

Connectrix MDS-9132T, MDS-9148T & MDS-9396T 32Gb/s Switches

The Dell Connectrix next generation MDS 9000T Switch series support up to 32Gigabit per second (Gb/s) Fibre Channel performance which accommodates mission-critical applications and today's all flash storage systems. All MDS-9000T switch models allow seamless transition to Fibre Channel Non-Volatile Memory Express (FC-NVMe) workloads without any hardware upgrade in the SAN. All Connectrix MDS 9000T switches offer state-of-the-art analytics and telemetry capability built into its next-generation Application-Specific Integrated Circuit (ASIC) platform.

Connectrix MDS 32Gb/s Fibre Channel Switch Models

MDS-9132T This 32-port switch provides high speed Fibre Channel connectivity from the server rack to the SAN core. Small-scale SAN architectures can be built from the foundation using this low-cost, low-power, non-blocking, line-rate, and low-latency, bi-directional airflow capable, fixed standalone SAN switch connecting both storage and host ports. Medium-size to large-scale SAN architectures built with SAN core directors can expand 32-Gbps connectivity to the server rack using these switches either in switch mode or Network Port Virtualization (NPV) mode. For ultimate flexibility, the MDS-9132T scales from 8- to 32- ports.

MDS-9148T This 48-port switch provides high-speed Fibre Channel connectivity for All-Flash arrays. It empowers small, midsize, and large enterprises that are rapidly deploying cloud-scale applications using extremely dense virtualized servers, providing the benefits of greater bandwidth, scale, and consolidation. Medium and large scale SAN architectures built with SAN core directors can expand 32Gb/s connectivity to the server rack using these switches in either switch mode or NPV mode. The MDS-9148T provides growth in small increments with four possible configurations of 24, 32, 40 and 48-ports.

MDS-9396T This powerful 96-port switch provides high-speed connectivity in the SAN with high performance, density and scale. For standalone SANs, this switch can serve dense hyperscale server environments that spawn thousands of virtual Host Bus Adapters (vHBAs) serving several virtual machine instances, providing each of them with predictable throughput, consistent latency and highly available paths by distributing the physical SAN connectivity across six different port groups of 16 ports each. Autozone allows these standalone deployments to benefit from automatic zoning of host and storage ports without requiring any manual zoning configuration thus, enabling a design with smaller failure domains rather than one large failure domain consisting of all switch ports. The MDS-9396T model allows for four possible configurations of 48, 64, 80 and 96-ports.

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. **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

System Architecture			
Features	MDS-9132T	MDS-9148T	MDS-9396T
Fibre Channel Ports	There are two models for the 32- port MDS-9132T. There is an 8-port base model with one power supply and one fan kit and a 24-port bundled model with two power supplies and two fan kits.	Up to 48 ports. There are three base models for the MDS-9148T. There's one model that is fully populated with 32Gb/s SFPs, another with a 24-port base, populated with 24 SFPs to which you can add an additional 24-ports and finally, there's a 48-port model with no SFPs. All three models have options for airflow.	Up to 96 ports. There are three base models for the MDS-9396T. There's one model that is fully populated with 32Gb/s SFPs, another with a 48-port base, populated with 48 SFPs to which you can add an additional 48-ports and finally, there's a 96-port model with no SFPs. All three models have options for airflow.
Virtual SANs	Up to 80 VSANs per fabric	Up to 80 VSANs per fabric	Up to 80 VSANs per fabric
Performance	4/8/16/32-Gb/s autosensing with 32Gb/s of dedicated bandwidth per port	4/8/16/32-Gb/s autosensing with 32Gb/s of dedicated bandwidth per port	4/8/16/32-Gb/s autosensing with 32Gb/s of dedicated bandwidth per port
Switch Core	Non-blocking	Non-blocking	Non-blocking
Classes of Service	Class 2, 3 and F	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), 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 B Enhanced: SD, ST and TE	Standard: E, F and B Enhanced: SD, ST and TE	Standard: E, F and B Enhanced: SD, ST and TE
Media Types	Hot swappable enhanced Small Form Factor Pluggable (SFP+) transceivers 32Gb/s Shortwave SFP+ up to 623 feet/190 meters Long wave SFP+ up to 6.2 miles/10km 16Gb/s – same as MDS-9148S and MDS-9396S	Hot swappable enhanced Small Form Factor Pluggable (SFP+) transceivers 32Gb/s Shortwave SFP+ up to 623 feet/190 meters Long wave SFP+ up to 6.2 miles/10km 16Gb/s – same as MDS-9148S and MDS-9396S	Hot swappable enhanced Small Form Factor Pluggable (SFP+) transceivers 32Gb/s Shortwave SFP+ up to 623 feet/190 meters Long wave SFP+ up to 6.2 miles/10km 16Gb/s – same as MDS-9148S and MDS-9396S
Advanced Functions	VSAN, IVR, Port Channel with multipath load balancing, flow-based and zone-based QoS	VSAN, IVR, Port Channel with multipath load balancing, flow-based and zone-based QoS	VSAN, IVR, Port Channel with multipath load balancing, flow-based and zone-based QoS
Hot swappable components	SFPs, power supplies and fans	SFPs, power supplies and fans	SFPs, power supplies and fans
NX-OS minimum revision	NX-OS 8.2.1	NX-OS 8.3.(1)	NX-OS 8.3.(1)

