

Interoperability Matrix for MDS 9000 Products

First Published: 2016-02-01

Last Modified: 2026-04-27

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

THE SPECIFICATIONS AND INFORMATION REGARDING THE PRODUCTS IN THIS MANUAL ARE SUBJECT TO CHANGE WITHOUT NOTICE. ALL STATEMENTS, INFORMATION, AND RECOMMENDATIONS IN THIS MANUAL ARE BELIEVED TO BE ACCURATE BUT ARE PRESENTED WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED. USERS MUST TAKE FULL RESPONSIBILITY FOR THEIR APPLICATION OF ANY PRODUCTS.

THE SOFTWARE LICENSE AND LIMITED WARRANTY FOR THE ACCOMPANYING PRODUCT ARE SET FORTH IN THE INFORMATION PACKET THAT SHIPPED WITH THE PRODUCT AND ARE INCORPORATED HEREIN BY THIS REFERENCE. IF YOU ARE UNABLE TO LOCATE THE SOFTWARE LICENSE OR LIMITED WARRANTY, CONTACT YOUR CISCO REPRESENTATIVE FOR A COPY.

The Cisco implementation of TCP header compression is an adaptation of a program developed by the University of California, Berkeley (UCB) as part of UCB's public domain version of the UNIX operating system. All rights reserved. Copyright © 1981, Regents of the University of California.

NOTWITHSTANDING ANY OTHER WARRANTY HEREIN, ALL DOCUMENT FILES AND SOFTWARE OF THESE SUPPLIERS ARE PROVIDED “AS IS" WITH ALL FAULTS. CISCO AND THE ABOVE-NAMED SUPPLIERS DISCLAIM ALL WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING, WITHOUT LIMITATION, THOSE OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NONINFRINGEMENT OR ARISING FROM A COURSE OF DEALING, USAGE, OR TRADE PRACTICE.

IN NO EVENT SHALL CISCO OR ITS SUPPLIERS BE LIABLE FOR ANY INDIRECT, SPECIAL, CONSEQUENTIAL, OR INCIDENTAL DAMAGES, INCLUDING, WITHOUT LIMITATION, LOST PROFITS OR LOSS OR DAMAGE TO DATA ARISING OUT OF THE USE OR INABILITY TO USE THIS MANUAL, EVEN IF CISCO OR ITS SUPPLIERS HAVE BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

Any Internet Protocol (IP) addresses and phone numbers used in this document are not intended to be actual addresses and phone numbers. Any examples, command display output, network topology diagrams, and other figures included in the document are shown for illustrative purposes only. Any use of actual IP addresses or phone numbers in illustrative content is unintentional and coincidental.

All printed copies and duplicate soft copies of this document are considered uncontrolled. See the current online version for the latest version.

Cisco has more than 200 offices worldwide. Addresses and phone numbers are listed on the Cisco website at www.cisco.com/go/offices.

Cisco and the Cisco logo are trademarks or registered trademarks of Cisco and/or its affiliates in the U.S. and other countries. To view a list of Cisco trademarks, go to this URL: https://www.cisco.com/c/en/us/about/legal/trademarks.html. Third-party trademarks mentioned are the property of their respective owners. The use of the word partner does not imply a partnership relationship between Cisco and any other company. (1721R)

© 2016–2026 Cisco Systems, Inc. All rights reserved.



CONTENTS

Full Cisco Trademarks with Software License ?

PREFACE

Preface v

Audience v

Document Conventions v

Documentation Feedback vii

Related Documentation vii

Communications, Services, and Additional Information vii

CHAPTER 1

New and Changed Information 1

Change Summary 1

CHAPTER 2

Switch Interoperability Matrix 3

Cisco MDS 9000 Series Switches and Cisco Nexus 9000/7000/5000 Series Switches 3

Cisco MDS and Third-Party Switch Compatibility Matrix 6

CHAPTER 3

Host Interoperability Matrix 9

HBA, CNA, and Operating System support 9

CHAPTER 4

Storage Interoperability Matrix 15

OSM Information 15

CHAPTER 5

DWDM Interoperability Matrix 33

DWDM Information 33

CHAPTER 6

Transceiver Interoperability Matrix 35

Transceiver Information 35

CHAPTER 7 **Fabric Services Interoperability Matrix 39**

EMC 39

FC-IP SAN Extension 40

IOA/FCIP Write Acceleration 41



Preface

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

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

Audience

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

Document Conventions

Command descriptions use these conventions:

Convention	Description
bold	Bold text indicates the commands and keywords that you enter literally as shown.
Italic	Italic text indicates arguments for which the user supplies the values.
[x]	Square brackets enclose an optional element (keyword or argument).
[x | y]	Square brackets enclosing keywords or arguments separated by a vertical bar indicate an optional choice.
{x | y}	Braces enclosing keywords or arguments separated by a vertical bar indicate a required choice.

Convention	Description
[x {y | z}]	Nested set of square brackets or braces indicate optional or required choices within optional or required elements. Braces and a vertical bar within square brackets indicate a required choice within an optional element.
`variable`	Indicates a variable for which you supply values, in context where italics cannot be used.
string	A nonquoted set of characters. Do not use quotation marks around the string or the string will include the quotation marks.

Examples use these conventions:

Convention	Description
`screen font`	Terminal sessions and information the switch displays are in screen font.
`boldface screen font`	Information you must enter is in boldface screen font.
italic screen font	Arguments for which you supply values are in italic screen font.
< >	Nonprinting characters, such as passwords, are in angle brackets.
[ ]	Default responses to system prompts are in square brackets.
!, #	An exclamation point (!) or a pound sign (#) at the beginning of a line of code indicates a comment line.

This document uses the following conventions:



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



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



Warning IMPORTANT SAFETY INSTRUCTIONS

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

SAVE THESE INSTRUCTIONS

Documentation Feedback

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

Related Documentation

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

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

Documentation Roadmap

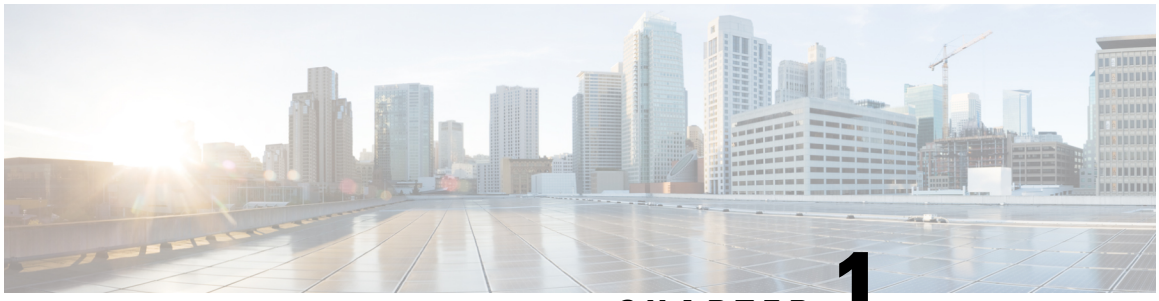
https://www.cisco.com/c/en/us/td/docs/storage/san_switches/mds9000/roadmaps/rel90.html

Communications, Services, and Additional Information

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

Cisco Bug Search Tool

Cisco Bug Search Tool (BST) is a web-based tool that acts as a gateway to the Cisco bug tracking system that maintains a comprehensive list of defects and vulnerabilities in Cisco products and software. BST provides you with detailed defect information about your products and software.



CHAPTER 1

New and Changed Information

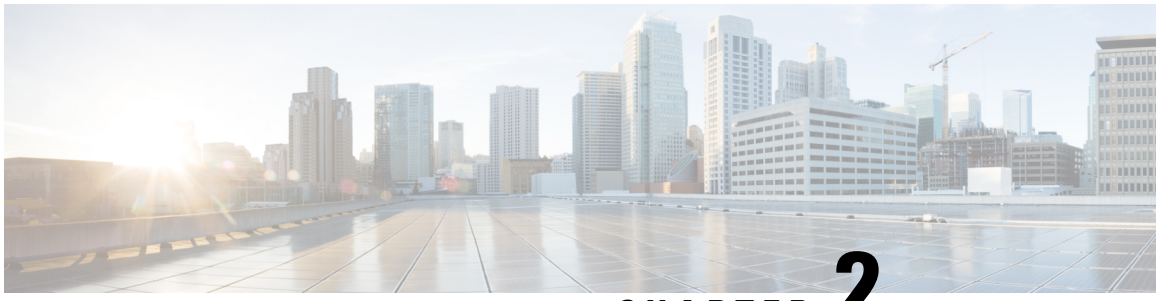
The following tables summarize the new and changed information in this document, and shows the releases in which each feature is supported. Your software release might not support all the features in this document. For the latest caveats and feature information, see the Bug Search Tool at https://bst.cloudapps.cisco.com/bugsearch and the release notes for your software release.

