Cisco MDS Fibre Channel Blade Switch for IBM BladeCenter and HP c-Class BladeSystem

The Cisco® MDS Fibre Channel Blade Switch, capable of speeds of 4, 2, and 1 Gbps, offers outstanding value by providing flexibility, high-availability, security, and ease-of-use at an affordable price in the form factor to fit IBM BladeCenter (BladeCenter, BladeCenter T, and BladeCenter H) and HP c-Class BladeSystem. With its flexibility to expand ports in increments, the Cisco MDS Fibre Channel Blade Switch offers the densities required from entry level to advanced. Powered by Cisco MDS 9000 SAN-OS Software, it includes advanced storage networking features and functions and is compatible with Cisco MDS 9500 Series Multilayer Directors and Cisco MDS 9200 Series Multilayer Fabric Switches, providing transparent, end-to-end service delivery in core-edge deployments.

Cisco MDS Fibre Channel Blade Switch for IBM BladeCenter

The Cisco MDS Fibre Channel Blade Switch for IBM BladeCenter has two models: the 10-port switch and the 20-port switch. There is a 10-port upgrade license to upgrade from 10 ports to 20 ports. In the10-port model, 7 ports are for internal connections to the server and 3 ports are external. In the 20-port model, 14-ports are for internal connections to the server and 6-ports are external. The Cisco MDS Fibre Channel Blade Switch is supported in the IBM BladeCenter, BladeCenter H, and BladeCenter T. The management of the module is integrated with the IBM Management Suite.

Cisco MDS Fibre Channel Blade Switch for HP C-Class BladeSystem

The Cisco MDS Fibre Channel Blade Switch for HP c-Class BladeSystem has two models: the base 12-port model and the 24-port model. There is a 12-port license upgrade to upgrade the 12-port model from 12 ports to 24 ports. In the 12-port model, 8 ports are for internal connections to the server, and 4 ports are external or storage area network (SAN) facing, In the 24-port model, 16 ports are internal for server connections, and 8 ports are external or SAN facing. The management of the module is integrated with the HP OpenView Management Suite.

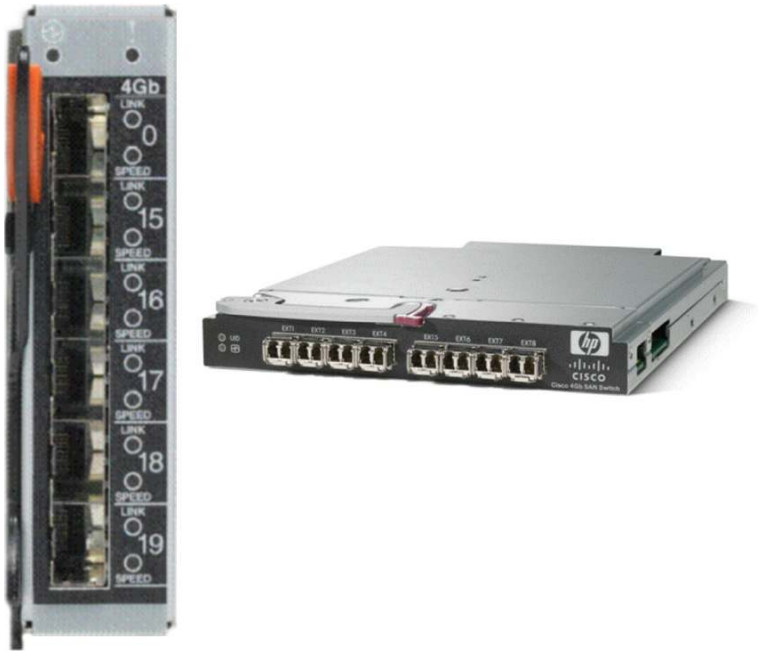
Overview

- Intelligent storage networking services at an affordable price - The Cisco MDS Fibre Channel Blade Switch, powered by Cisco MDS 9000 SAN-OS Software, offers intelligent storage networking capabilities such as virtual SANs (VSANs), PortChannels, quality of service (QoS), and security for cost-effective design, deployment, and management of departmental and enterprise SANs.
- Highly available platform for mission-critical deployments - The Cisco MDS Fibre Channel Blade Switch is designed for environments where downtime is not an option. It offers nondisruptive software upgrades, VSANs for fault isolation, and PortChannels for Inter-Switch Link (ISL) resiliency.