System Architecture			
Features	MDS-9132T	MDS-9148T	MDS-9396T
Installation options	19-inch EIA compliant rack	19-inch EIA compliant rack	19-inch EIA compliant rack
Management and Management Access	Data Center Network Manager (DCNM) Management access through two out-of-band 10/100/1000 Mb/s Ethernet ports Mgmt0: 10/100/1000 BASE-T port Mgmt1: 10/100/1000 BASE-T port	Data Center Network Manager (DCNM) Management access through two out-of-band 10/100/1000 Mb/s Ethernet ports Mgmt0: 10/100/1000 BASE-T port Mgmt1: 10/100/1000 BASE-T port	Data Center Network Manager (DCNM) Management access through two out-of-band 10/100/1000 Mb/s Ethernet ports Mgmt0: 10/100/1000 BASE-T port Mgmt1: 10/100/1000 BASE-T port
Physical specifications	Dimensions: (H x W x D): 1.72 x 17.3 x 20.11 in. (4.37 x 43.94 x 51.08 cm), 1RU excluding power supply unit and fan tray handles	Dimensions: (H x W x D): 1.72 x 17.3 x 22.3 in. excluding power supply unit and fan tray handles. (4.37 x 43.9 x 55.6 cm), 1RU	Dimensions: (H x W x D): 3.39 x 17.42 x 22.28 in. (8.61 x 44.25 x 56.59 cm), 2RU Weight: 41.62 lb (18.88 kg) fully configured

Power and Airflow			
Features	MDS-9132T	MDS-9148T	MDS-9396T
Power supply	650W with 180-240 VAC input; 2 per maximum per switch	650W 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	1200W AC/ HVAC/ HVDC Bidirectional airflow (2 per switch)
Power cord	IEC60320 C14 plug on 650W power supply connecting to a notched C15 socket connector	IEC60320 C14 plug on 650W power supply connecting to a notched C15 socket connector	IEC60320 C14 plug on 650W power supply connecting to a notched C15 socket connector
Frequency	50 to 60 Hz (nominal)	50 to 60 Hz (nominal)	50 to 60 Hz (nominal)
Maximum power consumption	100 to 240 VAC nominal (10% range)	100 to 240 VAC nominal (10% range)	<ul style="list-style-type: none"> AC input: 90V to 305V DC input: 192V to 400V
Airflow	Options: 1) Front-to-back (inward from ports) using port-side intake fans 2) Back-to-front (towards ports) using port-side exhaust fans 50 Cubic Feet per Minute (CFM) through system fan assembly at 77° F (25° C). 100 CFM maximum.	Options: 1) Front-to-back (inward from ports) using port-side intake fans 2) Back-to-front (towards ports) using port-side exhaust fans 50 Cubic Feet per Minute (CFM) through system fan assembly at 77° F (25° C). 100 CFM maximum.	Options: 1) Front-to-back (inward from ports) using port-side intake fans 2) Back-to-front (towards ports) using port-side exhaust fans Maximum 255 Cubic Feet per Minute (CFM) Nominal 110 CFM (25° C)

Environmental Specifications

Features	MDS-9132T	MDS-9148T	MDS-9396T
Temperature ambient operating	32 to 104 degrees F (0 to 40C)	32 to 104 degrees F (0 to 40C)	32 to 104 degrees F (0 to 40C)
Temperature ambient non-operating	-40 to 150 degrees F (-40 to 70C)	-40 to 150 degrees F (-40 to 70C)	-40 to 150 degrees F (-40 to 70 C)
Relative humidity, ambient (non condensing) operating	10 to 90%	10 to 90%	10 to 90%
Altitude operating	-197 to 6500 feet (-60 to 2000 m)	-197 to 6500 feet (-60 to 2000 m)	-197 to 6500 feet (-60 to 2000 m)

