</b>	
All 6.2(x) releases	Upgrade directly to NX-OS Release 6.2(13).
All 5.2(x) releases	Upgrade directly to NX-OS Release 6.2(13).
All 5.0(x) releases	<ol style="list-style-type: none"> <li>1. Upgrade to NX-OS Release 5.2(8f).</li> <li>2. Upgrade to NX-OS Release 6.2(13).</li> </ol>

**Table 13 Nondisruptive Upgrade Path to Cisco MDS NX-OS Release 6.2(13) (Continued)**

Current Release	Nondisruptive Upgrade Path and Ordered Upgrade Steps
All 4.2(x) releases and 4.1(x) releases	<ol style="list-style-type: none"> <li>1. Upgrade to NX-OS Release 5.0(8a).</li> <li>2. Upgrade to NX-OS Release 5.2(8f).</li> <li>3. Upgrade to NX-OS Release 6.2(13).</li> </ol>
<b>SAN-OS:</b>	
Release 3.3(2), 3.3(3), 3.3(4x), and 3.3(5x).	<ol style="list-style-type: none"> <li>1. Upgrade to NX-OS Release 4.2(9).</li> <li>2. Upgrade to NX-OS Release 5.0(8a).</li> <li>3. Upgrade to NX-OS Release 5.2(8f).</li> <li>4. Upgrade to NX-OS Release 6.2(13).</li> </ol>
Release 3.3(1c), all 3.2(x), 3.1(x), and 3.0(x) releases	<ol style="list-style-type: none"> <li>1. Upgrade to SAN-OS Release 3.3(5b).</li> <li>2. Upgrade to NX-OS Release 4.2(9).</li> <li>3. Upgrade to NX-OS Release 5.0(8a).</li> <li>4. Upgrade to NX-OS Release 5.2(8f).</li> <li>5. Upgrade to NX-OS Release 6.2(13).</li> </ol>
Release 2.1(3), 2.1(2e), 2.1(2d), and 2.1(2b)	<ol style="list-style-type: none"> <li>1. Upgrade to SAN-OS Release 3.3(1c).</li> <li>2. Upgrade to SAN-OS Release 3.3(5b).</li> <li>3. Upgrade to NX-OS Release 4.2(9).</li> <li>4. Upgrade to NX-OS Release 5.0(8a).</li> <li>5. Upgrade to NX-OS Release 5.2(8f).</li> <li>6. Upgrade to NX-OS Release 6.2(13).</li> </ol>
Release 2.1(2), 2.1(1b), 2.1(1a), and 2.0(x)	<ol style="list-style-type: none"> <li>1. Upgrade to SAN-OS Release 2.1(2b), 2.1(2d), 2.1(2e), or 2.1(3)</li> <li>2. Upgrade to SAN-OS Release 3.3(1c).</li> <li>3. Upgrade to SAN-OS Release 3.3(5b).</li> <li>4. Upgrade to NX-OS Release 4.2(9).</li> <li>5. Upgrade to NX-OS Release 5.0(8a).</li> <li>6. Upgrade to NX-OS Release 5.2(8f).</li> <li>7. Upgrade to NX-OS Release 6.2(13).</li> </ol>
Release 1.x	<ol style="list-style-type: none"> <li>1. Upgrade to SAN-OS Release 1.3(4a).</li> <li>2. Upgrade to SAN-OS Release 2.1(2b).</li> <li>3. Upgrade to SAN-OS Release 3.3(1c).</li> <li>4. Upgrade to SAN-OS Release 3.3(5b).</li> <li>5. Upgrade to NX-OS Release 4.2(9).</li> <li>6. Upgrade to NX-OS Release 5.0(8a).</li> <li>7. Upgrade to NX-OS Release 5.2(8f).</li> <li>8. Upgrade to NX-OS Release 6.2(13).</li> </ol>

## FICON Supported Releases and Upgrade Paths

Cisco MDS NX-OS Release 6.2(13) is not a FICON-certified release.

Table 14 lists the SAN-OS and NX-OS releases that are certified for FICON. Refer to the specific release notes for FICON upgrade path information.

**Table 14** FICON Supported Releases

FICON Supported Releases	
NX-OS	Release 6.2(11c)
	Release 6.2(5b)
	Release 6.2(5a)
	Release 5.2(2s)
	Release 5.2(2)
	Release 4.2(7b)
	Release 4.2(1b)
	Release 4.1(1c)
SAN-OS	Release 3.3(1c)
	Release 3.2(2c)
	Release 3.0(3b)
	Release 3.0(3)
	Release 3.0(2)
	Release 2.0(2b)

Use Table 15 to determine the nondisruptive upgrade path for FICON-certified releases. Find the image release number you are currently using in the Current Release with FICON Enabled column of the table and follow the recommended path.

**Table 15** FICON Nondisruptive Upgrade Paths

Current Release with FICON Enabled	Upgrade Path
NX-OS Release 6.2(5b)	You can nondisruptively upgrade directly to NX-OS Release 6.2(11c).
NX-OS Release 6.2(5a)	You can nondisruptively upgrade directly to NX-OS Release 6.2(5b).
NX-OS Release 5.2(2) or 5.2(2s)	You can nondisruptively upgrade directly to NX-OS Release 6.2(5a) or 6.2(5b).
NX-OS Release 4.2(7b)	You can nondisruptively upgrade directly to NX-OS Release 5.2(2).
NX-OS Release 4.2(1b)	You can nondisruptively upgrade directly to NX-OS Release 4.2(7b).
NX-OS Release 4.1(1c)	You can nondisruptively upgrade directly to NX-OS Release 4.2(1b).
SAN-OS Release 3.3(1c)	You can nondisruptively upgrade directly to NX-OS Release 4.2(1b).
SAN-OS Release 3.2(2c), 3.0(3b), 3.0(3), and 3.0(2).	First upgrade to SAN-OS Release 3.3(1c), and then upgrade to NX-OS Release 4.2(1b).

