



## DATA SHEET

# CISCO MDS 9020 FABRICWARE SOFTWARE

The Cisco® MDS 9000 FabricWare Software is the underlying system software that powers the Cisco MDS 9020 Fabric Switch. The Cisco MDS 9000 FabricWare is designed for enabling simple, secure, reliable, and scalable storage area networking solutions. The software's unique characteristics help the Cisco MDS 9020 Fabric Switch deliver low total cost of ownership (TCO) and a quick return on investment (ROI).

## KEY FEATURES AND BENEFITS

### Simplified Management

The Cisco MDS 9000 FabricWare incorporates a comprehensive set of capabilities that simplify management of storage area networks (SANs). These management capabilities are available with the command-line interface (CLI) through a serial port, or Simple Network Management Protocol (SNMP) over the out-of-band (OOB) Ethernet management port.

### Cisco Fabric Manager

Cisco Fabric Manager is a responsive, easy-to-use Java application with a graphical user interface (GUI) that provides an integrated approach to provisioning and managing the Cisco MDS 9020 Fabric Switch. Specifically, Cisco Fabric Manager:

- Performs centralized, automated discovery, and displays storage network topology, connectivity, and zone highlighting, allowing identification of network health and configuration issues at a glance.
- Offers powerful configuration capabilities for installing the Cisco MDS 9020 including setting up zones, network security, and fabric services. Wizards are provided to accelerate configuration and minimize errors. Switch parameters are readily accessible through the navigation tree and can be edited quickly within the information tables.
- Presents a device view to enable administrators to focus on a specific Cisco MDS 9020 Fabric Switch and determine its overall status at a glance. The device view provides realistic, graphical representations of the fabric switch. Color-coded status indicators are provided for all major components, including the chassis, fans, power supply, and individual ports. Clicking a particular component provides immediate access to detailed status information and configuration parameters.
- Presents real-time performance-monitoring statistics in tabular and graphical formats.

### CLI Management Interface Similar to Cisco IOS Software

The Cisco MDS 9000 FabricWare presents the user with a consistent, logical CLI. Adhering to the syntax of the widely known Cisco IOS® Software CLI, it is easy to learn and delivers broad management capability. The CLI is an extremely efficient and direct interface designed to provide optimal capability to administrators in enterprise environments. Administrators can write CLI scripts to manage the Cisco MDS 9020 using standard scripting languages.

### Fabric Device Management Interface

Fabric Device Management Interface (FDMI) capabilities provided by the Cisco MDS 9000 FabricWare simplify management of devices such as Fibre Channel host bus adapters (HBAs) through in-band communications. With FDMI, you can access HBA and host OS information without installing proprietary host agents.

## Open APIs

Cisco MDS 9000 FabricWare provides a truly open API for the Cisco MDS 9020 based on the industry-standard SNMP. Commands performed on the switches by Cisco Fabric Manager use this open API extensively.

## Switch Interoperability

The FabricWare-powered Cisco MDS 9020 has been designed to interoperate with embedded Fibre Channel switches in blade servers and the installed base of third-party fabric switches and directors. This added flexibility provides easy migration and investment protection.

## SAN Security

The Cisco MDS 9000 FabricWare takes a comprehensive approach to SAN security. The security features include zoning, centralized user management, role-based access control, Secure Shell (SSH) protocol support, and IP access control lists.

## Zoning

The Cisco MDS 9000 FabricWare helps ensure SAN integrity with zoning-based access controls between devices. FabricWare-based zoning can be specified using N-port WWN and Fibre Channel aliases.

## Authentication, Authorization, and Accounting Services

The Cisco MDS 9000 FabricWare offers authentication, authorization, and accounting (AAA) services using Remote Authentication Dial-In User Service (RADIUS) servers to authorize and authenticate SAN administrators. Additionally, all configuration changes to the Cisco MDS 9020 are logged to the RADIUS servers for analysis.

