



Storage Interoperability Matrix

This chapter includes the following topics:

- [Cisco Nexus 9000/7000/5000 Series Switches and Cisco MDS 9000 Series Switches, on page 1](#)
- [OSM Information, on page 4](#)

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

[Table 1: 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](#) lists 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.

The switches listed in [Table 1: 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](#) support the disk and tape storage products and the CNA and HBA devices listed in [Table 2](#), [Table 3](#), and [Table 7](#).

Table 1: 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(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 9396V switch	9.4(2a), 9.4(1a), 9.4(1)
Cisco MDS 9250i switch	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(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(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(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(2a), 9.4(1a), 9.4(1)
	9.3(2a), 9.3(2), 9.3(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)

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)
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)

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.

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.
<https://www.delltechnologies.com/en-us/products/interoperability/elab.htm>
- 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): <http://support.netapp.com/matrix/>
- Pure Storage—See https://support.purestorage.com/FishArray/Getting_Started_with_FishArray/Compatibility_Matrix/Network_Adapters/2C_HBAs_and_Switches

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 2: 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,	Windows 2012	All	FCoE	Yes	Yes	Yes	Yes	Yes
	VIC 1225T,	Windows 2016	All		Yes	Yes	Yes	Yes	Yes
	VIC 1227,	Windows 2019	All		Yes	Yes	Yes	Yes	Yes
	VIC1227T,	Windows 2022	All		Yes	Yes	—	—	—
	VIC 1240,	Red Hat 7.x	All		Yes	Yes	Yes	Yes	Yes
	VIC 1280,	Red Hat 8.x	All		Yes	Yes	Yes	Yes	Yes
	VIC 1285,	SUSE 11	All		Yes	Yes	Yes	Yes	Yes
	VIC 1340,	SUSE 12	All		Yes	Yes	Yes	Yes	Yes
	VIC 1380,	SUSE 15	All		Yes	Yes	Yes	Yes	Yes
	VIC 1385,	VMware ESX 6.x, 7.x, 8.x	All		Yes	Yes	Yes	Yes	Yes
	VIC 1455,								
	VIC 1495,								
	VIC 15000								

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 ⁷	LPe36000 Series HBA,	Windows 2012	All	FC	Yes	Yes	—	Yes	—	
		Windows 2016	All		Yes	Yes	—	Yes	—	
	LPe35000 Series HBA,	Windows 2019	All		Yes	Yes	—	Yes	—	
		Windows 2022	All		Yes	Yes	—	—	—	
	LPe32000 Series HBA,	Red Hat 7.x	All		Yes	Yes	—	Yes	—	
		Red Hat 8.x	All		Yes	Yes	—	Yes	—	
	LPe31000 Series HBA,	SUSE 12	All		Yes	Yes	—	Yes	—	
		SUSE 15	All		Yes	Yes	—	Yes	—	
	LPe16000 Series HBA,	Oracle Linux 6Ux (UEK)	All		Yes	Yes	—	Yes	—	
		Oracle Linux 7Ux (UEK)	All		Yes	Yes	—	Yes	—	
	LPe1250 Series HBA,	Oracle Linux 8Ux (UEK)	All		Yes	Yes	—	Yes	—	
		VMware ESX 6.x, 7.x, 8.x	All		Yes	Yes	—	Yes	—	
	LPe12000 Series HBA	HP-UX 11.31 IA	All		Yes	—	—	—	—	
		Solaris 11	All	Yes	—	—	—	—		
	OCe	14102 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
		11102 Series CNA	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 ⁸	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	—	—	—
		Red Hat 7.x	All		Yes	Yes	—	Yes	—
		Red Hat 8.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	FCoE	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	—	—	—	—

⁷ For Emulex adapter support with VIOS, IBMi, or AIX check IBM SSIC at <http://www-03.ibm.com/systems/support/storage/ssic/interoperability.wss>.

⁸ 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.