Regulatory Requirements

Features	MDS-9132T	MDS-9148T	MDS-9396T
Safety	<ul style="list-style-type: none"> CE Marking UL 60950 CAN/CSA-C22.2 No. 60950 EN60950 IEC 60950 TS 001 AS/NZS 3260 IEC60825 EN60825 21 CFR 1040 	<ul style="list-style-type: none"> CE Marking UL 60950 CAN/CSA-C22.2 No. 60950 EN60950 IEC 60950 TS 001 AS/NZS 3260 IEC60825 EN60825 21 CFR 1040 	<ul style="list-style-type: none"> CE Marking UL 60950 CAN/CSA-C22.2 No. 60950 EN60950 IEC 60950 TS 001 AS/NZS 3260 IEC60825 EN60825 21 CFR 1040
EMC Compliance	<ul style="list-style-type: none"> FCC Part 15 (CFR 47) Class A ICES-003 Class A EN 55022 Class A CISPR 22 Class A AS/NZS 3548 Class A VCCI Class A EN 55024 EN 50082-1 EN 61000-6-1 EN 61000-3-2 FIPS certified FIPS 140-2 Level 2 	<ul style="list-style-type: none"> FCC Part 15 (CFR 47) Class A ICES-003 Class A EN 55022 Class A CISPR 22 Class A AS/NZS 3548 Class A VCCI Class A EN 55024 EN 50082-1 EN 61000-6-1 EN 61000-3-2 EN 61000-3-3 	<ul style="list-style-type: none"> FCC Part 15 (CFR 47) Class A ICES-003 Class A EN 55022 Class A CISPR 22 Class A AS/NZS 3548 Class A VCCI Class A EN 55024 EN 50082-1 EN 61000-6-1 EN 61000-3-2 EN 61000-3-3

Network Security

MDS-9132T

- VSAN fabric isolation
- Intelligent packet inspection at port level
- Hardware zoning by Access Control Lists (ACLs)
- Fibre Channel Security Protocol (FC-SP) switch-to-switch authentication
- FC-SP host-to-switch authentication
- Role-based access control (RBAC) using RADIUS, TACACS+, or Lightweight Directory Access Protocol (LDAP) authentication, authorization, and accounting (AAA) functions
- Secure FTP (SFTP)
- Secure Shell Protocol Version 2 (SSHv2)
- Simple Network Management Protocol Version 3 (SNMPv3) implementing Advanced Encryption Standard (AES)
- Control-plane security
- Cisco TrustSec® payload encryption
- Secure Boot and Anti-counterfeit technology

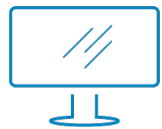
MDS-9148T

- VSAN fabric isolation
- Intelligent packet inspection at port level
- Hardware zoning by Access Control Lists (ACLs)
- Fibre Channel Security Protocol (FC-SP) switch-to-switch authentication
- FC-SP host-to-switch authentication
- Role-based access control (RBAC) using RADIUS, TACACS+, or Lightweight Directory Access Protocol (LDAP) authentication, authorization, and accounting (AAA) functions
- Secure FTP (SFTP)
- Secure Shell Protocol Version 2 (SSHv2)
- Simple Network Management Protocol Version 3 (SNMPv3) implementing Advanced Encryption Standard (AES)
- Control-plane security
- Cisco TrustSec® payload encryption
- Secure Boot and Anti-counterfeit technology

MDS-9396T

- VSAN fabric isolation
- Intelligent packet inspection at port level
- Hardware zoning by Access Control Lists (ACLs)
- Fibre Channel Security Protocol (FC-SP) switch-to-switch authentication
- FC-SP host-to-switch authentication
- Role-based access control (RBAC) using RADIUS, TACACS+, or Lightweight Directory Access Protocol (LDAP) authentication, authorization, and accounting (AAA) functions
- Secure FTP (SFTP)
- Secure Shell Protocol Version 2 (SSHv2)
- Simple Network Management Protocol Version 3 (SNMPv3) implementing Advanced Encryption Standard (AES)
- Control-plane security
- Cisco TrustSec® payload encryption
- Secure Boot and Anti-counterfeit technology

Availability Features		
MDS-9132T	MDS-9148T	MDS-9396T
Hot-swappable, dual redundant power supplies, fan tray and SFPs	Hot-swappable, dual redundant power supplies, fan trays and SFPs (Fan tray with integrated temperature and power management)	Hot-swappable, dual redundant power supplies, fan trays and SFPs
Redundant AC Input	Redundant AC Input	Redundant AC Input
Non-disruptive firmware upgrades	Non-disruptive firmware upgrades	Non-disruptive firmware upgrades
Stateful process restart	Stateful process restart	Stateful process restart
Per-VSAN Fabric Services	Per-VSAN Fabric Services	Per-VSAN Fabric Services
Any port configuration for PortChannels PortChannel for Inter-Switch Link (ISL) resiliency	Any port configuration for PortChannels	PortChannel for Inter-Switch Link (ISL) resiliency
Fabric-based multi-pathing	Fabric-based multi-pathing	Fabric-based multi-pathing
F-port Trunking, Port tracking, online diagnostics	F-port Trunking, Port tracking, online diagnostics	F-port Trunking, Port tracking, online diagnostics
FEC with HBA ports	FEC with HBA ports	FEC with HBA ports
Buffer-to-buffer state change notification with HBA ports	Buffer-to-buffer state change notification with HBA ports	Buffer-to-buffer state change notification with HBA ports



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