- Comprehensive security framework - The Cisco MDS Fibre Channel Blade Switch supports RADIUS and TACACS+, port security, fabric binding, Fibre Channel Security Protocol (FC-SP) host-to-switch and switch-to-switch authentication, Secure FTP (SFTP), Secure Shell Version 2 (SSHv2) and Simple Network Management Protocol Version 3 (SNMPv3) implementing Advanced Encryption Standard (AES), VSANs, hardware-enforced zoning, broadcast zones, and per-VSAN role-based access control (RBAC).
- Simplified storage management - The Cisco MDS Fibre Channel Blade Switch includes built-in storage network management, with all features available through a command-line interface (CLI) or Cisco Fabric Manager, a centralized management tool that simplifies management of a standalone switch or multiple switches and fabrics.
- Sophisticated diagnostics - Industry-leading intelligent diagnostics such as Fibre Channel Ping, Fibre Channel Traceroute, Switched Port Analyzer (SPAN), Cisco Fabric Analyzer, and integrated call-home capability enhance reliability, facilitate faster problem resolution, and reduce service costs.
- Reduced total cost of ownership (TCO) - Common platform architecture and the use of Cisco MDS 9000 SAN-OS Software intelligent storage-networking services across all Cisco MDS 9000 family switches reduce ongoing operating expenses by providing a consistent set of provisioning, management, and diagnostic capabilities.

Figure 1 shows the switches.

Figure 1. Cisco MDS Fibre Channel Blade Switch for IBM and HP C-class BladeSystem



Key Features and Benefits

Exceptional Flexibility and Scalability

The Cisco MDS Fibre Channel Blade Switch offers up to 20 or 24 autosensing Fibre Channel ports capable of speeds of 4, 2, and 1 Gbps. With 4 Gbps of dedicated bandwidth for each port, the Cisco MDS Fibre Channel Blade Switch is designed to meet the performance and scalability requirements of the most demanding environments.

The flexibility of the Cisco MDS Fibre Channel Blade Switch is provided by the on-demand port activation license, which allows expansion in 10- or 12-port increments. Customers can start with a base configuration and can upgrade onsite to activate more ports using these licenses.

The Cisco MDS Fibre Channel Blade Switch external ports include hot-swappable, Small Form-Factor Pluggable (SFP) line-card interfaces. All SFP interfaces are 4, 2, and 1 Gbps, with autosensing capabilities. Individual ports can be configured with either short- or long-wavelength SFP optics for connectivity of up to 500 meters (m) and 10 kilometers (km), respectively.

VSANs for Segmentation and Isolation

VSAN, an industry standard for fabric virtualization capabilities, allows more efficient storage network use by creating hardware-based isolated environments within a single physical SAN fabric or switch. Up to 16 VSANs are supported per switch. Each VSAN can be zoned as a typical SAN and maintains its own fabric services and management domains for added scalability and resilience. VSANs allow the cost of SAN infrastructure to be shared among more users, while helping ensure segregation of traffic and retaining independent control of configuration on a VSAN-by-VSAN basis.

Advanced Traffic Management for High-Performance, Resilient SANs

Advanced traffic management capabilities integrated into the Cisco MDS Fibre Channel Blade Switch simplify deployment and optimization of core edge fabrics.

