Cisco MDS 9148 Multilayer Fabric Switch

Overview

Q. What is the Cisco® MDS 9148 Multilayer Fabric Switch?

A. The Cisco MDS 9148 Multilayer Fabric Switch offers:

- High-performance line-rate 8-Gbps Fibre Channel connectivity for SANs
- Flexibility for growth and virtualization
- Enterprise-class features such as virtual SANs (VSANs); Quick Configuration Wizard; and industry-leading advanced security, high availability, quality of service (QoS), traffic management, and comprehensive diagnostic features at a cost-effective price point that lowers a customer's cost of entry to a SAN environment

The introduction of the new Cisco MDS 9148 completes the Cisco MDS 9000 Family portfolio of SAN switches and directors, providing end-to-end SAN options with industry-leading scalability, no matter the size of the customer's business or the scope of the project.

The Cisco MDS 9148 also complements Cisco's overall data center offerings in the Cisco Unified Computing System™ and Cisco Nexus® 5000 Series Switch platforms.

Q. What value does the Cisco MDS 9148 offer customers?

A. The Cisco MDS 9148 offers these benefits:

- The Cisco MDS 9148 offers performance and flexibility at a low cost.
- 8-Gbps Fibre Channel connectivity and enterprise-class storage networking features provide the high performance that small to medium-sized business (SMB) customers want.
- The expandability from 16 to 48 ports enables customers to pay for only what they need as their needs grow.
- The Cisco MDS 9148 offers customers a richer set of features and functions than the competition at a lower price point. Some important differentiators are discussed later in this document.

Q. What is the main Cisco MDS 9148 feature?

A. The Cisco MDS 9148 offers high performance, high density, low power consumption, flexibility, and enterprise-class capabilities at a cost-effective price.

Market

Q. Who are the primary customers for the Cisco MDS 9148 fabric switch?

A. The Cisco MDS 9148 is especially designed for small and midrange market commercial and enterprise customers. The switch provides an excellent solution for:

- SMB customers who need a cost-effective option for SAN and accelerated backup; proof points include the following:
  - Line-rate 1/2/4/8-Gbps interfaces provide high-performance connectivity.
  - On-demand port activation enables a pay-as-you-grow model.
  - Quick Configuration Wizard provides “plug-and-play” capabilities.
- Commercial customers who require enterprise-class availability features and scalable options to consolidate storage, backup, and SAN infrastructure; proof points include the following:

- On-demand licensing provides 8-port upgrades from 16- to 48-port configurations for scalability and growth.
- The Cisco MDS 9148 includes dual redundant power supplies and fan trays, nondisruptive In Service Software Upgrade (ISSU) with rollback capabilities, and a number of software features for switch availability and connectivity.
- VSANs provide a path to consolidate SANs and extend virtual server environments to the SAN and to storage.

- Enterprise customers who want low-cost, enterprise-class features for a core-edge SAN design; proof points include the following:
  - The Cisco MDS 9148 is fully compatible with the Cisco MDS 9000 Family multilayer directors and multilayer fabric switches for transparent, end-to-end service delivery in large data center core-edge deployments.

Q. How can I purchase a Cisco MDS 9148 switch?

A. The Cisco MDS 9148 is available through major server and storage vendors. The switch is sold by these vendors as an original storage manufacturer (OSM) product and original equipment manufacturer (OEM) product and is sold with their respective services. It is also available from Cisco Direct through selected distribution and channel partners and can be purchased with Cisco SMARTnet® Service.