- Change Summary, on page 1

Change Summary

Table 1: Feature History for Interoperability Matrix

Date	Description	Where Documented
June 16, 2026	Updated the guide with structural improvements, and removal of obsolete information.	—
May 6, 2026	Added Interoperability information for ADTRAN/ADVA for FSP3000	Cisco MDS 9000 Series Switches and Cisco Nexus 9000/7000/5000 Series Switches, on page 3
March 4, 2026	Updated Interoperability Matrix for Release 9.4(5)	—
August 8, 2025	Updated Interoperability Matrix for Release 9.4(4)	—



CHAPTER 2

Switch Interoperability Matrix

This chapter lists the devices tested by Cisco Solution-Interoperability Engineering group (iLAB) for switch interoperability and lists firmware versions and software versions.

This matrix is created based on the configurations that Cisco has successfully tested. If some configuration is not listed in this document, it does not mean that they do not work. It only means that the configuration was not officially tested by Cisco. Cisco TAC supports only the Cisco qualified configurations. For more information, contact your local Cisco representative.

- Cisco MDS 9000 Series Switches and Cisco Nexus 9000/7000/5000 Series Switches, on page 3
- Cisco MDS and Third-Party Switch Compatibility Matrix, on page 6

Cisco MDS 9000 Series Switches and Cisco Nexus 9000/7000/5000 Series Switches

The following tables list the Cisco NX-OS software releases that support Cisco MDS 9000 Series switches, Cisco Nexus 9000 Series switches, Cisco Nexus 7000 Series switches, Cisco Nexus 5000 Series switches. For Cisco MDS products, we recommend that customers refer to the Recommended Releases for Cisco MDS 9000 Series Switches document for NX-OS release for both new and existing deployments.

Table 2: Cisco NX-OS Releases Supported on Cisco MDS 9000 Series Switches, Cisco Nexus 9000 Series Switches, Cisco Nexus 7000 Series Switches, and Cisco Nexus 5000 Series Switches

Cisco MDS and Nexus Switches	Cisco NX-OS Releases
Cisco MDS 9706[1], 9710, and 9718[2] switches	9.4(5a), 9.4(5), 9.4(4), 9.4(3b), 9.4(3a), 9.4(3), 9.4(2a), 9.4(1a), 9.4(1)
	9.3(2a), 9.3(2), 9.3(1)
	9.2(2), 9.2(1a), 9.2(1)
	8.5(1)
	8.4(2f), 8.4(2e), 8.4(2d), 8.4(2c), 8.4(2b), 8.4(2a), 8.4(2), 8.4(1a), 8.4(1)
	8.3(2), 8.3(1)
	8.2(2), 8.2(1)
	8.1(1b), 8.1(1a), 8.1(1)
	7.3(1)DY(1), 7.3(0)DY(1), 7.3(1)D1(1), 7.3(0)D1(1)
Cisco MDS 9250i switch	9.4(5a), 9.4(5), 9.4(3b), 9.4(3a), 9.4(3), 9.4(2a), 9.4(1a), 9.4(1)
	9.3(2a), 9.3(2), 9.3(1)
	9.2(1a)
	8.5(1)
	8.4(2f), 8.4(2e), 8.4(2d), 8.4(2c), 8.4(2b), 8.4(2a), 8.4(2), 8.4(1a), 8.4(1)
	8.3(2), 8.3(1)
	8.2(2), 8.2(1)
	8.1(1b), 8.1(1a), 8.1(1)
	7.3(1)DY(1), 7.3(0)DY(1), 7.3(1)D1(1), 7.3(0)D1(1)
Cisco MDS 9220i switch	9.4(5a), 9.4(5), 9.4(3b), 9.4(3a), 9.4(3), 9.4(2a), 9.4(1a), 9.4(1)
	9.3(2a), 9.3(2), 9.3(1)
	9.2(2), 9.2(1a), 9.2(1)
	8.5(1)

Cisco MDS and Nexus Switches	Cisco NX-OS Releases
Cisco MDS 9148S and 9396S[3] switches	9.4(5a), 9.4(5), 9.4(3b), 9.4(3a), 9.4(3), 9.4(2a), 9.4(1a), 9.4(1)
	9.3(2a), 9.3(2), 9.3(1)
	9.2(1a)
	8.5(1)
	8.4(2f), 8.4(2e), 8.4(2d), 8.4(2c), 8.4(2b), 8.4(2a), 8.4(2)
	8.3(2), 8.3(1)
	8.2(2), 8.2(1)
	8.1(1b), 8.1(1a), 8.1(1)
	7.3(1)DY(1), 7.3(0)DY(1), 7.3(1)D1(1), 7.3(0)D1(1)
Cisco MDS 9132T, 9148T[4], and 9396T[5] switches	9.4(5a), 9.4(5), 9.4(3b), 9.4(3a), 9.4(3), 9.4(2a), 9.4(1a), 9.4(1)
	9.3(2a), 9.3(2), 9.3(1)
	9.2(2), 9.2(1a), 9.2(1)
	8.5(1)
	8.4(2f), 8.4(2e), 8.4(2d), 8.4(2c), 8.4(2b), 8.4(2a), 8.4(2), 8.4(1a), 8.4(1)
	8.3(2), 8.3(1)
	8.2(2), 8.2(1)
Cisco MDS 9148v and 9124v switches	9.4(5a), 9.4(5), 9.4(3b), 9.4(3a), 9.4(3), 9.4(2a), 9.4(1a), 9.4(1)
	9.3(2a), 9.3(2), 9.3(1)
Cisco MDS 9396V switch	9.4(5a), 9.4(5), 9.4(3b), 9.4(3a), 9.4(3), 9.4(2a), 9.4(1a), 9.4(1)
Cisco Nexus 9300[6] Series	10.3(3)F, 10.3(2)F, 10.3(1)F
	10.2(4)M, 10.2(3)F, 10.2(2) F, 10.2(1) F
	10.1(2), 10.1(1)
	9.3(12), 9.3(11), 9.3(10), 9.3(9), 9.3(8), 9.3(7), 9.3(6), 9.3(5), 9.3(4), 9.3(3), 9.3(2), 9.3(1)
	9.2(3), 9.2(2), 9.2(1)
	7.0(3)I4(1), 7.0(3)I7(3)

1 Cisco MDS 9706 is supported only from Cisco MDS NX-OS Release 6.2(9) and later releases.
2 Cisco MDS 9718 is supported only from Cisco MDS NX-OS Release 7.3(0)D1(1) and later releases.
3 Cisco MDS 9396S is supported only from Cisco MDS NX-OS Release 6.2(13) and later releases.
4 Cisco MDS 9148T switch is supported only from Cisco MDS NX-OS Release 8.3(1) and later releases.
5 Cisco MDS 9396T switch is supported only from Cisco MDS NX-OS Release 8.3(1) and later releases.
6 The Cisco NPV feature support requires Cisco MDS NX-OS Release 7.0(3)I7(3) and later releases.