- Virtual output queuing helps ensure line-rate performance on each port, independent of traffic pattern, by eliminating head-of-line blocking.
- Each port group consisting of 4 ports has a pool of 64 buffer credits, with a default of 16 buffer credits per port. When extended distances are required, up to 61 buffer credits can be allocated to a single port within the port group. This extensibility is available without additional licensing.
- PortChannels allow users to aggregate up to 16 physical ISLs into a single logical bundle, providing optimized bandwidth use across all links. The bundle can consist of any port from the switch, helping ensure that the bundle remains active even in the event of a port failure.
- Fabric Shortest Path First (FSPF)-based multipathing provides the intelligence to load balance across up to 16 equal-cost paths and, in the event of a switch failure, dynamically reroute traffic.
- QoS can be used to manage bandwidth and control latency, to prioritize critical traffic.
- Comprehensive port and flow statistics facilitate sophisticated performance analysis and service-level agreement (SLA) accounting.

Advanced Diagnostics and Troubleshooting Tools

Management of storage networks requires proactive diagnostics, tools to verify connectivity and route latency, and mechanisms for capturing and analyzing traffic. The Cisco MDS fibre channel blade switch integrates the industry's most advanced analysis and debugging tools. Power-on self-test (POST) and online diagnostics provide proactive health monitoring. The Cisco MDS fibre channel blade switch provides the integrated hardware functions required to implement diagnostic capabilities such as Fibre Channel Traceroute to detail the exact path and timing of flows and SPAN to intelligently capture network traffic. After traffic has been captured, it can be analyzed with the Cisco Fabric Analyzer, an embedded Fibre Channel analyzer. With the Cisco MDS Fibre Channel Blade Switch, Cisco delivers a comprehensive tool set for troubleshooting and analysis of an organization's storage network.

Comprehensive Security

Recognizing the need for unassailable security in storage networks, the Cisco MDS Fibre Channel Blade Switch offers an extensive security framework to protect highly sensitive data crossing today's enterprise networks.

- VSANs are used to achieve higher security and greater stability by providing complete isolation among devices that are connected to the same physical SAN.
- Intelligent packet inspection is performed at the port level, including the application of access control lists (ACLs) for hardware enforcement of zones, VSANs, and advanced port security features.
- Extended zoning capabilities help ensure that broadcasts are restricted to the selected zones (the broadcast zones).
- Smart Zoning: When the Smart Zoning feature is enabled, Cisco MDS 9000 Family fabrics provision the hardware access control entries specified by the zone set more efficiently, avoiding the superfluous entries that would allow servers (initiators) to talk to other servers, or allow storage devices (targets) to talk to other storage devices. This feature makes larger zones with multiple initiators and multiple targets feasible without excessive consumption of hardware resources. Thus, smart zones can correspond to applications, application clusters, hypervisor clusters, or other data center entities, saving the time that administrators previously spent creating many small zones, and enabling the automation of zoning tasks.
- FC-SP provides switch-to-switch and host-to-switch Diffie-Hellman Challenge Handshake Authentication Protocol (DH-CHAP) authentication supporting RADIUS or TACACS+, to help ensure that only authorized devices access protected storage networks. This feature, in conjunction with management access and control plane security, makes the Cisco MDS 9000 family among the most secure platforms of its kind.

High-Availability Platform for Mission-Critical Environments

The Cisco MDS Fibre Channel Blade Switch is designed for mission-critical availability. Nondisruptive software upgrades and the unique ability to automatically restart failed processes combine to define a new standard for fabric switch availability.

High availability is implemented at the fabric level through the industry's most robust and highest-performance ISLs. PortChannel capability allows users to aggregate up to 16 physical ports into one logical bundle. The bundle can sustain the failure of any physical link without causing a reset. Additionally, FSPF multipathing provides the intelligence to load balance across up to 16 equal-cost paths and, if a switch fails, to dynamically reroute traffic. The Cisco MDS Fibre Channel Blade Switch takes fabric-switch availability to a new level, minimizing TCO.

Simplified Management

The Cisco MDS Fibre Channel Blade Switch provides three principal modes of management: the Cisco MDS 9000 family CLI, the Cisco Fabric Manager, and integration with IBM or HP storage management tools.

