Cisco MDS 9000 Family Release Notes for Cisco MDS NX-OS Release 6.2(3n)

Release Date: May 16, 2014

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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 43.

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

Table 1 shows the on-line change history for this document.

Table 1 Online History Change

Revision	Date	Description
A0	May 16, 2013	Created the release notes.
B0	June 14, 2014	• Update the General Upgrading Guidelines section • Added open caveat CSCub40020.

Contents

This document includes the following:

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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.

Components Supported

Table 2 lists the NX-OS software part numbers and hardware components supported by the Cisco MDS 9000 Family.

Note For the latest information about supported transceivers, see the *Cisco MDS 9000 Family Pluggable Transceivers* data sheet.

Table 2 Cisco MDS 9000 Family Supported Software and Hardware Components

Component	Part Number	Description	Applicable Product
Software	M97S3K9-6.2.3	MDS 9700 Supervisor/Fabric-1, NX-OS software	MDS 9710 Switch
	M95S2K9-6.2.3	MDS 9500 Supervisor/Fabric-2, NX-OS software	MDS 9500 Series only
	M92S2K9-6.2.3	MDS 9200 Supervisor/Fabric-2, NX-OS software	MDS 9222i Switch
	M91S3K9-6.2.3	MDS 9148 Supervisor/Fabric-3 NX-OS software	MDS 9148 Switch

Table 2 Cisco MDS 9000 Family Supported Software and Hardware Components (continued)

Component	Part Number	Description	Applicable Product
Licenses	M9500SSE184K9	Storage Services Enabler License for one MSM-18/4 module	MDS 9500 Series only
	M9222ISSE1K9	Storage Services Enabler License	MDS 9222i Switch only
	M9200SSE184K9	Storage Services Enabler License for one MSM-18/4 module	MDS 9200 Series only
	M95DMM184K9	Data Mobility Manager License for one MSM-18/4 module	MDS 9500 Series only
	M9222IDMMK9	Data Mobility Manager License for Cisco MDS 9222i	MDS 9222i Switch
	M92DMM184K9	Data Mobility Manager License for one MSM-18/4 module	MDS 9200 Series only
	M95DMM184TSK9	Data Mobility Manager for one MSM-18/4 module — Time Limited to 180 days only	MDS 9500 Series only
	M9222IDMMTSK9	Data Mobility Manager — Time Limited to 180 days only	MDS 9222i Switch only
	M92DMM184TSK9	Data Mobility Manager for one MSM-18/4 module — Time Limited to 180 days only	MDS 9200 Series only
	M92SSESSNK9	Cisco Storage Services Enabler License for SSN-16 (1 engine)	MDS 9200 Series only
	M95SSESSNK9	Cisco Storage Services Enabler License for SSN-16 (1 engine)	MDS 9500 Series only
	M92SMESSNK9	Cisco Storage Media Encryption License for SSN-16 (1 engine)	MDS 9200 Series only
	M95SMESSNK9	Cisco Storage Media Encryption License for SSN-16 (1 engine)	MDS 9500 Series only
	M92IOASSN	Cisco I/O Accelerator License for SSN-16 (1 engine)	MDS 9200 Series only
	M95IOASSN	Cisco I/O Accelerator License for SSN-16 (1 engine)	MDS 9500 Series only
	M92IOA184	Cisco I/O Accelerator License for MSM-18/4	MDS 9200 Series only
	M95IOA184	Cisco I/O Accelerator License for MSM-18/4	MDS 9500 Series only
	M9222IIOA	Cisco I/O Accelerator License for Cisco MDS 9222i base switch	MDS 9222i Switch only
	M92EXTSSNK9	Cisco SAN Extension License for SSN-16 (1 engine)	MDS 9200 Series only
	M95EXTSSNK9	Cisco SAN Extension License for SSN-16 (1 engine)	MDS 9500 Series only
	M9200XRC	Cisco XRC Acceleration	MDS 9200 Series only
	M9500XRC	Cisco XRC Acceleration	MDS 9500 Series only

Table 2 Cisco MDS 9000 Family Supported Software and Hardware Components (continued)

Component	Part Number	Description	Applicable Product
Chassis	DS-C9710	Cisco MDS 9710 Multilayer Director (10-slot multilayer director with 2 half-width slots for Supervisor 1 modules, with 8 slots available for switching modules — SFPs sold separately)	MDS 9710 switch
	DS-C9513	Cisco MDS 9513 Multilayer Director (13-slot multilayer director with 2 slots for Supervisor-2 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-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
	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 2 Cisco MDS 9000 Family Supported Software and Hardware Components (continued)

Component	Part Number	Description	Applicable Product
Switching Modules	DS-X9448-768K9	Cisco MDS 9000 48-port 16-Gbps Fibre Channel Switching Module with SFP LC connectors	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
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-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 2 Cisco MDS 9000 Family Supported Software and Hardware Components (continued)

Component	Part Number	Description	Applicable Product
Power Supplies	DS-CAC-300W	300W AC power supply	MDS 9100 Series
	DS-C24-300AC	300W AC power supply	MDS 9124 Switch
	DS-CAC-845W	845W AC power supply for Cisco MDS 9200 Series	MDS9200 Series
	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
CompactFlash	MEM-MDS-FLD512M	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 3 lists the part numbers and optical components supported by the Cisco MDS 9000 Family.

Table 3 Cisco MDS 9000 Family Supported Optics and Transceivers

Component	Part Number	Description	Applicable Product
Optics	SFP-10G-SR	10GBASE-SR SFP+ Module	MDS 9710, MDS 9500 Series, 8-port 10-Gbps FCoE Module (DS-X9708-K9)
	SFP-10G-LR	10GBASE-LR SFP+ Module	MDS 9710, MDS 9500 Series, 8-port 10-Gbps FCoE Module (DS-X9708-K9)
	SFP-10G-ER	10GBASE-ER SFP+ Module	MDS 9710, MDS 9500 Series, 8-port 10-Gbps FCoE Module (DS-X9708-K9)
	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 3 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 9710, 48-port 16-Gbps Fibre Channel Switching Module (DS-X9448-768K9)
	DS-SFP-FC16G-LW	SFP+ optics (LC type) for 10-Gbps Fibre Channel for longwave mode	MDS 9710, 48-port 16-Gbps Fibre Channel Switching Module (DS-X9448-768K9)
	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 9148
	DS-SFP-FC8G-SW	SFP+ optics (LC type) for 2-, 4-, or 8-Gbps Fibre Channel for shortwave mode	MDS 9710, MDS DS-X9200 Series switching modules
	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 9710, MDS DS-X9200 Series switching modules
	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
	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	MDS 9000 Series
	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

Table 3 Cisco MDS 9000 Family Supported Optics and Transceivers (continued)

Component	Part Number	Description	Applicable Product
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
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
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 4 lists the MDS hardware chassis supported by Cisco MDS NX-OS Release 6.2 3.

Table 4 Cisco MDS NX-OS 6.2 Chassis Support Matrix

Switch	NX-OS Release 6.2 Support
MDS 9710	Yes
MDS 9513	Yes
MDS 9509	Yes
MDS 9506	Yes
MDS 9222i	Yes
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

Table 5 lists the MDS hardware chassis supported by Cisco MDS NX-OS Release 5.x.