## 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:

- [General Downgrading Guidelines, page 21](#)
- [FICON Downgrade Paths, page 22](#)

## General Downgrading Guidelines

Follow these general guidelines before you perform a software downgrade:

- Issue the system **no acl-adjacency-sharing** EXEC command to disable ACL adjacency usage on Generation 2 modules (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 nondisruptive.
- Be aware that some features impact whether a downgrade is disruptive or nondisruptive:
  - **Fibre Channel Ports:** Fibre Channel ports can be nondisruptively downgraded without affecting traffic on the ports. See [Table 16](#) for the nondisruptive downgrade path for all SAN-OS releases.
  - **Gigabit Ethernet Ports:** Traffic on GigabitEthernet/IPStorage ports is disrupted during a downgrade. This includes the Gigabit Ethernet ports on the MSM-18/4 module, the MDS 9222i switch, the MDS 9000 16-Port Storage Services Node (SSN-16), and the IPStorage ports in MDS 9250i. Those nodes that are members of VSANs traversing an FCIP ISL are impacted, and a fabric reconfiguration occurs. iSCSI initiators connected to the Gigabit Ethernet ports lose connectivity to iSCSI targets while the downgrade is in progress.
  - **FICON:** If you have FICON enabled, the downgrade path is different. See the [“FICON Downgrade Paths”](#) section on [page 22](#).

Use [Table 16](#) to determine the nondisruptive downgrade path from Cisco NX-OS Release 6.2(13). Find the NX-OS or SAN-OS image that you want to downgrade to in the To NX-OS or SAN-OS Release column of the table and follow the steps in the order specified to perform the downgrade.



**Note**

The software downgrade information in [Table 16](#) applies only to Fibre Channel switching traffic. Downgrading system software disrupts IP and intelligent services traffic.



**Note**

Downgrading from Cisco MDS NX-OS Releases 6.2(11), 6.2(11b), or 6.2(11c) to Cisco MDS NX-OS Releases 6.2(9b) or 6.2(9c) is not supported due to the introduction of a new feature to support longer role names (a maximum of 64 characters) in Cisco MDS NX-OS Releases 6.2(9b) and 6.2(9c).



**Note**

Downgrading from Cisco MDS NX-OS Release 6.2(13) to Cisco MDS NX-OS Release 6.2(5a), 6.2(5), 6.2(3), or 6.2(1) on a Cisco MDS 9700 Series Director with 48-port 10-Gigabit FCoE module or VSAN configurations require additional steps that must be performed before downgrading. For more information, see the *Cisco MDS 9000 NX-OS Software Upgrade and Downgrade Guide, Release 6.2(x)*.

**Table 16** *Nondisruptive Downgrade Path from NX-OS Release 6.2(13)*

To NX-OS or SAN-OS Release	Nondisruptive Downgrade Path and Ordered Downgrade Steps
<b>NX-OS:</b>	
All 6.2(x) releases	Downgrade directly from NX-OS Release 6.2(13).
All 5.2(x) releases	Downgrade directly from NX-OS Release 6.2(13).
All 5.0(x) releases	<ol style="list-style-type: none"> <li>1. Downgrade from NX-OS Release 6.2(13).</li> <li>2. Downgrade to NX-OS Release 5.2(8f).</li> <li>3. Downgrade to NX-OS Release 5.0(8a).</li> </ol>
All 4.2(x) and 4.1(x) releases	<ol style="list-style-type: none"> <li>1. Downgrade from NX-OS Release 6.2(13).</li> <li>2. Downgrade to NX-OS Release 5.2(8f).</li> <li>3. Downgrade to NX-OS Release 5.0(8a).</li> <li>4. Downgrade to NX-OS Release 4.2(x) or 4.1(x).</li> </ol>

## FICON Downgrade Paths

Table 17 lists the downgrade paths for FICON releases. Find the image release number that you want to downgrade to in the [To Release with FICON Enabled](#) column of the table and follow the recommended downgrade path.

**Table 17** *FICON Nondisruptive Downgrade Paths*

To Release with FICON Enabled	Downgrade Path
NX-OS Release 6.2(5b)	Downgrade directly from NX-OS Release 6.2(11c).
NX-OS Release 6.2(5a)	Downgrade directly from NX-OS Release 6.2(5b).
NX-OS Release 5.2(2) or 5.2(2s)	Downgrade directly from NX-OS Release 6.2(5b).
NX-OS Release 4.2(7b)	Downgrade directly from NX-OS Release 5.2(2).
NX-OS Release 4.2(1b)	Downgrade directly from NX-OS Release 4.2(7b).
NX-OS Release 4.1(1c)	Downgrade directly from NX-OS Release 4.2(1b).

## New Hardware Features in Cisco MDS NX-OS Release 6.2(13)

This section lists the new hardware chassis and features introduced in the Cisco MDS NX-OS Release 6.2(13).

### Cisco MDS 9396S Multilayer Fabric Switch

The Cisco MDS 9396S Multilayer Fabric Switch (DS-C9396S-48EK9) is a next generation multilayer Intelligent Services-oriented fabric switch. With powerful, compact, two rack-unit (2RU) form factors, it has an integrated 96-port Fibre Channel functionality. All Fibre Channel ports are capable of line rate at 2, 4, 8, 10, 16 Gbps.

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## New Software Features in Cisco MDS NX-OS Release 6.2(13)

This section lists the new software features introduced in Cisco MDS NX-OS Release 6.2(13).

