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Preface

This preface describes the audience, organization, and conventions of the *Cisco MDS 9000 Family Configuration Guide*. It also provides information on how to obtain related documentation.

Audience

This guide is for experienced network administrators who are responsible for configuring and maintaining the Cisco MDS 9000 Family of multilayer directors and fabric switches.

Organization

The Cisco MDS 9000 Family Fabric Manager Configuration Guide is organized as follows: :

Chapter	Title	Description
Chapter 1	Product Overview	Presents an overview of the Cisco MDS 9000 Family of multilayer switches and directors.
Chapter 2	Installation of Cisco MDS SAN-OS and Fabric Manager	Provides a brief overview of Fabric Manager components and capabilities, and information on installation and launching the applications.
Chapter 3	Fabric Manager Server	Provides in-depth descriptions of GUI and capabilities for the Fabric Manager Server.
Chapter 4	Authentication in Fabric Manager	Describes the authentication schemes between Fabric Manager components and fabric switches.
Chapter 5	Fabric Manager Client	Provides in-depth descriptions of GUI and capabilities for the Fabric Manager.
Chapter 6	Device Manager	Provides in-depth descriptions of GUI and capabilities for the Device Manager.
Chapter 7	Fabric Manager Web Server	Provides in-depth descriptions of GUI and capabilities for the Fabric Manager Web Client.
Chapter 8	Performance Manager	Provides overview of Performance Manager architecture.
Chapter 9	Cisco Traffic Analyzer	Describes installing and launching Cisco Traffic Analyzer from Performance Manager.

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Chapter	Title	Description
Chapter 10	Obtaining and Installing Licenses	Describes license types, procedure, installation, and management for the Cisco MDS SAN-OS software.
Chapter 11	On-Demand Port Activation Licensing	Describes how to use the on-demand port activation licensing feature on the Cisco MDS 9124 Fabric Switch, the Cisco MDS 9134 Fabric Switch, the Cisco Fabric Switch for HP c-Class BladeSystem, and the Cisco Fabric Switch for IBM BladeCenter.
Chapter 12	Initial Configuration	Provides initial switch configuration options and switch access information.
Chapter 13	Using the CFS Infrastructure	Explains the use of the Cisco Fabric Services (CFS) infrastructure to enable efficient database distribution.
Chapter 14	Configuring FlexAttach Virtual pWWN	FlexAttach virtual pWWN feature facilitates server and configuration management. In a SAN environment, the server installation or replacement, requires interaction and coordination among the SAN and server administrators.
Chapter 15	Software Images	Describes how to install and upgrade software images
Chapter 16	Managing Configuration Files	Describes the initial configuration of the switches using the configuration files so they can be accessed by other devices
Chapter 17	Configuring High Availability	Describes the high availability feature including switchover mechanisms.
Chapter 18	Managing System Hardware	Explains switch hardware inventory, power usage, power supply, module temperature, fan and clock modules, and environment information.
Chapter 19	Managing Modules	Explains how to display and analyze the status of each module and specifies the power on and power off process for modules.
Chapter 20	Configuring Interfaces	Explains Generation 1 and Generation 2 module port and operational state concepts in Cisco MDS 9000 Family switches and provides details on configuring ports and interfaces.
Chapter 21	Configuring N Port Virtualization	Provides an overview of N Port Virtualization and includes quidelines and requirements for configuring and verifying NPV.
Chapter 22	Configuring Generation 2 Switches and Modules	Explains configuration concepts for Generation 2 module ports and interfaces.