Table 5 Cisco MDS NX-OS 6.x Chassis Support Matrix

Switch	NX-OS Release 5.x Support
MDS 9513	Yes
MDS 9509	Yes
MDS 9506	Yes
MDS 9222i	Yes
MDS 9216i	No
MDS 9148	Yes
Cisco MDS 8-Gb Fabric Switch for HP c-Class Blade System	Yes
MDS 9134	Yes[1]
MDS 9124	Yes[1]
Cisco MDS 4-Gbps Fabric Switch for HP c-Class BladeSystem	Yes[1]
Cisco MDS 4-Gbps Fabric Switch for IBM BladeCenter	Yes[1]

1. This switch supports Cisco MDS NX-OS Release 5.2(2) and later 5.x releases, but does not support Release 6.2(x).

Table 6 lists the MDS hardware modules supported Cisco MDS NX-OS Release 6.2 Table 7 lists the MDS hardware modules supported by Cisco MDS NX-OS 5.x. For the list of MDS hardware modules supported by Cisco MDS SAN-OS 4.x, see Table 8. For the list of MDS hardware modules supported by Cisco MDS SAN-OS 3.x, see Table 9.

Table 6 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	N/A	N/A
DS-X9710-FAB1	MDS 9710 Fabric1 Module	Yes	N/A	N/A
DS-X9448-768K9	48-Port 16-Gbps Fibre Channel Switching Module	Yes	No	No
DS-X9530-SF2-K9	MDS 9500 Supervisor-2 Module	N/A	Yes	N/A
DS-X9530-SF2A-K9	MDS 9500 Supervisor-2A Module	N/A	Yes	N/A
DS-13SLT-FAB3	MDS 9513 Fabric Module 3	N/A	Yes	N/A
DS-13SLT-FAB2	MDS 9513 Fabric Module 2	N/A	Yes	N/A
DS-13SLT-FAB1	MDS 9513 Fabric Module 1	N/A	Yes	N/A
DS-X9708-K9	8-port 10-Gbps FCoE Module	No	Yes[1,2]	No
DS-X9232-256K9	32-port 8-Gbps Advanced Fibre Channel Switching Module	No	Yes[1]	No
DS-X9248-256K9	48-port 8-Gbps Advanced Fibre Channel Switching Module	No	Yes[1]	No
DS-X9224-96K9	24-port 8-Gbps Fibre Channel Switching Module	No	Yes[1]	No
DS-X9248-96K9	48-port 8-Gbps Fibre Channel Switching Module	No	Yes[1]	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. Requires DS-13SLT-FAB3 or DS-13SLT-FAB2 in the MDS 9513.
2. Requires the Supervisor-2A module.

Table 7 Module Support Matrix for Cisco MDS NX-OS 5.x

Module	Description	MDS 9500 Series		MDS 9222i	
		NX-OS 5.2(x)	NX-OS 5.0(x)	NX-OS 5.2(x)	NX-OS 5.0(x)
DS-X9530-SF2-K9	MDS 9500 Supervisor-2 Module	Yes	Yes	N/A	N/A
DS-X9530-SF2A-K9	MDS 9500 Supervisor-2A Module	Yes	Yes	N/A	N/A
DS-13SLT-FAB3	MDS 9513 Fabric Module 3	Yes	No	N/A	N/A
DS-13SLT-FAB2	MDS 9513 Fabric Module 2	Yes	Yes	N/A	N/A
DS-13SLT-FAB1	MDS 9513 Fabric Module 1	Yes	Yes	N/A	N/A
DS-X9708-K9	8-port 10-Gbps FCoE Module	Yes[1,2]	No	No	No
DS-X9232-256K9	32-port 8-Gbps Advanced Fibre Channel Switching Module	Yes[1]	No	No	No
DS-X9248-256K9	48-port 8-Gbps Advanced Fibre Channel Switching Module	Yes[1]	No	No	No
DS-X9224-96K9	24-port 8-Gbps Fibre Channel Switching Module	Yes[1]	Yes[3]	No	No
DS-X9248-96K9	48-port 8-Gbps Fibre Channel Switching Module	Yes[1]	Yes[3]	No	No
DS-X9248-48K9	4/44-port Host Optimized 8-Gbps Fibre Channel Switching Module	Yes	Yes	Yes	Yes
DS-X9316-SSNK9	16-port Storage Services Node (SSN-16)	Yes	Yes	Yes	Yes
DS-X9304-18K9	18/4-Port Multiservice Module (MSM-18/4)	Yes	Yes	Yes	Yes
DS-X9112	12-port 4-Gbps Fibre Channel Switching Module	Yes	Yes	Yes	Yes
DS-X9124	24-port 4-Gbps Fibre Channel Switching Module	Yes	Yes	Yes	Yes
DS-X9148	48-port 4-Gbps Fibre Channel Switching Module	Yes	Yes	Yes	Yes
DS-X9704	4-port 10-Gbps Fibre Channel Switching Module	Yes	Yes	Yes	Yes

1. Requires DS-13SLT-FAB3 or DS-13SLT-FAB2 in the MDS 9513.
2. Requires the Supervisor-2A module.
3. Requires DS-13SLT-FAB2 in the MDS 9513.

Table 8 Module Support Matrix for Cisco MDS NX-OS 4.x

Module	Description	MDS 9500 Series	MDS 9222i	MDS 9216i
DS-X9530-SF2-K9	MDS 9500 Supervisor-2 Module	Yes	N/A	N/A
DS-X9530-SF2A-K9	MDS 9500 Supervisor-2A Module	Yes[1]	N/A	N/A
DS-X9530-SF1-K9	MDS 9500 Supervisor-1 Module	No	N/A	N/A
DS-13SLT-FAB2	MDS 9513 Fabric Module 2	Yes	N/A	N/A
DS-13SLT-FAB1	MDS 9513 Fabric Module 1	Yes	N/A	N/A
DS-X9224-96K9	24-port 8-Gbps Fibre Channel Switching Module	Yes[2]	No	No
DS-X9248-96K9	48-port 8-Gbps Fibre Channel Switching Module	Yes[2]	No	No
DS-X9248-48K9	4/44-port Host Optimized8-Gbps Fibre Channel Switching Module	Yes	Yes	No
DS-X9316-SSNK9	16-port Storage Services Node (SSN-16)	Yes	Yes	Yes
DS-X9304-18K9	18/4-Port Multiservice Module (MSM-18/4)	Yes	Yes	Yes
DS-X9112	12-port 4-Gbps Fibre Channel Switching Module	Yes	Yes	Yes
DS-X9124	24-port 4-Gbps Fibre Channel Switching Module	Yes	Yes	Yes
DS-X9148	48-port 4-Gbps Fibre Channel Switching Module	Yes	Yes	Yes
DS-X9704	4-port 10-Gbps Fibre Channel Switching Module	Yes	Yes	Yes
DS-X9302-14K9	14/2-port Multiprotocol Services (MPS-14/2) Module	Yes	No	Yes
DS-X9016	16-port 1-, 2-Gbps Fibre Channel Switching Module	Yes	No	Yes
DS-X9032	32-port 1-, 2-Gbps Fibre Channel Switching Module	Yes	No	Yes
DS-X9032-SSM	32-port Storage Services Module (SSM)	Yes	Yes	Yes
DS-X9308-SMIP	8-port 1-, 2-Gbps IP Switching Module	No	No	No
DS-X9304-SMIP	4-port 1-, 2-Gbps IP Switching Module	No	No	No

1. In software releases earlier than Cisco NX-OS Release 4.2(7a), the Supervisor-2A module appears as unsupported hardware in Device Manager, but the Supervisor-2A module does work with Cisco NX-OS release 4.x software.
2. Requires DS-13SLT-FAB2 in the MDS 9513.

Table 9 lists the MDS hardware modules supported by Cisco MDS SAN-OS 3.x.