- **Configuring FCIP Tunnels for Maximum Performance on a Cisco MDS 9250i Switch**  
For detailed configuration information about this feature, see the following document:  
[http://www.cisco.com/c/en/us/td/docs/switches/datacenter/mds9000/sw/6\\_2/configuration/guides/ip\\_services/nx-os/ipsvc/cfcip.html](http://www.cisco.com/c/en/us/td/docs/switches/datacenter/mds9000/sw/6_2/configuration/guides/ip_services/nx-os/ipsvc/cfcip.html)
- **Changing Link Speed on 10 Gbps IP Storage Interfaces**  
For detailed configuration information about this feature, see the following document:  
[http://www.cisco.com/c/en/us/td/docs/switches/datacenter/mds9000/sw/6\\_2/configuration/guides/ip\\_services/nx-os/ipsvc/ips.html](http://www.cisco.com/c/en/us/td/docs/switches/datacenter/mds9000/sw/6_2/configuration/guides/ip_services/nx-os/ipsvc/ips.html)
- **Slow Drain Enhancements**  
For detailed configuration information about this feature, see the following document:  
[http://www.cisco.com/c/en/us/td/docs/switches/datacenter/mds9000/sw/6\\_2/configuration/guides/interfaces/nx-os/cli\\_interfaces/intf.html](http://www.cisco.com/c/en/us/td/docs/switches/datacenter/mds9000/sw/6_2/configuration/guides/interfaces/nx-os/cli_interfaces/intf.html)
- **Internal CRC Detection and Isolation**  
For detailed configuration information about this feature, see the following document:  
[https://www.cisco.com/c/en/us/td/docs/switches/datacenter/mds9000/sw/6\\_2/upgrade/guides/nx-os/cisco\\_mds9000\\_ha\\_config\\_guide\\_6\\_x.html](https://www.cisco.com/c/en/us/td/docs/switches/datacenter/mds9000/sw/6_2/upgrade/guides/nx-os/cisco_mds9000_ha_config_guide_6_x.html)
- **Role name length**  
Cisco MDS NX-OS release 6.2(9b) introduces support for longer role names than previous releases. The maximum characters for role name length is increased from 16 to 64 characters using a new command, "role name max-length 64." For more information on Configuring Users and Common Roles, see "Security" section in [Cisco MDS 9000 Family CLI Configuration Guide](#).
- **Cisco TrustSec Fibre Channel Link Encryption**  
For detailed configuration information about this feature, see the following document:  
[http://www.cisco.com/c/en/us/td/docs/switches/datacenter/mds9000/sw/6\\_2/configuration/guides/security/nx-os/sec\\_cli\\_6-x/fctrstsec.html](http://www.cisco.com/c/en/us/td/docs/switches/datacenter/mds9000/sw/6_2/configuration/guides/security/nx-os/sec_cli_6-x/fctrstsec.html)
- **Zoneset Activation Enhancement: "zoneset overwrite-control"**  
For detailed configuration information about this feature, see the following document:  
[http://www.cisco.com/c/en/us/td/docs/switches/datacenter/mds9000/sw/6\\_2/configuration/guides/fabric/nx-os/nx\\_os\\_fabric/zone.html](http://www.cisco.com/c/en/us/td/docs/switches/datacenter/mds9000/sw/6_2/configuration/guides/fabric/nx-os/nx_os_fabric/zone.html)

## New Hardware Features in Cisco MDS NX-OS Release 6.2(11)

There are no new hardware features introduced in Cisco MDS NX-OS Release 6.2(11).

## New Software Features in Cisco MDS NX-OS Release 6.2(11)

This section briefly describes the new software features introduced in Cisco MDS NX-OS Release 6.2(11).

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- FC Scale Monitoring

Cisco MDS NX-OS Release 6.2(11) introduces default and configurable thresholds for some of the scalability metrics listed below. Syslog messages are generated using Embedded Event Manager (EEM policies) to alert users whenever these thresholds are exceeded.

- Logins per port, line-card, switch and fabric
- Zone database size, Zone-sets, Zones, Zone members
- FCNS database

For detailed information about this feature, see the following document:

[http://www.cisco.com/c/en/us/td/docs/switches/datacenter/mds9000/sw/6\\_2/configuration/guides/system\\_management/nx-os/sysmgmt\\_cli\\_6-x/eem.html#pgfId-1137109](http://www.cisco.com/c/en/us/td/docs/switches/datacenter/mds9000/sw/6_2/configuration/guides/system_management/nx-os/sysmgmt_cli_6-x/eem.html#pgfId-1137109)

[http://www.cisco.com/c/en/us/td/docs/switches/datacenter/mds9000/sw/6\\_2/configuration/guides/config\\_limits/configuration\\_limits\\_6-2.html](http://www.cisco.com/c/en/us/td/docs/switches/datacenter/mds9000/sw/6_2/configuration/guides/config_limits/configuration_limits_6-2.html)

- FC Domain Scale

Starting with Cisco MDS NX-OS Release 6.2(11), 80 domains (switches) are supported in a single physical fabric, which is a 33% increase over the previous limit of 60. All the nodes in a given fabric require Cisco MDS NX-OS Release 6.2(11) or higher to avail this scale.

For detailed information about this feature, see the following document:

[http://www.cisco.com/c/en/us/td/docs/switches/datacenter/mds9000/sw/6\\_2/configuration/guides/config\\_limits/configuration\\_limits\\_6-2.html](http://www.cisco.com/c/en/us/td/docs/switches/datacenter/mds9000/sw/6_2/configuration/guides/config_limits/configuration_limits_6-2.html)

[http://www.cisco.com/c/en/us/td/docs/switches/datacenter/mds9000/sw/6\\_2/configuration/guides/system\\_management/nx-os/sysmgmt\\_cli\\_6-x/domn.html#pgfId-1551551](http://www.cisco.com/c/en/us/td/docs/switches/datacenter/mds9000/sw/6_2/configuration/guides/system_management/nx-os/sysmgmt_cli_6-x/domn.html#pgfId-1551551)

- Copper 10G SFP Support for IPS/FCIP Ports on Cisco MDS 9250i

Cisco MDS NX-OS Release 6.2(11) introduces support for Copper 10G SFP (Twinax) on Cisco MDS 9250i IPS/FCIP ports.

For detailed information about this feature, see the following document:

[http://www.cisco.com/c/en/us/products/collateral/storage-networking/mds-9000-series-multilayer-switches/product\\_data\\_sheet09186a00801bc698.html](http://www.cisco.com/c/en/us/products/collateral/storage-networking/mds-9000-series-multilayer-switches/product_data_sheet09186a00801bc698.html)

- Automated Corrective Actions via GOLD Framework

The Generic Online Diagnostic System (GOLD) leverages a policy-based framework called Embedded Event Manager (EEM) to detect and handle failure conditions. The current default action through EEM includes generating alerts (callhome, syslog) and logging (OBFL, exception logs). Starting with Cisco MDS NX-OS Release 6.2(11), the default actions can be overridden to automate corrective and recovery actions such as supervisor switchover, module reload, port reset, etc.

For detailed information about this feature, see the following document:

[http://www.cisco.com/c/en/us/td/docs/switches/datacenter/mds9000/sw/6\\_2/configuration/guides/system\\_management/nx-os/sysmgmt\\_cli\\_6-x/gold.html](http://www.cisco.com/c/en/us/td/docs/switches/datacenter/mds9000/sw/6_2/configuration/guides/system_management/nx-os/sysmgmt_cli_6-x/gold.html)

[http://www.cisco.com/c/en/us/td/docs/switches/datacenter/mds9000/sw/6\\_2/configuration/guides/system\\_management/nx-os/sysmgmt\\_cli\\_6-x/eem.html](http://www.cisco.com/c/en/us/td/docs/switches/datacenter/mds9000/sw/6_2/configuration/guides/system_management/nx-os/sysmgmt_cli_6-x/eem.html)

- Increase in Configuration Limits for features in Cisco MDS 9500 Series Supervisor-2A Module

The following features have increased configuration limits in Cisco MDS 9500 Series Supervisor-2A Module:

- Total number of zones per switch—10400
- Total number of zone members per switch—20800



- Total number of FCNS members per switch—13000

For detailed information about this feature, see the following document:

[http://www.cisco.com/c/en/us/td/docs/switches/datacenter/mds9000/sw/6\\_2/configuration/guides/config\\_limits/configuration\\_limits\\_6-2.html](http://www.cisco.com/c/en/us/td/docs/switches/datacenter/mds9000/sw/6_2/configuration/guides/config_limits/configuration_limits_6-2.html)

- Command-line interface (CLI) command changes:
  - **event zone**
  - **event fcns**
  - **event flogi**

## New Hardware Features in Cisco MDS NX-OS Release 6.2(9)

This section briefly describes the new hardware features introduced in Cisco NX-OS Release 6.2(9).