Table 3: Cisco NX-OS Releases Supported on Cisco MDS 9000 Series Switches and Cisco Nexus 7000 Series Switches

Cisco MDS and Nexus Switches	Cisco NX-OS Releases
Cisco Nexus 7000 and 7700 Series switches	8.4(8), 8.4(7), 8.4(6a), 8.4(5), 8.4(4a), 8.4(3), 8.4(2), 8.4(1)
	8.3(2), 8.3(1)
	8.2(10), 8.2(9), 8.2(8), 8.2(7), 8.2(6), 8.2(5), 8.2(4), 8.2(3), 8.2(2), 8.2(1)
	8.1(1)
	8.(0)1
	7.3(9)D1(1), 7.3(8)D1(1), 7.3(7)D1(1), 7.3(6)D1(1), 7.3(5)D1(1), 7.3(4)D1(1), 7.3(3)D1(1), 7.3(2)D1(1), 7.3(1)D1(1), 7.3(0)DX(1), 7.3(0)D1(1)
	7.2(2)D1(2), 7.2(2)D1(1), 7.2(2)D1(2), 7.2(2)D1(1), 7.2(1)D1(1), 7.2(0)D1(1)

Table 4: Cisco NX-OS Releases Supported on Cisco MDS 9000 Series Switches and Cisco Nexus 5000 Series Switches

Cisco MDS and Nexus Switches	Cisco NX-OS Releases
Cisco Nexus 5500 and 5600 Series	7.3(13)N1(1), 7.3(12)N1(1), 7.3(11)N1(1), 7.3(10)N1(1), 7.3(9)N1(1), 7.3(8)N1(1), 7.3(7)N1(1b), 7.3(7)N1(1a), 7.3(7)N1(1), 7.3(6)N1(1), 7.3(5)N1(1), 7.3(4)N1(1), 7.3(3)N1(1), 7.3(2)N1(1), 7.3(1)N1(1), 7.3(0)N1(1)
	7.2(1)N1(1), 7.2(0)N1(1)
	7.1(5)N1(1), 7.1(4)N1(1), 7.1(3)N1(2), 7.1(3)N1(1), 7.1(2)N1(1), 7.1(1)N1(1), 7.1(0)N1(1b), 7.1(0)N1(1a)
	7.0(8)N1(1), 7.0(7)N1(1), 7.0(6)N1(1), 7.0(5)N1(1a), 7.0(5)N1(1), 7.0(4)N1(1), 7.0(3)N1(1), 7.0(2)N1(1), 7.0(1)N1(1)

Cisco MDS and Third-Party Switch Compatibility Matrix

The switch Interoperability test was performed per the Fibre Channel Methodologies for Interconnect (FC-MI) Technical Report version 1.92 which describes common methodologies for facilitating interoperability in a heterogeneous switch SAN environment.

Note For information on switch interoperability that is not covered in this document, contact your local Cisco representative. When topology and functional requirements are made explicit, Cisco can propose adequate implementations to make a multivendor environment possible. Depending on your requirements, switch interoperability may or may not be required.

Note If a major version is qualified, then all the qualified versions must also work for the switch. Also, a desired combination of a Cisco NX-OS software version and a Brocade switch may not appear in this section. In such scenarios, contact your local Cisco representative for more information.

Note From FOS version 7.x, only interop mode 3 is supported.

Note All Cisco data center switches including MDS, Nexus platforms, and UCS FI are interoperable among each other at all code levels released on Cisco website. If there is any feature specific code level recommendation for a release, we publish the information in Release Notes and product configuration guides.

Table 5: Switch Interoperability Matrix (NPV Mode), MDS 9000 Series

Switch Vendor	Switch Models	Firmware Version	Cisco MDS NX-OS Train	Cisco MDS NX-OS Qualified Versions	Cisco Configuration Mode
Brocade	All switch models	7.x and later releases	6.2.x	6.2(1), 6.2(3)	NPV
			8.x	8.1(1), 8.2(1), 8.3(1), 8.4(1a)	
			9.x	9.4(1)	

Table 6: Switch Interoperability Matrix (NPIV Feature), MDS 9000 Series

Switch Vendor	Switch Models	Firmware Version	Cisco MDS NX-OS Train	Cisco MDS NX-OS Qualified Versions	Cisco Switch Feature
Brocade (Access Gateway Mode)	All switch models	7.x and later releases	6.2.x	6.2(1), 6.2(3)	NPIV
			8.x, 9.x	8.1(1), 8.2(1), 8.3(1), 8.4(1a), 9.4(3b)	

Table 7: Switch Interoperability Matrix (NPV Mode), Nexus 5000 Series

Switch Vendor	Switch Models	Firmware Version	Cisco Nexus 5000 OS Train	Cisco NX-OS Qualified Versions	Cisco Configuration Mode
Brocade	All switch models	7.x and later releases	7.x	7.0(1)N1(1) 7.1(1)N1(1) 7.3(2)N1(1) 7.0(7)N1(1) 7.1(4)N1(1)	NPV

Table 8: Switch Interoperability Matrix (NPV Mode), Nexus 9000 Series

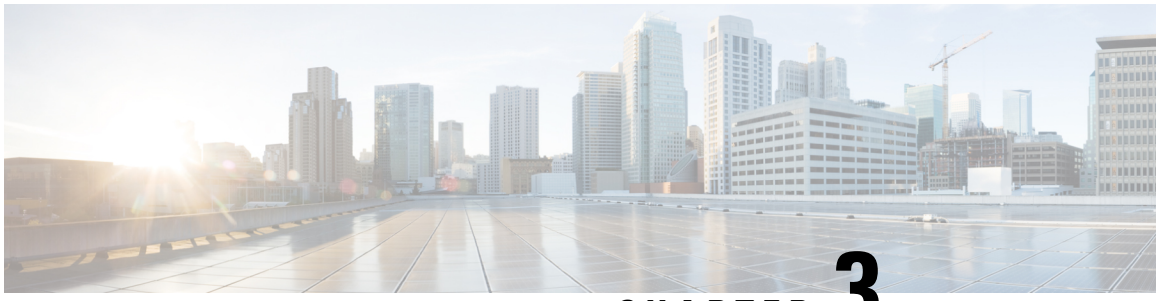
Switch Vendor	Switch Models	Firmware Version	Cisco Nexus 9000 OS Train	Cisco NX-OS Qualified Versions	Cisco Configuration Mode
Brocade	All switch models	7.x and later releases	7.x and later releases	9.3.5	NPV

Note Brocade switch in Access gateway (AG) Mode connected to Cisco MDS switch with NPIV enabled is certified, and vice versa. Brocade AG mode is equivalent to Cisco NPV mode and Brocade switch with NPIV feature enabled is equivalent to Cisco switch with NPIV feature enabled.

Table 9: Switch Interoperability Matrix (NPIV Feature), MDS 9000 Series

Switch Vendor	Switch Models	Firmware Version	Cisco Nexus 9000 OS Train	Cisco NX-OS Qualified Versions	Cisco Switch Feature
HPE[7]	HPE Virtual Connects.	1.0.x and later releases	6.2.x	6.2(23), 6.2(25), 6.2(27), 6.2(29), 6.2(31)	NPIV
			7.x	7.0(1)N1(1) or later releases	

[7] For detailed information, see https://h20272.www2.hpe.com/spock/utility/document.aspx?docurl=Shared%20Documents/hw/switches/C-Series_FC_Switch_Connectivity_Stream.pdf.



CHAPTER 3

Host Interoperability Matrix

The Cisco MDS and Host Interoperability Matrix is a technical reference that defines validated, supported configurations for connecting servers to a Cisco MDS fabric.

It includes details about supported HBA models, driver versions, firmware versions, and operating system requirements. Following this guide helps ensure vendor support, improves system stability, and reduces the risk of issues during infrastructure upgrades, or testing.

This chapter includes the following topics:

- HBA, CNA, and Operating System support, on page 9

HBA, CNA, and Operating System support

The following table provides details on HBA, CNA, and Operating System support.

Note In the following table, while choosing an adapter (CNA or HBA) of your interest, refer the adapter Release Notes first to check which operating system drivers are available and then choose from the Operating Systems column. Refer Table 5 for NVMe over FC support Matrix.

In the following *Software Support Matrix* tables:

- The term, *Yes* indicates the supported release versions.
- The "—" symbol indicates the unsupported release versions.

