



Brocade Fabric Manager

User's Guide

Version 4.1.1

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Brocade Communications Systems, Incorporated

Corporate Headquarters

1745 Technology Drive
San Jose, CA 95110
T: (408) 487-8000
F: (408) 487-8101
Email: info@brocade.com

European Headquarters

29, route de l'Aéroport
Case Postale 105
CH-1211 Geneva 15,
Switzerland
T: +41 22 799 56 40
F: +41 22 799 56 41
Email: europe-info@brocade.com

Asia-Pacific Headquarters

Shiroyama JT Trust Tower 36th Floor
4-3-1 Toranomon, Minato-ku
Tokyo, Japan 105-6036
T: +81 35402 5300
F: +81 35402 5399
Email: apac-info@brocade.com

Latin America Headquarters

5201 Blue Lagoon Drive
Miami, FL 33126
T: (305) 716-4165
Email: latinam-sales@brocade.com

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Brocade Fabric Manager User's Guide, v3.0	53-0000204-01	N/A	October 2001
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<i>Brocade Fabric Manager User's Guide, v4.1.1</i>	53-0000823-05	Editorial & structural changes, aligned information with online help information, updated Call Home feature information, updated link icons, additional troubleshooting information.	December 2003

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Glossary

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About This Document

This document is a fabric administrator's guide written to help you manage and monitor your fabric(s) using Fabric Manager.

"About This Document" contains the following sections:

- ["How This Document Is Organized" on page xvii](#)
- ["What's New in This Document" on page xix](#)
- ["Document Conventions" on page xx](#)
- ["Additional Information" on page xxi](#)
- ["Getting Technical Help" on page xxii](#)
- ["Document Feedback" on page xxiii](#)

How This Document Is Organized

This document is organized to help you find the particular information that you want as quickly and easily as possible.

This document provides both concepts and procedures. If you are already familiar with this topic, you might want to forgo reading the first two chapters and proceed directly to the instructions you need.

The document contains the following components:

- The title page and "Table of Contents" provide the version number, date, and part number of this publication; copyrighted information contained in the document; Brocade Communications, Inc., locations around the world; a document history table; and the topics covered in this particular document.
- "About This Document" provides information specific to this document: how it is organized, what information has changed since its most recent publication, the typographic conventions and particular terminology that it uses, where to go for further information on the topic, how to get technical assistance with your product, and how to provide your feedback about this document.
- [Chapter 1, "About Fabric Manager"](#) provides some basic information about the Fabric Manager software. It introduces you to the GUI and lists the system requirements for Fabric Manager.
- [Chapter 2, "Installing Fabric Manager"](#) provides information and instructions on installing the Fabric Manager server and client on supported operating systems.
- [Chapter 3, "Common Fabric Manager Tasks"](#) includes common tasks that fabric administrators perform.
- [Chapter 4, "Grouping"](#) provides information on how to create groups in Fabric Manager and perform group-wide tasks.

- [Chapter 5, “Licensing”](#) provides information on how to import and export license keys and use the Fabric Manager E-Licensing feature.
- [Chapter 6, “Zoning”](#) provides information on how to create and manage zones, aliases, and configurations in Fabric Manager.
- [Chapter 7, “Fabric Watch”](#) provides information on how the Fabric Watch feature works and how to configure alarms and thresholds.
- [Chapter 8, “Call Home”](#) provides information on how to enable, configure, and disable the Fabric Manager Call Home feature.
- [Chapter 9, “Security Management”](#) provides information on using the Security feature on switches and fabrics, including configuring policies, managing secure fabrics, and changing secure passwords.
- [Chapter 10, “Downloading Firmware”](#) provides information on how to download firmware to single and multiple switches simultaneously.
- [Chapter 11, “ISL Checking”](#) provides information on how to monitor ISLs and configure ISL checking in Fabric Manager.
- [Chapter 12, “Fabric Checking”](#) provides information on how to set up the Fabric Checking feature to notify you when switches are added and/or removed from your fabric.
- [Chapter 13, “Fabric Merge Check”](#) provides information on how to use the Fabric Merge Check feature to help you compare the various configuration elements of two fabrics before you connect those fabrics.
- [Chapter 14, “Comparing Configurations”](#) provides information on how to save baselines and compare switches against those configurations. It also includes information on creating custom templates.
- [Chapter 15, “Backing Up and Comparing Fabrics”](#) provides information on how to back up a fabric configuration and how to compare that backup to against an active fabric configuration.
- [Chapter 16, “Sequenced Reboot”](#) provides information on how to create a reboot group and set up a sequential reboot.
- [Chapter 17, “FDMI-Capable HBA Firmware Download”](#) provides information on how to download firmware to one or more HBAs.
- [Chapter 18, “Monitoring and Viewing Your SAN”](#) provides information on how to use Fabric Manager to view and monitor the behavior of your fabrics.
- [Chapter 19, “Troubleshooting”](#) provides information on how to filter events in the Fabric Manager application log and describes known issues and workarounds.
- [Appendix A, “File Menu Reference”](#) provides information about what options are available from the File menu.
- [Appendix B, “Edit Menu Reference”](#) provides information about what options are available from the Edit menu.
- [Appendix C, “View Menu Reference”](#) provides information about the different views in Fabric Manager.
- [Appendix D, “Actions Menu Reference”](#) provides information about what options are available from the Actions menu.
- [Appendix E, “Topology Menu Reference”](#) provides information about what options are available from the Topology menu.
- [Appendix F, “Tools Menu Reference”](#) provides information about what options are available from the Tools menu.

- [Appendix G, “Help Menu Reference”](#) provides information about what options are available from the Help menu.
- [Appendix H, “Zoning Reference”](#) lists and describes the components of the Zone Administration interface.
- [Appendix I, “Fabric Watch Reference”](#) lists and describes the fields you need to view and configure threshold and alarm settings.
- [Appendix J, “Call Home External Executable Reference”](#) provides information about the Call Home external executable.
- [Appendix K, “Fabric Topology”](#) discusses how to configure topology view options, assign a core switch, and more.
- [Appendix L, “Name Server”](#) includes information in the Name Server table.
- [“Glossary”](#) defines both terms specific to Brocade technology and common industry terms with uses specific to Brocade technology.
- [“Index”](#) points you to the exact pages on which specific information is located.

What’s New in This Document

The following changes have been made since this document was last released:

- Information that was added:
 - New link icons for trunked and bundled links
 - New troubleshooting information
 - Enhancements to the Call Home feature documentation
 - Additional Name Server information
 - Additional Fabric Topology information
- Information that was changed:
 - Structure of the document
 - Editorial changes
 - Added glossary
 - Updated Preface: renamed “About This Document”

For further information, refer to *Fabric Manager Release Notes*.

Document Conventions

This section describes text formatting conventions, important notices formats, and terms as they are used in this document.

Text Formatting

The following table describes the narrative-text formatting conventions that are used in this document.

Convention	Purpose
bold text	<ul style="list-style-type: none">Identifies command namesIdentifies GUI elementsIdentifies keywords/operandsIdentifies text to enter at the GUI or CLI
<i>italic text</i>	<ul style="list-style-type: none">Provides emphasisIdentifies variablesIdentifies paths and internet addressesIdentifies document titles and cross references
code text	<ul style="list-style-type: none">Identifies CLI outputIdentifies syntax examples

Notes, Cautions, and Warnings

The following notices appear in this document.



Note

A note provides a tip, emphasizes important information, or provides a reference to related information.



Caution

A caution alerts you to potential damage to hardware, firmware, software, or data.



Warning

A warning alerts you to potential danger to personnel.

Special Term Uses

The following table presents Fabric Manager-specific terms and provides descriptions of each.

Term	Description
baseline	The configuration (from a file or on a switch) to which you compare other configurations or that you download to one or more switches.
direct connect remove	An event in which you remove all ISLs between two switches.
discovery	The process you perform to begin to monitor elements with Fabric Manager.
export	Saving content to a file to distribute settings to other users.
file log	The file to which Fabric Manager stores log information. This log is not the log that appears when you click the Open FM Log icon.
import	Opening the contents of a file to add settings from other users.
launch switch	The switch that uses the IP address that you type into the Address field when you discover a fabric. The name of the fabric matches the name of the launch switch, unless you change the fabric name.
logical group	A collection of switches or ports that you designate to monitor or maintain as a unit.
pane	A subwindow that appears in Detail view and Summary view.
stamp	A snapshot of the ISL topology of a fabric.
timeout	When a fabric does not stabilize within the amount of time that you configure during a sequenced reboot.
view	A Fabric Manager display.

For definitions of SAN-specific terms, visit the Storage Networking Industry Association online dictionary at <http://www.snia.org/education/dictionary>.

Additional Information

This section lists additional Brocade and industry-specific documentation that you might find helpful.

Brocade Resources

Fabric OS and SilkWorm documentation is provided on the Brocade Documentation CD-ROM and on the Brocade web site, through Brocade Connect.

For practical discussions about SAN design, implementation, and maintenance, you can obtain *Building SANs with Brocade Fabric Switches* through:

<http://www.amazon.com>

For additional Brocade documentation, visit the Brocade SAN Info Center and click the Resource Library location:

<http://www.brocade.com>

Release notes are bundled with the Fabric OS.

Other Industry Resources

For additional resource information, visit the Technical Committee T11 Web site. This Web site provides interface standards for high-performance and mass storage applications for fibre channel, storage management, as well as other applications:

<http://www.t11.org>

For information about the Fibre Channel industry, visit the Fibre Channel Industry Association Web site:

<http://www.fibrechannel.org>

Getting Technical Help

Contact your switch support supplier for hardware, firmware, and software support, including product repairs and part ordering. To expedite your call, have the following information available:

1. General Information

- Technical Support contract number, if applicable
- Switch model
- Switch operating system version
- Error messages received
- **supportshow** command output
- Detailed description of the problem and specific questions
- Description of any troubleshooting steps already performed and results

2. Switch Serial Number

The switch serial number and corresponding bar code are provided on the serial number label, as shown.:



The serial number label is located as follows:

- *SilkWorm 2000-series switches*: bottom of chassis
- *SilkWorm 3200 and 3800 switches*: back of chassis
- *SilkWorm 3250 and 3850 switches*: back (nonport side)
- *SilkWorm 3900 switches*: bottom of chassis
- *SilkWorm 6400 and 12000 switches*: inside front of chassis
- *SilkWorm 24000*: inside the front of the chassis, on the wall to the left of the ports.

3. World Wide Name (WWN)

- *SilkWorm 3900 and 12000 switches*: Provide the license ID. Use the **licenseidshow** command to display the license ID.
- *All other SilkWorm switches*: Provide the switch WWN. Use the **wwn** command to display the switch WWN.

Document Feedback

Because quality is our first concern at Brocade, we have made every effort to ensure the accuracy and completeness of this document. However, if you find an error or an omission, or you think that a topic needs further development, we want to hear from you. Forward your feedback to documentation@brocade.com. Provide the title and version number and as much detail as possible about your issue, including the topic heading and page number and your suggestions for improvement

About Fabric Manager

This chapter includes the following sections:

- “Introduction,” next
- “Basic GUI” on page 1-2
- “Standard Fabric Manager Icons and Panes” on page 1-3
- “Data Storage” on page 1-5
- “System Requirements” on page 1-7

Introduction

Fabric Manager lets you manage your storage area networks (SAN) from a single user interface. With this software, you can configure any aspect of your SAN. Fabric Manager encompasses multiple fabrics, all switch types, and all firmware versions.

Fabric Manager provides high-level information about all switches in the fabric, launching the Advanced Web Tools application when more detailed information is required. The Advanced Web Tools launch is transparent, providing a seamless user interface.

Use Fabric Manager to configure multiple switches simultaneously from one location., view the status of multiple devices in one window, and perform SAN-level maintenance without accessing switch after switch.



Note

All switches in the fabric are represented in the main window of Fabric Manager, but only those with an Advanced Web Tools license can be managed through Fabric Manager.

Fabric OS supports a maximum of five simultaneous HTTP sessions to any one switch. HTTP sessions are leveraged by every copy of Fabric Manager and Advanced Web Tools that is monitoring any one switch.

The Fabric Manager graphical user interface (GUI) uses icons and menus to help you more quickly and easily administer your SANs. This chapter identifies many of the visual elements that you see when you open Fabric Manager. This chapter focuses on icons that appear in the Summary view. Specific chapters and appendices in this manual address icons and menus that appear in other views. For more detailed information, refer to “[Summary View](#)” on page C-12.

Basic GUI

The basic Fabric Manager GUI includes standard menus and tabs, as well as custom icons and windows. [Figure 1-1](#) shows the basic Fabric Manager interface.

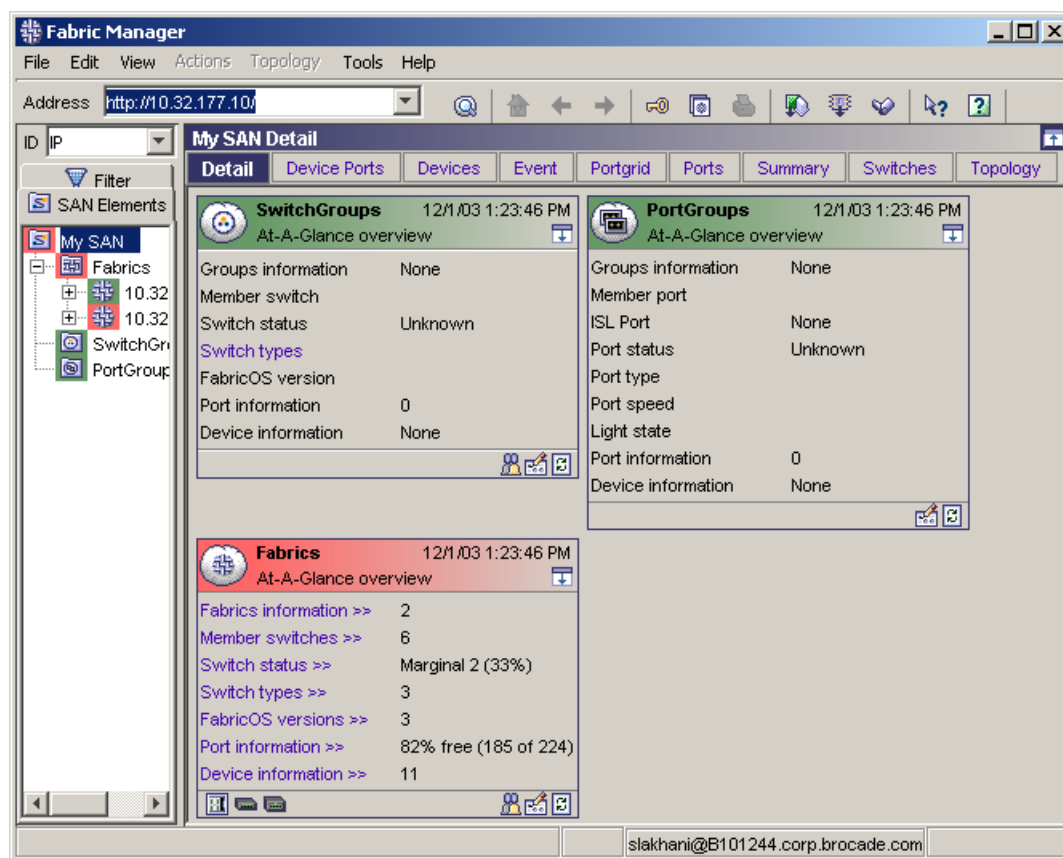


Figure 1-1 Fabric Manager GUI in Summary View

For information on the menus that appear in the interface, refer to the appropriate appendix. This manual explains each menu and all nested elements in separate appendices.

This chapter describes the following GUI elements:

- **Address** field
- icons and panes
- **ID** menu
- **SAN Elements** tab
- **Filter** tab

Address Field

Use the **Address** field to discover a new fabric. The **Address** field has a menu of the fabrics that you have discovered and lets you enter the IP address or switch name of new switches and fabrics that you want to monitor.

Standard Fabric Manager Icons and Panes

Standard icons appear in the Fabric Manager display; different panes appear in the display when you use the Summary view or the Detail view. [Table 1-1](#) lists and describes standard Fabric Manager icons. Additional icons appear in certain views; you can find descriptions of those icons in the appropriate View menu appendix.

Table 1-1 Standard Icons













Name	Icon	Description
Subnet scan icon		Opens the Subnet scan dialog to help you discover fabrics. For more information, refer to “Running a Subnet Scan (Fabric Scan)” on page 3-2 .
Home icon		Returns to the view that appeared when you opened Fabric Manager.
Previous icon		Returns to the previous view in the navigation history (if applicable). If you press the Previous icon for more than half a second, a menu showing the previous 10 views displays. You can select one of the views or select cancel.
Next icon		Moves forward to the next view in the navigation history (if applicable). If you press the Next icon for more than half a second, a menu showing the previous 10 views displays. You can select one of the views or select cancel.
Fabric login icon		Opens the Fabric login window so you can log in to one or more switches. For more information, refer to “Logging In to Multiple Switches Simultaneously” on page 3-6 .
Open FM Log icon		Opens the Fabric Manager log for support purposes.

Table 1-1 Standard Icons (Continued)

Name	Icon	Description
Print View icon		Prints the contents of the view. You cannot access this option in all views. You can click this icon when you open any of the following views: <ul style="list-style-type: none"> • Devices • Event • Portgrid • Ports • Switches • Topology You cannot click this icon when you open any of the following views: <ul style="list-style-type: none"> • Detail • Summary
Firmware download to HBAs icon		Opens the Firmware download to HBAs window . For more information, refer to “Downloading Firmware to an HBA” on page 17-2 .
Firmware download to switches icon		Opens the Firmware download to switches window . For more information, refer to “Downloading Firmware” on page 10-1 .
Sequenced reboot icon		Opens the Sequenced reboot window . For more information, refer to “Sequenced Reboot” on page 16-1 .
Context Help icon		Changes your pointer to the help pointer. Click an element of the GUI for context-sensitive help.
Help icon		Opens Fabric Manager Help .

Panes appear in the Summary view and the Detail view to display information about elements in the **SAN Elements** tab. [Figure 1-2](#) displays a pane in the Summary view.

**Figure 1-2** Example Fabric Manager Pane

Panes contain content and icons that you can use to monitor and configure your SAN. For more information, refer to [“Detail View” on page C-1](#) and [“Summary View” on page C-12](#).

ID Menu

The **ID** menu allows you to customize how you view your switches and fabrics. For instructions on selecting identities with the ID field, refer to [“Selecting Identity” on page 3-7](#).

SAN Elements Tab

The **SAN Elements** tab displays the various elements that you monitor with Fabric Manager. As you use Fabric Manager, you repeatedly select items from the **SAN Elements** tab to configure and monitor.

When an element that Fabric Manager monitors changes status, the element changes color in the **SAN Elements** tab, as do its parent elements.



Note

Port status does not affect switch status color.

When an item in your **SAN Elements** tab changes color, the change does not necessarily represent the failure of an entire fabric or switch. Expand the navigation tree to identify the source of the status change.

Filter Tab

The **Filter** tab lets you view elements that include a particular alphanumeric string. For instance, if you name all switches for your Accounting team “acctx,” where *x* is a number, you can view just your accounting switches if you select **name** from the menu, type **acct** in the text field, and click **Enter**. The **Filter** tab displays every switch that has “acct” in its name.

You can filter elements by the following attributes:

- IP
- Name
- Switch Type
- Version
- WWN
- Domain ID

Data Storage

Fabric Manager requires that you log in to use the software, and it stores user-specific settings for each user.

Fabric Manager stores user settings when you exit, *not while you run the software*. Some persistent settings reside on the server and others reside on the client. If the client cannot access the server at exit, Fabric Manager alerts you that your settings will not persist.

When the client attempts to log in to the server, the server authenticates the client login. After the server authenticates the client, Fabric Manager launches and polls switches.

The following sections discuss which data and files are persisted through log ins.

Persistent Data

Fabric Manager stores the following user settings locally:

- user name
- host name/server IP address of all servers you have successfully accessed
- port numbers
- browser path to launch Advanced Web Tools
- dimensions of the Fabric Manager window
- Fabric Manager log directory path
- group definitions
- discovered fabrics
- UI settings (view customizations, topology locations, and so on.)
- switch user names and passwords

Persistent Files

Prior to Fabric Manager v4.0, two files stored user information locally. [Table 1-2](#) lists and describes those files.

Table 1-2 Original Fabric Manager Persistent Files

File	Contents
FabricManager.properties	Stores UI settings and configurable parameters.
FabricManager.xml	Stores discovered fabrics and group definitions.

To adapt to the client-server architecture of Fabric Manager v4.0 (and later), some of the content of the FabricManager.properties file now appears in a FabricManagerUser.properties file that resides on the server. [Table 1-3](#) lists and describes the files that store user settings.

Table 1-3 Current Fabric Manager Persistent Files

File	Location	Contents
FabricManager.properties	client	Stores Fabric Manager host name/IP addresses and ports, user name, browser path, Fabric Manager window dimensions, and “x” and “y” coordinates.
FabricManager.xml	server	Stores discovered fabrics and group definitions.
LocationTable	server	Stores “x” and “y” locations for topology nodes in Topology view.
FabricManagerUser.properties	server	Stores user interface settings such as known fabrics, file transfer settings, and default layout and link styles for the Topology view.
SwitchInfo.txt	server	Stores switch login information with passwords encrypted.

System Requirements

Fabric Manager v4.1.1 supports the following switches:

- 2000-series switches
- 3000-series switches
- 12000 switch
- 24000 director

For the following Fabric Manager functions to function, TCP/UDP port numbers 111 (rpc mapping) and 600-1023 must not be blocked by a network firewall or proxy server:

- Set Time
- Security
- FDMI

For the firmware download feature to function, ports 20 and 21 must be free.

You must enable HTTP protocol on every switch that you want to discover, monitor, and configure with Fabric Manager. In addition, for the following Fabric Manager features to run, you must enable HTTP on your SAN:

- firmware download
- sequenced reboot
- port name change on switch
- license management
- configuration handling

- multifabric administration
- topology/ISL monitoring

Some Fabric Manager features run only on particular firmware versions. [Table 1-4](#) lists the features that only run on particular versions and the versions on which they run.

Table 1-4 Firmware-Specific Features

Feature	Firmware Version(s)
port name change on a switch	3.1.0, 4.1.0 +
topology/ISL monitoring	2.6.0, 3.0, 3.1.0, 4.0, 4.1.0 +
security	2.6.X, 3.1.0, 4.1.0 +
port swapping	4.1.0 +
FDMI/ HBA Firmware Download	3.1.0, 4.1.0 +

Fabric Manager Client

The Fabric Manager client accesses switches under management through an Ethernet connection. If your client and server are on different machines, you must ensure that both machines (client and server) have access to the switches.

Fabric Manager client runs on the following operating systems:

- Windows 2000
- Windows 2003
- Windows NT 4.0
- Windows XP
- Solaris 2.7
- Solaris 2.8
- Solaris 9



Note

Advanced Web Tools requires a Java Plug-in. Refer to the Web Tools documentation to find the Java Plug-in that you need.

Fabric Manager Server

Fabric Manager Server is used for:

- User authentication.
- Data Persistence.
- Call Home.

Fabric Manager server runs on the following operating systems:

- Windows 2000
- Windows 2003
- Windows XP
- Solaris 2.8
- Solaris 9

Each Fabric Manager server can support up to five Fabric Manager clients.

Installing Fabric Manager

This chapter includes the following sections:

- “Introduction,” next
- [“Installing Fabric Manager” on page 2-1](#)
- [“Launching Fabric Manager for the First Time” on page 2-9](#)
- [“Registering Fabric Manager” on page 2-9](#)
- [“Uninstalling Fabric Manager” on page 2-9](#)

Introduction

This chapter describes how to install the Fabric Manager client and server software on the supported operating systems. Choose from the following types of installation:

- [“Full Version”](#)
- [“Evaluation Version”](#)

Fabric Manager gives you the option of installing the following:

- Fabric Manager Server and Client
- Fabric Manager Server only
- Fabric Manager Client only

Installing Fabric Manager

When you install Fabric Manager over an existing version on a Windows system, the installer will automatically find the existing serial number and license key and attempt to validate them. If the serial number and license key are valid, the installer will skip the version selection panel and go directly to the install set panel. The serial number and license key are saved. If the serial number and license key are not valid, you must re-enter the serial number and license key to install the full version of Fabric Manager.

When you install Fabric Manager over an existing version on a UNIX system, the installer will prompt you to select the location where the existing version of Fabric Manager is installed. Then the installer will find the existing serial number and license key, and attempt to validate them. If the serial number and license key are valid, the installer will skip the version selection panel and go directly to the install set panel. The serial number and license key are saved. If the serial number and license key are not valid, you must re-enter the serial number and license key to install the full version of Fabric Manager.

**Note**

If you currently have only Fabric Manager Server v4.0.x (or earlier) installed and you are upgrading to Fabric Manager v4.1.0 (server only, client only, or server and client) or later, the installer prompts you to re-enter the license key and serial number.

Full Version

A valid serial number and license key are required for a full installation.

Evaluation Version

Fabric Manager offers an evaluation version that you can use for up to 60 days. You do not need to provide a serial number or license key to use the evaluation version; however you must accept the license agreement displayed during the installation.

Every time you launch Fabric Manager, a warning message displays, notifying you when the evaluation installation will expire and giving you the option to register Fabric Manager or continue with the evaluation version (see [Figure 2-1](#)).

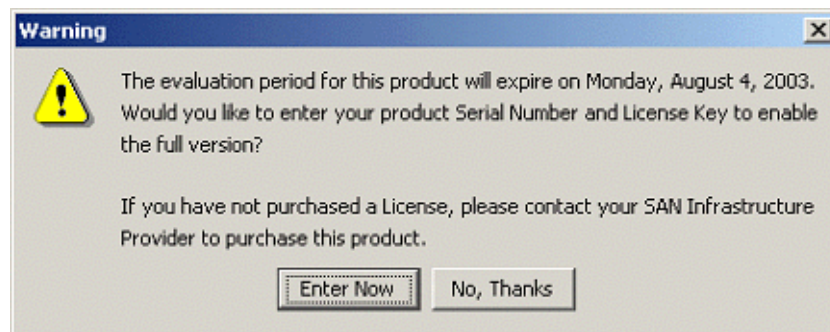


Figure 2-1 Fabric Manager Evaluation Installation Version Warning

After the sixtieth day, the evaluation version expires and an error message is displayed when you launch the trial version of Fabric Manager (see [Figure 2-2](#)).

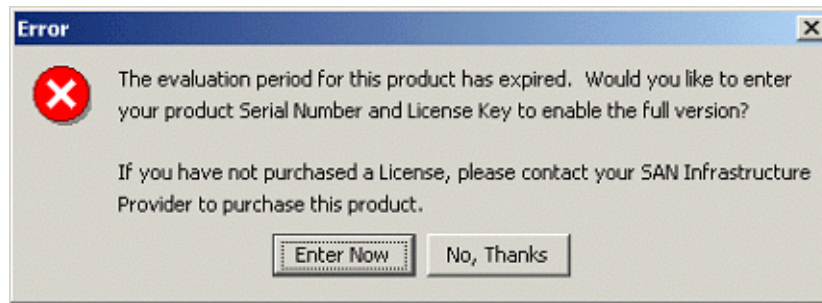


Figure 2-2 Fabric Manager Evaluation Installation Version Expiration Error

You have the option of registering the software to make it a full version or discontinue use of Fabric Manager.

Any time before the 60 days are up, you can convert your evaluation version to a full version by registering Fabric Manager. You can register Fabric Manager in any of the following ways:

- Click **Enter Now** from the warning message that displays when you launch Fabric Manager every time during the 60 day evaluation period (see [Figure 2-1](#)). You will need to enter your serial number and license key.
- Click **Enter Now** from the error message that displays when you launch Fabric Manager after the 60 day evaluation period is up (see [Figure 2-2](#)). You will need to enter your serial number and license key.
- Select **Register** from the Help menu in Fabric Manager. For detailed instructions, refer to [“Registering Fabric Manager” on page 2-9](#).

Installing the Client and Server Together



Note

In a Windows environment, if the server workstation is not a member of the specified domain, Fabric Manager authentication will succeed for *any* user credentials (if the guest account on the workstation is enabled).

To ensure that the security of your Fabric Manager Server is not compromised, ensure that your Windows guest user permissions are disabled and that your Fabric Manager server workstation is a member of the domain you specify during the Fabric Manager server installation. For instructions on disabling your Windows guest user permissions, refer to your Windows documentation.

To install the Fabric Manager server and client at the same time, perform the following steps:

1. *Windows:* Double-click the **Windows** folder from the Fabric Manager Installation CD-ROM.
Solaris: Click **install.bin** from the File Manager window that displays when you insert the Fabric Manager Installation CD-ROM.
2. Double-click the **Install** icon. The **InstallAnywhere** dialog runs; then, the Fabric Manager installation wizard displays.

3. Select the version you would like to install (Evaluation or Full) and click **Next**. The **User Input** screen displays.



Note

A valid serial number and license key are required for a full installation. You cannot continue the full installation process without a valid serial number and license key.

4. Enter a valid serial number and license key; then click **Next**. You are prompted to wait while Fabric Manager configures your system. The **Choose Install Set** screen displays.
5. Click the **Server and Client** icon; then click **Next**. The **Introduction** screen displays.
6. Read the introduction and click **Next**. The **Important Information** screen displays.
7. Read the important information and click **Next**. The **Select Destination** (for Fabric Manager Client) screen displays.
8. Select a location to install the Fabric Manager client. The default location is *C:\Program Files\Fabric Manager*. Click **Choose** to browse to another location.



Note

Solaris: The installation folder for Fabric Manager client and server should not exceed 59 characters.

Click **Next**. The **Select Destination Folder** (for Fabric Manager Server) screen displays.

9. Select a location to install the Fabric Manager Server. The default location is *C:\FMServer*. Click **Choose** to browse to another location.



Note

Solaris: The installation folder for Fabric Manager client and server should not exceed 59 characters.

Do not include spaces in the directory path for the server.

10. Click **Install**. You will be prompted to wait while Fabric Manager configures your system. The **Please Specify Starting Port Number** screen displays.

Enter a starting port number.



Note

The port number you enter and the next six ports must be free ports. If you do not enter a free port number, the server cannot start up correctly.

Make note of the port number that you enter. When you install clients to access this server, you must use the same port number during the client installation.

11. Click **Next**. You are prompted to wait while Fabric Manager configures your system. The **Configure Mail Server Options** screen displays.

12. Enter the name of the SMTP/mail server that the Fabric Manager server will send the Call Home Email notifications to in the **Mail SMTP Host** field.
Enter the Email address from which Call Home notifications will arrive in the **Mail From** field; both are required.
13. Click **Next**.
Windows: The **Please Input Windows Domain Name** screen displays.
Solaris: The **Please Input NIS Hostname and Domain Name** screen displays.
14. *Windows:* Enter your Windows domain name.
Solaris: Enter your NIS hostname or IP address and domain name for the Fabric Manager server user authentication. If you do not specify an NIS server host name or IP address, and no NIS server exists on the same subnet as the Fabric Manager server, then all authentication requests to that server will fail.

The valid domain names

- Include no more than 67 characters (including *.com*, *.net*, *.org* at the end).
- Include only alphanumeric values and dashes (-); spaces and other characters are not permitted.
- Cannot begin or end with a dash (-).



Note

In a Windows environment, if the server workstation is not a member of the specified domain, Fabric Manager authentication will succeed for *any* user credentials (if the guest account on the workstation is enabled).

To ensure that the security of your Fabric Manager Server is not compromised, ensure that your Windows guest user permissions are disabled and that your Fabric Manager server workstation is a member of the domain you specify during the Fabric Manager server installation. For instructions on disabling your Windows guest user permissions, refer to your Windows documentation.

15. Click **Next**. The **Important Information** screen displays.
16. Read the information and click **Next**.
The **Configure Client Options** screen displays.
17. Enter a Server IP Address, and click **Next**.
The **Install Complete Screen** displays, and the installation is complete.

Installing Fabric Manager Server

To install the Fabric Manager server, perform the following steps:

1. *Windows:* Double-click the **Windows** folder from the Fabric Manager Installation CD-ROM.
Solaris: Click **install.bin** from the File Manager window that displays when you insert the Fabric Manager Installation CD-ROM.
2. Double-click the **Install** icon. The **InstallAnywhere** dialog runs; then, the **Fabric Manager** installation wizard displays.

3. Select the version you would like to install (Evaluation or Full) and click **Next**.



Note

A valid serial number and license key are required for a full installation. You cannot continue the full installation process without a valid serial number and license key.

4. Enter a valid serial number and license key; then click **Next**.
You are prompted to wait while Fabric Manager configures your system. The **Choose Install Set** screen displays.
5. Click the **Server** icon; then click **Next**.
The **Introduction** screen displays.
6. Read the Introduction information, then click **Next**.
The **Select Destination Folder** screen displays.
7. Select a location to install the Fabric Manager Server. The default location is *C:\FMServer*. Click **Choose** to browse to another location.



Note

Solaris: The installation folder for Fabric Manager client and server should not exceed 59 characters.

Do not include spaces in the directory path for the server.

Click **Install**. You are prompted to wait while Fabric Manager configures your system. The **Please Specify Starting Port Number** screen displays.

8. Enter a starting port number.



Note

The port number you enter and the next six ports must be free ports. If you do not enter a free port number, the server cannot start up correctly.

Make note of the port number that you enter. When you install clients to access this server, you must use the same port number during the client installation.

Click **Next**. You are prompted to wait while Fabric Manager configures your system. The **Configure Mail Server Options** screen displays.

9. Enter the SMTP/mail server that the Fabric Manager server will send the Call Home email notifications to in the **Mail SMTP Host** field and enter the email address from which Call Home notifications will arrive in the **Mail From** field; both are required.
10. Click **Next**.
Windows: The **Please Input Windows Domain Name** screen displays.
Solaris: The **Please Input NIS Hostname and Domain Name** screen displays.

11. *Windows*: Enter your Windows domain name.

Solaris: Enter your NIS hostname or IP address and domain name, for the Fabric Manager server user authentication. If you do not specify an NIS server host name or IP address, and no NIS server exists on the same subnet as the Fabric Manager server, then all authentication requests to that server will fail.

The valid domain names

- Include no more than 67 characters (including *.com*, *.net*, *.org* at the end).
- Include only alphanumeric values and dashes (-); spaces and other characters are not permitted.
- Cannot begin or end with a dash (-).



Note

In a Windows environment, if the server workstation is not a member of the specified domain, Fabric Manager authentication will succeed for *any* user credentials (if the guest account on the workstation is enabled).

To ensure that the security of your Fabric Manager Server is not compromised, ensure that your Windows guest user permissions are disabled and that your Fabric Manager server workstation is a member of the domain you specify during the Fabric Manager server installation. For instructions on disabling your Windows guest user permissions, refer to your Windows documentation.

12. Click **Next**; the **Important Information** screen displays.

13. Read the information and click **Next**.

The **Install Complete** screen displays, and the installation is complete.

Installing Fabric Manager Client



Note

If you are installing FM Client over an existing installation of FM Client (without uninstalling the old version first), you must manually edit the system path to include only one FM client directory.

The installation wizard does not check to see if there is an existing path specified for the FM Client during the installation, and just appends to the system path file, resulting in multiple paths. Although multiple paths do not affect functionality, they could result in other applications being unable to add additional path names since the length of FM Client paths is too lengthy.

To install the Fabric Manager client, perform the following steps:

1. *Windows*: Double-click the **Windows** folder from the Fabric Manager Installation CD-ROM.
Solaris: Click **install.bin** from the File Manager window that displays when you insert the Fabric Manager Installation CD-ROM.
2. Double-click the **Install** icon. The **InstallAnywhere** dialog runs; then the **Fabric Manager** installation wizard displays.

3. Select the version you would like to install (Evaluation or Full) and click **Next**.

**Note**

A valid serial number and license key are required for a full installation. You cannot continue the full installation process without a valid serial number and license key.

4. Enter a valid serial number and license key, then click **Next**.
You will be prompted to wait while Fabric Manager configures your system. The **Choose Install Set** screen displays.
5. Click the client icon and click **Next**.
The **Introduction** screen displays.
6. Read the introduction and click **Next**.
The **Important Information** screen displays.
7. Read the information and click **Next**.
The **Select Destination Folder** screen displays.
8. Select a location to install the Fabric Manager Client. The default location is *C:\Program Files\Fabric Manager*. Click **Choose** to browse to another location.

**Note**

Solaris: The installation folder for Fabric Manager client and server should not exceed 59 characters.

Click **Next** to use the default location, or click **Choose** to browse to another location; then click **Next**.

The **Configure Client Options** screen displays.

9. Enter a server IP address and a server port number. The server IP address you enter will be the default server for the Fabric Manager client. The server port number *must* be the same port number as the starting port number of the Fabric Manager Server.
10. Click **Next**. The **Install Complete** screen displays and the installation is complete.

**Note**

Solaris: log out of your workstation and log in again to access all Fabric Manager features.

Launching Fabric Manager for the First Time

To launch Fabric Manager for the first time, perform the following steps:

1. *Windows:* From the **Start** menu, select **Programs > Fabric Manager > Fabric Manager**.
Solaris: Navigate to the location where you installed Fabric Manager. Run the **startFabricManager** script.

The **Fabric Manager Login** dialog displays. Fabric Manager automatically populates the **Server** and **Port** fields of the dialog with the values that you specified when you installed the application.

2. In the **User name** field, type the user name that you use to log in to the server.



Note

Fabric Manager stores your user name and automatically populates this field when you subsequently launch the software. *User names must be alphanumeric; they can contain only the following special characters: underscore (_), dashes (-), and periods (.).*

3. In the **Password** field, type the password that you use to log in to the server and click **OK**. Fabric Manager launches.

Registering Fabric Manager

During a full installation, Fabric Manager is automatically registered. If you install the evaluation version of Fabric Manager, you need to register Fabric Manager within 60 days of installing. After 60 days, the evaluation version will not be usable until it is registered, which changes it into a full version.

To register Fabric Manager, perform the following steps:

1. Select **Register** from the Help menu.
The **Fabric Manager Registration** window displays.
2. Enter a valid serial number and license key.
3. Click **Enter**. A **Congratulations** dialog displays indicating that you have successfully registered Fabric Manager.
4. Click **OK** in the **Congratulations** dialog.
5. Click **Cancel** to close the **Fabric Manager Registration** window.

Uninstalling Fabric Manager

Windows Operating Systems

1. From the **Start** menu, select **Programs > Fabric Manager > Uninstall Fabric Manager**.
2. Click **Next**.

3. Click the **Complete Uninstall** icon to remove both the Fabric Manager client and server from your machine, or click the **Uninstall Specific Features** icon and proceed as follows:
 - a. Click **Next**.
 - b. *Uncheck* features that you want to uninstall.
 - c. Click **Uninstall**.
4. Click **Done**.

Solaris Operating Systems

1. Navigate to the location where you installed Fabric Manager. From the **Fabric_Manager/UninstallerData** directory, run **Uninstall_FabricManager**.
2. Click **Next**.
3. Click the **Complete Uninstall** icon and click **Next**.
4. Click **Done**.

Common Fabric Manager Tasks

This chapter includes the following sections:

- [“Discovering a Fabric” on page 3-2](#)
- [“Deleting a Fabric” on page 3-3](#)
- [“Renaming a Fabric” on page 3-3](#)
- [“Renaming a Switch” on page 3-4](#)
- [“Renaming a Port” on page 3-4](#)
- [“Viewing SAN Information” on page 3-5](#)
- [“Logging In to Multiple Switches Simultaneously” on page 3-6](#)
- [“Selecting Identity” on page 3-7](#)
- [“Navigating Fabric Manager” on page 3-7](#)
- [“Customizing Tables” on page 3-9](#)
- [“Enabling and Disabling Elements” on page 3-9](#)
- [“Configuring Log Parameters” on page 3-10](#)
- [“Printing” on page 3-12](#)
- [“Downloading a Configuration” on page 3-13](#)
- [“Configuring File Transfer Options” on page 3-14](#)
- [“Synchronizing Time and Date Across a Fabric” on page 3-16](#)
- [“Filtering Elements” on page 3-16](#)
- [“Designating a Switch as a Core Switch” on page 3-17](#)
- [“Identifying Switches with Insistent Domain IDs” on page 3-17](#)
- [“Identifying Ports That Have Completed the RNID Exchange” on page 3-17](#)
- [“Monitoring Link Incidents” on page 3-18](#)
- [“Monitoring Link Performance” on page 3-18](#)
- [“Opening a Telnet Session for a Nonsecure Switch” on page 3-19](#)

Discovering a Fabric

You must *discover* a fabric to add it to the **SAN Elements** tab and administer it with Fabric Manager. To discover a fabric, perform the following steps:

1. Place your cursor in the **Address** field and delete the contents of the field.
2. In the **Address** field, enter the IP address or switch name of a switch in the fabric that you want to administer and press **Enter**. You do not need to include **http://** before the IP address to discover a fabric.

Running a Subnet Scan (Fabric Scan)

Fabric Manager can scan a subnet to discover fabrics. With this discovery mechanism, you do not need to know the exact address of a switch to discover a fabric. When you specify a subnet, Fabric Manager lists the switches and fabrics that it finds so that you can add them to the **SAN Elements** tab.



Note

Switches might appear in your subnet scan even after you unplug the Ethernet cables of those switches.

To run a subnet scan, perform the following steps:

1. From the **Tools** menu, select **Subnet scan...** The **Subnet scan** dialog opens.
2. Enter the first three sets of digits of an IP address in the first three sections of the **IP Address Range** field.

Example

The screenshot shows a dialog box titled "Subnet scan". It has two input fields: "IP Address Range" and "Subnet Mask". The "IP Address Range" field contains the text "10. 255. 255. *". The "Subnet Mask" field contains the text "255. 255. 255. 0". Below these fields are three buttons: "Scan", "Cancel", and "Help".

3. Enter a wildcard in the last section of the **IP Address Range** field to represent the range of scan. Choose from one of the following three options:
 - a. **192.168.168.*** discovers any fabric in the address range of 192.168.168.0 - 192.168.168.255.
 - b. **192.168.168.1**** discovers any fabric in the address range of 192.168.168.100 - 192.168.168.199. (The first digit in the wildcard cannot exceed a value of 2; see Note.)
 - c. **192.168.168.11*** discovers any fabric in the address range of 192.168.168.110 - 192.168.168.119. (See Note.)



Note

The number before the "*" can be any number so long as the resulting range is greater than 0 and less than 255. For example, you cannot enter 192.168.168.3** or 192.168.168.26*. Also, if you enter 192.168.168.25*, the range is 192.168.168.250 - 192.168.168.255.

4. Click **Scan**. The scan result appears. IP addresses that appear as underlined links with two angle brackets (>>) represent fabrics. Click the link to view the switches in the fabric.

**Note**

To add a switch or fabric to your **SAN Elements** tab, check the checkbox next to the element; then, click the **Add** button.

Deleting a Fabric

To no longer monitor a fabric with Fabric Manager, perform the following steps:

1. In the **SAN Elements** tab, click the fabric that you want to remove from Fabric Manager.
2. Press the **Delete** key to remove the fabric. Fabric Manager prompts you to make sure that you want to delete the fabric.

You can also select **Delete** from the **Actions** menu to remove the selected fabric from Fabric Manager.

**Note**

The fabric's deleted switches and ports that you added to logical switchgroups and portgroups still appear in those groups.

Renaming a Fabric

When you discover a fabric, Fabric Manager assigns a name to that fabric that matches the name of the switch that you used to discover the fabric. For instance, to monitor a fabric that includes Switch_01, enter the IP address of Switch_01 in the Address field to discover the fabric. Fabric Manager then names that fabric Switch_01 and displays that name in the **SAN Elements** tab.

After you discover the fabric, you can assign a name to the fabric that serves a more useful purpose for you (for instance, "mktng_SAN" or "HQ").

**Note**

Fabric names are local on Fabric Manager and must be changed individually on all clients.

To rename a fabric:

1. In the **SAN Elements** tab, click the fabric that you want to rename.
2. From the **Edit** menu, select **Rename**. A cursor appears to the right of the current name.
You can also use the F2 key or triple-click a fabric, switch, or port icon to rename it.
3. Rename the fabric and press **Enter**.

Renaming a Switch



Note

Switch names are changed in Fabric Manager and on the switch.

To rename a switch:

1. In the **SAN Elements** tab, click the switch that you want to rename. You must be logged in to that switch.
2. From the **Edit** menu, select **Rename**. A cursor appears next to the name of the switch in the **SAN Elements** tab.
3. Edit the name of the switch and press **Enter**.

Tip: You can also use the F2 key or triple-click a fabric, switch, or port icon to rename it.

Renaming a Port



Note

When you rename a port on a switch that runs firmware versions other than 3.1.0 (and higher) or 4.1.0 (and higher), the port name applies only to your local Fabric Manager view. If you rename a port on a switch that runs firmware versions 3.1.0 (and higher) or 4.1.0 (and higher), Fabric Manager propagates that name to the port and changes the port name on the switch, provided the Fabric Login information has been set up successfully. For all other versions of firmware, port names are local on the Fabric Manager Clients and must be changed individually on each.