### Cisco MDS 9706 Director

The Cisco MDS 9706 (DS-C9706) supports up to 192 ports in a 6-slot modular chassis, with up to 768 ports in a single rack. You can configure ports as Fibre Channel (2/4/8-Gbps, 4/8/16-Gbps, or 10-Gbps), FCoE (10-Gbps), or a mix of both Fibre Channel and FCoE. The Cisco MDS 9706 supports the same Fibre Channel and FCoE switching modules as the Cisco MDS 9710 director for a high degree of system commonality.

For detailed information about the Cisco MDS 9706 Director, see the *Cisco MDS 9700 Series Hardware Installation Guide*: <http://www.cisco.com/c/en/us/support/storage-networking/mds-9000-nx-os-san-os-software/products-installation-guides-list.html>

### Cisco MDS 9148S Multilayer Fabric Switch

The Cisco MDS 9148S Multilayer Fabric Switch (DS-C9148S48PK9) is the next generation of the highly reliable and flexible Cisco MDS 9100 Series switches. It combines high performance with exceptional flexibility and cost-effectiveness. A powerful compact one rack-unit (1RU) form factor can scale from 12 to 48 line-rate 16 Gbps Fibre Channel ports.

For detailed information about the Cisco MDS 9148S Multilayer Fabric Switch, see the *Cisco MDS 9148S Hardware Installation Guide*: <http://www.cisco.com/c/en/us/support/storage-networking/mds-9000-nx-os-san-os-software/products-installation-guides-list.html>

## New Software Features in Cisco NX-OS Release 6.2(9)

This section briefly describes the new software features introduced in Cisco NX-OS Release 6.2(9).

- Confirm Commit Device Alias
- Confirm Commit Zone
- FC and FCoE scale enhancements
- FCoE long-distance
- Fibre Channel Common Transport (FC-CT) Management Security

- Poweron Auto Provisioning (POAP)
- Slow drain enhancements for hardware-based capabilities on Cisco MDS 9700 Series, MDS 9250i, and MDS 9148S switch.
- TrustSec link-encryption for Cisco MDS 9700 Series
- Command-line interface (CLI) command changes:
  - **confirm commit device alias** (new)
  - **confirm commit zone** (new)
  - **fc-management enable** (new)
  - **fc-management database vsan** (new)
  - **hardware ejector enable** (new)
  - **priority-flow-control long-distance** (changed) (new)
  - **no-credit-drop** (new)
  - **show fc-management database** (new)
  - **show process creditmon credit-loss-events** (new)
  - **show process creditmon slowport-monitor-events** (new)
  - **show system internal eth-qos port-node interface** (new)
  - **show tech-support fc-management** (new)
  - **slow port monitor** (new)
  - **system timeout slowport-monitor mode E/F** (new)
  - **feroute** (deprecated)

## New Hardware in Cisco MDS NX-OS Release 6.2(7)

This section briefly describes the new hardware introduced in Cisco NX-OS Release 6.2(7). For detailed information about the new hardware, see the *Cisco MDS 9250i Hardware Installation Guide* that is available from this URL: <http://www.cisco.com/c/en/us/support/storage-networking/mds-9000-nx-os-san-os-software/products-installation-guides-list.html>

### Cisco MDS 48-Port 10-Gigabit Fibre Channel over Ethernet Module Ethernet Module

The Cisco MDS 48-Port 10-Gigabit Fibre Channel over Ethernet Module (DS-X9848-480K9) is designed for the Cisco MDS 9710 Directors. The Cisco MDS 9710 Director supports up to eight 10 Gigabit Ethernet modules. These modules are hot-swappable and they support 10-Gigabit Ethernet ports in SFP+ form factor.

The Cisco MDS 48-Port 10-Gigabit Ethernet module delivers integrated Fibre Channel over Ethernet (FCoE), simplifies the network infrastructure and helps reduce costs. The FCoE module allows you to extend the existing Fibre Channel SANs by using FCoE. The Cisco MDS 48-Port 10-Gigabit Ethernet module supports connectivity to FCoE switching platforms and to FCoE devices. This module also supports connectivity to FCoE initiators and targets that only send FCoE traffic.

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## New Software Features in Cisco NX-OS Release 6.2(7)

This section briefly describes the new software features introduced in Cisco NX-OS Release 6.2(7).

- Enhanced the scalability for zones, maximum devices in the fabric and maximum devices in the switch.
- Forward Error Correction (FEC) for 16-Gbps ISL connections
- Enhanced scalability for simultaneous FLOGIs for Cisco MDS 9500 Series switches
- Restriction of the number of NPIV logins to not exceed the configuration limits in for Cisco MDS 9500 Series switches
- Command-line interface (CLI) command changes:
  - **fens bulk-notify**
  - **rscn coalesce swrscn vsan**
  - **switchport max-npiv-limit (new)**
  - **switchport trunk-max-npiv-limit (new)**
  - **switchport fec**
  - **system port pacer mode F interface-login-threshold**
  - **show fabric switch information vsan**

## New Hardware in Cisco MDS NX-OS Release 6.2(5)

This section briefly describes the new hardware introduced in Cisco NX-OS Release 6.2(5). For detailed information about the new hardware, see the *Cisco MDS 9250i Hardware Installation Guide* that is available from this URL:

<http://www.cisco.com/c/en/us/support/storage-networking/mds-9000-nx-os-san-os-software/products-installation-guides-list.html>

### Cisco MDS 9250i Multiservice Fabric Switch

The Cisco MDS 9250i Multiservice Fabric Switch (DS-C9250I-K9) is an optimized platform for deploying high-performance SAN extension solutions, distributed intelligent fabric services, and cost-effective multiprotocol connectivity for both open systems and mainframe environments.