The following table provides details on Disk Storage support.

Table 3: Disk Storage Support Matrix

Vendor	Model	Protocol	Cisco MDS 9xxx	Cisco Nexus 9xxx	Cisco Nexus 7xxx	Cisco Nexus 5xxx
IBM	DS8700, DS8800, DS8900	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 5100, 5100H, 5200, 5200H, 5500, 5500H, 5600, 5600H	FC, NVMe/FC, FICON	Yes	—	Yes	Yes
	Virtual Storage Platform G100G150F150	FC, FCoE, FICON	Yes	—	Yes	Yes
	Virtual Storage Platform 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		Yes	Yes	Yes	Yes
	Primera 600 Storage	FC	Yes	—	—	Yes
	Alletra 6000, 9000		Yes	—	—	—
	MSA 1000/2000/3000		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
Pure 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	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

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

Table 4: 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, NVMeFC	MDS NX-OS 7.x and above from Table 1: Cisco NX-OS Releases Supported on Cisco MDS 9000 Series Switches, Cisco Nexus 9000 Series Switches, and Cisco Nexus 5000 Series Switches for 7.x		NX-OS 7.x and above from Table 1: Cisco NX-OS Releases Supported on Cisco MDS 9000 Series Switches, Cisco Nexus 9000 Series Switches, and Cisco Nexus 7000 Series Switches for 7.x	All HBA/CNA/Operating Systems and UCS release products. http://www.cisco.com/c/en/us/support/serve
	Cisco UCS 6300 Series Fabric Interconnects,					
	Cisco UCS 6400 Series Fabric Interconnects					
	Cisco UCS 6536 Fabric Interconnect					
	Cisco UCS 9108 100G Intelligent Fabric Module					

Vendor	Model	Protocol	Cisco MDS 9xxx	Cisco Nexus 5xxx/2xxx	Cisco Nexus 7xxx	HBA/CNA/Operating Systems and UCS-M Version
				<p>NX-OS 6.0(2)N1(1) and above from Table 1: 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 for 6.x</p> <p>NX-OS 7.0(1)N1(1) and above from Table 1: Cisco NX-OS Releases Supported on Cisco MDS 9000 Series Switches, Cisco Nexus 9000</p>		

Vendor	Model	Protocol	Cisco MDS 9xxx	Cisco Nexus 5xxx/2xxx	Cisco Nexus 7xxx	HBA/CNA/Operating Systems and UCS-M Version
				Series Switches, Cisco Nexus 7000 Series Switches, and Cisco Nexus 5000 Series Switches for 7.x		

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 5: 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 ⁹ Cisco MDS 9220i ¹⁰ , Cisco MDS 9250i Cisco MDS 9132T Cisco MDS 9148S Cisco MDS 9148T ¹¹ Cisco MDS 9148V ¹² Cisco MDS 9124V ¹³ 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: 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 for 8.x	NX-OS 7.3(3)N1(1) and above from Table 1: 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 for 7.x	NX-OS 7.0(3)I7(3) and above from Table 1: 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 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: 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 for 8.x	NX-OS 7.3(3)N1(1) and above from Table 1: 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 for 7.x	NX-OS 7.0(3)I7(3) and above from Table 1: 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 for 7.x
	Cisco	VIC 14xx				

Cisco MDS and Nexus Switches	Vendor	HBA Model	Operating System	Cisco MDS 9xxx	Cisco Nexus 5xxx	Cisco Nexus 9xxx
			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: 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 for 8.x	NX-OS 7.3(3)N1(1) and above from Table 1: Cisco NX-OS Releases Supported on Cisco MDS 9000 Series Switches, Cisco Nexus 9000 Series Switches, and Cisco Nexus 5000 Series Switches for 7.x	NX-OS 7.0(3)I7(3) and above from Table 1: Cisco NX-OS Releases Supported on Cisco MDS 9000 Series Switches, Cisco Nexus 9000 Series Switches, and Cisco Nexus 5000 Series Switches for 7.x

⁹ Cisco MDS 9396T switch requires Cisco MDS NX-OS Release 8.3(1) and later.