Table 9 Module Support Matrix for Cisco MDS SAN-OS 3.x

Module	Description	MDS 9500 Series	MDS 9222i	MDS 9216i	MDS 9216A	MDS 9216
DS-X9530-SF2-K9	MDS 9500 Supervisor-2 Module	Yes	N/A	N/A	N/A	N/A
DS-X9530-SF2A-K9	MDS 9500 Supervisor-2A Module	Yes[1]	N/A	N/A	N/A	N/A
DS-X9530-SF1-K9	MDS 9500 Supervisor-1 Module	Yes	N/A	N/A	N/A	N/A

Table 9 Module Support Matrix for Cisco MDS SAN-OS 3.x (continued)

Module	Description	MDS 9500 Series	MDS 9222i	MDS 9216i	MDS 9216A	MDS 9216
DS-13SLT-FAB2	MDS 9513 Fabric Module 2	Yes	N/A	N/A	N/A	N/A
DS-13SLT-FAB1	MDS 9513 Fabric Module 1	Yes	N/A	N/A	N/A	N/A
DS-X9224-96K9	24-port 8-Gbps Fibre Channel Switching Module	No	No	No	No	No
DS-X9248-96K9	48-port 8-Gbps Fibre Channel Switching Module	No	No	No	No	No
DS-X9248-48K9	4/44-port Host Optimized8-Gbps Fibre Channel Switching Module	No	No	No	No	No
DS-X9316-SSNK9	16-port Storage Services Node (SSN-16)	No	No	No	No	No
DS-X9304-18K9	18/4-Port Multiservice Module (MSM-18/4)[2]	Yes	Yes	Yes	Yes	No
DS-X9112	12-port 4-Gbps Fibre Channel Switching Module	Yes	Yes	Yes	Yes	No
DS-X9124	24-port 4-Gbps Fibre Channel Switching Module	Yes	Yes	Yes	Yes	No
DS-X9148	48-port 4-Gbps Fibre Channel Switching Module	Yes	Yes	Yes	Yes	No
DS-X9704	4-port 10-Gbps Fibre Channel Switching Module	Yes	Yes	Yes	Yes	No
DS-X9302-14K9	14/2-port Multiprotocol Services (MPS-14/2) Module	Yes	No	Yes	Yes	Yes
DS-X9016	16-port 1-, 2-Gbps Fibre Channel Switching Module	Yes	No	Yes	Yes	Yes
DS-X9032	32-port 1-, 2-Gbps Fibre Channel Switching Module	Yes	No	Yes	Yes	Yes
DS-X9032-SSM	32-port Storage Services Module (SSM)	Yes	Yes	Yes	Yes	Yes
DS-X9308-SMIP	8-port 1-, 2-Gbps IP Switching Module	Yes	No	Yes	Yes	Yes
DS-X9304-SMIP	4-port 1-, 2-Gbps IP Switching Module	Yes	Yes	Yes	Yes	Yes

1. In software releases earlier than Cisco NX-OS Release 3.3(5a), the Supervisor-2A module appears as unsupported hardware in Device Manager, but the Supervisor-2A module does work with Cisco NX-OS release 3.x software.
2. Cisco SAN-OS Release 3.2(1) and later support the 18/4-Port Multiservice Module (MSM-18/4).

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

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 10 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 10 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(3)	NX-OS Release 6.2(1) or later	NX-OS Release 6.2(1) or later
	NX-OS Release 5.2(x) or later	NX-OS Release 5.2(x) or later
	NX-OS Release 5.0(1a) or later	NX-OS Release 5.0(1a) and later
	NX-OS Release 4.2(3) or later	NX-OS Release 4.2(3) and later
	SAN-OS Release 3.3(5) or 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 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 note for details on how you can nondisruptively upgrade your Cisco MDS 9000 switch. Issuing the **install all** command from the CLI, or using Cisco DCNM for SAN to perform the downgrade, enables the compatibility check. The check indicates if the upgrade can happen nondisruptively or disruptively depending on the current configuration of your switch and the reason.

```
Compatibility check is done:
```

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

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

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 an MDS 9148 Switch

The system and kickstart image that you use for an MDS 9148 switch is shown in Table 11.

Table 11 Software Images for MDS 9148 Switches

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

Selecting the Software Image for an MDS 9200 Series Switch

The system and kickstart image that you use for an MDS 9222i switch is shown in Table 12.

Table 12 Software Images for MDS 9222i Switch

Cisco MDS 92221 Switch	Naming Convention
MDS 9222i	Filename begins with m9200-s2ek9

Selecting the Software Image for an MDS 9500 Series Switch

The system and kickstart image that you use for an MDS 9500 Series switch with a Supervisor-2 or Supervisor-2A module is shown in Table 13. Cisco NX-OS Release 6.x. Release 5.x and Release 4.x do not support the Supervisor-1 module.

Table 13 Software Images for MDS 9500 Series Switches

Cisco MDS 9500 Series Switch Type	Naming Convention
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 an MDS 9710 Switch

The system and kickstart image that you use for an MDS 9710 switch is shown in Table 14.

Table 14 Software Images for MDS 9710 Switch

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

NPE Software Images

No payload encryption (NPE) images are available with Cisco MDS NX-OS Release 6.2(3) 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:

- m9700-sf3ek9-kickstart-mz-npe.6.2.3n.bin
- m9700-sf3ek9-mz-npe.6.2.3n.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:

Note Before you begin the upgrade process, review the list of chassis and modules that Cisco MDS NX-OS Release 6.2(3) supports. See the "MDS 9000 Chassis and Module Support" section on page 9.

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/en/US/products/ps10495/prod_release_notes_list.html

General Upgrading Guidelines

Before upgrading your Cisco NX-OS software, you must determine if the following issue has occurred in your switch:

```
%FLOGI-1-MSG_FLOGI_REJECT_FCID_ERROR after upgrade/switchover
```

An ISSU or ISSD involves a supervisor switchover, so it is very important that you determine if this issue is present before a supervisor switchover occurs. If this issue is detected before the supervisor switchover, the affected interfaces can be restored easily by entering the **shutdown** and **no shutdown** command sequence.

The following example shows how to determine if the issue has occurred before a supervisor switchover:

```
switch# show flogi internal info | i key|Interface | i key p 1
Interface fc4/32: mode[F] [119f000] Mode: F State: UP Vsan: 237
  Vsan no:237 Max flogi key:0x1002a(65578) num_fl[0x1]<<<Max flogi key greater than 65535
--
Interface fc6/32: mode[F] [129f000] Mode: F State: UP Vsan: 237
  Vsan no: 237 Max flogi key: 0x1(1) num_fl[0x1]
--
```

Look for the value for a Max flogi key that is greater than 65535.

In the example, the fc4/32 interface has encountered this issue, but the fc6/32 interface is normal.

If you see that an interface has a Max flogi key greater than 65535 before a system switchover, ISSU, or ISSD, you must disable the interface and then reenable it by using the **shutdown** command followed by the **no shutdown** command. This process disrupts the devices on the interface that is being shut down. After the devices relogin, the Max flogi key is reset to 1 and you can avoid this issue.

If an install and/or ISSU, or supervisor switchover has occurred, compare the number of devices fabric login (FLOGI) with the number of devices in the Fibre Channel Name Server (FCNS) local database. Enter the **show flogi database** and the **show fcns database local** commands and use the CLI outputs for comparison. If the FLOGI database has fewer entries than the FCNS local database, the issue has occurred.

Also, if the following error message appears after an install, ISSU, or supervisor switchover, the issue might bug may have been encountered:

```
 %FLOGI-1-MSG_FLOGI_REJECT_FCID_ERROR: %$VSAN xxx%$ [VSAN xxx, Interface fc4/19: mode[F]]
FLOGI rejected - FCID allocation failed with error 0x401b0000.
```

If you observe either of the above situations, open a case with the Cisco TAC.

Note If the Max flogi key value is a large number and is incrementing, it indicates that a device is repeatedly logging in. This situation might be a separate problem that needs further investigation. For assistance, contact the Cisco TAC.