To rename a port:

1. In the **SAN Elements** tab, click the port that you want to rename.
2. From the **Edit** menu, select **Rename**. A cursor appears next to the name of the switch in the **SAN Elements** tab.
3. Edit the name of the port and press **Enter**.

Tip: You can also use the F2 key or triple-click a fabric, switch, or port icon to rename it.

Viewing SAN Information

To view information about a particular element of your SAN, *click the element immediately above it in the hierarchy*. When you click the “parent” element, information about the “child” element that you want to view appears in the right-hand view window.

When you click an element in the **SAN Elements** tab, Fabric Manager displays information about all immediately-subordinate elements in the hierarchy. For instance, if you click My SAN in Summary view, Fabric Manager displays summaries for Fabrics, SwitchGroups, and PortGroups. If you click a particular fabric in the hierarchy, Fabric Manager displays information on each switch in the fabric. If you click a particular group, Fabric Manager displays information on each member of the group.

Each view in the View menu displays different informational content, and you can customize which content appears. (For more information on how to customize views, refer to [“Customizing a View” on page 3-5.](#))

Customizing a View

Customize a view so that each time you select that view, it displays only the information that you want to see. To customize a view, perform the following steps:

1. Click an element in the **SAN Elements** tab.
2. From the **View** menu, select the view that you want to customize.
3. From the **Edit** menu, select **View Options...** The **Edit View Options** window appears.
4. Click an item, then click the appropriate directional arrow to add items to the display or remove items from the display. You can use the **Ctrl** and **Shift** keys to select multiple items at once. In the view display columns, designate the order of the columns as follows:
 - a. Click an item in the Display Items field.
 - b. Click an up or down directional arrow to change the order of the column in the display.
5. Click **OK**.

Changing Pane Descriptions

When you change a pane description, you change the text that appears immediately below the name of the pane. To change a description, perform the following steps:

1. In the **SAN Elements** tab, click the element that you want to change.
2. From the **Edit** menu, select **Change Description**. The **Please enter the new description** dialog appears.
3. In the **New Description** field, enter a description for the pane and click **OK**. To view the description, click the parent element in the **SAN Elements** tab. The new description appears on the appropriate pane.

Logging In to Multiple Switches Simultaneously

You can use Fabric Manager to log in to multiple switches at the same time. With multiple login, you do not need to log in to each switch individually to administer your fabric. After you log in to a switch, Fabric Manager stores your login information and automatically logs you in to the switches. You must log in to a switch to perform the following Fabric Manager tasks:

- firmware download to HBAs and switches

- license key installation
- fabric compare and merge
- date/time synchronization
- baseline configuration upload/download
- sequenced reboot
- security policy configuration
- fabric backup
- diff with backup

To log in to multiple switches, perform the following steps:


1. From the **File** menu, select **Fabric Login...**
2. Select switches or fabrics from the **SAN Elements** tab and click the right arrow to move them to the **Selected Switches** window.



Note

Drag fabrics or switches to quickly move them into the **Selected Switches** window.

3. In the **User Id** field, enter your user ID.
4. In the **Password** field, enter your password.
5. Click **Apply**. The success or failure of the login appears in the **Status** column of the **Selected Switches** window.

A key icon () appears next to each switch and fabric that completes a successful login.

The background of the status field changes colors to display its status as follows:

- **Green.** The login was successful. The user ID and password will be saved for performing admin operations until the session is terminated. When the session is terminated, this user ID and password is persisted to a file on the Fabric Manager Server. The saved information is used for successive Fabric Manager sessions when Admin operations are initiated from Fabric Manager.
- **Red.** The login failed. The user ID and password are not saved in memory.
- **Yellow.** One of the following:
 - The switch login is being applied; the **Status** column text changes to “Testing.”
 - The switch is “Unreachable” in Fabric Manager. When you add this unreachable switch to the **Selected Switches** list, the status text is set to “Unreachable.”



Note

If you did not log in to all of the switches successfully, remove the successful switches from the **Selected Switches** window and retry with a new user ID and password.

Selecting Identity

Fabric Manager lets you view SAN elements by the identifier that you find most useful. Because you can identify most SAN elements in multiple ways (for instance, you can identify a switch by IP address, domain ID, WWN, and name), Fabric Manager lets you choose the identifier that you want. When you select identity, you choose the type of identifier that Fabric Manager displays for each element.

To select identity, select the type of identifier from the **ID** pulldown menu that you want to use to label the elements in your display.

Navigating Fabric Manager


Click elements, menus, views, and navigation buttons to navigate Fabric Manager. As you move from view to view and element to element, Fabric Manager tracks your views so you can use the navigation buttons to move back and forth between the selections that you made from the View menu and view selector. The sections that follow describe the navigation tools that Fabric Manager provides.

Navigating with Elements and Views

To navigate Fabric Manager, you must select different elements and different views. Fabric Manager provides the following two ways to access different views:

1. From the **View** menu, select the view that you want to access.
2. Use the view selector.

To use the view selector, perform the following steps:


1. Click the **Display view selector** icon () in the top right corner of the interface. The view selector displays.



2. In the view selector, click the view that you want to access.



Note

The icon that displays the view selector () serves other functions when it appears in other locations. Only the icon in the top right corner of the interface displays the view selector.




[Table 3-1](#) provides a list of views and explains the information that each displays. For more detailed information about each view, refer to [“View Menu Reference” on page C-1](#).

Table 3-1 Fabric Manager Views

View	Description
Detail	Provides information about the components and status of an element.
Device Ports	Provides a list of device ports attached to a given element in the SAN Elements tab.
Devices	Provides information about all devices that connect to an element.
Event	Provides an event log for the element and the status reason.
Portgrid	Displays the node that connects to each port. The Portgrid View displays devices only; it does not show ISL information.
Ports	Provides information about the status and traits of each port.
Summary	Provides a summarized version of Detail view. Summary view provides the same view options as Detail view. Customize Summary view to display content that you regularly reference. Customize Detail view to provide a more thorough report. For more information, refer to “Customizing a View” on page 3-5 .
Switches	Provides information about the status and traits of each switch.
Topology	Provides a graphical display of topology.

Navigating with Navigation Buttons and History

Fabric Manager maintains a history of the views that you visit. Use the navigation buttons to move forward and backward through views that you have already accessed. Use navigation buttons as follows:

- Click the **Back** button () to return to the previous view.
Click-and-hold the **Back** button to display a list of the views that you have visited, then drag the mouse to the view you want to see and release the mouse button.
- Click the **Forward** button () to move forward to the next view in your view history.
Click-and-hold the **Forward** button to display a list of the views that you have visited, then drag the mouse to the view you want to see and release the mouse button.
- Click the **Home** button () to display the view that appeared when you launched Fabric Manager.

Customizing Tables

With Fabric Manager you can change the order and size of columns that appear in views such as Portgrid and Switches. With customizable tables, you can do the following:

- Click-and-drag table headers to change the order in which columns appear in the table.
- Click-and-drag the border between column headers to resize columns.
- Click column headers to organize information in ascending or descending order by that column.

The **Status** column in Portgrid view and Switches view sorts contents by severity when you click the column header.

Copying Tables to Spreadsheet Applications

Fabric Manager tables migrate quickly and easily to spreadsheet applications. To copy a table to a spreadsheet application, perform the following steps:

1. Navigate to a view that displays a table.
2. From the **Edit** menu, select **Copy Table**.
3. Open a spreadsheet application.
4. From the **Edit** menu, select **Paste**.

Enabling and Disabling Elements

You can use Fabric Manager to quickly disable or enable large numbers of switches or ports across multiple switches or fabrics. To enable or disable elements, perform the following steps:

1. Verify that you have logged-in to all necessary switches. You cannot enable or disable a port or switch until you log in to that switch. For more information on how to log in, refer to [“Logging In to Multiple Switches Simultaneously” on page 3-6](#).
2. From the **SAN Elements** tab, select the switches, ports, or groups that you want to disable.
3. From the **Actions** menu, select **Disable/Enable...** and click the appropriate option.



Note

The results of selecting the switch enable/disable menu item depends on switch status; for example, when the switch is disabled, only switch enable menu item is enabled and, the switch disable menu item is greyed out, and vice versa. For telnet, switch enable/disable commands can be executed regardless of switch status.

Configuring Log Parameters

Configure log parameters to set the file log path and priority levels for Fabric Manager log information. When you configure the level of each log, you designate what errors Fabric Managers saves to the file log and what errors appear when you open the Fabric Manager log. Changes made to logging paths and log levels are dynamic and do not require an application restart to take effect.

To configure log parameters, perform the following steps:

1. From the **File** menu, select **Options...** The **Options** window opens.
2. From the **Configurations** navigation tree, click **Log Parameters**.
3. In the **Log Directory Path** field, enter a directory or click **Browse** to select a directory to store the log directory.
4. From the **FabricManager Log Level** pulldown menu, select a severity level. Fabric Manager will log all events of that severity level and lower.
5. From the **File Log Level** pulldown menu, select a severity level. Fabric Manager will log all events of that severity level and lower.
6. Click **OK**.

Fabric Manager Log Parameters

You can set the following log parameters for the Fabric Manager log:

- Log Directory Path
- Fabric Manager Log Level
- File Log Level



Caution

Do not change log parameters unless support personnel instruct you to do so.

Logging Path

The logging path is the root path that the logger uses to create the log sub-directory.

The following levels are available for the Fabric Manager Log Level and the File Log Level:

- Debug (not typically used by end users, and only available at the File Log Level)
- Warning
- Error
- Info
- None

Setting the Log Directory Path

To set the log directory path, perform the following steps:

1. Select **Options** from the File menu.
The **Options** window displays.
2. Select **Log Parameters** from the left pane.
3. Click **Browse** to locate and select a log directory path.

Setting the Fabric Manager Log Level

To set the Fabric Manager log level, perform the following steps:

1. Select **Options** from the File menu.
The **Options** window displays.
2. Select **Log Parameters** from the left pane.
3. Select a level from the **Fabric Manager Log Level** menu. The options are:
 - Warning
 - Error
 - Info
 - None



Note

Selecting None disables the logger.

4. Click **OK** to apply the settings.

Setting the File Log Level

To set the file log level, perform the following steps:

1. Select **Options** from the File menu.
The **Options** window displays.
2. Select **Log Parameters** from the left pane.
3. Select a level from the **File Log Level** menu. Fabric Manager will log all events of that severity level and lower.
The options are:
 - Debug
 - Warning
 - Error
 - Info
 - None



Note

Selecting None disables the logger.

4. Click **OK** to apply the settings.

Printing

Fabric Manager can print the following views:

- Devices

- Event
- Portgrid
- Ports
- Switches
- Topology

To print a view, perform the following steps:

1. From the **View** menu, select a view that Fabric Manager can print.
2. From the **File** menu, select **Print...** The Print dialog opens.
3. Select a printer and click **OK**.

Printing in One Page

From the Topology view, you can from in one page.

To print a view in one page, perform the following steps:

1. From the **View** menu, select a view that Fabric Manager can print.
2. From the **File** menu, select **Print In One Page...** The Print dialog opens.
3. Select a printer and click **OK**.

Downloading a Configuration

With Fabric Manager, you have the opportunity to download a configuration from a saved baseline file or from a switch. During the download process, you can selectively choose the settings that you want to download and the settings that you want to omit. For instructions on saving a baseline configuration to a file, refer to [“Saving a Baseline Configuration to a File” on page 14-2](#).

Downloading to Switches from a Baseline File

To download a baseline file to one or more switches, perform the following steps:

1. From the **Tools** menu, select **Config > Compare/Download from File**. The **Compare/Download from File -- Select Baseline Configuration** dialog opens.
2. Navigate to the baseline file and click **Open**. The **Compare/Download from File -- Target Switch Selection** window opens.

3. From the **SAN Elements** tab, select switches you want to compare and move them to the right-hand window and click **OK**. You can
 - Navigate to a switch, click the switch, then click the right-pointing arrow.
 - Click-and-drag a switch from the **SAN Elements** tab to the right-hand window.
 - Press-and-hold **Ctrl**, click multiple switches in the **SAN Elements** tab, and click the right-pointing arrow.
 - Press-and-hold **Ctrl**, click multiple switches, and click-and-drag the switches from the **SAN Elements** tab to the right-hand window.
 - Click-and-drag a fabric to the right-hand window to move add all of the switches in that fabric to the window.

The **Compare/Download from File -- Switch Configuration comparison and Download** window opens.

4. Click **Apply Baseline...**



Note

The delay timer at the bottom of the **Apply Baseline...** dialog cannot be configured from this dialog. It is propagated from current settings in the sequenced reboot group and represented by the combination of “Fabric Stabilization timeout” and “Delay after Fabric Stabilization” parameters.

Prompts display to ensure that you do not accidentally download a configuration.

The **Apply Baseline** window opens. The **root** navigation tree divides the switches into the following two groups:

- Non-Reboot Config Group: these switches are Linux-based and do not need to reboot after a config download.
 - Reboot Config Group: these switches are VXWorks-based and must reboot after a config download.
5. Click **Apply**. Fabric Manager will prompt you to be sure that you want to proceed. The download proceeds one group at a time. The status of the switches appears in the right-hand window.

Downloading to Switches from a Baseline Switch

To download a configuration from a baseline switch to one or more switches, perform the following steps:

1. From the **Tools** menu, select **Config > Compare/Download from Switch**. The **Compare/Download from Switch -- Source Configuration Selection** window opens.
2. Navigate to the switch that you want to use as a baseline and click the right-pointing arrow to move that switch to the right-hand window.
3. Click **OK**. The **Compare/Download from Switch -- Target Switch Selection** window opens.

4. From the **SAN Elements** tab, select switches you want to compare and move them to the right-hand window. You can
 - Navigate to a switch, click the switch, then click the right-pointing arrow.
 - Click-and-drag a switch from the **SAN Elements** tab to the right-hand window.
 - Press-and-hold **Ctrl**, click multiple switches in the **SAN Elements** tab, and click the right-pointing arrow.
 - Press-and-hold **Ctrl**, click multiple switches, and click-and-drag the switches from the **SAN Elements** tab to the right-hand window.
 - Click-and-drag a fabric to the right-hand window to move add all of the switches in that fabric to the window.
5. Click **Apply Baseline...**

Configuring File Transfer Options

You must set up file transfer options before you can transfer files from a host IP to a remote IP using File Transfer Protocol (FTP).

To configure file transfer options, perform the following steps:

1. From the **File** menu, select **Options...** The **Options** window opens. The **Options** window is displayed in [Figure 3-1](#).

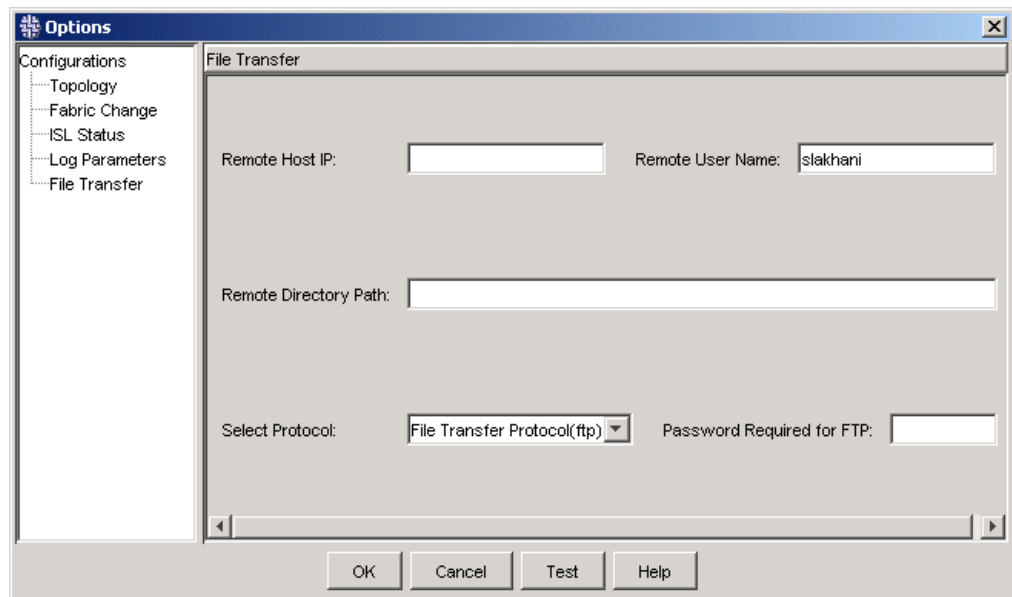


Figure 3-1 Options Window

2. The default view in the Options window is the File Transfer view. If the File Transfer view is not displayed, select File Transfer from the Configurations navigation tree. The **Configurations** navigation tree is displayed in [Figure 3-2](#).

**Figure 3-2** Options Window Configurations Tree

3. In the **Remote Host IP field**, enter the IP address of your FTP server.
4. In the **Remote User Name field**, enter your login name.
5. In the **Remote Directory Path field**, enter a default FTP directory. Do not enter a file name, only a directory.
6. From the Select Protocol pulldown menu, select **File Transfer Protocol(ftp)**.
7. In the **Password Required for FTP field**, enter your password.
8. Click **Test** to ensure that you can access the FTP server specified. Fabric Manager will report success or failure. The test must be successful in order for certain features to work (for example, Config download, merge check, etc.).

In addition to validating connectivity to the FTP server, the Test button writes a temporary file to the specified FTP directory. In order for the test to complete successfully,

- write permissions must be set up properly on the specified directory of the FTP server
- ports 20 and 21 must be open between the Fabric Manager client, the FTP Server, and the switch.

9. Click **OK** to save settings.

Synchronizing Time and Date Across a Fabric

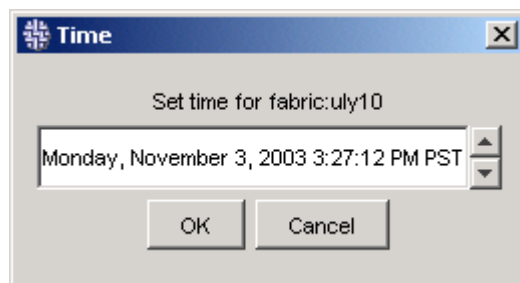
You can synchronize time and date across an entire fabric. Because the firmware timestamps entries in the port log dump, you can more easily correlate events when you synchronize your fabric.

You must be logged in to switches within a fabric when attempting to set the time on that fabric. The type of fabric configuration determines which switches you must be logged in to. If you are not logged in to the appropriate switches, a dialog displays prompting you to log in to the appropriate switches before setting the time.

To synchronize time and date, perform the following steps:

1. Log in to the switches in the fabric that you want to synchronize. For more information, refer to [“Logging In to Multiple Switches Simultaneously” on page 3-6](#). You can select a fabric, but not a switch group.
2. In the **SAN Elements** tab, click the fabric that you want to synchronize.
3. From the **Action** menu, select **Set Time...** The **Time** dialog opens.

Example



4. To adjust the time or date, click the appropriate field in the **Time** dialog and use the up and down arrows to change the value; then click **OK**.

Filtering Elements

The **Filter** tab consists of the following three components:

- a text field
- a pulldown menu
- a **SAN Elements** field

To use the **Filter** tab, perform the following steps:

1. From the pulldown menu, select an identifier. For more information, refer to [“Filter Tab” on page 1-5](#).
2. In the text field, type text (letters, numbers, or symbols such as a period) that appears in the elements that you want to view. For instance, to view elements that all include **switch** in the name, select **Name** from the pulldown menu and enter **switch** in the text field. To view elements that include **10.32** in the IP address, select **IP** from the pulldown menu and enter **10.32** in the text field.
3. Press **Enter**. Every element that includes the text that you entered appears in the **SAN Elements** field.

Designating a Switch as a Core Switch



Note

This procedure applies only to Core Edge topologies.

All switches defined in the FCS policy of a secure fabric are considered core switches. Any switches with devices attached to them are automatically considered edge switches. For more information, refer to [“Topology View” on page C-19](#). If you want to manually assign a core switch, perform the following steps:

1. From the **SAN Elements** tab, click the switch that you want to designate.
2. From the **Actions** menu, select **Core Switch**. When you view the fabric to which that switch belongs in Topology view and select the core-edge layout, your switch will appear as a core switch.

Identifying Switches with Insistent Domain IDs

To identify IDID Mode enabled switches, perform the following steps:

1. Launch Fabric Manager.
2. Enter the IP address or name of a switch in the fabric in the **Address** field.
3. Select the **Switch View**.
The IDID column identifies switches which have IDID Mode enabled with a value of “true.”

Identifying Ports That Have Completed the RNID Exchange

To identify ports that have completed the RNID exchange, perform the following steps:

1. Launch Fabric Manager.
2. Enter the IP address or name of a switch in the fabric in the **Address** field.
3. Select the **Device Ports View**.
The **Capability** column identifies ports which have completed the RNID exchange with a value of “FICON.”

Monitoring Link Incidents

Link incidents are problems that occur on links between a host and the switch or the storage CU port and the switch, including the following:

- bit-error-rate threshold exceeded
- loss of signal or synchronization
- non-operational primitive sequence (NOS) recognized

- primitive sequence time-out
- invalid primitive sequence for port state

Implicit link incidents are FRU failures, including the following:

- WWN card
- power supply
- system hardware slot
- fan

To monitor link incidents, perform the following steps:

1. Launch Fabric Manager.
2. Enter the IP address or name of a switch in the fabric in the **Address** field.
3. Select the **Events View**.
The **EventSrc** column identifies the source of link incidents as FICON or MSFICON.
The source of implicit link incidents are identified as EM or FW.

Monitoring Link Performance

You can monitor link performance in the **Topology** view.

In relation to links, you can change the following:

- threshold percent
- trigger period

You can change the threshold percent and it will immediately take effect, without having to restart Fabric Manager. If you change the trigger period, you must restart Fabric Manager. The trigger period can be set to a value of 1 to 60 seconds.

The threshold and trigger period are tied to each other. When in the Topology View. If traffic bandwidth goes over the specified percentage of the actual link bandwidth for the specified period of time, the link in the Topology view turns neon red. If the link is part of a collapsed bundle, the link also turns neon red. The neon red color links go away when traffic bandwidth has gone below the set percentage for the set trigger period.

Setting Link Threshold Percent

To set the link threshold percent, perform the following steps:



Note

The threshold percent is for link in the entire fabric, not an individual switch link.

1. Select **Options** from the File menu. The Options dialog displays.
2. Click **Topology**.
3. Enter a value in the threshold percent field.
4. Click **OK** to apply configuration changes; click **Cancel** to abort configuration changes.

Setting Link Trigger Period

To set the link trigger period, perform the following steps:

1. Select **Options** from the File menu. The Options dialog displays.
2. Click **Topology**.
3. Enter a value (in seconds) in the trigger period field, that the bandwidth of a link must exceed the threshold percent before the link raises a flag. The maximum value allowed is 60 seconds.
4. Click **OK** to apply configuration changes; click **Cancel** to abort configuration changes.

Opening a Telnet Session for a Nonsecure Switch

If a telnet session is already active on a nonsecure switch running firmware versions v2.6.x, 3.0.x, or 3.1.0 and you attempt to launch a new session, a message displays asking if you want to close the existing session and launch a new session. If you agree, the active session terminates and a new session is launched.

To open a telnet session for a nonsecure switch, perform the following steps:

1. Select a nonsecure switch from the **SAN Elements** tab.
2. Select **Telnet** from the **Actions** menu (or click the Telnet icon from the toolbar when in the **Detail view**). The Telnet prompt displays.
3. Log in as usual.

Grouping

This chapter includes the following sections:

- [“Introduction” on page 4-1](#)
- [“Creating Switch Groups” on page 4-2](#)
- [“Creating Port Groups” on page 4-3](#)
- [“Editing a Group” on page 4-3](#)
- [“Deleting a Group” on page 4-4](#)
- [“Exporting Groups” on page 4-4](#)
- [“Importing a Group” on page 4-4](#)

Introduction

Logical *groups* consist of SAN elements (either switches or ports) that you select to monitor as a unit. When you click a group in the **SAN Elements** tab and select Summary view, you immediately see the status of the switches or ports that you added to the group. You can use groups to

- Simplify monitoring.
- Simplify management.
- Organize switches by function, switch type, firmware version, or any other criteria that you choose.
- Create functional hierarchies of groups.

Create groups of similar switches and ports so you can monitor and configure them as a unit instead of individually. For instance, if you create a group of switches that run the same firmware, you can download new firmware to those switches as a group, rather than one by one. Whenever you need to perform the same task on multiple switches, you can save time if you create a group and perform that task on the group. Examples of such tasks include

- Multiple switch login.
- Simultaneous firmware downloads.
- Fabric-wide license key activations.

A switch can appear in multiple groups at the same time.

Groups persist on your server in your FabricManager.xml file. You can import and export groups so that multiple users can share group definitions.

Switches remain in a group even if you remove their source fabrics from Fabric Manager. That is, if switch X is in fabric Y and you add it to group Z, switch X remains in group Z even after you delete fabric Y from Fabric Manager.

Furthermore, when you look at a logical switch group in the Topology view, links disappear if the switches in this group are no longer in the SAN Elements tab in Fabric Manager.

The following list describes valuable ways to use Fabric Manager groups:

- Create groups of switch model types or firmware versions to expedite firmware downloads.
- Group switches by function to monitor switches that belong to different departments or that serve as a backbone to the SAN.
- Group switches by physical location to monitor fabrics in disparate locations.
- Group switches by SAN island to monitor or update individual islands
- Group switches by redundancy so you can maintain half of a fabric while the other half continues to carry traffic.
- Nest fabrics to drill down to the source of a problem. For instance, if you create a switch group for a campus, then nest within that switch groups for departments, you can move down the hierarchy to determine the source of any status change.
- Create separate groups for monitoring and management to reduce unnecessary levels of nesting.
- Group ports by certain devices and hosts to more easily monitor those elements.
- Use groups to simplify the monitoring view of a large or complex fabric.

When you remove a switch from a fabric, you must remove that switch from all group definitions because Fabric Manager does not do so dynamically. For the same reason, if you replace the switch with a new switch, you must add that switch to all applicable group definitions.

Creating Switch Groups

A switch group consists of a collection of switch identifiers. After you create a group, you can drag that group during tasks, to work with all switches at once. For instance, if you want to log in to all of the switches in a group, you can drag the group into the appropriate window so you do not need to select each individual switch. Logical switch group names are local on Fabric Manager Clients and must be changed individually on all clients.

To create a group of switches, perform the following steps:

1. From the **File** menu, select **Groups > Edit Switch Groups...** The **Edit Switch Groups** dialog box appears.
2. Click the **SwitchGroups** icon in the right window.
The group that you create appears nested within the item that you click in this step. If you click an existing group instead of the **SwitchGroups** icon, your new group will appear as a subgroup of that group. After you create a group, you can click-and-drag it to a new location in the hierarchy.
3. Click **Create...** The **Create Group** dialog box appears.
4. Type a name for your group in the **Name** field and click **Okay**.
5. Click the icon of the group that you created.
6. In the left-hand window, click the switch that you want to add to your group, then click the right-pointing arrow to add the switch to the group.

To add multiple switches at once, press and hold the **Ctrl** key as you click additional switches or simply click-and-drag any node in the tree to add the switches from that node.

Click-and-drag switches directly from the left-hand window to the switch group to more quickly populate the group.

7. Click **OK** after you add switches to your group. The group appears in the **SAN Elements** tab under **SwitchGroups**. To view the contents of the group, click the group.

Creating Port Groups

A port group consists of a collection of port identifiers. After you create a group, you can drag that group during tasks, to work with all ports at once. Logical port group names are local on Fabric Manager Clients and must be changed individually on all clients.

Perform the following steps to create a group of ports:

1. From the **File** menu, select **Groups > Edit Port Groups...** The **Edit Port Groups** dialog box appears.
2. Click the **PortGroups** icon in the right-hand window.

The group that you create appears nested within the item that you click in this step. If you click an existing group instead of the **PortGroups** icon, your new group will appear as a subgroup of that group. After you create a group, you can click-and-drag it to a new location in the hierarchy.
3. Click **Create...** The **Create Group** dialog box appears.
4. Type a name for your group in the **Name** field and click **Okay**.
5. Click the icon of the group that you created.
6. In the left-hand window, click the port that you want to add to your group, then click the right-pointing arrow to add the port to the group.

To add multiple ports at once, press and hold the **Ctrl** key as you click additional ports.

Click-and-drag ports directly from the left-hand window to the port group to more quickly populate the group.

7. Click **OK** when you have finished adding ports to your group. The group appears in the **SAN Elements** tab under **PortGroups**. To view the contents of the group, click the group.

Editing a Group

To edit a group, perform the following tasks:

1. From the **File** menu, select **Groups > Edit {Switch | Port}Groups....** The **Edit {Switch | Port} Groups** dialog box appears.
2. Select the switch group or port group that you want to edit from the right window.
3. Add members from one group to another by dragging to another group.

Delete members from a group by selecting the member and clicking **Delete** in the **Edit Groups** dialog.
4. Click **OK**.

Deleting a Group

To delete a group, perform the following tasks:

1. From the **File** menu, select **Groups > Edit {Switch | Port} Groups...** The **Edit {Switch | Port} Groups** dialog box appears.
2. In the right window, navigate to the group that you want to delete and click that group.
3. Click **Delete**, then click **OK**.

Tip: You can also select the group you want to delete from the SAN Elements tab and press **Delete** on your keyboard to delete a group.

Exporting Groups

When you create a group, that group exists in your FabricManager.xml file. To share your group definitions with other users, export the group so another user can import the group.

To export a group, perform the following steps:

1. From the **File** menu, select **Groups > Export...** The **Export** dialog box appears.
2. Click the **Browse...** button, navigate to the file to which you want to export the group, and click **Open**.
3. Under the **SAN Elements** tab in the left window, click the group or groups that you want to add to the file. You must select the parent group in order to import the parent group and all of its sub-groups at a later time.
4. Click the arrow to add the group(s) to the file, then click **Save**.

Importing a Group

Import groups to add group definitions from other users to your personal profile so you do not need to recreate the groups yourself.

To import a group, perform the following steps:

1. From the **File** menu, select **Groups > Import...** The **Import from file:** dialog box opens.
2. Navigate to the file that contains the group that you want to import. Click the file, then click **Open**. The groups in the file appear under the **SAN Elements** tab under the appropriate groups type.

Licensing

This chapter includes the following sections:

- [“Introduction” on page 5-1](#)
- [“Exporting and Importing License Keys” on page 5-2](#)
- [“Removing a License Key from a Switch” on page 5-3](#)
- [“Performing E-Licensing” on page 5-3](#)

Introduction

Fabric Manager can display, store, load, and reload your license keys so that you do not lose them if your switch fails. With E-Licensing, you can request license keys online and install them with Fabric Manager.



Note

An Advanced Web Tools license must be installed on a switch for Fabric Manager to recognize the switch. All other licenses can be installed using Fabric Manager.

You can print license information about switches from the **License Admin** dialog by clicking **Print**.

You must have an activated license (on each switch in the fabric) to use the following features:

- Full Fabric
- Extended Fabric
- Entry Fabric
- Fabric Watch
- Trunking
- Advanced Performance Monitoring
- Security
- QuickLoop
- Remote Switch
- Remote Fabric
- SES
- Advanced Zoning
- Firmware v2.2
- Advanced Web Tools

Exporting and Importing License Keys

Export license keys from healthy switches to a file so you can restore the licenses if switches fail. If for any reason you need to recover your license keys, import those keys from the file you created.

Exporting License Keys from Switches to a File

You can export the license keys of multiple switches to a single file. You can even export keys from different switches in different fabrics to one file. The file matches the license keys to the WWN of the appropriate switch so you can quickly and easily import the keys at any time. To export license keys to a file, perform the following steps:

1. From the **Tools** menu, select **Licensing > Load from Switch...** The **License Admin -- Switch Selection** window appears.
2. In the **SAN Elements** tab, click the switches and/or fabrics with license keys that you want to export.
3. Click the right-pointing arrow to move elements that you selected into the right-hand window, then click **OK**. The **License Administration** window appears. If you have not already logged-in to the switches, Fabric Manager prompts you to do so.
4. Click the **Switch** tab, then click the **Export to File** button. The **Export Licenses as an XML file** dialog appears.
5. Select a directory, enter a name for the file, and click **Export**.



Caution

Do not open or manually edit this file.

Importing License Keys from a File to a Switch

If you need to restore license keys to a switch, import the keys that you saved to a file. To import license keys from a file, perform the following steps:

1. From the **Tools** menu, select **Licensing > Import from File...** The **Import License -- Select license file** window appears.
2. Navigate to your license key file, select it, and click **Open**. The **License Administration** window opens.
3. Click the licenses that you want to download and click **Download to Switch...** Fabric Manager loads the licenses to the appropriate switches. If you have not already logged-in to the switches, Fabric Manager prompts you to do so.

Removing a License Key from a Switch

To remove a license key and disable the functionality of a licensed feature, perform the following steps:

1. From the **Tools** menu, select **Licensing > Load from Switch...** The **License Admin -- Switch Selection** window appears.
2. In the **SAN Elements** tab, click the switches and fabrics with license keys that you want to remove.
3. Click the right-pointing arrow to move elements that you selected into the right-hand window, then click **OK**. The **License Administration** window appears.
4. Click the **Switch** tab, select the licenses that you want to remove and click **Remove from Switch**.

Performing E-Licensing

E-Licensing provides users with the ability to acquire licenses online for switch-based software features. In order to use this feature, users need to have already purchased the licenses and obtained a Transaction Key in electronic form. Electronic Transaction Keys are provided as a file, typically delivered as an attachment to an email.



Note

Not all fabric infrastructure providers support the delivery of Electronic Transaction Keys, and therefore this feature may not be available to some users.

Obtaining Licenses from Transaction Keys

To obtain licenses from transaction keys, perform the following steps:

1. Request a transaction key file from your switch supplier.
2. Download the transaction key file from your email to your client machine.
3. Log on to the switches for which you want to obtain a license. For more information, refer to [“Logging In to Multiple Switches Simultaneously” on page 3-6](#).
4. From the **Tools** menu, select **Licensing > Generate Licenses...** The **Create License Request -- Select transaction key file or saved request** dialog opens.
5. Open the transaction key file. The **License Request Administration** window opens and displays all of the features available to you from the transaction key files that you opened.
6. Select one or more of the features in the **Feature Name** column.
7. Click **Select Switches**.



Note

Only switches already discovered by Fabric Manager display in the **Switch Selection** dialog. You can only select as many switches as you have transaction keys per switch.

8. Choose switches from the **SAN Elements** tab for which you want to obtain licenses and click **OK**. If you have not already logged in to the switches, Fabric Manager will prompt you to do so.

9. Click **Save Request** to save the License Request file in XML format and submit at a later time. Click **Load TXN Key** to select another transaction key file or a saved License Request file. Click **Submit** to submit the request. If you entered your email address in the request, you will receive a record of licenses in email. Click **Reset** to remove any switches that you have entered in the **Switches** column and to reset the available quantity.
The **License Administration** window opens.
10. Click the **Obtained Licenses** tab. All the licenses that you obtained appear.
11. Click one or more licenses, then click **Download to Switch** to download the licenses to your switches. To obtain the Security license, you must agree to a license agreement.

Zoning

This chapter includes the following sections:

- [“Introduction” on page 6-2](#)
- [“Accessing the Zone Administration Module” on page 6-5](#)
- [“Viewing the Zone Configuration Summary” on page 6-5](#)
- [“Adding a WWN in the Zoning Database” on page 6-5](#)
- [“Deleting a WWN in the Zoning Database” on page 6-6](#)
- [“Replacing a WWN in the Zoning Database” on page 6-6](#)
- [“Searching for a Zone Member” on page 6-6](#)
- [“Selecting a Zoning Method” on page 6-7](#)
- [“Refreshing Zoning” on page 6-7](#)
- [“Refreshing the Fabric” on page 6-7](#)
- [“Enabling a Configuration” on page 6-8](#)
- [“Disabling Zoning” on page 6-8](#)
- [“Saving Changes to an Existing Configuration” on page 6-9](#)
- [“Clearing the Zoning Database” on page 6-9](#)
- [“Creating an Alias” on page 6-10](#)
- [“Modifying the Members of an Alias” on page 6-10](#)
- [“Deleting an Alias” on page 6-11](#)
- [“Renaming an Alias” on page 6-11](#)
- [“Creating a Zone” on page 6-11](#)
- [“Modifying the Members of a Zone” on page 6-12](#)
- [“Deleting a Zone” on page 6-12](#)
- [“Renaming a Zone” on page 6-12](#)
- [“Creating a QuickLoop” on page 6-13](#)
- [“Modifying the Members of a QuickLoop” on page 6-14](#)
- [“Deleting a QuickLoop from the Database” on page 6-14](#)
- [“Renaming a QuickLoop” on page 6-14](#)
- [“Creating a Fabric Assist Zone” on page 6-14](#)
- [“Modifying the Members of a Fabric Assist Zone” on page 6-15](#)
- [“Deleting a Fabric Assist Zone” on page 6-15](#)
- [“Renaming a Fabric Assist Zone” on page 6-16](#)

- “Creating a Configuration” on page 6-16
- “Modifying the Members of a Configuration” on page 6-17
- “Deleting a Configuration” on page 6-17
- “Renaming a Configuration” on page 6-17
- “Creating a Configuration Analysis Report” on page 6-18

Introduction

Fabric Manager uses Advanced Web Tools to configure and administer zoning. This chapter provides high-level zoning instructions, then goes into detail about zoning concepts and practices.



Note

A Zoning license and administrative privileges are required to access the Zone Admin module.

Specific Advanced Web Tools interfaces vary by firmware. Your interface and functionality may not match the interface that appears in the figures and examples in this chapter.

Zoning enables you to partition your SAN into logical groupings of devices that can access each other. For example, you can partition your SAN into two zones, *winzone* and *unixzone*, so that your Windows servers and storage do not interact with your UNIX servers and storage. To configure zoning, you must use zones, aliases, and configurations.

If you plan to add a switch to a fabric that uses zoning, discover that switch with Fabric Manager and run a merge check between that switch and the fabric to which you plan to add it. This check will identify any zoning and configuration mismatches before you physically connect the switch.

Zone

A zone is a region within the fabric where switches and devices can communicate. A device can only communicate with other devices connected to the fabric within its specified zone. You can specify members of a zone based on the following identifiers:

- alias names
- switch domain and port area number pairs (for example, "2, 20")
- WWNs
- QuickLoop AL_PAs

Alias

An alias is a logical group of ports, WWNs, or AL_PAs. Specifying groups of ports or devices as an alias makes zone configuration easier, by enabling you to configure zones using an alias rather than a long string of individual members. You can specify members of an alias using the following methods:

- A switch domain and port area number pair

Example

```
2,20
```

- WWN (device)
- QuickLoop AL_PAs (device)

Configuration

A configuration (often called a config) is a group of zones. Zoning is enabled on a fabric by enabling a specific configuration. You can specify members of a configuration with the following identifiers:

- zone names
- QuickLoop names
- Fabric Assist (FA) zone names

Zoning Schemes

Various levels of zoning (or zoning *schemes*) isolate systems that have different operating environments. For example, you can create a zone of all ports connected to UNIX servers, or another zone of all ports connected to Windows servers. Zones limit access of devices to other devices connected to the fabric within the same zone.

Zones can be configured dynamically. They can vary in size depending on the number of fabric connected devices, and devices can belong to more than one zone. Because zone members can access only other members of the same zone, a device not included in a zone is not available to members of that zone.

Security

When you enable security, you can only access zoning with the primary FCS switch. The zoning icon does not appear on any other switch in the display. If you do not enable security, you can configure zoning from any switch.

Zoning Methods

Zoning methods determine what appears in the subsequent components of the **Zone Administration** window. You can use four methods to define members of a zone. Each method is considered either hard zoning or soft zoning. Hard zoning defines alias members exclusively with domain/port ID pairs or with WWNs. Soft zoning defines alias members with a mixture of port IDs and WWNs. [Table 6-1](#) lists and describes the methods.

Table 6-1 Zoning Methods

Method	Description
Mixed Zoning	This method enables you to define members using the port area number, device WWNs, QuickLoop AL_PAs. This method is considered soft zoning.
Port Zoning	This method enables you to define members using port area number only. This method is considered hard zoning.
WWN Zoning	This method enables you to define members of zone using device WWNs. This method is considered hard zoning.
AL_PA Zoning	This method enables you to define members of zone using QuickLoop AL_PAs only. This method is considered hard zoning.

Zoning Method and Tabs Available

Depending on the zone method that you use, certain tabs may or may not be available on the **Zone Administration** window.

Table 6-2 Zone Methods and Tabs Table

Zone Level	Available Tabs
Mixed Zoning	Alias, Zone, QuickLoop, Fabric Assist, Config
Port Zoning	Alias, Zone, QuickLoop, Fabric Assist, Config
WWN Zoning	Alias, Zone, QuickLoop, Fabric Assist, Config
AL_PA Zoning	Alias, Zone, QuickLoop, Config

Accessing the Zone Administration Module

To access the Zone Administration window, perform the following steps:

1. From the **View** menu, select **Summary**.
2. In the **SAN Elements** tab, click the fabric that you want to view.
3. From the **Actions** menu, select **Zone Admin...** Web Tools launches and prompts you to log in.
4. Log in to Advanced Web Tools. The **Zone Administration** window opens.

Viewing the Zone Configuration Summary

To view the **Zone Configuration summary**, perform the following steps:

1. Access the **Zone Administration** window. For more information, refer to [“Accessing the Zone Administration Module”](#) on page 6-5.
2. Select **File > Print Summary**. The **Zone Configuration summary** dialog box appears. An example of the **Zone Configuration summary** is shown in [Figure 6-1](#).

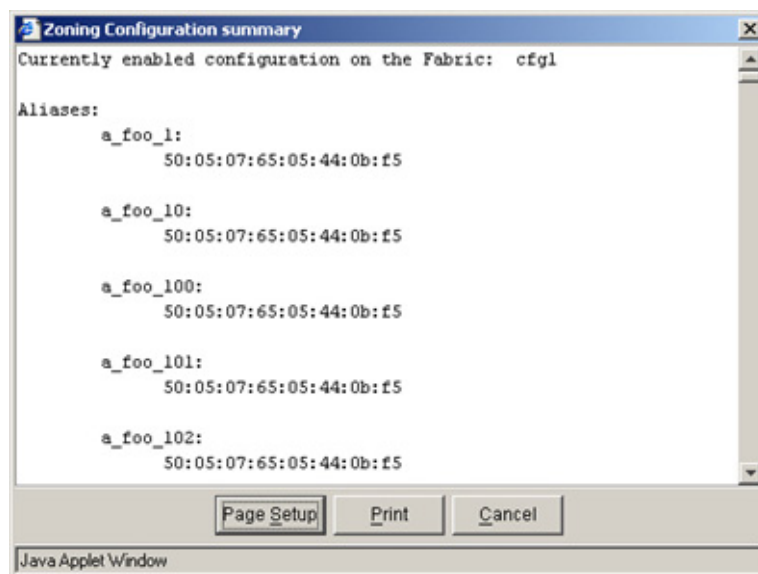


Figure 6-1 Zone Configuration Summary

Adding a WWN in the Zoning Database

This WWN added does not need to currently exist in the fabric. This procedure enables you to configure a WWN as a member in a zone configuration before you add that device to the fabric.

To add a WWN to the zoning database, perform the following steps:

1. Access the **Zone Administration** window. For more information, refer to [“Accessing the Zone Administration Module” on page 6-5](#).
2. Select **Edit > Add a WWN**. The **Add WWN...** dialog box appears.
3. Enter a WWN value in the **WWN** field.
4. Click the **OK** button. The WWN is added to the zoning database and can be used as a member.

Deleting a WWN in the Zoning Database

To delete a WWN from the zoning database, perform the following steps:

1. Access the **Zone Administration** window. For more information, refer to [“Accessing the Zone Administration Module” on page 6-5](#).
2. Select **Edit > Delete a WWN**. The **Delete WWN...** dialog box is displayed.
3. Enter a WWN value in the **WWN** field.
4. Click the **OK** button. The WWN is deleted from the zoning database and as a member from any alias or zone.

Replacing a WWN in the Zoning Database

This procedure enables you to replace a WWN throughout the zoning database. This is helpful when exchanging out devices in your fabric, and easily maintaining your current Configuration. To replace a WWN in the zoning database, perform the following steps:

1. Access the **Zone Administration** window. For more information, refer to [“Accessing the Zone Administration Module” on page 6-5](#).
2. Select **Edit > Replace a WWN**. The **Replace WWN...** dialog box is displayed.
3. Enter the WWN to be replaced in the **Replace** field.
4. Enter the new WWN in the **By** field.
5. Click the **OK** button. The old WWN is replaced in the zoning database by the new WWN, including within any alias or zone where the old WWN was a member.

Searching for a Zone Member

To search for a zone member, perform the following steps:

1. Access the **Zone Administration** window. For more information, refer to [“Accessing the Zone Administration Module” on page 6-5](#).
2. Select **Edit > Search Member**.
3. Type the zone member name in the **Member Name** field.
4. (Optional) Check one or more checkboxes to narrow the search.

5. Click the **Next** button to begin the zone member search.

Selecting a Zoning Method

The zoning method you choose determines how members appear in the various member selection windows. It also determines whether you are using hard zoning or soft zoning.

