



Getting Started with Cisco Fabric Manager

The Cisco Fabric Manager is a set of network management tools that supports Secure Simple Network Management Protocol version 3 (SNMPv3) and legacy versions. It provides a graphical user interface (GUI) that displays real-time views of your network fabric, and lets you manage the configuration of Cisco MDS 9000 Family devices and third-party switches. The Cisco Fabric Manager applications are:

- Fabric Manager Server
- Device Manager
- Fabric Manager Client
- Performance Manager

Fabric Manager Server is the server component of the Cisco Fabric Manager tool set, and must be started before running Fabric Manager. On a Windows PC, Fabric Manager Server is installed as a service. This service can then be administered using the Service Panel in the Control Panel.

The Fabric Manager displays a map of your network fabric, including Cisco MDS 9000 Family switches, third-party switches, hosts, and storage devices.

The Device Manager presents two views of a switch.

- Device View displays a graphic representation of the switch configuration, and provides access to statistics and configuration information for a single switch.
- Summary View displays a summary of xEPorts (Inter-Switch Links), Fx Ports (fabric ports), and Nx Ports (attached hosts and storage) on the switch, as well as FC and IP neighbor devices.

Performance Manager provides detailed traffic analysis by capturing data with SNMP. This data is compiled into various graphs and charts which can be viewed with any web browser.

The Cisco Fabric Manager applications are an alternative to the command-line interface (CLI) for most switch configuration commands. For information on using the CLI to configure a Cisco MDS 9000 Family switch, refer to the *Cisco 9000 Family Configuration Guide* or the *Cisco 9000 Family Command Reference*. To learn more about the general capabilities of Cisco Fabric Manager, refer to this document.

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Managing Cisco MDS 9000 Switches

The Cisco MDS 9000 Family of switches can be accessed and configured in many different ways, and support standard management protocols. The different protocols that are supported in order to access, monitor, and configure the Cisco MDS 9000 Family of switches are described in the following table:

Table 2-1 Supported Management Protocols

Management Protocol	Purpose
Telnet/SSH	Provides remote access to the CLI for a Cisco MDS 9000 switch.
FTP/SFTP/TFTP, SCP	Copies configuration and software images between devices.
SNMPv1, v2c, and v3	Includes over 70 distinct Management Information Bases (MIBs). Cisco MDS 9000 Family switches support SNMP version 1, 2, and 3 and RMON V1 and V2. RMON provides advanced alarm and event management, including setting thresholds and sending notifications based on changes in device or network behavior. By default, the Cisco Fabric Manager communicates with Cisco MDS 9000 Family switches using SNMPv3, which provides secure authentication using encrypted user names and passwords. SNMPv3 also provides the option to encrypt all management traffic.
HTTP	HTTP is only used for the distribution and installation of the Cisco Fabric Manager software. It is not used for communication between the Cisco Fabric Manager and Cisco MDS 9000 Family switches.

Table 2-1 Supported Management Protocols (continued)

Management Protocol	Purpose
ANSI T11 FC-GS3	<p>Fibre Channel-Generic Services (FC-GS)³ in the definition of the management servers defines the Fabric Configuration Server (FCS), which is a standard mechanism to collect information about platforms (end devices) and interconnecting elements (switches) building the fabric.</p> <p>The Cisco MDS 9000 uses the information provided by FCS on top of the information contained in the Name Server database and in the Fibre Channel Shortest Path First (FSPF) topology database to build a detailed topology view, and collect information for all the devices building the fabric.</p>
XML/CIM	CIM server support for designing storage area network management applications to run on Cisco MDS SAN-OS.

Storage Management Solutions Architecture

Management services required for the storage environment can be divided into five “layers,” with the bottom layer being closest to the physical storage network equipment, and the top layer managing the interface between applications and storage resources.

Of these five layers of storage network management, Cisco Fabric Manager provides tools for device (element) management and fabric management. In general, the Device Manager is most useful for device management (a single switch), while Fabric Manager is more efficient for performing fabric management operations involving multiple switches.

