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## Preface

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This document is intended to provide guidance for troubleshooting issues that may appear when deploying a storage area network (SAN) using the Cisco MDS 9000 Family of switches. This document will help you investigate the configuration of the different systems included in the SAN environment, such as hubs, hosts, and storage arrays and Cisco MDS 9000 switches. It also covers basic storage commands, switch configurations, and common storage parameters. It introduces tools and methodologies to recognize a problem, determine its cause, and find possible solutions.

## Document Organization

This document is organized into the following chapters:

Chapter	Title	Description
Chapter 1	Troubleshooting Overview	Describes basic concepts, methodology, and tools to use for troubleshooting.
Chapter 2	Troubleshooting Switch Hardware and Booting Problems	Describes how to identify and resolve problems for a single Cisco MDS 9000 Family switch.
Chapter 3	Troubleshooting Switch Level Issues and Interswitch Connectivity	Describes how to identify and resolve problems that affect basic connectivity between switches, hosts, and storage in the network fabric.
Chapter 4	Troubleshooting Switch Fabric Level Issues	Describes switch fabric-level troubleshooting procedures.
Chapter 5	Troubleshooting IP Storage Issues	Describes IP storage troubleshooting procedures for the FCIP and iSCSI features.
Chapter 6	Troubleshooting the Fabric	Provides information on using Fabric Manager to troubleshoot your fabric.
Chapter 7	Troubleshooting Fabric Manager Issues	Describes some common issues you may experience while using Cisco Fabric Manager, and provides solutions.

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## 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.
string	A nonquoted set of characters. Do not use quotation marks around the string or the string will include the quotation marks.

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

For Fabric Manager and Device Manager field descriptions, refer to the *Cisco MDS 9000 Family Fabric Manager Online Help*. For additional information, refer to the following documents:

- *Regulatory Compliance and Safety Information for the Cisco MDS 9000 Family*
- *Cisco MDS 9100 Series Hardware Installation Guide*
- *Cisco MDS 9200 Series Hardware Installation Guide*
- *Cisco MDS 9500 Series Hardware Installation Guide*
- *Cisco MDS 9000 Family Configuration Guide*
- *Cisco MDS 9000 Family Command Reference*
- *Cisco MDS 9000 Family System Messages Guide*

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- *Cisco MDS 9000 Family MIB Reference Guide*
- *Cisco MDS 9000 Family CIM Programming Reference Guide*
- *Cisco MDS 9000 Family SAN Volume Controller Configuration Guide*

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For information on VERITAS Storage Foundation™ for Networks 1.0, Cisco software, refer to the following Veritas documents available at <http://support.veritas.com/>:

- *VERITAS Storage Foundation for Networks Overview*
- *VERITAS Storage Foundation for Networks Installation and Configuration Guide*
- *VERITAS Storage Foundation for Networks Obtaining and Installing Licenses*
- *VERITAS Storage Foundation for Networks GUI Administrator's Guide*
- *VERITAS Storage Foundation for Networks CLI Administrator's Guide*
- *VERITAS Storage Foundation for Networks README*

For information on IBM TotalStorage SAN Volume Controller Storage Software for Cisco MDS 9000, refer to the following IBM documents available at <http://www.ibm.com/storage/support/2062-2300>

- *IBM TotalStorage SAN Volume Controller Storage Software for Cisco MDS 9000 Getting Started*
- *IBM TotalStorage SAN Volume Controller Storage Software for Cisco MDS 9000 Configuration Guide*
- *IBM TotalStorage SAN Volume Controller Storage Software for Cisco MDS 9000 Command-Line Interface User's Guide*
- *IBM TotalStorage Enterprise Storage Server*
- *IBM TotalStorage SAN Volume Controller*
- *IBM TotalStorage SAN Volume Controller for Cisco MDS 9000*
- *Subsystem Device Driver User's Guide*

## Obtaining Documentation

Cisco provides several ways to obtain documentation, technical assistance, and other technical resources. These sections explain how to obtain technical information from Cisco Systems.