Differentiators

Q. What are the main differentiators of the Cisco MDS 9148?

A. The main differentiators are listed here:

- The switch has the highest 8-Gbps line-rate port density per rack unit (RU) in the industry. It is optimized for power and space.
- Integrated, advanced Cisco NX-OS Software features (such as VSANs, PortChannels, Cisco Data Center Network Manager (DCNM) for SAN Essentials Edition, management security, and diagnostics) are a part of the base package, not hidden costs for the end user.
- The switch enables virtual machine-aware SANs with features such as VSANs, N-port virtualization (NPV), and FlexAttach. A Quick Configuration Wizard enables fast and easy setup.
- The PortChannels feature enables up to 16 8-Gbps aggregated links, for up to 128-Gbps link aggregation with inherent load balancing and failover capabilities.
- The new Zero-Touch Installation feature provides easy plug-and-play deployment and provisioning capabilities, significantly enhancing the overall end-user out-of-the-box experience.

General

Q. What is the basis for the Cisco MDS 9148 architecture?

A. The Cisco MDS 9148 is based on switch-on-a-chip architecture, with a fully arbitrated internal crossbar within the application-specific integrated circuit (ASIC).

Q. Will the Cisco MDS 9124 and 9134 Multilayer Fabric Switches be placed in end-of-sale status?

A. End of sale and end of life will be based on the demand for these switches. At present, we will continue to offer the Cisco MDS 9124 for the foreseeable future. We have placed the Cisco MDS 9134 in end-of-life status and has gone end-of-sale as of February 7, 2011; check the following URL for formal end-of-life and end-of-sale external announcements: http://www.cisco.com/en/US/products/ps5987/prod_eol_notices_list.html.

Q. Is Cisco planning to announce more products for the fabric switch portfolio?

A. Cisco does not preannounce products. Cisco continues to make substantial R&D investments to enable success in the 8-Gbps and upcoming 16-Gbps Fibre Channel markets.

Q. How does the Cisco MDS 9148 interoperate with Cisco MDS 9000 Family directors and other products?

A. The Cisco MDS 9148 is fully backward compatible with the Cisco MDS 9000 Family of multilayer fabric switches and directors based on Cisco NX-OS Software. The Cisco MDS 9148 is also interoperable with Cisco Nexus 5000 Series and Cisco Unified Computing System products and is a critical component of the Cisco Data Center Business Advantage initiative. All Cisco MDS 9000 Family SAN and Cisco Nexus LAN products are now managed by a common Cisco DCNM software platform in support of the ongoing industry adoption of converged network fabrics.

General: New Features

Q. What are the interoperation and upgrade considerations for the new Cisco DCNM for SAN Essentials and Advanced Editions relative to the previous Cisco Fabric Manager and Cisco Fabric Manager Server software packages?

A. Answers to these and many other questions specific to Cisco DCNM can be found in the Cisco DCNM Q&A document posted on Cisco.com.

Q. Is the new Zero-Touch Installation deployment and provisioning feature available with the initial Cisco NX-OS Software Release 5.2(1)?

A. No. The new Zero-Touch Installation feature will be available in a subsequent maintenance release a short time after the initial introduction of Cisco NX-OS Release 5.2(1) in Q3FY11.

Q. Is the new Zero-Touch Installation deployment and provisioning feature also supported on the Cisco MDS 9124 or 9134 fabric switches?

A. No. The new Zero-Touch Installation feature is exclusive to the Cisco MDS 9148 fabric switch. However, the new Cisco NX-OS Release 5.2 (1) does support the Cisco MDS 9124 and 9134 switches.

Q. Is the new Zero-Touch Installation deployment and provisioning feature optional and chargeable?

A. No. The new Zero-Touch Installation feature is standard at no additional charge on every Cisco MDS 9148 fabric switch running the future Cisco NX-OS 5.2(x) maintenance release.

Q. When will Cisco NX-OS Release 5.2(1) ship installed on the Cisco MDS 9148?

A. The factory cutover date for shipping the Cisco MDS 9148 with Cisco NX-OS Release 5.2(1) has not been determined yet, but is targeted to be within 6 months after first customer shipment (FCS) in Q3FY11. The OS release will be shipped only after all OSM partners have tested and qualified this new release.

