



Cisco MDS 9000 Family Release Notes for Cisco MDS NX-OS Release 6.2(11e)

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This document describes the caveats and limitations for switches in the Cisco MDS 9000 Family. Use this document in conjunction with documents listed in the “[Obtaining Documentation and Submitting a Service Request](#)” section on page 27.

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 Family Release Notes*:

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

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Introduction

The Cisco MDS 9000 Family 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 Family 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.



Note

The Cisco MDS NX-OS Release 6.2(11e) is an IBM-certified FICON release .

Components Supported

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

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

Component	Part Number	Description	Applicable Product
Software	M97S3K9-6.2.11e	MDS 9700, NX-OS software	MDS 9706 Switch
			MDS 9710 Switch
	M95S2K9-6.2.11e	MDS 9500, NX-OS software	MDS 9500 Series
	M92S5K9-6.2.11e	MDS 9250i NX-OS software	MDS 9250i Switch
	M92S2K9-6.2.11e	MDS 9222i, NX-OS software	MDS 9222i Switch

Table 1 Cisco MDS 9000 Family Supported Software and Hardware Components (continued)

Component	Part Number	Description	Applicable Product
Licenses	DCNM-SAN-M97-K9	Cisco Prime Data Center Network Manager for Cisco MDS 9700 Series	MDS 9706 Switch MDS 9710 Switch
	M97FIC1K9	Cisco MDS 9700 Mainframe Package license for one MDS 9700 Switches	MDS 9710 Director only
	M97ENTK9	Enterprise Package for one Cisco MDS 9700 Series Multilayer Director	MDS 9710 Director only
	M9500FIC1K9	Cisco MDS 9500 Series Mainframe Package	MDS 9500 Series only
	M9500SSE184K9z	Storage Services Enabler License for one MSM-18/4 module	MDS 9500 Series only
	M95DMM184K9	Data Mobility Manager License for one MSM-18/4 module	MDS 9500 Series only
	M95DMM184TSK9	Data Mobility Manager for one MSM-18/4 module — Time limited to 180 days only	MDS 9500 Series only
	M95SSESSNK9	Cisco Storage Services Enabler License for SSN-16 (1 engine)	MDS 9500 Series only
	M95SMESSNK9	Cisco Storage Media Encryption License for SSN-16 (1 engine)	MDS 9500 Series only
	M95IOASSN	Cisco I/O Accelerator License for SSN-16 (1 engine)	MDS 9500 Series only
	M95IOA184	Cisco I/O Accelerator License for MSM-18/4	MDS 9500 Series only
	M95EXTSSNK9	Cisco SAN Extension License for SSN-16 (1 engine)	MDS 9500 Series only
	M9500XRC	Cisco XRC Acceleration	MDS 9500 Series only
	M9200ENT1K9	Cisco MDS 9200 Series Enterprise Package	MDS 9200 Series only
	DCNM-SAN-M92-K9	Cisco Prime Data Center Network Manager for Cisco MDS 9250i	MDS 9200 Series only
	M9250IDMMT6M	Cisco MDS 9250i DMM License - 6-month period	MDS 9200 Series only
	M9200FIC1K9	Cisco MDS 9200 Series Mainframe Package	MDS 9200 Series only
	M9200XRC	Cisco XRC Acceleration	MDS 9200 Series only
	M9222ISSE1K9	Storage Services Enabler License	MDS 9222i Switch
	M9200SSE184K9	Storage Services Enabler License for one MSM-18/4 module	MDS 9222i Switch
	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
	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
	M92SMESSNK9	Cisco Storage Media Encryption License for SSN-16 (1 engine)	MDS 9222i Switch

Table 1 Cisco MDS 9000 Family Supported Software and Hardware Components (continued)

Component	Part Number	Description	Applicable Product
Licenses	M92IOASSN	Cisco I/O Accelerator License for SSN-16 (1 engine)	MDS 9222i Switch
	M92IOA184	Cisco I/O Accelerator License for MSM-18/4	MDS 9222i Switch
	M9222HIOA	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
	M9250HIOA	Cisco MDS 9250i I/O Accelerator Services package	MDS 9250i Switch
	M9200XRC	Cisco MDS 9200 XRC Acceleration Package for IBM series z, spare	MDS 9250i Switch
	DCNM-SAN-M92-K9	Cisco Prime Data Center Network Manager	MDS 9250i Switch only
	M9250IP20-16G	MDS 9250i 20-port Fibre Channel Upgrade License	MDS 9250i Switch only
	M9250IDMMT6M	Cisco MDS 9250i DMM License - 6-month period M9200FIC1K9 Cisco MDS 9200 Series Mainframe Package	MDS 9250i Switch only
	M9250IDMMK9	Cisco MDS 9250i Data Mobility Manager package	MDS 9250i Switch
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-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

