



# Connectrix MDS-9148S and MDS-9396S 16Gb/s Fibre Channel Switches

The Dell EMC Connectrix MDS 9000S Switch series support up to 16 Gigabit per second (Gb/s) Fibre Channel performance which accommodates mission-critical applications and today's all flash storage systems. Both models are NVMe over Fabric (NVMe oF) capable with no change required in the SAN.

## Connectrix MDS 16Gb/s Fibre Channel Switch Models

**MDS-9148S** This switch scales from 12 to 48 line-rate 16 Gb/s Fibre Channel ports in a single compact one rack-unit (RU) form factor, providing high performance with exceptional flexibility at effective cost. The MDS-9148S is an ideal solution for a standalone Storage Area Network (SAN) in small departmental storage environments, a top-of-rack switch in medium-sized redundant fabrics or as an edge switch in larger-scale enterprise data center core-edge topologies. The MDS-9148S delivers speeds of 2, 4, 8 and 16 Gb/s, with 16Gb/s of dedicated bandwidth for each port. Individual ports can be configured with either short or long wavelength optics.

**MDS-9396S** This 96-port switch is a highly reliable, flexible, fabric switch. It combines high performance with exceptional flexibility and cost effectiveness. This powerful, compact two rack-unit (2RU) switch scales from 48 to 96 line-rate 16 Gb/s Fibre Channel ports. For ultimate flexibility, there are two MDS-9396S models to support options for airflow. You can choose port side intake (PSI) where air flows front to back or port side exhaust (PSE) where air flow flows back to front. Model MDS-9396S-48S-I includes a 48-port base and port side intake whereas model MDS-9396S-48 includes a 48-port base and port side exhaust. Having two MDS-9396S airflow options extends the flexibility for hot/cold aisle network designs.

## Connectrix MDS Optional Features and Data Center Network Manager (DCNM)

**Enterprise License** – includes advanced traffic engineering and network security features such as IVR, QoS, zoned based QoS, Fibre Channel Security Protocol (FC-SP), port security, VSAN-based access control and fabric binding.

**Data Center Network Manager (DCNM) Server-based SAN License** – includes advanced management capabilities such as vCenter integration, performance trending, advanced provisioning, backup and dashboards. License is hosted on a server.

**Data Center Network Manager (DCNM) Switch-based SAN License** – includes advanced management capabilities such as vCenter integration, performance trending, advanced provisioning, backup and dashboards. License is hosted on the switch.

## Specifications

Features	MDS-9396S	MDS-9148S
Fibre Channel Ports	48-port base. 96 ports maximum. Units can be configured with 48,60,72,84, or 96 ports.	Up to 48 ports. Units can be configured with 12, 24, 36 or 48 ports
Virtual SANs	Up to 80 VSANs per fabric	Up to 80 VSANs per fabric
Performance	2/4/8/10/16-Gb/s autosensing with 16Gb/s of dedicated bandwidth per port	2/4/8/16-Gb/s autosensing with 16Gb/s of dedicated bandwidth per port
Switch Core	Non-blocking	Non-blocking
Classes of Service	Class 2, 3 and F	Class 2, 3 and F
Fabric Services	Name Server, Registered State Change Notification (RSCN), Login Services, Fabric Configuration Server (FCS), Public Loop, Broadcast, In-order delivery	Name Server, Registered State Change Notification (RSCN), Login Services, Fabric Configuration Server (FCS), Public Loop, Broadcast, In-order delivery
Fibre Channel port types	Standard: E, F and FL Enhanced: SD, ST and TE	Standard: E, F and FL Enhanced: SD, ST and TE
Media Types	Hot swappable enhanced Small Form Factor Pluggable (SFP+) transceivers  16Gb/s Shortwave SFP+ up to 1,312 feet/400 meters Long wave SFP+ up to 6.2 miles/10km	Hot swappable enhanced Small Form Factor Pluggable (SFP+) transceivers  16Gb/s: Shortwave SFP+ up to 1,312 feet/400 meters Long wave SFP+ up to 6.2 miles/10km
Advanced Functions	VSAN, IVR, PortChannel, QoS, NPV	VSAN, IVR, PortChannel, QoS, NPV
Hot swappable components	SFPs, power supplies and fans	SFPs, power supplies and fans
NX-OS minimum revision	MDS-9396S port side exhaust: 6.2.13 MDS-9396S port side intake: 6.2.15	MDS-9148S 6.2.9

System Architecture		
Features	MDS-9396S	MDS-9148S
Installation options	19-inch EIA compliant rack	19-inch EIA compliant rack
Management	Data Center Network Manager (DCNM) Access: Out-of-band 10/100/1000 Ethernet port, RS-232 serial console port, USB	Data Center Network Manager (DCNM) Access: Out-of-band 10/100/1000 Ethernet port, RS-232 serial console port, USB
Physical specifications	Dimensions: (H x W x D): 3.4 x 17.42 x 22.28 in. (8.64 x 44.25 x 56.59 cm), 2RU Weight (fully configured): 39.24 lb (17.8 kg)	Dimensions: (H x W x D): 1.72 x 17.16 x 16.34 in. (4.37 x 43.59 x 41.50 cm), 1RU Weight (fully configured): 19.84 lb (9 kg)