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Chapter	Title	Description
Chapter 23	Configuring PortChannels	Explains PortChannels and load balancing concepts and provides details on configuring PortChannels, adding ports to PortChannels, and deleting ports from PortChannels.
Chapter 24	Configuring TrunkingConfiguring Trunking	Explains TE ports and trunking concepts.
Chapter 25	Configuring Domain Parameters	Explains the Fibre Channel domain (fcdomain) feature, which includes principal switch selection, domain ID distribution, FC ID allocation, and fabric reconfiguration functions.
Chapter 1	Configuring and Managing VSANs	Describes how virtual SANs (VSANs) work, explains the concept of default VSANs, isolated VSANs, VSAN IDs, and attributes, and provides details on how to create, delete, and view VSANs.
Chapter 27	SAN Device Virtualization	Describes how to configure virtual devices to represent physical end devices for switches running Cisco MDS SAN-OS Release 3.1(2) and later.
Chapter 28	Creating Dynamic VSANs	Defines the Dynamic Port VSAN Membership (DPVM) feature that is used to maintain fabric topology when a host or storage device connection is moved between two Cisco MDS switches.
Chapter 29	Configuring Inter-VSAN Routing	Provides details on sharing resources across VSANs using the inter-VSAN Routing (IVR) feature.
Chapter 30	Configuring and Managing Zones	Defines various zoning concepts and provides details on configuring a zone set and zone management features.
Chapter 24	Distributing Device Alias Services	Describes the use of the Distributed Device Alias Services (device alias) to distribute device alias names on a fabric-wide basis.
Chapter 25	Configuring Fibre Channel Routing Services and Protocols	Provides details and configuration information on Fibre Channel routing services and protocols.
Chapter 33	Dense Wavelength Division Multiplexing	Dense Wavelength-Division Multiplexing (DWDM) multiplexes multiple optical carrier signals on a single optical fiber. DWDM uses different wavelengths to carry various signals.
Chapter 26	Managing FLOGI, Name Server, FDMI, and RSCN Databases	Provides name server and fabric login details required to manage storage devices and display registered state change notification (RSCN) databases.
Chapter 27	Discovering SCSI Targets	Describes how the SCSI LUN discovery feature is started and displayed.

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Chapter	Title	Description
Chapter 28	Configuring FICON	Provides details on the FI-bre CON-nection (FICON) interface, fabric binding, and the Registered Link Incident Report (RLIR) capabilities in Cisco MDS switches.
Chapter 29	Advanced Features and Concepts	Describes the advanced configuration features—time out values, fctrace, fabric analyzer, world wide names, flat FC IDs, loop monitoring, and interoperating switches.
Chapter 30	Configuring FIPS	Describes the configuration guidelines for FIPS and also how to enable FIPS mode and how to conduct FIPS self-tests.
Chapter 39	Configuring Users and Common Roles	Describes how to configure users and common roles.
Chapter 31	Configuring SNMP	Provides details on how you can use SNMP to modify a role that was created using CLI.
Chapter 32	Configuring RADIUS and TACACS+	Discusses the AAA parameters, user profiles, and RADIUS authentication security options provided in all switches in the Cisco MDS 9000 Family and provides configuration information for these options.
Chapter 33	Configuring IPv4 and IPv6 Access Control Lists	Describes the IPv4 static routing feature and its use to route traffic between VSANs.
Chapter 34	Configuring Certificate Authorities and Digital Certificates	Describes how to interoperate with Certificate Authorities (CAs) and use digital certificates for secure, scalable communication.
Chapter 35	Configuring IPsec Network Security	Provides details on the digital certificates, IP Security Protocol (IPsec) open standards, and the Internet Key Exchange (IKE) protocol that it uses to handle protocol and algorithm negotiation.
Chapter 36	Configuring FC-SP and DHCHAP	Describes the DHCHAP protocol, an FC-SP protocol, that provides authentication between Cisco MDS 9000 Family switches and other devices.
Chapter 37	Configuring Port Security	Provides details on port security features that can prevent unauthorized access to a switch port in the Cisco MDS 9000 Family.
Chapter 38	Configuring Fabric Binding	Describes the fabric binding security feature for VSANs, which ensures that ISLs are only enabled between specific switches.
Chapter 48	Configuring FCIP	Describes how the switch allows IP hosts to access Fibre Channel storage using the iSCSI protocol.
Chapter 41	Configuring the SAN Extension Tuner	Explains the SAN extension tuner (SET) feature that optimizes FCIP performance.