Q. Can I add the optional Cisco DCNM for SAN Advanced Edition, Enterprise Package, or 8-Port On-Demand Upgrade licenses (the latter with or without Small Form-Factor Pluggables [SFPs]) as part of the Cisco MDS 9148 configure-to-order (CTO) process with the Cisco Dynamic Configuration Tool (DCT)?

A. Yes. The new CTO part numbers have been set up to allow you to add any or all of these to your initial Cisco MDS 9148 (and Cisco MDS 9124) switch orders and have been incorporated into the Cisco DCT. Note that these offerings ship inside the unit box with the switch; however, the licenses come uninstalled. Also, the part numbers are identical to those of the existing spares that ship separately, except that they do not have the “=” suffix.

Technical

Q. Is there a DC power supply version of the Cisco MDS 9148?

A. No. Currently the only Cisco MDS 9000 Family fabric switches that support a DC power supply option are the Cisco MDS 9124 and 9134.

Q. What is the direction of the airflow on the Cisco MDS 9148?

A. The direction of the airflow on the Cisco MDS 9148 is back to front (ports). Note that this is the opposite of the airflow for the Cisco MDS 9124 and 9134 fabric switches. The airflow direction cannot be reversed on the Cisco MDS 9148.

Q. Is the Cisco NX-OS Software fault tolerant?

A. Yes. Cisco NX-OS has several industry-unique innovations that support fault-tolerant nonstop operation: self-healing intelligence, enhanced fault isolation, and corrupted-data handling and recovery.

Q. Is the Cisco MDS 9148 a line-rate switch?

A. Yes. The switch has an 8-Gbps line rate and is totally nonblocking in all configurations.

Q. Does the Cisco MDS 9148 support N-Port ID Virtualization (NPIV)?

A. Yes. The switch supports NPIV and can also be configured as an NPIV core switch.

Q. Can the Cisco MDS 9148 be configured in NPV mode?

A. Yes.

Q. Does the Cisco MDS 9148 support Inter-VSAN Routing (IVR)?

A. At this time, the Cisco MDS 9148 does not support IVR. However, the switch-on-a-chip ASIC is ready to support it. No plans have been announced regarding if or when Cisco will add IVR support for the Cisco MDS 9148 in a future Cisco NX-OS Software release.

Q. Does the Cisco MDS 9148 support mainframe IBM Fiber Connection (FICON) interconnection?

A. No.

Q. Can the Cisco MDS 9148 upgrade code nondisruptively?

A. Yes. The Cisco MDS 9148 supports nondisruptive ISSU just like the Cisco MDS 9124 and 9134 fabric switches. It also has enough internal memory to support rollback to the previous version of the software.

Q. Does Cisco allow third-party optics for the Cisco MDS 9148?

A. No.

Q. Can a customer purchase a spare rack-mount kit for the Cisco MDS 9148?

A. Yes. A spare rack-mount kit is included in the Generic Cisco Accessory Kit. Order spare part number DS-9148-KIT-CSCO=.

Q. What else is contained in a Cisco MDS 9148 accessory kit?

A. The Cisco MDS 9148 accessory kit includes the following:

- RJ-45 to RJ-45 rollover cable
- RJ-45 to DB-9 female DTE adapter (labeled "Terminal")
- RJ-45 to DB-25 female DTE adapter (labeled "Terminal")
- RJ-45 to DB-25 male DCE adapter (labeled "Modem")
- Rack-mount rail kit hardware (including new longer front-mount brackets)
- Fabric Manager CD (today), DCNM for SAN Essentials Edition (future)
- Partner-specific branded labels and documentation (OSM Accessory Kits only)

Q. Can a customer reuse Cisco MDS 9124 and 9134 rack-mount kits to mount a Cisco MDS 9148?

A. No. The mounting holes are different. Each of the three Cisco MDS 9100 Series Multilayer Fabric Switches has a unique rack-mount rail kit.

Q. How are the ports on the Cisco MDS 9148 licensed?

A. The Cisco MDS 9148 is available in 16-, 32-, and 48-port preconfigured models. Customers that purchase 16- and 32-port units can upgrade in increments of 8 ports, up to 48 ports.