1. Access the **Zone Administration** window. For more information, refer to [“Accessing the Zone Administration Module” on page 6-5](#).
2. From the **View** pulldown menu, select one of the following:
 - **Mixed Zoning**
 - **Port Zoning**
 - **WWN Zoning**
 - **AL_PA Zoning**

The zoning method that you choose determines how members appear in the various member selection windows. Refer to [“Zoning Methods” on page 6-4](#) for more information.

Refreshing Zoning

To refresh zoning, perform the following steps:

1. Access the **Zone Administration** window. For more information, refer to [“Accessing the Zone Administration Module” on page 6-5](#).
2. From the **View** menu, select **Refresh Zoning** to refresh the zoning database and delete any unsaved changes. You can view the current zoning database from the **Zone Configuration Summary** window. For more information, refer to [“Viewing the Zone Configuration Summary” on page 6-5](#).

Refreshing the Fabric

To refresh the fabric, perform the following steps:

1. Access the **Zone Administration** window. For more information, refer to [“Accessing the Zone Administration Module” on page 6-5](#).
2. From the **View** menu, select **Refresh Fabric** to refresh the enabled zone configuration on the fabric and delete any unsaved changes. You can view the current zoning database from the **Zone Configuration Summary** window. For more information, refer to [“Viewing the Zone Configuration Summary” on page 6-5](#).

Enabling a Configuration

The **Actions > Enable a Config** option enables a configuration that has previously been created (refer to [“Creating a Configuration” on page 6-16](#)). A dialog box appears; select the desired configuration from the pulldown menu.

Several configurations can reside on a switch at once and you can quickly alternate between configurations. For instance, you may want to enable one configuration during the business hours, and enable another overnight. You can only enable one zone configuration at a time.

To create a new configuration, refer to [“Creating a Configuration” on page 6-16](#). To enable a configuration, perform the following steps:

1. Access the **Zone Administration** window. For more information, refer to [“Accessing the Zone Administration Module” on page 6-5](#).
2. Click the **View** pulldown menu.
3. Select the desired level of zoning.
4. Select the **Config** tab.
5. Select **Actions > Enable Config** to activate a configuration. The **Enable Config** dialog box appears. [Figure 6-2](#) shows the **Enable Config...** dialog.



Figure 6-2 Enable Config Dialog Box

6. Select the configuration to be enabled from the pulldown menu. A warning dialog box appears.
7. Click the **Yes** button to enable the selected configuration.

Disabling Zoning

The **Actions > Disable Zoning** option disables the enabled configuration. The **Disable Config** dialog box appears. When you disable the zoning feature, the fabric enters non-zoning mode and all devices can freely access other devices in the fabric.

When you disable the active configuration, the zoning feature is disabled on the fabric and all devices within the fabric can communicate with all other devices. This does not mean that the zoning database is deleted however, only that there is no configuration active on the fabric. To disable zoning, perform the following steps:

1. Access the **Zone Administration** window. For more information, refer to [“Accessing the Zone Administration Module” on page 6-5](#).
2. Select **Actions > Disable Zoning** to disable the current enabled configuration. The **Disable Config** warning appears.
3. Click the **Yes** button to disable the current configuration.

Saving Changes to an Existing Configuration

To save changes to an existing configuration, perform the following steps:

1. Access the **Zone Administration** window. For more information, refer to [“Accessing the Zone Administration Module” on page 6-5](#).
2. Click the **Config** tab.
3. Make desired changes to configuration (refer to [“Creating a Zone” on page 6-11](#)).

You can make changes to a configuration that is currently enabled; changes will not appear until the configuration is disabled and re-enabled.

4. Select the **Actions > Save Config Only** option.

The configuration changes will be saved. Changes will not take effect until the configuration is re-enabled.

To enable the configuration, refer to [“Enabling a Configuration” on page 6-8](#).

Clearing the Zoning Database

The following procedure disables any active configuration and deletes the entire zoning database.

1. Access the **Zone Administration** window. For more information, refer to [“Accessing the Zone Administration Module” on page 6-5](#).
2. Select the **Actions > Clear All** option. The **Disable Config** warning appears.



Caution

This action will not only disable zoning on the fabric, but will delete the entire zoning database.

3. Click **Yes** to disable the current configuration.

Creating an Alias

To create an alias, perform the following steps:

1. Access the **Zone Administration** window. For more information, refer to [“Accessing the Zone Administration Module” on page 6-5](#).
2. Select the **View** menu to determine the method used to view members. The different methods are as follows:
 - Mixed Zoning
 - Port Zoning
 - WWN Zoning
 - AL_PA Zoning

The member view method you choose determines how members are displayed in the **Member Selection List** window. Refer to [“View Menu” on page H-3](#) for more information.

3. Click the **Alias** tab (selected by default).
4. Click the **Create Alias** button. The **Create New Alias** dialog box appears.
5. Enter a name for the new alias.
6. Click the **OK** button.
7. Click on any “+” signs in the **Member Selection List** to view the nested elements. The choices available in the **Member Selection List** depend on the selection that you made in the **View** menu.
8. Highlight an element in the **Member Selection List** that you want to include in your alias. The **Add Member** button becomes active.
9. Click the **Add Member** button to add alias members. Selected members move to the **Alias Members** window.
10. Repeat [step 7](#) and [step 8](#) to add more elements to your alias.
11. Use the **Add Other** button to include a WWN, port, or QuickLoop (AL_PA) that is not currently a part of the fabric (optional).

The new alias appears in the **Name** pulldown list.

Modifying the Members of an Alias

To modify the members of an alias, perform the following steps:

1. Access the **Zone Administration** window. For more information, refer to [“Accessing the Zone Administration Module” on page 6-5](#).
2. Select the **Alias** tab (selected by default).
3. From the **Name** pulldown menu, select the alias you want to modify.
4. Highlight an element in the Member Selection List that you want to include in your alias; or, highlight an element in the **Alias Members** field that you want to delete.

5. Click the **Add Member** button to add an alias member or click the **Remove Member** button to remove an alias member.

Deleting an Alias

To delete an alias, perform the following steps:

1. Access the **Zone Administration** window. For more information, refer to [“Accessing the Zone Administration Module” on page 6-5](#).
2. Select the **Alias** tab (selected by default).
3. From the **Name** pulldown menu, select the alias you want to delete.
4. Click the **Delete** button. The **Confirm Deleting Alias** dialog opens.
5. Click the **OK** button to delete the alias from the zoning database.

Renaming an Alias

To rename an alias, perform the following steps:

1. Access the **Zone Administration** window. For more information, refer to [“Accessing the Zone Administration Module” on page 6-5](#).
2. Select the **Alias** tab (selected by default).
3. From the **Name** pulldown menu, select the alias you want to rename.
4. Click the **Rename** button. The **Rename an Alias** dialog box appears.
5. Enter a new alias name and click **OK**.

Creating a Zone

To create an zone, perform the following steps:

1. Access the **Zone Administration** window. For more information, refer to [“Accessing the Zone Administration Module” on page 6-5](#).
2. Select the **View** menu to determine the method used to view members. The different methods include the following:
 - Mixed Zoning
 - Port Zoning
 - WWN Zoning
 - AL_PA Zoning

The member view method that you choose determines how members are displayed in the **Member Selection List** window. For more information, refer to [“View Menu” on page H-3](#).

3. Select the **Zone** tab.

4. Click the **Create** button. The **Create New Zone** dialog box appears.
5. Enter a name for the new zone and click the **OK** button.
6. Click on any “+” signs in the **Member Selection List** to view the nested elements. The choices available in the **Member Selection List** depend on the selection made in the **View** menu.
7. Highlight an element in the **Member Selection List** that you want to include in your Zone. The **Add Member** button becomes active.
8. Click the **Add Member** button or use drag and drop to add zone members. Selected members move to the **Zone Members** window.
9. Repeat [step 7](#) and [step 8](#) to add more elements to your zone.
10. Use the **Add Other** button to include a WWN, port, or QuickLoop (AL_PA) that is not currently a part of the fabric (optional). The new zone appears in the **Name** pulldown menu.

Modifying the Members of a Zone

To modify the members of a zone, perform the following steps:

1. Access the **Zone Administration** window. For more information, refer to [“Accessing the Zone Administration Module” on page 6-5](#).
2. Select the **Zone** tab.
3. From the **Name** pulldown menu, select the zone that you want to modify.
4. Highlight an element in the **Member Selection List** that you want to include in your zone; or, highlight an element in the **Zone Members** field that you want to delete.
5. Click the **Add Member** button to add a zone member or click the **Remove Member** button to remove an zone member.

Deleting a Zone

To delete a zone, perform the following steps:

1. Access the **Zone Administration** window. For more information, refer to [“Accessing the Zone Administration Module” on page 6-5](#).
2. Select the **Zone** tab.
3. From the **Name** pulldown menu, select the zone you want to delete.
4. Click the **Delete** button. The **Confirm Deleting Zone** dialog opens.
5. Click the **OK** button.

Renaming a Zone

To rename a zone, perform the following steps:

1. Access the **Zone Administration** window. For more information, refer to [“Accessing the Zone Administration Module” on page 6-5](#).
2. Select the **Zone** tab.
3. From the **Name** pulldown menu, select the zone you want to rename.
4. Click the **Rename** button. The **Rename a Zone** dialog box appears.
5. Enter a new zone name and click the **OK** button.

Creating a QuickLoop

To create a QuickLoop, perform the following steps:

1. Access the **Zone Administration** window. For more information, refer to [“Accessing the Zone Administration Module” on page 6-5](#).
2. From the **View** menu, select one of the following methods:
 - Mixed Zoning
 - Port Zoning
 - WWN Zoning
 - AL_PA Zoning

The method that you choose determines how members appear in the **Member Selection List** window. For more information, refer to [“View Menu” on page H-3](#).

3. Select the **QuickLoop** tab.
4. Click the **Create** button. The **Create New QuickLoop** dialog box appears.
5. Enter a name for the new QuickLoop and click the **OK** button.
6. Highlight an element in the **Member Selection List** that you want to include in your QuickLoop. (Click on any “+” signs in the **Member Selection List** to view the nested elements. The choices available in the **Member Selection List** depend on the selection made in the **View** menu.) The **Add Member** button becomes active.



Note

There is a limit of two members per QuickLoop. Only switches capable of running QuickLoop are displayed in the Member Selection List.

7. Click the **Add Member** button to add QuickLoop members. Selected members move to the **QuickLoop Members** field.
8. Repeat [step 6](#) and [step 7](#) to add more elements to your QuickLoop.
9. Use the **Add Other** button to include a WWN, port, or QuickLoop (AL_PA) that is not currently a part of the fabric (optional).

The new QuickLoop appears in the **Name** pulldown menu.

Modifying the Members of a QuickLoop

To modify the members of a QuickLoop, perform the following steps:

1. Access the **Zone Administration** window. For more information, refer to [“Accessing the Zone Administration Module” on page 6-5](#).
2. Select the **QuickLoop** tab.
3. From the **Name** pulldown menu, select the QuickLoop you want to modify.
4. Highlight an element in the **Member Selection List** that you want to include in your QuickLoop or highlight an element in the **QuickLoop Members** that you want to delete.
5. Click the **Add Member** button to add a QuickLoop member or click the **Remove Member** button to remove an QuickLoop member.

Deleting a QuickLoop from the Database

To delete a QuickLoop, perform the following steps:

1. Access the **Zone Administration** window. For more information, refer to [“Accessing the Zone Administration Module” on page 6-5](#).
2. Select the **QuickLoop** tab.
3. From the **Name** pulldown menu, select the QuickLoop you want to delete.
4. Click the **Delete** button. The **Confirm Deleting QuickLoop** dialog opens.
5. Click the **OK** button.

Renaming a QuickLoop

To rename a QuickLoop, perform the following steps:

1. Access the **Zone Administration** window. For more information, refer to [“Accessing the Zone Administration Module” on page 6-5](#).
2. Select the **QuickLoop** tab.
3. From the **Name** pulldown menu, select the QuickLoop you want to rename.
4. Click the **Rename** button. The **Rename a QuickLoop** dialog box appears.
5. Enter a new QuickLoop name.
6. Click the **OK** button.

Creating a Fabric Assist Zone

This procedure uses the Mixed Zone level as an example.

To create a Fabric Assist zone, perform the following steps:

1. Access the **Zone Administration** window. For more information, refer to [“Accessing the Zone Administration Module” on page 6-5](#).
2. Enter the admin level user name and password.
3. From the **View** menu, select **Mixed Zoning**. (You can select any view except for the Devices view.) The **Mixed View** tab appears.
4. Select the **Fabric Assist** tab.
5. Select the **Create** button. The **Create New FA** dialog box appears.
6. Enter a name for the new FA zone and click the **OK** button. (A fabric host is required.)
7. Highlight the desired Fabric Assist zone members from the **Member Selection List**.
8. Click the **Add Member** button. The new members appear in the **Fabric Assist Members** window. The newly created FA zone also appears in the **Config** tab.

Modifying the Members of a Fabric Assist Zone

To modify the members of a Fabric Assist zone, perform the following steps:

1. Access the **Zone Administration** window. For more information, refer to [“Accessing the Zone Administration Module” on page 6-5](#).
2. Select the **Fabric Assist** tab.
3. From the **Name** pulldown menu, select the Fabric Assist Zone that you want to modify.
4. Highlight an element in the **Member Selection List** that you want to include in your Fabric Assist zone; or, highlight an element in the **Fabric Assist Zone Members** field that you want to delete.
5. Click the **Add Member** button to add a Fabric Assist zone member or click the **Remove Member** button to remove an Fabric Assist zone member.

Deleting a Fabric Assist Zone

To delete a Fabric Assist zone, perform the following steps:

1. Access the **Zone Administration** window. For more information, refer to [“Accessing the Zone Administration Module” on page 6-5](#).
2. Select the **Fabric Assist Zone** tab.
3. From the **Name** pulldown menu, select the Fabric Assist zone you want to delete.
4. Click the **Delete** button. The **Confirm Deleting Fabric Assist Zone** dialog opens.
5. Click the **OK** button.

Renaming a Fabric Assist Zone

To rename a Fabric Assist zone, perform the following steps:

1. Access the **Zone Administration** window. For more information, refer to [“Accessing the Zone Administration Module” on page 6-5](#).
2. Select the **Fabric Assist** tab.
3. From the **Name** pulldown menu, select the Fabric Assist zone that you want to rename.
4. Click the **Rename** button. The **Rename a Fabric Assist Zone** dialog box appears.
5. Enter a new Fabric Assist zone name and click the **OK** button.

Creating a Configuration

To create a configuration, perform the following steps:

1. Access the **Zone Administration** window. For more information, refer to [“Accessing the Zone Administration Module” on page 6-5](#).
2. From the **View** menu, select one of the following methods:
 - Mixed Zoning,
 - Port Zoning,
 - WWN Zoning,
 - AL_PA Zoning.

The member view method that you choose determines how members appear in the **Member Selection List** window. Refer to [“View Menu” on page H-3](#) for more information.

3. Select the **Config** tab.
4. Click the **Create** button. The **Create New Config** dialog box appears.
5. Enter a name for the new configuration and click the **OK** button.
6. Click on any “+” signs in the **Member Selection List** to view the nested elements.
7. Highlight an element in the **Member Selection List** that you want to include in your configuration. The **Add Member** button becomes active.
8. Click the **Add Member** button to add configuration members. Selected members move to the **Config Members** field.
9. Repeat [step 7](#) and [step 8](#) to add more elements to your configuration.
10. Select the **Actions > Save Config Only** option. The new configuration appears in the Name pulldown list. To enable the configuration, refer to [“Enabling a Configuration” on page 6-8](#).

Any changes made to the currently enabled configuration appear only when the configuration is re-enabled.

Modifying the Members of a Configuration

To modify the members of a configuration, perform the following steps:

1. Access the **Zone Administration** window. For more information, refer to [“Accessing the Zone Administration Module” on page 6-5](#).
2. Click the **Config** tab.
3. From the **Name** pulldown menu, select the configuration that you want to modify.
4. Click an element in the **Member Selection List** that you want to include in your configuration or click an element in the **Config Members** that you want to delete.
5. Click the **Add Member** button to add a configuration member or click the **Remove Member** button to remove a member from a configuration.

You can make changes to a configuration that is currently enabled; changes will not appear until the configuration is disabled and re-enabled.

6. Select the **Actions > Save Config Only** option.

The configuration changes are saved and take effect once the configuration is re-enabled.

To enable the configuration, refer to [“Enabling a Configuration” on page 6-8](#).

Deleting a Configuration

You cannot delete a currently enabled configuration.

To delete a configuration, perform the following steps:

1. Access the **Zone Administration** window. For more information, refer to [“Accessing the Zone Administration Module” on page 6-5](#).
2. Select the **Config** tab.
3. From the **Name** pulldown menu, select the configuration you want to delete.
4. Click the **Delete** button. The **Confirm Deleting Config** dialog opens.
5. Click the **OK** button.

Renaming a Configuration

To rename a configuration, perform the following steps:

1. Access the **Zone Administration** window. For more information, refer to [“Accessing the Zone Administration Module” on page 6-5](#).
2. Select the **Config** tab.
3. From the **Name** pulldown menu, select the configuration you want to rename.
4. Click the **Rename** button. The **Rename a Config** dialog box appears.
5. Enter a new **Config** name and click the **OK** button.

You can make changes to a configuration that is currently enabled; changes will not appear until the configuration is disabled and re-enabled.

6. Select the **Actions > Save Config Only** option.

The configuration changes are saved and will take effect only when the configuration is re-enabled.

To enable the configuration, refer to [“Enabling a Configuration” on page 6-8](#).

Creating a Configuration Analysis Report

1. Access the **Zone Administration** window. For more information, refer to [“Accessing the Zone Administration Module” on page 6-5](#).
2. Select the **Config** tab.
3. From the **Name** pulldown menu, select a configuration to analyze.
4. Select the **Analyze Config** button. An analysis window appears. An example of an analysis report is shown in [Figure 6-3](#).

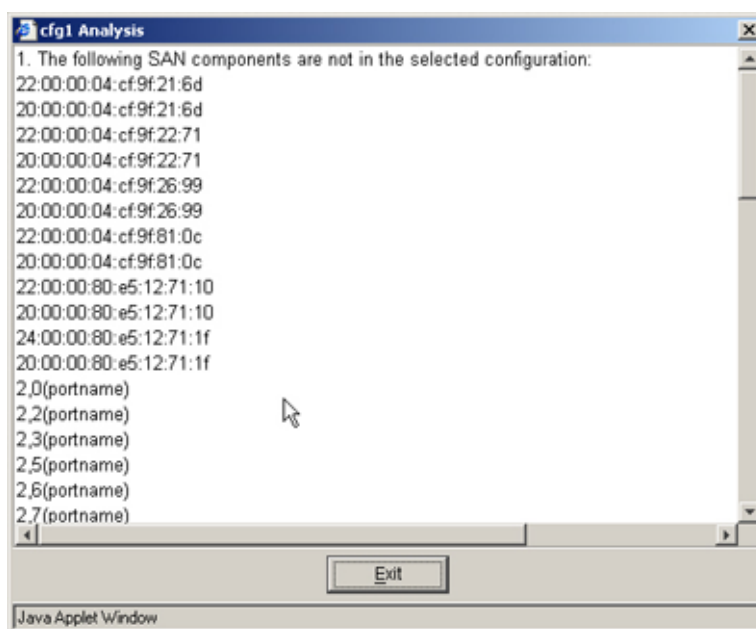


Figure 6-3 Analyze Config Report Example

5. View the Configuration Analysis. A report appears that lists the following:
 - SAN components (ports, WWNs, and AL_PAs) that are not included in the configuration.
 - SAN components (ports, WWNs, and AL_PAs) that are contained in the configuration but not in the fabric.

Fabric Watch

This chapter includes the following sections:

- [“Introduction” on page 7-1](#)
- [“How Fabric Watch Works” on page 7-2](#)
- [“Using Fabric Watch” on page 7-2](#)
- [“Accessing Fabric Watch” on page 7-3](#)
- [“Viewing Alarms” on page 7-3](#)
- [“Configuring Threshold Boundaries and Alarms” on page 7-3](#)
- [“Configuring Email Alert” on page 7-4](#)
- [“Enabling and Disabling Thresholds” on page 7-4](#)
- [“Configuring Threshold Traits” on page 7-5](#)
- [“Viewing an Alarm Configuration Report” on page 7-5](#)

Introduction

Fabric Watch software monitors the performance and status of switches and can alert SAN administrators when problems arise. The real-time alerts from Fabric Watch software help SAN administrators solve problems before they become costly failures. Fabric Manager launches Advanced Web Tools to configure Fabric Watch, so the options that Fabric Manager provides depend on the individual switch and the firmware that runs on the switch. SAN managers can configure Fabric Watch software to monitor any of the following:

- fabric events (such as topology reconfigurations and zone changes)
- physical switch conditions (such as fan speeds, power supply status, and chassis temperature)
- port behavior and availability (such as state changes, errors, and performance)
- small form factor pluggables (SFPs)
- security events (violations and attempted violations)



Note

The switch must have a Fabric Watch license installed to use this feature.

Fabric Watch Terms

Table 7-1 lists and defines Fabric Watch terms.

Table 7-1 Fabric Watch Terms and Definitions

Term	Definition
threshold	A configuration of boundaries, traits, and alarms that determine when an event occurs and how Fabric Watch responds to the event.
boundary	A limit (high or low) on the acceptable value of a counter.
counter	The value of the behavior of an element. For instance, the temperature of an SFP or the number of CRC errors.
trait	Behavioral characteristic of a threshold.
alarm	Response to an event.
element	Any component or condition of a switch that Fabric Watch monitors.
event	Behavior of a counter that can trigger an alarm. The following events can trigger an alarm: <ul style="list-style-type: none"> • a counter value rises above a high boundary (above event) • a counter value falls below a low boundary (below event) • a counter value rises above or falls below a range of acceptable values (exceeded event) • the value of a counter changes (changed event) • a counter value returns from a value outside of an acceptable range to a value within the acceptable range (in-between event)

How Fabric Watch Works

With Fabric Watch software, SAN administrators can place limits, or *boundaries*, on the behavior of different switch and fabric *elements*. Fabric Watch then monitors these behavior variables, or *counters*, and can issue an alarm when a counter triggers an *event*. An alarm may email the SAN administrator or forward all error information to a proxy switch; the response depends upon how the administrator configures Fabric Watch.

Using Fabric Watch

To use Fabric Watch

- Choose elements that you want to monitor.

- Place limits on the acceptable values of those elements (configure threshold boundaries).

**Note**

This step applies only when you monitor counters that must remain within boundaries. If you want Fabric Watch to alert you whenever a counter changes, configure an alarm for a changed event.

- Choose if and how Fabric Watch alerts you to errant values (configure threshold alarms).
- Choose whether or not Fabric Watch continues to alert you to persistent errant values (configure threshold traits).
- Enable the thresholds that you configured (configure threshold traits).

Accessing Fabric Watch

To access Fabric Watch, perform the following steps:

1. Verify that the switch that you want to configure includes a Fabric Watch license. For more information, refer to [“Licensing” on page 5-1](#).
2. In the **SAN Elements** tab, click the switch that you want to configure.
3. From the **Actions** menu, select **Fabric Watch...** A separate browser window opens and prompts you to log into the switch. After you successfully log in, the Web Tools **Fabric Watch** window opens.

Viewing Alarms

To view Fabric Watch alarms, perform the following steps:

1. Launch Fabric Watch (refer to [“Accessing Fabric Watch” on page 7-3](#)).
2. In the **Fabric Watch** navigation tree, click the class that you want to check for alarms.
3. Click the **Alarm Notification** tab.
4. From the **Select Area** pulldown menu, select the area that you want to check for alarms. All alarms for that area appear. For troubleshooting responses to alarms, refer to the Fabric Watch documentation for your firmware.

Configuring Threshold Boundaries and Alarms

Configure Fabric Watch boundaries and alarms to designate the circumstances that trigger events and how Fabric Watch responds to those events. To configure threshold boundaries and alarms, perform the following steps:

1. Launch Fabric Watch (refer to [“Accessing Fabric Watch” on page 7-3](#)).
2. In the **Fabric Watch** navigation tree, click the class that you want configure.
3. Click the **Threshold Configuration** tab.

4. Click the **Area Configuration** subtab.
5. From the **Select Area** pulldown menu, select the area that you want to configure.
6. Enter custom values in the trait fields (such as **Unit**, **High**, and **Low**) in the **Boundary Settings (Default Settings in Parentheses)** partition.
7. From the **Select Boundary Level** pulldown menu in the **Boundary** partition, select **Custom**.
8. In the **Alarm Notification Mechanisms (Default Mechanisms in Parentheses)** partition, check the events that you want to trigger an alarm. You can choose from the following events:
 - Changed
 - Exceeded
 - Below
 - Above
 - In-Between

After you click an event, you can select alarms to notify you when the event occurs.

9. Check the checkbox of each alarm that you want to associate with the event(s) that you checked.
10. From the **Select Alarm Level** pulldown menu in the **Alarm Setting** partition, select **Custom**.
11. Click **Apply**.

For your alarms to function once you configure them, you must enable alarms (refer to [“Enabling and Disabling Thresholds” on page 7-4](#)).

Configuring Email Alert

To configure the Email Alert alarm, perform the following steps:

1. Launch Fabric Watch (refer to [“Accessing Fabric Watch” on page 7-3](#)).
2. Click the **Email Configuration** tab.
3. In the **Mail To:** field, enter the email address of the administrator who receives email alerts.
4. In the **Mail Status** partition, click the **Enabled** radio button, then click the **Apply** button.

Enabling and Disabling Thresholds

Perform the following steps to enable or disable alarms:

1. Launch Fabric Watch (refer to [“Accessing Fabric Watch” on page 7-3](#)).
2. In the **Fabric Watch** navigation tree, click the class with the alarms that you want to enable or disable.
3. Click the **Threshold Configuration** tab.
4. From the **Select Area** pulldown menu, select the area with the alarms that you want to enable or disable.
5. Click the **Element Configuration** subtab.

6. From the **Select Element** pulldown menu, select the element that you want to enable or disable.
7. In the **Status** partition, click the **Enabled** or **Disabled** radio button.
8. Click **Apply**. Advanced Web Tools enables or disable the element.

Configuring Threshold Traits

Configure threshold traits to designate if and when Fabric Watch monitors an element. To configure threshold traits, perform the following steps:

1. Launch Fabric Watch (refer to [“Accessing Fabric Watch” on page 7-3](#)).
2. In the **Fabric Watch** navigation tree, click the class that you want to configure to a different behavior.
3. Click the **Threshold Configuration** tab.
4. From the **Select Area** pulldown menu, select the area that you want to configure to a different behavior.
5. Click the **Element Configuration** subtab.
6. From the **Select Element** pulldown menu, select the element that you want to configure to a different behavior.
7. Click the **Triggered** radio button to configure triggered behavior or click the **Continuous** radio button to configure continuous behavior.

If you click the **Continuous** radio button, enter a time interval in the **Time Interval** pulldown menu, or select an interval from the pulldown menu.

8. Click **Apply**.

Viewing an Alarm Configuration Report

View an alarm configuration report to review information about Fabric Watch settings and thresholds. For detailed information on the configuration report, refer to [“Configuration Report Tab” on page I-5](#). To view the configuration report, perform the following steps:

1. Launch Fabric Watch (refer to [“Accessing Fabric Watch” on page 7-3](#)).
2. In the **Fabric Watch** navigation tree, click the class that you want to configure to a different behavior.
3. Click the **Threshold Configuration** tab.
4. From the **Select Area** pulldown menu, select the area that you want to view.
5. Click the **Configuration Report** subtab.

Call Home

This chapter includes the following sections:

- [“Introduction” on page 8-1](#)
- [“Configuring Call Home” on page 8-2](#)
- [“Editing Configurations” on page 8-3](#)
- [“Globally Enabling or Disabling Call Home” on page 8-4](#)

Introduction

The Call Home feature of Fabric Manager continuously monitors the status of switches and sends a “call home” email message to user-defined email addresses when a triggering condition occurs. Triggering conditions include the following:

- switch status change (consists of any change that registers in **switchstatuspolicyshow** command output)
- switch reboot
- switch unreachable (experiences a complete loss of connectivity)

Call Home, when enabled, automatically sends an email alert in the event of a status change or a reboot. You must configure Call Home to

- Send an alert when the host cannot contact the switch (“switch unreachable”).
- Use an external executable to send out alerts when an event occurs.

The Fabric Manager server monitors the switches that you have discovered, and you can use the Fabric Manager client to configure

- Which switches to monitor.
- Global Call Home functionality.

The email alert from Call Home includes the following information:

- reason for call
- brief description of failure
- switch(es) on which event occurred (provides name, IP address for Ethernet and Fibre Channel, and WWN)
- domain ID of the switch
- switch type
- factory serial number of the switch

- supplier serial number of the switch
- firmware version
- switch status and state

The Call Home email alert contains an attachment that includes the following information:

- detailed switch information
- 100 most recent events from the event log

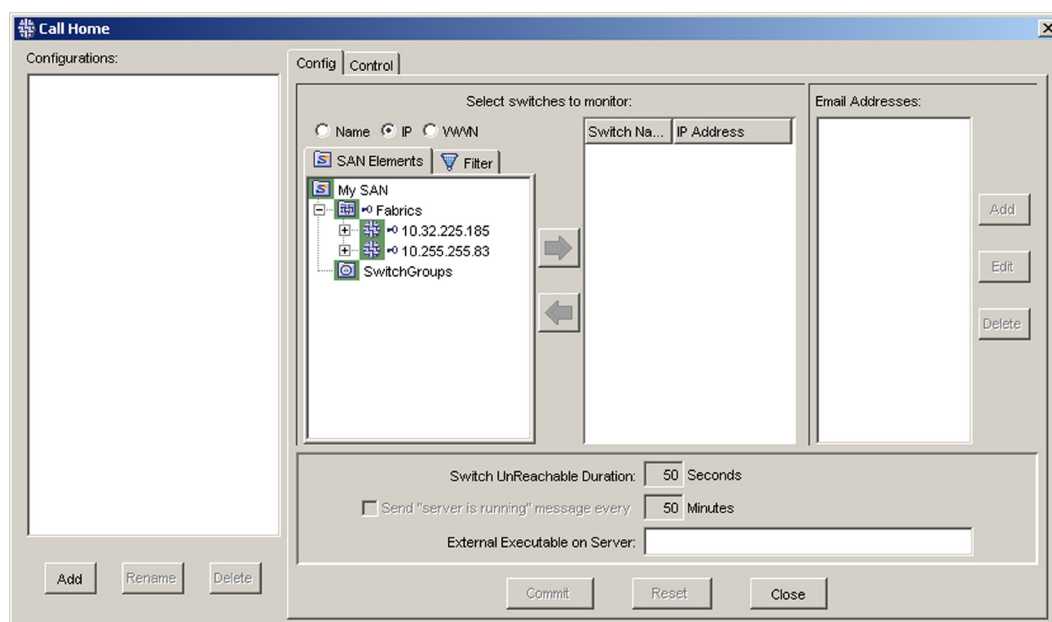
Configuring Call Home

Call Home configurations act independently of each other. No configuration ever impacts another configuration.

To configure Call Home, perform the following steps:

1. From the **Tools** menu, select **Call Home**.

Example



2. From the **SAN Elements** tab, select the switches that you want to monitor with Call Home and click the right-pointing arrow to move them to the central window.
3. Under the **Configurations** field on the left-hand side of the display, click **Add**. A **Call Home** dialog opens.
You do not need to include any email addresses if you opt to configure an external executable (step 9).
4. In the **Enter a configuration name field**, enter a name for your new configuration and click **OK**.
5. In the **Email Addresses** partition of the display, click the **Add** button. A **Call Home** dialog opens.
6. In the **Enter an email address field**, enter the email address that you want Call Home to send mail to when an event occurs.

7. In the **Switch UnReachable Duration** field, enter how long (in seconds) the server must fail to contact the switch before Call Home sends an email alert. The duration defaults to 50 seconds. Fabric Manager does not accept a value less than 40 seconds.
8. (Optional) Click the checkbox to prompt the server to send you a “server is running” message at intervals, and configure the time interval between messages. These messages let you know that Call Home continues to function properly. The interval defaults to one minute. Fabric Manager does not accept a value of less than 1 minute.
9. (Optional) In the **External Executable on Server** field, enter a path to an executable that resides on the Fabric Manager server to run that script when Call Home sends an email alert. For more information, refer to [“Call Home External Executable Reference” on page J-1](#).
10. Click **Commit**. You cannot commit a configuration until you add at least one switch ([step 2](#)) and either one email address ([step 5](#)) or the path of an external executable ([step 9](#)).

Editing Configurations

At any time you can edit a Call Home configuration. Any change that you make applies at the moment you commit the change. To edit a Call Home configuration, perform the following steps:

1. From the **Tools** menu, select **Call Home**. The **Call Home** window opens.
2. Click a configuration in the **Configurations** field.
3. Perform any of the following changes:
 - a. Click the **Reset** button to restore the Call Home configuration displayed in the client UI to what was originally pulled from the server.
 - b. Click the **Rename** button to change the name the configuration.
 - c. Click the **Delete** button below the **Configurations** field to delete the configuration.
 - d. Add or remove switches from the **Select Switches to monitor** field.
 - e. Add, edit, or remove email addresses from the **Email Addresses** field.
 - f. Reconfigure the **Switch UnReachable Duration** field.
 - g. Reconfigure the **Send “server is running” message every** options.
 - h. Configure an external executable



Note

At any point before you commit changes, you can click the **Reset** button to undo all the changes that you made since you last committed the configuration.

4. Click **Commit**.

Globally Enabling or Disabling Call Home

To globally enable or disable Call Home, perform the following steps:

1. From the **Tools** menu, select **Call Home**.
2. Click the **Control** tab.
3. Click **Enable** or **Disable**. This action processes on the server immediately.

Note: Fabric Manager enables Call Home by default on the Fabric Manager server. However, you must configure the client to select fabrics to monitor before the Call Home server can monitor switches.

Security Management

This chapter includes the following sections:

- [“Introduction” on page 9-1](#)
- [“Administering Security with Fabric Manager” on page 9-3](#)
- [“Viewing and Configuring Security Policy Options” on page 9-3](#)
- [“Adding a Switch to a Secure Fabric” on page 9-4](#)
- [“Configuring SCC Policy Options” on page 9-4](#)
- [“Configuring FCS Options” on page 9-5](#)
- [“Configuring Telnet Policy Options” on page 9-5](#)
- [“Configuring RSNMP Policy Options” on page 9-6](#)
- [“Configuring WSNMP Policy Options” on page 9-6](#)
- [“Configuring HTTP Policy Options” on page 9-7](#)
- [“Configuring API Policy Options” on page 9-7](#)
- [“Configuring DCC Policy Options” on page 9-8](#)
- [“Configuring SES Policy Options” on page 9-8](#)
- [“Configuring MS Policy Options” on page 9-9](#)
- [“Configuring Serial Policy Options” on page 9-9](#)
- [“Configuring Front Panel Policy Options” on page 9-10](#)
- [“Configuring No Node WWN Zoning” on page 9-10](#)
- [“Changing the FCS or Non-FCS Admin Security Password” on page 9-11](#)

Introduction

Fabric Manager provides a GUI interface to manage security once you enable security with command-line commands. For Fabric Manager to access secure switches, you must configure your security policies (at the command line) as follows:

- You must add the IP address of any host that runs the Fabric Manager server to the IP policy of your fabric. The server cannot communicate with the fabric if you do not include this IP address. (This holds true whether or not the machine also runs the Fabric Manager client.)
- You must add every client that you want to run the API to the API policy of your fabric.

Fabric Manager lets you configure SAN security to restrict sensitive operations to a few “trusted” switches. It allows administrators to designate a small number of switches, known as Fabric Configuration Servers (FCS), to perform fabric-wide management operations. Security acts on a policy basis, which means you can selectively choose what functionality a switch can access.

You can configure numerous aspects of security with Fabric Manager in the **Security Admin** window. The Security Admin window is displayed in [Figure 9-1](#).

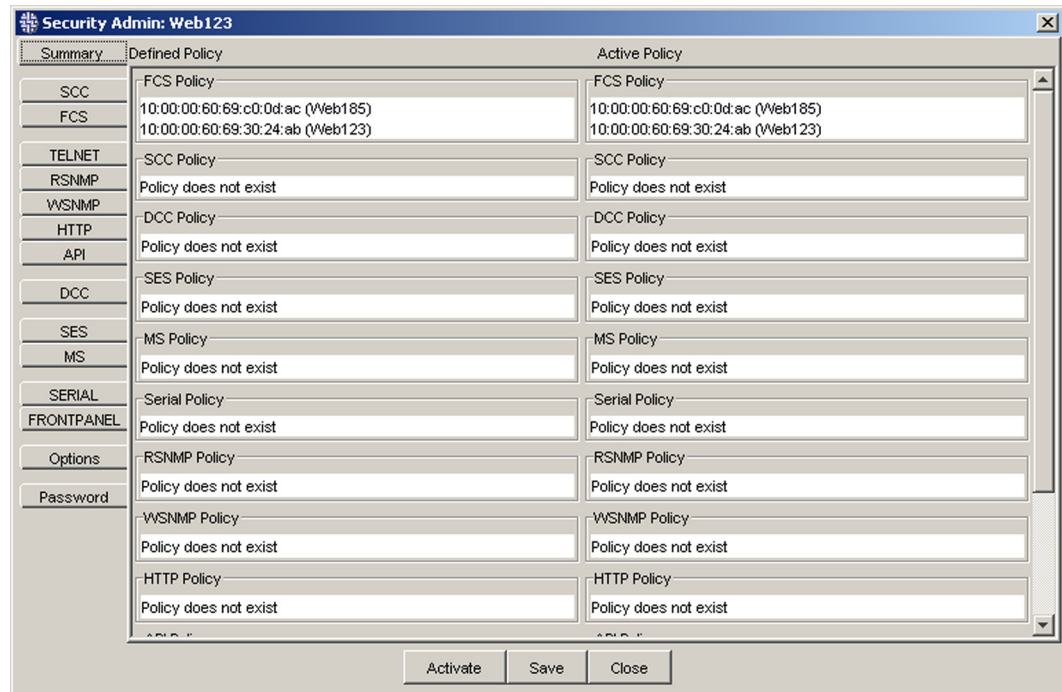


Figure 9-1 Security Admin Window

For detailed information on security, refer to the *Secure Fabric OS User's Guide*.

Some secure areas have certain requirements, as listed in [Table 9-1](#).

Table 9-1 Secure Area Requirements

Secure Area	Requirement(s)
API	Requires IP Address of a management workstation.
FRONTPANEL	None.
HTTP	Requires IP Address of a management workstation.
MGT_SERVER	None.
SERIAL	None.
SES	None.
SNMP-RO	Requires IP Address of a management workstation.
SNMP-RW	Requires IP Address of a management workstation.
TELNET	Requires IP Address of a management workstation.

Configuring switch permissions is a fabric-wide operation, not a switch-by-switch operation, and applies to secure switches only.

Administering Security with Fabric Manager

To administer security with Fabric Manager

1. Enable security on a fabric.
2. Administer the following options:
 - Create, remove, or add switch members in the Switch Connection Controls (SCC) policy.



Note

Policies (other than the FCS) do not exist until they are created and populated with switches.

- Add, remove, or move FCS members
- Add or remove switches from the Telnet, RSNMP, WSNMP, HTTP, and API policies.
Remove all switches to shut down an access method.
- For device connection control (DCC) policies, configure multiple policies with unique names.

Viewing and Configuring Security Policy Options

To configure security on a secure fabric, perform the following steps:

1. Log in to the primary FCS of the secure fabric that you want to configure.
2. From the **SAN Elements** tab, select the fabric that you want to secure.
3. From the **Actions** menu, select **Security**. The **Security Admin** window appears.
4. Select the **Summary** tab to view your defined policies and active policies.

When you make changes in the Security Admin window, you have the option to click **Apply** to activate your changes, or **Save** to store your updates but not activate them.

Adding a Switch to a Secure Fabric

To add a switch to a secure fabric, you must define that switch in the SCC policy. The SCC policy defines all switches in the fabric (FCS and non-FCS). You cannot add a new switch to a fabric if you do not add that switch to the SCC policy.

To add a switch to a secure fabric:

1. From the **SAN Elements** tab, choose the fabric that you want to secure.
2. From the **Actions** menu, select **Security**.
3. Select the **SCC** tab.

4. Enter the new switch WWN in the empty field.
When switches already exist in the fabric, you can specify a "*" (do not include quotes) in place of a switch WWN. When added, the "*" will expand to include all switches in the fabric.
5. Select **Add Switch** > to move the switch to the **Fabric Switches** window.
6. Select **Activate** to add the new switch to secure fabric, implement the security policy, and exit the window.

Configuring SCC Policy Options

The SCC policy defines all switches in the secure fabric (FCS and non-FCS). You cannot add a new switch to a secure fabric without adding the switch to the SCC policy.

To create an SCC policy:

1. From the **Security Admin** window, click the Switch Connection Controls (SCC) tab.
2. Click **Create Policy**. The WWN of all current switches in the fabric appears in the **Fabric Switches** field.
3. In the **Enter New Switch WWN** field, enter the WWN of a switch that you want to include in the policy, or enter * to add all switches in the fabric.
4. Click the **Add Switch** > button.



Note

All switches within a fabric must be included in the SCC policy or else the excluded switches will be segmented out into their own fabric.

5. Repeat [step 3](#) and [step 4](#) to add more switches.
6. Click **Save** to save your changes but not apply them, or click **Activate** to save and apply your changes.

To edit a SCC policy, click the **SCC** tab perform any of the following actions:

- To delete the policy, click **Delete Policy**.
- To add WWNs to the policy, enter the WWN of another switch in the **Enter New Switch WWN** field and click **Add Switch**>. Repeat this step for every WWN that you want to add.
- To remove WWNs from the policy, click a WWN in the **Fabric Switches** field, then click < **Remove Switch**.

Configuring FCS Options

Switches in your FCS policy serve as "trusted switches." The first switch in the policy serves as the primary FCS (from which you can configure your fabric), and each subsequent switch serves as a backup FCS. The order in which switches appear in the policy represents the order in which each backup switch will take over as primary FCS if the preceding primary FCS fails. To add an FCS to your fabric, perform the following steps:

1. From the **Security Admin** window, click the Fabric Configuration Servers (**FCS**) tab.
2. Select a switch from the **Available Switch List** column and use the **Add FCS** button to add it to the **FCS Switch List**. The switches appear in the order in which they will become a primary FCS switch if the primary FCS fails.
3. Optionally, click **Add Others...** to open the **Enter WWN** dialog. Enter a switch WWN in this dialog to add the switch to the **FCS Switch List**.



Note

Changing the Primary FCS causes updates in the fabric that might take time to complete, depending on the fabric size.

4. Click **Save** to save your changes but not apply them, or click **Activate** to apply your changes. After clicking **Save** or **Activate**, the **Security Policy Review** dialog displays.
5. After reviewing the security policy, click
 - **Continue** to continue applying your changes.
 - **Cancel** to cancel your changes.
 - **Copy to File** to copy the Security Policy to a file.

To make changes to your FCS Switch List, perform any of the following actions:

- To remove a switch from the FCS list, click the WWN of a switch in the FCS Switch List and click **< Remove FCS**.
- To change the order of the FCS switches (to determine which switch will become the next primary FCS), click a switch and click the up or down buttons beneath the **FCS Switch List** field.

Configuring Telnet Policy Options

The telnet policy contains a list of IP addresses and/or subnets that can establish telnet connections to any switch in the fabric. Telnet attempts from any IP address or subnet that does not appear in the policy will fail. If you create an empty policy, you prevent all telnet access to your fabric. To create a telnet policy, perform the following steps:

1. Click the **TELNET** tab in the **Security Admin** window.
2. Click **Create Policy**.
3. Type the IP address of a host that you want to include in the policy in the **Enter IP Address** field.
4. Click **Add IP**. The IP address appears in the **Permitted Access Points** field.
5. Click **Save** to save your changes but not apply them, or click **Activate** to apply your changes.

To make changes to your telnet policy, perform any of the following actions:

- To remove a switch from the **Permitted Access Points** field, click the IP address of a switch in the field and click **< Remove IP**.
- To delete the telnet policy, click **Delete Policy**.

Configuring RSNMP Policy Options

Configure the RSNMP policy to limit SNMP access to specific, trusted management stations in your environment. You cannot create a RSNMP policy without a WSNMP policy already present.

To create a RSNMP policy, perform the following steps:

1. Click the **RSNMP** tab in the **Security Admin** window.
2. Click **Create Policy**.
3. Type the IP address of a host that you want to include in the policy in the **Enter IP Address** field.
4. Click **Add IP**. The IP address appears in the **Permitted Access Points** field.
5. Click **Save** to save your changes but not apply them, or click **Activate** to apply your changes.

To make changes to your RSNMP policy, perform any of the following actions:

- To remove a switch from the **Permitted Access Points** field, click the IP address of a switch in the field and click **Remove IP**.
- To delete the RSNMP policy, click **Delete Policy**.

Configuring WSNMP Policy Options

Configure the WSNMP policy to limit SNMP access to specific, trusted management stations in your environment. When you add a member to the WSNMP policy, that member automatically gains RSNMP access.