In addition, follow these general guidelines before performing a software upgrade:

- Review the nondisruptive upgrade path to Release 6.2(3) in Table 15.
- 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 15 for the nondisruptive upgrade path for all NX-OS and SAN-OS releases.
- **Gigabit Ethernet Ports**: Traffic on Gigabit Ethernet ports is disrupted during an upgrade or downgrade. This includes IPS modules and the Gigabit Ethernet ports on the MSM-18/4 module and the MDS 9222i switch. 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 21.

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.

Nondisruptive Upgrade Paths

Use Table 15 to determine your nondisruptive upgrade path to Cisco MDS NX-OS Release 6.2(3). 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 15 applies only to Fibre Channel switching traffic. Upgrading system software disrupts IP traffic and intelligent services traffic.

Table 15 Nondisruptive Upgrade Path to Cisco MDS NX-OS Release 6.2(3)

Current Release	Nondisruptive Upgrade Path and Ordered Upgrade Steps
NX-OS:	
Release 6.2(1), 5.2(1), 5.2(2), 5.2(2a), 5.2(2d), 5.2(6), 5.2(6a), 5.2(6b), 5.2(8), 5.2(8a), and 5.2(8b)	Upgrade directly to NX-OS Release 6.2(3).
All 5.0(x) releases	**1.** Upgrade to NX-OS Release 5.2(x). **2.** Upgrade to NX-OS Release 6.2(3).
All 4.2(x) releases and 4.1(x) releases	**1.** Upgrade to NX-OS Release 5.0(8a). **2.** Upgrade to NX-OS Release 5.2(x). **3.** Upgrade to NX-OS Release 6.2(3).
SAN-OS:	
Release 3.3(2), 3.3(3), 3.3(4x), and 3.3(5x).	**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(x). **4.** Upgrade to NX-OS Release 6.2(3).
Release 3.3(1c), all 3.2(x), 3.1(x), and 3.0(x) releases)	**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(x). **5.** Upgrade to NX-OS Release 6.2(3).
Release 2.1(3), 2.1(2e), 2.1(2d), and 2.1(2b)	**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(x). **6.** Upgrade to NX-OS Release 6.2(3).

Table 15 Nondisruptive Upgrade Path to Cisco MDS NX-OS Release 6.2(3) (continued)

Current Release	Nondisruptive Upgrade Path and Ordered Upgrade Steps
Release 2.1(2), 2.1(1b), 2.1(1a), and 2.0(x)	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(x). 7. Upgrade to NX-OS Release 6.2(3).
Release 1.x	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(x). 8. Upgrade to NX-OS Release 6.2(3).

FICON Supported Releases and Upgrade Paths

Cisco MDS NX-OS Release 6.2(3) is not a FICON-certified release.

Table 16 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 16 FICON Supported Releases

FICON Supported Releases	
NX-OS	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 17 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 17 FICON Nondisruptive Upgrade Path

Current Release with FICON Enabled	Upgrade Path
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 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

Follow these general guidelines before you perform a a software downgrade:

- Issue the system **no acl-adjacency-sharing** execute command to disable ACL adjacency usage on Generation 2 and Generation 1 modules. 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 18 for the nondisruptive downgrade path for all SAN-OS releases.
  - **Gigabit Ethernet Ports**: Traffic on Gigabit Ethernet ports is disrupted during a downgrade. This includes IPS modules and the Gigabit Ethernet ports on the MSM-18/4 module, and the MDS 9222i switch. 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 24.

Use Table 18 to determine the nondisruptive downgrade path from Cisco NX-OS Release 6.2(3). 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 18 applies only to Fibre Channel switching traffic. Downgrading system software disrupts IP and intelligent services traffic.

Table 18 Nondisruptive Downgrade Path from NX-OS Release 6.2(3)

To NX-OS or SAN-OS Release	Nondisruptive Downgrade Path and Ordered Downgrade Steps
NX-OS:	
Release 6.2(1), 5.2(1), 5.2(2), 5.2(2a), 5.2(2d), 5.2(6), 5.2(6a), 5.2(6b), and 5.2(8), 5.2(8a), and 5.2(8b)	Downgrade directly from NX-OS Release 6.2(3).
All 5.0(x) releases	1. Downgrade from NX-OS Release 6.2(3). 2. Downgrade to NX-OS Release 5.2(x). 3. Downgrade to NX-OS Release 5.0(x).
All 4.2(x) and 4.1(x) releases	1. Downgrade from NX-OS Release 6.2(3). 2. Downgrade to NX-OS Release 5.2(x). 3. Downgrade to NX-OS Release 5.0(x). 4. Downgrade to NX-OS Release 4.2(x) or 4.1(x).
SAN-OS:	
All 3.3(x) releases	1. Downgrade from NX-OS Release 6.2(3).. 2. Downgrade to NX-OS Release 5.2(x). 3. Downgrade to NX-OS Release 5.0(x). 4. Downgrade to NX-OS Release 4.2(x) or Release 4.1(x). 5. Downgrade to SAN-OS Release 3.3(x).
All 3.2(x), 3.1(x), 3.0(x) releases, and all 2.1(x) releases.	1. Downgrade from NX-OS Release 6.2(3). 2. Downgrade to NX-OS Release 5.2(x). 3. Downgrade to NX-OS Release 5.0(x). 4. Downgrade to NX-OS Release 4.2(x) or Release 4.1(x). 5. Downgrade to SAN-OS Release 3.3(x). 6. Downgrade to SAN-OS Release 3.2(x), Release 3.1(x)., Release 3.0(x), or Release 2.1(x).

Table 18 Nondisruptive Downgrade Path from NX-OS Release 6.2(3)

To NX-OS or SAN-OS Release	Nondisruptive Downgrade Path and Ordered Downgrade Steps
All 2.0(x) releases.	1. Downgrade from NX-OS Release 6.2(3). 2. Downgrade to NX-OS Release 5.2(x). 3. Downgrade to NX-OS Release 5.0(x). 4. Downgrade to NX-OS Release 4.2(x) or Release 4.1(x). 5. Downgrade to SAN-OS Release 3.3(x). 6. Downgrade to SAN-OS Release 2.1(2x). 7. Downgrade to SAN-OS Release 2.0(x).
Release 1.x	1. Downgrade from NX-OS Release 6.2(3). 2. Downgrade to NX-OS Release 5.2(x). 3. Downgrade to NX-OS Release 5.0(x). 4. Downgrade to NX-OS Release 4.2(x) or Release 4.1(x). 5. Downgrade to SAN-OS Release 3.3(x). 6. Downgrade to SAN-OS Release 2.1(2b). 7. Downgrade to SAN-OS Release 1.3(4a). 8. Downgrade to SAN-OS Release 1.x.

FICON Downgrade Paths

Table 19 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 19 FICON Downgrade Path

To Release with FICON Enabled	Downgrade Path
NX-OS Release 4.2(7b)	You can nondisruptively downgrade directly from NX-OS Release 5.2(2)
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).
SAN-OS 3.3(1c)	You can nondisruptively downgrade directly from NX-OS Release 4.1(1c).
SAN-OS 3.2(2c)	First downgrade to SAN-OS Release 3.3(1c) and then downgrade to Release 3.2(2c).
SAN-OS 3.0(3b)	First downgrade to SAN-OS Release 3.3(1c) and then downgrade to Release 3.0(3b).
SAN-OS 3.0(2)	First downgrade to SAN-OS Release 3.3(1c) and then downgrade to Release 3.0(2).

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 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 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 Family 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

- 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

- 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

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 MDS 9148 48-Port Multilayer 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).

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

http://www.cisco.com/en/US/partner/products/ps6029/products_data_sheets_list.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 S/390 and z/900 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 MDS 9148 48-Port Multilayer 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 and on the 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 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(5a):

The following software features are not supported or are changed in Cisco MDS NX-OS Release 6.2(3):

- Fibre Channel Security Protocol (FC-SP) is currently not supported on the Cisco MDS 9710 Director.
- Local switching is not supported on the Cisco MDS 9710 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 9710 Director instead of the OHMS. In Cisco NX-OS Release 6.2(3), the GOLD system does not provide any support for automation of corrective actions such as rebooting modules based on error thresholds.