Q. Can NPIV-capable host bus adapters (HBAs) work as NPIV aggregators for VMware with the Cisco MDS 9148 in switch mode?

A. Yes.

Q. What security features are included as standard on the Cisco MDS 9148, and which are part of the optional Enterprise Package license?

A. Table 1 lists the security features that are standard on the Cisco MDS 9148.

Table 1. Standard Security Features

Security Feature	Support
Standard Cisco NX-OS Software support	Cisco MDS 9148
VSAN fabric isolation	Yes
Intelligent packet inspection at port level	Yes
Hardware zoning by access control list (ACL)	Yes
Logical-unit-number (LUN) zoning and read-only zones	Yes
Extended broadcast zoning	Yes
Fibre Channel Security Protocol (FC-SP) switch-to-switch authentication	Yes
FC-SP host-to-switch authentication	Yes
Role-based access control (RBAC) using RADIUS or TACACS+ authentication, authorization, and accounting (AAA) functions	Yes
Management access	Yes
Secure FTP (SFTP)	Yes
Secure Shell Version 2 (SSHv2)	Yes

Table 2 lists the advanced security features that are part of the optional Enterprise Package license for the Cisco MDS 9148.

Table 2. Advanced Security Features

Security Feature	Support
Optional Enterprise Package license	MDS 9148
IVR for Fibre Channel	No
Fibre Channel port security	Yes
FC-SP switch-to-switch authentication	Yes
FC-SP host-to-switch authentication	Yes
Per-VSAN access control	Yes
Fibre Channel QoS	Yes
Extended buffer-to-buffer credits	No
Diffie-Hellman Challenge Handshake Authentication Protocol (DH-CHAP)	Yes
Small Computer System Interface (SCSI) flow statistics for Cisco MDS 9000 Family Storage Services Module (SSM)	No
Digital certificates	Yes
Fabric binding for open systems	Yes

Cisco TrustSec® Fibre Channel link encryption	No
IP Security (IPsec) and Internet Key Exchange (IKE) for IPv4	No

Q. Can a port upgrade license be moved from one Cisco MDS 9148 switch to another?

A. No.

Q. Does the Cisco MDS 9148 interoperate with the Cisco Nexus 5000 Series Switches and Cisco UCS 6100 Series Fabric Interconnects?

A. Yes.

Q. Are there any limitations on Inter-Switch Link (ISL) connectivity?

A. There are no port-group limitations for ISL connectivity.

Q. Does the port license restrict the specific ports that can be used on the Cisco MDS 9148?

A. No. All of the ports licensed can be assigned to any of the 48 physical ports.

Q. If all licensed ports are in use and one fails, can an unlicensed port be used to recover from the failed port?

A. Yes, but the process is manual, though quite fast. The failed port must be disabled before the unlicensed port can be enabled and activated.

Q. Can the Cisco MDS 9148 Fibre Channel ports support extended distance and is an optional license required?

A. The Cisco MDS 9148 supports as standard extended-distance Fibre Channel ports with 8-Gbps Enhanced SFP (SFP+) long-wave optical transceivers (older 4-Gbps long-wave SFP optical transceivers are not supported). The architecture provides as standard up to 128 buffer credits for each group of four ports. The default is 32 buffer credits per port. However, this value can be changed in single-buffer-credit increments to a maximum of 125 buffer credits for a single port (the other three ports in the four-port group will have 1 remaining buffer credit assigned). No additional license is required.

Q. Are the physical 2 x 6 port cages field replaceable?

A. No.

Q. Are the Cisco MDS 9148 power supplies and fan tray field replaceable?

A. Yes. They are hot-swappable customer replaceable units (CRUs).

Q. If a Cisco MDS 9148 power supply or fan tray fails, should it be removed immediately?

A. No. Since the Cisco MDS 9148 has fully redundant dual power supplies and fan trays, the unit will continue to operate normally indefinitely (or until a second failure occurs). However, for operation to continue, the failed CRU must remain installed in the unit to maintain proper airflow for cooling. Replacement of the failed CRU should be undertaken only when the new CRU is onsite and available for immediate installation after removal of the failed CRU.