Table 1 Cisco MDS 9000 Family Supported Software and Hardware Components (continued)

Component	Part Number	Description	Applicable Product
	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 Family Switching and Services modules)	MDS 9222i Switch
Supervisor Modules	DS-X97-SF1-K9	Cisco MDS 9700 Series Supervisor-1 Module	MDS 9706 Switch MDS 9710 Switch
	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
Switching Modules	DS-X9448-768K9	Cisco MDS 9000 48-port 16-Gbps Fibre Channel Switching Module with SFP LC connectors	MDS 9706 Switch MDS 9710 Switch
	DS-X9848-480K9	Cisco MDS 48-Port 10-Gigabit Fibre Channel over Ethernet (FCoE) Module with SFP LC connectors	MDS 9706 Switch MDS 9710 Switch
	DS-X9112	Cisco MDS 9000 12-port 4-Gbps Fibre Channel Switching Module with SFP LC connectors	MDS 9500 Series MDS 9200 Series
	DS-X9124	Cisco 24-port 4-Gbps Fibre Channel Switching Module with SFP LC connectors	MDS 9500 Series MDS 9200 Series
	DS-X9148	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 Family 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

Table 1 Cisco MDS 9000 Family Supported Software and Hardware Components (continued)

Component	Part Number	Description	Applicable Product
Services Modules	DS-X9316-SSNK9	Cisco MDS 9000 Family 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
Power Supplies	DS-CAC-845W	845W AC power supply for Cisco MDS 9200 Series	MDS 9200 Series
	DS-C50I-300AC	300W AC power supply	MDS 9250i 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 9706 Switch MDS 9710 Switch
	DS-CDC97-3KW	3000W DC power supply for Cisco MDS 9700 Series	MDS 9706 Switch MDS 9710 Switch
CompactFlash	MEM-MDS-FLD51 2M	External 512-MB CompactFlash memory for supervisor module	MDS 9500 Series
Port Analyzer Adapter	DS-PAA-2, DS-PAA	Standalone Fibre Channel-to-Ethernet adapter that allows for simple, transparent analysis of Fibre Channel traffic in a switched fabric	MDS 9000 Family
Smart Card Reader	DS-SCR-K9	Storage Media Encryption (SME) Smart Card Reader	MDS 9000 Family
Smart Card	DS-SC-K9	SME Smart Card	MDS 9000 Family

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



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

Table 2 Cisco MDS 9000 Family Supported Optics and Transceivers

Component	Part Number	Description	Applicable Product
Optics	SFP-10G-SR / DS-SFP-10GE-SR	10GBASE-SR SFP+ Module	MDS 9706 Switch, MDS 9710 Switch, MDS 9500 Series, 8-port 10-Gbps FCoE Module (DS-X9708-K9), MDS 9250i
	SFP-10G-SR / DS-SFP-10GE-LR	10GBASE-LR SFP+ Module	MDS 9706 Switch, MDS 9710 Switch, MDS 9500 Series, 8-port 10-Gbps FCoE Module (DS-X9708-K9), MDS 9250i
	SFP-10G-ER	10GBASE-ER SFP+ Module	MDS 9706 Switch, MDS 9710 Switch, MDS 9500 Series, 8-port 10-Gbps FCoE Module (DS-X9708-K9), MDS 9250i
	SFP-H10GB-CU1M	10GBASE-CU SFP+ cable 1 meter	MDS 9500 Series, 8-port 10-Gbps FCoE Module (DS-X9708-K9)
	SFP-H10GB-CU3M	10GBASE-CU SFP+ cable 3 meter	MDS 9500 Series, 8-port 10-Gbps FCoE Module (DS-X9708-K9)
	SFP-H10GB-CU5M	10GBASE-CU SFP+ cable 5 meter	MDS 9500 Series, 8-port 10-Gbps FCoE Module (DS-X9708-K9)
	SFP-H10GB-ACU7M	10GBASE-CU SFP+ active copper cable 7 meter	MDS 9500 Series, 8-port 10-Gbps FCoE Module (DS-X9708-K9)
	SFP-H10GB-ACU10M	10GBASE-CU SFP+ active copper cable 10 meter	MDS 9500 Series, 8-port 10-Gbps FCoE Module (DS-X9708-K9)