The Cisco MDS 9250i switch is an ideal solution for local office and remote branch-office SANs and also in large-scale SANs operating the Cisco MDS 9700 and 9500 Series Multilayer director platforms.

The Cisco MDS 9250i switch offers 40 autosensing 2-, 4-, 8-, and 16-Gbps line-rate Fibre Channel ports, eight 10-Gigabit Ethernet Fibre Channel over Ethernet (FCoE) ports, and two 10-Gigabit Ethernet IP storage services ports in a fixed two-rack-unit (2RU) form factor.

## New Software Features in Cisco NX-OS Release 6.2(5)

This section briefly describes the new software features introduced in Cisco NX-OS Release 6.2(5).

- DMM support for Cisco MDS 9250i switch
  - FCIP support for Cisco MDS 9250i switch
  - FCR support for Cisco MDS 9250i switch
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- IOA support for Cisco MDS 9250i switch
- Path Trace
- Command-line interface (CLI) command changes:
  - Changed the CLI output for the **show ioa cluster flows** command.
  - Introduced the **ioa-ping** command.
  - Introduced the ability to display IOA engine utilization.
  - Introduced the ability to display hosts and targets by device alias in IOA.

## New Software Features in Cisco NX-OS Release 6.2(3)

This section briefly describes the new software features introduced in Cisco NX-OS Release 6.2(3).

- Cisco MDS Data Mobility Manager (DMM) supports logical unit numbers (LUN) sizes that are larger than 2 terabyte. The supported number of sessions per DMM job is more than 255. For more information, see the *Cisco MDS 9000 Family Data Mobility Manager Configuration Guide*.
- FC-Redirect (FCR) support for Cisco MDS 9710 Director. For more information on IOA, see the *Cisco MDS 9000 Family I/O Accelerator Configuration Guide*. For more information on SME, see the *Cisco MDS 9000 Family Storage Media Encryption Configuration Guide*.
- Command-line interface (CLI) command changes, including the following:
  - Changed the CLI output for the **show fcdomain vsan** command.
  - Deprecated the **show interface counters performance** command.

## New Hardware in Cisco MDS NX-OS Release 6.2(1)

This section briefly describes the new hardware introduced in Cisco NX-OS Release 6.2(1). For detailed information about the new hardware, see the *Cisco MDS 9710 Hardware Installation Guide* that is available from this URL:

<http://www.cisco.com/c/en/us/support/storage-networking/mds-9000-nx-os-san-os-software/products-installation-guides-list.html>

This section includes the following topics:

- [Cisco MDS 9710 Director, page 28](#)
- [Cisco MDS 9000 48-Port, 16-Gbps Fibre Channel Switching Module, page 29](#)

## Cisco MDS 9710 Director

The Cisco MDS 9710 Director is a high-performance SAN switch that is designed to meet the requirements of enterprise data center storage environments. The Cisco MDS 9710 Director has a ten-slot chassis that supports up to eight 48-port, 16-Gbps switching modules, two supervisor modules, up to six fabric modules, three fan trays, and up to eight power supplies. Airflow is front-to-back in the Cisco MDS 9710 chassis.

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## Cisco MDS 9000 48-Port, 16-Gbps Fibre Channel Switching Module

Up to eight Cisco MDS 9000 48-Port 16-Gbps Fibre Channel switching modules can be used in the Cisco MDS 9710 Director. These modules are hot-swappable and compatible with 2-, 4-, 8-, 16- and 10-Gbps interfaces, and they support hot-swappable Enhanced Small Form-Factor Pluggable (SFP+) transceivers.

The Fibre Channel switching module has 12 4-port port groups. Each port group is capable of a speed of 64-Gbps in each direction simultaneously. Ports on this switching module support expansion port (E port), fabric port (F port), fabric loop port (FL port), SPAN destination port (SD port), and (TE port) port mode.

- Individual ports can be configured with Cisco 16-Gbps, 8-Gbps or 10-Gbps shortwave or longwave SFP+ transceivers. Each port supports 500 buffer credits with no additional licensing required. With the Cisco Enterprise Package, up to 4095 buffer credits can be allocated to an individual port.

## New Software Features in Cisco NX-OS Release 6.2(1)

This section briefly describes the new software features introduced in Cisco NX-OS Release 6.2(1).

- Generic Online Diagnostics

Starting with Cisco NX-OS Release 6.2(1), the Cisco MDS 9000 Series supports the generic online diagnostics (GOLD) feature. With online diagnostics, you can test and verify the hardware functionality of a device while the device is connected to a live network. In particular, the online diagnostics help you verify that hardware and internal data paths are operating as designed so that you can rapidly isolate faults.

For more information about this feature, see the *Cisco MDS 9000 System Management Configuration Guide* at this URL:

[http://www.cisco.com/en/US/products/ps5989/products\\_installation\\_and\\_configuration\\_guides\\_list.html](http://www.cisco.com/en/US/products/ps5989/products_installation_and_configuration_guides_list.html)

- Enhancement to map LDAP/AD users to Cisco NX-OS roles and allow both local and remote users to use SSH or Telnet.

For more information about this feature, see the *Cisco MDS 9000 Security Configuration Guide*, at this URL:

[http://www.cisco.com/en/US/products/ps5989/products\\_installation\\_and\\_configuration\\_guides\\_list.html](http://www.cisco.com/en/US/products/ps5989/products_installation_and_configuration_guides_list.html)

- Command-line interface (CLI) command changes, including the following:

- Enhance the **clear snmp counters** command.
- Display ISL related information.
- Display a warning messages for a shared port interface when you bring down the port.
- Display throughput information for all ports on a line card or ISL or on a switch or chassis.
- Provide an estimated time for DMM job completion.
- Shorten the **show dmm job job-id 50571379 session session\_id (1-20)** command to **show dmm job-id 50571379 session\_id 1**

Information about the modified CLI commands can be found in the *Cisco MDS 9000 Command Reference* at this URL:

[http://www.cisco.com/en/US/products/ps5989/prod\\_command\\_reference\\_list.html](http://www.cisco.com/en/US/products/ps5989/prod_command_reference_list.html)

## Licensed Cisco NX-OS Software Packages

Most Cisco MDS 9000 Series software features are included in the standard package. However, some features are logically grouped into add-on packages that must be licensed separately, such as the Cisco MDS 9000 Enterprise package, SAN Extension over IP package, Mainframe package, and Data Mobility Manager package. On-demand ports activation licenses are

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also available for the Cisco MDS 9250i Multiservice Fabric Switch, Cisco MDS 9148 48-Port Multilayer Fabric Switch, Cisco MDS 9148S 48-Port Multilayer Fabric Switch, the Cisco MDS 8-Gb Fabric Switch for HP c-Class Blade System, and the Cisco MDS 9396S 96-Port Multilayer Fabric Switch.