¹⁰ Cisco MDS 9220i switch requires Cisco MDS NX-OS Release 8.5(1) and later.

¹¹ Cisco MDS 9148T switch requires Cisco MDS NX-OS Release 8.3(1) and later.

¹² Cisco MDS 9148v switches requires Cisco MDS NX-OS Release 9.3(1) and later.

¹³ Cisco MDS 9124v switches requires Cisco MDS NX-OS Release 9.3(1) and later.

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

Table 6: 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		
			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		

Vendor	Model	Protocol	Cisco MDS 9xxx	Cisco Nexus 7xxx	Cisco Nexus 5xxx	HBA/CNA	Operating System
Tegile Systems	IntelliFlash Storage Array Family ¹⁴	FC	Cisco MDS NX-OS Release 6.2(9) and above	—		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
					<p>NX-OS 6.0(2)x(x) and above from Table 1: 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 for 6.x</p> <p>NX-OS 7.0(5)x(x) and above from Table 1: 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</p>		

Vendor	Model	Protocol	Cisco MDS 9xxx	Cisco Nexus 7xxx	Cisco Nexus 5xxx	HBA/CNA	Operating System
					Switches for 7.x		
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: 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 for 7.x	Qlogic 2600 Series Qlogic 2500 Series	Windows 2012 R2, SP1 Solaris 11 RHEL 7.2 ESX 6.0

Vendor	Model	Protocol	Cisco MDS 9xxx	Cisco Nexus 7xxx	Cisco Nexus 5xxx	HBA/CNA	Operating System
Vexata	VX-100F	FC	Cisco MDS NX-OS Release 8.2(1) and later from Table 1: 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 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

¹⁴ 8G FC only.

The following table provides details on Tape Storage support.

Table 7: 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
	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

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	—	—
	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 8: Recommended iSCSI initiators

iSCSI Initiators
Open iSCSI 2.0-873.29.e16
Microsoft iSCSI Initiator 6.2.9200.16813, 6.1.7601.18386 and 6.3.9600.17090

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 9: DWDM Support

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

Contact the WDM vendors for specific configuration guidelines or version recommendations.

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.

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 10: 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 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		Cisco MDS 9250i Cisco MDS 9396S	
DS-8G-ZR-Dxxxx	SFP+, 8/4/2/1 Gbps FC/FICON, DWDM, SM, DDM, 23dB, 80km		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	

Table 11: 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	Cisco MDS 9148S Cisco MDS 9250i	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	8.2(1) and later	Cisco MDS 9396S Cisco MDS 24/10 Port SAN Extension Module	
DS-16G-ER-Dxxxx	SFP+, 16/8/4 Gbps FC/FICON, DWDM, SM, DDM, 13dB, 40km		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	

Table 12: 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	<p>Cisco MDS 48 Port 32 Gbps Fibre Channel Switching Module</p> <p>Cisco MDS 9132T</p> <p>Cisco MDS 9148T and MDS 9396T</p> <p>Cisco MDS 9220i</p> <p>Cisco MDS 48 Port 64 Gbps Fibre Channel Switching Module</p> <p>Cisco MDS 9124V and MDS 9148V</p> <p>Cisco MDS 9396V</p>	<p>The Cisco MDS 9220i switch is supported starting from Cisco MDS NX-OS Release 8.5(1).</p> <p>The Cisco MDS 48 Port 64 Gbps Fibre Channel Switching Module is supported from Cisco MDS NX-OS Release 9.2(1).</p> <p>The Cisco MDS 9124V, and MDS 9148V switches are supported from Cisco MDS NX-OS Release 9.3(1)</p> <p>The MDS 9396V switch is supported from Cisco MDS NX-OS Release 9.4(1)</p>