### Cisco.com

You can access the most current Cisco documentation on the World Wide Web at this URL:

<http://www.cisco.com/univercd/home/home.htm>

You can access the Cisco website at this URL:

<http://www.cisco.com>

International Cisco websites can be accessed from this URL:

[http://www.cisco.com/public/countries\\_languages.shtml](http://www.cisco.com/public/countries_languages.shtml)

### Documentation CD-ROM

Cisco documentation and additional literature are available in a Cisco Documentation CD-ROM package, which may have shipped with your product. The Documentation CD-ROM is updated regularly and may be more current than printed documentation. The CD-ROM package is available as a single unit or through an annual or quarterly subscription.

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Registered Cisco.com users can order a single Documentation CD-ROM (product number DOC-CONDOCCD=) through the Cisco Ordering tool:

[http://www.cisco.com/en/US/partner/ordering/ordering\\_place\\_order\\_ordering\\_tool\\_launch.html](http://www.cisco.com/en/US/partner/ordering/ordering_place_order_ordering_tool_launch.html)

All users can order monthly or quarterly subscriptions through the online Subscription Store:

<http://www.cisco.com/go/subscription>

## **Ordering Documentation**

You can find instructions for ordering documentation at this URL:

[http://www.cisco.com/univercd/cc/td/doc/es\\_inpk/pdi.htm](http://www.cisco.com/univercd/cc/td/doc/es_inpk/pdi.htm)

You can order Cisco documentation in these ways:

- Registered Cisco.com users (Cisco direct customers) can order Cisco product documentation from the Networking Products Marketplace:

<http://www.cisco.com/en/US/partner/ordering/index.shtml>

- Nonregistered Cisco.com users can order documentation through a local account representative by calling Cisco Systems Corporate Headquarters (California, U.S.A.) at 408 526-7208 or, elsewhere in North America, by calling 800 553-NETS (6387).

## **Documentation Feedback**

You can submit comments electronically on Cisco.com. On the Cisco Documentation home page, click **Feedback** at the top of the page.

You can e-mail your comments to [mdsfeedback-doc@cisco.com](mailto:mdsfeedback-doc@cisco.com).

You can submit comments by using the response card (if present) behind the front cover of your document or by writing to the following address:

Cisco Systems  
Attn: Customer Document Ordering  
170 West Tasman Drive  
San Jose, CA 95134-9883

We appreciate your comments.

## **Obtaining Technical Assistance**



### **Note**

If you purchased Cisco support through a Cisco reseller, contact the reseller directly. If you purchased support directly from Cisco, contact Cisco Technical Support at this URL:

<http://www.cisco.com/warp/public/687/Directory/DirTAC.shtml>

Cisco provides Cisco.com, which includes the Cisco Technical Support website, as a starting point for all technical assistance. Customers and partners can obtain online documentation, troubleshooting tips, and sample configurations from the Cisco Technical Support Website. Cisco.com registered users have complete access to the technical support resources on the Cisco Technical Support Website, including technical support tools and utilities.

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## Cisco.com

Cisco.com offers a suite of interactive, networked services that let you access Cisco information, networking solutions, services, programs, and resources at any time, from anywhere in the world.

Cisco.com provides a broad range of features and services to help you with these tasks:

- Streamline business processes and improve productivity
- Resolve technical issues with online support
- Download and test software packages
- Order Cisco learning materials and merchandise
- Register for online skill assessment, training, and certification programs

To obtain customized information and service, you can self-register on Cisco.com at this URL:

<http://tools.cisco.com/RPF/register/register.do>

## Technical Support Center

Cisco technical support is available to all customers who need technical assistance with a Cisco product, technology, or solution. Two types of support are available: the Cisco Technical Support Website and the Cisco Escalation Center. The type of support that you choose depends on the priority of the problem and the conditions stated in service contracts, when applicable.

We categorize Cisco technical support inquiries according to urgency:

- Priority level 4 (P4)—You need information or assistance concerning Cisco product capabilities, product installation, or basic product configuration. There is little or no impact to your business operations.
- Priority level 3 (P3)—Operational performance of the network is impaired, but most business operations remain functional. You and Cisco are willing to commit resources during normal business hours to restore service to satisfactory levels.
- Priority level 2 (P2)—Operation of an existing network is severely degraded, or significant aspects of your business operations are negatively impacted by inadequate performance of Cisco products. You and Cisco will commit full-time resources during normal business hours to resolve the situation.
- Priority level 1 (P1)—An existing network is “down,” or there is a critical impact to your business operations. You and Cisco will commit all necessary resources around the clock to resolve the situation.