**Note**

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A license is not required to use the Cisco MDS 9000 8-port 10-Gbps Fibre Channel over Ethernet (FCoE) module (DS-X9708-K9) and the Cisco MDS 48-Port 10- Gigabit Fibre Channel over Ethernet Module (DS-X9848-480K9).

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Additional information about licensed Cisco NX-OS software packages is available at this URL:

<http://www.cisco.com/c/en/us/products/storage-networking/mds-9000-software-licensing/datasheet-listing.html>

## Enterprise Package

The standard software package that is bundled at no charge with the Cisco MDS 9000 Series switches includes the base set of features that Cisco believes are required by most customers for building a SAN. The Cisco MDS 9000 Series also has a set of advanced features that are recommended for all enterprise SANs. These features are bundled together in the Cisco MDS 9000 Enterprise package. Refer to the [Cisco MDS 9000 Enterprise package fact sheet](#) for more information.

## SAN Extension over IP Package

The Cisco MDS 9000 SAN Extension over IP package allows the customer to use FCIP to extend SANs over wide distances on IP networks using the Cisco MDS 9000 Series IP storage services. Refer to the [Cisco MDS 9000 SAN Extension over IP package fact sheet](#) for more information.

## Mainframe Package

The Cisco MDS 9000 Mainframe package uses the FICON protocol and allows control unit port management for in-band management from IBM System z processors. FICON VSAN support is provided to help ensure true hardware-based separation of FICON and open systems. Switch cascading, fabric binding, and intermixing are also included in this package. Refer to the [Cisco MDS 9000 Mainframe package fact sheet](#) for more information.

## Data Mobility Manager Package

The Cisco MDS 9000 Data Mobility Manager package enables data migration between heterogeneous disk arrays without introducing a virtualization layer or rewiring or reconfiguring SANs. Cisco DMM allows concurrent migration between multiple LUNs of unequal size. Rate-adjusted migration, data verification, dual Fibre Channel fabric support, and management using Cisco DCNM for SAN provide a complete solution that greatly simplifies and eliminates most downtime associated with data migration. Refer to the [Cisco MDS 9000 Data Mobility Manager package fact sheet](#) for more information. The Data Mobility Manager package is for use only with Cisco MDS 9000 Series switches.

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## On-Demand Port Activation License

On-demand ports allow customers to benefit from Cisco NX-OS Software features while initially purchasing only a small number of activated ports on the Cisco MDS 9250i Multiservice Fabric Switch, MDS 9148S 48-Port Multilayer Fabric Switch, MDS 9148 48-Port Multilayer Fabric Switch, the Cisco MDS 8-Gb Fabric Switch for HP c-Class Blade System, and the Cisco MDS 9396S Multilayer Fabric Switch. As needed, customers can expand switch connectivity by licensing additional ports.

## I/O Accelerator Package

The Cisco I/O Accelerator (IOA) package activates IOA on the Cisco MDS 9222i fabric switch, the Cisco MDS 9000 18/4 Multiservice Module (MSM-18/4), and on the SSN-16 module. The IOA package is licensed per service engine and is tied to the chassis. The number of licenses required is equal to the number of service engines on which the intelligent fabric application is used. The SSN-16 requires a separate license for each engine on which you want to run IOA. Each SSN-16 engine that you configure for IOA checks out a license from the pool managed at the chassis level. SSN-16 IOA licenses are available as single licenses.

## XRC Acceleration License

The Cisco Extended Remote Copy (XRC) acceleration license activates FICON XRC acceleration on the Cisco MDS 9222i switch, the Cisco MDS 9250i switch, and the SSN-16 or MSM-18/4 in the Cisco MDS 9500 Series directors. One license per chassis is required. You must install the Mainframe Package and the SAN Extension over FCIP Package before you install the XRC acceleration license. The Mainframe Package enables the underlying FICON support, and the FCIP license or licenses enable the underlying FCIP support.

## Deprecated and Changed Features

### Zoning Features

LUN zoning, read-only zones, and broadcast zones are no longer supported. These features affect the following hardware:

- Cisco MDS 9250i Multiservice Fabric Switch
- Cisco MDS 9396S Multilayer Fabric Switch
- Cisco MDS 9000 8-port 10-Gbps Fibre Channel over Ethernet (FCoE) Module
- Cisco MDS 9000 48-port 8-Gbps Advanced Fibre Channel Switching Module
- Cisco MDS 9000 32-port 8-Gbps Advanced Fibre Channel Switching Module
- Cisco MDS 9000 48-port 16-Gbps Fibre Channel Switching Module

You cannot bring up these modules if these features are already configured. You should completely remove all configurations that include these features before you attempt to bring up these modules. In addition, you cannot configure these features after you bring up these modules.

In addition, the following software features are not supported or are changed in Cisco MDS NX-OS Release 6.2(9):

- Fibre Channel Security Protocol (FC-SP) is currently not supported on Cisco MDS 9250i Multiservice Fabric Switch.
  - Local switching is not supported on the Cisco MDS 9700 Series Director, but continues to be supported on the Cisco MDS 9500 Series.
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- Online Health Management System (OHMS)—The Generic Online Diagnostics (GOLD) system provides diagnostics for the Cisco MDS 9700 Series Director instead of the OHMS. In Cisco NX-OS Release 6.2, the GOLD system does not provide any support for automation of corrective actions, such as rebooting modules based on error thresholds.

**Note**

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OHMS is supported on Cisco MDS 9500 Series directors, Cisco MDS 9250i Multiservice Fabric Switch, Cisco MDS 9148S Multilayer Fabric Switch, Cisco MDS 9148 Multilayer Fabric Switch, and the Cisco MDS 9396S Multilayer Fabric Switch.