- Consistent, logical CLI - Adhering to the syntax of the widely known Cisco IOS® Software CLI, the Cisco MDS 9000 family CLI is easy to learn and delivers broad management capabilities. The Cisco MDS 9000 family CLI is an extremely efficient and direct interface designed to provide optimal capabilities to administrators in enterprise environments.
- Cisco Fabric Manager - Cisco Fabric Manager is included with the Cisco MDS Fibre Channel Blade Switch for integrated, comprehensive management of larger SAN environments. Cisco Fabric Manager is a responsive, easy-to-use Java application that allows administrators to perform vital tasks such as topology discovery, fabric configuration and verification, provisioning, monitoring, and fault resolution.

- The Cisco MDS Fibre Channel Blade Switch provides an extensive API for integration with third-party and user-developed management tools. The APIs are based on industry-standard protocols, including SNMP and the Storage Networking Industry Association (SNIA) Storage Management Initiative Specification (SMI-S).

Specifications

Minimum Software Requirements

- Cisco MDS 9000 SAN-OS Software Release 3.1(2a)

Performance and Port Configurations

- Port speed - 4-, 2-, and 1-Gbps autosensing with 4 Gbps of dedicated bandwidth per port
- Buffer credits - Up to 64 for a group of 4 ports, with a default of 16 buffer credits per port
- Base configuration with 10 ports for IBM bladecenter and 12 ports for HP c-Class Bladesystem
  - Additional port increments with the port activation license Additional port increments with the port activation license
- PortChannel - Up to 16 ports in a PortChannel

Supported Optics, Media, and Transmission Distances

Table 1 summarizes the interfaces and distances supported by the Cisco MDS Fibre Channel Blade Switch.

Table 1. Optics, Media, and Transmission Distances Supported by the Cisco MDS Fibre Channel Blade Switch

SFP Optics	Wavelength (nanometers)	Fiber Type	Core Size (microns)	Gigabaud Rate (GBd)	Cable Distance
4G FC-SW **4Gbps Fibre Channel Short Wave SFP Optic**	850	Multimode fiber (MMF)	62.5	1.0625	984 ft (300m)
			62.5	2.125	492 ft (150m)
			62.5	4.250	230 ft (70m)
			50.0	1.0625	1640 ft (500m)
			50.0	2.125	984 ft (300m)
			50.0	4.250	492 ft (150m)
4G FC-MR **4Gbps Fibre Channel Mid Range SFP Optic**	1310	Single-mode fiber (SMF)	9.0	1.0625	13,123 ft (4 km)
			9.0	2.125	13,123 ft (4 km)
			9.0	4.250	13,123 ft (4 km)
4G FC-LR **4Gbps Fibre Channel Long Range SFP Optic**	1310	SMF	9.0	1.0625	32,808 ft (10 km)
			9.0	2.125	32,808 ft (10 km)
			9.0	4.250	32,808 ft (10 km)

Security

- VSANs
- Zoning
  - Hardware-enforced zoning
  - Logical-unit-number (LUN) zoning and read-only zones
- FC-SP for host-to-switch and switch-to-switch authentication
- Port security

- Management access
  - SSHv2
  - SNMPv3
  - IP ACLs

Compatibility

- Fibre Channel protocols
  - FC-PH, Revision 4.3
  - FC-PH-2, Revision 7.4
  - FC-PH-3, Revision 9.4
  - FC-GS-2, Revision 5.3
  - FC-GS-3, Revision 7.01
  - FC-FLA, Revision 2.7
  - FC-FG, Revision 3.5
  - FC-SW-2, Revision 5.3
  - FC-AL, Revision 4.5
  - FC-AL-2, Revision 7.0
  - FC-PLDA, Revision 2.1
  - FC-VI, Revision 1.61
  - FCP, Revision 12
  - FCP-2, Revision 7
  - FC-SB-2, Revision 2.1
  - FC-BB, Revision 4.7
  - FC-FS, Revision 1.9
  - FC-PI, Revision 13
  - FC-MI, Revision 1.99
  - FC-Tape, Revision 1.17
  - IP over Fibre Channel (RFC 2625)
  - Extensive IETF-standards-based TCP/IP, SNMPv3, and Remote Monitoring (RMON) MIBs
  - Class of service: Class 2, Class 3, and Class F
  - Fibre Channel standard port types: E, F, and FL
  - Fibre Channel enhanced port types: SD and TE