Table 10: HBA, CNA, and Operating System Support

Vendor	HBA/CNA Model	Operating Systems	Version/ Patch	Protocol	Cisco MDS 9xxx	Cisco Nexus 9xxx	Cisco Nexus 7xxx	Cisco Nexus 5xxx	Cisco Nexus 2xxx
Cisco	VIC 1225, VIC 1225T, VIC 1227, VIC1227T, VIC 1240, VIC 1280, VIC 1285, VIC 1340, VIC 1380, VIC 1385, VIC 1455, VIC 1495, VIC 15000	Windows 2012	All	FCoE	Yes	Yes	Yes	Yes	Yes
		Windows 2016	All		Yes	Yes	Yes	Yes	Yes
		Windows 2019	All		Yes	Yes	Yes	Yes	Yes
		Windows 2022	All		Yes	Yes	—	—	—
		Red Hat 7.x, 8.x	All		Yes	Yes	Yes	Yes	Yes
		SUSE 11	All		Yes	Yes	Yes	Yes	Yes
		SUSE 12	All		Yes	Yes	Yes	Yes	Yes
		SUSE 15	All		Yes	Yes	Yes	Yes	Yes
		VMware ESX 6.x, 7.x, 8.x	All		Yes	Yes	Yes	Yes	Yes

Vendor	HBA/CNA Model	Operating Systems	Version/ Patch	Protocol	Cisco MDS 9xxx	Cisco Nexus 9xxx	Cisco Nexus 7xxx	Cisco Nexus 5xxx	Cisco Nexus 2xxx
Emulex[8]	LPe38000 Series HBA, LPe37000 Series HBA, LPe36000 Series HBA, LPe35000 Series HBA, LPe32000 Series HBA, LPe31000 Series HBA, LPe16000 Series HBA, LPe1250 Series HBA, LPe12000 Series HBA	Windows 2012	All	FC	Yes	—	—	—	—
		Windows 2016	All		Yes	Yes	—	Yes	—
		Windows 2019	All		Yes	Yes	—	Yes	—
		Windows 2022	All		Yes	Yes	—	—	—
		Windows 2025	All		Yes	Yes	—	—	—
		Red Hat 7.x, 8.x, 9.x, 10.x	All		Yes	Yes	—	Yes	—
		SUSE 12	All		Yes	Yes	—	Yes	—
		SUSE 15	All		Yes	Yes	—	Yes	—
		Oracle Linux 6Ux (UEK)	All		Yes	Yes	—	Yes	—
		Oracle Linux 7Ux (UEK)	All		Yes	Yes	—	Yes	—
		Oracle Linux 8Ux (UEK)	All		Yes	Yes	—	Yes	—
		VMware ESX 6.x, 7.x, 8.x, 9.x	All		Yes	Yes	—	Yes	—
		HP-UX 11.31 IA	All		Yes	—	—	—	—
		Solaris 11	All		Yes	—	—	—	—
	OCe 14102 Series CNA, OCe 11102 Series CNA	Windows 2012	All	FCoE	Yes	Yes	Yes	Yes	Yes
		Windows 2016	All		Yes	Yes	Yes	Yes	Yes
		Red Hat 7.x	All		Yes	Yes	Yes	Yes	Yes
		SUSE 11	All		Yes	Yes	Yes	Yes	Yes
		SUSE 12	All		Yes	Yes	Yes	Yes	Yes
		VMware ESX 6.x	All		Yes	Yes	Yes	Yes	Yes

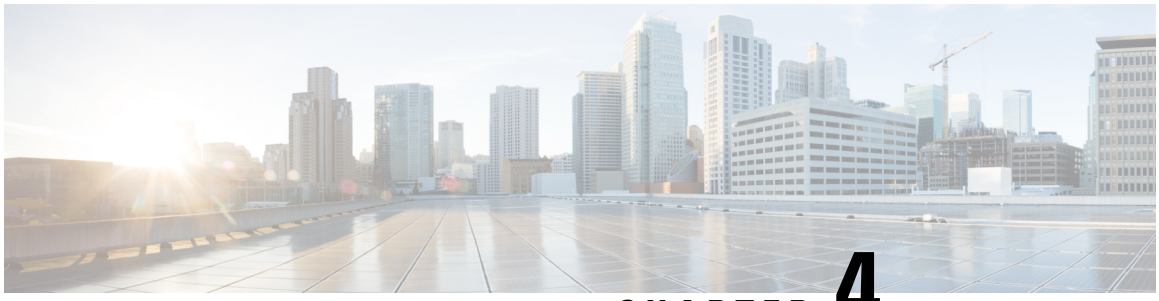
Vendor	HBA/CNA Model	Operating Systems	Version/ Patch	Protocol	Cisco MDS 9xxx	Cisco Nexus 9xxx	Cisco Nexus 7xxx	Cisco Nexus 5xxx	Cisco Nexus 2xxx
Qlogic[9]	2800 Series HBA, 2700 Series HBA, 2600 Series HBA, 2500 Series HBA	Windows 2012	All	FC	Yes	Yes	—	Yes	—
		Windows 2016	All		Yes	Yes	—	Yes	—
		Windows 2019	All		Yes	Yes	—	Yes	—
		Windows 2022	All		Yes	Yes	—	—	—
		Windows 2025	All		Yes	Yes	—	—	—
		Red Hat 7.x, 8.x, 9.x, 10.x	All		Yes	Yes	—	Yes	—
		SUSE 11	All		Yes	Yes	—	Yes	—
		SUSE 12	All		Yes	Yes	—	Yes	—
		SUSE 15	All		Yes	Yes	—	Yes	—
		Oracle Linux 6Ux (UEK)	All		Yes	Yes	—	Yes	—
		Oracle Linux 7Ux (UEK)	All		Yes	Yes	—	Yes	—
		Oracle Linux 8Ux (UEK)	All		Yes	Yes	—	Yes	—
		VMware ESX 6.x, 7.x, 8.x	All		Yes	Yes	—	Yes	—
		HP-UX 11.31 IA	All		Yes	—	—	—	—
		AIX 7.x	All		Yes	Yes	—	Yes	—
	8400 Series CNA, 8300 Series CNA, 8200 Series CNA	Windows 2012	All	FCoE	Yes	Yes	Yes	Yes	Yes
		Windows 2016	All		Yes	Yes	Yes	Yes	Yes
		Red Hat 7.x	All		Yes	Yes	Yes	Yes	Yes
		SUSE 11	All		Yes	Yes	Yes	Yes	Yes
		SUSE 12	All		Yes	Yes	Yes	Yes	Yes
		VMware ESX 6.x	All		Yes	Yes	Yes	Yes	Yes
	QL41262 CNA, QL45462 CNA	Windows 2019	All		Yes	Yes	—	—	—
		SLES 15	All		Yes	Yes	—	—	—
		Red Hat 8.x	All		Yes	Yes	—	—	—

Vendor	HBA/CNA Model	Operating Systems	Version/ Patch	Protocol	Cisco MDS 9xxx	Cisco Nexus 9xxx	Cisco Nexus 7xxx	Cisco Nexus 5xxx	Cisco Nexus 2xxx
ATTO	CTFC-322E	Windows 2016	All	FC	Yes	—	—	—	—
		Red Hat 7.x	All		Yes	—	—	—	—
		SUSE 12	All		Yes	—	—	—	—
		VMware ESX 6.x	All		Yes	—	—	—	—

[8] For Emulex adapter support with VIOS, IBMi, or AIX check IBM SSIC at http://www-03.ibm.com/systems/support/storage/ssic/interoperability.wss.

[9] For Qlogic adapter support with VIOS, IBMi, or AIX check IBM SSIC at http://www-03.ibm.com/systems/support/storage/ssic/interoperability.wss.

Note For information on OEM-branded Fibre Channel Host Bus Adapters from Broadcom and Marvell, see https://www.broadcom.com/ or www.marvell.com, and refer to the Cross Reference guides for the equivalent part or model numbers.



CHAPTER 4

Storage Interoperability Matrix

The Cisco MDS and Storage Interoperability Matrix is the reference guide for validating supported connectivity between Cisco MDS switches and storage arrays.

It provides details on compatible storage controllers, supported FC protocols, and the fabric feature settings required for stable data paths. Following these specifications helps ensure full vendor support and reduces the risk of configuration-related outages in the storage environment.

Use this guide for regression testing and validating interoperability requirements, helping maintain a consistent, high-performance storage infrastructure as well.

This chapter includes the following topics:

- OSM Information, on page 15

OSM Information

More configuration information for host, target, switch, or optical equipment may be available on the OSM web site.

For HBA or CNA driver and firmware version and storage firmware version, see the following OSM websites to obtain their latest support matrix.

- Dell EMC—See the Dell EMC Interoperability support matrices. Refer to this matrix for comprehensive list of the latest supported Dell EMC storage arrays. Support Matrix is located here: http://elabnavigator.dell.com/vault/html/Stand-Alone_Switch.html. Target codes are listed here: https://www.dell.com/support/kbdoc/en-in/000228560/minimum-recommended-and-latest-code-versions-for-networking-products
- Hitachi Vantara—See the Product Interoperability Documentation: https://support.hitachivantara.com/en/answers/interoperability.html
- HPE—See the HPE Single Point of Connectivity Knowledge (SPOCK) website : https://www.hpe.com/storage/spock
- IBM—See http://www-03.ibm.com/systems/support/storage/ssic/interoperability.wss
- NetApp—See the Interoperability Matrix Tool (IMT): https://www.netapp.com/company/interoperability/
- Everpure Storage—See https://support.purestorage.com/FlashArray/Getting_Started_with_FlashArray/Compatibility_Matrix#Network_Adapters.2C_HBAs_and_Switches

The following table provides details on Disk Storage support.