Power and Airflow		
Features	MDS-9396S	MDS-9148S
Power supply	1200W with 180-240 VAC input; and 800W with 90-180 VAC input 2 per switch Power grid redundancy (1+) with 180 to 264 VAC input only	300W AC (two per switch) 100 to 240 VAC (10% range)
Power cord	Notched C15 socket connector connecting to C16 plug on power supply	Notched C15 socket connector connecting to C16 plug on power supply
Frequency	50 to 60 Hz (nominal)	50 to 60 Hz (nominal)
Maximum power consumption	100 to 240 VAC nominal (+/- 10% full range); 50 to 60 Hz nominal (+/-3 Hz for full range)	100 to 240 VAC nominal (+/- 10% full range); 50 to 60 Hz nominal (+/-3 Hz for full range)
Airflow	MDS-9396S-48 Airflow: Port-side exhaust (air flows from back to front) MDS-9396S-48-I Airflow: Port-side intake (air flows from front to back) Maximum 255 cubic feet per minute <u>Note</u> : It is recommended to maintain air space of 2.5 inches (6.4 cm) between walls and chassis air vents and a minimum horizontal separation of 6 inches (15.2 cm) between two chassis to prevent overheating.	Back to front (towards ports) 200 linear feet per minute (LFM) through system fan assembly <u>Note</u> : It is recommended to maintain air space of 2.5 inches (6.4 cm) between walls and chassis air vents and a minimum horizontal separation of 6 inches (15.2 cm) between two chassis to prevent overheating.

## Environmental Specifications

Features	MDS-9396S	MDS-9148S
Temperature ambient operating	32 to 104 degrees F (0 to 40C)	32 to 104 degrees F (0 to 40C)
Temperature ambient non-operating	40 to 158 degrees F (-40 to 70C)	40 to 158 degrees F (-40 to 70 C)
Relative humidity, ambient (non condensing) operating	10 to 90%	10 to 90%
Altitude operating	-197 to 6500 feet (-60 to 2000 m)	-197 to 6500 feet (-60 to 2000 m)

## Regulatory Requirements

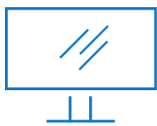
Features	MDS-9396S	MDS-9148S
Safety	<ul style="list-style-type: none"> <li>CE Marking</li> <li>UL 60950</li> <li>CAN/CSA-C22.2 No. 60950</li> <li>EN60950</li> <li>IEC 60950</li> <li>TS 001</li> <li>AS/NZS 3260</li> <li>IEC60825</li> <li>EN60825</li> <li>21 CFR 1040</li> </ul>	<ul style="list-style-type: none"> <li>CE Marking</li> <li>UL 60950</li> <li>CAN/CSA-C22.2 No. 60950</li> <li>EN60950</li> <li>IEC 60950</li> <li>TS 001</li> <li>AS/NZS 3260</li> <li>IEC60825</li> <li>EN60825</li> <li>21 CFR 1040</li> </ul>
EMC Compliance	<ul style="list-style-type: none"> <li>FCC Part 15 (CFR 47) Class A</li> <li>ICES-003 Class A</li> <li>EN 55022 Class A</li> <li>CISPR 22 Class A</li> <li>AS/NZS 3548 Class A</li> <li>VCCI Class A</li> <li>EN 55024</li> <li>EN 50082-1</li> <li>EN 61000-6-1</li> <li>EN 61000-3-2</li> <li>EN 61000-3-3</li> </ul>	<ul style="list-style-type: none"> <li>FCC Part 15 (CFR 47) Class A</li> <li>ICES-003 Class A</li> <li>EN 55022 Class A</li> <li>CISPR 22 Class A</li> <li>AS/NZS 3548 Class A</li> <li>VCCI Class A</li> <li>EN 55024</li> <li>EN 50082-1</li> <li>EN 61000-6-1</li> <li>EN 61000-3-2</li> <li>EN 61000-3-3</li> </ul>

## Network Security

MDS-9396S	MDS-9148S
Per VSAN RBAC using RAIDUS and TACACS+-based authentication, authorization and accounting (AAA) functions	Per VSAN RBAC using RAIDUS and TACACS+-based authentication, authorization and accounting (AAA) functions
VSAN Fabric Isolation	VSAN Fabric Isolation
Intelligent packet inspection at port level	Intelligent packet inspection at port level
Fibre Channel Security Protocol (FC-SP) from host-to-switch and switch-to-switch authentication	Fibre Channel Security Protocol (FC-SP) from host-to-switch and switch-to-switch authentication
Secure File Transfer Protocol (SFTP)	Secure File Transfer Protocol (SFTP)
Secure Shell Version 2 (SSHv2) with Advanced Encryption Services (AES)	Secure Shell Version 2 (SSHv2) with Advanced Encryption Services (AES)
Simple Network Management Protocol version 3 (SNMPv3) with Advanced Encryption Services (AES)	Simple Network Management Protocol version 3 (SNMPv3) with Advanced Encryption Services (AES)
Other built-in security: Control plane security, logical unit number (LUN) zoning and read-only zones, hardware enforced zoning and broadcast zones, management access FIPS 140-2 compliance. Other enhanced security features are available in the Enterprise Package.	Other built-in security: Control plane security, logical unit number (LUN) zoning and read-only zones, hardware enforced zoning and broadcast zones, management access FIPS 140-2 compliance. Other enhanced security features are available in the Enterprise Package.

## Availability Features

MDS-9396S	MDS-9148S
Hot-swappable, dual redundant power supplies, fan trays and SFPs	Hot-swappable, dual redundant power supplies, fan trays and SFPs
Redundant AC Input	Redundant AC Input
Non-disruptive firmware upgrades	Non-disruptive firmware upgrades
Stateful process restart	Stateful process restart
Per-VSAN Fabric Services	Per-VSAN Fabric Services
Any port configuration for PortChannels	PortChannel for Inter-Switch Link (ISL) resiliency
Fabric-based multi-pathing	Fabric-based multi-pathing
Port tracking	F-port trunking for resiliency from an MDS 9148S operating in NPV mode



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