Fabric Services

- Name server
- Registered state change notification (RSCN)
- Login services
- Public loop
- Broadcast

- In-order delivery
- Name-server zoning

Diagnostics and Troubleshooting Tools

- Power-on self-test (POST) diagnostics
- Online diagnostics
- Internal loopbacks
- SPAN
- Fibre Channel Traceroute capability
- Fibre Channel Ping
- Fibre Channel Debug
- Cisco Fabric Analyzer
- Syslog
- Port-level statistics

Management

- Access methods
  - Access is via the bladeserver chassis management port
- Access protocols
  - CLI
  - SNMP
  - SMI-S
- Security
  - RBACL using RADIUS or TACACS+ authentication, authorization, and accounting (AAA) functions
  - VSAN-based roles
  - SSHv2
  - SNMPv3
- Management applications
  - Cisco MDS 9000 family CLI
  - Cisco Fabric Manager and Device Manager
  - Cisco Fabric Manager Server (optional; requires Cisco Fabric Manager Server license)

Availability

- Nondisruptive software upgrades
- Stateful process restart
- Per-VSAN fabric services
- Hot-swappable SFP optics
- PortChannels aggregating up to 16 ports
- Online diagnostics

Serviceability

- Configuration file management
- Call home
- Port beaconing
- System LEDs
- SNMP traps for alerts

Ordering Information

Table 2 provides ordering information for the Cisco MDS Fibre Channel Blade Switches. Table 3 lists product specifications.

Table 2. Ordering Information

Cisco MDS Fibre Channel Blade Switch for IBM BladeCenter	Part Number
Cisco MDS Fibre Channel Blade Switch for IBM BladeCenter, BladeCenter T, and BladeCenter H	
	IBM Part Number
Cisco 4Gb 20-port FC switch module for IBM Blade Center	39Y9280
Cisco 4Gb 10-port FC switch module for IBM Blade Center	30Y9284
Cisco 10-port License Upgrade for IBM Blade Center 4GB Modules	39Y9290
SFP Optics Options	
Cisco 4Gb Short-Wave length 4-pack SFP Modules for IBM BladeCenter	41Y8596
Cisco 4Gb Short-Wave length SFP Modules for IBM BladeCenter	41Y8498
Cisco 4Gb Long-Wave length SFP Modules for IBM BladeCenter	41Y8600
Cisco MDS Fibre Channel Blade Switch for HP c-Class BladeSystem	
	HP Part Number
Cisco MDS 9124e 12-port fabric switch	AG641-63001
Cisco MDS 9124e 24-port fabric switch	AG642-63001
Cisco MDS 9124e 12-port license upgrade	T5169-63101

Table 3. Product Specifications

	IBM MDS Fibre Channel Blade Switch	HP MDS 9124e Fibre Channel Blade Switch
Internal (server-facing ports)	7 ports (10-port model) 14 ports (20-port model)	8 ports (12-port model) 16 ports (24-port model)
External (SAN-facing ports)	3 ports (10-port model) 6 ports (20-port model)	4 ports (12-port model) 8 ports (24-port model)
Dimensions	(H x W x D) 1 1/8 x 4 3/8 x 10 1/8 in.	(H x W x D) 1.25 x 7.75 x 11IN.
Power consumption	55W	55W
SFPs shipped	SFPs need to be purchased separately	2 4-Gbps SW SFP (10-port model) 4 4-Gbps SW SFP (24-port model)
SFPs supported		4-Gbps SW SFP, 4-Gbps LW SFP, and 4-Gbps MR SFP

Service and Support

Level 1 and 2 support is provided by IBM and HP for their respective blade switches.

For More Information

For more information, visit http://www.cisco.com/go/9124 or contact your local account representative.

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