Table 11: Disk Storage Support Matrix

Vendor	Model	Protocol	Cisco MDS 9xxx	Cisco Nexus 9xxx	Cisco Nexus 7xxx	Cisco Nexus 5xxx
IBM	DS8700, DS8800, DS8870	FC, FICON	Yes	—	—	Yes
	DS8900		Yes	—	—	Yes
	XIV Gen 3		Yes	—	—	Yes
	FlashSystem 840/V840	FC, FCoE	Yes	Yes	—	Yes
	SAN Volume Controller (SVC)		Yes	Yes	Yes	Yes
	FlashSystem 900, 9000, 9100	FC, FCoE, NVMe/FC	Yes		—	Yes
	FlashSystem 5000, 7200, 9200		Yes	Yes	—	Yes
	Storwize 5100, 7000		Yes	Yes	—	Yes
	FlashSystem 7300, 9500	FC, NVMe/FC	Yes	Yes	—	Yes
	FlashSystem A9000	FC	Yes		—	Yes

Vendor	Model	Protocol	Cisco MDS 9xxx	Cisco Nexus 9xxx	Cisco Nexus 7xxx	Cisco Nexus 5xxx
Dell EMC	VMAX Family	FC, FCoE, FICON	Yes	—	—	—
	VNX and VNXe Family	FC, FCoE	Yes	Yes	Yes	Yes
	XtremIO	FC	Yes	Yes	Yes	Yes
	DDR670		Yes	—	—	Yes
	VPLEX		Yes	—	—	Yes
	Unity Family		Yes	—	—	Yes
	PowerStore Family	FC, NVMe/FC	Yes	Yes	—	Yes
	PowerMAX	FC, NVMe/FC, FICON	Yes	Yes	—	Yes
	SC Series	FC	Yes	Yes	—	Yes

Vendor	Model	Protocol	Cisco MDS 9xxx	Cisco Nexus 9xxx	Cisco Nexus 7xxx	Cisco Nexus 5xxx
Hitachi Vantara	Virtual Storage Platform (VSP) 5100, 5100H, 5200, 5200H, 5500, 5500H, 5600, 5600H	FC, NVMe/FC, FICON	Yes	—	Yes	Yes
	Virtual Storage Platform (VSP) One Block 24, 26, 28, 26 QLC	FC, NVMe/FC	Yes	—	—	—
	Virtual Storage Platform (VSP) G1000G1500F1500	FC, FCoE, FICON	Yes	—	Yes	Yes
	Virtual Storage Platform (VSP) E990, E790, E790H, E590, E590H, E1090, E1090H, G900, G800, G700, G600, G400, G370, G200, F900, F800, F700, F600, F400, F370, F350	FC	Yes	—	Yes	Yes

Vendor	Model	Protocol	Cisco MDS 9xxx	Cisco Nexus 9xxx	Cisco Nexus 7xxx	Cisco Nexus 5xxx
HPE	P9500	FC, FCoE	Yes	Yes	Yes	Yes
	3PAR StoreServ 7000 8000 9000 10000 20000		Yes	Yes	Yes	Yes
	Primera 600 Storage	FC	Yes	—	—	Yes
	Alletra 6000, 9000		Yes	—	—	—
	MSA 1050 1060 2040 2050 2060		Yes	Yes	—	Yes
	XP7, XP8	FC, FICON	Yes	—	—	Yes
	Nimble Storage CS Series	FC	Yes	Yes	—	Yes
	Nimble Storage AFA Series		Yes	Yes	—	Yes
NetApp	AFF A-Series/C-Series	FC, FCoE, NVMe/FC	Yes	Yes	Yes	Yes
	FAS2000	FC, FCoE	Yes	Yes	Yes	Yes
	FAS3000		Yes	Yes	Yes	Yes
	FAS6000		Yes	Yes	Yes	Yes
	FAS8000	FC, FCoE, NVMe/FC	Yes	Yes	Yes	Yes
	FAS9000		Yes	Yes	Yes	Yes
	EF280, E2800	FC	Yes	—	—	Yes
	EF570, EF600, E5700	FC, NVMe/FC	Yes	—	—	Yes

Vendor	Model	Protocol	Cisco MDS 9xxx	Cisco Nexus 9xxx	Cisco Nexus 7xxx	Cisco Nexus 5xxx
Everpure Storage	FA-400 Series	FC	Yes	Yes	—	Yes
	FlashArray//M Series		Yes	Yes	—	Yes
	FlashArray//X Series	FC, NVMe/FC	Yes	Yes	—	—
	FlashArray//XL Series		Yes	Yes	—	—
	FlashArray//C Series		Yes	Yes	—	—
	FlashArray//E Series		Yes	Yes	—	—

Vendor	Model	Protocol	Cisco MDS 9xxx	Cisco Nexus 9xxx	Cisco Nexus 7xxx	Cisco Nexus 5xxx
Huawei	OceanStor F/V3 series 2100V3/2200, V3/2600, V3/2600F, V3/2800, V3/5300, V3/5500, V3/5500F, V3/5600, V3/5600F, V3/5800, V3/5800F, V3/6800, V3/6800F, V3/6900, V3/18500, V3/18500F, V3/18800, V3/18800F V3	FC, FCoE, NVMe/FC	Yes	Yes	—	Yes
	OceanStor DoradoV3 series Dorado 3000 V3/5000 V3/6000 V3/18000 V3		Yes	Yes	—	Yes
			Yes	Yes	—	Yes

Vendor	Model	Protocol	Cisco MDS 9xxx	Cisco Nexus 9xxx	Cisco Nexus 7xxx	Cisco Nexus 5xxx
	OceanStor K/F/V5 series 2600 V5/2800 V5/5100K V5/5200K V5/5300 V5/5300F V5/5300K V5/5500K V5/5500 V5/5500F V5/5600 V5/5600F V5/ 5800 V5/5800F V5/6800 V5/6800F V5/18500 V5/18500F V5/18800 V5/18800F V5 2810 V5/5110 V5/5110F V5/5110 V5 Enhanced/5110F V5 Enhanced/5210 V5/5210F V5/5210 V5 Enhanced/5210F V5 Enhanced/5310 V5/5310F V5/5510 V5/5510F V5/5610 V5/5610F V5/ 5810 V5/5810F V5/6810 V5/6810F V5/18510 V5/18510F V5/18810 V5/18810F					

Vendor	Model	Protocol	Cisco MDS 9xxx	Cisco Nexus 9xxx	Cisco Nexus 7xxx	Cisco Nexus 5xxx
	V5					
	OceanStor DoradoV6 series Dorado 3000 V6/5000 V6/6000 V6/8000 V6/18000 V6 /5300 V6/5500 V6/5600 V6/5800 V6/6800 V6/18500 V6/18800 V6/18800K V6		Yes	Yes	—	Yes
	OceanStor A series OceanStor A310/A800		—	Yes	—	Yes
	OceanStor Dorado V7 series Dorado 5000 6000 8000 18000 5000 6000 8000 18000		Yes	Yes	—	Yes

The following table provides details on Cisco UCS-B Series Fabric Interconnect support.

Table 12: Cisco UCS-B and X Series Fabric Interconnect Support Matrix

Vendor	Model	Protocol	Cisco MDS 9xxx	Cisco Nexus 5xxx/2xxx	Cisco Nexus 7xxx	HBA/CNA/Operating Systems and UCS-M Version
Cisco	Cisco UCS 6200 Series Fabric Interconnects,	FC, FCoE, NVMe/FC	MDS NX-OS 7.x and above from Table 1 for 7.x	NX-OS 6.0(2)N1(1) and above from Table 1 for 6.x NX-OS 7.0(1)N1(1) and above from Table 1 for 7.x	NX-OS 7.x and above from Table 1 for 7.x	All HBA/CNA/Operating Systems and UCS releases listed i products.http://www.cisco.com/c/en/us/support/servers-unifi
	Cisco UCS 6300 Series Fabric Interconnects,					
	Cisco UCS 6400 Series Fabric Interconnects					
	Cisco UCS 6536 Fabric Interconnect					
	Cisco UCS 9108 100G Intelligent Fabric Module					

The following table provides details on NVMe over FC and FCoE support matrix.