Tools for “upper-layer” management tasks can be provided by Cisco or by third-party storage and network management applications. The following summarizes the goals and function of each layer of storage network management:

- Device management provides tools to configure and manage a device within a system or a fabric. You use device management tools to perform tasks on one device at a time, such as initial device configuration, setting and monitoring thresholds, and managing device system images or firmware.
- Fabric management provides a system-oriented view of a fabric and its devices. Fabric management applications provide fabric discovery, fabric monitoring, reporting, and fabric configuration.
- Resource management provides tools for managing resources such as fabric bandwidth, connected paths, disks, I/O operations per second (IOPS), CPU, and memory. You can use Fabric Manager to perform some of these tasks.

- Data management provides tools for ensuring the integrity, availability, and performance of data. Data management services include redundant array of independent disks (RAID) schemes, data replication practices, backup or recovery requirements, and data migration. Data management capabilities are provided by third-party tools.
- Application management provides tools for managing the overall system consisting of devices, fabric, resources, and data from the application. Application management integrates all these components with the applications that use the storage network. Application management capabilities are provided by third-party tools.

In-Band Management and Out-of-Band Management

Cisco Fabric Manager requires an out-of-band (Ethernet) connection to at least one Cisco MDS 9000 Family switch. You need either mgmt0 or IP over Fibre Channel (IPFC) to manage the fabric.

MGMT0

The interface referred to as the out-of-band management connection is a 10/100 Mbps Ethernet interface on the supervisor module, labeled mgmt0. The mgmt0 interface can be connected to a management network to access the switch through IP over Ethernet. You must connect to at least one Cisco MDS 9000 Family switch in the fabric, through its Ethernet management port. You can then use this connection to manage the other switches using in-band (Fibre Channel) connectivity. Otherwise, you need to connect the mgmt0 port on each switch to your Ethernet network.

Each supervisor module has its own Ethernet connection; however, the two Ethernet connections in a redundant supervisor system operate in active or standby mode. The active supervisor module also hosts the active mgmt0 connection. When a failover event occurs to the standby supervisor module, the IP address and media access control (MAC) address of the active Ethernet connection are moved to the standby Ethernet connection.

IPFC

You can also manage switches on a Fibre Channel network using an in-band IP connection. The Cisco MDS 9000 Family supports RFC 2625 IP over Fibre Channel, which defines an encapsulation method to transport IP over a Fibre Channel network.

IPFC encapsulates IP packets into Fibre Channel frames so that management information can cross the Fibre Channel network without requiring a dedicated Ethernet connection to each switch. IP addresses are resolved to the Fibre Channel address through Address Resolution Protocol (ARP). This feature allows you to build a completely in-band management solution.

Installing the Applications

Before you can access the Cisco Fabric Manager, you must complete the following tasks:

- A supervisor module must be installed on each switch that you want to manage.
- The supervisor module must be configured with the following values using the setup routine or the CLI:
 - IP address assigned to the mgmt0 interface
 - SNMP Credentials (v1/v2 communities, or v3 user name and password), maintaining the same password for all the switches in the fabric. Must be on each PC.

The Cisco Fabric Manager software executables reside on each supervisor module of each Cisco MDS 9000 Family switch in your network. The supervisor module provides an HTTP server that responds to browser requests and distributes the software to Windows or UNIX network management stations.

To install the software for the first time, or if you want to update or reinstall the software, access the supervisor module with a web browser. When you click the Install buttons on the web page that appears, the software running on your workstation is verified to make sure you are running the most current version of the software. If it is not current, the most recent version is downloaded and installed on your workstation.

New installation options include:

- Upgrade/Downgrade—The installer detects your current version of Fabric Manager and Device Manager, and provides the option to upgrade or downgrade. The default is to upgrade to the latest version of Fabric Manager or Device Manager.
- Autoupgrade—If you always want to run the latest version of Fabric Manager and Device Manager, select “Always autoupgrade, don’t ask me again.” Subsequent upgrades will happen automatically, without prompting.
- Uninstall—Before upgrading or uninstalling Fabric Manager or Device Manager, make sure any instances of these applications have been shut down. Use the Uninstall batch file or shell script to uninstall. Do not delete the .cisco_mds9000 folder as this might make your installation unsafe for upgrades.

To download and install the software on your workstation, follow these steps:

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- Step 1** Enter the IP address or host name of the supervisor module in the Address or Location field of your browser.

When you connect to the server for the first time, it checks to see if you have the correct Sun Java Virtual Machine version installed on your workstation. If not, a link is provided to the appropriate web page on Sun Microsystems’s website so you can install it.

The supervisor module HTTP server displays the window.