## Cisco Technical Support Website

The Cisco Technical Support Website provides online documents and tools to help troubleshoot and resolve technical issues with Cisco products and technologies. To access the Cisco Technical Support Website, go to this URL:

<http://www.cisco.com/techsupport>

All customers, partners, and resellers who have a valid Cisco service contract have complete access to the technical support resources on the Cisco Technical Support Website. Some services on the Cisco Technical Support Website require a Cisco.com login ID and password. If you have a valid service contract but do not have a login ID or password, go to this URL to register:

<http://tools.cisco.com/RPF/register/register.do>

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If you are a Cisco.com registered user, and you cannot resolve your technical issues by using the Cisco Technical Support Website, you can open a case online at this URL:

<http://www.cisco.com/techsupport/caseopen>

If you have Internet access, we recommend that you open P3 and P4 cases online so that you can fully describe the situation and attach any necessary files.

## **Cisco Technical Support Escalation Center**

The Cisco Technical Support Escalation Center addresses priority level 1 or priority level 2 issues. These classifications are assigned when severe network degradation significantly impacts business operations. When you contact the Technical Support Escalation Center with a P1 or P2 problem, a Cisco technical support engineer automatically opens a case.

To obtain a directory of toll-free Cisco Technical Support telephone numbers for your country, go to this URL: <http://www.cisco.com/warp/public/687/Directory/DirTAC.shtml>

Before calling, please check with your network operations center to determine the Cisco support services to which your company is entitled: for example, SMARTnet, SMARTnet Onsite, or Network Supported Accounts (NSA). When you call the center, please have available your service agreement number and your product serial number.

## **Obtaining Additional Publications and Information**

Information about Cisco products, technologies, and network solutions is available from various online and printed sources.

- The *Cisco Product Catalog* describes the networking products offered by Cisco Systems, as well as ordering and customer support services. Access the *Cisco Product Catalog* at this URL:  
[http://www.cisco.com/en/US/products/products\\_catalog\\_links\\_launch.html](http://www.cisco.com/en/US/products/products_catalog_links_launch.html)
- Cisco Press publishes a wide range of networking publications. Cisco suggests these titles for new and experienced users: *Internetworking Terms and Acronyms Dictionary*, *Internetworking Technology Handbook*, *Internetworking Troubleshooting Guide*, and the *Internetworking Design Guide*. For current Cisco Press titles and other information, go to Cisco Press online at this URL:  
<http://www.ciscopress.com>
- *Packet* magazine is the Cisco quarterly publication that provides the latest networking trends, technology breakthroughs, and Cisco products and solutions to help industry professionals get the most from their networking investment. Included are networking deployment and troubleshooting tips, configuration examples, customer case studies, tutorials and training, certification information, and links to numerous in-depth online resources. You can access *Packet* magazine at this URL:  
<http://www.cisco.com/go/packet>
- iQ Magazine is the Cisco bimonthly publication that delivers the latest information about Internet business strategies for executives. You can access iQ Magazine at this URL:  
<http://www.cisco.com/go/iqmagazine>
- Internet Protocol Journal is a quarterly journal published by Cisco Systems for engineering professionals involved in designing, developing, and operating public and private internets and intranets. You can access the Internet Protocol Journal at this URL:  
[http://www.cisco.com/en/US/about/ac123/ac147/about\\_cisco\\_the\\_internet\\_protocol\\_journal.html](http://www.cisco.com/en/US/about/ac123/ac147/about_cisco_the_internet_protocol_journal.html)

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- Training—Cisco offers world-class networking training. Current offerings in network training are listed at this URL:

[http://www.cisco.com/en/US/learning/le31/learning\\_recommended\\_training\\_list.html](http://www.cisco.com/en/US/learning/le31/learning_recommended_training_list.html)