

## Cisco MDS 9124 24-Port Multilayer Fabric Switch

The Cisco® MDS 9124 24-Port Multilayer Fabric Switch, with 24 ports 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 a compact 1-rack-unit (1RU) form factor. With its flexibility to expand from 8 to 24 ports in 8-port increments, the Cisco MDS 9124 offers the densities required for both departmental storage area network (SAN) switches and edge switches in enterprise SANs. The Cisco MDS 9124 supports quick configuration and task wizards that allow it to be deployed quickly and easily in networks of any size. 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.

### Highlights

- Exceptional flexibility and scalability—The Cisco MDS 9124 offers up to 24 autosensing Fibre Channel ports capable of speeds of 4, 2, and 1 Gbps in a compact 1RU form-factor chassis with 4 Gbps of dedicated bandwidth for each port and an aggregate platform bandwidth of 192 Gbps. The base configuration has 8 active ports with flexibility to upgrade onsite to 16 and 24 ports, in 8-port increments, with the Cisco MDS 9124 On-Demand Port Activation Licenses. The Cisco MDS 9124 is an ideal platform as a standalone departmental SAN switch and as an edge switch in enterprise core-edge SANs. The 1RU compact design is ideal for space-constrained environments where maximum port density per rack is imperative.
- Intelligent storage networking services at an affordable price—The Cisco MDS 9124, 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 9124 is designed for environments where downtime is not an option. It offers nondisruptive software upgrades, dual hot-swappable power supplies (with integrated FANs for optional redundancy), VSANs for fault isolation, and PortChannels for Inter-Switch Link (ISL) resiliency.
- Comprehensive security framework—The Cisco MDS 9124 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 9124 includes built-in storage network management, with all features available through a command-line interface (CLI) or Cisco

Fabric Manager, a centralized management tool with task-based wizards that simplify 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.** The Cisco MDS 9124



## Key Features and Benefits

### Exceptional Flexibility and Scalability

The Cisco MDS 9124 offers up to 24 autosensing Fibre Channel ports capable of speeds of 4, 2, and 1 Gbps in a compact 1RU form-factor chassis. With 4 Gbps of dedicated bandwidth for each port, the Cisco MDS 9124 is designed to meet the performance and scalability requirements of the most demanding environments.

The flexibility of the Cisco MDS 9124 is provided by the Cisco MDS 9124 On-Demand Port Activation License, which allows expansion in 8-port increments. Customers can start with a base configuration of 8 ports and can upgrade onsite to 16 and 24 ports using these licenses. With advanced storage networking capabilities built into the platform, it is an ideal choice both as a standalone departmental SAN switch and as an edge switch in enterprise core-edge SANs.

The Cisco MDS 9124 includes hot-swappable, Small Form-Factor Pluggable (SFP), LC 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 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. Upto 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 9124 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 9124 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 9124 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 9124, Cisco delivers a comprehensive toolset for troubleshooting and analysis of an organization's storage network.

### **Comprehensive Security**

Recognizing the need for unassailable security in storage networks, the Cisco MDS 9124 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 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).
- 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 9124 is designed for mission-critical availability. Nondisruptive software upgrades; hot-swappable, redundant fans and power supplies; 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 9124 takes fabric-switch availability to a new level, minimizing TCO.

### **Simplified Management**

The Cisco MDS 9124 provides three principal modes of management: the Cisco MDS 9000 family CLI, the Cisco Fabric Manager, and integration with third-party 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.
- Quick Configuration Wizard—The Quick Configuration Wizard helps eliminate management complexity and creates a readily available SAN environment for small-and midsized-business applications. The wizard allows server access to storage to be set up quickly and easily in a single step, using an intuitive GUI.
- Cisco Fabric Manager—Cisco Fabric Manager is included with the Cisco MDS 9124 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 9124 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 Requirement**

- Cisco MDS 9000 SAN-OS Software Release 3.1(1)

### **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
- Ports per chassis—Up to 24 ports

Base configuration with 8 ports Additional ports in 8-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 9124.