Table 2 Cisco MDS 9000 Family Supported Optics and Transceivers (continued)

Component	Part Number	Description	Applicable Product
LC-type fiber-optic SFP	DS-SFP-FC16G-SW	SFP+ optics (LC type) for 16-Gbps Fibre Channel for shortwave mode	MDS 9706 Switch, MDS 9710 Switch, 48-port 16-Gbps Fibre Channel Switching Module (DS-X9448-768K9), MDS 9250i
	DS-SFP-FC16G-LW	SFP+ optics (LC type) for 10-Gbps Fibre Channel for longwave mode	MDS 9706 Switch, MDS 9710 Switch, 48-port 16-Gbps Fibre Channel Switching Module (DS-X9448-768K9), MDS 9250i
	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)
	DS-SFP-FC10G-LW	SFP+ optics (LC type) for 10-Gbps Fibre Channel for longwave 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)
	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, MDS 9250i
	DS-SFP-FC8G-SW	SFP+ optics (LC type) for 2-, 4-, or 8-Gbps Fibre Channel for shortwave mode	MDS 9706 Switch, MDS 9710 Switch, MDS 9500 Series, MDS DS-X9200 Series switching modules, MDS 9250i
	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 9706 Switch, MDS 9710 Switch, MDS 9500 Series, MDS DS-X9200 Series switching modules, MDS 9250i
	DS-SFP-FC4G-SW	SFP optics (LC type) for 1-, 2-, or 4-Gbps Fibre Channel for shortwave mode	MDS 9222i, 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 9222i, and DS-X9200 Series switching modules
	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 9222i, 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	MDS 9000 Series	

Table 2 Cisco MDS 9000 Family Supported Optics and Transceivers (continued)

Component	Part Number	Description	Applicable Product
	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	MDS 9000 Series
	DS-SFP-GE-T	SFP (RJ-45 connector) for Gigabit Ethernet over copper	MDS 9000 Series
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 Family
	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 Family
	CWDM8G1490	1490 nm CWDM 2/4/8-Gbps Fibre Channel SFP+	MDS 9000 Family
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 Family
	DWDM-SFP10G-xx.xx	10GBASE-DWDM SFP+	MDS 9710 Director

Table 2 Cisco MDS 9000 Family Supported Optics and Transceivers (continued)

Component	Part Number	Description	Applicable Product
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 Family
	DS-CWDMOADM4B	4-channel CWDM OADM module (Cisco CWDM 1550, 1570, 1590, or 1610 NM Add/Drop Module)	MDS 9000 Family
	DS-CWDM-MUX8A	ADM for 8 CWDM wavelengths	MDS 9000 Family
CWDM Multiplexer Chassis	DS-CWDMCHASSIS	2-slot chassis for CWDM ADMs	MDS 9000 Family

MDS 9000 Chassis and Module Support

Table 3 lists the MDS hardware chassis supported by Cisco MDS NX-OS Release 6.2

Table 3 Cisco MDS NX-OS 6.2 Chassis Support Matrix

Switch	NX-OS Release 6.2 Support
MDS 9710	Yes
MDS 9706	Yes ¹
MDS 9513	Yes
MDS 9509	Yes
MDS 9506	Yes
MDS 9250i	Yes
MDS 9222i	Yes
MDS 9148S	No
MDS 9148	No
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

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

Table 4 lists the MDS hardware modules supported Cisco MDS NX-OS Release 6.2.