Q. Will an 8-Gbps enhanced optical transceiver (SFP+) automatically sense and switch down to 1 Gbps?

A. No. 2 Gbps is the lowest speed to which an 8-Gbps SFP+ optical transceiver will automatically switch. To support 1-Gbps Fibre Channel connections, a standard 4-Gbps SFP must be used.

Q. Do domestic power cords come standard on the Cisco MDS 9148?

A. No. Power cords are a CTO option and are available for various countries worldwide. The Cisco DCT will ask you to specify the power cords you want to order. Replacement spare power cords can be individually ordered using the part numbers listed in the data sheet.

Q. Can power supplies and fans from the Cisco MDS 9124 or 9134 be used with the Cisco MDS 9148?

A. No. The Cisco MDS 9148 uses different power supplies and fans than the Cisco MDS 9124 and 9134 switches. These have different part numbers.

Q. Is the MDS 9148 supported in a Virtual Computing Environment (VCE) coalition Vblock™ Infrastructure Packages solution?

A. Although the Cisco MDS 9222i Multiservice Modular Switch and Cisco MDS 9506 Multilayer Director are the defaults for VCE coalition and Vblock1 support, the Cisco MDS 9148 is supported as an option for use in VCE coalition Vblock1 and Vblock2 solutions: that is, it can be used in place of the Cisco MDS 9222i or 9506 with the stipulation that it has no services (Cisco Discovery Protocol, Fibre Channel over IP [FCIP], etc.).

Technical: New Features

Q. Do the new Cisco DCNM for SAN Essentials Edition and the new optional Cisco DCNM for SAN Advanced Edition licenses require the user to load the software onto the Cisco MDS 9148 switch?

A. No. The Cisco DCNM for SAN software licenses are loaded by the user on the management server only and should not be loaded on the Cisco MDS 9148 switch (except for switches sold by IBM or IBM partners).

Q. What do I have to plug in to enable the Cisco MDS 9148 Zero-Touch Installation feature?

A. Simply plug in the power cord and an Ethernet network access cable so that the Cisco MDS 9148 switch and the computer are on the same subnet. The Zero-Touch Installation feature eliminates the need for a serial console cable.

Q. How do I discover the Cisco MDS 9148 switch IP address, World Wide Name (WWN), and MAC address with Zero-Touch Installation feature?

A. The Zero-Touch Installation feature automatically assigns an IP address (using the Dynamic Host Configuration Protocol [DHCP]) or provides a default address if a DHCP server is not available. The Zero-Touch Installation feature also automatically launches the Quick Configuration Wizard, which then provides the means to discover the IP address, WWN and MAC address.

Q. How do I perform further provisioning beyond that automatically provided by the Zero-Touch Installation feature?

A. Further provisioning can be performed using the Quick Configuration Wizard or the Cisco Device Manager software.

Q. Can the Cisco MDS 9148 be mounted in the rack so that the front (port side) is recessed in the rack to provide adequate clearance for the rack door to be closed?

A. Yes. New longer front mounting brackets are replacing the current short brackets in the Cisco MDS 9148 rack-mount rail kit that is part of the accessory kit. These new longer brackets have four sets of mounting holes to allow the switch to be recessed at various depths up to 2¾ inches, which allows adequate clearance for the optical cable bending radius and provides a vertical airflow chimney (in the Cisco MDS 9148, the airflow direction is rear to front).

Americas Headquarters
Cisco Systems, Inc.
San Jose, CA

Asia Pacific Headquarters
Cisco Systems (USA) Pte. Ltd.
Singapore

Europe Headquarters
Cisco Systems International BV Amsterdam,
The Netherlands

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

Printed in USA C67-581881-02 03/11