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Cisco NX-OS Release 6.2 does not support the following hardware:

- Cisco MDS 9134 Fabric Switch
- Cisco MDS 9124 Fabric Switch
- Cisco MDS 4-Gbps Fabric Switch for HP c-Class BladeSystem
- Cisco MDS 4-Gbps Fabric Switch for IBM BladeCenter

## Limitations and Restrictions

This section lists the limitations and restrictions. The following limitations are described:

- [Cisco DCNM compatibility with Cisco MDS NX-OS Release 6.2\(13\), page 32](#)
- [Connecting an NPIV enabled Cisco MDS 9396S Multilayer Fabric Switch to an NPV Switch, page 32](#)
- [ASCII File Can Be Copied to the Startup Configuration, page 33](#)
- [Fibre Channel Security Protocol \(FC-SP\) Support, page 33](#)
- [Install Module Command Changes, page 33](#)
- [IOA Scaling Support on Supervisor-2 Module, page 33](#)

### Cisco DCNM compatibility with Cisco MDS NX-OS Release 6.2(13)

Cisco Prime DCNM support for Cisco MDS NX-OS Release 6.2(13) starts from Cisco Prime DCNM Release 7.2(1). Using releases earlier than Cisco Prime DCNM Release 7.2(1) with Cisco MDS NX-OS Release 6.2(13) causes authentication failure. See [CSCun41202](#) for more information.

### Connecting an NPIV enabled Cisco MDS 9396S Multilayer Fabric Switch to an NPV Switch

When trunking is enabled on the NPV ports of any MDS switch (released before the Cisco MDS 9396S Multilayer Fabric Switch) that runs on an MDS NX-OS release earlier than 6.2(13), and you connect an NPIV-enabled Cisco MDS 9396S Multilayer Fabric Switch, use ports fc1/1 through fc1/63.



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**Note** Trunking failure can occur in both non-portChannel (individual physical NP uplinks) and portChannel NP uplinks. To avoid trunking failure, ensure that you upgrade the NPV switch to Cisco MDS NX-OS Release 6.2(13) or above.

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## ASCII File Can Be Copied to the Startup Configuration

The `copy bootflash:running-config.ascii startup-config` command that was deprecated in an earlier Cisco NX-OS release is enabled from Cisco NX-OS Release 6.2(1).

## Fibre Channel Security Protocol (FC-SP) Support

From Cisco MDS NX-OS Release 6.2(9) onwards, the FC-SP feature is supported on Cisco MDS 9700 Series.

## Install Module Command Changes

The `install module module-number bios` command is not supported on the Cisco MDS 9710 switch in Cisco NX-OS Release 6.2(1) and later releases. Use the `install all` command to upgrade the BIOS during a software upgrade.

The `install module module-number bios` command continues to be supported in Cisco NX-OS Release 6.2(1) on Cisco MDS 9500 Series switches.

## IOA Scaling Support on Supervisor-2 Module

From Cisco MDS NX-OS Release 6.2(9) onwards, I/O Accelerator (IOA) scaling is supported only on the Supervisor-2A module and is not supported on the Supervisor-2 module.

## Caveats

### Resolved Caveats

**Table 18** Resolved Caveats in Cisco MDS NX-OS Release 6.2(13)

Identifier	Description
<a href="#">CSCuf35479</a>	"Bad IPv6 host address" - while adding snmp-server hostname.
<a href="#">CSCug79410</a>	Perform sup switchover on pm bus failure.
<a href="#">CSCur81171</a>	Port-manager causes Supervisor failure during switchover.
<a href="#">CSCur97227</a>	MDS 9250i silently reloaded with no reason in log.
<a href="#">CSCud85336</a>	Need eth-trace-log entry for when FCIP-WA generates an ABTS.
<a href="#">CSCuq98119</a>	Some ports go down and traffic stops on MDS 9710.
<a href="#">CSCtr50223</a>	DS-X9304-18K9 module reports 'failure in service lc_mnt_mgr' error.
<a href="#">CSCts82921</a>	LDAP feature missing when MDS is in NPV mode.
<a href="#">CSCut66383</a>	FCIP WA with IVR NAT does not work.
<a href="#">CSCut77412</a>	Assess April 2015 NTPd vulnerabilities for MDS.
<a href="#">CSCus26870</a>	December 2014 ntpd CVEs for Nexus 5k/6k/7k/MDS.
<a href="#">CSCtu21244</a>	MDS 9100s & 9200s send COLD_BOOT callhome for non-disruptive upgrade.

**Table 18** *Resolved Caveats in Cisco MDS NX-OS Release 6.2(13)*

<b>Identifier</b>	<b>Description</b>
<a href="#">CSCur26436</a>	Nexus 7000 & MDS 9000 evaluation of SSLv3 vulnerability (POODLE).
<a href="#">CSCup65102</a>	No user control to disable fcanalyzer TCP port 2002 on mgmt0.
<a href="#">CSCup82769</a>	snmpd crashes when cvacmSecurityGrpStatus (Row status) is set to 5.
<a href="#">CSCuq00007</a>	Max FCIP throughput is sub-linear on MDS 9250i platform.
<a href="#">CSCut07222</a>	False raising and falling alarm for pmon counter on clearing the counter.
<a href="#">CSCut95456</a>	Supervisor reload after %SYSMGR-2-PSS2_VOLATILE_DB_FULL error.
<a href="#">CSCus57836</a>	MDS9710- Assigning user with sshkey failed and made vsh core.
<a href="#">CSCun41202</a>	N7K: weak CBC mode and weak ciphers should be disabled.
<a href="#">CSCum30306</a>	Security service crashes while configuring an SSH authentication key.
<a href="#">CSCus76715</a>	PSU failure in MDS 9513 leads to both PSUs indicating 'fail/shut' state.
<a href="#">CSCur37168</a>	Zoneset Activation Enhancement Request - Different Name Flag.
<a href="#">CSCus42713</a>	2014 and 2015 OpenSSL Vulnerabilities.
<a href="#">CSCus46630</a>	ISCSI max-bandwidth-mbps configurable is only 1 GIG for 10 Gig IPS port.
<a href="#">CSCuu76450</a>	NPV mode port-monitor fails to alert on F port after (T)NP port flap