To create a WSNMP policy, perform the following steps:

1. Click the **WSNMP** tab in the **Security Admin** window.
2. Click **Create Policy**.
3. Type the IP address of a host that you want to include in the policy in the **Enter IP Address** field.
4. Click **Add IP >**. The IP address appears in the **Permitted Access Points** field.
5. Click **Save** to save your changes but not apply them, or click **Activate** to apply your changes.

To make changes to your WSNMP policy, perform any of the following actions:

- To remove a switch from the **Permitted Access Points** field, click the IP address of a switch in the field and click **< Remove IP**.
- To delete the WSNMP policy, click **Delete Policy**.

Configuring HTTP Policy Options

Configure the HTTP policy to grant access to IP addresses and/or subnets so they can establish HTTP connections to the switches in the fabric.



Note

The IP address of your Fabric Manager client must appear in this policy or you cannot access the fabric with Fabric Manager.

To create a HTTP policy, perform the following steps:

1. Click the **HTTP** tab in the **Security Admin** window.
2. Click **Create Policy**.
3. Type the IP address of a host that you want to include in the policy in the **Enter IP Address** field.
4. Click **Add IP >**. The IP address appears in the **Permitted Access Points** field.
5. Click **Save** to save your changes but not apply them, or click **Activate** to apply your changes.

To make changes to your HTTP policy, perform any of the following actions:

- To remove a switch from the **Permitted Access Points** field, click the IP address of a switch in the field and click **< Remove IP**.
- To delete the HTTP policy, click **Delete Policy**.

Configuring API Policy Options

Create an API policy to control the workstations that can use the API to write to the fabric.



Caution

If you use Fabric Manager to update the API policy to disable API access from the current host (either by creating an empty policy, or by specifically excluding this host from the API policy list), the security transaction will be locked and can take up to two hours before Fabric OS releases the security transaction. You cannot modify the policies until the security transaction is released.

To create a API policy, perform the following steps:

1. Click the **API** tab in the **Security Admin** window.
2. Click **Create Policy**.
3. Type the IP address of a switch that you want to include in the policy in the **Enter IP Address** field.
4. Click **Add IP >**. The IP address appears in the **Permitted Access Points** field.
5. Click **Save** to save your changes but not apply them, or click **Activate** to apply your changes.

To make changes to your API policy, perform any of the following actions:

- To remove a switch from the **Permitted Access Points** field, click the IP address of a switch in the field and click **< Remove IP**.
- To delete the API policy, click **Delete Policy**.

Configuring DCC Policy Options

Configure DCC policies to bind device ports to specific switch ports. With Fabric Manager, you can create and configure multiple DCC policies with unique names. Populate DCC policies with switch and device WWNs. To create a DCC policy, perform the following steps:

1. From the **Security Admin** window, click the **DCC** tab.
2. Click the **Create Policy** button. The **Enter DCC Policy** dialog box appears.
3. In the **Enter Policy Name** field, enter a name for a new policy and click **Create**. The name appears in the **Policy** pulldown menu.
4. Use the **Add member >**, **< Remove member**, and **Add Device WWN...** buttons to populate the policy.



Note

To add a WWN that does not appear in the Switches and Devices tab, click **Add Device WWN** and enter the WWN you want to add.

5. Click **Save** to save your changes but not apply them, or click **Activate** to apply your changes.

To make changes to your DCC policies, perform any of the following actions for each individual DCC policy:

- To remove a DCC policy, select the policy from the **Policy:** pulldown menu and click the **Delete Policy** button.
- To rename a DCC policy, select the policy from the **Policy:** pulldown menu and click the **Rename Policy** button.
- To change the contents of a DCC policy, select the policy from the **Policy:** pulldown menu, then select WWNs from the appropriate window and click the **Add member >** button to add the WWN or **< Remove member** button to remove the WWN from the policy. To add a WWN that does not appear in the **Switches and Devices** tab, click the **Add Device WWN...** button and enter the WWN that you want to add.

Configuring SES Policy Options

Create an SES policy to allow device ports to access SES. With Fabric Manager, you can create and configure multiple SES policies with unique names. Populate SES policies with switch and device WWNs. SES and MS policies are device-based.

To create a SES policy, perform the following steps:

1. From the **Security Admin** window, click the **SES** tab.
2. Click **Create Policy**. The WWN of a device that connects to the fabric appears in the **Permitted Access Points** field.
3. Select a device from the **Permitted Access Points** field.
4. Select the **Add Device >** button.
5. Click **Save** to save your changes but not apply them, or click **Activate** to apply your changes.

To make changes to your SES policy, perform any of the following actions:

- To delete the policy, click the **Delete Policy** button.
- To add a device to the policy, click the device in the **Available Access Points** field, then click the **Add Device >** button. (Click the **Save** or **Activate** button as appropriate.)
- To remove a device from the policy, click the device in the **Permitted Access Points** field, then click the **< Remove Device** button. (Click the **Save** or **Activate** button as appropriate.)

Configuring MS Policy Options

Create a MS policy to allow trusted fabric-connected devices to access the management server. With Fabric Manager, you can create and configure multiple MS policies with unique names. Populate MS policies with switch and device WWNs. MS and MS policies are device-based. To create a MS policy, perform the following steps:

1. From the **Security Admin** window, click the **MS** tab.
2. Click **Create Policy**. The WWN of a device that connects to the fabric appears in the **Permitted Access Points** field.
3. Select a device from the **Permitted Access Points** field.
4. Select the **Add Device >** button.
5. Click **Save** to save your changes but not apply them, or click **Activate** to apply your changes.

To make changes to your MS policy, perform any of the following actions:

- To delete the policy, click the **Delete Policy** button.
- To add a device to the policy, click the device in the **Available Access Points** field, then click the **Add Device >** button. (Click the **Save** or **Activate** button as appropriate.)
- To remove a device from the policy, click the device in the **Permitted Access Points** field, then click the **< Remove Device** button. (Click the **Save** or **Activate** button as appropriate.)

Configuring Serial Policy Options



Caution

If you create either

- empty policies in the serial, telnet, HTTP, and API policies simultaneously or
- policies without Fabric Manager Client/Server IP addresses,

you can no longer manage security.

Create a serial policy to grant serial port access to specific switches. To create a serial policy, perform the following steps:

1. From the **Security Admin** window, click the **SERIAL** tab.
2. Click **Create Policy**. You have now created an empty policy, which denies serial access to *all switches in the fabric*.
3. Click a switch in the **Available Access Points** field and click **Add Switch >** to add it to your policy. Repeat this step for each switch that you want to add.

4. Click **Save** to save your changes but not apply them, or click **Activate** to apply your changes.

To make changes to your serial policy, perform any of the following actions:

- To delete the policy, click the **Delete Policy** button.
- To add a switch to the policy, click the switch in the **Available Access Points** field, then click the **Add Switch >** button. (Click the **Save** or **Activate** button as appropriate.)
- To remove a switch from the policy, click the switch in the **Permitted Access Points** field, then click the **< Remove Switch** button. (Click the **Save** or **Activate** button as appropriate.)

Configuring Front Panel Policy Options

Configure the front panel policy to enable front panel access to specific Silkworm 2800 switches. To create a front panel policy, perform the following steps:

1. From the **Security Admin** window, click the **FRONTPANEL** tab.
2. Click **Create Policy**. You have now created an empty policy, which denies front panel access to *all switches in the fabric*.
3. Click a switch in the **Available Access Points** field and click **Add Switch >** to add it to your policy. Repeat this step for each switch that you want to add.
4. Click **Save** to save your changes but not apply them, or click **Activate** to apply your changes.

To make changes to your front panel policy, perform any of the following actions:

- To delete the policy, click the **Delete Policy** button.
- To add a switch to the policy, click the switch in the **Available Access Points** field, then click the **Add Switch >** button. (Click the **Save** or **Activate** button as appropriate.)
- To remove a switch from the policy, click the switch in the **Permitted Access Points** field, then click the **< Remove Switch** button. (Click the **Save** or **Activate** button as appropriate.)

Configuring No Node WWN Zoning

Fabric Manager provides a tab that lets you enable or disable No Node WWN Zoning. When you enable this feature, security becomes port-oriented. Devices have port and node WWNs. When you disable node zoning, you ensure that devices with multiple ports cannot access secure fabrics with node WWNs. You must add individual port WWNs to your policies for devices to access your secure fabric. To configure No Node WWN Zoning, perform the following steps:

1. From the **Security Admin** window, click the **Options** tab.
2. To enable No Node WWN Zoning, check the **No Node WWN Zoning** box; to disable, uncheck the **No Node WWN Zoning** box.
3. Click **Save** to save changes without activating the defined policy; click **Activate** to save changes and activate the defined policy.

Changing the FCS or Non-FCS Admin Security Password

To change the password that implements security, perform the following steps:

1. From the **Security Admin** window, click the **Password** tab.
2. In the **FCS Administrator Password** field, enter the appropriate password.
3. In the **New Password** field, enter your new password.
4. In the **Verify** field, enter your new password again.
5. Select **FCS Switches** to change the admin password for Secure FCS switches only.
Select **Non-FCS Switches** to change the admin password for Secure Non-FCS switch only.
6. Click **Change Password**.

Telnet

The Telnet-to-FCS option is only accessible for a secure fabric when that fabric is selected in the **SAN Elements** tab; when a nonsecure fabric is selected, only the default Telnet option is accessible from the **Actions** menu.

SecTelnet is launched instead of the default telnet client for fabrics running a secure firmware version.

Opening a Telnet Session for a Secure Fabric

To open a telnet session for a secure fabric, perform the following steps:

1. Select a secure fabric from the **SAN Elements** tab.
2. Select **Telnet to FCS** from the **File** menu (or click the Telnet icon from the toolbar when in the Detail View). The SecTelnet prompt appears.

You can also launch a telnet session by right-clicking a switch from the **SAN Elements** tab.

3. Log in as usual with your Login ID and password.



Note

If a SecTelnet session is already active on a secure switch running firmware versions v2.6.x or 3.1.0 and you attempt to launch a new session, you will receive the message, "Sorry, this system is engaged." You must close the open telnet session and relaunch telnet for the secure switch.

Downloading Firmware

This chapter includes the following sections:

- [“Introduction” on page 10-1](#)
- [“Performing a Firmware Download to Multiple Switches” on page 10-2](#)

Introduction

Perform a firmware download with Fabric Manager to concurrently download firmware to multiple switches and (optionally) reboot the switches simultaneously. Before you download firmware, verify that your task meets the following requirements:

- All switches that you choose to upgrade can run the firmware that you plan to download.
- All switches that you choose to simultaneously reboot reside on the same fabric.
- Ports 20 and 21 must be available for the firmware download to function correctly.

When you upgrade firmware from v3.0.0/4.0.0 to v3.1.0/4.1.0, any port name changes that you have made in Fabric Manager are lost; this ensures that multiple Fabric Manager clients that are simultaneously active during the firmware upgrade do not overwrite each other's port names.

When you download firmware to multiple switches at once and then reboot the switches simultaneously, you use less time than if you update your switches individually.

Performing a Firmware Download to Multiple Switches

To download firmware to multiple switches, perform the following steps:

1. Log-on to the switches that you want to upgrade. For more information, refer to [“Logging In to Multiple Switches Simultaneously”](#) on page 3-6.
2. From the **Tools** menu, select **Firmware download to switches...** The **Firmware download to switches** window opens. This window is displayed in [Figure 10-1](#).

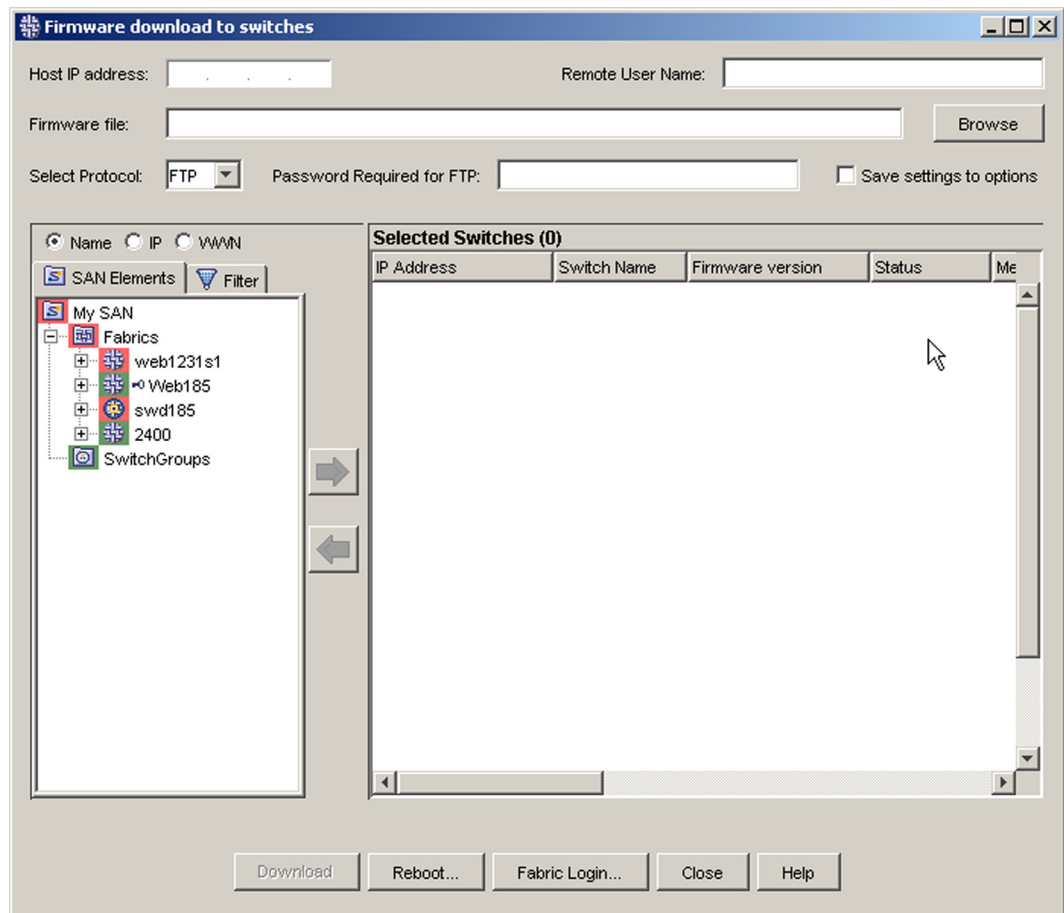


Figure 10-1 Firmware Download to Switches Window

3. In the **Host IP address** field, enter the IP address of the FTP server with the firmware file. If you have not configured file transfer options, check the **Save settings to options** checkbox to save your FTP settings as your file transfer options. For more information, refer to [“Configuring File Transfer Options”](#) on page 3-14.



Note

You must click **Download** to commit the file transfer options. If for any other reason you close this window, the file transfer options will not apply.

4. In the **Remote User Name** field, enter your user ID for the FTP server.

5. In the **Firmware file** field, enter the path and name of the firmware file (in UNIX format), or click **Browse** to navigate to the file.
6. From the **Select Protocol** pulldown menu, select **FTP**.
7. In the **Password Required for FTP** field, enter your password.
8. From the **SAN Elements** tab, select the switches that you want to upgrade and move them to the **Selected Switches** window. You can
 - Navigate to a switch, click the switch, then click the right-pointing arrow.
 - Click-and-drag a switch from the **SAN Elements** tab to the **Selected Switches** window.
 - Press-and-hold **Ctrl**, click multiple switches, and click the right-pointing arrow.
 - Press-and-hold **Ctrl**, click multiple switches, and click-and-drag the switches from the **SAN Elements** tab to the **Selected Switches** window.
 - Click-and-drag a fabric to the **Selected Switches** window to move add all of the switches in that fabric to the **Selected Switches** window.

**Note**

You can only perform a multiple switch firmware download to a maximum of 5 switches running versions of Fabric Manager prior to v4.1.0.

In addition, if you want to download firmware to a dual-switch chassis, *you can only download firmware to one logical switch at a time*. Furthermore, you only need to download the firmware to one logical switch in a dual-switch chassis. If you add both of the logical switches in a chassis to the **Selected Switches** window, you will receive an error prompt when you click **Download**.

9. Click **Download**. When the download completes, click **Reboot...** to open the **Sequenced Reboot** window.

**Note**

If the switch loses network connectivity during the firmware download from Fabric Manager, the firmware download action will time out after 25 minutes for switches running firmware v2.x/3.x and after 80 minutes for switches running firmware v4.x.

No error message is returned when the firmware download process gets interrupted.

Controlling Firmware Download Reboots

Switches do not automatically reboot after you perform a firmware download. Fabric Manager gives you the opportunity to create a download sequence so you can control the order in which the switches reboot. For more information, refer to [“Performing a Sequenced Reboot” on page 16-3](#).

ISL Checking

This chapter includes the following sections:

- [“Introduction” on page 11-1](#)
- [“Assigning Color Status Settings” on page 11-2](#)
- [“Enabling and Disabling ISL Checking” on page 11-3](#)
- [“Updating ISL Checking \(Stamp/Restamp\)” on page 11-3](#)
- [“Incorporate Adds into a Stamp” on page 11-3](#)
- [“Monitoring ISL Changes” on page 11-4](#)

Introduction

Enable Inter-Switch Link (ISL) Checking to monitor any changes to your ISL topology. When you enable ISL Checking, Fabric Manager takes a snapshot, or *stamp*, of your ISLs. Whenever you add, remove, or change an ISL, Fabric Manager compares the change to the stamp and triggers an event when mismatches occur. Events change the color and status of related icons in the Fabric Manager display and create log entries. ISL Checking monitors the following:

- when you add a new ISL to the fabric
- when you remove an ISL from the fabric
- when you remove all ISLs between two switches in a fabric
- when you plug an existing ISL into a different port on the same switch

You can set up Fabric Manager to monitor ISL status. This feature is called ISL Checking. When ISL Checking is enabled, Fabric Manager;

- Records changes in ISL status in the Status Reason of the Event Log.
- Displays changes in the Topology View (links and switch nodes change color according to status).

ISL events are displayed in the **Status Reason** portion of the **Event** view.

When you activate ISL Checking, Fabric Manager takes a "stamp" of your topology so it can compare changes and register events. If you make permanent changes that do not match the "stamp," you must restamp the fabric so that Fabric Manager can match your topology against the correct baseline.

Before enabling ISL Checking, configure ISL Checking options to assign an alarm status level to each ISL Checking event.

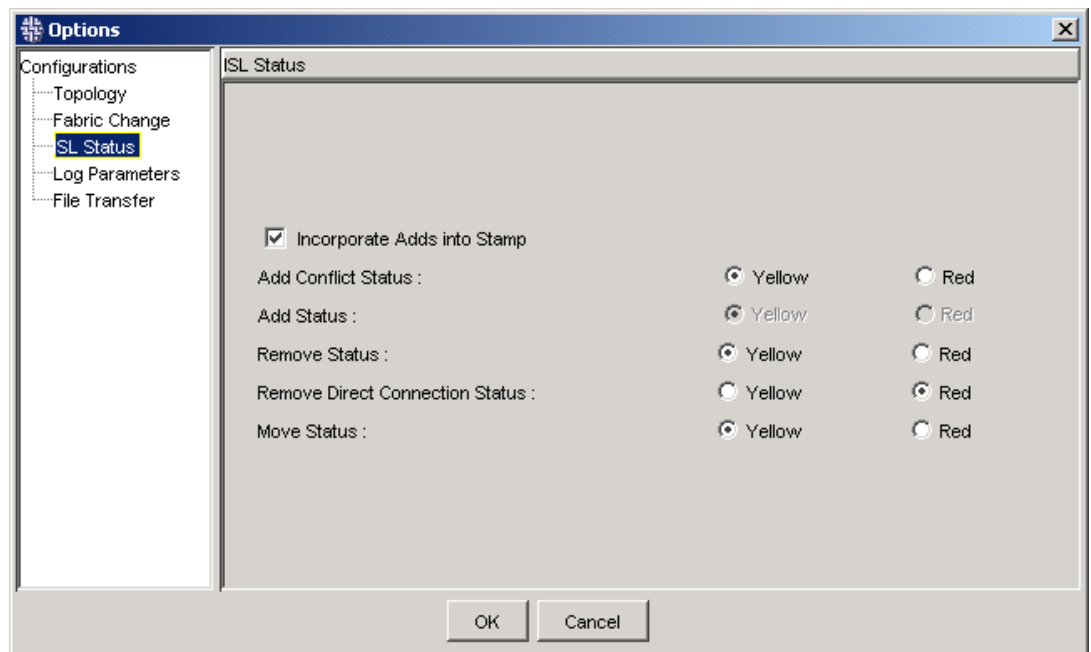
Assigning Color Status Settings

Before you enable ISL Checking, configure ISL Checking options to assign an alarm status level to each ISL Checking event. For more information on the individual ISL Checking options, refer to “[ISL Status Options](#)” on page A-9.

When an event occurs, the appropriate element changes to the color that you assign. To assign color status, perform the following steps:

1. From the **File** menu, select **Options...** The **Options** window opens.
2. Click the **ISL Status** branch in the **Configurations** navigation tree. ISL Status options appear in the window.

Example



Note

The Remove Direct Connection Status level must always be the same as or higher status than the Remove Status level.

3. Click the buttons that assign the colors that you choose; then click **OK**.

Enabling and Disabling ISL Checking

To enable or disable ISL Checking, perform the following steps:

1. Assign color status settings. For more information, refer to [“Assigning Color Status Settings” on page 11-2](#).
2. In the **SAN Elements** tab, click the fabric that you want to check or no longer want to check.
3. From the **Actions** menu, select **ISL > ISL Checking**. A checkmark appears next to **ISL Checking** to indicate that you have enabled it. The checkmark will disappear when you disable it.

When you enable ISL Checking on a fabric, a gold center appears on the icon of the fabric in the **SAN Elements** tab. When you disable ISL Checking, the gold center disappears.

4. Select **Fabric Events** from the **Actions** menu to view ISL status changes within the fabric.

There is a 10 second delay in posting ISL status information.

Updating ISL Checking (Stamp/Restamp)

When you activate ISL Checking, Fabric Manager takes a stamp of your topology so it can compare changes and register events. If you make permanent changes that do not match the stamp, you must restamp the fabric so that Fabric Manager knows to match your topology against the correct baseline.

Stamps take snapshots of domain IDs, so if you change the domain ID of a switch, a remove event occurs and you must restamp the fabric.

To restamp your fabric, perform the following steps:

1. In the **SAN Elements** tab, click the fabric that you want to restamp.
2. From the **Actions** menu, select **ISL > Restamp**.

Incorporate Adds into a Stamp

ISL Checking gives you the opportunity to automatically incorporate new ISLs into the stamp (including if you add new ISLs to switches that did not connect to the fabric before). To incorporate new ISLs and switches into your stamp when you add them to your fabrics, perform the following steps:

1. From the **File** menu, select **Options...** The **Options** window opens.
2. Click the **ISL Status** branch in the **Configurations** navigation tree. ISL Status options appear in the window.
3. Click the **Incorporate Adds into Stamp** checkbox and click **OK**.

Monitoring ISL Changes

When your fabric experiences a change that triggers an ISL Checking event, Fabric Manager changes the color (as per your configuration) of appropriate icons to alert you. You can investigate the status change with Event view and Topology view.

ISL Changes and Event View

The **Current Status Reason** window displays each switch that changed from HEALTHY/OK status to any other status level. The window includes the new status of each switch and the reason that the status changed. The **Event Log** window appears on the bottom half of the display and includes events that preceded the status change. [Figure 11-1](#) reflects ISL Checking color changes in Event view.

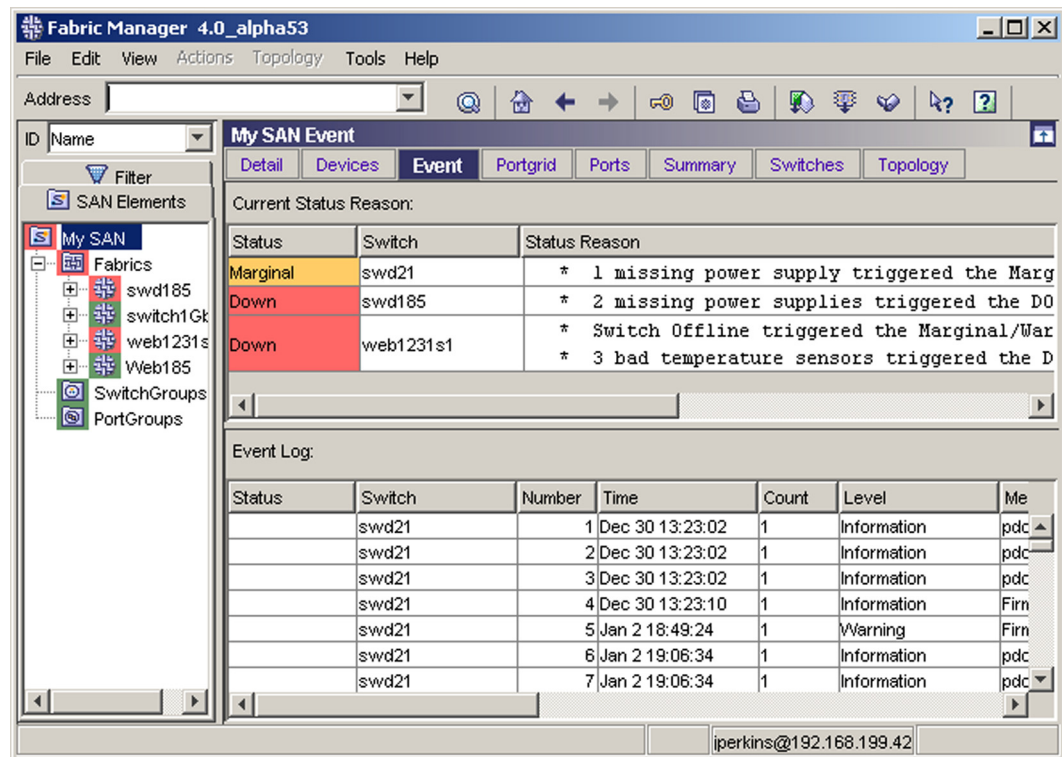


Figure 11-1 ISL Checking Status in Event View

ISL Changes and Topology View

When you enable Fabric Checking, the nodes, links, and link bundles in Topology view change color to reflect your ISL Checking color status settings.



Note

When a direct connect remove event occurs, Topology view does not change color reflect an ISL event because the ISL no longer appears.

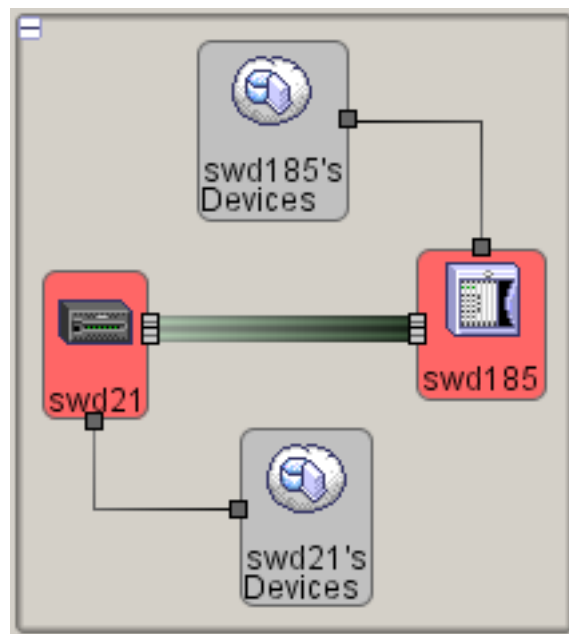


Figure 11-2 ISL Checking Status in Topology View

Fabric Checking

This chapter includes the following sections:

- [“Introduction” on page 12-1](#)
- [“Enabling Fabric Checking on a Fabric” on page 12-2](#)
- [“Resetting Fabric Checking” on page 12-2](#)
- [“Automatically Enabling Fabric Checking on All Fabrics” on page 12-3](#)
- [“Disabling Fabric Checking” on page 12-3](#)
- [“Monitoring Fabric Checking in Topology View” on page 12-4](#)
- [“Setting Up Fabric Change Handling” on page 12-5](#)

Introduction

You can configure the Fabric Checking feature to monitor the fabric and register events when you add switches to or remove switches from the fabric. When you add or remove a switch from a selected fabric, Fabric Checking adds an entry to the switch event log and changes the status color of the fabric. You can configure Fabric Checking to ignore additions to the fabric, but the software always registers an event when you remove a switch.

You can select what you would like to be notified of using the Fabric Change Handling option:

- If Fabric Change Handling is set to check for lost and added switches, the added switch appears in Event Log Status Reason with a red event and the fabric also turns red in the **Topology** view.
- If Fabric Change Handling is set to check for lost switches, the removed (lost) switch remains in the fabric but appears as a "ghost" switch. It is also segmented into its own fabric.



Note

Fabric Checking monitors *switches* (not devices) removed from and added to a fabric.

Fabric Manager polls the fabric every fifteen seconds to determine if the fabric has changed. [Table 12-1](#) lists the changes that Fabric Checking monitors and describes how the software responds to the change.

Table 12-1 Fabric Checking Alerts

Change	Response
switch disconnects from fabric	<p>Fabric Manager creates a “ghost” switch image that lasts until you restore the switch to the fabric or disable Fabric Checking. The following actions take place to represent the changes in Fabric Manager:</p> <ul style="list-style-type: none"> • Fabric Manager adds an entry to the switch event log stating that the switch has been removed from the fabric. • Fabric Manager changes the status color of the fabric. • A “ghost” switch image appears in the Topology View, At-A-Glance View(s), and the Switch table. • Entries for the “ghost” switch are removed from the portgrid, ports, and devices tables.
switch connects to fabric	Fabric Manager adds an entry to the switch event log and changes the status color of the fabric.



Note

The Fabric Checking option is only available when a fabric is selected from the **SAN Elements** tab.

Enabling Fabric Checking on a Fabric

To enable Fabric Checking, perform the following steps:

1. In the **SAN Elements** tab, click the fabric that you want to check.
2. From the **Actions** menu, select **Fabric Checking**. A dark blue ring appears around the icon in the **SAN Elements** tab, the **Topology** view, and the **At-A-Glance** views to indicate that you enabled Fabric Checking.

Resetting Fabric Checking

Reset Fabric Checking after you make a permanent addition or deletion to your fabric. To reset Fabric Checking, perform the following steps:

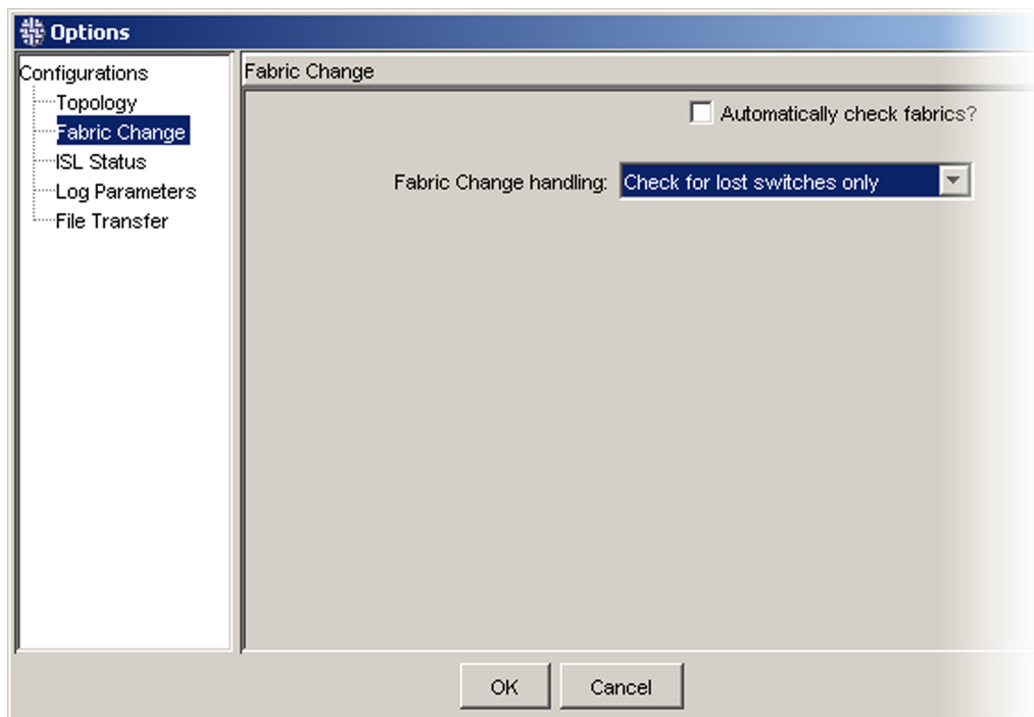
1. In the **SAN Elements** tab, click the fabric that you want to reset.
2. From the **Actions** menu, select **Fabric Checking** to disable fabric checking on the fabric.
3. From the **Actions** menu, select **Fabric Checking** to enable Fabric Checking with the new topology.

Automatically Enabling Fabric Checking on All Fabrics

To automatically enable fabric checking on all fabrics that Fabric Manager discovers, perform the following steps:

1. From the **File** menu, select **Options...** The **Options** dialog box appears

Example



2. In the **Configurations** tree, click **Fabric Change**. The **Fabric Change** dialogue appears in the right-hand window.
3. In the **Fabric Change** window, check the **Automatically check fabrics?** checkbox and click **OK**.

Disabling Fabric Checking

To disable Fabric Checking, perform the following steps:

1. In the **SAN Elements** tab, click the fabric that you no longer want to check.
2. From the **Actions** menu, select **Fabric Checking**. The checkmark beside **Fabric Checking** is removed. The blue ring from the fabric node icon in the **Topology** view is also removed.

Monitoring Fabric Checking in Topology View

When you remove a switch from a checked fabric, the switch appears “ghosted” in Topology view and the links to the switch no longer appear. When you return the switch, the standard node replaces the “ghost” node.

Figure 12-1 displays a fabric that runs Fabric Checking.

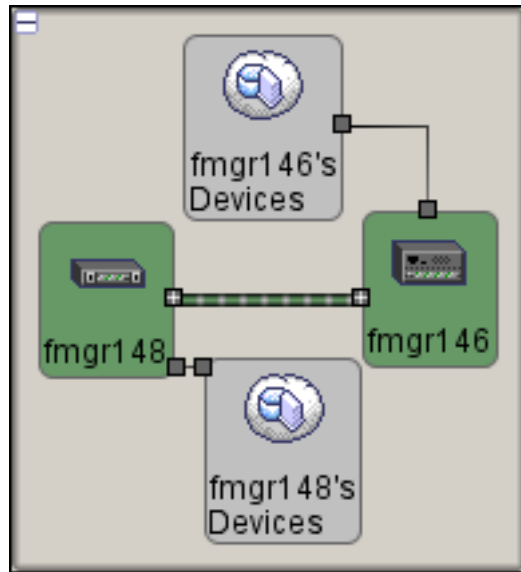


Figure 12-1 Fabric Before a Remove Event

Figure 12-2 displays the same fabric after the administrator removes a switch. Switch fmgr146 appears as a “ghost.”

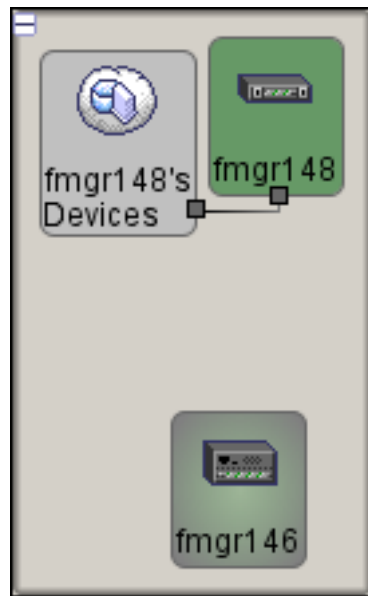


Figure 12-2 Fabric After a Remove Event



Note

If ISL Checking and Fabric Checking are both enabled, and a switch is removed from the fabric, a red color link will be displayed in the Topology view connecting the “ghosted” switch node to the original switch it was connected to.

If ISL Checking and Fabric Checking are both enabled, and a switch is removed from the fabric, a red color link is displayed in the Topology view connecting the “ghosted” switch node to the original switch it was connected to.

Setting Up Fabric Change Handling

To set up fabric change handling, perform the following steps:

1. Select a fabric from the **SAN Elements** tab on which to enable or disable Fabric Checking.



Note

The Fabric Checking option is only available when a fabric is selected from the **SAN Elements** tab.

2. Select **Options** from the **File** menu. The Options dialog displays.
3. Click **Fabric Change**. The Fabric Change dialog displays.
4. Select **Check for lost and added switches** or **Check for lost switches** only from the Fabric Change Handling pull-down menu.

If Fabric Change Handling is set to **Check for lost and added switches**, the added switch appears in the Event Log Status Reason with a red event and the fabric also turns red in the Topology View.

If Fabric Change Handling is set to **Check for lost switches**, the removed (lost) switch remains in the fabric but appears as a "ghost" switch. It is also segmented into its own fabric.

5. Click **OK** to apply the configuration changes; click **Cancel** to abort.

Fabric Merge Check

This chapter includes the following sections:

- [“Introduction” on page 13-1](#)
- [“Comparing Fabrics for a Fabric Merge” on page 13-2](#)

Introduction

Perform a fabric merge check to determine if two fabrics will segment if you merge them. Fabric Manager provides the fabric merge check to compare various configuration elements of two fabrics before you connect those fabrics. Fabric Manager extracts copies of configuration elements from each fabric that can cause the fabric to segment and compares them in memory for inconsistency. Inconsistencies are displayed in the merge-check results window. Fabric Manager performs the following tests during a fabric merge check:

- Domain ID test
- TimeOutValue test
- Buffer-to-Buffer Credit test
- Disable Device Probe test
- Route Priority per Frame test
- Sequence Level Switching test
- Suppress Class F test
- Long Distance Mode test
- InterOp Mode test
- Data Field Size test
- VC Encoding test
- PID test
- Zoning test (only runs on non-secure fabrics)
- VC Priority test

The following tests only run in a secure fabric:

- Security test
- FCS policies test
- SCC policy test
- Version stamp test

- Management Server platform test

If the test is not applicable to the fabric, the test is not executed and Fabric Manager displays the message, “Test not applicable to subject fabrics.”

For example, if one or more fabrics are secure, the management server platform test and the zoning test are not executed and the message is displayed.

Comparing Fabrics for a Fabric Merge

You can check any two fabrics that you have discovered.

To perform a fabric merge check, perform the following steps:

1. Log-on to the switches that you want to check. For more information, refer to [“Logging In to Multiple Switches Simultaneously” on page 3-6](#).
2. From the **Tools** menu, select **Fabric Merge...** The **Fabric Merge Check** dialog box opens.
3. From each **fabric** pulldown menu, select one of the two fabrics that you want to merge and click **Check...** A **Merge Check Results** list appears and identifies the inconsistencies between the fabrics.

Note: If you run a fabric merge check between a secure fabric and a nonsecure fabric, the results of the Security, FCS policies, version stamp, and Management Server platform tests display the following message, “Not applicable to subject fabrics.”

If the two zoning databases on the fabrics will prevent the fabrics from merging, the user is queried about launching the Zone Merge Manager tool. If the user chooses to do so, the Zone Merge Manager is launched. It highlights in red all zoning conflicts between the two fabric’s zoning configurations. The user can resolve the conflicts and apply the results to either of the fabrics in question.

After this process the user is returned to the merge check results window, where, at the zoning test stage, it reports, “Merge Check Successful,” along with the results of the other tests. If the user had decided not to enter the zone merge manager, then the zoning test would report “Operator cancelled zone merge - Merge Check Failed” for the zoning test, along with the results of all the other tests in the merge check results window.

Comparing Configurations

This chapter includes the following sections:

- [“Introduction” on page 14-1](#)
- [“Saving a Baseline Configuration to a File” on page 14-2](#)
- [“Comparing Switches to a Baseline” on page 14-3](#)
- [“Customizing Baseline Templates” on page 14-6](#)

Introduction

Fabric Manager can compare the configuration files of your switches to a *baseline* configuration to

- Validate and ensure consistent configuration settings among the switches in your fabric.
- Propagate configuration settings to switches in your fabric.
- Store a selection of configuration settings that you can easily propagate throughout your fabric.
- Troubleshoot a switch.

[Table 14-1](#) explains the two sources that Fabric Manager can use as baselines.

Table 14-1 Baseline Sources

Source	Explanation
switch	You can compare multiple switches to one switch that you identify as a baseline.
file	You can save the configuration file of a switch as a file on a FTP server, then compare switches to that file or propagate that file to switches.

You can save portions of a configuration to a file so you can propagate fabric-wide settings but leave switch-specific settings untouched. For instance, you can save Fabric Watch configuration settings to a baseline, then propagate those settings to an entire fabric and not alter the switchname of any switch in the fabric.

Best Practices

The following best practices describe tasks you can perform with the **Save Baseline...** tool to administer your fabric more efficiently.

- Propagate a baseline configuration to each new switch that you add to a fabric to ensure that the switch is compatible with the fabric.

- Propagate the baseline of one fabric throughout a second fabric before you merge the fabrics.
- Propagate a baseline configuration throughout a fabric to ensure consistent Fabric Watch and SNMP settings.
- Create and store multiple baselines that serve different purposes so you can quickly adapt your fabric when it switches function.

You can create a limitless number of baselines.

- Use baselines to recover fabric and switch settings.

Saving a Baseline Configuration to a File



Note

If you just discovered a fabric and want to save a baseline, wait about 60 seconds to let Fabric Manager discover all port, device, and ISL information. If you do not wait, you will receive incomplete results when you run the baseline compare.

Save a baseline from a single switch in a fabric. You can export the following categories of information from the configuration file to the baseline:

- settings that you can normally assign with the **configure** command
- settings for Fabric Watch and SNMP

When you create your baseline, Fabric Manager gives you the opportunity to choose what settings you want to add to the baseline and what settings you want to omit from the baseline.

Before saving a baseline configuration to a file, you must set up configuration file transfer properties between switches and your host.

To save a baseline:

1. Configure file transfer settings if you have not already done so. For more information, refer to [“Configuring File Transfer Options” on page 3-14](#).
2. Log in to the switch with the configuration that you want to save as a baseline. For more information, refer to [“Logging In to Multiple Switches Simultaneously” on page 3-6](#).
3. From the **Tools** menu, select **Config > Save Baseline...** The **Save Baseline -- Configuration Template Selection** dialog box opens.
4. Select **Full Configuration** and click **Next**. The **Save Baseline -- Switch Selection** window opens.
5. From the **SAN Elements** tab, choose the switch with the configuration that you want to save, then click the right-pointing arrow to add it to the right-hand window.
6. Click **OK**. The **Save Baseline -- Parameter Selection** window opens.
7. Check the checkboxes for each setting or group of settings of the configuration file that you want to save to the baseline. Expand and collapse the navigation tree to access your options.



Note

The Solaris environment does not display checkboxes clearly. If the checkbox appears full, the value is selected. If the checkbox appears shallow, it is not selected.

8. Click **Save**. The **Save base file** dialog box opens.

9. Enter a name for your baseline, choose a folder to store it, and click **Save**.

Comparing Switches to a Baseline

When you compare the configuration of a switch to a baseline, Fabric Manager identifies and lists all parameters that do not match. Compare the configuration of one or more switches to a baseline when

- You plan to merge two fabrics.
- You plan to add a new switch to a fabric.
- You want to verify that Fabric Watch and SNMP settings are consistent across a fabric.
- A fabric segments and you need to troubleshoot the problem.



Note

If you just discovered a fabric and want to run Fabric Backup or Diff with Backup, need to wait about 60 seconds to let Fabric Manager discover all port, device, and ISL information. If you do not wait, you will have incomplete results when running the Fabric Backup or Diff with Backup.

Comparing Switches to a Baseline File

To compare switches to a baseline file, perform the following steps:

1. From the **Tools** menu, select **Config > Compare/Download from File**. The **Compare/Download from File -- Select Baseline Configuration** dialog opens.
2. Navigate to the baseline file and click **Open**. The **Compare/Download from File -- Target Switch Selection** window opens.



Note

In a Solaris environment, make sure you select a directory, not the actual file, to compare the configuration against.

3. From the **SAN Elements** tab, select the switches that you want to compare and move them to the right-hand window. You can
 - Navigate to a switch, click the switch, then click the right-pointing arrow.
 - Click-and-drag a switch from the **SAN Elements** tab to the right-hand window.
 - Press-and-hold **Ctrl**, click multiple switches in the **SAN Elements** tab, and click the right-pointing arrow.
 - Press-and-hold **Ctrl**, click multiple switches, and click-and-drag the switches from the **SAN Elements** tab to the right-hand window.
 - Click-and-drag a fabric to the right-hand window to move add all of the switches in that fabric to the window.
4. Click **OK**. The **Compare/Download from File -- Switch Configuration comparison and Download** window appears and compares the configuration(s) of the switch(es) to the baseline.