Cisco NX-OS Release 6.2(3) 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:

FCoE on the Cisco MDS 9710 Director

The Cisco MDS 9710 Director does not support FCoE. However, the following command-line interface (CLI) commands display information about FCoE, even though the FCoE functionality does not work on the Cisco MDS 9710 switch:

- The **show feature-set** command shows fcoe feature-set enabled.
- The **show fcoe** command shows FCoE FCF details.
- In global configuration mode, the **fcf** argument to the **fcoe** command can be modified.
- The **vlan** *vlan-number* command allows the VLAN to be created.
- The **show vlan** command shows VLAN information.

FCoE vlan-vsan map creation through SNMP is allowed.

FCoE can be enabled or disabled through SNMP.

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 the Cisco NX-OS Release 6.2(1).

Fibre Channel Security Protocol (FC-SP) Not Supported

Cisco NX-OS Release 6.2(1) does not support the Fibre Channel Security Protocol (FC-SP) feature only on the Cisco MDS 9710 Director.

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.

Fabric Binding Error Message

When fabric binding is enabled, an error message appears whenever the Mainframe Package license is not installed and also when the grace period is disabled. There is functional impact associated with the error message and the feature is enabled correctly.

IOA Scaling Support on Supervisor-2 Module

In the Cisco MDS NX-OS Release 6.2.3, I/O Accelerator (IOA) scaling is supported only on the Supervisor-2A module and not supported on the Supervisor-2 module.

Caveats

This section lists the open and resolved caveats for this release. Use Table 20 to determine the status of a particular caveat. In the table, “O” indicates an open caveat and “R” indicates a resolved caveat.

Table 20 Open Caveats and Resolved Caveats Reference

DDTS Number	NX-OS Software Release (Open or Resolved)	NX-OS Software Release (Open or Resolved)
	6.2(1)	**6.2(3)**
Severity 2		
CSCub47799	O	R
CSCuc37616	O	R
CSCuc376163	O	R

Table 20 Open Caveats and Resolved Caveats Reference (continued)

DDTS Number	NX-OS Software Release (Open or Resolved)	NX-OS Software Release (Open or Resolved)
	6.2(1)	**6.2(3)**
CSCuf90771	O	R
CSCug01540	O	R
CSCug13649	O	R
CSCug17272	O	R
CSCug22090	O	O
CSCug25141	O	R
CSCug64503	—	R
CSCum21081	O	O
CSCum30306	O	O
CSCum82608	O	O
CSCuo24658	O	O
CSCuq64102	O	O
CSCuq98083	O	O
CSCuw82693	O	O
CSCuu76450	O	O
Severity 3		
CSCtr50223	O	O
CSCts79593	O	R
CSCue15656	O	R
CSCuf54635	O	R
CSCub40020	O	O
CSCuf64822	O	O
CSCug14717	O	R
CSCug69116	O	R
CSCuh49283	—	O
CSCuh49283	O	R
CSCui21601	—	O
CSCul22781	O	O
CSCuw06365	O	O
CSCuv42986	—	O
Severity 4		
CSCtz15893	O	R
CSCuf35479	O	O
CSCuf50037	O	R

Table 20 Open Caveats and Resolved Caveats Reference (continued)

DDTS Number	NX-OS Software Release (Open or Resolved)	NX-OS Software Release (Open or Resolved)
	6.2(1)	**6.2(3)**
CSCva31989	O	O
Severity 6		
CSCud07594	—	O

Resolved Caveats

- CSCub47799

  Symptom: Zone crash or switch reload occurs after renaming an enhanced device-alias.

  Condition: This issue applies to the following NX-OS versions or platform combinations only:

  – The Cisco MDS switches running MDS NX-OS Release 5.2(6), 5.2(6a), 5.2(6b), 5.2(8), 5.2(8a), or 6.2(1).

  – The Cisco Nexus 7000 switches running NX-OS version 6.1(3) or 6.1(4).

  In addition, the following conditions must be true:

  – Device-alias is set to enhanced mode by using the **device-alias mode enhanced** command.

  – Multiple commands are performed on the same device-alias before a commit and one of which is the **rename** command.

Note This issue occurs in both zone mode basic and zone mode enhanced.

  Workaround: This issue is resolved.

- CSCuc37616

  Symptom: The SNMPD process crashes with the following error:

  ```
  KERN-2-SYSTEM_MSG  [ 7920.428773] mts_is_q_space_available_new(): NO SPACE
  ```

  This situation occurs when the message and transaction service (MTS) messages flows are piled up at a faster rate than the SNMPD server can process.

  Workaround: This issue is resolved.

- CSCuc376163

  Symptom: Nexus 7000 may experience a crash at the snmpd process.

  Condition: MTS buffers may leak and after a few minutes, triggers snmpd to crash.

  KERN-2-SYSTEM_MSG [7920.428773] mts_is_q_space_available_new(): NO SPACE

  Workaround: None

- CSCud61263

  Symptom: A Cisco MDS 9000 switch can experience a memory issue leading to unexpected reload when polling for transceiver information which is part of ENTITY-SENSOR-MIB.

  Condition: This situation occurs during the SNMP polling for ENTITY-SENSOR-MIB.

  Workaround: This issue is resolved.

- CSCuf90771

  Symptom: Links go down and they do not recover; modules display the following error:

  ```
  Error Description : TBIRD_FWD_EBM_0_RO_INT_CAM_FULL_ERR ...
  ```

  Condition: This issue rarely occurs and only occurs with Cisco MDS Generation 4 modules. In some cases, a link sync loss between a Generation 4 module and the fabric switching module might cause congested ports. This might lead the peer devices on the ports trying to reset the links and go down.

  Workaround: Reset any Cisco MDS Generation 4 module that displays this error.

- CSCug01540

  Symptom: The VSH process fails when the line length is greater than 471 characters.

  Condition: This issue occurs if the line length configured in the scheduler is greater than 471 characters.

  Workaround: This issue is resolved.

- CSCug13649

  Symptom: Bootflash files cannot be copied from the switch to the TFTP server using Device Manager.

  This symptom might be seen on the Cisco MDS 9513. When it occurs, SNMP immediately returns 14 (deviceBusy). When it occurs on the Cisco MDS 9710, SNMP immediately returns 2 (success).

  Workaround: This issue is resolved.

- CSCug17272

  Symptom: You cannot use Cisco Data Center Network Manager (DCNM) to configure a Data Mobility Manager (DMM) job.

  Condition: This situation occurs when if you use DCNM Release 6.2.1 to configure a DMM job.

  Workaround: This issue is resolved.

- CSCug25141

  Symptom: The power consumption displayed in the output of the **show environment power** command is different than the actual power consumption. The command output shows a higher value than the actual value.

  Condition: This symptom might be seen under normal operating conditions for the Cisco MDS 9710 switch.

  Workaround: This issue is resolved.

- CSCug64503

  One of the following type of exceptions are logged in the module exception log:

  ```
  TBIRD_FWD_EBM_0_BASE_A_ECC_1ERR
  TBIRD_FWD_EBM_0_BASE_B_ECC_1ERR
  TBIRD_FWD_EBM_1_BASE_A_ECC_1ERR
  TBIRD_FWD_EBM_1_BASE_B_ECC_1ERR
  ```

  If the TACACS accounting is enabled, the following messages are displayed in the syslog:

  ```
  %TACACS-3-TACACS_ERROR_MESSAGE: All servers failed to respond
  %AAA-1-AAA_SESSION_LIMIT_REJECT: aaa request rejected as maximum aaa sessions are in
  progress
  ```

Condition: This issue occurs only in Cisco MDS DS-X9232-256K9 and DS-X9248-256K9 modules. You can see the AAA message only if the AAA command authorization is configured.