Note Refer to Storage Vendors Matrix support documents for end to end NVMe/FC support details.

Table 13: NVMe over FC and FCoE Support Matrix

Cisco MDS and Nexus Switches	Vendor	HBA Model	Operating System	Cisco MDS 9xxx	Cisco Nexus 5xxx	Cisco Nexus 9xxx
Cisco MDS 97xx Cisco MDS 9396S Cisco MDS 9396T[10] Cisco MDS 9220i[11], Cisco MDS 9250i Cisco MDS 9132T Cisco MDS 9148S Cisco MDS 9148T[12] Cisco MDS 9148V[13] Cisco MDS 9124V[14] Cisco MDS 9396v[15] Cisco Nexus 56xx Cisco Nexus 93180YC-FX Cisco Nexus 93360YC-FX2	Emulex	LPe 32000, LPe 35000 LPe 36000	Windows Server 2016 Windows Server 2019 SLES 12 SP4 SLES 15 RHEL 7.6 and above RHEL 8.0 and above OL 8.2 (UEK) ESXi 7.0	MDS NX-OS 8.2(1) and above from Table 1 for 8.x	NX-OS 7.3(3)N1(1) and above from Table 1 for 7.x	NX-OS 7.0(3)I7(3) and above from Table 1 for 7.x
	QLogic	QLE 2700, QLE 2600	SLES 12 SP4 SLES 15 RHEL 7.6 RHEL 8.0	MDS NX-OS 8.2(1) and above from Table 1 for 8.x	NX-OS 7.3(3)N1(1) and above from Table 1 for 7.x	NX-OS 7.0(3)I7(3) and above from Table 1 for 7.x
	Cisco	VIC 14xx	RHEL 8.1 SLES 12 SP3 SLES 15 SP1 and above ESX 6.x and 7.x	MDS NX-OS 8.2(1) and above from Table 1 for 8.x	NX-OS 7.3(3)N1(1) and above from Table 1 for 7.x	NX-OS 7.0(3)I7(3) and above from Table 1 for 7.x

[10] Cisco MDS 9396T switch requires Cisco MDS NX-OS Release 8.3(1) and later.
[11] Cisco MDS 9220i switch requires Cisco MDS NX-OS Release 8.5(1) and later.
[12] Cisco MDS 9148T switch requires Cisco MDS NX-OS Release 8.3(1) and later.
[13] Cisco MDS 9148v switches requires Cisco MDS NX-OS Release 9.3(1) and later.
[14] Cisco MDS 9124v switches requires Cisco MDS NX-OS Release 9.3(1) and later.
[15] Cisco MDS 9124v switches requires Cisco MDS NX-OS Release 9.4(1) and later.

The following table provides details on Storage array support based on vendor self-certification.

Table 14: Storage Array Support based on Vendor Self-certification

Vendor	Model	Protocol	Cisco MDS 9xxx	Cisco Nexus 7xxx	Cisco Nexus 5xxx	HBA/CNA	Operating System
Fujitsu	FUJITSU Storage ETERNUS DX60 Sx, DX100 Sx, DX200 Sx, DX500 Sx, DX600 Sx, DX900 Sx, DX200F, AF150 Sx, AF250, AF250 Sx, AF650, AF650 Sx	FC	Yes	—	Yes	Table 2	Table 2
	FUJITSU Storage ETERNUS DX8700 S3, DX8900 S3, DX8900 S4		Yes	—	—		
	FUJITSU Storage ETERNUS DX60 S2, DX80 S2, DX90 S2		Yes	—	Yes		
	FUJITSU Storage ETERNUS DX400 S2 Series, DX8000 S2 Series		Yes	—	Yes		
	FUJITSU Storage ETERNUS DX60, DX80, DX90		Yes	—	Yes		
			Yes	—	Yes		

Vendor	Model	Protocol	Cisco MDS 9xxx	Cisco Nexus 7xxx	Cisco Nexus 5xxx	HBA/CNA	Operating System
	FUJITSU Storage ETERNUS DX400 Series						
	FUJITSU Storage ETERNUS DX8000 Series		Yes	—	Yes		
	FUJITSU Storage ETERNUS 2000, 4000, 8000		Yes	—	Yes		
	FUJITSU Storage ETERNUS DX100 S3, DX200 S3, DX500 S3, DX600 S3	FCOE	—	—	Yes		
	FUJITSU Storage ETERNUS DX80 S2, DX90 S2		—	—	Yes		
	FUJITSU Storage ETERNUS DX400 S2 Series		—	—	Yes		
	FUJITSU Storage ETERNUS DX8000 S2 Series		—	—	Yes		
	FUJITSU Storage ETERNUS AX Series	FC, FCoE, NVMe/FC	Yes	Yes	Yes		
		FC, FCoE	Yes	Yes	Yes		

Vendor	Model	Protocol	Cisco MDS 9xxx	Cisco Nexus 7xxx	Cisco Nexus 5xxx	HBA/CNA	Operating System
	FUJITSU Storage ETERNUS HX2000 Series						
	FUJITSU Storage ETERNUS HX6000 Series	FC, FCoE, NVMe/FC	Yes	Yes	Yes		
	FUJITSU Storage ETERNUS HB1000 Series, HB2000 Series	FC	Yes	—	Yes		
	FUJITSU Storage ETERNUS AB Series, HB5000 Series	FC, NVMe/FC	Yes	—	Yes		
Tegile Systems	IntelliFlash Storage Array Family[16]	FC	Cisco MDS NX-OS Release 6.2(9) and above	—	NX-OS 6.0(2)x(x) and above from Table 1 for 6.x NX-OS 7.0(5)x(x) and above from Table 1 for 7.x	Qlogic 2500 Series Emulex 12000 CISCO VICM81KR CISCO VIC122x CISCO VIC128x CISCO VIC13xx	Windows2012 R2,SP1 RHEL 6.5 ESXi 5.5,5.1 ESX 5.0

Vendor	Model	Protocol	Cisco MDS 9xxx	Cisco Nexus 7xxx	Cisco Nexus 5xxx	HBA/CNA	Operating System
Infinidat	InfiniBox F-Series	FC	Cisco MDS NX-OS Release 6.2(9) and above	—	Yes	Qlogic 2600 Series Qlogic 2700 Series LPE16000 Series LPE35000 Series	Windows 2016 Windows 2019 RHEL 7.9 RHEL 8.2 ESXi 6.7U3
Kaminario	K2 All Flash Array	FC	Cisco MDS NX-OS Release 6.2(9) and above	—	NX-OS 7.3(0)N1(1) and above from Table 1 for 7.x	Qlogic 2600 Series Qlogic 2500 Series	Windows2012 R2, SP1 Solaris 11 RHEL 7.2 ESX 6.0
Vexata	VX-100F	FC	Cisco MDS NX-OS Release 8.2(1) and later from Table 1 for 8.x	—	—	Qlogic 2500 Series Qlogic 2600 Series Qlogic 2700 Series Emulex 12000 Emulex 16000 Emulex 32000 CISCO VIC122x CISCO VIC 128x	Windows2012 R2,SP1 RHEL 7 SuSE 12 ESXi 5.5, ESX 6.5

[16] 8G FC only.

The following table provides details on Tape Storage support.