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Chapter	Title	Description
Chapter 42	Configuring iSCSI	Describes the iSCSI feature that is specific to the IPS module and is available in the Cisco MDS 9200 Switches or Cisco MDS 9500 Directors.
Chapter 43	Configuring IP Services	Provides details on IP over Fibre Channel (IPFC) services and provides configuring IPFC, virtual router, and DNS server configuration information.
Chapter 44	Configuring IP Storage	Provides details on extending the reach of Fibre Channel SANs by connecting separated SAN islands together through IP networks using FCIP, and allowing IP hosts to access FC storage using the iSCSI protocol.
Chapter 53	Configuring IPv4 for Gigabit Ethernet Interfaces	Describes the IPv4 protocol support provided by Cisco MDS 9000 Family switches.
Chapter 46	Configuring IPv6 for Gigabit Ethernet Interfaces	Describes the IPv6 protocol support provided by Cisco MDS 9000 Family switches.
Chapter 55	Configuring SCSI Flow Services and Statistics	Describes the SCSI flow services and SCSI flow statistics, the Intelligent Storage Services.
Chapter 48	Configuring Fibre Channel Write Acceleration	Describes Fibre Channel Write Acceleration support and configuration.
Chapter 49	Configuring SANTap	Describes SANTap support and configuration.
Chapter 50	Configuring NASB	Describes NASB support and configuration.
Chapter 59	Network Monitoring	Describes how to use Fabric Manager monitoring features.
Chapter 60	Performance Monitoring	Provides details on using Performance Manager.
Chapter 61	Configuring RMON	Provides details on using RMONs to configure alarms and events.
Chapter 52	Monitoring Network Traffic Using SPAN	Describes the Switched Port Analyzer (SPAN), SPAN sources, filters, SPAN sessions, SD port characteristics, and configuration details.
Chapter 53	Configuring System Message Logging	Describes how system message logging is configured and displayed.
Chapter 64	Configuring Call Home	Provides details on the Call Home service and includes information on Call Home, event triggers, contact information, destination profiles, and e-mail options.
Chapter 55	Configuring Fabric Configuration Servers	Describes how the fabric configuration server (FCS) feature is configured and displayed.
Chapter 57	Configuring Fabric Congestion Control and QoS	Provides details on the quality of service (QoS) and Fibre Channel Congestion Control (FCC) features.

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Chapter	Title	Description
Chapter 57	Configuring Port Tracking	Provides information about a port tracking feature that provides a faster recovery from link failures.
Chapter 68	Troubleshooting Your Fabric	Describes basic troubleshooting methods used to resolve issues with switches.
Chapter 69	Management Software FAQ	Provides answers to some of the most frequently asked questions about Cisco Fabric Manager and Device Manager.
Chapter 59	Monitoring System Processes and Logs	Provides information on displaying system processes and status. It also provides information on configuring core and log files, HA policy, heartbeat and watchdog checks, and upgrade resets.
Appendix A	Launching Fabric Manager in Cisco SAN-OS Releases Prior to 3.2(1)	Provides instructions for launching Fabric Manager Client in Cisco SAN-OS releases prior to 3.2(1).
Appendix B	Cisco Fabric Manager Unsupported Feature List	Provides a list of features and functions not supported by Cisco Fabric Manager or Device Manager.
Appendix C	Interface Nonoperational Reason Codes	Provides the nonoperational reason codes for why an interface is up and the operational state is down.
Appendix D	Managing Cisco FabricWare	Provides information on the Cisco FabricWare software running on the MDS 9020 Switch which offers Fibre Channel switching services that realize maximum performance.
Appendix 60	Configuration Limits for Cisco MDS SAN-OS Release 3.1(x) and 3.2(x)	lists the Cisco verified limits and maximum limits for switches running Cisco MDS SAN-OS Release 3.1(x) and Release 3.2(x).

Document Conventions

Command descriptions use these conventions:

boldface font	Commands and keywords are in boldface.
italic font	Arguments for which you supply values are in italics.
[ ]	Elements in square brackets are optional.
[x | y | z]	Optional alternative keywords are grouped in brackets and separated by vertical bars.

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Screen examples use these conventions:

`screen font`	Terminal sessions and information the switch displays are in screen font.
`boldface screen font`	Information you must enter is in boldface screen font.
italic screen font	Arguments for which you supply values are in italic screen font.
`< >`	Nonprinting characters, such as passwords, are in angle brackets.
`[ ]`	Default responses to system prompts are in square brackets.
`!, #`	An exclamation point (!) or a pound sign (#) at the beginning of a line of code indicates a comment line.

This document uses the following conventions:

Note Means reader *take note*. Notes contain helpful suggestions or references to material not covered in the manual.