Workaround: This issue is resolved.

- CSCtz15893

  Symptom: Logs for Cisco MDS Generation 4 Fibre Channel switching module DS-X9232-259K9 and DS-X9248-256K9 are displayed in a format that does not identify the specific interface.

  Condition: This situation occurs only for the DS-X9232-259K9 and DS-X9248-256K9 Fibre Channel switching modules.

  Workaround: This issue is resolved.

- CSCug69116

  Symptom: Several types of Embedded Event Manager (EEM) events on Cisco MDS Fibre Channel switching modules fail to be logged on the supervisor.

  Condition: This situation occurs only for events that originate from the Cisco MDS DS-X9232-256K9 and DS-X9248-256K9 switching modules.

- CSCts79593

  Workaround: This issue is resolved.

  Symptom: The operational status of a virtual storage area network (VSAN) is displayed as Down.

  Condition: This issue occurs when one of these conditions is met:

  – After the suspend and no suspend command for a VSAN, which is carried on an E port.

  – In the VSAN 1, without any trigger, the F ports associated to the VSAN 1 go Down.

  Workaround: This issue is resolved.

- CSCuf54635

  Symptom: When both the Enterprise Package and the Mainframe Package licenses are installed and the fabric binding feature is enabled, the standby supervisor module goes into a failure state.

  Condition: This situation occurs only when both the MAINFRAME and ENTERPRISE license are installed.

  Workaround: This issue is resolved.

- CSCue15656

  Symptom: After performing an SNMP set operation to the CONFIG-COPY-MIB from Cisco Datacenter Network Manager (DCNM), polling the ccCopyState OID returns successful even if the operation fails.

  Condition: This situation occurs during the config copy operation to a TFTP server.

  Workaround: This issue is resolved.

- CSCuf64822

  Symptom: The DCBX local information shows LLS DCBX registration when a port is in the shut state:

```
Local DCBXP Control information:
Operation version: 00  Max version: 00  Seq no: 1  Ack no: 0
Type/
Subtype    Version    En/Will/Adv Config
006/001     000        Y/N/Y      80
```

  In this example 006/001 is the LLS TLV.

In general, all the other DCBX features are deregistered on a port down and this symptom is not seen in the DCBX output. However, the LLS is not deregistered when a port is shut, and therefore it keeps appearing in the output.

Condition: This situation occurs after a switchover or module reload.

Workaround: This issue is resolved.

- **CSCuf50037**

  Symptom: Duplicate entries of the IP hosts are displayed when the ow startup-config command is entered

  Condition: This situation occurs during a normal operation.

  Workaround: This issue is resolved.

Open Caveats

- CSCva23262

  Symptom: The command-line interface (CLI) service crashes multiple times after a reload of the supervisor, triggering another supervisor reload. **show logging nvram** command shows the following syslog messages:

  %SYSMGR-2-SERVICE_CRASHED: Service CLIs have not caught signal 11 (core will be saved).
  %USER-2-SYSTEM_MSG: Failed to initialize CLI server - CLIs **show system reset-reason** command shows the following reason:

  – Reason: Reset triggered due to HA policy of Reset

  – Service: CLIs hap reset

  No core files are actually saved.

  Workaround: Remove "feature fcrxbbcredit extended" before ISSU and reconfigure it after ISSU.

- CSCug22090

  Symptom: When an ISSU occurs from Cisco NX-OS Release 5.2(6b) to Release 6.2(1), LLDP CLI commands are not available. In this situation, LLDP is running and traffic is flowing normally even after the ISSU, but the CLI commands are not available.)

  This symptom might be seen when **feature-set fcoe** was enabled on the original image, and **feature lldps** commands were working in the original image. Following the ISSU to Cisco NX-OS Release 6.2.1 image, the commands are not available.

  Workaround: Following the ISSU, enter the **feature lldp** command on the switch to make the LLDP commands available on the switch.

  ```
  switch(config)# feature lldp
  switch(config)# show lldp ?
  ```

- CSCum21081

  Symptom: When Cisco MDS switches are upgraded to or running Cisco MDS NX-OS Software Release 6.2(1) or 6.2(3), the Fibre Channel over IP (FCIP) tunnel throughput is reduced considerably. Devices that use these FCIP tunnels might experience latency issues and application outages.

  Condition: This issue applies to FCIP tunnels on 16-Port Storage Services Node (SSN16) (DS-X9316-SSNK9) modules only.

  Workaround: You must upgrade to Cisco MDS NX-OS Release 6.2(5).

More Information: This issue not seen on Cisco MDS 9000 Family 18/4-Port Multiservice Module (DS-X9304-18K9).

- CSCuo24658

  Symptom: After a switch upgrade to NX-OS 6.2(1) or later, a previously working AAA authenticated user who is configured for non network-operator privileges (such as network-admin) only receives network-operator privileges. This user is no longer able to configure the switch via CLI or SNMP.

  The CLI user will show as having 'network-operator' role:

```
switch# show user-account fieldsupport
user:fieldsupport
        roles:network-operator
```

  If the SNMP user exists, it will show as having 'network-operator' role:

```
switch# show snmp user fieldsupport
_____________________________________________________________________
                    SNMP USERS
_____________________________________________________________________
User                 Auth  Priv(enforce) Groups
____                 ____  ______________ ______
fieldsupport         md5   des(no)       network-operator
```

  Condition: This issue only affects logins that meet all of the following conditions:

  1) are logins to MDS switches

  2) are authenticated remotely via RADIUS

  3) have multiple vendor-specific attributes (VSAs) defined as a single Cisco-AV Pair, for example, shell and SNMP version 3 settings:

```
shell:roles="operations-user fieldsupport" snmpv3:auth=SHA priv=AES-128
```

  This issue does not occur if the 'shell:roles' VSA is defined alone (even with multiple roles assigned).

  Workaround: On the AAA server, create a separate RADIUS policy for NX-OS 6.2(x) users that splits Cisco-AV Pairs into true attribute pairs. For example:

```
Cisco-AVPair #1:  shell:roles="operations-user fieldsupport
Cisco-AVPair #2:  snmpv3:auth=SHA priv=AES-128
```

  Assign this policy conditionally on the requesting RADIUS client IP address (that is, a Cisco MDS switch mgmt0 IP address). Continue to use the original policy with the old format for RADIUS authentication requests from switches running NX-OS earlier than 6.2(1).

  If the RADIUS server does not support conditional assignment of policies by RADIUS client IP address then an alternate method is possible. Create a local user on the switch with local role assignment which will override the remotely supplied role using the following commands:

```
switch(config)# no username <userid>
switch(config)# username <userid> password ! role fieldsupport
```

  Further Problem Description: This issue was introduced in NX-OS release 6.2(1) due to changes to make RADIUS VSA handling consistent across NX-OS platforms.

- CSCuq98083

Symptom: An FCSP-ESP enabled (encrypted) port that was working fails to come up after ISSU/ISSD followed by link flap.

Condition: This issue only affects FCSP encrypted ports on MDS 9700 DS-X9448-768K9 and MDS 9500 DS-X9248-256K9 and DS-X9232-256K9 switching modules after an ISSU or ISSD to an affected version of NX-OS.

Workaround: Only a switch reload will recover from this situation. The switch must be running a fixed release of NX-OS (NX-OS 6.2(11) or above) before the reload to prevent the issue from recurring after recovery.

None of the following steps alone will not recover the port functionality:

- Shut/no-shut the affected port.
- Reloading the affected linecard.
- Removing the FCSP configuration and re-configuring FCSP.
- Upgrading to NX-OS 6.2(11) or above.