Table 4 Module Support Matrix for Cisco MDS NX-OS Release 6.2

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 ¹	No	No
DS-X9706-FAB1	MDS 9706 Fabric1 Module	Yes ²	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 ^{3, 4}	No
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

1. Supported on Cisco MDS 9710 Director only.
2. Supported on Cisco MDS 9706 Director only.
3. Requires DS-13SLT-FAB3 or DS-13SLT-FAB2 in the MDS 9513.
4. 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 12](#)
- [Determining Software Version Compatibility, page 12](#)
- [Downloading Software, page 12](#)
- [Selecting the Software Image for a Cisco MDS 9222i Switch, page 13](#)
- [Selecting the Software Image for a Cisco MDS 9250i Switch, page 13](#)
- [Selecting the Software Image for a Cisco MDS 9500 Series Switch, page 14](#)
- [Selecting the Software Image for an MDS 9700 Series Switch, page 14](#)
- [NPE Software Images, page 14](#)

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.

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 Family 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(11e)	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.

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 6](#).

Table 6 Software Images for MDS 9222i Switch

Cisco MDS 9222i Switch	Naming Convention
Cisco MDS 9222i Switch	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 7](#).

Table 7 Software Images for MDS 9250i Switch

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

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 8](#). Cisco NX-OS Release 6.x, Release 5.x, and Release 4.x do not support the Supervisor-1 module.

Table 8 *Software Images for MDS 9500 Series Switches*

Cisco MDS 9500 Series Switch Type	Naming Convention
Cisco MDS 9513, 9509, and 9506 Switches	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 an MDS 9700 Series Switch

The system and kickstart image that you use for an MDS 9700 Series switch is shown in [Table 9](#).

Table 9 *Software Images for MDS 9700 Series Switch*

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

NPE Software Images

No payload encryption (NPE) images are available with Cisco MDS NX-OS Release 6.2(11e) 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:

- m9200-s2ek9-kickstart-mz-npe.6.2.11e.bin
- m9200-s2ek9-mz-npe.6.2.11e.bin
- m9250-s5ek9-kickstart-mz-npe.6.2.11e.bin
- m9250-s5ek9-mz-npe.6.2.11e.bin
- m9500-sf2ek9-kickstart-mz-npe.6.2.11e.bin
- m9500-sf2ek9-mz-npe.6.2.11e.bin
- m9700-sf3ek9-kickstart-mz-npe.6.2.11e.bin
- m9700-sf3ek9-mz-npe.6.2.11e.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 15](#)
- [Nondisruptive Upgrade Paths, page 16](#)
- [FICON Supported Releases and Upgrade Paths, page 18](#)



Note Before you begin the upgrade process, review the list of chassis and modules that Cisco MDS NX-OS Release 6.2(11e) supports. See the [“MDS 9000 Chassis and Module Support”](#) section on page 10.

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(11e) in [Table 10](#).
- 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 10](#) 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 downgrade 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 18.



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), 6.2(11c), 6.2(11d), or 6.2(11e) 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).

Nondisruptive Upgrade Paths

Use [Table 10](#) to determine your nondisruptive upgrade path to Cisco MDS NX-OS Release 6.2(11e). 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 10](#) applies only to Fibre Channel switching traffic. Upgrading system software disrupts IP traffic and intelligent services traffic.

Table 10 *Nondisruptive Upgrade Path to Cisco MDS NX-OS Release 6.2(11e)*

Current Release	Nondisruptive Upgrade Path and Ordered Upgrade Steps
NX-OS:	
All 6.2(x) releases except 6.2(9b),6.2(9c)	Upgrade directly to NX-OS Release 6.2(11e).
All 5.2(x) releases	Upgrade directly to NX-OS Release 6.2(11e).
All 5.0(x) releases	<ol style="list-style-type: none"> 1. Upgrade to NX-OS Release 5.2(8e). 2. Upgrade to NX-OS Release 6.2(11e).
All 4.2(x) releases All 4.1(x) releases	<ol style="list-style-type: none"> 1. Upgrade to NX-OS Release 5.0(8a). 2. Upgrade to NX-OS Release 5.2(8e). 3. Upgrade to NX-OS Release 6.2(11e).
SAN-OS:	
Release 3.3(2), 3.3(3), 3.3(4x), and 3.3(5x).	<ol style="list-style-type: none"> 1. Upgrade to NX-OS Release 4.2(9). 2. Upgrade to NX-OS Release 5.0(8a). 3. Upgrade to NX-OS Release 5.2(8e). 4. Upgrade to NX-OS Release 6.2(11e).
Release 3.3(1c), all 3.2(x), 3.1(x), and 3.0(x) releases	<ol style="list-style-type: none"> 1. Upgrade to SAN-OS Release 3.3(5b). 2. Upgrade to NX-OS Release 4.2(9). 3. Upgrade to NX-OS Release 5.0(8a). 4. Upgrade to NX-OS Release 5.2(8e). 5. Upgrade to NX-OS Release 6.2(11e).
Release 2.1(3), 2.1(2e), 2.1(2d), and 2.1(2b)	<ol style="list-style-type: none"> 1. Upgrade to SAN-OS Release 3.3(1c). 2. Upgrade to SAN-OS Release 3.3(5b). 3. Upgrade to NX-OS Release 4.2(9). 4. Upgrade to NX-OS Release 5.0(8a). 5. Upgrade to NX-OS Release 5.2(8e). 6. Upgrade to NX-OS Release 6.2(11e).