Caution Means *reader be careful*. In this situation, you might do something that could result in equipment damage or loss of data.

Related Documentation

The documentation set for the Cisco MDS 9000 Family includes the following documents. To find a document online, use the Cisco MDS SAN-OS Documentation Locator at: http://www.cisco.com/en/US/products/ps5989/products_documentation_roadmap09186a00804500c1.html. For information on IBM TotalStorage SAN Volume Controller Storage Software for the Cisco MDS 9000 Family, refer to the IBM TotalStorage Support website: http://www.ibm.com/storage/support/2062-2300/

Release Notes

- *Cisco MDS 9000 Family Release Notes for Cisco MDS SAN-OS Releases*
- Cisco MDS 9000 Family Release Notes for Storage Services Interface Images
- Cisco MDS 9000 Family Release Notes for Cisco MDS 9000 EPLD Images

Compatibility Information

- Cisco MDS 9000 SAN-OS Hardware and Software Compatibility Information
- Cisco MDS 9000 Family Interoperability Support Matrix
- Cisco MDS SAN-OS Release Compatibility Matrix for IBM SAN Volume Controller Software for Cisco MDS 9000
- Cisco MDS SAN-OS Release Compatibility Matrix for Storage Service Interface Images

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Regulatory Compliance and Safety Information

- *Regulatory Compliance and Safety Information for the Cisco MDS 9000 Family*

Hardware Installation

- *Cisco MDS 9500 Series Hardware Installation Guide*
- *Cisco MDS 9200 Series Hardware Installation Guide*
- *Cisco MDS 9216 Switch Hardware Installation Guide*
- *Cisco MDS 9100 Series Hardware Installation Guide*
- *Cisco MDS 9124 Multilayer Fabric Switch Quick Start Guide*
- *Cisco MDS* 9020 Fabric Switch *Hardware Installation* Guide

Cisco Fabric Manager

- Cisco MDS 9000 Family Fabric Manager Quick Configuration Guide
- Cisco MDS 9000 Family Fabric Manager Configuration Guide
- Cisco MDS 9000 Fabric Manager Online Help
- Cisco MDS 9000 Fabric Manager Web Services Online Help

Command-Line Interface

- Cisco MDS 9000 Family Software Upgrade and Downgrade Guide
- Cisco MDS 9000 Family CLI Quick Configuration Guide
- *Cisco MDS 9000 Family CLI Configuration Guide*
- *Cisco MDS 9000 Family Command Reference*
- Cisco MDS 9000 Family Quick Command Reference
- Cisco MDS 9020 Fabric Switch Configuration Guide and Command Reference
- *Cisco MDS 9000 Family SAN Volume Controller Configuration Guide*

Intelligent Storage Networking Services Configuration Guides

- Cisco MDS 9000 Family Data Mobility Manager Configuration Guide
- Cisco MDS 9000 Family Storage Media Encryption Configuration Guide
- Cisco MDS 9000 Family Secure Erase Configuration Guide - For Cisco MDS 9500 and 9200 Series

Troubleshooting and Reference

- *Cisco MDS 9000 Family Troubleshooting Guide*

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- *Cisco MDS 9000 Family MIB Quick Reference*
- Cisco MDS 9020 Fabric Switch MIB Quick Reference
- *Cisco MDS 9000 Family* SMI-S *Programming Reference*
- *Cisco MDS 9000 Family System Messages Reference*
- Cisco MDS 9020 Fabric Switch System Messages Reference

Installation and Configuration Note

- Cisco MDS 9000 Family SSM Configuration Note
- *Cisco MDS 9000 Family Port Analyzer Adapter Installation and Configuration Note*

Obtaining Documentation and Submitting a Service Request

For information on obtaining documentation, submitting a service request, and gathering additional information, see the monthly *What's New in Cisco Product Documentation*, which also lists all new and revised Cisco technical documentation, at:

http://www.cisco.com/en/US/docs/general/whatsnew/whatsnew.html

Subscribe to the *What's New in Cisco Product Documentation* as a Really Simple Syndication (RSS) feed and set content to be delivered directly to your desktop using a reader application. The RSS feeds are a free service and Cisco currently supports RSS Version 2.0.

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