Table 15: Tape Storage Support Matrix

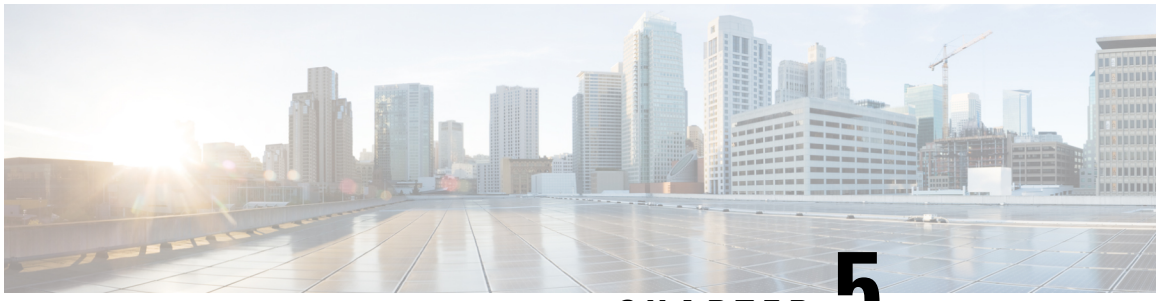
Vendor	Library/Drive Model	Protocol	Cisco MDS 9xxx	Cisco Nexus 7xxx	Cisco Nexus 5xxx
Oracle/STK	SL3000(Library)	FC	Yes	—	Yes
	SL500 (Library)		Yes	—	Yes
	SL150(Library)		Yes	—	Yes
	L700(Library)		Yes	—	Yes
	L180(Library)		Yes	—	Yes
	VTLplus		Yes	—	Yes
	STK-9840-C		Yes	—	Yes
	STK-9840-D		Yes	—	Yes
	STK-9940-B		Yes	—	Yes
	STK-T10K-A		Yes	—	Yes
	STK-T10K-B		Yes	—	Yes
	STK-T10K-C		Yes	—	Yes
	STK-T 10K-D	FC/FCoE	Yes	Yes	Yes
	HP LTO5	FC	Yes	—	Yes
	HP LTO6		Yes	—	Yes
	IBM LTO5		Yes	—	Yes
	IBM LTO6		Yes	—	Yes
	IBM LTO7		Yes	—	Yes
	HP HH LTO5		Yes	—	Yes
	HP HH LTO6		Yes	—	Yes
	IBM HH LTO6		Yes	—	Yes
	IBM HH LTO7		Yes	—	Yes
HPE	LTO3	FC	Yes	—	Yes
	LTO4		Yes	—	Yes
	LTO5		Yes	—	Yes
	LTO5HH		Yes	—	Yes
	LTO6HH		Yes	—	Yes
	LTO6		Yes	—	Yes
	LTO7		Yes	—	Yes
	LTO8		Yes	—	—
	LTO9		Yes	—	—

Vendor	Library/Drive Model	Protocol	Cisco MDS 9xxx	Cisco Nexus 7xxx	Cisco Nexus 5xxx
IBM	3584 (Library)	FC	Yes	—	Yes
	3592-EO5		Yes	—	—
	3952 – E08		Yes	—	—
	3952 – E06		Yes	—	—
	LTO3		Yes	—	Yes
	LTO4		Yes	—	Yes
	LTO5		Yes	—	Yes
	LTO6		Yes	—	Yes
	LTO7		Yes	—	Yes
	LTO8		Yes	—	—
	LTO9		Yes	—	—
	LTO10		Yes	—	—
	TS4300 (Library)		Yes	—	—
Quantum	I500 (Library)	FC	Yes	—	Yes
	HP LTO5		Yes	—	Yes
	HP LTO6		Yes	—	Yes
	IBM LTO5		Yes	—	Yes
	IBM LTO6		Yes	—	Yes
Spectralogic	T50e (Library)	FC	Yes	—	—
	IBM HHLTO6		Yes	—	—

The following table provides details on recommended iSCSI initiators.

Table 16: Recommended iSCSI initiators

iSCSI Initiators
Open iSCSI 2.0-873.29.el6
Microsoft iSCSI Initiator 6.2.9200.16813, 6.1.7601.18386 and 6.3.9600.17090



CHAPTER 5

DWDM Interoperability Matrix

This chapter includes the following topics:

- DWDM Information, on page 33

DWDM Information

The following table provides details on Dense Wavelength-Division Multiplexing (DWDM) support. The products have been through system verification tests.

Cisco supports all WDM networking systems that are compliant with Fibre Channel standards for distance extension and are expected to work with Cisco MDS 9000 Series switches.

Table 17: DWDM Support

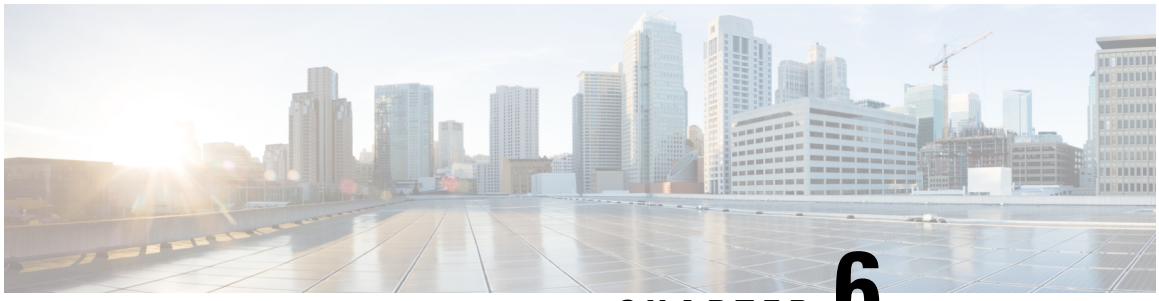
Vendor	Type	Data Rate (Gbps)	MDS Model
Cisco	ONS 15454, NCS 2000	4, 8, 10, 16, 32	MDS 9xxx
Adtran/ADVA	FSP2000, FSP3000		

Note Extended link-initialization times, even greater than 1 hour, may occur at 32G speed when using Cisco MDS 32G capable Fibre Channel interfaces with ADVA FSP 3000 ports with Clock Data Recovery(CDR). Links operate normally once established. Customers experiencing this behavior should contact Cisco TAC for recommended configuration guidance. This problem does not occur on Cisco MDS 64G capable Fibre Channel interfaces.

Recommendations:

- FEC on Cisco MDS 9000 Series switches should be disabled on 16 Gbps links.
- Ensure that enough buffer credits are configured on MDS ports to cover the distance for the specific frame size.

- Use logical link bundling via port channels across DWDM links even in case of different path lengths. The superior technology of port channels to any other logical bundling solution in the industry makes this possible and provides the benefit of higher reliability without impacting FSPF routing decisions.
- Check with your DWDM vendor for specific configurations and setting, specifically for NOS/LOS propagation.
- Enable port-tracking on Cisco MDS 9000 Series switches.



CHAPTER 6

Transceiver Interoperability Matrix

This chapter includes the following topics:

- Transceiver Information, on page 35

Transceiver Information

The following table provides details on transceiver support. The products have been through system verification tests.

Recommendations:

The following table provides details on Non-Cisco Transceiver Support support.

Note For the Part Numbers, xxxx refers to notation for frequency data. For full product description, see http://www.smartoptics.com/products/cisco-collection/.

Table 18: Non-Cisco Transceiver Support of 8G SFP for the vendor Smartoptics

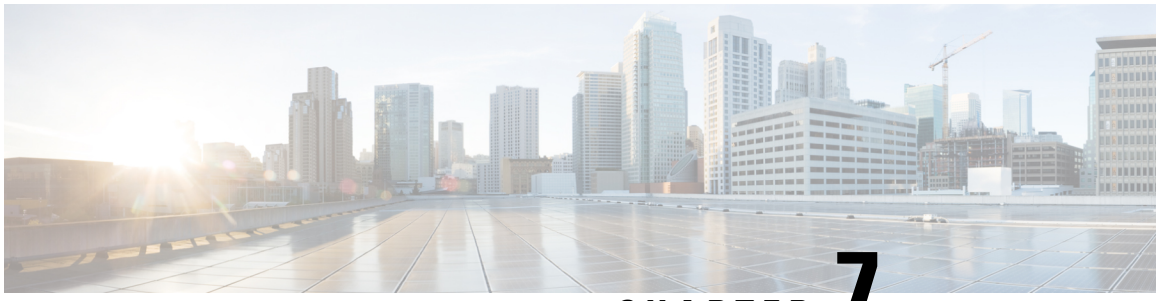
Part Number	Description	Required OS	Supported Platforms	Comments
DS-8G-ZR	SFP+, 8/4/2/1 Gbps FC/FICON, 1550nm, SM, DDM, 23dB, 80km	6.2(19) and later 8.2(1) and later	Cisco MDS 9148S Cisco MDS 9250i Cisco MDS 9396S Cisco MDS 24/10 Port SAN Extension Module Cisco MDS 9700 48-Port 16-Gbps Fibre Channel Switching Module Cisco MDS 48 Port 32 Gbps Fibre Channel Switching Module Cisco MDS 9132T Cisco MDS 9148T and MDS 9396T Cisco MDS 9220i	Cisco MDS 48 Port 32 Gbps Fibre Channel Switching Module is supported starting from Cisco MDS NX-OS Release 8.2(1). The Cisco MDS 9132T switch is supported starting from Cisco MDS NX-OS Release 8.2(1). The Cisco MDS 9148T and MDS 9396T switches are supported starting from Cisco MDS NX-OS Release 8.3(1). The Cisco MDS 9220i switch is supported starting from Cisco MDS NX-OS Release 8.5(1).
DS-8G-ZR-Cxx	SFP+, 8/4/2/1 Gbps FC/FICON, CWDM, SM, DDM, 23dB, 70km			
DS-8G-ZR-Dxxxx	SFP+, 8/4/2/1 Gbps FC/FICON, DWDM, SM, DDM, 23dB, 80km			