Table 10 *Nondisruptive Upgrade Path to Cisco MDS NX-OS Release 6.2(11e) (continued)*

Current Release	Nondisruptive Upgrade Path and Ordered Upgrade Steps
Release 2.1(2), 2.1(1b), 2.1(1a), and 2.0(x)	<ol style="list-style-type: none"> 1. Upgrade to SAN-OS Release 2.1(2b), 2.1(2d), 2.1(2e), or 2.1(3) 2. Upgrade to SAN-OS Release 3.3(1c). 3. Upgrade to SAN-OS Release 3.3(5b). 4. Upgrade to NX-OS Release 4.2(9). 5. Upgrade to NX-OS Release 5.0(8a). 6. Upgrade to NX-OS Release 5.2(8e). 7. Upgrade to NX-OS Release 6.2(11e).
Release 1.x	<ol style="list-style-type: none"> 1. Upgrade to SAN-OS Release 1.3(4a). 2. Upgrade to SAN-OS Release 2.1(2b). 3. Upgrade to SAN-OS Release 3.3(1c). 4. Upgrade to SAN-OS Release 3.3(5b). 5. Upgrade to NX-OS Release 4.2(9). 6. Upgrade to NX-OS Release 5.0(8a). 7. Upgrade to NX-OS Release 5.2(8e). 8. Upgrade to NX-OS Release 6.2(11e).

FICON Supported Releases and Upgrade Paths

The Cisco MDS NX-OS Release 6.2(11e) is an IBM-certified FICON release.

[Table 11](#) 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 11 *FICON Supported Releases*

FICON Supported Releases	
NX-OS	Release 6.2(11e)
	Release 6.2(11d) for the <i>Cisco MDS 9250i Switch only</i>
	Release 6.2(11c) for <i>all FICON supported platforms except the Cisco MDS 9250i Switch</i>
	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 12](#) 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 12 *FICON Nondisruptive Upgrade Path*

Current Release with FICON Enabled	Upgrade Path
NX-OS Release 6.2(11d)	You can nondisruptively upgrade directly to NX-OS Release 6.2(11e).
NX-OS Release 6.2(11c)	You can nondisruptively upgrade directly to NX-OS Release 6.2(11e).
NX-OS Release 6.2(5b)	You can nondisruptively upgrade directly to NX-OS Release 6.2(11e).
NX-OS Release 6.2(5a)	You can nondisruptively upgrade directly to NX-OS Release 6.2(11e).
NX-OS Release 5.2(2), 5.2(2E4), and 5.2(2s)	You can nondisruptively upgrade directly to NX-OS Release 6.2(5b).
NX-OS Release 4.2(7b)	You can nondisruptively upgrade directly to NX-OS Release 5.2(2), 5.2(2E4), and 5.2(2s).
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).

Table 12 FICON Nondisruptive Upgrade Path

Current Release with FICON Enabled	Upgrade Path
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 SAN-OS Software Image

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

- [General Downgrading Guidelines, page 20](#)
- [FICON Downgrade Paths, page 21](#)

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 13](#) 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 21](#).

Use [Table 13](#) to determine the nondisruptive downgrade path from Cisco NX-OS Release 6.2(11e). Find the NX-OS or SAN-OS image that you want to downgrade to in the To 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 13](#) applies only to Fibre Channel switching traffic. Downgrading system software disrupts IP and intelligent services traffic.

**Note**

Downgrading from Cisco MDS NX-OS Release 6.2(11e) 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)*.