**Table 1.** Optics, Media, and Transmission Distances Supported by the Cisco MDS 9124

SFP Optics	Wavelength (nanometers)	Fiber Type	Core Size (microns)	Giga Baud Rate (GBd)	Cable Distance
4G FC-SW	850	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	1310	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	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)

For SFP compatibility matrix please refer to

[http://www.cisco.com/en/US/prod/collateral/ps4159/ps6409/ps4358/product\\_data\\_sheet09186a00801bc698.html](http://www.cisco.com/en/US/prod/collateral/ps4159/ps6409/ps4358/product_data_sheet09186a00801bc698.html).

### Product Specifications

Table 2 lists the product specifications for the Cisco MDS.

**Table 2.** Product Specifications for the Cisco MDS 9124

Item	Specification
<b>Security</b>	<ul style="list-style-type: none"> <li>• VSANs</li> <li>• Zoning <ul style="list-style-type: none"> <li>◦ Hardware-enforced zoning</li> <li>◦ Logical-unit-number (LUN) zoning and read-only zones</li> </ul> </li> <li>• FC-SP for host-to-switch and switch-to-switch authentication</li> <li>• Port security</li> <li>• Management access <ul style="list-style-type: none"> <li>◦ SSHv2</li> <li>◦ SNMPv3</li> <li>◦ IP ACLs</li> </ul> </li> </ul>

Item	Specification
<b>Compatibility</b>	Fibre Channel protocols <ul style="list-style-type: none"> <li>• FC-PH, Revision 4.3</li> <li>• FC-PH-2, Revision 7.4</li> <li>• FC-PH-3, Revision 9.4</li> <li>• FC-GS-2, Revision 5.3</li> <li>• FC-GS-3, Revision 7.01</li> <li>• FC-FLA, Revision 2.7</li> <li>• FC-FG, Revision 3.5</li> <li>• FC-SW-2, Revision 5.3</li> <li>• FC-AL, Revision 4.5</li> <li>• FC-AL-2, Revision 7.0</li> <li>• FC-PLDA, Revision 2.1</li> <li>• FC-VI, Revision 1.61</li> <li>• FCP, Revision 12</li> <li>• FCP-2, Revision 7</li> <li>• FC-SB-2, Revision 2.1</li> <li>• FC-BB, Revision 4.7</li> <li>• FC-FS, Revision 1.9</li> <li>• FC-PI, Revision 13</li> <li>• FC-MI, Revision 1.99</li> <li>• FC-Tape, Revision 1.17</li> <li>• IP over Fibre Channel (RFC 2625)</li> <li>• Extensive IETF-standards-based TCP/IP, SNMPv3, and Remote Monitoring (RMON) MIBs</li> <li>• Class of service: Class 2, Class 3, Class F</li> <li>• Fibre Channel standard port types: E, F, FL</li> <li>• Fibre Channel enhanced port types: SD, TE</li> </ul>
<b>Fabric Services</b>	<ul style="list-style-type: none"> <li>• Name server</li> <li>• Registered state change notification (RSCN)</li> <li>• Login services</li> <li>• Public loop</li> <li>• Broadcast</li> <li>• In-order delivery</li> <li>• Name-server zoning</li> </ul>
<b>Diagnostics and Troubleshooting Tools</b>	<ul style="list-style-type: none"> <li>• Power-on self-test (POST) diagnostics</li> <li>• Online diagnostics</li> <li>• Internal loopbacks</li> <li>• SPAN</li> <li>• Fibre Channel Traceroute capability</li> <li>• Fibre Channel Ping</li> <li>• Fibre Channel Debug</li> <li>• Cisco Fabric Analyzer</li> <li>• Syslog</li> <li>• Port-level statistics</li> </ul>