To apply this baseline to the switches that you selected, click **Apply Baseline...**

Comparing Switches to a Baseline Switch

To compare switches to a baseline switch, perform the following steps:

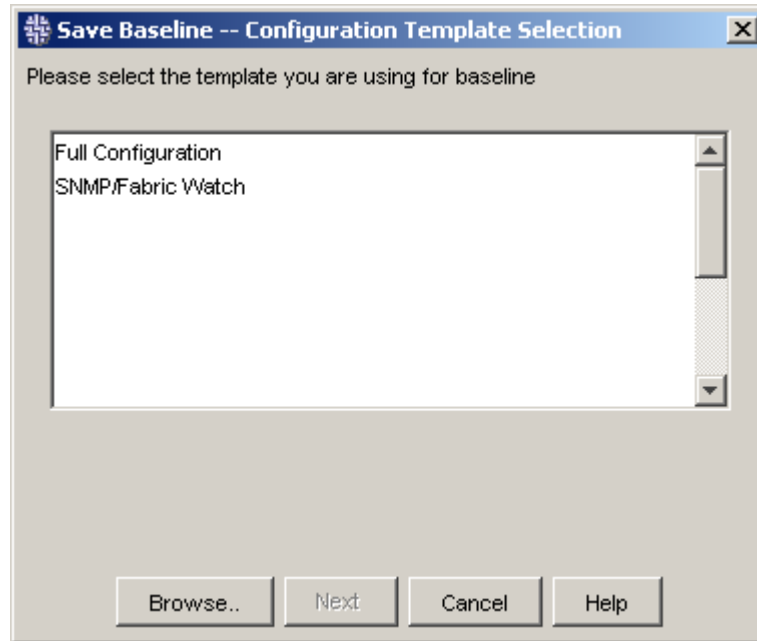
1. From the **Tools** menu, select **Config > Compare/Download from Switch**. The **Compare/Download from Switch -- Source Configuration Selection** window opens.
2. Navigate to the switch that you want to use as a baseline and click the right-pointing arrow to move that switch to the right-hand window.
3. Click **OK**. The **Compare/Download from Switch -- Target Switch Selection** window opens.
4. From the **SAN Elements** tab, select switches you want to compare and move them to the right-hand window. You can
 - Navigate to a switch, click the switch, then click the right-pointing arrow.
 - Click-and-drag a switch from the **SAN Elements** tab to the right-hand window.
 - Press-and-hold **Ctrl**, click multiple switches in the **SAN Elements** tab, and click the right-pointing arrow.
 - Press-and-hold **Ctrl**, click multiple switches, and click-and-drag the switches from the **SAN Elements** tab to the right-hand window.
 - Click-and-drag a fabric to the right-hand window to move add all of the switches in that fabric to the window.
5. Click **OK**. The **Compare/Download from Switch -- Switch Configuration comparison and Download** window appears and compares the configuration(s) of the switch(es) to the baseline.

To apply this baseline to the switches that you selected, click **Apply Baseline...**

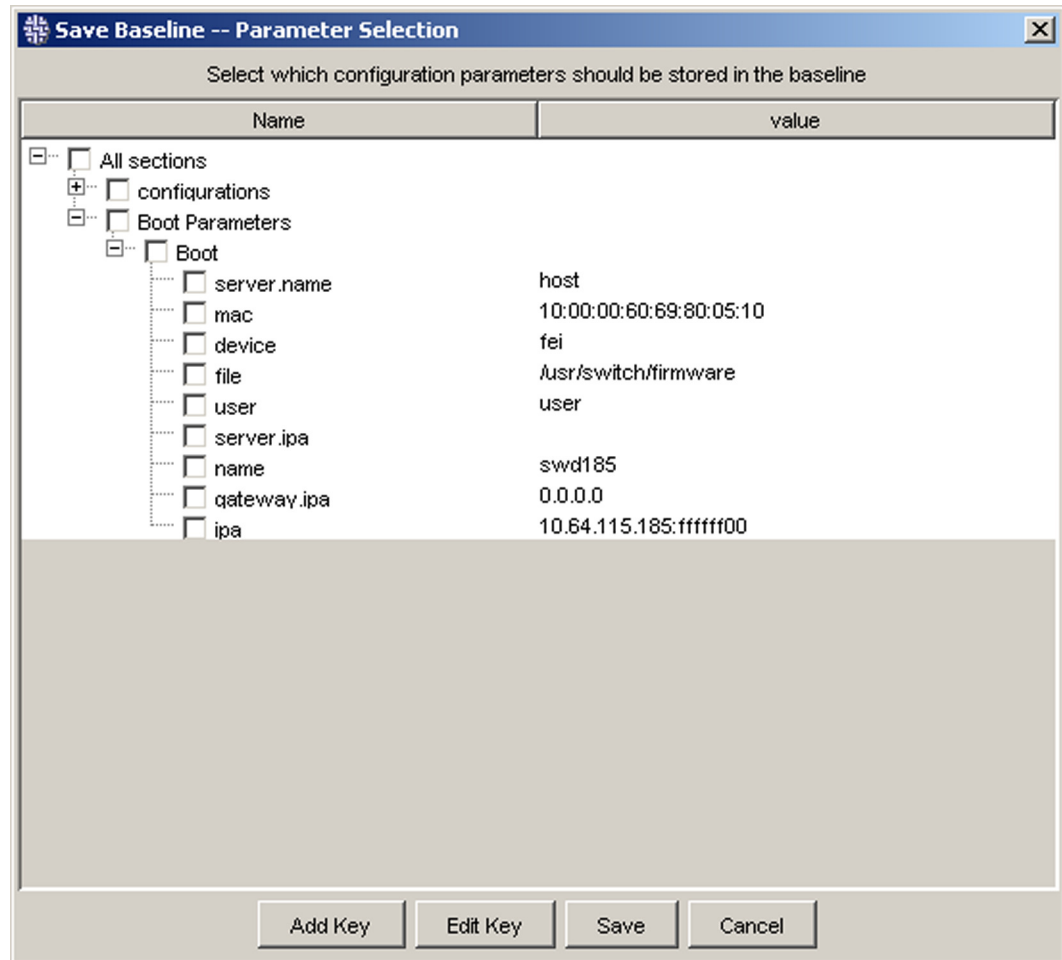
Customizing Baseline Templates

When you save a baseline configuration, Fabric Manager requires that you choose a configuration template. The templates display in the **Save Baseline -- Configuration Template Selection**.

Example



The template that you choose determines what parameters appear in the **Save Baseline -- Parameter Selection** dialog box.

Example

Fabric Manager provides two templates, but you can create custom templates or edit the existing templates. To create a custom template, create an XML file (as defined below) and save it in the **Fabric Manager > baseline > template** directory on your Fabric Manager server. The **Full Configuration** and **SNMP/Fabric Watch** template files appear in this directory.

Anatomy of Template Files

To customize a baseline template file, you must define custom XML tags. This section describes those tags.

Description Tag

The **Description** tag encloses the summary tag, which defines what template title appears in the **Save Baseline -- Configuration Template Selection** dialog box. The example that follows displays **My Template** in the dialog box.

Example

```
<Description>
  <summary>My Template</summary>
  <detail>This will show my custom parameters</detail>
</Description>
```

The results of this configuration appear in [Figure 14-1](#).

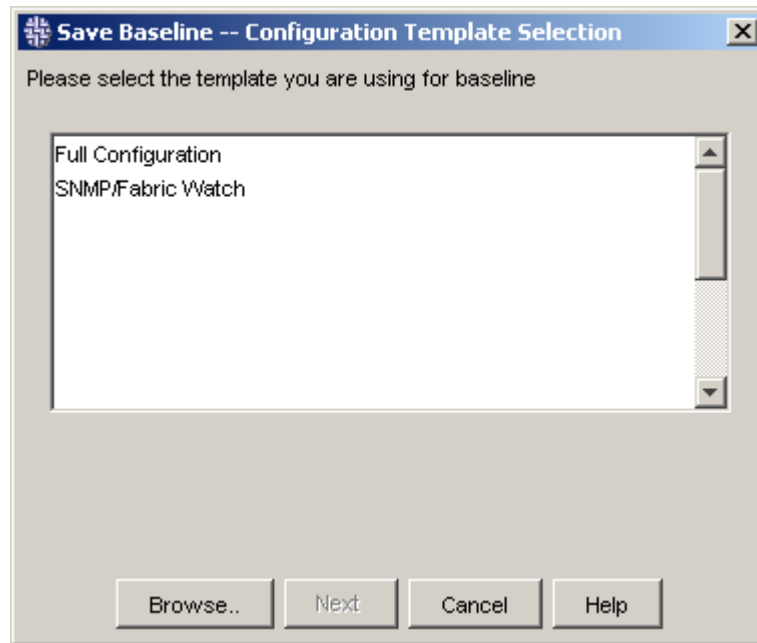


Figure 14-1 Description Change Results

section Tag

Each **section** tag adds a section from the configuration file to the template. Sections appear in the configuration file as text in square brackets ([,]). Section tags contain prefix tags.

In the example that follows, the **section** tag uses a “Boot Parameters” **value** attribute to add the [Boot Parameters] section of the configuration file to the display. It uses a “Boot Parameter” **text** attribute to identify the checkbox in the **Save Baseline -- Parameter Selection** dialog box. This **section** tag includes a **prefix** tag to add parameters to the section.

Example

```
<section value="Boot Parameters" text="boot parameters">
  <prefix ID="boot" text="Boot"/>
</section>
```

The results of this configuration appear in [Figure 14-2](#).

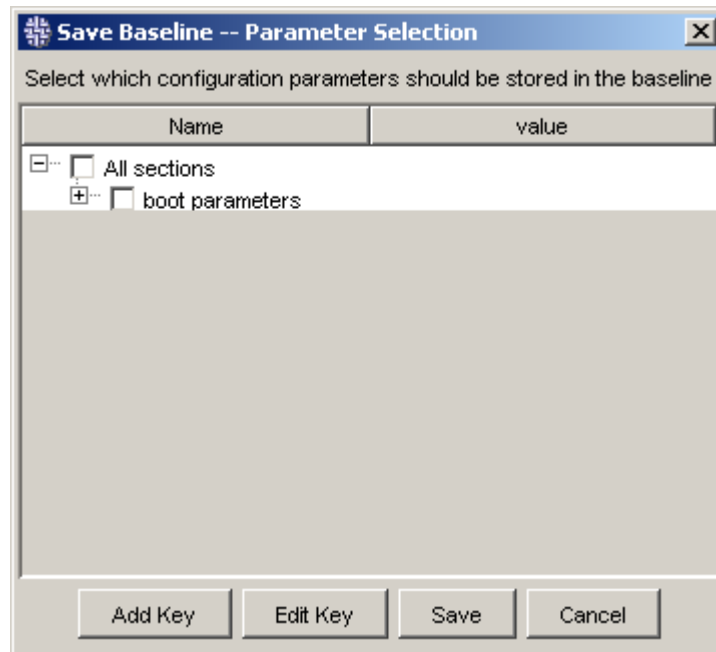


Figure 14-2 Section Change Results

prefix Tag

The **prefix** tag adds parameters to the template. Every parameter in the configuration file includes a prefix before the first dot (.). Set the **ID** attribute of the prefix tag to add all configuration file parameters that use that prefix to the template. For instance, if you set the ID attribute to **route**, parameters such as route.delayReroute, route.embeddedPortBcast, and route.stickyRoutes appear in your template. Set the **text** attribute to define the text that accompanies the parameter in the **Save Baseline -- Parameter Selection** dialog box.

The example that follows adds all parameters in the configuration file that begin with **boot.** to the template.

Example

```
<prefix ID="boot" text="Boot"/>
```

The results of this configuration appear in [Figure 14-3](#).

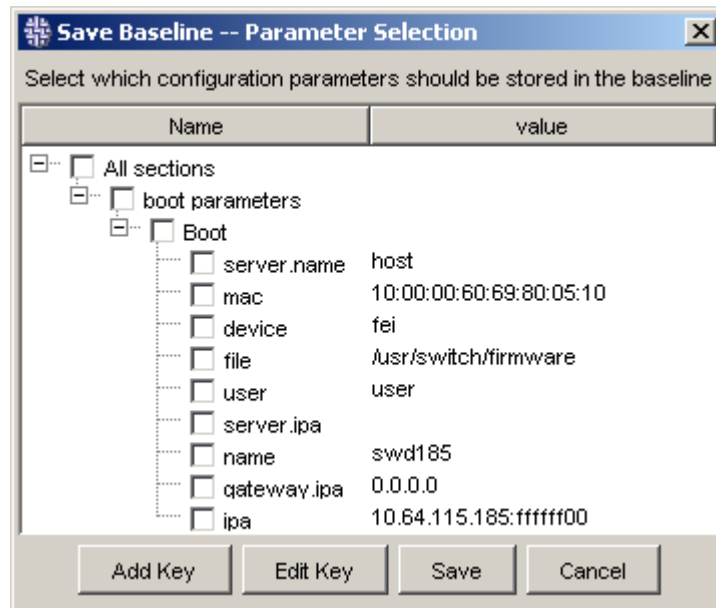


Figure 14-3 Prefix Change Results

Creating or Editing a Template

To create a custom baseline template, perform the following steps:

1. Open **fullBaseLineTemplate.xml** in a text editor.



Note

When running Fabric Manager in a Windows environment, Notepad does not work for this task. To edit the XML document, you must open the file in WordPad or a similar application that recognizes carriage returns.

2. Edit the text that appears between the **<summary>** and **</summary>** tags to configure the template name that appears in the **Save Baseline -- Configuration Template Selection** dialog box.
3. Add or remove **section** tags to include or remove sections from the **Save Baseline -- Parameter Selection** dialog box.
4. Add or remove **prefix** tags to **section** tags to include or remove parameters from the **Save Baseline -- Parameter Selection** dialog box.

In each section, only include prefixes that appear in the analogous section in the configuration file.

5. Save the file to customize the existing file, or save the file in the same directory with a different file name to create a new configuration.

Backing Up and Comparing Fabrics

This chapter includes the following sections:

- [“Introduction” on page 15-1](#)
- [“Backing Up a Fabric” on page 15-2](#)
- [“Comparing a Fabric to a Backup” on page 15-2](#)

Introduction

The backup action in Fabric Manager aggregates a number of the features of the application to create a thorough backup file of your entire fabric. This action backs-up the following information about a fabric to one file:

- the configuration file of every switch in the fabric
- the license keys for every switch in the fabric
- a list of switches that belong to the fabric
- an ISL stamp

Note: The backup action does not store the current ISL stamp. It creates a stamp of the ISLs as they appear *at the moment of the backup*.

- all zone definitions (and notes the active zone)
- which firmware version each switch runs
- name server information

Once you back-up your fabric, you can compare the settings of your live fabric to the settings in your baseline file. Fabric Manager displays the discrepancies between the two in HTTP format.

You should keep the following suggestions in mind when backing up and comparing fabrics:

- Make sure that the fabrics are stable before you back them up.
- Ensure that each fabric is in a separate subdirectory; otherwise, only the last saved configurations are valid.

Backing Up a Fabric

Verify that Fabric Manager has discovered all fabric information before you perform a backup. If you just discovered a fabric and want to run a backup, wait about 60 seconds to let Fabric Manager discover all port, device, and ISL information. If you do not wait, you will receive incomplete results when you run the backup compare.

To back up a fabric, perform the following steps:

1. From the **SAN Elements** tab, click the fabric that you want to back-up.
2. From the **Actions** menu, select **Backup...** The **Backup fabric configuration-Select a folder** dialog opens.



Note

In a Solaris environment, you see two buttons: **Help** and **Update**. These buttons are not related to Fabric Manager and should be ignored.

3. Browse to the location to which you want to back up your file.



Caution

In a Solaris environment, make sure that you select a directory, not a file. If you want to create a new directory to save the configuration to while running in a Solaris environment, create it outside of Fabric Manager. Fabric Manager does not immediately recognize the newly created directory if it is created from within the **Backup Configuration** window.

4. Click **Backup now**. A file called backup.xml is created and each switch's configuration file is saved to the directory.

Comparing a Fabric to a Backup

To compare a fabric to a backup, perform the following steps:

1. From the **SAN Elements** tab, click the fabric that you want to check against a backup.
2. From the **Actions** menu, select **Diff with backup...** The **Diff fabric configuration with backup** dialog opens.
3. Navigate to the directory that contains your backup and click **Diff**. The **Live/Backup Configuration Difference** window opens and lists the discrepancies between your live fabric and your backup.

Sequenced Reboot

This chapter includes the following sections:

- “Introduction” on page 16-1
- “Creating a Reboot Group” on page 16-2
- “Assigning Switches to a Reboot Group” on page 16-2
- “Creating Single Switch Groups” on page 16-3
- “Performing a Sequenced Reboot” on page 16-3

Introduction

With Fabric Manager, you can define groups of switches that reboot simultaneously, and then configure groups to reboot sequentially. Reboot groups let you simultaneously reboot switches that run the same firmware, serve the same function, reside in the same physical location, or share any other attribute by which you want to group them. [Table 16-1](#) defines the critical terms in this section.

Table 16-1 Sequenced Reboot Terms

Term	Definition
reboot group	A group of switches (from the same fabric) that reboot simultaneously.
timeout	Occurrence where a fabric does not stabilize within the amount of time that you configure.
stabilization	Occurrence where all WWNs of a fabric appear in the fabricshow command output.

Reboot groups consist of one or more switches from a single fabric. You cannot group switches from different fabrics. Any given switch can only belong to one reboot group.

Sequenced reboots give sections of your SAN an opportunity to reboot and stabilize before other switches in the fabric begin to reboot, which reduces the load of inter-switch traffic on the SAN.

Use the following reboot strategies to take full advantage of this feature:

- Simultaneously reboot switches that run the same firmware.
- Simultaneously reboot switches of the same model.
- Reboot the core switches of a fabric, then the edge switches.
- Reboot the backbone of a large SAN, then reboot other sections.
- Reboot distant physical locations sequentially.

Creating a Reboot Group

To create a reboot group, perform the following steps:

1. From the **Tools** menu, select **Reboot > Create Reboot Sequence...** The **Create or change reboot groups and sequence** window opens.
2. Select a fabric from the **Select Fabric** pulldown menu.
3. Click **Create...** The **Create reboot group** dialog opens.
4. In the **Name of the Reboot Group** field, type a name for the group.
5. In the **Fabric Stabilization timeout** field, specify the amount of time for the fabric to stabilize.
6. Optionally, in the **What to do if timeout occurs?** field, click one of the following buttons:
 - **Prompt** displays a prompt when a timeout occurs that asks you if you want to continue.
 - **Continue** continues the reboot sequence when a timeout occurs.
 - **Abort** terminates the reboot sequence when a timeout occurs.

If you do not make a selection in this field, the default selection is prompt.

7. In the **Delay After Fabric Stabilization** field, configure the amount of time that must elapse before the next reboot in the sequence begins.

Fabric Manager considers a fabric stable when all WWNs appear in the **fabricshow** command output.

8. Click **OK**. Your reboot group appears in the Reboot Groups tree.

When your reboot group appears in the Reboot Groups tree, bracketed text appears next to the name of the group. The text in the brackets represents the fabric stabilization timeout duration, timeout option, and delay after fabric stabilization options that you configured.

Example

[1m,P,2m]

In this example, **1m** identifies a stabilization timeout of one minute, **P** identifies that Fabric Manager will prompt you if a timeout occurs, and **2m** indicates that two minutes will elapse before the next reboot in the sequence begins.

Assigning Switches to a Reboot Group

To assign switches to a reboot group, perform the following steps:

1. From the **Tools** menu, select **Reboot > Create Reboot Sequence...** The **Create or change reboot groups and sequence** window opens.
2. Select a fabric from the **Select Fabric** pulldown menu. The switches in that fabric appear in the **Unassigned Switches** window.
3. Click the reboot group that you want to populate.
4. Click a switch that you want to add to the group, click the left-pointing arrow, and click **OK** to save the changes and apply them later; click **Apply** to save the changes and apply them now.

To add multiple switches at once, press-and-hold **Ctrl** and click each switch that you want to add, then click the left-pointing arrow.

Creating Single Switch Groups

Create a single switch group to account for individual switches that you have not assigned to a group. Single switch groups include these individual switches in the reboot sequence.

To create a single switch group, perform the following steps:

1. From the **Tools** menu, select **Reboot > Create Reboot Sequence...** The **Create or change reboot groups and sequence** window appears.
2. Select a fabric from the **Select Fabric** pulldown menu.
3. Select a switch from the **Unassigned Switches** window. To create multiple single-switch groups, select multiple switches. Each switch will be made into its own group.
4. Click the **Create single switch groups...** button. The **Create single switch reboot groups** dialog appears.
5. Optionally, in the **Name of the Reboot Group** field, type a name for the group(s). If you do not enter a name for the group, a default name is assigned in the `RebootSwitchName` format, where *SwitchName* is the name of the switch.
6. In the **What to do if timeout occurs?** field, click one of the following radio buttons:
 - Prompt displays a prompt when a timeout occurs that asks you if you want to continue.
 - Continue continues the reboot sequence when a timeout occurs.
 - Abort terminates the reboot sequence when a timeout occurs.
7. In the **Delay After Fabric Stabilization** field, configure the amount of time that must elapse before the next reboot in the sequence.

Fabric Manager considers a fabric stable when all WWNs appear in the **fabricshow** command output.
8. Click **OK**. Your reboot group appears in the **Reboot Groups** tree.

Performing a Sequenced Reboot

To set up a sequenced reboot, perform the following steps:

1. Log in to the switches that you want to reboot. For more information, refer to [“Logging In to Multiple Switches Simultaneously” on page 3-6](#).
2. From the **Tools** menu, select **Reboot > Sequenced Reboot...** The **Sequenced Reboot** window appears.
3. Select a fabric from the **Select Fabric** pulldown menu.
4. In the **Reboot Groups** tab, click the group that you want to reboot first, then click the right-pointing arrow to add it to the **Selected Switches** window.
5. Repeat [step 4](#) to add additional groups in the order that you want them to reboot.

To re-arrange the order of the reboot sequence, click the up and down arrow keys in the **Sequenced Reboot** window.

6. Click **Fastboot** or **Reboot** to begin the sequenced reboot. Fabric Manager will prompt you several times to be sure that you want to proceed. The prompt will present potential problems in your fabric. A message appears at the end of the reboot sequence to list successful and unsuccessful reboots.

FDML-Capable HBA Firmware Download

This chapter includes the following sections:

- [“Introduction” on page 17-1](#)
- [“Downloading Firmware to an HBA” on page 17-2](#)

Introduction



Note

Fabric Manager supports up to 50 firmware downloads to multiple HBAs simultaneously.

Downloading Firmware to an HBA



Warning

During a firmware download to HBA, if you reboot the switch to which the HBA is attached, or reboot the host to which the HBA is attached, then the firmware in the HBA flash can become corrupted and the HBA flash can become corrupted and the HBA is not able to log back in to the switch and/or respond to the query from the switch.

Neither Fabric Manager nor the switch can see the HBA, and it drops out of the Name Server list. In this case, the solution is to use HBAnyware on the attached host and reload the firmware on the HBA.

To download firmware to one or more HBAs, perform the following steps:

1. Log in to a switch (or switches) with version 3.1.0 or 4.1.0 firmware loaded and FDMI-capable HBAs connected to it (or them). For more information, refer to [“Logging In to Multiple Switches Simultaneously” on page 3-6](#).
2. From the **Tools** menu, select **Firmware download to HBAs...** The **Firmware download to HBAs** window opens.
3. In the **Host IP address** field, enter the IP address of the FTP server with the firmware file. The IP address appears automatically if you have already configured file transfer options. For more information, refer to [“Configuring File Transfer Options” on page 3-14](#). If you have not configured file transfer options, check the **Save settings to options** checkbox to save your FTP settings as your file transfer options.
4. In the **User Name** field, enter your user ID for the FTP server.
5. In the **Firmware file** field, enter the path and name of the firmware file (in UNIX format) or click **Browse** to navigate to the file. Clicking **Browse** overrides the current settings for host IP address, user name and password. The information defaults to the current host system from which the Fabric Manager application is executed.
6. In the **Password** field, enter your password.
7. From the **SAN Elements** tab, select the HBAs that you want to upgrade and move them to the **Selected HBAs** window. You can
 - Navigate to an HBA, click the HBA, and click the right-pointing arrow.
 - Drag a HBA from the **SAN Elements** tab to the **Selected HBAs** window.
 - Press **Ctrl** while clicking multiple HBAs and click the right-pointing arrow.
 - Press **Ctrl**, while clicking multiple HBAs and drag the HBAs from the **SAN Elements** tab to the **Selected HBAs** window.
 - Drag a fabric to the **Selected HBAs** window to add all of the HBAs in that fabric to the **Selected HBAs** window.



Warning

Simultaneous firmware download to one or more HBAs on the same host from multiple Fabric Manager clients is not supported and will most likely permanently corrupt the firmware on the HBAs, causing them to be unusable.

Non-FDMI capable HBAs appear with a grey background.

If Fabric Manager detects that a device is no longer in the Name Server, the device is displayed with a grey background in the **Firmware Download to HBAs** window until the device logs into the Name Server again.

8. Click the **Download** button to begin the firmware download. Fabric Manager prompts you with a confirmation dialog.
9. Click **OK** to proceed or **Cancel** to abort. Fabric Manager provides a report of successful and unsuccessful downloads.



Note

Click **Refresh FDMI** to refresh FDMI information available in the **Firmware Download to HBA** window for the selected HBAs.

Monitoring and Viewing Your SAN

This chapter includes the following sections:

- [“Introduction” on page 18-1](#)
- [“Viewing Your Fabric with Topology View” on page 18-1](#)
- [“Viewing Fabric Events with Event View” on page 18-2](#)

Introduction

After you establish your SAN, use Fabric Manager to view and monitor the behavior of your fabrics. Topology view and Event view continuously provide information about the events and layout of your fabrics.

Viewing Your Fabric with Topology View

Topology view provides a graphical representation of your fabric. For detailed information on Topology view, refer to [“Topology View” on page C-19](#).



Note

Topology view might take a considerable amount of time to open. Topology view options might also respond slowly.

After you click a fabric in the **SAN Elements** tab, you can perform the following tasks to view more information about your fabric:

- Click-and-hold on any element in the view to display a “tool tip.” Tool tips provide basic information about the element that you clicked. Tool tips disappear when you release the mouse button.
- Double-click a device group to open a window that displays each device in the group in detail. This window also provides a **Print** option.
- Double-click a bundled link to view the individual links that compose the bundle. Double click the individual links to view the bundle again. When you double-click a bundle, you can then view tool tips on each individual link. The tool tip includes the bandwidth, and the ports and switches to which the ISL connects.

You cannot expand a bundle when you engage the **Select** icon.

- Click the **Select** icon in the toolbar to move nodes in the display. Fabric Manager stores the changes that you make to the locations of the nodes.

- Graphically view ISL Checking events and Fabric Checking events. For more information, refer to [“ISL Changes and Topology View” on page 11-4](#) and [“Monitoring Fabric Checking in Topology View” on page 12-4](#).
- Click the **SnapShot** icon to save an image file of your topology. You can use this file as a baseline and compare your fabric to it at a later time.
- From the **Layout** menu, select **Circular**, **Core-Edge**, or **Tree** to view your fabrics from different perspectives.

Viewing Fabric Events with Event View

To view fabric events, perform the following:

1. Click a SAN, fabric, or switch under the **SAN Elements** tab.
2. From the View menu, select Event. Two tables appear in event view and display fabric events.

[Table 18-1](#) describes the tables that display fabric events in Event View.

Table 18-1 Fabric Event Tables

Table	Content
Current Status Reason	Provides the status of an individual switch or of all the switches in a fabric or SAN. This table does not include entries for healthy switches.
Event Log	Provides a list of events from an individual switch or from all the switches in a fabric or SAN.

[Table 18-2](#) describes the fields in the Current Status Reason table.

Table 18-2 Current Status Reason Table Fields

Field	Description
Status	Displays a colored icon when the switch status changes: Red= Down/Failure Yellow= Marginal/Warning Green= Healthy/OK
Switch	Identifies the switch that experienced the status change.
Status Reason	Describes the event that changed the status of the switch to its current status. The Status Reason field is supported on firmware version 2.5 and higher. In earlier versions, the firmware displays switch health in the column, but does not give a reason.

Table 18-3 describes the fields in the Event Log table.

Table 18-3 Event Log Table Fields

Field	Description
Status	Displays the switch status that the event triggered.
Switch	Identifies the switch that experienced the event.
Number	Assigns a number to identify the event in a sequence of events.
Time	Displays the time that the event occurred.

Table 18-3 Event Log Table Fields (Continued)

Field	Description
Count	Displays the number of consecutive occurrences of the same event.
Level	<p>Displays the severity level of the event. Ascending numbers represent descending severity, as follows:</p> <ul style="list-style-type: none"> • 0: panic (switch reboots) • 1: critical • 2: error • 3: warning • 4: informational • 5: debug
Message	Describes the event.
EventSrc	<p>Indicates the event source, as a daemon or library module. The possible event sources are:</p> <p>BLADE</p> <p>BLOOM</p> <p>DIAG</p> <p>EM</p> <p>ERRLOG</p> <p>FABRIC</p> <p>FICON</p> <p>FSSME</p> <p>FW</p> <p>HAM</p> <p>HAMKERNEL</p> <p>MS</p> <p>PD TRACE</p> <p>RCS</p> <p>SULIB</p> <p>SYSC</p> <p>TRACK</p> <p>TS</p> <p>ZONE</p> <p>kSWD</p> <p>syslog</p>

Troubleshooting

This chapter includes the following sections:

- [“Introduction” on page 19-1](#)
- [“Viewing Fabric Manager Application Log” on page 19-1](#)
- [“Problems and Solutions” on page 19-1](#)

Introduction

This chapter provides solutions to problems that you may encounter as you manage your SAN with Fabric Manager. If you cannot troubleshoot the problem successfully, please contact technical support.

Viewing Fabric Manager Application Log

When you contact technical support, they may ask you for information from the Fabric Manager Application log. This log is different from the Event View. The Fabric Manager Application Log logs events for the application, not necessarily the SAN or its elements.

To view events in the Fabric Manager Application log, click the **File** menu and select **Log...** After you open the window, you can filter what information appears in the window.

Filtering Events

To filter events, perform the following steps:

1. From the **File** menu, select **Log...** The **Fabric Log** dialogue box opens.
2. Click **Filter**. The **Filter** dialog box opens.
3. Enter the criteria for the messages that you want to filter, then click **Filter**. The messages that fit your criteria appear in the log.

Problems and Solutions

The sections in this chapter describe problems that you may experience with Fabric Manager. A solution to the problem follows each section.

Installing Fabric Manager Client on Solaris Using BASH as Default Shell

When installing the Fabric Manager Client on a Solaris 8 OS with a BASH as the default shell, you must run the following commands from the command line before launching the Fabric Manager Client:

```
bash --login
```

If you do not run this command prior to launching the Client, the Security Admin, Set Time, and FDMI features might not work properly in Fabric Manager.

Cannot Locate Fabric Manager License Key and Serial Number

Fabric Manager v4.1.0 and later stores the serial number and license key in a file each time a user successfully registers Fabric Manager. The file name is **fmlicense.txt** and should be in the local Fabric Manager user directory. The file contains the version of Fabric Manager installed, the serial number, license key, license type, and licensing date. If you cannot locate the file, contact Technical Support.

Fabric Manager Client Cannot Access the Server

Verify that the client uses the same port as the server.

Switches and Hosts No Longer Recognize an HBA After a Firmware Download to the HBA

During the firmware download to HBA process, if the switch (that the HBA is attached to) is rebooted, or the host (that the HBA is attached to) is rebooted, the firmware in the HBA flash memory can become corrupted and HBA will not be able to log in to the switch or respond to the query from the switch. Thus from both the Fabric Manager and the switch point of view, this HBA does not appear and drops out of the name server list. To solve this problem, use HBAnyware on the attached host and reload the firmware on the HBA.

503 Service Unavailable/Overloaded Error Appears

Poll the switch with fewer Fabric Manager clients.

Indicates that Fabric Manager discovered a switch whose web server is displaying the 503 error. When a switch throws this error after Fabric Manager has already discovered the switch, the error only appears in the error log. Although switches can appear as unreachable in FM when they experience this error, this error occurs more frequently on switches that run firmware versions 2.x and 3.x.

A Zero-Switch (Empty) Fabric Appears in the SAN Elements Tab

When a switch segments from a fabric that runs Fabric Checking and then rejoins the fabric, an empty fabric remains in the **SAN Elements** tab. To remove this empty fabric, select it and then disable Fabric Checking on that fabric. It will disappear from the tab.

Installation Wizard Does Not Launch

Run the DOS command **dxdiag** and make sure that the graphics tests run without errors. If any version of DirectX files or any diagnostic files are missing, go to Microsoft's Web site and upgrade to the latest version of DirectX.

Installation Wizard Locks Up

Press the **Ctrl** key until a DOS Java console displays. The console captures a log of the entire installation process.

Login Scenarios

After you log in to Fabric Manager, you might experience connection problems that can potentially interfere with the client. The following two scenarios occur most commonly:

1. While your client runs, your password changes on the server. When you try to close the client and store your settings, the client prompts you to enter your password. You must enter the new password to persist your data and close the client.
2. While your client runs, the server goes down. When you try to close the client, the client alerts you that you cannot persist your settings. The client gives you the option to close and lose your settings or wait until the server comes back up. When the server comes back up, you can exit and your settings persist.

File Menu Reference

This appendix includes the following sections:

- [“Introduction” on page A-1](#)
- [“Fabric Login Window” on page A-2](#)
- [“Groups Submenu” on page A-3](#)
- [“Options Window” on page A-6](#)
- [“Fabric Log Window” on page A-12](#)

Introduction

The **File** menu in Fabric Manager provides basic administrative options to the user. [Table A-1](#) describes the options in the **File** menu.

Table A-1 File Menu Options

Option	Description
New...	Opens a new Fabric Manager window. All other Fabric Manager windows remain open.
Close	Closes the active Fabric Manager window. This option is only available when you open multiple Fabric Manager windows.
Fabric Login...	Opens the Fabric Login window to log in to multiple switches. For more information, refer to “Fabric Login Window” on page A-2 .
Groups	Opens the Groups submenu so you can create, edit, import, and export switchgroups and portgroups. For more information on the Groups submenu, refer to “Groups Submenu” on page A-3 . For information on how to create, edit, and delete groups, refer to “Grouping” on page 4-1 .
Options	Opens the Options window to set default options for the following areas: <ul style="list-style-type: none">• Topology• Fabric Change• ISL Status• Log Parameters• File Transfers For more information, refer to “Options Window” on page A-6 .

Table A-1 File Menu Options (Continued)

Option	Description
Log...	Opens the Fabric Log window to view Fabric Manager log entries. For more information, refer to “Fabric Log Window” on page A-12 .
Print...	Opens the Print window to print a report summary or topology.
Print In One Page...	Opens the Print window to print a topology to one page.
Page Setup...	Opens the Page Setup window to configure print options.
Exit	Closes Fabric Manager.

Fabric Login Window

The **Fabric Login** window lets you log in to multiple switches simultaneously. [Table A-2](#) describes the components of the window.

Note: For instructions that explain how to perform a fabric login, refer to [“Logging In to Multiple Switches Simultaneously” on page 3-6](#).

Table A-2 Fabric Login Window Components

Component	Description
User Id field	Accepts the user ID that you use to log into the switches.
Password field	Accepts the password that you use to log into the switches.
Name/IP/WWN radio buttons	Determine how the SAN Elements tab identifies switches. For more information, refer to “Selecting Identity” on page 3-7 .
SAN Elements tab	Displays the fabrics, switches, and groups that you can log in to.
Filter tab	Filters elements based on alphanumeric text strings.
directional arrows	Add or remove switches from the Selected Switches field.
Selected Switches field	Displays the switches that you have chosen to log in to.
IP Address column	Displays the IP address of each switch in the Selected Switches field. Click the column header to list all switches in ascending or descending order by IP address.
Switch Name column	Displays the switch name of each switch in the Selected Switches field. Click the column header to list all switches in ascending or descending order by switch name.
Firmware version column	Displays the firmware that runs on each switch in the Selected Switches field. Click the column header to list all switches in ascending or descending order by firmware version.

Table A-2 Fabric Login Window Components (Continued)

Component	Description
UserID column	Displays the user ID that you used to log in to each switch in the Selected Switches field. If you have not logged-in to the switch, this field remains blank. Click the column header to list all switches in ascending or descending order by user ID.
Status column	Displays the log in status of each switch in the Selected Switches field. Click the column header to list all switches in ascending or descending order by status.
Apply button	Applies the userID and password that you specify to log in to one or more switches.
Close button	Closes the Fabric Login window.
Help button	Opens Fabric Manager Help.

Groups Submenu

The **Groups** submenu lets you configure, import, and export Fabric Manager logical groups. [Table A-3](#) lists the options in this submenu and describes each option.

Note: For instructions on how to create and edit logical groups, refer to [“Grouping” on page 4-1](#).

Table A-3 Groups Submenu Items

Option	Description
Edit Switch Groups...	Opens the Edit Switch Groups window to create or modify switch groups. For information on the window, refer to “Edit Switch Groups Window” on page A-4 .
Edit Port Groups...	Opens the Edit Port Groups window to create or modify port groups. For information on the window, refer to “Edit Port Groups Window” on page A-4 .
Import Group...	Opens the Import from file window to add a group (from a previously-saved group file) to your user profile. For instructions on how to import a group, refer to “Importing a Group” on page 4-4 .
Export Group...	Opens the Export window to export one or of the groups that you defined in Fabric Manager. For information on the window, refer to “Export Window” on page A-5 .

Edit Switch Groups Window

The **Edit Switch Groups** window lets you create new switch groups and modify or delete existing switch groups. [Table A-4](#) lists and describes the components of the window.

Table A-4 Edit Switch Groups Window Components

Component	Description
Name/IP/WWN radio buttons	Determine how the SAN Elements tab identifies switches. For more information, refer to “Selecting Identity” on page 3-7 .
SAN Elements tab	Displays the fabrics and switches that you can add to your groups.
Filter tab	Filters elements based on alphanumeric text strings.
SwitchGroups navigation tree	Displays existing switch groups and lets you move groups within the tree.
Create... button	Opens the Create Group window to create and name a new switch group.
Edit... button	Opens the Edit Group window to rename an existing switch group.
Delete button	Deletes an existing switch group.
OK button	Applies and saves switch group edits.
Cancel button	Aborts switch group edits.
Help button	Opens Fabric Manager Help to the Groups section.

Edit Port Groups Window

The **Edit Port Groups** window lets you create new port groups and modify or delete existing port groups. [Table A-5](#) lists and describes the components of the window.

Table A-5 Edit Port Groups Window Components

Component	Description
Name/IP/WWN radio buttons	Determine how the SAN Elements tab identifies switches. For more information, refer to “Selecting Identity” on page 3-7 .
SAN Elements tab	Displays the fabrics and switches that you can add to your groups.
Filter tab	Filters elements based on alphanumeric text strings.
PortGroups navigation tree	Displays existing port groups and lets you move groups within the tree.
Create... button	Opens the Create Group window to create and name a new port group.
Edit... button	Opens the Edit Group window to rename an existing port group.

Table A-5 Edit Port Groups Window Components (Continued)

Component	Description
Delete button	Deletes an existing port group.
OK button	Applies and saves port group edits.
Cancel button	Aborts port group edits.
Help button	Opens Fabric Manager Help to the Groups section.

Export Window

Use the **Export** window to export one or more logical groups to a XML file. [Table A-6](#) lists and describes the components of the window.

Note: For instructions on how to export groups, refer to [“Exporting Groups” on page 4-4](#).

Table A-6 Export Window Components

Component	Description
File field	Accepts the path to a file to which you export your group(s).
Browse... button	Opens the Export to file window to choose the file to which you export your group(s).
Name/IP/WWN radio buttons	Determine how the SAN Elements tab identifies switches. For more information, refer to “Selecting Identity” on page 3-7 .
SAN Elements tab	Displays the fabrics and switches that you can add to your groups.
To Export field	Lists the groups to export.
Group column	Lists the name of each group in the To Export field.
Path column	Lists the path of each group in the To Export field. The path matches the hierarchy in the groups navigation tree.
Type column	Lists the group type (switch or port) of each group in the To Export field.
Save button	Saves groups to a file.
Cancel button	Aborts the export process.
Delete button	Removes one or more groups that you select from the To Export field.
Help button	Opens Fabric Manager Help to the Groups section.

Options Window

The **Options** window lets you configure various Fabric Manager defaults. The **Configurations** navigation tree displays the categories of options that you can configure. [Table A-7](#) lists and describes the categories of options that you can configure.

Table A-7 Options Categories

Category	Description
Topology	<p>Lets you configure the following defaults:</p> <ul style="list-style-type: none">• Default Startup Layout• Default Startup Link Style• Default Link Bundle State• Tile Direction• Threshold Percent• Threshold Trigger Period <p>For more information on these defaults, refer to “Topology Options” on page A-8.</p>

Table A-7 Options Categories (Continued)

Category	Description
Fabric Change	<p>Lets you configure the following:</p> <ul style="list-style-type: none"> • Fabric Checking • Fabric Change handling <p>For more information on these defaults, refer to “Fabric Change Options” on page A-9.</p>
ISL Status	<p>Lets you configure the following:</p> <ul style="list-style-type: none"> • Incorporate Adds into Stamp • Add Conflict Status • Add Status • Remove Status • Remove Direct Connection Status • Move Status <p>For more information on these defaults, refer to “ISL Status Options” on page A-9.</p>
Log Parameters	<p>Lets you configure the following:</p> <ul style="list-style-type: none"> • Log Directory Path • Fabric Manager Log Level • File Log Level <p>For more information on these defaults, refer to “Log Parameter Options” on page A-10.</p>
File Transfer	<p>Lets you configure the following:</p> <ul style="list-style-type: none"> • Remote Host IP • Remote User Name • Remote Directory Path • Select Protocol • Password Required for FTP <p>For more information on these defaults, refer to “File Transfer Options” on page A-11.</p>

Topology Options

Configure topology options to establish the default appearance of fabric topologies in Topology view. [Table A-8](#) lists and describes the default topology traits that you can configure.

Table A-8 Topology Options

Option	Description
Default Startup Layout pulldown menu	Configures the topology layout that appears by default when you open Topology view. You can select from the following layouts: <ul style="list-style-type: none"> • Circular layout arranges the switches and nodes of a fabric into a circle. • Core-Edge layout visually separates core switches, edge switches, and nodes. • Tree layout organizes the fabric hierarchically. For more information on topology layouts, refer to “Topology View” on page C-19 .
Default Startup Link Style pulldown menu	Configures the link style that appears by default when you open Topology view. You can select from the following styles: <ul style="list-style-type: none"> • Orthogonal style displays all links as horizontal and vertical lines that turn at right angles. • Straight style displays all links as straight, unbending lines that connect switches along the shortest path.
Default Link Bundle State pulldown menu	Designates the default link bundle state as expanded or collapsed.
Tile Direction pulldown menu	Designates the way you want non-connected graph objects to appear in relation to each other (horizontally or vertically).
Threshold Percent field	Configures the percent of bandwidth above which the link raises a flag.
Threshold Trigger Period field	Configures the amount of time (in seconds) that the bandwidth of a link must exceed the threshold percent before the link raises a flag. You cannot configure this field to a value higher than 60 seconds.
OK button	Applies configuration changes.
Cancel button	Aborts configuration changes.

Fabric Change Options

Configure fabric change options to enable and customize Fabric Checking. [Table A-9](#) lists and describes the fabric change options that you can configure.

Table A-9 Fabric Change Options

Options	Description
Automatically check fabrics? checkbox	Enables fabric checking on all fabrics currently monitored by Fabric Manager, and any additional fabrics discovered from this point on. For more information on how to configure Fabric Checking, refer to “Automatically Enabling Fabric Checking on All Fabrics” on page 12-3 .
Fabric Change handling pulldown menu	Configures allowable changes to the fabric. Choose one of the following: <ul style="list-style-type: none">• Check for lost and added switches.• Check for lost switches only.
OK button	Applies configuration changes.
Cancel button	Aborts configuration changes.

ISL Status Options

Configure ISL status options to establish

- If Fabric Manager incorporates new switches directly into the stamp.
- The severity level of the flag that each status change evokes.

[Table A-10](#) lists and describes the ISL status options that you can configure.

For instructions on how to configure ISL status parameters, refer to [“Assigning Color Status Settings” on page 11-2](#).

Table A-10 ISL Status Options

Options	Description
Incorporate Adds into Stamp check box	Automatically updates the ISL stamp when you add ISLs to the fabric.
Add Conflict Status radio buttons	Configures the color of the flag (red or yellow) that Fabric Manager raises when you connect an ISL to a port that, according to the stamp, “belongs” to a different switch in the fabric.
Add Status radio buttons	Configures the color of the flag (red or yellow) that Fabric Manager raises when you add an ISL that does not appear in the current stamp. You cannot configure this option if you check the Incorporate Adds into Stamp checkbox.
Remove Status radio buttons	Configures the color of the flag (red or yellow) that Fabric Manager raises when you remove an ISL that appears in the current stamp. You cannot configure Remove status to be more severe than Remove Direct Connection status.
Remove Direct Connection Status radio buttons	Configures the color of the flag (red or yellow) that Fabric Manager raises when you remove every link between two domains. Direct connect remove events occur when you remove every link between two domains/switches.
Move Status radio buttons	Configures the color of the flag (red or yellow) that Fabric Manager raises when you move an ISL from one port to another port on the same switch. Move events occur when you move one end of an ISL to a different port on the same switch, but do not change the port on the other end of the ISL.