## Open Caveats

**Table 19** *Open Caveats in Cisco MDS NX-OS Release 6.2(13)*

<b>Identifier</b>	<b>Description</b>
<a href="#">CSCus81943</a>	FCIP config should be blocked during octeon reset.
<a href="#">CSCun40429</a>	Trunked F port between MDS and Nexus 5000 in NPIV mode doesn't come up.
<a href="#">CSCun48223</a>	Adding member to a pc fails on an interface having port-security config.
<a href="#">CSCum78761</a>	M9700:zone merge lock not cleared by zoneserver even after 10 hrs.
<a href="#">CSCut08818</a>	SNMPD crashes with role with only deny OIDs.
<a href="#">CSCut32564</a>	Spurious NOS OLS and LRR counters shown after ISSU.
<a href="#">CSCul12775</a>	ACL_TCAM_NO_TCAM_LEFT even though TCAM is not completely full.
<a href="#">CSCut16603</a>	Gen4/5 port not able to be brought up (error disabled) on an IVR switch.
<a href="#">CSCup29425</a>	flogi process crash after upgrading to NX-OS 5.2(8d) & 6.2(9a).
<a href="#">CSCue63909</a>	IOA VI/VT's can fill up FCID persistent DB and prevent new logins.
<a href="#">CSCud43510</a>	LDAP fails when using SSL and port 636.
<a href="#">CSCuc67644</a>	New time is not properly propagated through NX-OS when enabling NTP.
<a href="#">CSCud93587</a>	MDS9148 OBFL doesn't contain FCP_CNTR_TX_WT_AVG_B2B_ZERO.
<a href="#">CSCui74500</a>	NX-OS - exec-timeout behaviour should be consistent.
<a href="#">CSCuo53926</a>	Slowport statistics are not properly displayed.
<a href="#">CSCuo69195</a>	M9250i: No response for IPv6 Router Advertisement.

**Table 19**      **Open Caveats in Cisco MDS NX-OS Release 6.2(13)**

<b>Identifier</b>	<b>Description</b>
<a href="#">CSCup69479</a>	system default F mode causes FCIP tunnel to come up in F mode.
<a href="#">CSCup86840</a>	M9250i: ELS entries on fwd-eng 4 not getting deleted after ISSU.
<a href="#">CSCts15767</a>	NX-OS Radius server doesn't send service-type(6) attribute.
<a href="#">CSCuu10695</a>	RSCN crashes in MDS switches after upgrading Brocade switch.
<a href="#">CSCtq55178</a>	Unable to remove RMON config created with Device Manager via CLI.
<a href="#">CSCtt32421</a>	Add an 'action' option to port-monitor for internal frame drops.
<a href="#">CSCur41556</a>	Port Monitor doesn't take action after thresholds crossed.
<a href="#">CSCun82498</a>	Port-Monitor delta threshold traps not sent after port goes down/flaps.
<a href="#">CSCtz23417</a>	Allow spanning local physical interfaces to supervisor for frame capture.
<a href="#">CSCus87358</a>	Module ejector handling incorrect - can report false open or close.
<a href="#">CSCuu67700</a>	M9396S: Mgmt Port connectivity down after duplex parameter change.
<a href="#">CSCuu76775</a>	After disabling monitor of any counter ,counter config is missing.
<a href="#">CSCuu90233</a>	snmp user "admin" getting n/w operator role after ISSD to 6211c.
<a href="#">CSCuu98635</a>	FCIP tunnels from multiple modules will not work in IVR NAT topology.
<a href="#">CSCuu99077</a>	MDS 9396s: Software takes more than 60 secs to detect fan failure.
<a href="#">CSCue64981</a>	Zone import fails with 3 or more ISLs between 2 switches.
<a href="#">CSCui42999</a>	Zone status is blank when the zoneset is picked up via Merge.
<a href="#">CSCue48324</a>	Radius/tacacs+ users unable to login after upgrading - 'access denied'.
<a href="#">CSCut28175</a>	flogi process crash occurs during ISSU
<a href="#">CSCuv42986</a>	Callhome stops working.
<a href="#">CSCuv48370</a>	SNMPD hang - MDS95xx/97xx - Linecard reload/upgrade/downgrade
<a href="#">CSCuw82693</a>	Link up over DWDM very slow (DS-X9448-768K module)
<a href="#">CSCuw06365</a>	Link up over DWDM very slow (DS-X9248-256K9 and DS-X9232-256K9 modules)
<a href="#">CSCva23262</a>	"feature fcrxbbcredit extended" causes disruptive ISSU.
<a href="#">CSCva31989</a>	'clis' service crash during supervisor switchover or ISSU.
<a href="#">CSCvc46296</a>	fcns/topology not working with tcp max-bandwidth-mbps 40 command on FCIP.
<a href="#">CSCvi51088</a>	During ISSU, installation fails. Return code 0x40930039 (aborting due to failed upgrade).
<a href="#">CSCvk10575</a>	notConnected interfaces go into Error Disabled state after upgrade in NPV mode.
<a href="#">CSCvf68489</a>	FICON: Fcd hap reset (heartbeat loss) during ISSU & upgrade aborts.

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## Related Documentation

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

[http://www.cisco.com/en/US/products/ps5989/tsd\\_products\\_support\\_series\\_home.html](http://www.cisco.com/en/US/products/ps5989/tsd_products_support_series_home.html)

The documentation set for Cisco Prime Data Center Network Manager is available from the following URL:

[http://www.cisco.com/en/US/products/ps9369/tsd\\_products\\_support\\_series\\_home.html](http://www.cisco.com/en/US/products/ps9369/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>

## Regulatory Compliance and Safety Information

<http://www.cisco.com/c/en/us/td/docs/switches/datacenter/mds9000/hw/regulatory/compliance/RCSI.html>

## Compatibility Information

<http://www.cisco.com/c/en/us/support/storage-networking/mds-9000-nx-os-san-os-software/products-device-support-tables-list.html>

## Installation and Upgrade

<http://www.cisco.com/c/en/us/support/storage-networking/mds-9000-nx-os-san-os-software/products-installation-guides-list.html>

## Configuration Guides

<http://www.cisco.com/c/en/us/support/storage-networking/mds-9000-nx-os-san-os-software/products-installation-and-configuration-guides-list.html>

## Command-Line Interface

<http://www.cisco.com/c/en/us/support/storage-networking/mds-9000-nx-os-san-os-software/products-command-reference-list.html>

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## Troubleshooting and Reference

<http://www.cisco.com/c/en/us/support/storage-networking/mds-9000-nx-os-san-os-software/tsd-products-support-troubleshoot-and-alerts.html>

## Obtaining Documentation and Submitting a Service Request

For information on obtaining documentation, submitting a service request, and gathering additional information, see the monthly *What's New in Cisco Product Documentation*, which also lists all new and revised Cisco technical documentation, at:

<http://www.cisco.com/en/US/docs/general/whatsnew/whatsnew.html>

Subscribe to the *What's New in Cisco Product Documentation* as a Really Simple Syndication (RSS) feed and set content to be delivered directly to your desktop using a reader application. The RSS feeds are a free service and Cisco currently supports RSS version 2.0.

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