Item	Specification
<b>Management</b>	<ul style="list-style-type: none"> <li>• Access methods <ul style="list-style-type: none"> <li>◦ Out-of-band 10/100 Ethernet port</li> <li>◦ EIA/TIA-232 serial console port</li> <li>◦ In-band IP over Fibre Channel</li> </ul> </li> <li>• Access protocols <ul style="list-style-type: none"> <li>◦ CLI</li> <li>◦ SNMP</li> <li>◦ SMI-S</li> </ul> </li> <li>• Security <ul style="list-style-type: none"> <li>◦ RBACL using RADIUS or TACACS+ authentication, authorization, and accounting (AAA) functions</li> <li>◦ VSAN-based roles</li> <li>◦ SSHv2</li> <li>◦ SNMPv3</li> </ul> </li> <li>• Management applications <ul style="list-style-type: none"> <li>◦ Cisco MDS 9000 family CLI</li> <li>◦ Cisco Fabric Manager and Device Manager</li> <li>◦ Cisco Fabric Manager Server (optional; requires Cisco Fabric Manager Server license)</li> </ul> </li> </ul>
<b>Availability</b>	<ul style="list-style-type: none"> <li>• Nondisruptive software upgrades</li> <li>• Stateful process restart</li> <li>• Per-VSAN fabric services</li> <li>• Redundant, hot-swappable power supply and fans (optional)</li> <li>• Hot-swappable SFP optics</li> <li>• PortChannels aggregating up to 16 ports</li> <li>• Online diagnostics</li> </ul>
<b>Serviceability</b>	<ul style="list-style-type: none"> <li>• Configuration file management</li> <li>• Call home</li> <li>• Port beaconing</li> <li>• System LEDs</li> <li>• SNMP traps for alerts</li> </ul>
<b>Environmental</b>	<ul style="list-style-type: none"> <li>• Ambient operating temperature is 32 to 104°F (0 to 40°C)</li> <li>• Ambient nonoperating temperature is –40 to 158°F (–40 to 70°C)</li> <li>• Physical dimensions (H x W x D) of 1 RU <ul style="list-style-type: none"> <li>◦ 1.75 x 17.5 x 16 in. (4.5 x 44.5 x 40.6 cm)</li> </ul> </li> <li>• Weight <ul style="list-style-type: none"> <li>◦ Switch with dual power supplies: 18.5 lb [8.4 KG]</li> </ul> </li> </ul>
<b>Power and Cooling</b>	<p>Power supplies (300W AC) (maximum of two per switch):</p> <ul style="list-style-type: none"> <li>• Input: 100 to 240 VAC nominal (+/–10% for full range) <ul style="list-style-type: none"> <li>◦ Input current maximum 20A</li> </ul> </li> <li>• Input current steady state <ul style="list-style-type: none"> <li>◦ 4A @ 110 VAC</li> <li>◦ 2A @ 220 VAC</li> </ul> </li> <li>◦ 50 to 60 Hz nominal (+/–3 Hz for full range)</li> <li>• Output: 300W @ 100 VAC <ul style="list-style-type: none"> <li>◦ 300W @ 220 VAC</li> </ul> </li> </ul> <p>Airflow:</p> <ul style="list-style-type: none"> <li>◦ Front to rear</li> </ul> <p>Power Consumption: 80W, 0.73A@110V, 0.36A@220V</p>
<b>Safety</b>	<ul style="list-style-type: none"> <li>• UL 60950 -1</li> <li>• CAN/CSA-C22.2 No. 60950 -1</li> <li>• EN 60950 -1</li> <li>• IEC 60950 -1</li> <li>• AS/NZS 60950</li> <li>• IEC 60825</li> <li>• EN 60825</li> <li>• 21 CFR 1040</li> </ul>

Item	Specification
<b>EMC</b>	<ul style="list-style-type: none"> <li>• FCC Part 15 (CFR 47) Class A</li> <li>• ICES-003 Class A</li> <li>• EN55022 Class A</li> <li>• CISPR22 Class A</li> <li>• AS/NZS CISPR22 Class A</li> <li>• VCCI Class A</li> <li>• EN55024</li> <li>• ETS300 386</li> <li>• EN50082-1</li> <li>• EN61000-3-2</li> <li>• EN61000-3-3</li> <li>• EN61000-6-1</li> <li>• CISPR24</li> <li>• NEBS <ul style="list-style-type: none"> <li>◦ GR-63-Core NEBS Level 3</li> <li>◦ GR-1089-Core NEBS Level 3</li> </ul> </li> <li>• ETSI <ul style="list-style-type: none"> <li>◦ ETS 300 019 Storage Class 1.1</li> <li>◦ ETS 300 019 Transportation Class 2.3</li> <li>◦ ETSI 300 019 Stationary Use Class 3.1</li> </ul> </li> </ul>

## Ordering Information

Table 3 provides ordering information for the Cisco MDS 9124.