Log Parameter Options

Configure log parameters to assign severity levels to various fabric events and to assign a directory to store logs. [Table A-11](#) lists and describes log parameter options.

For instructions on how to configure log parameters, refer to [“Configuring Log Parameters” on page 3-10](#).

Table A-11 Log Parameter Options

Option	Description
Log Directory Path field	Configures the directory to which Fabric Manager stores logs.
Browse button	Opens the Select window to choose a directory to store logs.
Fabric Manager Log Level pulldown menu	Assigns the severity level of Fabric Manager application log entries.
File Log Level pulldown menu	Assigns the severity level of file log entries.
OK button	Applies log parameter changes.
Cancel button	Aborts log parameter changes.
Restore to Defaults button	Restores all fields to default values.
Help button	Opens Fabric Manager Help .

File Transfer Options

Configure file transfer options to perform tasks such as firmware download that require FTP to execute. [Table A-12](#) lists and describes the file transfer fields.

For instructions on how to configure transfer options, refer to [“Configuring File Transfer Options” on page 3-14](#).

Table A-12 File Transfer Options

Option	Description
Remote Host IP field	Accepts the IP address of a host that runs FTP.
Remote User Name field	Accepts the user name with which to log in to the host.
Remote Directory Path field	Accepts the path on the server to access.
Select Protocol pulldown menu	Identifies the protocol to use to contact the host.
Password Required for FTP field	Accepts the password with which to log in to the host.

Table A-12 File Transfer Options (Continued)

Option	Description
OK button	Applies file transfer changes.
Cancel button	Aborts file transfer changes.
Test button	Tests if you can successfully access the host with the protocol you configured in the Select Protocol pulldown menu.
Help button	Opens Fabric Manager Help .

Fabric Log Window

The **Fabric Log** window lists log entries that the application logs about itself as it runs. This log appears for customer support purposes only. [Table A-13](#) lists and describes the components of this window.

Table A-13 Fabric Log Components

Component	Description
Severity column	Displays the severity of the event that prompted the log entry. Click the column header to list all log entries in ascending or descending order by severity.
Time column	Displays the date and time that event occurred. Click the column header to list all log entries in ascending or descending order by timestamp.
Module column	Displays the application module associated with the event. Click the column header to list all log entries in ascending or descending order by module.
Message column	Displays messages for customer support. Click the column header to list all log entries in ascending or descending order by message.
Module Instance column	Displays Fabric Manager thread instances. Click the column header to list all log entries in ascending or descending order by application-module instance.
Detail Log Message window	Aggregates a row in the Fabric Log table into a single consolidated message.
Search button	Opens the Search Dialog window. For more information on this window, refer to “Search Dialog Window” on page A-13 .
Filter button	Opens the Filter Dialog window. For more information on this window, refer to “Filter Dialog Window” on page A-13 .
Close button	Closes the Fabric Log window.

Search Dialog Window

Use the **Search Dialog** window to search the contents of the log. [Table A-14](#) lists and describes the components of the window.

Table A-14 Search Dialog Window Components

Component	Description
Message Contains field	Accepts text to search for in the message.
Case Sensitive checkbox	Applies case sensitivity when Fabric Manager searches for the text in the Message Contains field.
Severity pulldown menu	Limits the search to messages of particular severity levels.
Module field	Limits the search to messages with particular modules.
Date Range pulldown menus	Limits the search to messages with time stamps between a particular range (inclusive).
Search button	Begins the search.
Next button	Progresses to the next log entry that meets the search criteria.
Prev button	Returns to the previous entry that met the search criteria.
Close button	Closes the Search Dialog window.

Filter Dialog Window

Use the **Filter Dialog** window to filter the log entries that the **Fabric Log** window displays. [Table A-15](#) lists and describes the components of the window.

The filter excludes all messages that do not meet the criteria of the **Filter Dialog** window.

For instructions on how to filter fabric events, refer to [“Filtering Events” on page 19-1](#).

Table A-15 Filter Dialog Window Components

Component	Description
Message Contains field	Accepts text that Fabric Manager uses as a criteria to filter out a message. Fabric Manager excludes all messages that do not contain the text.
Case Sensitive checkbox	Applies case sensitivity when Fabric Manager filters messages with the Message Contains field.
Severity pulldown menu	Filters out messages of all other severity levels.

Table A-15 Filter Dialog Window Components (Continued)

Component	Description
Module field	Filters out messages of all other modules.
Date Range pulldown menus	Filters out all messages with dates that do not fall within the date range.
Filter button	Applies the filter.
Close button	Closes the Filter Dialog window.

Edit Menu Reference

This appendix includes the following sections:

- [“Introduction” on page B-2](#)
- [“Edit View Options Windows” on page B-3](#)

Introduction

The **Edit** menu manages elements of the GUI. [Table B-1](#) describes the options in the **Edit** menu.

Table B-1 Edit Menu Options

Option	Description
Copy Table	<p>Copies a table so you can paste it into an application that uses tab-delimited cell/return-delimited row format.</p> <p>To select the Copy Table option, you must first open one of the following views:</p> <ul style="list-style-type: none">• Devices view• Portgrid view• Ports view• Switches view
Rename	<p>Changes the identifier of a switch, port, or fabric in the SAN Elements tab.</p> <p>This option does not reconfigure the Switch Name. It only changes how the fabric or switch appears in Fabric Manager.</p> <p>To select the Rename option, you must first click one of the following elements:</p> <ul style="list-style-type: none">• a fabric in the SAN Elements tab• a switch in the SAN Elements tab• a port in the SAN Elements tab

Table B-1 Edit Menu Options (Continued)

Option	Description
View Options...	Opens the Edit View Options for X window (where <i>X</i> represents the current active view) to customize the Fabric Manager display. For more information on this window, refer to “Edit View Options Windows” on page B-3 .
Change description	<p>Opens the Please enter the new description dialog box to change the description of a pane. Every Fabric Manager view that displays a pane (for instance, Summary view when you click Fabrics in the SAN Elements tab) includes a description. By default, this description reads Double click to add description. This option provides an alternative method to change the description.</p> <p>After you change the description of an element, you must click the parent element to view the new description in the pane.</p>

Edit View Options Windows

Each view uses a different **Edit View Options** window, but not all views support the **Edit > View Options...** selection. You can open an **Edit View Options** window with the following views:

- Device Ports view
- Devices view
- Ports view
- Summary view (but only when you select a fabric, group, or switch from the **SAN Elements** tab)
- Switches view

The **Edit>View Options...** selection will be greyed out for all other views.

Edit View Options for Details

Details vary based on the element that you select in the **SAN Elements** tab. [Table B-2](#) lists the elements that you can click in the **SAN Elements** tab and provides the window that opens. A description of each window follows the table.

Table B-2 Elements and Edit View Option Windows

Element	Window
My SAN	Not applicable. You cannot select Edit > View Options... when you click My SAN .
Fabrics	Edit View Options for Fabric At-A-Glance Detail
any given fabric	Edit View Options for Switch At-A-Glance Detail
any given switch	Edit View Options for Card At-A-Glance Detail (for switches that use cards) Edit View Options for At-A-Glance Port Detail (for all other switches)

Table B-2 Elements and Edit View Option Windows (Continued)

Element	Window
any given card	Edit View Options for Port At-A-Glance Detail
any given port	Edit View Options for Devices
SwitchGroups	Edit View Options for Logical Group At-A-Glance Detail
any given switch group	Edit View Options for Switch At-A-Glance Detail
PortGroups	Edit View Options for Port Group At-A-Glance Detail
any given port group	Edit View Options for Port At-A-Glance Detail

Edit View Options for Fabrics At-A-Glance Detail

The **Edit View Options for Fabrics At-A-Glance Detail** window lists the various fabric traits and properties that Fabric Manager can display and lets you choose which options appear in Summary view. The **Edit View Options for Fabric Detail** window lets you choose from the following options:

- Launch switch
- Principal switch
- Member switches
- Switch status
- Switch types
- FabricOS versions
- Port information
- Device information
- Active zones

Edit View Options for Switch At-A-Glance Detail

The **Edit View Options for Switch At-A-Glance Detail** window lists the various switch traits and properties that Fabric Manager can display and lets you choose which options appear in Ports view. The **Edit View Options for Switch Detail** window lets you choose from the following options:

- Switch status
- Switch types
- Fabric OS versions
- Domain ID
- Ethernet IP
- Ethernet Mask
- FCnet IP
- FCnet Mask
- Gateway IP
- WWN
- Switch Role

- Trunk Information
- Member ports
- ISL Ports
- Port status
- Port type
- Port speed
- Light state
- Port information
- Device information

Edit View Options for Card At-A-Glance Detail

The **Edit View Options for Card At-A-Glance Detail** window lists the various card traits and properties that Fabric Manager can display and lets you choose which options appear in Ports view. The **Edit View Options for Card Detail** window lets you choose from the following options:

- Member ports
- ISL Ports
- Port status
- Port speed
- Light state
- Port information
- Device information

Edit View Options for Port At-A-Glance Detail

The **Edit View Options for Port At-A-Glance Detail** window lists the various port traits and properties that Fabric Manager can display and lets you choose which options appear in Ports view. The **Edit View Options for Port Detail** window lets you choose from the following options:

- Port number
- Port status
- Port type
- Port WWN
- Port speed
- Light state
- Device information

Edit View Options for Logical Group At-A-Glance Detail

The **Edit View Options for Logical Group At-A-Glance Detail** window lists the various switch group traits and properties that Fabric Manager can display and lets you choose which options appear in Ports view. The **Edit View Options for Logical Group Detail** window lets you choose from the following options:

- Groups information

- Member switches
- Switch status
- Switch types
- Fabric OS versions
- Port information
- Device information

Edit View Options for Port Group At-A-Glance Detail

The **Edit View Options for Port Group At-A-Glance Detail** window lists the various port traits and properties that Fabric Manager can display and lets you choose which options appear in Ports view. The **Edit View Options for Port Group Detail** window lets you choose from the following options:

- Groups information
- Member ports
- ISL ports
- Port status
- Port type
- Port speed
- Light state
- Port information
- Device information

Edit View Options for Device Ports

The **Edit View Options for Device Ports window** lists the various device traits and properties that Fabric Manager can display and lets you choose which options appear in Device Ports view. This window lets you choose from the following options:

- Domain ID
- Port
- Port ID
- Port Type
- Fabric Port WWN
- Device Port WWN
- Device Node WWN
- Device Name
- FC4 Type
- COS
- Port IP Address
- Hard Address
- Manufacturer

- Sequence Number
- Device Type Number
- Model
- Manufacturing Plant
- Tag
- Capability

Edit View Options for Devices

The **Edit View Options for Devices** window lists the various device traits and properties that Fabric Manager can display and lets you choose which options appear in Devices view. This window lets you choose from the following options:

- Device Node WWN
- SCSI Inquiry name
- Serial number
- Model description
- Hardware
- Driver
- ROM version
- Firmware
- OS name and version

Edit View Options for Ports

The **Edit View Options for Ports** window lists the various port traits and properties that Fabric Manager can display and lets you choose which options appear in Ports view. This window lets you choose from the following options:

- Fabric
- Switch
- ID
- Status
- Light
- State
- Type
- Speed
- Port Module
- Card Number
- Port Number
- User Port Number

- WWN
- Name

Edit View Options for Summaries

Summaries vary based on the element that you select in the **SAN Elements** tab. [Table B-3](#) lists the elements that you can click in the **SAN Elements** tab and provides the window that opens. A description of each window follows the table.

Table B-3 Elements and Edit View Option Windows

Element	Window
My SAN	Not applicable. You cannot select Edit > View Options... when you click My SAN .
Fabrics	Edit View Options for Fabric At-A-Glance Summary
any given fabric	Edit View Options for Switch At-A-Glance Summary
any given switch	Edit View Options for Card At-A-Glance Summary (for switches that use cards) Edit View Options for Port At-A-Glance Summary (for all other switches)
any given card	Edit View Options for Port At-A-Glance Summary
any given port	Edit View Options for Device At-A-Glance Summary
SwitchGroups	Edit View Options for Logical Group At-A-Glance Summary
any given switch group	Edit View Options for Switch At-A-Glance Summary
PortGroups	Edit View Options for Port Group At-A-Glance Summary
any given port group	Edit View Options for Port At-A-Glance Summary

Edit View Options for Fabric At-A-Glance Summary

The **Edit View Options for Fabric At-A-Glance Summary** window lists the various fabric traits and properties that Fabric Manager can display and lets you choose which options appear in Summary view. This window lets you choose from the following options:

- Launch switch
- Principal switch
- Member switches
- Switch status
- Switch types
- FabricOS versions
- Port information
- Device information
- Active zones

Edit View Options for Switch At-A-Glance Summary

The **Edit View Options for Switch At-A-Glance Summary** window lists the various switch traits and properties that Fabric Manager can display and lets you choose which options appear in Ports view. This window lets you choose from the following options:

- Switch status
- Switch types
- Fabric OS versions
- Domain ID
- Ethernet IP
- Ethernet Mask
- FCnet IP
- FCnet Mask
- Gateway IP
- WWN
- Switch Role
- Trunk Information
- Member ports
- ISL Ports
- Port status
- Port type
- Port speed
- Light state
- Port information
- Device information

Edit View Options for Card At-A-Glance Summary

The **Edit View Options for Card At-A-Glance Summary** window lists the various card traits and properties that Fabric Manager can display and lets you choose which options appear in Ports view. This window lets you choose from the following options:

- Blade State
- Power State
- Attn State
- Member ports
- ISL Ports
- Port status
- Port type
- Port speed
- Light state
- Port information

- Device information

Edit View Options for Port At-A-Glance Summary

The **Edit View Options for Port At-A-Glance Summary** window lists the various port traits and properties that Fabric Manager can display and lets you choose which options appear in Ports view. This window lets you choose from the following options:

- Port number
- Port status
- Port type
- Port WWN
- Port speed
- Light state
- Device information

Edit View Options for Logical Group At-A-Glance Summary

The **Edit View Options for Logical Group At-A-Glance Summary** window lists the various switch group traits and properties that Fabric Manager can display and lets you choose which options appear in Ports view. This window lets you choose from the following options:

- Groups information
- Member switches
- Switch status
- Switch types
- Fabric OS versions
- Port information
- Device information

Edit View Options for Port Group At-A-Glance Summary

The **Edit View Options for Port Group At-A-Glance Summary** window lists the various port traits and properties that Fabric Manager can display and lets you choose which options appear in Ports view. This window lets you choose from the following options:

- Groups information
- Member ports
- ISL ports
- Port status
- Port type
- Port speed
- Light state
- Port information
- Device information

Edit View Options for Switches

The **Edit View Options for Switches** window lists the various switch traits and properties that Fabric Manager can display and lets you choose which options appear in Ports view. This window lets you choose from the following options:

- Name
- IP
- Version
- Status
- Fabric
- ID
- IP Mask
- Gateway
- FCIP
- FC Mask
- Responding
- Role
- Domain ID
- WWN
- Serial Number
- State
- Is Core
- Port Count
- Free Ports
- ISL Count
- Secure Mode
- Using FCIP
- Have UserID
- Has Certificate
- Trunk Count
- Trunked Port Count
- Device Count
- Switch PartNumber
- IDID

View Menu Reference

This appendix includes the following sections:

- [“Introduction” on page C-1](#)
- [“Detail View” on page C-1](#)
- [“Device Ports View” on page C-6](#)
- [“Devices View” on page C-7](#)
- [“Event View” on page C-8](#)
- [“Portgrid View” on page C-11](#)
- [“Ports View” on page C-11](#)
- [“Summary View” on page C-12](#)
- [“Switches View” on page C-17](#)
- [“Topology View” on page C-19](#)

Introduction

The **View** menu lists the various Fabric Manager views. The sections that follow describe each view. You can use the **View** menu to navigate Fabric Manager just as you use the view selector. For more information on the navigation options, refer to [“Navigating with Elements and Views” on page 3-7](#).

Detail View

Detail view provides detailed information about SAN elements. When you click an element in the **SAN Elements** tab and select Detail view, Fabric Manager displays a pane for each nested element. (That is, if you click a fabric, you see panes for each switch in the fabric; if you click a switch, you see panes for each card or port on the switch.) You can expand any item in the pane that includes two right angle brackets (>>). Click the item to expand it. Click the item again to collapse it.




My SAN Detail

Each pane in **My SAN Detail** provides an **At-A-Glance overview** of the major categories of elements: **Fabrics**, **SwitchGroups**, and **PortGroups**. The information that appears in the overview depends on the options that you configure with the **Edit** menu. For more information on view options, refer to [“Edit View Options for Devices” on page B-7](#).

Each **At-A-Glance overview** pane includes a series of icons at the bottom. The icons in the bottom-left-hand corner of the pane represent the switch types (in the case of **SwitchGroups** and **Fabrics**) or port types (in the case of **PortGroups**) that appear in that element. One icon appears for each type of switch or port that appears. Place your pointer over the icon to display the number of that type of device that appears.

The icons that appear in the bottom-right-hand corner of the **At-A-Glance overview** pane provide administrative options. [Table C-1](#) presents and describes each icon.

Table C-1 At-A-Glance Overview Administrative Icons

Icon	Description
Events icon ()	Opens Event view in a new Fabric Manager window for the appropriate element. (For instance, if you click the events icon in the SwitchGroups pane, Fabric Manager selects SwitchGroups from the SAN Elements tab and opens Event view.) For more information, refer to “Event View” on page C-8 .
Display icon ()	Opens the Edit View Options window for the appropriate element. For more information, refer to “Edit View Options Windows” on page B-3 .
Update icon ()	Updates the information in the display pane.

Fabrics Detail

Each pane in the **Fabrics Detail** view displays details about each fabric. The information that appears in the overview depends on the options that you configure with the **Edit** menu. For more information on view options, refer to [“Edit View Options for Summaries” on page B-8](#).

Each pane includes a series of icons at the bottom. The icons in the bottom-left-hand corner of the pane represent the switch types that appear in the fabric. One icon appears for each type of switch that appears in the fabric. Place your pointer over the icon to see how many switches of that type appear in the fabric.

The icons that appear in the bottom-right-hand corner of the pane provide administrative options. [Table C-2](#) presents and describes each icon.

Table C-2 Fabrics Detail Icons








Icon	Description
Fabric Events icon ()	Opens Event view in a new Fabric Manager window for the appropriate fabric. (For instance, if you click the events icon in the “Switch X” pane, Fabric Manager selects Switch X from the SAN Elements tab and opens Event view.) For more information, refer to “Event View” on page C-8 .
Zone Admin icon ()	Opens the Zone Admin windows of Web Tools.
Name Server icon ()	Opens the Name Server Table window of Web Tools.

Table C-2 Fabrics Detail Icons (Continued)

Icon	Description
Fabric Topology icon ()	Opens Web Tools topology view to show tables of data that display the routes that the data takes.
Security Admin icon ()	Opens the Security Admin window. For more information, refer to “Security Management” on page 9-1 . This icon only appears in the pane of a secure fabric.
Telnet to FCS icon ()	Opens a telnet session to the FCS. For more information, refer to “Security Management” on page 9-1 . This icon only appears in the pane of a secure fabric.
Update icon ()	Updates the information in the display pane.






Miscellaneous Fabric Detail

Each pane in the Detail view of a given fabric displays details about a switch in the fabric. The information that appears depends on the options that you configure with the **Edit** menu. For more information on view options, refer to [“Edit View Options for Summaries” on page B-8](#).

Each pane includes a series of icons at the bottom. The icons in the bottom-left-hand corner of each pane represent the port types that appear in the switch. One icon appears for each type of port that appears in the switch. Place your pointer over the icon to see how many ports of that type appear in the switch.

The icons that appear in the bottom-right-hand corner of the pane provide administrative options. [Table C-3](#) presents and describes each icon.

Table C-3 Misc. Fabric Detail Icons

Icon	Description
Switch Events icon ()	Opens Event view for the switch in a new Fabric Manager window.
Admin View icon ()	Opens the Switch Admin window of Web Tools.
Fabric Watch icon ()	Opens the Fabric Watch window of Web Tools.
Telnet icon ()	Opens a telnet session to the switch.
Update icon ()	Updates the information in the display pane.


Miscellaneous Switch Detail

Each pane in the detail view of a given switch displays details about a card or port in the switch. The information that appears depends on the options that you configure with the **Edit** menu. For more information on view options, refer to [“Edit View Options for Summaries” on page B-8](#).

For switches that use cards, each pane includes a series of icons at the bottom. The icons in the bottom-left-hand corner of each pane represent the port types that appear in the switch. One icon appears for each type of port that appears in the switch. Place your pointer over the icon to see how many cards or ports of that type appear in the switch.

The icons that appear in the bottom-right-hand corner of the pane provide administrative options. [Table C-4](#) presents and describes each icon.

Table C-4 Misc. Switch Detail Icons


Icon	Description
Update icon ()	Updates the information in the display pane.

Miscellaneous Card Detail

Each pane in the detail view of a given card displays details about a port in the card. The information that appears depends on the options that you configure with the **Edit** menu. For more information on view options, refer to [“Edit View Options for Summaries” on page B-8](#).

The icons that appear in the bottom-right-hand corner of the pane provide administrative options. [Table C-5](#) presents and describes each icon.

Table C-5 Misc. Card Detail Icons

Icon	Description
Update icon ()	Updates the information in the display pane.





SwitchGroups Detail

Each pane in the **SwitchGroups Detail** view displays details about a particular switch group. The information that appears depends on the options that you configure with the **Edit** menu. For more information on view options, refer to [“Edit View Options for Summaries” on page B-8](#).

Each pane includes a series of icons at the bottom. The icons in the bottom-left-hand corner of each pane represent the switch types that appear in the group. One icon appears for each type of switch that appears in the group. Place your pointer over the icon to see how many switches of that type appear in the group.

The icons that appear in the bottom-right-hand corner of the pane provide administrative options. [Table C-6](#) presents and describes each icon.

Table C-6 SwitchGroups Detail Icons

Icon	Description
Group Events icon ()	Opens Event view for the switch in a new Fabric Manager window.
Group Creation icon ()	Opens the Edit Switch Group window. For more information on this window, refer to “Edit Switch Groups Window” on page A-4 .
Group Exportation icon ()	Opens the Export window. For more information on this window, refer to “Export Window” on page A-5 .
Update icon ()	Updates the information in the display pane.






Miscellaneous Switch Group Detail

Each pane in the detail view of a given switch group displays details about a switch in the group. The information that appears depends on the options that you configure with the **Edit** menu. For more information on view options, refer to [“Edit View Options for Summaries” on page B-8](#).

Each pane includes a series of icons at the bottom. The icons in the bottom-left-hand corner of each pane represent the port types that appear in the switch. One icon appears for each type of port that appears in the switch. Place your pointer over the icon to see how many ports of that type appear in the switch.

The icons that appear in the bottom-right-hand corner of the pane provide administrative options. [Table C-7](#) presents and describes each icon.

Table C-7 Misc. Switch Group Detail Icons

Icon	Description
Switch Events icon ()	Opens Event view for the switch in a new Fabric Manager window.
Admin View icon ()	Opens the Switch Admin window of Web Tools.
Fabric Watch icon ()	Opens the Fabric Watch window of Web Tools.
Telnet icon ()	Opens a telnet session to the switch.
Update icon ()	Updates the information in the display pane.




PortGroups Detail

Each pane in the **PortGroups Detail** view displays details about a particular port group. The information that appears depends on the options that you configure with the **Edit** menu. For more information on view options, refer to [“Edit View Options for Summaries” on page B-8](#).

Each pane includes a series of icons at the bottom. The icons in the bottom-left-hand corner of each pane represent the port types that appear in the group. One icon appears for each type of port that appears in the port group. Place your pointer over the icon to see how many ports of that type appear in the group.

The icons that appear in the bottom-right-hand corner of the pane provide administrative options. [Table C-8](#) presents and describes each icon.

Table C-8 PortGroups Detail Icons


Icon	Description
Group Creation icon ()	Opens the Edit Port Group window. For more information on this window, refer to “Edit Port Groups Window” on page A-4 .
Group Exportation icon ()	Opens the Export window. For more information on this window, refer to “Export Window” on page A-5 .
Update icon ()	Updates the information in the display pane.

Miscellaneous Port Group Detail

Each pane in the detail view of a given port group displays details about a port in the group. The information that appears depends on the options that you configure with the **Edit** menu. For more information on view options, refer to [“Edit View Options for Summaries” on page B-8](#).

The icons that appear in the bottom-right-hand corner of the pane provide administrative options. [Table C-9](#) presents and describes each icon.

Table C-9 Misc. Port Group Detail Icons

Icon	Description
Update icon ()	Updates the information in the display pane.

Device Ports View

The Device Ports view lists the device ports attached to a given element in the **SAN Elements** tab. The properties that the Device Ports view displays appear in [Table C-10](#).

Table C-10 Device Ports View Display

Column	Description
Domain ID	Identifies the domain ID.
Port	Identifies the device and the port on that device.
Port ID	Identifies the port ID, in hexadecimal format.
Port Type	Identifies the port type.
Fabric Port WWN	Identifies the fabric port World Wide name.
Device Port WWN	Identifies the device port World Wide name.
Device Node WWN	Identifies the device node World Wide name.
Device Name	Identifies the device name.
FC4 Type	Identifies the FC4 type.

Table C-10 Device Ports View Display (Continued)

Column	Description
COS	Identifies the class of service.
Port IP Address	Identifies the port IP address.
Hard Address	Identifies the hard address.
Manufacturer	Identifies the device's manufacturer.
Sequence Number	Identifies the sequence number.
Device Type Number	Identifies the device type number.
Model	Identifies the model number.
Manufacturing Plant	Identifies the manufacturing plant of the device.
Tag	Identifies the device tag.
Capability	Identifies the device capability.

Devices View

Devices view lists the devices attached to a given element in the **SAN Elements** tab. [Table C-11](#) lists the properties displayed in the Devices view.

Table C-11 Devices View Display

Column	Description
Device Node WWN	Displays the world wide name of the device.
SCSI Inquiry Name	Displays the SCSI inquiry name of the device. The SCSI inquiry name serves as the symbolic SCSI name of the device. If the device does not have a SCSI inquiry name, nothing appears in this field.
Serial number	Displays the serial number of FDMI-capable HBAs.
Model Description	Displays a description of an FDMI-capable device.
Hardware	Displays an internal identifier of the FDMI-capable HBA manufacturer.
Driver	Displays the driver that host runs for that HBA.
ROM version	Indicates the ROM version.
Firmware	Displays the firmware that the HBA runs.
OS name and version	Displays the OS of the device on which the HBA is installed.

Event View

Event view consists of two sections, as follows:

- Current Status Reason
- Event Log

Event view is displayed in [Figure C-1](#).

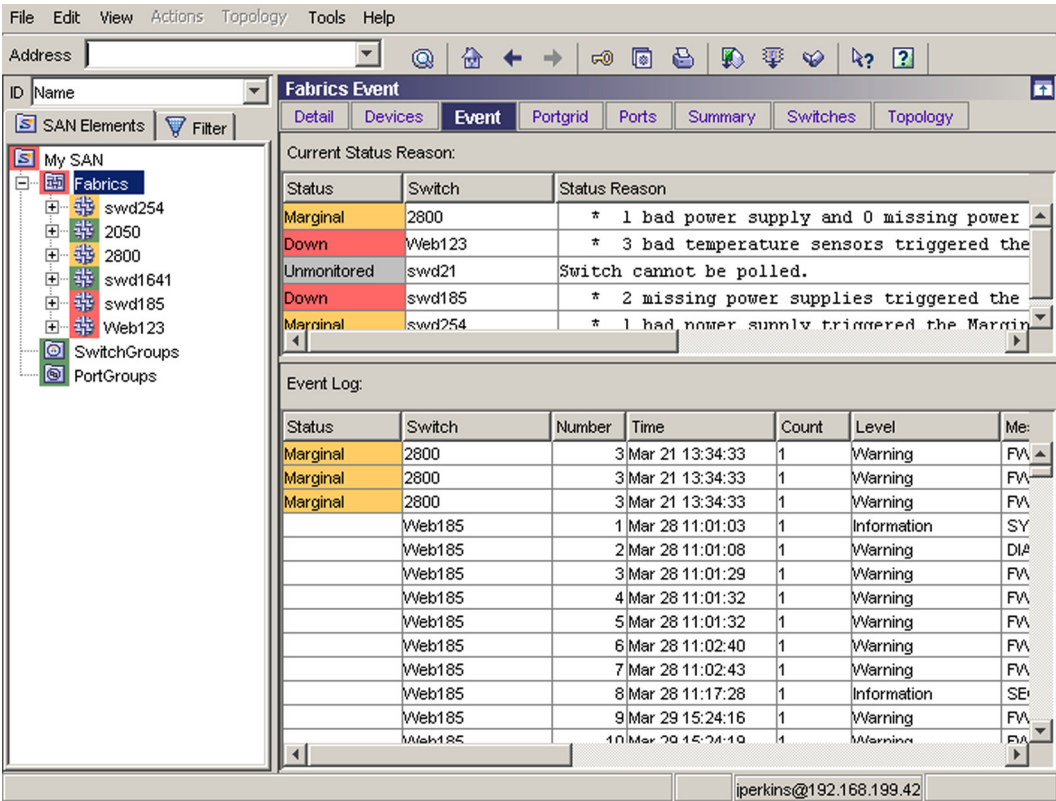


Figure C-1 Event View

The Current Status Reason section provides the following information about each switch that appears:

- the status of the switch
- the name of the switch
- the reason for the state of the switch

The Event Log section lists log entries and provides information about each entry. [Table C-12](#) describes the information that appears in each entry.

Table C-12 Event View Log Entry Display

Property	Description
Status	Displays the status of the switch.
Switch	Displays the name of the switch.
Number	Displays the number of the event. Events are numbered sequentially based on the time that they occurred.
Time	Displays the time that the event occurred.

Table C-12 Event View Log Entry Display

Property	Description
Count	Displays the number of consecutive occurrences of the same event.
Level	Displays the severity level of the event.
Message	Displays the description of the event that occurred. Fabric Manager takes this description from the error log of the switch.
EventSrc	<p>Indicates the event source, as a daemon or library module. The possible event sources are:</p> <ul style="list-style-type: none"> • BLADE • BLOOM • DIAG • EM • ERRLOG • FABRIC • FICON • FSSME • FW • HAM • HAMKERNEL • MS • PD TRACE • PORTSWAP • RCS • SULIB • SYSC • TRACK • TS • ZONE • kSWD • syslog

The quantity of switch and log information depends on the item that you choose from the **SAN Elements** tab.

Portgrid View

Portgrid view displays which ports connect to which devices for switches. Portgrid view only works when you click **My SAN**, **Fabrics**, or a specific fabric or switch in the **SAN Elements** tab. If a device has a SCSI Inquiry Name, Portgrid view will display it. If not, Portgrid view will display the WWN. For loop devices, Portgrid view shows “loop” and the number of devices in the loop.

Ports View

Ports view provides detailed information on every port in the element you select from the **SAN Elements** tab. The view includes status information. The following events (and only these events) change the port status to “down:”

- Diag_Flt
- Lock_Ref
- Port_Flt
- No_Sync
- Laser_Flt
- No_Port

The following events (and only these events) change the port status to “marginal:”

- No_Light
- Disabled
- Testing

The following events (and only these events) change the port status to “healthy:”

- In_Sync
- No_Module
- No_Card
- Online

[Table C-13](#) describes the details that appear in Ports view.

Table C-13 Ports View Display

Property	Description
Fabric	Displays the name of the fabric to which the port belongs.
Switch	Displays the name of the switch to which the port belongs.
ID	Displays the port ID of the port.
Status	Displays the status of the port.
Light	Displays the LED state of the port.
State	Displays the state of the port module.
Type	Displays the port type of the port.

Table C-13 Ports View Display (Continued)

Property	Description
Speed	Displays the speed of the port in gbit/sec.
Port Module	Displays whether the port is copper or fiber.
Card Number	Identifies the card in a dual-switch chassis to which the port belongs.
Port Number	Displays the number of the port in the port card (0-15).
User Port Number	Displays the number of the port in the switch (variable).
WWN	Displays the WWN of the port.
Name	Displays the name that you assigned to the switch with Fabric Manager. For more information, refer to “Renaming a Port” on page 3-4 .
Responding	Indicates the current responding state of the HTTP session.

Summary View

Summary view provides high-level information about SAN elements. When you click an element in the **SAN Elements** tab and select Summary view, Fabric Manager displays a pane for each nested element. (That is, if you click a fabric, you see panes for each switch in the fabric; if you click a switch, you see panes for each card or port on the switch.) You can expand any item in the pane that includes two right angle brackets (>>). Click the item to expand it. Click the item again to collapse it.




My SAN Summary

Each pane in **My SAN Summary** provides an **At-A-Glance overview** of the major categories of elements: **Fabrics**, **SwitchGroups**, and **PortGroups**. The information that appears in the overview depends on the options that you configure with the **Edit** menu. For more information on view options, refer to [“Edit View Options for Devices” on page B-7](#).

Each **At-A-Glance overview** pane includes a series of icons at the bottom. The icons in the bottom-left-hand corner of the pane represent the switch types (in the case of **SwitchGroups** and **Fabrics**) or port types (in the case of **PortGroups**) that appear in that element. One icon appears for each type of switch or port that appears. Place your pointer over the icon to display the number of that type of device that appears.

The icons that appear in the bottom-right-hand corner of the **At-A-Glance overview** pane provide administrative options. [Table C-14](#) presents and describes each icon.

Table C-14 At-A-Glance Overview Administrative Icons

Icon	Description
Events icon ()	Opens Event view in a new Fabric Manager window for the appropriate element. (For instance, if you click the events icon in the SwitchGroups pane, Fabric Manager selects SwitchGroups from the SAN Elements tab and opens Event view.) For more information, refer to “Event View” on page C-8 .
Display icon ()	Opens the Edit View Options window for the appropriate element. For more information, refer to “Edit View Options Windows” on page B-3 .
Update icon ()	Updates the information in the display pane.

Fabrics Summary

Each pane in the **Fabrics Summary** view displays details about each fabric. The information that appears in the overview depends on the options that you configure with the **Edit** menu. For more information on view options, refer to [“Edit View Options for Summaries” on page B-8](#).

Each pane includes a series of icons at the bottom. The icons in the bottom-left-hand corner of the pane represent the switch types that appear in the fabric. One icon appears for each type of switch that appears in the fabric. Place your pointer over the icon to see how many switches of that type appear in the fabric.

The icons that appear in the bottom-right-hand corner of the pane provide administrative options. [Table C-15](#) presents and describes each icon.

Table C-15 Fabrics Detail Icons








Icon	Description
Fabric Events icon ()	Opens Event view in a new Fabric Manager window for the appropriate fabric. (For instance, if you click the events icon in the “Switch X” pane, Fabric Manager selects Switch X from the SAN Elements tab and opens Event view.) For more information, refer to “Event View” on page C-8 .
Zone Admin icon ()	Opens the Zone Admin windows of Web Tools.
Name Server icon ()	Opens the Name Server Table window of Web Tools.

Table C-15 Fabrics Detail Icons (Continued)

Icon	Description
Fabric Topology icon ()	Opens Web Tools topology view to show tables of data that display the routes that the data takes.
Security Admin con ()	Opens the Security Admin window. For more information, refer to “Security Management” on page 9-1 . This icon only appears in the pane of a secure fabric.
Telnet to FCS icon ()	Opens a telnet session to the FCS. For more information, refer to “Security Management” on page 9-1 . This icon only appears in the pane of a secure fabric.
Update icon ()	Updates the information in the display pane.






Miscellaneous Fabric Summary

Each pane in the Summary view of a given fabric displays summary information about a switch in the fabric. The information that appears depends on the options that you configure with the **Edit** menu. For more information on view options, refer to [“Edit View Options for Summaries” on page B-8](#).

Each pane includes a series of icons at the bottom. The icons in the bottom-left-hand corner of each pane represent the port types that appear in the switch. One icon appears for each type of port that appears in the switch. Place your pointer over the icon to see how many ports of that type appear in the switch.

The icons that appear in the bottom-right-hand corner of the pane provide administrative options. [Table C-16](#) presents and describes each icon.

Table C-16 Misc. Fabric Detail Icons

Icon	Description
Switch Events icon ()	Opens Event view for the switch in a new Fabric Manager window.
Admin View icon ()	Opens the Switch Admin window of Web Tools.
Fabric Watch icon ()	Opens the Fabric Watch window of Web Tools.
Telnet icon ()	Opens a telnet session to the switch.
Update icon ()	Updates the information in the display pane.

Miscellaneous Switch Summary


Each pane in the summary view of a given switch displays summary information about a card or port in the switch. The information that appears depends on the options that you configure with the **Edit** menu. For more information on view options, refer to [“Edit View Options for Summaries” on page B-8](#).

For switches that use cards, each pane includes a series of icons at the bottom. The icons in the bottom-left-hand corner of each pane represent the card or port types that appear in the switch. One icon appears for each type of port that appears in the switch. Place your pointer over the icon to see how many cards or ports of that type appear in the switch.

The icons that appear in the bottom-right-hand corner of the pane provide administrative options.

[Table C-17](#) presents and describes each icon.

Table C-17 Misc. Switch Detail Icons

Icon	Description
Update icon ()	Updates the information in the display pane.


Miscellaneous Card Summary

Each pane in the summary view of a given card displays summary information about a port in the card. The information that appears depends on the options that you configure with the **Edit** menu. For more information on view options, refer to [“Edit View Options for Summaries” on page B-8](#).

The icons that appear in the bottom-right-hand corner of the pane provide administrative options.

[Table C-18](#) presents and describes each icon.

Table C-18 Misc. Card Detail Icons

Icon	Description
Update icon ()	Updates the information in the display pane.





SwitchGroups Summary

Each pane in the **SwitchGroups Summary** view displays summary information about a particular switch group. The information that appears depends on the options that you configure with the **Edit** menu. For more information on view options, refer to [“Edit View Options for Summaries” on page B-8](#).

Each pane includes a series of icons at the bottom. The icons in the bottom-left-hand corner of each pane represent the switch types that appear in the group. One icon appears for each type of switch that appears in the group. Place your pointer over the icon to see how many cards or ports of that type appear in the switch.

The icons that appear in the bottom-right-hand corner of the pane provide administrative options. [Table C-19](#) presents and describes each icon.

Table C-19 SwitchGroups Detail Icons

Icon	Description
Group Events icon ()	Opens Event view for the switch in a new Fabric Manager window.
Group Creation icon ()	Opens the Edit Switch Group window. For more information on this window, refer to “Edit Switch Groups Window” on page A-4 .
Group Exportation icon ()	Opens the Export window. For more information on this window, refer to “Export Window” on page A-5 .
Update icon ()	Updates the information in the display pane.






Miscellaneous Switch Group Summary

Each pane in the summary view of a given switch group displays summary information about a switch in the group. The information that appears depends on the options that you configure with the **Edit** menu. For more information on view options, refer to [“Edit View Options for Summaries” on page B-8](#).

Each pane includes a series of icons at the bottom. The icons in the bottom-left-hand corner of each pane represent the port types that appear in the switch. One icon appears for each type of port that appears in the switch. Place your pointer over the icon to see how many ports of that type appear in the switch.

The icons that appear in the bottom-right-hand corner of the pane provide administrative options. [Table C-20](#) presents and describes each icon.

Table C-20 Misc. Switch Group Detail Icons

Icon	Description
Switch Events icon ()	Opens Event view for the switch in a new Fabric Manager window.
Admin View icon ()	Opens the Switch Admin window of Web Tools.
Fabric Watch icon ()	Opens the Fabric Watch window of Web Tools.
Telnet icon ()	Opens a telnet session to the switch.
Update icon ()	Updates the information in the display pane.




PortGroups Summary

Each pane in the **PortGroups Summary** view displays summary information about a particular port group. The information that appears depends on the options that you configure with the **Edit** menu. For more information on view options, refer to [“Edit View Options for Summaries” on page B-8](#).

Each pane includes a series of icons at the bottom. The icons in the bottom-left-hand corner of each pane represent the port types that appear in the group. One icon appears for each type of port that appears in the port group. Place your pointer over the icon to see how many ports of that type appear in the group.

The icons that appear in the bottom-right-hand corner of the pane provide administrative options. [Table C-21](#) presents and describes each icon.

Table C-21 PortGroups Detail Icons


Icon	Description
Group Creation icon ()	Opens the Edit Port Group window. For more information on this window, refer to “Edit Port Groups Window” on page A-4 .
Group Exportation icon ()	Opens the Export window. For more information on this window, refer to “Export Window” on page A-5 .
Update icon ()	Updates the information in the display pane.

Miscellaneous Port Group Summary

Each pane in the detail view of a given port group displays details about a port in the port. The information that appears depends on the options that you configure with the **Edit** menu. For more information on view options, refer to [“Edit View Options for Summaries” on page B-8](#).

The icons that appear in the bottom-right-hand corner of the pane provide administrative options. [Table C-22](#) presents and describes each icon.

Table C-22 Misc. Port Group Detail Icons

Icon	Description
Update icon ()	Updates the information in the display pane.

Switches View

[Table C-23](#) describes the information that Switches view displays about switches.

Table C-23 Switches View Display

Property	Description
Name	Displays the name of the switch.
IP	Displays the IP address of the switch.
Version	Displays the firmware version that the switch runs.
Status	Displays the status of the switch.
Fabric	Displays the fabric to which the switch connects.
ID	Displays the ID that you choose from the ID pulldown menu. For more, refer to “Selecting Identity” on page 3-7 .
IP Mask	Displays the subnet mask of the switch.
Gateway	Displays the gateway of the switch.
FCIP	Displays the FC IP address of the switch, if configured.

Table C-23 Switches View Display (Continued)

Property	Description
FC Mask	Displays the FC mask of the switch, if configured.
Responding	Displays true if the switch responds to Fabric Manager and false if it does not.
Role	Displays the role that the switch plays in the fabric (principal or subordinate).
Domain ID	Displays the domain ID of the switch.
WWN	Displays the WWN of the switch.
State	Displays whether the switch is enabled or disabled.
Is Core	Displays whether the switch is a core switch or an edge switch. For more information, refer to “Designating a Switch as a Core Switch” on page 3-17 .
Port Count	Displays the number of ports in the switch.
Free Ports	Displays the number of unused/available ports in the switch.
ISL Count	Displays the number of ISLs (E_Ports) connected to the switch.
Secure Mode	Displays whether Secure Mode is enabled or disabled.
Using FCIP	Identifies whether or not the switch is configured for FCIP.
Have UserID	Identifies whether or not user information has been added to a switch. Provides fabric login (flogi) status.
Has Certificate	Identifies whether or not a security certificate is installed.
Trunk Count	Displays the number of trunks that connect to the switch.
Trunked Port Count	Displays the number of ports in each trunk that connects to the switch.
Device Count	Displays the number of devices that connect to the switch.
IDID	Identifies whether or not Insistent Domain ID Mode (IDID Mode) is enabled or disabled; a value of “true” indicates it is enabled, a value of “false” indicates it is disabled.
Type Number	Displays a string that represents switch type. These values come from the switch RNID database and are available for FICON [®] capable switches.
Model	Displays the switch model number.
Manufacturer	Displays the switch manufacturer.
Switch Type	Displays the switch type.
Switch Part Number	Identifies the chassis part number, for applicable switches.
Serial Number	Identifies the switch serial number.

Figure C-2 displays Switches view as it appears when you click **My SAN** in the **SAN Elements** tab.

My SAN Switches						
Detail	Devices	Event	Portgrid	Ports	Summary	Switches
Name	IP	Version	Status	Fabric	ID	IP Mask
Web185	10.32.225.185	jkerai_fcs_z...	Healthy	Web185	Web185	255.255.240
renamed	10.32.225.123	v2.6.0f	Down	web1231s1	renamed	255.255.240
swd185	10.64.115.185	4.1.0_main_...	Down	swd185	swd185	255.255.240
swd21	10.64.115.21	v4.1.0t11Mar...	Healthy	swd185	swd21	255.255.240

Figure C-2 Switches View

Topology View











Topology view provides a graphical representation of the elements that Fabric Manager monitors and the connections between and within them. When you open Topology view a number of icons appear at the top of your Fabric Manager window. Table C-24 lists and describes these icons.



Note

Topology view may take a considerable amount of time to open. Topology view options may also respond slowly.

Table C-24 Topology View Icons

Icon	Description
Pan icon ()	Lets you click-and-drag the Topology view to pan up, down, left, & right to see different portions of the view.
Select icon ()	Lets you move nodes in Topology view.
Zoom in rect icon ()	Lets you click-and-drag to zoom in on a particular rectangular region of the topology.
Zoom in icon ()	Click to zoom in.
Zoom out icon ()	Click to zoom out.
Fit to view icon ()	Click to fit the entire topology in your Fabric Manager window.
Overview icon ()	Opens a new window that displays the entire topology in miniature.
Snap Shot icon ()	Takes a screen shot of your topology graph that you can save in .png format.
Straight Link Style icon ()	Arranges links so they connect in a straight line from one element to another.
Orthogonal Link Style icon ()	Arranges links in horizontal and vertical lines, with right angles, to connect elements.