- CSCtr50223

  Symptom: On the MDS 9513 switch, when an MSM-18/4 module boots up, it sends a request to the supervisor module to mount the modflash on the MSM-18/4 module. If there is a timeout or error in response, the following syslog message displays:

  ```
  2011 Jul 14 01:18:13 sw-dc5-br2-12 %LC_MNT_MGR-SLOT3-2-LC_MNT_MGR_ERROR: SUP mount
  failed. MTS receive timedout
  2011 Jul 14 01:19:06 sw-dc5-br2-12 %PROC_MGR-SLOT3-2-ERR_MSG: ERROR: PID 1144
  (lc_mnt_mgr) exited abnormally, exit status (0xa)
  2011 Jul 14 01:19:06 sw-dc5-br2-12 %MODULE-2-MOD_MINORSWFAIL: Module 3 (serial:
  JAE1141ZB43) reported a failure in service lc_mnt_mgr
  ```

  This issue might be seen when the supervisor module is unusually busy and cannot process the mount request from the MSM-18/4 module, or the actual mount command on the supervisor takes a long time.

  Workaround: Reload the MSM-18/4 module in the same slot/module where the modflash mount failed. A request will be sent to the supervisor to mount the modflash.

- CSCub40020

  Symptom: After an In Service Software Upgrade (ISSU), In Service Software Downgrade (ISSD), or supervisor switchover, devices fail to FLOGI into the switch, and the following error is logged in the syslog:

  ```
  %FLOGI-1-MSG_FLOGI_REJECT_FCID_ERROR after upgrade/switchover
  ```

  Condition: This situation occurs if one or all of the following occur:

  1. The Max flogi key is greater than 65535. The key can get this high if there are repeated FLOGIs on an interface. After the key exceeds 65535, this issue occurs. However, this situation does not impact end devices.
  2. If a supervisor switchover, such as ISSU, ISSD, or system switchover occurs when the key is greater than 65535, Fibre Channel Identifiers (FC IDs) can be dropped from the FLOGI table. The end devices continue to function normally until they are logged out and then attempt to relogin.
  3. If after both 1 and 2 above have occurred and then an end device is rebooted on the affected interface, that end device might not be able to log back in.

Workaround: You must first resolve the issue with the device on the interface with the Max flogi key over 65535, such as FLOGI rejects or port security, to prevent the FLOGI key from incrementing.

If the Max flogi key value is greater than 65535 before any supervisor switchover, ISSU, or ISSD, use the **shutdown** and then **no shutdown** command on the interface. Consequently, the Max flogi key value must be checked before any supervisor switchover. However, if the supervisor switchover has already occurred and logging in are failing, you must follow either of these steps:

- Contact Cisco TAC to implement a nondisruptive recovery. This requires special files not accessible to customers.
- Suspend the VSAN and wait for 5 minutes and then unsuspend the VSAN of the affected devices on the switch. This action is disruptive to all devices in that VSAN connected to this switch.

More Information: For detailed information about this issue, see the General Upgrading Guidelines, page 18**.**

- CSCug14717

  Symptom: If beaconing is configured on some ports, they might stop blinking after a supervisor switchover or module reload.

  Condition: This might be seen following a supervisor switchover or module reload.

  Workaround: None.

- CSCuh49283

  Symptom: One of the symptoms are observed:

  - A zone member goes offline.
  - ARegistered State Change Notification (RSCN) is not sent to zone members.
  - The device-mapping entry, port world wide name (pWWN) associated to a device alias is not displayed in the Dynamic Port VSAN Membership (DPVM) database
  - The **show running-configuration ivr** command does not display the changes when a device alias member in an Inter-VSAN routing zone (IVR zone) is renamed.
  - The port world wide name (pWWN) associated with the device alias is found dissociated in the port security database.
  - Adevice alias member is not found in the port security database.

  Condition: This situation occurs when all or one of the conditions is met:

  - A user attempts to perform a device-alias operation in batch, such as renaming an offline device alias to an existing online device alias or vice versa.
  - A device alias was renamed.
  - A device alias was deleted and an existing device alias is renamed to the deleted device alias in the same commit.
  - A device alias, which is not configured, resides in the DPVM database and an online device is renamed to the former.
  - The IVR distribute option is enabled and the device alias is in enhanced mode, and the changes in a device alias is not updated to the IVR running configuration.

  Workaround: Add the offline member to the device alias database, revert to the previous name if you have renamed a device alias, and flap the ports that are connected to the affected zone member.

- CSCui16928

Symptom: Although the http-server feature is enabled by default, Element Manager cannot be downloaded.

Condition: This situations occurs on the Cisco MDS 9710 Director running MDS NX-OS Release 6.2(3) software.

Workaround: You must enable the http-server by using the **feature http-server** command.

- **CSCui21601**

  Symptom The Cisco MDS 9710 Director does not allow a copy running saving configurations and a switch reload operation.

  Condition: Active Fibre Channel Redirect (FC-Redirect) configurations are present in Cisco MDS 9710 Director.

  Workaround: Remove the MDS 9710 Director from the fabric.

- CSCuf35479

  Symptom: The “Bad IPv6 host address” error appears when the snmp-server hostname is configured instead of the IP address. This issue occurs when the domain name and the name-server IP address are configured.

  Workaround: Configure the IP addresses instead of the host name.

- CSCud07594

  Symptom: In a virtual SAN (VSAN), the Inter-switch Link (ISL) might fail after entering the **suspend** command followed by the **no suspend** command.

  Condition: This situation occurs if the **no suspend** command is entered after a VSAN suspend operation.

  Workaround: After entering the **suspend** command, wait 10 to 15 at least 5 minutes and then use the no suspend command.

- CSCum82608

  Symptom: The full zoneset database in one or more VSANs may be empty after a supervisor switchover.

  Conditions: This issue only occurs after the supervisors fail over or a user-initiated switch over occurs (but not an in service switchover situation, ie ISSU/ISSD). The precondition is created before the switchover by activating zone changes (such as adding or removing zones from a zoneset) and is more likely to occur on systems with very large zone configurations.

  The symptom described here can occur if zones are modified while a switch is running any NX-OS release 5.2(2) to 5.2(8c) (inclusive), and 6.2(1) to 6.2(5) (inclusive).

  Workaround: To recover from this condition follow these steps:

  1.

  [i] If the full zoneset db for the affected VSAN contains multiple zonesets (ie, inactive zonesets) follow these steps:

  a. add dummy zone to any zoneset in the full zoneset db for the vsan on a *neighbouring* switch, and then

  b. if zoning mode is basic distribute the change or if the zoning mode is enhanced commit the change, and then

  c. the dummy zone may be removed now and the zoneset redistributed/recommitted.

  [ii] If the full zoneset db for the affected VSAN contains only a single zoneset (ie, no inactive zonesets) follow these steps:

a. copy the active zoneset db to the full zoneset db on the *affected* switch (it is only necessary to copy zonesets for VSANs that have empty databases), For example:

```
switch# zone copy active-zoneset full-zoneset vsan 1-4093
```

2. In both cases, save the config on the *affected* switch after step 1, For example:

```
switch# copy running start
```

To recover from condition 2 (isolated ISL) contact Cisco TAC for assistance.

- CSCul22781

  Symptom: After a supervisor switchover, a subsequent ISL flap results in one or more VSAN becoming isolated on the ISL.

  Conditions: These issues only occur in situations after the supervisors fail over or a user-initiated switch over ocuurs (but not an in service switchover situation, ie ISSU/ISSD). The preconditions are created before the switchover by activating zone changes (such as adding or removing zones from a zoneset) and is more likely to occur on systems with very large zone configurations.

  The symptoms described here can occur if zones are modified while a switch is running any NX-OS release 5.2(2) to 5.2(8c) (inclusive), and 6.2(1) to 6.2(5) (inclusive).