**Table 3.** Ordering Information for the Cisco MDS 9124

Product Description	Part Number
Cisco MDS 9124 24-Port Fabric Switch with 8 4-Gbps active ports, VSANs, PortChannels, and Cisco Fabric Manager	DS-C9124-K9
Optional redundant power supply	DS-C24-300AC=
<b>Small Form-Factor Pluggable (SFP) Optics Options</b>	
Cisco MDS 9000 Family 4/2/1-Gbps Fibre Channel-SW, SFP, LC, 4-Pack	DS-SFP-FC4G-SW
Cisco MDS 9000 Family 4/2/1-Gbps Fibre Channel-MR (4 km), SFP, LC	DS-SFP-FC4G-MR
Cisco MDS 9000 Family 4/2/1-Gbps Fibre Channel-LW (10 km), SFP, LC	DS-SFP-FC4G-LW
Cisco MDS 9000 Family 4/2/1-Gbps Fibre Channel-SW, SFP, LC, spare	DS-SFP-FC4G-SW=
Cisco MDS 9000 Family 4/2/1-Gbps Fibre Channel-SW, SFP, LC, 4-pack, spare	DS-SFP-4G-SW-4=
Cisco MDS 9000 Family 4/2/1-Gbps Fibre Channel-MR (4 km), SFP, LC, spare	DS-SFP-FC4G-MR=
Cisco MDS 9000 Family 4/2/1-Gbps Fibre Channel-LW (10 km), SFP, LC, spare	DS-SFP-FC4G-LW=
<b>Optional Licenses</b>	
Cisco MDS 9124 On-Demand Port Activation License; activates increments of 8 ports	M9124PL8-4G=
Cisco MDS 9000 Family Enterprise Package, option	M9100ENT1K9
Cisco MDS 9000 Family Enterprise Package, spare	M9100ENT1K9=
Cisco MDS 9000 Family Fabric Manager Server Package, option	M9100FMS1K9
Cisco MDS 9000 Family Fabric Manager Server Package, spare	M9100FMS1K9=

## Service and Support

Cisco offers a wide range of services programs to accelerate customer success. These innovative services programs are delivered through a unique combination of people, processes, tools, and partners, resulting in high levels of customer satisfaction. Cisco services help you protect your network investment, optimize network operations, and prepare the network for new applications to



extend network intelligence and the power of your business. For more information about Cisco Services, see [Cisco Technical Support Services](#) or [Cisco Advanced Services](#).

### For More Information

For more information about the Cisco MDS 9124, visit <http://www.cisco.com/go/9124> or contact your local account representative.



**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](http://www.cisco.com/go/offices).

CCDE, CCVP, Cisco, Cisco StadiumField, the Cisco logo, CPE, and Welcome to the Human Network are trademarks; Changing the Way We Work, Live, Play and Learn is a service mark; and Access Registrar, Altran, AsyncOS, Bringing the Meeting To You, Catalyst, CCDA, CCDP, CCIE, CCIP, CCNA, CCNP, CCS, Cisco, the Cisco Certified Internetwork Expert logo, Cisco IOS, Cisco Press, Cisco Systems, Cisco Systems Capital, the Cisco Systems logo, Cisco Unity, Collaboration Without Limitation, Enterprise/Solver, EtherChannel, EtherFast, EtherSwitch, Event Center, Fast Step, Follow Me Browsing, FormShare, GigaDrive, HomeLink, Internet Quotient, IOS IPPhone, IP/TV, IQ Expertise, the IQ logo, IQ Net Readiness Scorecard, iQuickStudy, IronPort, the IronPort logo, LightStream, Linksys, MediaTone, MeetingPlace, MIM, Networkers, Networking Academy, Network Registrar, PCNow, PIX, PowerPanels, ProConnect, ScriptShare, SenderBase, SMARTnet, Spectrum Expert, StackWise, The Fastest Way to Increase Your Internet Quotient, TransPath, WebEx, and the WebEx logo are registered trademarks of Cisco Systems, Inc. and/or its affiliates in the United States and certain other countries.

All other trademarks mentioned in this document or Website are the property of their respective owners. The use of the word partner does not imply a partnership relationship between Cisco and any other company. ©2008