Table 19: Non-Cisco Transceiver Support of 16G SFP and the vendor Smartoptics

Part Number	Description	Required OS	Supported Platforms	Comments
DS-16G-ER	SFP+, 16/8/4 Gbps FC/FICON, 1550nm, SM, DDM, 13dB, 40km	6.2(19) and later 8.2(1) and later	Cisco MDS 9148S Cisco MDS 9250i Cisco MDS 9396S Cisco MDS 24/10 Port SAN Extension Module Cisco MDS 9700 48-Port 16-Gbps Fibre Channel Switching Module Cisco MDS 48 Port 32 Gbps Fibre Channel Switching Module Cisco MDS 9132T Cisco MDS 9148T and MDS 9396T Cisco MDS 9220i Cisco MDS 48 Port 64 Gbps Fibre Channel Switching Module Cisco MDS 9124V and MDS 9148V Cisco MDS 9396V	Cisco MDS 48 Port 32 Gbps Fibre Channel Switching Module is supported starting from Cisco MDS NX-OS Release 8.2(1). The Cisco MDS 9132T switch is supported starting from Cisco MDS NX-OS Release 8.2(1). The Cisco MDS 9148T and MDS 9396T switches are supported starting from Cisco MDS NX-OS Release 8.3(1). The Cisco MDS 9220i switch is supported starting from Cisco MDS NX-OS Release 8.5(1). The Cisco MDS 48 Port 64 Gbps Fibre Channel Switching Module is supported from Cisco MDS NX-OS Release 9.2(1). The Cisco MDS 9124V, and MDS 9148V switches are supported from Cisco MDS NX-OS Release 9.3(1) The MDS 9396V switch is supported from Cisco MDS NX-OS Release 9.4(1)
DS-16G-ER-Cxx	SFP+, 16/8/4 Gbps FC/FICON, CWDM, SM, DDM, 13dB, 40km			
DS-16G-ER-Dxxxx	SFP+, 16/8/4 Gbps FC/FICON, DWDM, SM, DDM, 13dB, 40km			

Table 20: Non-Cisco Transceiver Support of 32G SFP for the vendor Smartoptics

Part Number	Description	Required OS	Supported Platforms	Comments
DS-32G-IR-Dxxxx	SFP28, 8/16/32G FC, DWDM 100GHz, DDM, 7dB, 10km	8.4(1a) and later	Cisco MDS 48 Port 32 Gbps Fibre Channel Switching Module Cisco MDS 9132T Cisco MDS 9148T and MDS 9396T Cisco MDS 9220i Cisco MDS 48 Port 64 Gbps Fibre Channel Switching Module Cisco MDS 9124V and MDS 9148V Cisco MDS 9396V	The Cisco MDS 9220i switch is supported starting from Cisco MDS NX-OS Release 8.5(1). The Cisco MDS 48 Port 64 Gbps Fibre Channel Switching Module is supported from Cisco MDS NX-OS Release 9.2(1). The Cisco MDS 9124V, and MDS 9148V switches are supported from Cisco MDS NX-OS Release9.3(1) The MDS 9396V switch is supported from Cisco MDS NX-OS Release 9.4(1)



CHAPTER 7

Fabric Services Interoperability Matrix

This chapter lists Cisco fabric applications supported by the SSM module and tested by Cisco's Solution-Interoperability Engineering group (iLAB) to ensure seamless installation at the end-user data center.

- EMC, on page 39
- FC-IP SAN Extension, on page 40
- IOA/FCIP Write Acceleration, on page 41

EMC

Table 21: EMC CX4-480 (FLARE v04.30.000.5.511)

Operating System	OS Version	HBA	HBA Driver	Multipath Application	Failover Mode
Windows Server 2003	SP2	Qlogic QLE 2462	9.1.8.25	PowerPath 5.5	Failover Mode: 4
AIX	5300-12	IBM FC 1905, 5758, 5760, 5761 PN 03N5014	Native OS driver	PowerPath 5.1.0	Failover Mode: 1

Table 22: EMC Clarion CX700 (FLARE v02.16.700.5.010)

Operating System	OS Version	HBA	HBA/CNA Driver	Multipath Application	Failover Mode
Windows Server 2003	SP2	Qlogic QLE 2462	9.1.8.25	PowerPath 5.5	Failover Mode: 1
AIX	5300-12	IBM FC 1905, 5758, 5760, 5761 PN 03N5014	Native OS driver	PowerPath 5.1.0	Failover Mode: 1
Red Hat	5.5	Cisco M71KR-E	1.3(1n)	PowerPath 5.5	Failover Mode: 1

Table 23: EMC VNX-5300 (v05.31.000.5.008)

Operating System	OS Version	HBA	HBA/CNA Driver	Multipath Application	Failover Mode
Red Hat	5.5	Cisco M71KR-E	1.3(1n)	PowerPath 5.5	Failover Mode: 1

Table 24: NetApp FAS940(6.5.6)

Operating System	OS Version	HBA	HBA/CNA Driver	Multipath Application	Failover Mode
Red Hat	5.5	Cisco M71KR-E	1.3(1n)	Native	Load-balance

Table 25: HDS 9585v

Operating System	OS Version	HBA	HBA/CNA Driver	Multipath Application	Failover Mode
Windows Server 2008 Datacenter	SP2	Cisco M71KR-Q	1.3(1n)	MPIO	

FC-IP SAN Extension

The Cisco MDS 9250i switch, the 24/10 Port SAN Extension Module, the MSM-18/4, and SSN-16 modules support Auto, Mode1 and Mode2 compression modes. All of these modes internally use the hardware compression engine of the module. By default, Auto mode is enabled. Mode2 uses a larger batch size for compression than Auto mode, which results in higher compression throughput. However, Mode2 incurs a small latency because of the compression throughput. For the deployments where aggressive throughput is most important, Mode2 should be used. Mode1 gives the better compression ratio when compared to all other modes. For the deployments where compression ratio is most important, Mode1 should be used. Auto mode is similar to Mode2 with respect to the algorithm used for compression except that the batching is not done in Auto mode.

Note For more information on module and version support, see *Cisco MDS 9000 Series IP Services Configuration Guide*.

Table 26: SAN Extension InterOp Support Matrix

Cisco MDS Modules/Switches	IPSEC	FCIP-WA	HW Compression —Auto	HW Compression —Mode1	HW Compression —Mode2	FCIP-TA
9220i	Yes	Yes	Yes	Yes	Yes	Yes
24/10 Port SAN Extension Module	Yes	Yes	Yes	Yes	Yes	Yes

Cisco MDS Modules/Switches	IPSEC	FCIP-WA	HW Compression —Auto	HW Compression —Mode1	HW Compression —Mode2	FCIP-TA
9250i	Yes	Yes	Yes	Yes	Yes	Yes
SSN-16	Yes	Yes	Yes	Yes	Yes	Yes[17]
9222i/18+4	Yes	Yes	Yes	Yes	Yes	Yes

[17] Only Veritas NetBackup and IBM TSM backup applications are supported.

IOA/FCIP Write Acceleration

For information about Write Acceleration see the Cisco MDS 9000 Series I/O Accelerator Configuration Guide.

The following table lists SCSI write initiators tested by Cisco with NX-OS IOA/FCIP Write Acceleration. This includes initiators in array to array replication.

Table 27: IOA/FCIP Write Acceleration Support

Vendor	Array	Replication Application
T10 Standard SCSI write(6)	All	All
T10 Standard SCSI write(10)	All	All
Hitachi	Virtual Storage Platform G1000/G1500/F1500 E570, E590, E990, 5100, 5100H, 5500, 5500H, G200, G350, G400, G600, G700, G800, G900 F350, F370, F400, F600, F700, F800, F900	TrueCopy
Dell EMC	VMAX All Flash VMAX 10K VMAX3 PowerMax 2000, 8000	SRDF