Topology view provides three different layout options: circular, core-edge, and tree. [Table C-25](#) describes these layouts.

Table C-25 Topology View Layouts

Layout	Description
circular	Arranges the switches and nodes of a fabric into a circle.
core-edge	Separates core switches, edge switches, and nodes.
tree	Organizes the fabric hierarchically.

Each Topology view consists of nested panes and element icons. Element icons that contain other elements (for instance, as a fabric contains switches) include an expand (+) icon in the top-left-hand corner. If you expand the icon, the icon becomes a pane that displays the nested icons. Panes include a collapse icon (-) in the top-left-hand corner so you can hide the subordinate icons.

Links

The lines that connect icons in Topology view represent different varieties of links in the fabrics. [Table C-26](#) displays the various link images and explains the meaning of each.

Table C-26 Topology View Link Images








Image	Description	
	bundled links	Represents all links between two switches to reduce clutter in the topology display. Double-click the bundle to expand it.
	expanded bundle	Displays the individual links that form a bundle. Double-click the expanded bundle to collapse the links into a bundle.
	1 Gbit/sec link	Represents a 1 Gbit/sec link between two switches. When you enable ISL Checking, this link appears as red, yellow, or green based on the ISL Checking status of the link. For more information, refer to “ISL Changes and Topology View” on page 11-4.

Table C-26 Topology View Link Images (Continued)

Image		Description
	2 Gbit/sec link	Represents a 2 Gbit/sec link between two switches. When you enable ISL Checking, this link appears as red, yellow, or green based on the ISL Checking status of the link. For more information, refer to “ISL Changes and Topology View” on page 11-4 .
	trunked links	Represents a trunk between two switches. This link appears as red, yellow, or green based on the ISL Checking status of the link.
	device groups	Represents the devices that connect to a switch. Double-click the device group to open a window that displays the devices in table format.
	device links	Represents the link between a switch and the devices that connect to it.

Actions Menu Reference

This appendix includes the following sections:

- [“Introduction” on page D-1](#)
- [“Fabric Actions” on page D-2](#)
- [“Switch Actions” on page D-5](#)
- [“Port Actions” on page D-6](#)

Introduction

The Actions menu displays tasks that you can perform with Fabric Manager. You can only access items in this menu in the following cases:

- when you click a specific fabric in the **SAN Elements** tab
- when you click a specific switch in the **SAN Elements** tab
- when you click a switchgroup node in the **SAN Elements** tab
- when you click a switchgroup in the **SAN Elements** tab
- when you click a specific port in the **SAN Elements** tab
- when you click a portgroup node in the **SAN Elements** tab
- when you click a portgroup in the **SAN Elements** tab
- when you click a specific card in the **SAN Elements** tab (for switches that support cards)

Fabric Actions

When you click a fabric in the **SAN Elements** tab and open the Actions menu, the menu provides a series of fabric-wide tasks that you can perform. [Table D-1](#) lists and describes the actions.

Table D-1 Fabric Actions

Action	Description
Events	Opens the Fabric Manager Event Log.
Telnet to FCS...	Telnets to the FCS of a secure fabric. If you click a non-secure fabric in the SAN Elements tab, you cannot access this action and it appears as Telnet... This option only appears when you click a secure fabric in the SAN Elements tab.
Security...	Opens the Security Admin window to administer security. For more information, refer to “Security Admin Window” on page D-3 . This option only appears when you click a secure fabric in the SAN Elements tab.
Zone Admin...	Opens the Zone Administration window of Web Tools.
Name Server...	Opens the Name Server Table window in Web Tools.
ISL	Opens the ISL submenu to initiate or restamp ISL checking. For more information, refer to “ISL Submenu” on page D-5 .
Set Time...	Opens the Time dialog box to update the time and date settings on the switches in the fabric. To configure the time, place your cursor in any part of the Time field and use the up arrow or down arrow to iterate the field, then click OK .
Refresh FDMI Info	Refreshes FDMI information. This option only appears when FDMI capable HBAs are connected to switches running Fabric OS versions that support FDMI.
Backup...	Opens the Backup fabric configuration-Select a folder window to create a backup file that contains the following information: <ul style="list-style-type: none"> the configuration file of every switch in the fabric the license keys for every switch in the fabric a list of switches that belong to the fabric an ISL stamp <p>The Backup action does not store the current ISL stamp. It creates a stamp of the ISLs as they appear <i>at the moment of the backup</i>.</p> <ul style="list-style-type: none"> all zone definitions (and notes the active zone) which firmware version each switch runs name server information

Table D-1 Fabric Actions (Continued)

Action	Description
Diff with Backup...	Opens the Diff fabric configuration with backup window to compare a fabric to a backup file and lists discrepancies.
Fabric Checking	Activates or deactivates Fabric Checking. A dark blue ring appears around the fabric icon to indicate that you enabled Fabric Checking, and a check mark appears next to the action in the Actions menu.
Delete	Deletes the selected fabric.
Rename	Allows you to rename the selected fabric.

Security Admin Window

The **Security Admin** window consists of tabs that let you view and configure the various security policies. The **Security Admin** window is displayed in [Figure D-1](#).

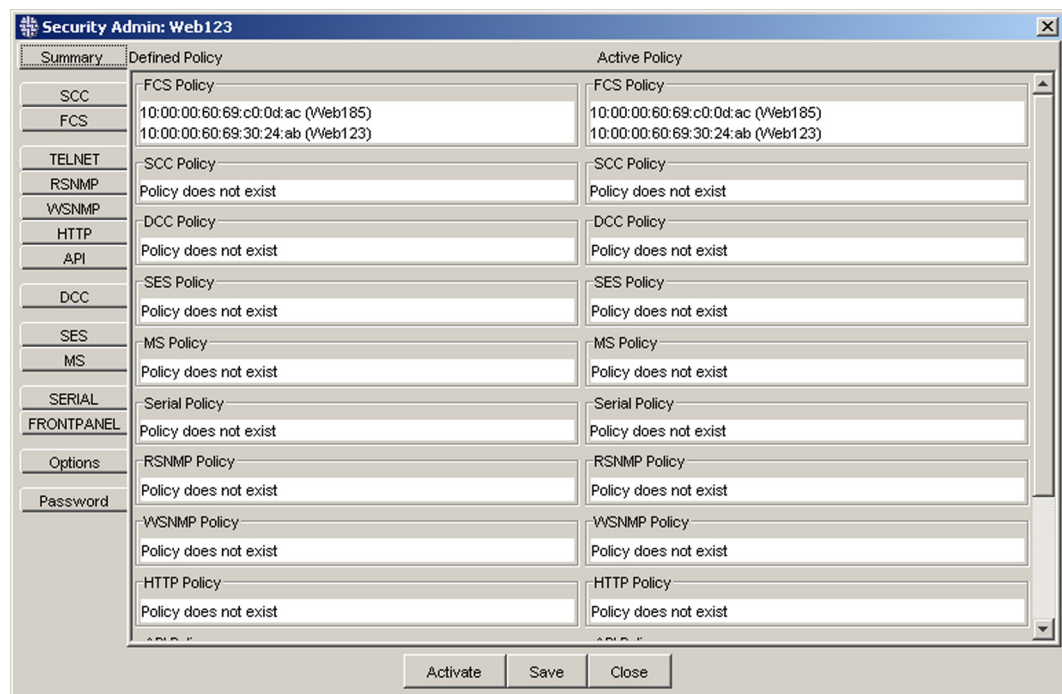


Figure D-1 Security Admin Window

[Table D-2](#) lists and describes the tabs and buttons in the Security Admin window.

Table D-2 Security Admin Window Objects

Object	Description
Summary tab	Presents a column of defined security policies and a column of active security policies.
SCC tab	The components of this tab let you add a switch to a secure fabric. For more information, refer to “Adding a Switch to a Secure Fabric” on page 9-4 .
FCS tab	The components of this tab display each switch that serves as a Fabric Configuration Server (FCS) and lets you add or remove switches from the list.
TELNET tab	The components of this tab let you grant access to individual switches to run telnet in a secure fabric.
RSNMP tab	The components of this tab let you grant access to individual switches to run RSNMP in a secure fabric.
WSNMP tab	The components of this tab let you grant access to individual switches to run WSNMP in a secure fabric.
HTTP tab	The components of this tab let you grant access to individual switches to run HTTP in a secure fabric.
API tab	The components of this tab let you grant access to individual switches to run API in a secure fabric.
DCC tab	The components of this tab let you create a security policy. For more information, refer to “Configuring DCC Policy Options” on page 9-8 .
SES tab	The components of this tab let you grant access to individual switches to run SES in a secure fabric.
MS tab	The components of this tab let you grant access to individual switches to run Management Server in a secure fabric.
SERIAL tab	The components of this tab let you grant access to individual switches to accept a serial connection in a secure fabric.
FRONTPANEL tab	The components of this tab let you grant access to individual switches to accept configuration changes from the front panel in a secure fabric.
Options tab	The field in this tab lets you enable or disable No Node WWN zoning.
Password tab	The components of this tab let you change passwords for FCS switches and non-FCS switches.
Activate button	Activates the changes that you made to the components of the Security Admin window tabs.
Save button	Saves the changes that you made to the components of the Security Admin window tabs but does not apply them.
Close button	Closes the Security Admin window.

ISL Submenu

The **ISL** submenu lets you initiate or restamp ISL checking. [Table D-3](#) lists and describes the options that appear in the **ISL** submenu.

Table D-3 ISL Submenu Options

Option	Description
ISL Checking	Enables ISL Checking. For more information on this topic, refer to “ISL Checking” on page 11-1 .
Restamp	Resets the ISL stamp to which ISL Checking compares the fabric. For more information on this topic, refer to “Updating ISL Checking (Stamp/Restamp)” on page 11-3 .

Switch Actions

When you click a switch in the **SAN Elements** tab and open the Actions menu, the menu provides a series of switch-wide tasks that you can perform. [Table D-4](#) lists and describes the actions.

Table D-4 Switch Actions

Action	Description
Events	Opens the Events View in Fabric Manager.
Switch View	Opens the Switch View window of Web Tools.
Admin	Opens the Switch Admin window of Web Tools.
Fabric Watch	Opens the Fabric Watch window of Web Tools.
Telnet	Opens a telnet session to the switch.
Firmware Download	Opens the Firmware Download dialog.
Close Telnet	Closes a telnet session to the switch. This option is not applicable to switches that run 4.X firmware.
Disable/Enable	Disables or enables the switch.
Core Switch	Labels a switch as a core switch. This action impacts the location of the switch in Topology view for Core Edge layouts.
Delete	Deletes the switch.

Port Actions

When you click a port in the **SAN Elements** tab and open the **Actions** menu, the menu provides port-wide tasks that you can perform. [Table D-5](#) lists and describes the actions.

Table D-5 Port Actions

Action	Description
Disable/Enable	Disables or enables the port.

Topology Menu Reference

This appendix includes the following section:

- [“Introduction” on page E-1](#)

Introduction

The **Topology** menu provides options to help you use and customize Topology view. You can only access the **Topology** menu after you open Topology view. [Table E-1](#) lists and describes **Topology** menu options.

Fabric size impacts Topology view response speed.

Table E-1 Topology Menu Options

Option	Description
Layout	Opens the Layout submenu to select a layout or clear any changes you made to the layout. For more information on Topology view layouts, refer to “Topology View” on page C-19 .
Links	Opens the Links submenu to <ul style="list-style-type: none">• Expand all links• Collapse all links• Orthogonal link style• Straight link style
Overview	Opens a new window that displays the entire topology in miniature.
Snapshot	Takes a snapshot of your current topology so you can compare a later topology to this baseline.

Tools Menu Reference

This appendix includes the following sections:

- [“Introduction” on page F-1](#)
- [“Reboot Submenu” on page F-2](#)
- [“Config Submenu” on page F-3](#)
- [“Licensing Submenu” on page F-3](#)

Introduction

The **Tools** menu serves as a toolbox of mini-applications to help you perform a variety of tasks. [Table F-1](#) lists and describes the options in the **Tools** menu.

Table F-1 Tools Menu Options

Option	Description
Firmware download to switches...	Opens the Firmware download to switches window. For more information on how to download firmware to switches with Fabric Manager, refer to “Downloading Firmware” on page 10-1 .
Firmware download to HBAs...	Opens the Firmware download to HBAs window. For more information on how to download firmware to HBAs with Fabric Manager, refer to “FDMI-Capable HBA Firmware Download” on page 17-1 .
Reboot	Opens the Reboot submenu to configure or execute a sequenced reboot. For more information, refer to “Reboot Submenu” on page F-2 .
Config	Opens the Config submenu to save a baseline configuration or to compare configurations. For more information, refer to “Config Submenu” on page F-3 .
Licensing	Opens the Licensing submenu to manage software licenses. For more information, refer to “Licensing Submenu” on page F-3 .
Fabric Merge...	Opens the Fabric Merge Check dialog box to verify that you can merge two fabrics successfully. For more information, refer to “Comparing Fabrics for a Fabric Merge” on page 13-2 .
Subnet scan...	Opens the Subnet scan dialog box to discover available fabrics.
Call Home	Opens the Call Home window. For more information, refer to “Call Home” on page 8-1 .

Reboot Submenu

The **Reboot** submenu helps you prepare and execute a sequenced reboot. [Table F-2](#) lists and describes the options in this menu.

Table F-2 Reboot Submenu Options

Option	Description
Create Reboot Sequence...	Opens the Create or change reboot groups and sequence window to make or edit a reboot group. For more information on how to create and change reboot groups, refer to “Sequenced Reboot” on page 16-1 .
Sequence Reboot...	Opens the Sequenced Reboot window to execute a sequenced reboot. For more information, refer to “Sequenced Reboot” on page 16-1 .

Config Submenu

The **Config** submenu provides options that let you save, download, and compare configuration files. [Table F-3](#) lists and describes the options in this menu.

Table F-3 Config Submenu Options

Option	Description
Save Baseline...	Opens the Save Baseline -- Configuration Template Selection dialog box so you can begin to save the configuration file of a switch to a server. For more information about how to save a baseline, refer to “Saving a Baseline Configuration to a File” on page 14-2 .
Compare/Download From File	Opens the Compare/Download from File -- Select Baseline Configuration window to choose a file to compare or download. For more information on comparing and downloading configurations, refer to “Comparing Configurations” on page 14-1 .
Compare/Download From Switch	Opens the Compare/Download from Switch -- Source Configuration Selection window to select a switch so you can compare to the configuration of that switch or download the configuration of that switch. For more information on comparing and downloading configurations, refer to “Comparing Configurations” on page 14-1 .

Licensing Submenu

The **Licensing** submenu provides options that let you manage licenses with Fabric Manager. [Table F-4](#) lists and describes the options in this menu.

Table F-4 Licensing Submenu Options

Option	Description
Import from File...	Opens the Import License -- Select license file dialog to import license keys from a file that you can apply to one or more switches. For more information on how to import a license file, refer to “Exporting and Importing License Keys” on page 5-2 .
Load from Switch...	Opens the License Admin -- Switch Selection window. For more information on how to load licenses from a switch, refer to “Licensing” on page 5-1 .
Generate Licenses...	Opens the Create License Request -- Select transaction key file or saved request window to obtain licenses and later apply them to switches.
Load Generated Licenses...	Opens the License Admin -- Switch Selection window to open previously-saved license files which you can then download to switches.

Help Menu Reference

This appendix includes the following section:

- [“Introduction” on page G-1](#)

Introduction

The **Help** menu provides access to information about Fabric Manager. [Table G-1](#) lists and describes the options that appear in the **Help** menu.

Table G-1 Help Menu Options

Option	Description
Help...	Opens Fabric Manager Help .
Context Help...	Creates a pointer to provide help about any portion of Fabric Manager that you click.
Status Legend...	Displays the Fabric Manager status legend.
About...	Provides information about your version of Fabric Manager.
Register...	Opens Fabric Manager Registration dialog. For details, refer to “Registering Fabric Manager” on page 2-9 .

Zoning Reference

This appendix includes the following sections:

- [“Introduction” on page H-1](#)
- [“File Menu” on page H-2](#)
- [“Edit Menu” on page H-3](#)
- [“View Menu” on page H-3](#)
- [“Actions Menu” on page H-4](#)
- [“Alias Tab” on page H-5](#)
- [“Zone Tab” on page H-7](#)
- [“QuickLoop Tab” on page H-9](#)
- [“Fabric Assist Tab” on page H-10](#)
- [“Config Tab” on page H-13](#)

Introduction

This reference provides information about Zoning fields. It lists and describes the components of the **Zone Administration** interface. [Table H-1](#) lists and describes the components of the **Zone Administration** window.

Zoning interfaces vary by firmware. Your interface might appear differently.

Table H-1 Zone Administration Window Components

Component	Description
File menu	Provides administrative options. For more information on the items in this menu, refer to “File Menu” on page H-2 .
Edit menu	Lets you add, delete, replace, and search for zone member identifiers. For more information, refer to “Edit Menu” on page H-3 .
View menu	Lets you choose a zoning display. For more information, refer to “View Menu” on page H-3 .

Table H-1 Zone Administration Window Components (Continued)

Component	Description
Actions menu	Lets you enable, disable, and save zoning configurations. For more information, refer to “Actions Menu” on page H-4 .
zoning type display	Appears beneath the File menu and displays the zoning type that you chose from the View menu.
Enabled Config display	Displays the enabled zoning configuration.
zoning configuration tabs	Let you configure zoning. For more information, refer to the tab-specific sections that follow: <ul style="list-style-type: none"> • “Alias Tab” on page H-5 • “Zone Tab” on page H-7 • “QuickLoop Tab” on page H-9 • “Fabric Assist Tab” on page H-10 • “Config Tab” on page H-13

File Menu

[Table H-2](#) describes the options that appear in the **File** menu of the **Zone Administration** window.

Table H-2 File Menu Options

Option	Description
Print Summary	Select to print a zoning configuration report. A window displays both the effective configuration and the defined zoning configuration, if one exists.
Close	Select to close the Zone Administration window.

Edit Menu

[Table H-3](#) describes the options that appear in the **Edit** menu of the **Zone Administration** window.

Table H-3 Edit Menu Options

Option	Description
Add WWN...	Select to add a WWN across aliases, zones, or Fabric Assist zones. A dialog box appears; enter the WWN number.
Delete WWN...	Select to delete a WWN across aliases, zones, or Fabric Assist zones. A dialog box appears; enter the WWN number.
Replace WWN...	Select to replace one WWN with another. A dialog box appears; enter first the WWN number to be replaced, and then the new WWN number.
Search Member...	<p>Select to search for a member of a zone. A dialog box appears; Enter any element that appears in the Member Selection List: Domain Name, Port name, Port ID, WWN, Device, Zone Name, or Alias Name.</p> <p>Narrow searches by checking one or more of the following boxes:</p> <ul style="list-style-type: none"> • Match Case • Match whole words only • Wrap around. <p>Check the Wrap around box if you want the search engine to restart after it hits the end of the string. Leave unchecked if you want the search engine to stop once it hits the end of the string; a message appears to indicate the search is complete.</p>

View Menu

The options available in the View menu of the Zone Administration window are described in [Table H-4](#).

Table H-4 View Menu Options

Option	Description
Mixed Zoning	Use the Mixed Zoning option when you want to include various objects as member of an alias, zone, or configuration file.
Port Zoning	Select the Port Zoning option when you want to include only ports in a group. Grouping zones by port alone constitutes “hard zoning”.

Table H-4 View Menu Options (Continued)

Option	Description
WWN Zoning	Select the WWN Zoning option when you want to zone by World Wide Names. Grouping zones by WWN alone constitutes “hard zoning”.
AL_PA Zoning	Select the AL_PA Zoning option when you want to create or manage a zone of devices.
Refresh Zoning	Select the Refresh Zoning option to refresh the zoning database. This will overwrite any unsaved zoning database changes you have made.
Refresh Fabric	Select the Refresh Fabric option to display the latest fabric changes.

Actions Menu

The options available in the **Action Menu** of the Zone Administration window are described in [Table H-5](#).

Table H-5 Actions Menu Options

Menu Item	Description
Enable Config	Select to save and enable the configuration selected from the Config tab Name field. This command also saves all other configurations in the zoning database.
Disable Zoning	Select to disable the configuration that is currently enabled. A dialog box provides a warning before disabling.
Save Config Only	Select to save all defined zoning configurations. The saved changes will only apply to the defined configurations. Changes can be made to a configuration that is currently enabled; changes will not appear until the configuration is disabled and re-enabled.
Clear All	Select to delete all aliases, zones, Fabric Assist zones, and configurations; the cleared configuration is saved. Any enabled configuration will be disabled.

Alias Tab

Use the **Alias** tab to create, modify, rename, or delete aliases in the zoning database. An example of the **Alias** tab is displayed in [Figure H-1](#).

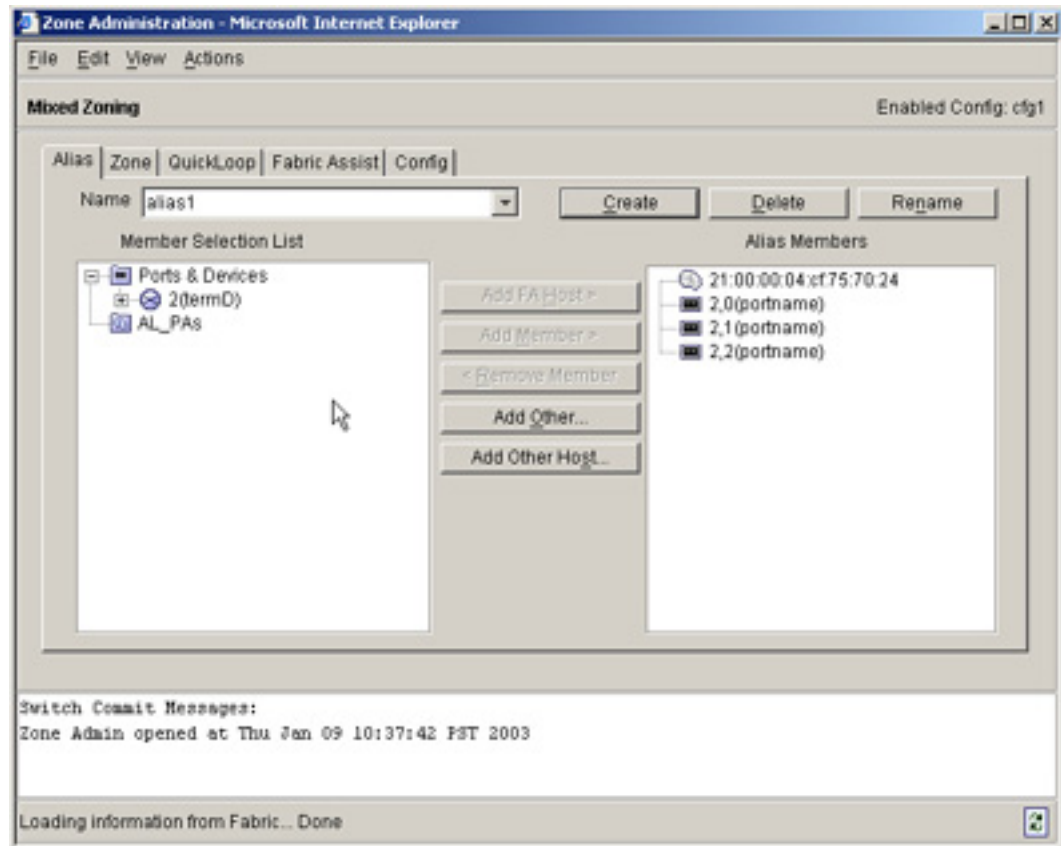


Figure H-1 Alias Tab in the Zone Administration Window

Alias Tab Descriptions

Table H-6 lists and describes the components of the **Alias** tab.

Table H-6 Alias Tab Component Descriptions

Component	Description
Name pulldown menu	Displays existing alias names from the pulldown menu.
Create button	Click to create a new alias. A dialog box displays. Enter the name of the new alias. All names must be unique and contain no spaces.
Delete button	Click to delete the alias selected in the Name field. Deleting an alias automatically removes it from all zones, and configurations.
Rename button	Click to rename the alias selected in the Name field. A dialog displays in which you can rename the alias. Renaming an alias automatically renames it in all zones and configurations.
Member Selection List field	Use to select available items from the Member Selection List . In Mixed Zones you can select Ports, WWNs, and AL_PAs.
Alias Members field	Displays the current members of an alias.
Add FA Host button	Click to add a Fabric Assist host to the member list.
Add Member button	Click to add a member from the Member Selection List to the Alias Members field. You must select a member within Member Selection List for this button to become active.
Remove Member button	Click to remove a member from the Alias Members list. You must select a member within Alias Members for this button to become active.
Add Other button <ul style="list-style-type: none"> Other Other Port Other WWN Other AL_PA 	Click to add a port, WWN or AL_PA that is not currently part of the fabric. A dialog box will display for you to type in the host that is not a member of the fabric.
Add Other Host button <ul style="list-style-type: none"> Other Host Other Port Host Other WWN Host 	Click to add a host that is not currently part of the fabric. The button displayed depends on the zoning method that you have selected.

Zone Tab

Use the **Zone** tab to create, modify, rename, or delete zones in the zoning database. An example of a **Zone** tab is displayed in [Figure H-2](#).

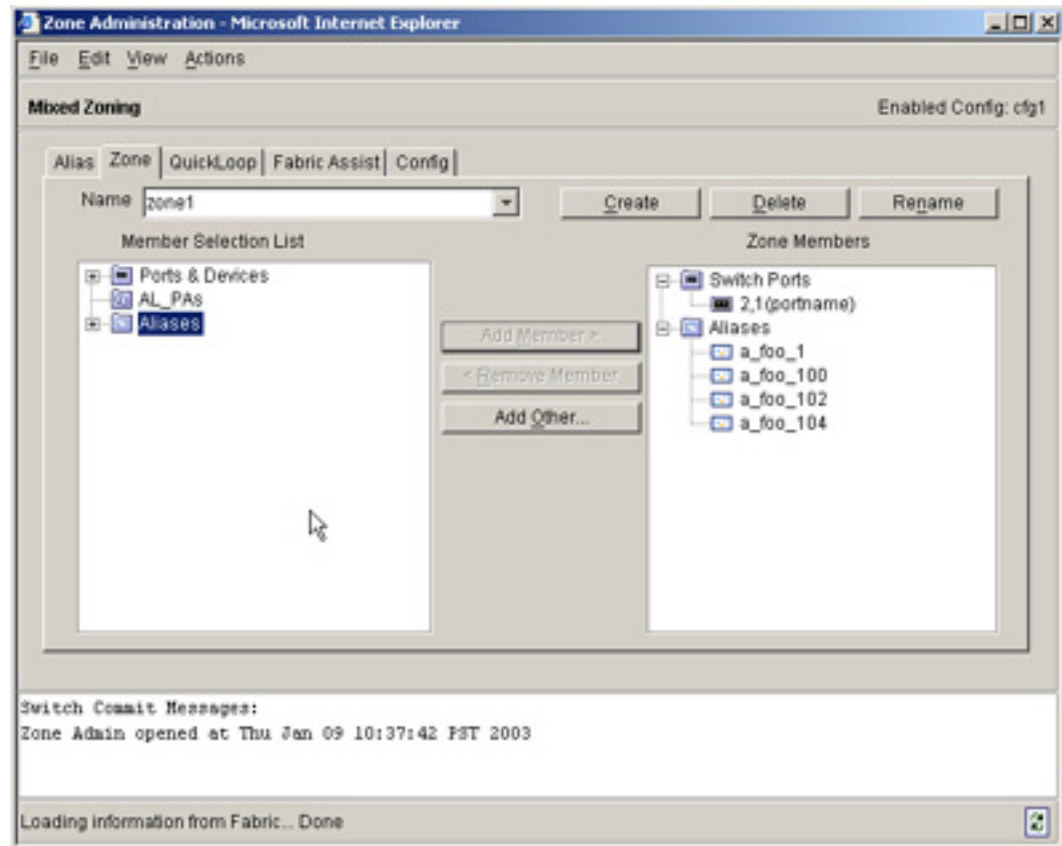


Figure H-2 Zone Tab in the Zone Administration Window

Zone Tab Descriptions

Table H-7 lists and describes the components of the **Zone** tab.

Table H-7 Zone Tab Component Descriptions

Component	Descriptions
Name pulldown menu	Displays existing zones from the pulldown menu.
Create button	Click to create a new zone. A dialog box displays. Enter the name of the new zone. All zone names must be unique and must consist of letters, numbers or the underscore character. Spaces or special characters are not allowed in zone names, and a name cannot start with a number.
Delete button	Click to delete the zone selected in the Name field. Deleting a zone automatically removes it from all configurations.
Rename button	Click to rename the Zone selected in the Name field. A dialog box displays in which you can edit the zone name. Renaming a zone in the zone tab automatically renames it in all configurations.
Member Selection List field	Select available items from the Member Selection List .
Zone Members field	Displays the current members of a zone.
Add Member button	Click to add a member from the Member Selection List to the Zone Members field. You must select a member within Member Selection List for this button to become active.
Remove Member button	Click to remove a member from the Zone Members list. You must select a member within Zone Members for this button to become active.
Add Other <ul style="list-style-type: none"> Other Port Other WWN Other AL_PA 	Click to add a port, WWN or AL_PA that is not currently part of the fabric. A dialog box will display for you to type in the host that is not a member of the fabric.

QuickLoop Tab

Use the **QuickLoop** tab to manage QuickLoops in the zoning database. For more information regarding QuickLoops, refer to your firmware documentation. An example of the **QuickLoop** tab is displayed in [Figure H-3](#).

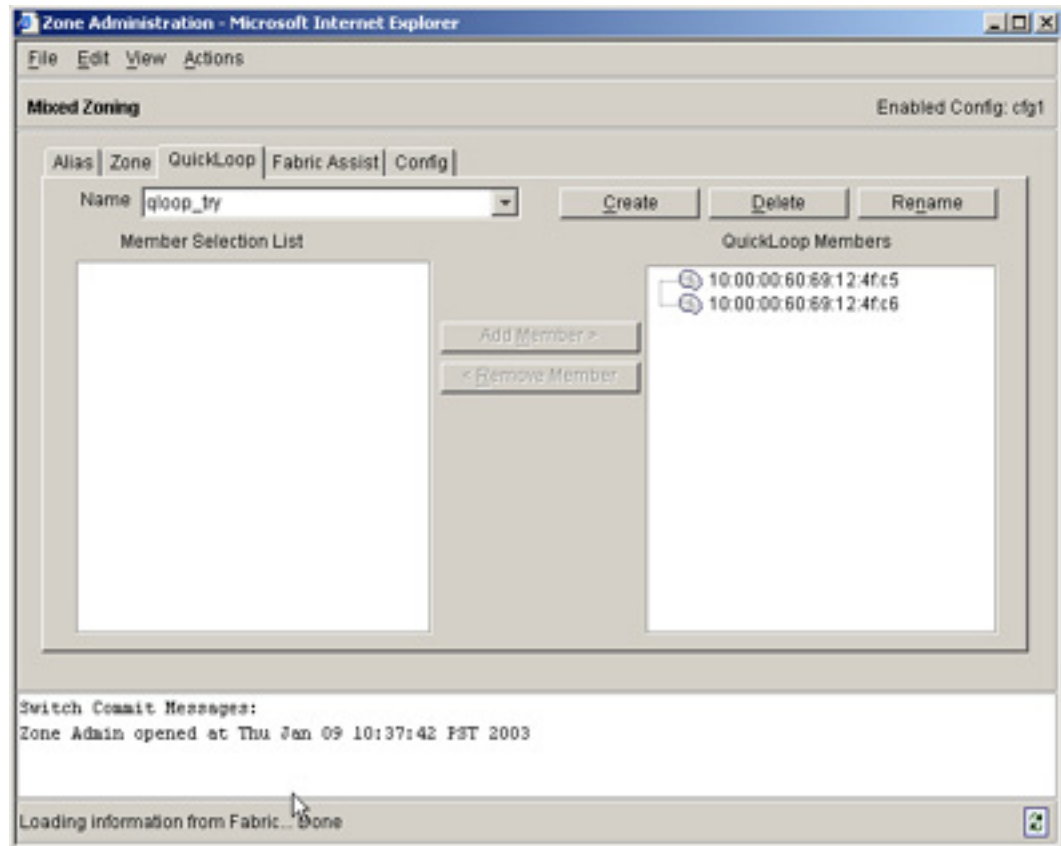


Figure H-3 QuickLoop Tab in the Zone Administration Window

QuickLoop Tab Descriptions

Table H-8 lists and describes the components of the QuickLoop tab.

Table H-8 QuickLoop Tab Component Descriptions

Component	Description
Name pulldown menu	Displays existing QuickLoops.
Create button	Click to create a new QuickLoop. A dialog box appears. Enter the name of the new QuickLoop. All names must be unique and contain no spaces.
Delete button	Click to delete the QuickLoop selected in the Name pulldown menu. Deleting a QuickLoop automatically removes it from all configurations.
Rename button	Click to rename the QuickLoop selected in the Name pulldown menu. A dialog displays in which you can edit the QuickLoop name. Renaming a QuickLoop automatically renames it in all configurations.
Member Selection List field	Select available members from the Member Selection List . QuickLoop is not supported on switches that run firmware versions 4.x. However you can manage a QuickLoop from these switches if it is attached to another switch in the fabric.
QuickLoop Members field	Displays the current members of a QuickLoop.
Add Member button	Click to add a member from the Member Selection List to the QuickLoop Members field. You must select a member within Member Selection List for this button to become active.
Remove Member button	Click to remove a member from the QuickLoop Members field. You must select a member within QuickLoop Members field for this button to become active.

Fabric Assist Tab

Use the Fabric Assist tab to create and manage Fabric Assist zones. Fabric Assist allows private hosts to communicate with public targets across a switched fabric. Fabric Assist also allows private hosts to communicate with public targets that do not reside in the same switched fabric.

You cannot create a fabric zone without a fabric host.

You cannot access the Fabric Assist tab if you selected **View > AL_PA Zoning**.

An example of a Fabric Assist tab is displayed in [Figure H-4](#).

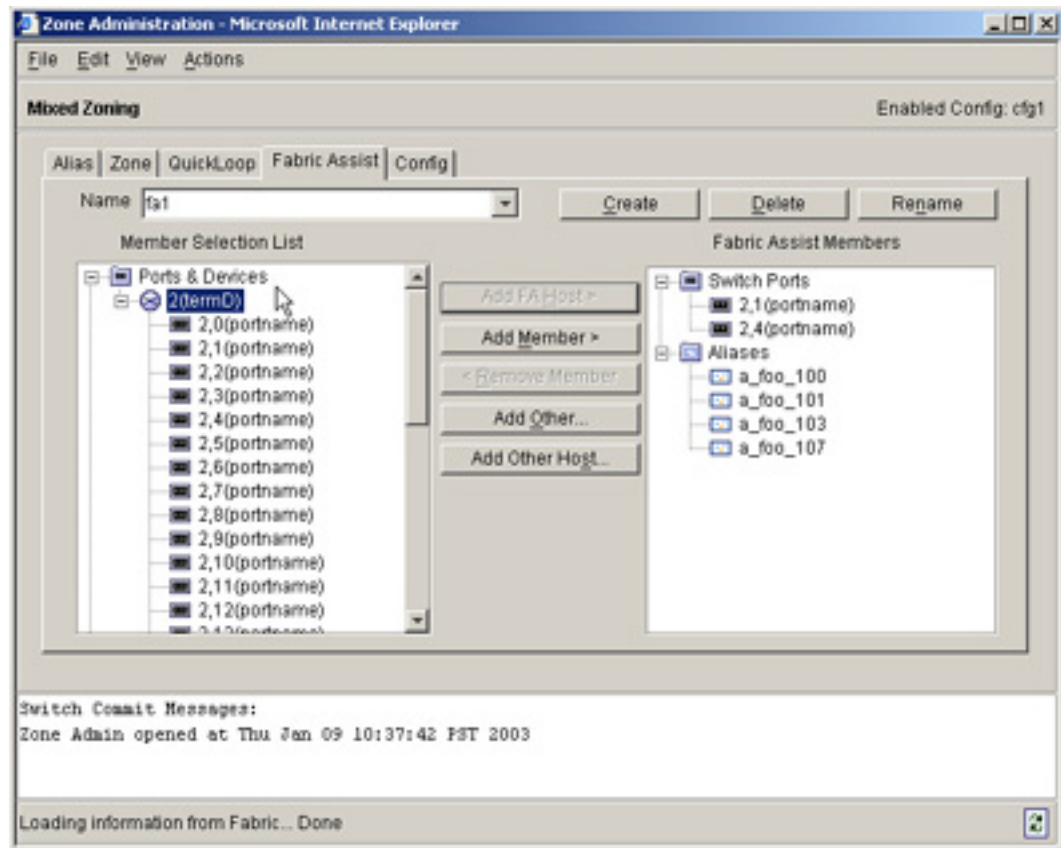


Figure H-4 Fabric Assist Tab in the Zone Administration Window

Fabric Assist Descriptions

[Table H-9](#) lists and describes the components of the Fabric Assist tab.

Table H-9 Fabric Assist Components Descriptions

Components	Descriptions
Name pulldown menu	Displays existing Fabric Assist zones from the pulldown menu.
Create button	Click to create a new Fabric Assist zone. A dialog box displays; Enter the name of the new Fabric Assist zone. All names must be unique and contain no spaces.
Delete button	Click to delete the Fabric Assist zone selected in the Name pulldown menu. Deleting a Fabric Assist Zone automatically removes it from configurations.
Rename button	Click to rename the Fabric Assist zone selected in the Name pulldown menu. A dialog displays in which you can edit the Fabric Assist name. Renaming a Fabric Assist Zone automatically renames it in all configurations.

Table H-9 Fabric Assist Components Descriptions (Continued)

Components	Descriptions
Member Selection List field	Select available items from the Member Selection List .
Fabric Assist Members field	Displays the current members of an Fabric Assist zone.
Add FA Host button	Click to add a Fabric Assist host that is not currently part of the fabric.
Add Member button	Click to add a member from the Member Selection List to the Fabric Assist Members field. You must select a member within Member Selection List for this button to become active.
Remove Member button	Click to remove a member from the Fabric Assist Members list. You must select a member within Fabric Assist Members field for this button to become active.
Add Other button <ul style="list-style-type: none"> • Other • Other Port • Other WWN • Other AL_PA 	Click to add a Fabric Assist zone that is not currently part of the fabric. A dialog box will display for you to type in the host that is not a member of the fabric.
Add Other Host button <ul style="list-style-type: none"> • Other Host • Other Port Host • Other WWN Host 	Click to add a host that is not currently part of the fabric. The button displayed depends on the zoning method that you have selected.

Config Tab

Use the Config tab to create and manage configurations. An example of the Config tab is displayed in Figure H-5.

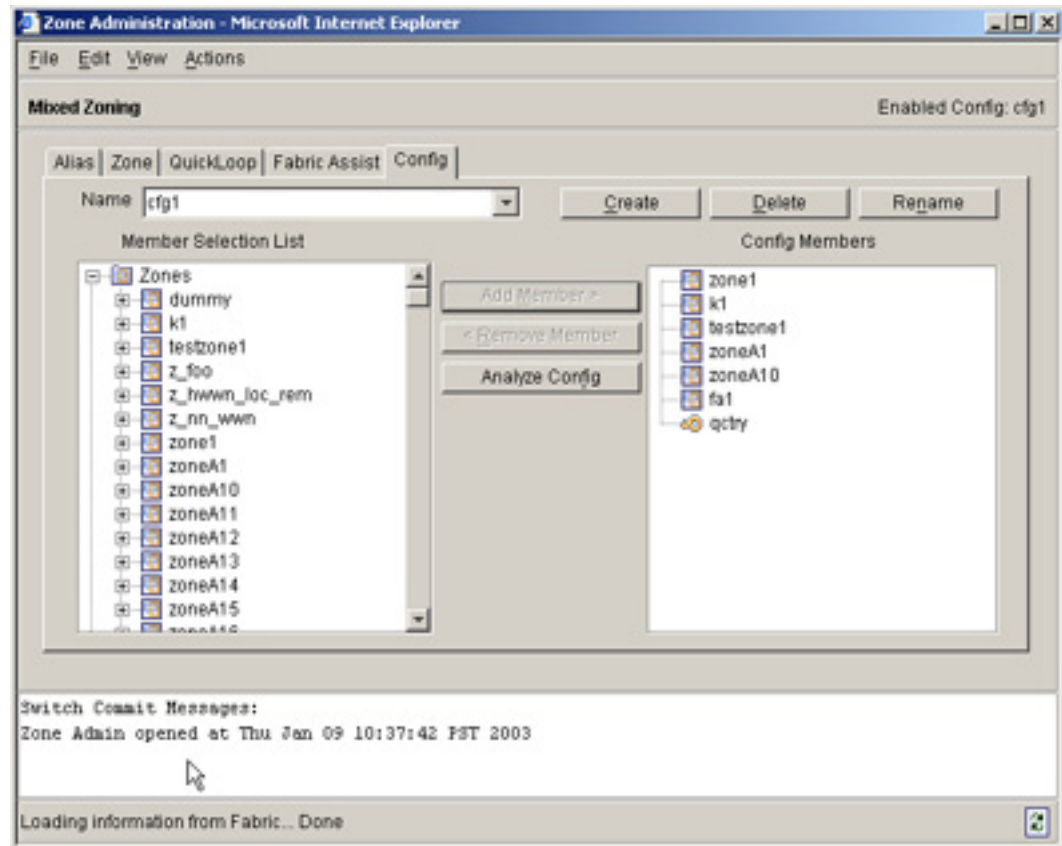


Figure H-5 Config Tab in the Zone Administration Window

Config Tab Descriptions

Table H-10 lists and describes the components of the Config tab.

Table H-10 Config Tab Component Descriptions

Component	Description
Name pulldown menu	Select an existing configuration from the pulldown menu to display or modify.
Create button	Click to create a new configuration. A dialog displays; enter the name of the new configuration. All names must be unique and contain no spaces.
Delete button	Click to delete the configuration selected in the Name pulldown menu. Deleting a configuration does not delete any of the elements contained in that configuration.
Rename button	Click to rename the configuration selected in the Name pulldown menu. A dialog displays in which you can edit the configuration name.
Member Selection List field	Select available items from the Member Selection List .
Config Members field	Displays the current config members.
Add Member button	Click to add a member from the Member Selection List to the Config Members field. You must select a member within Member Selection List for this button to become active.
Remove Member button	Click to remove a member from the Config Members List . You must select a member within Config Members field for this button to become active.
Analyze Config button	Analyzes the configuration that is selected along with it's member zones. A report is created that lists: <ul style="list-style-type: none"> SAN components (ports, WWNs, and AL_PAs) that are not included in the configuration. SAN components (ports, WWNs, and AL_PAs) that are contained in the configuration but not in the fabric.

Fabric Watch Reference

This appendix includes the following sections:

- [“Introduction” on page I-1](#)
- [“Alarm Notification Tab” on page I-2](#)
- [“Threshold Configuration Tab” on page I-3](#)
- [“Email Configuration Tab” on page I-5](#)

Introduction

The Fabric Watch window provides the fields you need to view and configure threshold and alarm settings. [Table I-1](#) lists and describes the components of the window.

Table I-1 Fabric Watch Window Components

Component	Description
Fabric Watch navigation tree	Displays the various Fabric Watch classes that you can configure. For more information on how to configure Fabric Watch, refer to “Using Fabric Watch” on page 7-2 .
Alarm Notification tab	Displays Fabric Watch alarms that fabric events have triggered. For more information, refer to “Alarm Notification Tab” on page I-2 .
Threshold Configuration tab	Lets you configure threshold boundaries, traits, and alarms. For more information, refer to “Threshold Configuration Tab” on page I-3 .
Email Configuration tab	Lets you configure the Fabric Watch Email alert alarm. For more information, refer to “Email Configuration Tab” on page I-5

Alarm Notification Tab

Use the **Alarm Notification** tab of the Fabric Watch window to view the information for all Fabric Watch elements and classes. The **Alarm Notification** tab polls current events from Fabric Watch and refreshes the display according to the threshold configuration. [Table I-2](#) lists and describes the components of the Alarm Notifications tab.

Table I-2 Alarm Notification Tab Component Descriptions

Component	Description
Selected Area pulldown menu	Displays the configurable areas in the pulldown menu. The items listed will change depending on the item selected in the navigation tree.
Name column	Displays the name of the alarm. Threshold names consist of the following three parts, with no separators: <ol style="list-style-type: none">1. class name abbreviation2. area name abbreviation3. element index number
State column	Displays the severity of the alarm that governs what kind of traps Fabric Watch employs a response to an event. The State of the alarm can be Informative, Normal, or Faulty.
Reason column	Displays the reason that an alarm notification was sent, such as Started, Changed, Exceeded, Below, Above, or In between.
Last Value column	Displays the value of a counter (behavior variable) prior to the alarm.
Current Value column	Displays the value of the counter (behavior variable) that set off the alarms.
Time column	Displays the time and date the notification was sent from the switch.

Threshold Configuration Tab

Use the Threshold Configuration tab to view and configure Fabric Watch thresholds for the Fabric Watch class that you select in the Fabric Watch navigation tree. [Table I-3](#) lists and describes the components of the Threshold Configuration tab.