## Role-Based Access Control

The Cisco MDS 9000 FabricWare provides role-based access control (RBAC) for securing the management interface on the Cisco MDS 9020 Fabric Switch. With RBAC, FabricWare limits access to switch operations by assigning roles to users. FabricWare supports two fixed roles, network administrator and network operator: The network administrator has full access to execute all configuration commands and make configuration changes, while the network operator has only permission to review the configuration, and to perform a limited set of commands in the CLI exec mode.

The scope of RBAC is CLI using the console (serial connection), Telnet, or Secure Shell (SSH) Protocol. The authentication procedure, based on the user's credential, supplies the administrative role information to be used in determining the user's administrative privileges.

## SSH Protocol Version 2

The Cisco MDS 9000 FabricWare supports SSH Protocol Version 2 for authentication, data integrity, and privacy of management sessions.

## IP Access Control Lists

IP access control lists (ACLs) control management traffic over IP by regulating the traffic types that are allowed or denied to the switch. IP ACLs can be configured for the OOB Ethernet management port.

## Scalability

The following features help characterize the Cisco MDS 9000 FabricWare as a highly flexible and scalable platform for enterprise SANs.

### Multiple-Switch Fabrics

The FabricWare-powered Cisco MDS 9020 is fully compatible with SAN-OS-based Cisco MDS 9500 Series multilayer directors and Cisco MDS 9200 Series and MDS 9100 Series multilayer fabric switches for transparent, end-to-end service delivery in large data center core-edge deployments.

### Serviceability, Troubleshooting, and Diagnostics

The Cisco MDS 9000 FabricWare provides a wide set of serviceability features that simplify the process of proactively managing a SAN. These features also increase availability by minimizing SAN disruptions for maintenance and reducing recovery time from critical problems.

### Nondisruptive Software Upgrades

The Cisco MDS 9000 FabricWare provides nondisruptive software upgrades on the Cisco MDS 9020. SAN administrators can upload new software using FTP and Trivial FTP (TFTP) and perform software upgrade without any downtime.

### Performance Monitoring

Performance of the Cisco MDS 9020 can be monitored using the available interface byte, frame, error, and discard counters.

### Environmental Monitoring

The Cisco MDS 9000 FabricWare offers comprehensive environmental monitoring and reporting capabilities to proactively notify the SAN administrators about the status of power supplies, fans, and the operating temperature of the Cisco MDS 9020.

### System Log

The Cisco MDS 9000 Family system log (syslog) capabilities greatly enhance debugging and management. Messages can be selectively routed to a console and log files. Messages are logged internally, and they can be sent to external syslog servers.

### Traps

Traps can be generated based on alarm conditions such as exceeding temperature threshold values, port state changes, and switch configuration change conditions.

### Network Time Protocol

Network Time Protocol (NTP) synchronizes system clocks in the fabric, providing a precise time base for all switches. An NTP server must be accessible from the fabric through the OOB Ethernet management port.

### Loopback Testing

The Cisco MDS 9000 FabricWare provides local and remote Fibre Channel port loopback testing capabilities to verify the integrity and availability of Fibre Channel ports.

## PRODUCT SPECIFICATIONS

### Protocol Support

The following protocols for switch management are supported by the Cisco MDS 9000 FabricWare:

- FTP, and TFTP

- Telnet, SSH, SNMPv1 or SNMPv2c
- FC-GS-3

### MIB Support

The Cisco MDS 9000 FabricWare provides support for the following industry standard Management Information Base (MIBs):

- Element MIB
- Fibre Alliance MIB

### ORDERING INFORMATION

Table 1 lists the software images and applicable software ordering information for the Cisco MDS 9000 FabricWare Software.

**Table 1.** Software Ordering Information

Part Number	Description
M90S1K9-2.1.2	MDS 9020 Supervisor/Fabric-I, FabricWare Release 2.1.2

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### FOR MORE INFORMATION

For more information about the Cisco MDS 9020, visit <http://www.cisco.com/en/US/products/hw/ps4159/ps4358/index.html> or contact your local account representative.

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