- CSCum30306

  Symptom: The security service crashes when configuring an SSH authentication key.

  Configuring SSH keys multiple times within 10 minutes results in a HAP reset that resets the active supervisor.

  Condition: This issue intermittently occurs when configuring an SSH authentication key.

  Workaround: To avoid the supervisor reset, do not configure more than 2 SSH keys per 10 minutes.

- CSCuq64102

  Symptom: The RSCN or ZONE service crashes with the following syslog message:

  ```
  %SYSMGR-2-SERVICE_CRASHED: Service "rscn" (PID 5405) hasn't caught signal 11 (core
  will be saved).
  or
  %SYSMGR-2-SERVICE_CRASHED: Service "zone" (PID 5430) hasn't caught signal 6 (core will
  be saved)
  ```

  A Cisco MDS 9700 switch can incur a switchover, however in most cases, the crash occurs again before the standby is available and the dual supervisor switch will reload.

  For Example:

  ```
  show system reset-reason
  ----- reset reason for Supervisor-module 5 (from Supervisor in slot 5) ---
  1) At 161169 usecs after Thu Dec dd hh:mm:ss 2014
      Reason: Reset triggered due to HA policy of Reset
      Service: rscn hap reset
  ...
  ----- reset reason for Supervisor-module 6 (from Supervisor in slot 6) ---
  1) At 422003 usecs after Thu Dec dd hh:mm:ss 2014
      Reason: Reset triggered due to HA policy of Reset
      Service: rscn hap reset.
  ```

  Condition: This issue occurs only when "port" format RSCNs are configured and an RSCN is sent on the relevant VSAN. RSCNs are sent, for example, after activating zoneset changes or a link changing state. Further, only the following platforms are affected:

  Cisco MDS 9710 Switch

Cisco MDS 9706 Switch

Cisco Nexus 7000 Switch

Cisco Nexus 7710 Switch

This issue does not occur when RSCNs are sent with "fabric" format.

Workaround: Use the default RSCN address format by removing the following lines from the switch configuration:

no zone rscn address-format port vsan

Note that some end devices may not support receiving RSCNs in this format.

Further Problem Description: This wrong data is constructed by the zone server. It can corrupt its own heap while creating the payload to put into MTS.

The crash can be either in the zone server or RSCN. It is just which module runs into the issue first. The fix that went in is to prevent both.

- CSCuw82693

  Symptom: An ISL connected over a DWDM path does not reach link up state.

  Condition: This issue only applies to MDS 9700 DS-X9448-768K9 modules used with some DWDM vendors.

  Workaround: None.

  Further Problem Description: **show interface** shows the link in "Link failure or not-connected" with OLS/LRR and NOS increasing in both directions.

- CSCuw06365

  Symptom: An ISL does not initialize quickly across a DWDM connection. The link can take minutes, hours or even days to connect. Once connected, it is stable.

  Condition: This issue only applies to DS-X9248-256K9 and DS-X9232-256K9 modules when connecting an ISL over a Tellabs 7100 DWDM path.

  Workaround: None.

  Further Problem Description: **show interface** shows the link in "Link failure or not-connected" with OLS/LRR and NOS increasing in both directions.

- CSCuv42986

  Symptom: Callhome stops working and callhome tests fail.

  Condition: Only destination profiles of full_txt are configured.

  Workaround: To prevent from hitting this defect, configure an additional destination profile that is either short_txt or XML.

  To recover from this defect after it has already been hit, perform a system switchover or reload the switch.

- CSCuu76450

  Symptom: MDS fabric switch running in NPV mode fails to generate port-monitor alerts.

  Condition: Applies to all MDS fabric switches running in NPV mode using port-monitor.

  Applies to all versions prior to NX-OS 6.2(13).

  Will occur only in the following conditions:

  - After one or more upstream NP or TNP ports goes down and then back up.

- For each (T)NP port that flaps, one F port at the end of the range of ports

will no longer be scanned for port-monitor counter events. For example, if the

(T)NP port fc1/1 flaps then the last F port being used(ex. fc1/48) will no

longer be scanned for port-monitor counter events.

Workaround: There are two workarounds, one temporary and one permanent:

1 - Contact the TAC and they can assist with killing the port-monitor process. Once the port-monitor process restarts, all ports will be once again scanned.

This is only temporary in the sense that if an upstream (T)NP port flaps again the problem will recur

2 - Move the (T)NP ports to the end of the ports on the switch. For example, if there are four (T)NP uplinks on a MDS 9148 or MDS 9148S, then move them to fc1/45-fc1/48. Once this has been done the problem will not recur.

Further Problem Description: The fix is integrated into NX-OS 6.2(13) and later versions.

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

- *Cisco MDS 9000 Family Release Notes for Cisco MDS NX-OS Releases*
- *Cisco MDS 9000 Family Release Notes for MDS SAN-OS Releases*
- *Cisco MDS 9000 Family Release Notes for Storage Services Interface Images*
- *Cisco MDS 9000 Family Release Notes for Cisco MDS 9000 EPLD Images*

Regulatory Compliance and Safety Information

- *Regulatory Compliance and Safety Information for the Cisco MDS 9000 Family*

Compatibility Information

- *Cisco Data Center Interoperability Support Matrix*
- *Cisco MDS 9000 NX-OS Hardware and Software Compatibility Information and Feature Lists*
- *Cisco MDS NX-OS Release Compatibility Matrix for Storage Service Interface Images*
- *Cisco MDS 9000 Family Switch-to-Switch Interoperability Configuration Guide*

Hardware Installation

- *Cisco MDS 9710 Director Hardware Installation Guide*
- *Cisco MDS 9500 Series Hardware Installation Guide*
- *Cisco MDS 9500 Series Supervisor-2A Tech Note*
- *Cisco MDS 9200 Series Hardware Installation Guide*
- *Cisco MDS 9100 Series Hardware Installation Guide*

Software Installation and Upgrade

- *Cisco MDS 9000 NX-OS Software Upgrade and Downgrade Guide*

Cisco NX-OS Configuration Guides

- *Cisco MDS 9000 Family NX-OS Licensing Guide*
- *Cisco MDS 9000 Family NX-OS Fundamentals Configuration Guide*
- *Cisco MDS 9000 Family NX-OS System Management Configuration Guide*
- *Cisco MDS 9000 Family NX-OS Interfaces Configuration Guide*
- *Cisco MDS 9000 Family NX-OS Fabric Configuration Guide*
- *Cisco MDS 9000 Family NX-OS Quality of Service Configuration Guide*
- *Cisco MDS 9000 Family NX-OS Security Configuration Guide*
- *Cisco MDS 9000 Family NX-OS IP Services Configuration Guide*
- *Cisco MDS 9000 Family NX-OS Intelligent Storage Services Configuration Guide*
- *Cisco MDS 9000 Family NX-OS High Availability and Redundancy Configuration Guide*
- *Cisco MDS 9000 Family NX-OS Inter-VSAN Routing Configuration Guide*

Command-Line Interface

- *Cisco MDS 9000 Family Command Reference*

Intelligent Storage Networking Services Configuration Guides

- *Cisco MDS 9000 I/O Acceleration Configuration Guide*
- *Cisco MDS 9000 Family SANTap Deployment Guide*
- *Cisco MDS 9000 Family Data Mobility Manager Configuration Guide*
- *Cisco MDS 9000 Family Storage Media Encryption Configuration Guide*

Troubleshooting and Reference

- *Cisco NX-OS System Messages Reference*
- *Cisco MDS 9000 Family NX-OS Troubleshooting Guide*
- *Cisco MDS 9000 Family NX-OS MIB Quick Reference*
- *Cisco MDS 9000 Family NX-OS SMI-S Programming Reference*

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.

This document is to be used in conjunction with the documents listed in the "Obtaining Documentation and Submitting a Service Request" section.