**Note**

Downgrading from Cisco MDS NX-OS Releases 6.2(11), 6.2(11b), 6.2(11c), 6.2(11d), or 6.2(11e) 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

ISSD Guidelines for Cisco MDS 9250i Switch

- Downgrading from Cisco MDS NX-OS Release 6.2(11e) to lower releases is not supported on a Cisco MDS 9250i Switch which has only one online PSU.
- Downgrading from Cisco MDS NX-OS Release 6.2(11e) to lower releases on a Cisco MDS 9250i Switch with two online PSUs results in loss of N:N grid redundancy. The switch will run in non-redundant mode.
- Downgrading from Cisco MDS NX-OS Release 6.2(11e) to lower releases 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.

Table 13 *Nondisruptive Downgrade Path from NX-OS Release 6.2(11e)*

To NX-OS or SAN-OS Release	Nondisruptive Downgrade Path and Ordered Downgrade Steps
NX-OS:	
All 6.2(x) releases except 6.2(9b) and 6.2(9c)	Downgrade directly from NX-OS Release 6.2(11e).
All 5.2(x) releases	Downgrade directly from NX-OS Release 6.2(11e).
All 5.0(x) releases	<ol style="list-style-type: none"> Downgrade to NX-OS Release 5.2(8e). Downgrade to NX-OS Release 5.0(8).
All 4.2(x) and 4.1(x) releases	<ol style="list-style-type: none"> Downgrade to NX-OS Release 5.2(8e). Downgrade to NX-OS Release 5.0(8). Downgrade to NX-OS Release 4.2(x) or 4.1(x).

FICON Downgrade Paths

Table 14 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 14 FICON Nondisruptive Downgrade Paths

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

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

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

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

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

Cisco MDS 9250i Power Redundancy Enhancements

Support for grid redundancy is available with two online PSUs on a Cisco MDS 9250i Multiservice Fabric Switch. For detailed information about this feature, see the Power Supplies section of the [Cisco MDS 9250i Multiservice Fabric Switch Hardware Installation Guide](#).

Licensed Cisco NX-OS Software Packages

Most Cisco MDS 9000 family 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 also available for the Cisco MDS 9250i Multiservice Fabric Switch, and the Cisco MDS 8-Gb Fabric Switch for HP c-Class Blade System.



Note

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).

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 Family switches includes the base set of features that Cisco believes are required by most customers for building a SAN. The Cisco MDS 9000 family 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 family 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 Family switches.

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, and the Cisco MDS 8-Gb Fabric Switch for HP c-Class Blade System. 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 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.
- 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 OHMS is supported on Cisco MDS 9500 Series directors and Cisco MDS 9250i Multiservice Fabric Switches.

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:

- [ASCII File Can Be Copied to the Startup Configuration, page 25](#)
- [Fibre Channel Security Protocol \(FC-SP\) Support, page 25](#)
- [Install Module Command Changes, page 25](#)
- [IOA Scaling Support on Supervisor-2 Module, page 25](#)

ASCII File Can Be Copied to the Startup Configuration

The `copy bootflash:runnig-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 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 15 Resolved Caveats in Cisco MDS NX-OS Release 6.2(11e)

Identifier	Description
CSCuz21138	FCNS database does not show actual interface when the interface is FICON.
CSCvb22738	FICON FTA - Always flow controlling writes and reads leads to poor performance.
CSCuy94970	FICON FTA - Write and Read acceleration fail for SecureAgent Virtual Tape.

Table 15 *Resolved Caveats in Cisco MDS NX-OS Release 6.2(11e)*

Identifier	Description
CSCum52148	Distributed reflective denial-of-service vulnerability on NTP server.
CSCum35502	Cisco NX-OS Software-Based Products AAA Bypass Vulnerability.
CSCux86332	N3k/N6K/N7K/N9K/MDS January 2016 OpenSSH vulnerabilities.

Open Caveats

Table 16 *Open Caveats in Cisco MDS NX-OS Release 6.2(11e)*

Identifier	Description
CSCuv42986	Callhome stops working.
CSCvf68489	FICON: Fcd hap reset (heartbeat loss) during ISSU & upgrade aborts.

Related Documentation

The documentation set for the Cisco MDS 9000 Family 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

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

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>

Troubleshooting and Reference

<http://www.cisco.com/c/en/us/support/storage-networking/mds-9000-nx-os-san-os-software/tsd-products-support-troubleshooting-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/c/en/us/td/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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