- Step 2** Click the link to the Sun Java Virtual Machine software (if required) and install the software.

Using the instructions provided by the Sun Microsystems website to reconnect to the supervisor module by reentering the IP address or host name in the Location or Address field of your browser.



Note The recommended version of Java is 1.4.2, although 1.4 and above is supported. To change the JRE version, start Java Web Start and set the Java preferences.

Step 3 Click on any installation link (Fabric Manager or Device Manager).

You see a prompt asking for permission to install the applications on your workstation.

Clicking on a link first runs an installer, which detects the installed version of the software, prompts for upgrades/downgrades and other options if applicable, and runs the application you selected.

All software is installed in a folder called “.cisco_mds9000”. On a Windows machine, the pathname is %HOME%\cisco_mds9000. On a UNIX machine, the pathname is \$HOME/.cisco_mds9000.

On a Windows machine, a Cisco MDS program group is created under Start > Programs. This program group contains shortcuts to batch files in the install directory. On a Solaris or Linux machine, shell scripts are created in the install directory.



Note Fabric Manager cannot run without the server component, Fabric Manager Server. Fabric Manager Server is downloaded and installed when you download and install Fabric Manager or Device Manager. On a Windows machine you install the FMServer as a service. This service can then be administered using the Service Panel in the Control Panel. The default setting for the FMServer service is that the server is automatically started when the machine is rebooted. You can change this behavior by modifying the properties in the Service panel.

Launching the Applications

To launch the Fabric Manager Server, Fabric Manager Client (Fabric View) or Device Manager (Device View and Summary View), follow these steps:

Step 1 Double-click the **Fabric Manager** icon or the **Device Manager** icon on your desktop or select the option from the Windows **Start** menu.

If you double-click on Fabric Manager, the Fabric Manager Server will load (a command line window will appear briefly).

A login screen for Fabric Manager or Device Manager appears.

Step 2 Enter the IP address or device name in the Device Name(s) field, or select an IP address from the list of previously accessed devices, accessible through the Device Name(s) drop-down list.

Step 3 Check the **SNMPv3** check box to select SNMP version 3.



Note The default authentication digest used for storing user names and passwords is MD5. In case you selected SHA instead, the relative check box in the Fabric Manager initial login screen should be checked.

Step 4 Enter a user name and password.

- Step 5** If the SNMPv3 Privacy option is enabled, enter the Privacy Password used for encrypting management traffic
- The Privacy option causes all management traffic to be encrypted while, with SNMPv3, user names and passwords are always encrypted.
- Step 6** Click **Open**.
- You see either the Fabric Manager or the Device Manager.
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Using the Management Services Wizard

The Management Services Wizard enables you to quickly create and apply initial configuration CLI scripts for the MDS 9000 family. You can run the Management Services Wizard by accessing the switch's supervisor module with a web browser.

To create a configuration script, step sequentially through all the configuration steps by filling in the required fields on each page, and clicking the Next button. You can also selectively configure features by clicking on their category titles in the left frame (e.g., Call Home).



Note

When creating configuration scripts this way, you cannot go to any panel with failures in the validation of fields. Use the Enable check box on each panel to enable validation and script generation for that panel. The exception to this is that a Role can only be created if a user is created at the same time.

If you want to change information on a previous page, use the Back button. You can also view and change information you have entered at any time by clicking on the Review category title.

To edit an existing script file, you must open the script file with a text editor, select it, and copy it. In the Management Services Wizard, click on Review under the Script item in the menu tree. Then, paste the script into the text area of the script dialog.

A Note on Ports

For PCs running Fabric Manager Server, Fabric Manager Client, Device Manager, and Performance Manager, certain ports need to be available.

Fabric Manager Client and Device manager use the first available UDP port for receiving SNMP responses. The UDP SNMP Trap local ports are (FM=1162, DM=1163 or 1164). Fabric Manager Client also opens TCP RMI port (9099). If Device Manager is opened from Fabric Manager Client, it listens on the first available UDP port for Fabric Manager requests.

Fabric Manager Server requires two predictable TCP ports to be opened on the firewall for an incoming connection:

- `java.rmi.registry.port = 9099`
- `java.rmi.server.remoteObjectPort = 9199`

As long as these two ports are opened, the Fabric Manager client is able to connect to the server. There may be other TCP ports connected to a Fabric Manager client, but they are initiated by server, which is behind the firewall.