Table I-3 Threshold Configuration Tab Components

Component	Description
Select Area pulldown menu	Lists the areas of thresholds that you can configure. The areas that appear in the pulldown menu depend on the class that you select from the Fabric Watch navigation tree.
Area Configuration tab	Provides fields to configure Fabric Watch threshold boundaries and alarms. For more information, refer to “Area Configuration Tab” on page I-3 .
Element Configuration tab	Provides fields to configure Fabric Watch threshold traits. For more information, refer to “Element Configuration Tab” on page I-4 .
Configuration Report tab	Displays the Fabric Watch settings for the class that you select from the Fabric Watch navigation tree. For more information, refer to “Configuration Report Tab” on page I-5 .

Area Configuration Tab

[Table I-4](#) lists and describes the components of the Area Configuration tab.

Table I-4 Area Configuration Components

Component	Description
Boundary Partition	
Unit field	Set or display the selected unit values used for the chosen area. Depending on the area of interest, this is figured in units of “downs, reconfigs, errors, changes, logins”, etc.
High field	Set or display the number of high boundaries (the highest limit at which an element will not trigger an event) for the selected area.
BufferSize field	Set or display the threshold boundary buffer size of the selected area.
TimeBase pulldown menu	Set or display the basic unit of time in which events are recorded for the selected area. The units available from the pulldown menu are: none, second, minute, hour, or day.
Low field	Set or display the number of low boundaries (the lowest limit at which an element will not trigger an event) for the selected area.

Table I-4 Area Configuration Components (Continued)

Component	Description
Select Boundary Level pulldown menu	Select either a default or custom setting for the boundary levels from the pulldown menu. The default values are shown in parenthesis.
Alarm Setting Partition	
Alarm Notification Mechanisms checkboxes.	Select Alarm settings for Errorlog, SNMP, RAN, Portlog and Email to be active on the switch side.
Select Alarm Level pulldown menu	Select either a custom or default setting for the alarm level from the pulldown; this setting will be active on the switch side menu.

Element Configuration Tab

[Table I-5](#) lists and describes the components of the Element Configuration tab.

Table I-5 Element Configuration Tab Components

Component	Description
Select Element pulldown menu	Use the pulldown menu to chose a specific element to configure.
Status Partition	
Enable radio button	Select the radio button to enable alarms.
Disable radio button	Select the radio button to disable alarms.
Behavior Type Partition	
Triggered radio button	Select the Triggered Behavior mode if you want Fabric Watch to register an event when a variable exceeds a threshold. An event will not be triggered again until the variable falls and exceeds the threshold again.
Continuous radio button	Select Continuous mode if you want Fabric Watch to register an event when a variable exceeds a threshold and continue to register an event for every time interval.
Time Interval Partition	
Time Interval (in secs) pulldown menu	Select the amount of time (in seconds) that you want Fabric Watch to poll for a new event.

Configuration Report Tab

Table I-6 describes the contents of the Configuration Report tab.

Table I-6 Threshold Configuration Report Component Descriptions

Component	Description
Configuration for Class	Describes the class that is being reported. The item selected in the Navigation tree appears here.
Begin Area	Describes the current settings configured for the selected area. Refer to Table I-5 .
Begin Element	Describes the current settings configured for the selected area.
Changed	Displays thresholds that have changed.
Exceeded	Displays thresholds that have been exceeded.
Below	Displays thresholds that have fallen below the configured level.
Above	Displays thresholds that have risen above the configured levels.
In between	Displays thresholds that have are in within the configured level.

Email Configuration Tab

Use the Email Configuration tab to enable and configure email alarm notifications. A different email configuration can be set for each Fabric Watch class. For example, one email notification can be set for SFPs and another can be set for E-Ports (see the navigation tree).

The Fabric Watch Email Configuration components are described in [Table I-7](#)

Table I-7 Email Configuration Component Descriptions

Component	Description
Mail To: field	Accepts the email address that Fabric Watch emails when an event occurs that triggers an email alert.
Mail Status partition	Lets you enable or disable email alert.
Mail Validation partition	Gives you the option to send a test email to the recipient in the Mail To: field when you click Apply .
Apply button	Applies your configuration.
Reset button	Resets the fields to default values.

Call Home External Executable Reference

This appendix includes the following sections:

- [“Introduction” on page J-1](#)
- [“Call Home Executable Requirements” on page J-1](#)

Introduction

The Fabric Manager Call Home feature can accept an external executable that runs when a Call Home event occurs. If you configure an external executable, Fabric Manager passes an XML file to the executable when the event occurs. The external executable runs as a background process, and the task manager monitors the process. All other functionality is at your discretion.



Caution

Large executables might impair the performance of your server.

Call Home Executable Requirements

The executable must be:

- Capable of being executed by the OS on which the Fabric Manager server is installed and it must be a valid binary for that OS (Windows or Solaris).
- Able to handle Fabric Manager passing it a command-line argument. The argument is the name of an XML file that Call Home generates when an event occurs.

Example

If I enter the executable **C:\executable.exe** in the **External Executable on Server** field in my Call Home window, Call Home launches **C:\executable.exe filename.xml** when an event occurs.

There might be additional executable requirements, depending on your needs.

Fabric Topology

This appendix includes the following sections:

- [“Introduction” on page K-1](#)
- [“Assigning a Core Switch Manually” on page K-1](#)
- [“Configuring Topology View Options” on page K-2](#)
- [“Viewing Discovered Fabric Topologies” on page K-2](#)
- [“Taking a Snapshot of a Topology” on page K-3](#)
- [“Moving a Topology Object” on page K-3](#)

Introduction

You can choose from among the fabric topology layouts that Fabric Manager displays in the **Topology** view. You can select from the following layouts:

- **Circular Layout.** Lays out the ring/star topologies in a way that preserves the visual identity of each cluster and avoids overlapping nodes and clusters.
- **Core-Edge Layout.** The core-edge layout is the default layout. Visually separates core switches, edge switches, and nodes. By default, when a nonsecure fabric is discovered, all switches with devices attached are marked as edge switches. All switches without devices attached are marked as core switches.

All switches defined in the FCS policy of a secure fabric are considered core switches. Any switches with devices attached to them are automatically considered edge switches. You can assign a core switch manually. For instructions, refer to [“Designating a Switch as a Core Switch” on page 3-17](#).

- **Tree Layout.** Organizes the fabric hierarchically.

Assigning a Core Switch Manually



Note

You can only assign a core switch in the Core Edge topology layout.

To assign a core switch manually, perform the following steps:

1. Select a switch from the **SAN Elements** tab.
2. Select **Core Switch** from the **Actions** menu.

A check mark displays next to **Core Switch** in the **Actions** menu, indicating that the switch is selected as the core switch.

Configuring Topology View Options

To configure **Topology** view options, perform the following steps:

1. Select **Options** from the **File** menu. The Options dialog displays.
2. Click **Topology**.
3. Select a layout from the **Default Startup Layout** menu. The available options are Circular, Core Edge, and Tree.
4. Select a link style from the **Default Startup Link Style** menu. The available options are Orthogonal and Straight.
5. Select a default link bundle state from the **Default Link Bundle State** menu. The available options are Expanded and Collapsed.



Note

The existing bundled links will not change to reflect your selection, however newly added bundled links will reflect your selection.

6. Select a tile direction from the **Tile Direction** menu. The available options are Vertical and Horizontal.
7. Enter a threshold percent in the **Threshold Percent** field.
8. Enter a threshold trigger period in the **Threshold Trigger Period** field.
9. Click **OK**.

Viewing Discovered Fabric Topologies

To view discovered fabric topologies, perform the following steps:

1. Select **Topology** from the **View** menu.
2. Select a SAN or fabric from the **SAN Elements** tab. The SAN or fabric node displays in the **View** area.



Note

To view a specific section of a large fabric in a different window, select the overview icon from the Topology menu.

3. Click the "+" to expand the view to the desired level. The Fabric Node will disappear and an outlined sub-graph appears; click the "-" to collapse the sub-graph back to the **Fabric** view.

Taking a Snapshot of a Topology

To take a snapshot of a topology, perform the following steps:

1. Select **Topology** from the **View** menu.
2. Select a SAN or fabric from the **SAN Elements** tab. The SAN or fabric node appears in the **View** area.
3. Select the snapshot icon from the **Topology** toolbar. The **Snapshot** window displays.
4. Click the **Export to PNG** icon. The **Export as PNG file** window displays.
5. Save a PNG version of the topology snapshot to a folder.



Note

The snapshot will only capture what you see in the current Topology window, and nothing that is not visible on the screen.

Moving a Topology Object

To move a topology object, perform the following steps:

1. Select **Topology** from the **View** menu.
2. Select a SAN or fabric from the **SAN Elements** tab. The SAN or fabric node displays in the **View** area.
3. Select the arrow icon from the **Topology** toolbar.



Note

Tooltips are disabled while using the select arrow, pan, or interactive zoom features.

4. Select and drag a node using the mouse.

Name Server

This appendix includes the following sections:

- [“Introduction” on page L-1](#)
- [“Displaying Name Server Entries” on page L-2](#)

Introduction

Fabric Manager launches Advanced Web Tools to display name server entries listed in the Simple Name Server database. This includes all name server entries for the fabric, not only those related to the local domain. Each row in the table represents a different device.



Note

The polling interval for the Name Server information is every 30 seconds.

The following items are in the Name Server Table:

Table L-1 Name Server Table Entries

Field/Button	Description
Auto Refresh	Check to enable Auto Refresh. Un-check to disable Auto Refresh.
Auto Refresh Interval	Enter the number of seconds for the refresh interval if Auto Refresh is checked.
Refresh	Select to refresh the window immediately.
OK	Select to close the window.
Domain #	The domain ID of the switch to which the device is connected.
Port #	The number of the switch port to which the device is connected.
Port Name	Displays the name of the port. This option is only available on switches running firmware versions 3.1.0 or 4.1.0.
Port ID	The port ID of the device (24-bit hexadecimal value).
Port Type	The port type of the device, where:
	N= fabric direct attached port
	NL= fabric direct attached loop port

Table L-1 Name Server Table Entries (Continued)

Field/Button	Description
Fabric Port WWN	The worldwide name of the fabric port.
Device Port WWN	The worldwide name of the device port.
Device Node WWN	Displays the worldwide name of the device node.
Device Name	Displays the symbolic name of the device assigned through the SCSI inquiry command.
FC4 Types	Displays the Fibre Channel FC4 layer types supported by the device, such as IP or FCP.
COS	Displays the Fibre Channel classes of service supported by the device.
Port IP Address	Displays the IP address of the fabric port.
Hard Address	Displays the hard address of the fabric port.
Member of Zones	Displays the zones to which this device belongs. This column does not update when the table is refreshed. To view updated zoning information, close and re-open the Name Server Table.

Displaying Name Server Entries

1. Select the fabric for which you want to see the name server entries from the SAN Elements tab.
2. Select Name Server from the Actions menu.
Advanced Web Tools launches and displays the Name Server information.
3. Enter a the number of seconds which auto refresh should update information in and check the Auto Refresh check-box to enable auto refresh.
Un-check the Auto Refresh check-box to disable auto refresh.

Glossary

A

AL_PA	Arbitrated loop physical address. A unique 8-bit value assigned during loop initialization to a port in an arbitrated loop. Alternately, “arbitrated loop parameters.”
alias	A logical grouping of elements in a fabric. An alias is a collection of port numbers and connected devices, used to simplify the entry of port numbers and WWNs when creating zones.
alias address identifier	An address identifier recognized by a port in addition to its standard identifier. An alias address identifier can be shared by multiple ports. <i>See also</i> alias .
alias AL_PA	An AL_PA value recognized by an L_Port in addition to the AL_PA assigned to the port. <i>See also</i> AL_PA .
alias server	A fabric software facility that supports multicast group management.
ANSI	American National Standards Institute.
API	Application programming interface. A defined protocol that allows applications to interface with a set of services.
arbitrated loop	A shared 100-MB/sec Fibre Channel transport structured as a loop. Can support up to 126 devices and one fabric attachment. <i>See also</i> topology .
area number	In Brocade Fabric OS v4.0 and above, ports on a switch are assigned a logical area number. Port area numbers can be viewed by entering the switchshow command. They are used to define the operative port for many Fabric OS commands: for example, area numbers can be used to define the ports within an alias or zone.
authentication	The process of verifying that an entity in a fabric (such as a switch) is what it claims to be. <i>See also</i> digital certificate , switch-to-switch authentication .

B

bandwidth	The total transmission capacity of a cable, link, or system. Usually measured in bps (bits per second). Can also refer to the range of transmission frequencies available to a link or system. <i>See also</i> throughput .
beacon	A tool in which all of the port LEDs on a switch are set to flash from one side of the switch to the other, to enable identification of an individual switch in a large fabric. A switch can be set to beacon by a CLI command or through Advanced Brocade Web Tools.

bit synchronization The condition in which a receiver is delivering retimed serial data at the required bit error rate.

block As it applies to Fibre Channel technology, upper-level application data that is transferred in a single sequence.

bypass circuitry Circuits that automatically remove a device from the data path when valid signals are dropped.

C

CA Certificate authority. A trusted organization that issues digital certificates. *See also* [digital certificate](#).

cascade Two or more interconnected Fibre Channel switches. Brocade SilkWorm 2000 and later switches can be cascaded up to 239 switches, with a recommended maximum of seven interswitch links (no path longer than eight switches). *See also* [fabric](#), [ISL](#).

CFG Configuration.

chassis The metal frame in which the switch and switch components are mounted.

CIM Common Information Model. A management structure enabling disparate resources to be managed by a common application.

circuit An established communication path between two ports. Consists of two virtual circuits capable of transmitting in opposite directions.

Class 1 service The class of frame-switching service for a dedicated connection between two communicating ports (also called "connection-oriented service"). Includes acknowledgement of frame delivery or nondelivery.

Class 2 service A connectionless class of frame-switching service that includes acknowledgement of frame delivery or nondelivery.

Class 3 service A connectionless class of frame-switching service that does not include acknowledgement of frame delivery or nondelivery. Can be used to provide a multicast connection between the frame originator and recipients, with acknowledgement of frame delivery or nondelivery.

Class 4 service A connection-oriented service that allows fractional parts of the bandwidth to be used in a virtual circuit.

Class 6 service A connection-oriented multicast service geared toward video broadcasts between a central server and clients.

Class F service The class of frame-switching service for a direct connection between two switches, allowing communication of control traffic between the E_Ports. Includes acknowledgement of data delivery or nondelivery.

class of service A specified set of delivery characteristics and attributes for frame delivery.

CLI	Command line interface. An interface that depends entirely on the use of commands, such as through telnet or SNMP, and does not involve a GUI.
client	An entity that, using its common transport (CT), makes requests of a server.
community (SNMP)	A relationship between a group of SNMP managers and an SNMP agent, in which authentication, access control, and proxy characteristics are defined. <i>See also</i> SNMP .
compact flash	Flash (temporary) memory that is used in a manner similar to hard disk storage. It is connected to a bridging component that connects to the PCI bus of the processor. Not visible within the processor's memory space.
configuration	(1) A set of parameters that can be modified to fine-tune the operation of a switch. Use the configshow command to view the current configuration of your switch. (2) In Brocade Zoning, a zoning element that contains a set of zones. The Configuration is the highest-level zoning element and is used to enable or disable a set of zones on the fabric. <i>See also</i> zone configuration .
congestion	The realization of the potential of oversubscription. A congested link is one on which multiple devices are contending for bandwidth.
connection initiator	A port that has originated a Class 1 dedicated connection and received a response from the recipient.
connection recipient	A port that has received a Class 1 dedicated connection request and transmitted a response to the originator.
controller	A computer module that interprets signals between a host and a peripheral device. The controller typically is part of the peripheral device.
core PID	Core switch port identifier. The core PID must be set for Brocade Fabric OS v3.1 and earlier switches included in a fabric of v4.1 switches. This parameter is located in the configure command of firmware versions v3.1 and earlier. All v4.1 switches and above use the core PID format by default; this parameter is not present in the configure command for these switches.
COS	Class of service.
CP	Control processor.
credit	As it applies to Fibre Channel technology, the number of receive buffers available to transmit frames between ports. <i>See also</i> EE_Credit .
cut-through	A switching technique that allows the route for a frame to be selected as soon as the destination address is received. <i>See also</i> route .

D

D_ID	Destination identifier. A 3-byte field in the frame header, used to indicate the address identifier of the N_Port to which the frame is headed.
DAS	Direct attached storage.

datagram	A Class 3 Fibre Channel service that allows data to be sent quickly to devices attached to the fabric, without receipt confirmation.
defined zone configuration	The set of all zone objects defined in the fabric. Can include multiple zone configurations. <i>See also enabled zone configuration, zone configuration.</i>
deskew	Related to the Brocade Trunking feature. The time difference between traffic traveling over each ISL other than the shortest ISL in the group and traffic traveling over that shortest ISL. The deskew number corresponds to nanoseconds divided by 10. The firmware automatically sets the minimum deskew value of the shortest ISL to 15.
DHCP	Dynamic Host Configuration Protocol.
DHCPD	Dynamic Host Configuration Protocol daemon.
digital certificate	An electronic document issued by a CA (certificate authority) to an entity, containing the public key and identity of the entity. Entities in a secure fabric are authenticated based on these certificates. <i>See also authentication, CA.</i>
disparity	The proportion of 1s and 0s in an encoded character. "Neutral disparity" means an equal number of each, "positive disparity" means a majority of 1s, and "negative disparity" means a majority of 0s.
DLS	Dynamic load-sharing. Dynamic distribution of traffic over available paths. Allows for recomputing of routes when an Fx_Port or E_Port changes status.
domain controller	A domain controller (or embedded port) communicates with and gets updates from other switches' embedded ports. The well-known address is <i>fffcdd</i> , where <i>dd</i> = domain number.
domain ID	A unique identifier for all switches in a fabric, used in routing frames. Usually automatically assigned by the principal switch but can be assigned manually. The domain ID for a Brocade SilkWorm switch can be any integer between 1 and 239.

E

E_D_TOV	Error-detect timeout value. The minimum amount of time a target waits for a sequence to complete before initiating recovery. Can also be defined as the maximum time allowed for a round-trip transmission before an error is declared. <i>See also R_A_TOV, RR_TOV.</i>
E_Port	Expansion port. A type of switch port that can be connected to an E_Port on another switch to create an ISL. <i>See also ISL.</i>
ECCN	Export classification control number. A government classification of encryption. For example, SSH is in the high-encryption category (number 5x02) and therefore has certain restrictions regarding its transfer.
EE_Credit	End-to-end credit. The number of receive buffers allocated by a recipient port to an originating port. Used by Class 1 and 2 services to manage frame exchange across the fabric, between source and destination. <i>See also end-to-end flow control.</i>
EIA rack	A storage rack that meets the standards set by the Electronics Industry Association (EIA).

ELP	Exchange link parameters.
ELS	Extended link service. ELSs are sent to the destination N_Port to perform the requested function or service. ELS is a Fibre Channel standard that is sometimes referred to as "Fibre Channel Physical (FC_PH) ELS."
EM	Environmental monitor. Monitors FRUs and reports failures.
embedded port	An embedded port (or domain controller) communicates and get updates from other switches' embedded ports. The well-known address is <i>fffcd</i> , where <i>dd</i> = domain number.
EMI	Electromagnetic interference.
emulex	A brand of host bus adapter.
enabled zone configuration	The currently enabled configuration of zones. Only one configuration can be enabled at a time. <i>See also defined zone configuration, zone configuration.</i>
end-to-end flow control	Governs flow of Class 1 and 2 frames between N_Ports. <i>See also EE_Credit.</i>
entry fabric	The basic Brocade software license that allows one E_Port per switch.
EOF	End of frame. A group of ordered sets used to mark the end of a frame.
error	As it applies to the Fibre Channel industry, a missing or corrupted frame, timeout, loss of synchronization, or loss of signal (link errors). <i>See also loop failure.</i>
Ethernet	Popular protocols for LANs.
exchange	The highest-level Fibre Channel mechanism used for communication between N_Ports. Composed of one or more related sequences, it can work in either one or both directions.

F

F_Port	Fabric port. A port that is able to transmit under fabric protocol and interface over links. Can be used to connect an N_Port to a switch. <i>See also FL_Port, Fx_Port.</i>
F_RJT	Fabric port reject frame. A frame issued by the fabric to indicate that delivery of a frame is being denied, perhaps because a class is not supported, there is an invalid header, or no N_Port is available.
fabric	A Fibre Channel network containing two or more switches in addition to hosts and devices. Also referred to as a "switched fabric." <i>See also cascade, SAN, topology.</i>
Fabric Manager	An optionally licensed Brocade software. Fabric Manager is a GUI that allows for fabric-wide administration and management. Switches can be treated as groups, and actions such as firmware downloads can be performed simultaneously.
Fabric Mode	One of two possible modes for an L_Port, in which the L_Port is connected to another port that is not loop capable, using fabric protocol.

fabric name	The unique identifier assigned to a fabric and communicated during login and port discovery.
fabric port count	The number of ports available for connection by nodes in a fabric.
fabric services	Codes that describe the communication to and from any well-known address.
fabric topology	The arrangement of switches that form a fabric.
Fabric Watch	An optionally licensed Brocade software. Fabric Watch can be accessed through either the command line or Advanced Web Tools, and it provides the ability to set thresholds for monitoring fabric conditions.
failover	Describes the Brocade SilkWorm 12000 process of one CP passing active status to another CP. A failover is nondisruptive.
FAN	Fabric address notification. Retains the AL_PA and fabric address when a loop reinitializes, if the switch supports FAN.
fan-in	The ratio of hosts to storage devices; the view of the SAN from the storage port's perspective.
fan-out	The ratio of storage devices to hosts; the view of the SAN from the host port's perspective.
FC-0	Lowest layer of Fibre Channel transport. Represents physical media.
FC-1	Layer of Fibre Channel transport that contains the 8b/10b encoding scheme.
FC-2	Layer of Fibre Channel transport that handles framing and protocol, frame format, sequence/exchange management, and ordered set usage.
FC-3	Layer of Fibre Channel transport that contains common services used by multiple N_Ports in a node.
FC-4	Layer of Fibre Channel transport that handles standards and profiles for mapping upper-level protocols such as SCSI and IP onto the Fibre Channel Protocol.
FC-AL-3	The Fibre Channel arbitrated loop standard defined by ANSI. Defined on top of the FC-PH standards.
FC-AV	Fibre Channel audio visual.
FCC	Federal Communications Commission.
FC-CT	Fibre Channel common transport.
FC-FG	Fibre Channel generic requirements.
FC-FLA	The Fibre Channel fabric loop-attach standard defined by ANSI.
FC-FS	Fibre Channel framing and signaling.
FC-GS	Fibre Channel generic services.
FC-GS-2	Fibre Channel generic services, second generation.

FC-GS-3	Fibre Channel Generic Services, third generation.
FC_IP	Fibre Channel-over-IP.
FC-PH	The Fibre Channel physical and signaling standard for FC-0, FC-1, and FC-2 layers of the Fibre Channel Protocol. Indicates signaling used for cable plants, media types, and transmission speeds.
FC-PH-2	Fibre Channel Physical Interface, second generation.
FC-PH-3	Fibre Channel Physical Interface, third generation.
FC-PI	Fibre Channel Physical Interface standard, defined by ANSI.
FC-PLDA	The Fibre Channel Private Loop Direct Attach standard defined by ANSI. Applies to the operation of peripheral devices on a private loop.
FC_SB	Fibre Channel single bytes.
FC_VI	Fibre Channel virtual interface.
FCA	Flow-control acknowledgement (DLSW).
FCIA	Fibre Channel Industry Association. An international organization of Fibre Channel industry professionals. Provides oversight of ANSI and industry-developed standards, among other tasks.
FCLC	Fibre Channel Loop Community.
FCP	Fibre Channel Protocol. Mapping of protocols onto the Fibre Channel standard protocols. For example, SCSI FCP maps SCSI-3 onto Fibre Channel.
FCS switch	Relates to the Brocade Secure Fabric OS feature. One or more designated switches that store and manage security parameters and configuration data for all switches in the fabric. They also act as a set of backup switches to the primary FCS switch. <i>See also bandwidth, primary FCS switch.</i>
FFFFF5	Well-known Fibre Channel address for a Class 6 multicast server.
FFFFF6	Well-known Fibre Channel address for a clock synchronization server.
FFFFF7	Well-known Fibre Channel address for a security key distribution server.
FFFFF8	Well-known Fibre Channel address for an alias server.
FFFFF9	Well-known Fibre Channel address for a QoS facilitator.
FFFFFA	Well-known Fibre Channel address for a management server.
FFFFFB	Well-known Fibre Channel address for a time server.
FFFFFC	Well-known Fibre Channel address for a directory server.
FFFFFD	Well-known Fibre Channel address for a fabric controller.

FFFFFFE	Well-known Fibre Channel address for a fabric F_Port.
FFFFFFF	Well-known Fibre Channel address for a broadcast alias ID.
Fibre Channel	Fibre Channel is a protocol used to transmit data between servers, switches, and storage devices. It is a high-speed, serial, bidirectional, topology-independent, multiprotocol, and highly scalable interconnection between computers, peripherals, and networks.
Fibre Channel transport	A protocol service that supports communication between Fibre Channel service providers. <i>See also</i> FSP .
FICON®	A protocol used on IBM mainframes. Brocade SilkWorm switch FICON® support enables a SilkWorm fabric to transmit FICON® format data between FICON® capable servers and storage.
FIFO	First in, first out. Refers to a data buffer that follows the first in, first out rule.
fill word	An IDLE or ARB ordered set that is transmitted during breaks between data frames to keep the Fibre Channel link active.
firmware	The basic operating system provided with the hardware.
FL_Port	Fabric loop port. A port that is able to transmit under fabric protocol and also has arbitrated loop capabilities. Can be used to connect an NL_Port to a switch. <i>See also</i> F_Port , Fx_Port .
flash	Programmable nonvolatile RAM (NVRAM) memory that maintains its contents without power.
FLOGI	Fabric login. The process by which an N_Port determines whether a fabric is present and, if so, exchanges service parameters with it. <i>See also</i> PLOGI .
FOTP	Fiber Optic Test Procedure. Standards developed and published by the Electronic Industries Association (EIA) under the EIA-RS-455 series of standards.
FPD	Field-programmable device. Interchangeable with “PLD”.
FPGA	Field-programmable gate array. An FPD that allows high logic capacity.
frame	The Fibre Channel structure used to transmit data between ports. Consists of a start-of-frame delimiter, header, optional headers, data payload, cyclic redundancy check (CRC), and end-of-frame delimiter. There are two types of frames: link control frames (transmission acknowledgements and so forth) and data frames.
FRU	Field-replaceable unit. A component that can be replaced onsite.
FS	Fibre Channel service. A service that is defined by Fibre Channel standards and exists at a well-known address. For example, the Simple Name Server is a Fibre Channel service. <i>See also</i> FSP .
FSP	Fibre Channel Service Protocol. The common protocol for all fabric services, transparent to the fabric type or topology. <i>See also</i> FS .
FSPF	Fabric shortest path first. The Brocade routing protocol for Fibre Channel switches.

FSS	Fabric OS state synchronization. The FSS service is related to high availability (HA). The primary function of FSS is to deliver state update messages from active components to their peer standby components. FSS determines if fabric elements are synchronized (and thus FSS "compliant").
FTP	File Transfer Protocol.
FTS	Fiber Transport Services.
full fabric	The Brocade software license that allows multiple E_Ports on a switch, making it possible to create multiple ISL links.
full fabric citizenship	A loop device that has an entry in the Simple Name Server.
full-duplex	A mode of communication that allows the same port to simultaneously transmit and receive frames. <i>See also half-duplex.</i>
Fx_Port	A fabric port that can operate as either an F_Port or FL_Port. <i>See also F_Port, FL_Port.</i>

G

G_Port	Generic port. A port that can operate as either an E_Port or an F_Port. A port is defined as a G_Port when it is not yet connected or has not yet assumed a specific function in the fabric.
gateway	Hardware that connects incompatible networks by providing translation for both hardware and software. For example, an ATM gateway can be used to connect a Fibre Channel link to an ATM connection.
GBIC	Gigabit interface converter. A removable serial transceiver module that allows gigabaud physical-level transport for Fibre Channel and gigabit Ethernet.
Gb/sec	Gigabits per second (1,062,500,000 bits/second).
GB/sec	Gigabytes per second (1,062,500,000 bytes/second).
GUI	A graphic user interface, such as Brocade Advanced Web Tools and Brocade Fabric Manager.

H

HA	High availability. A set of features in Brocade SilkWorm switches that is designed to provide maximum reliability and nondisruptive replacement of key hardware and software modules.
half-duplex	A mode of communication that allows a port to either transmit or receive frames at any time except simultaneously (with the exception of link control frames, which can be transmitted at any time). <i>See also full-duplex.</i>
hard address	The AL_PA that an NL_Port attempts to acquire during loop initialization.

Hardware Translative Mode A method for achieving address translation. There are two hardware translative modes available to a QuickLoop enabled switch: Standard Translative Mode and QuickLoop Mode.

HBA Host bus adapter. The interface card between a server or workstation bus and the Fibre Channel network.

header A Fibre Channel frame has a header and a payload. The header contains control and addressing information associated with the frame.

host A computer system that provides end users with services like computation and storage access.

hot-swappable A hot-swappable component can be replaced under power.

HTTP Hypertext Transfer Protocol. The standard TCP/IP transfer protocol used on the World Wide Web.

hub A Fibre Channel wiring concentrator that collapses a loop topology into a physical star topology. Nodes are automatically added to the loop when active and removed when inactive.

HW Hardware.

I

ID_ID Insistent domain ID. A parameter of the **configure** command in the Brocade Fabric OS.

idle Continuous transmission of an ordered set over a Fibre Channel link when no data is being transmitted, to keep the link active and maintain bit, byte, and word synchronization.

iFCP Internet Fibre Channel Protocol. Supports Fibre Channel Layer 4 FCP-Over-TCP/IP. It is a gateway-to-gateway protocol in which TCP/IP switching and routing components enhance/replace Fibre Channel fabric.

in-band Transmission of management protocol over the Fibre Channel.

Insistent Domain ID Mode Sets the domain ID of a switch as insistent, so that it remains the same over reboots, power cycles, failovers, and fabric reconfigurations. This mode is required to support FICON® traffic.

integrated fabric The fabric created by a Brocade SilkWorm 6400, consisting of six SilkWorm 2250 switches cabled together and configured to handle traffic as a seamless group.

interswitch link See [ISL](#).

intracabinet A specification for copper cabling that allows up to a 13-meter (42-foot) distance within a single cabinet.

IOD In-order delivery. A parameter that, when set, guarantees that frames are either delivered in order or dropped.

IP Internet Protocol. The addressing part of TCP.

iSCSI Internet Small Computer Systems Interface. A protocol that defines the processes for transferring block storage applications over TCP/IP networks by encapsulating SCSI commands into TCP and transporting them over the network via IP.

ISL Interswitch link. A Fibre Channel link from the E_Port of one switch to the E_Port of another. *See also [cascade](#), [E_Port](#).*

ISL oversubscription ratio The ratio of the number of free ports (non-ISL) to the number of ISLs on a switch.

isolated E_Port An E_Port that is online but not operational due to overlapping domain IDs or nonidentical parameters (such as E_D_TOVs). *See also [E_Port](#).*

ISP Internet service provider.

IU Information unit. A set of information as defined by either an upper-level process protocol definition or upper-level protocol mapping.

J

JBOD "Just a bunch of disks." Indicates a number of disks connected in a single chassis to one or more controllers. *See also [RAID](#).*

K

key A string of data (usually a numeric value) shared between two entities and used to control a cryptographic algorithm. Usually selected from a large pool of possible keys to make unauthorized identification of the key difficult. *See also [key pair](#).*

key pair In public key cryptography, a pair of keys consisting of an entity's public and private key. The public key can be publicized, but the private key must be kept secret.

L

L_Port Loop port. A node port (NL_Port) or fabric port (FL_Port) that has arbitrated-loop capabilities. An L_Port can be in either Fabric Mode or Loop Mode.

LAN Local area network. A network in which transmissions typically take place over fewer than 5 kilometers (3.4 miles).

latency The time required to transmit a frame. Together, latency and bandwidth define the speed and capacity of a link or system.

LED Light-emitting diode. Used to indicate the status of elements on a switch.

Link Services A protocol for link-related actions.

LM_TOV Loop master timeout value. The minimum time that the loop master waits for a loop initialization sequence to return.

login server	The unit that responds to login requests.
loop circuit	A temporary bidirectional communication path established between L_Ports.
loop failure	Loss of signal within a loop for any period of time, or loss of synchronization for longer than the timeout value.
Loop_ID	A hexadecimal value representing one of the 127 possible AL_PA values in an arbitrated loop.
loop initialization	The logical procedure used by an L_Port to discover its environment. Can be used to assign AL_PA addresses, detect loop failure, or reset a node.
Loop Mode	One of two possible modes for an L_Port, in which the L_Port is in an arbitrated loop, using loop protocol. An L_Port in Loop Mode can also be in Participating Mode or Nonparticipating Mode.
looplest	A set of devices connected in a loop to a port that is a member of another loop.
LPB	Loop port bypass. A primitive sequence transmitted by an L_Port to bypass one or all L_Ports to which it is directed. It is used only in arbitrated loops.
LPE	Loop port enable. A primitive sequence transmitted by an L_Port to enable one or all L_Ports that have been bypassed with the LPB. It is used only in arbitrated loops.
LPSM	Loop Port State Machine. Logic that monitors and performs the tasks required for initialization and access to the loop. It is maintained by an L_Port to track behavior through different phases of loop operations. Alternatively, the logical entity that performs arbitrated loop protocols and defines the behavior of L_Ports when they require access to an arbitrated loop.
LR	Link reset. A primitive sequence used during link initialization between two N_Ports in point-to-point topology or an N_Port and an F_Port in fabric topology. The expected response is an LRR.
LRR	Link reset response. A primitive sequence during link initialization between two N_Ports in point-to-point topology or an N_Port and an F_Port in fabric topology. It is sent in response to an LR and expects a response of Idle.
LWL	Long wavelength. A type of fiber optic cabling that is based on 1300-nm lasers and supports link speeds of 1.0625 Gb/sec. Can also refer to the type of GBIC or SFP. <i>See also</i> SWL .

M

MALLOC	Memory allocation. Usually relates to buffer credits.
MAN	Metropolitan area network.
MB/sec	Megabytes per second.
Mb/sec	Megabits per second.
metric	A relative value assigned to a route to aid in calculating the shortest path (1000 @ 1 Gb/sec, 500 @ 2 Gb/sec).

MIB	Management Information Base. An SNMP structure to help with device management, providing configuration and device information.
MMF	Multimode fiber. <i>See</i> SWL .
MS	Management Server. The Management Server allows a storage area network (SAN) management application to retrieve information and administer the fabric and interconnected elements, such as switches, servers, and storage devices. The MS is located at the Fibre Channel well-known address FFFFFAh.
MSD	Management Server daemon. Monitors the MS. Includes the Fabric Configuration Service and the Unzoned Name Server.
MTBF	Mean time between failures. An expression of time, indicating the longevity of a device.
multicast	The transmission of data from a single source to multiple specified N_Ports (as opposed to all the ports on the network).
multimode	A fiber optic cabling specification that allows up to 500 meters between devices.

N

N_Port	Node port. A port on a node that can connect to a Fibre Channel port or to another N_Port in a point-to-point connection. <i>See also</i> NL_Port , Nx_Port .
Name Server	Simple Name Server (SNS). A switch service that stores names, addresses, and attributes for up to 15 minutes and provides them as required to other devices in the fabric. SNS is defined by Fibre Channel standards and exists at a well-known address. Also referred to as "directory service."
NAS	Network-attached storage. A disk array connected to a controller that gives access via a LAN.
NDMP	Network Data Management Protocol. Used for tape backup without using server resources.
NL_Port	Node loop port. A node port that has arbitrated-loop capabilities. Used to connect an equipment port to the fabric in a loop configuration through an FL_Port. <i>See also</i> N_Port , Nx_Port .
node	A Fibre Channel device that contains an N_Port or NL_Port.
node count	The number of nodes attached to a fabric.
node name	The unique identifier for a node, communicated during login and port discovery.
Non-participating Mode	A mode in which an L_Port in a loop is inactive and cannot arbitrate or send frames but can retransmit received transmissions. This mode is entered if there are more than 127 devices in a loop and an AL_PA cannot be acquired. <i>See also</i> L_Port .
NOS	Not operational. The NOS primitive sequence is transmitted to indicate that the FC_Port transmitting the NOS has detected a link failure or is offline, waiting for the offline sequence (OLS) to be received.
NSCAM	Name Server Cache Manager. Updates the Name Server (NS) databases across switches as a background task.

Nx_Port A node port that can operate as either an N_Port or NL_Port.

O

OLS Primitive sequence offline.

OPN Open primitive signal. Applies only to arbitrated loop; sent by an L_Port that has won the arbitration process to open communication with one or more ports on the loop.

ordered set A transmission word that uses 8b/10b mapping and begins with the K28.5 character. Ordered sets occur outside of frames and include the following items:

Frame delimiters. Mark frame boundaries and describe frame contents.

Primitive signals. Indicate events.

Primitive sequences. Indicate or initiate port states.

Ordered sets are used to differentiate Fibre Channel control information from data frames and to manage frame transport.

originator The Nx_Port that originated an exchange.

out-of-band Transmission of management protocol outside of the Fibre Channel network, usually over Ethernet.

oversubscription A situation in which more nodes could potentially contend for a resource than the resource could simultaneously support (typically an ISL). Oversubscription could be a desirable attribute in fabric topology, as long as it does not produce unacceptable levels of congestion.

P

packet A set of information transmitted across a network. *See also* [frame](#).

PAL Programmable Array Logic. A relatively small FPD.

parallel The simultaneous transmission of data bits over multiple lines.

payload A Fibre Channel frame has a header and a payload. The payload contains the information being transported by the frame; it is determined by the higher-level service or FC_4 upper-level protocol. There are many different payload formats, based on protocol.

Performance Monitoring A Brocade SilkWorm switch feature that monitors port traffic and includes frame counters, SCSI read monitors, SCSI write monitors, and other types of monitors.

persistent error log Error messages of a high enough level (by default, Panic or Critical) are saved to flash memory on the switch instead of to RAM. These messages are saved over reboots and power cycles, constituting the persistent error log. Note that each CP on a SilkWorm 12000 has its own unique persistent error log.

phantom address An AL_PA value that is assigned to a device that is not physically in the loop. Also known as "phantom AL_PA."

phantom device	A device that is not physically in an arbitrated loop but is logically included through the use of a phantom address.
PID	Port identifier. <i>See also</i> core PID .
PKI	Public key infrastructure. An infrastructure that is based on public key cryptography and CA (certificate authority) and that uses digital certificates. <i>See also</i> CA , digital certificate .
PKI certification utility	Public key infrastructure certification utility. A utility that makes it possible to collect certificate requests from switches and to load certificates to switches. <i>See also</i> digital certificate , PKI .
PLOGI	Port login. The port-to-port login process by which initiators establish sessions with targets. <i>See also</i> FLOGI .
point-to-point	A Fibre Channel topology that employs direct links between each pair of communicating entities. <i>See also</i> topology .
port	In a Brocade SilkWorm switch environment, an SFP or GBIC receptacle on a switch to which an optic cable for another device is attached.
port address	In Fibre Channel technology, the port address is defined in hexadecimal. In the Brocade Fabric OS, a port address can be defined by a domain and port number combination or by area number. In an ESCON Director, an address used to specify port connectivity parameters and to assign link addresses for attached channels and control units.
port cage	The metal casing extending out of the optical port on the switch, into which the SFP can be inserted.
port card	A hardware component that provides a platform for field-replaceable, hot-swappable ports.
port log	A record of all activity on a switch, kept in volatile memory.
port log dump	A view of what happens on a switch, from the switch's point of view. The portlogdump command is used to read the port log.
port name	A user-defined alphanumeric name for a port.
port swapping	The ability to redirect a failed port to another port. This feature is available in Brocade Fabric OS v4.1.0 and higher.
port_name	The unique identifier assigned to a Fibre Channel port. Communicated during login and port discovery.
POST	Power-on self-test. A series of tests run by a switch after it is turned on.
PPP	Point-to-Point Protocol.
primary FCS switch	Relates to the Brocade Secure Fabric OS feature. The primary fabric configuration server switch actively manages security and configurations for all switches in the fabric. <i>See also</i> bandwidth , FCS switch.

primitive sequence	An ordered set that is transmitted repeatedly and continuously. Primitive sequences are transmitted to indicate specific conditions within or conditions encountered by the receiver logic of an FC_Port. <i>See OLS and NOS.</i>
primitive signals	An ordered set that indicates actions or events and requires just one occurrence to trigger a response. Idle and R_RDY are used in all three topologies: ARB, OPN, and CLS. MRK is used in arbitrated loop.
principal switch	The first switch to boot up in a fabric. Ensures unique domain IDs among roles.
private device	A device that supports arbitrated loop protocol and can interpret 8-bit addresses but cannot log in to the fabric.
private key	The secret half of a key pair. <i>See also key, key pair.</i>
private loop	An arbitrated loop that does not include a participating FL_Port.
private loop device	A device that supports a loop and can understand 8-bit addresses but does not log in to the fabric.
private NL_Port	An NL_Port that communicates only with other private NL_Ports in the same loop and does not log in to the fabric.
protocol	A defined method and set of standards for communication. Determines the type of error-checking, the data-compression method, how sending devices indicate an end of message, and how receiving devices indicate receipt of a message.
pstate	Port State Machine.
PSU	Power supply unit.
public device	A device that supports arbitrated-loop protocol, can interpret 8-bit addresses, and can log in to the fabric.
public loop	An arbitrated-loop that includes a participating FL_Port and can contain both public and private NL_Ports.
public NL_Port	An NL_Port that logs in to the fabric, can function within either a public or a private loop, and can communicate with either private or public NL_Ports.

Q

QLA	A type of Fibre Channel controller.
QLFA	QuickLoop Fabric Assist. Arbitrated-loop technology.
quad	A group of four adjacent ports that share a common pool of frame buffers.
queue	A mechanism for each AL_PA address that allows for collecting frames prior to sending them to the loop.

QuickLoop	A Brocade software product that allows multiple ports on a switch to create a logical loop. Devices connected via QuickLoop appear to each other as if they are on the same arbitrated loop.
QuickLoop Mode	Allows initiator devices to communicate with private or public devices that are not in the same loop.

R

R_A_TOV	Resource allocation timeout value. The maximum time a frame can be delayed in the fabric and still be delivered. <i>See also</i> E_D_TOV , RR_TOV .
R_CTL	Route control. The first 8 bits of the header, which defines the type of frame and its contents.
R_RDY	Receiver ready. A primitive signal indicating that the port is ready to receive a frame.
R_T_TOV	Receiver transmitter timeout value, used by receiver logic to detect loss of synchronization between transmitters and receivers.
radius	The greatest "distance" between any edge switch and the center of a fabric. A low-radius network is better than a high-radius network.
RAID	Redundant array of independent disks. A collection of disk drives that appear as a single volume to the server and are fault tolerant through mirroring or parity checking. <i>See also</i> JBOD .
RAIT	Redundant array of independent tapes.
RCS	Reliable Commit Service. Refers to Brocade-specific ILS command code.
RCS_SFC	RCS Stage Fabric Config. Refers to Brocade-specific ILS command code.
receiver	A device that performs detection and signal processing.
redundancy	Having multiple occurrences of a component to maintain high availability (HA).
remote switch	An optional product for long-distance fabrics, requiring a Fibre Channel-to-ATM or SONET gateway.
request rate	The rate at which requests arrive at a servicing entity.
resilience	A fabric's ability to adapt to or tolerate a failure of a component within the fabric.
resilient core/ edge topology	Two or more switches acting as a core to interconnect multiple edge switches. Nodes attach to the edge switches.
responder	The N_Port with which an exchange originator wants to communicate.
return loss	The ratio (expressed in dB) of incident power to reflected power, when a component or assembly is introduced into a link or system. Can refer to optical power or to electrical power in a specified frequency range.
RLS	Read Link Status.

route	As it applies to a fabric, the communication path between two switches. Might also apply to the specific path taken by an individual frame, from source to destination. <i>See also</i> FSPF .
routing	The assignment of frames to specific switch ports, according to frame destination. [<i>and traffic? -ed.</i>]
RR_TOV	Resource recovery timeout value. The minimum time a target device in a loop waits after a LIP before logging out an SCSI initiator. <i>See also</i> E_D_TOV , R_A_TOV .
RSCN	Registered state change notification. A switch function that allows notification of fabric changes to be sent from the switch to specified nodes. The fabric controller issues RSCN requests to N_Ports and NL_Ports, but only if they have registered to be notified of state changes in other N_Ports and NL_Ports. This registration is performed via the State Change Registration (SCR) Extended Link Service. An N_Port or NL_Port can issue an RSCN to the fabric controller without having completed SCR with the fabric controller.
running disparity	A binary parameter indicating the cumulative disparity (positive or negative) of all previously issued transmission characters.
RW	Read/write. Refers to access rights.
RX	Receiving frames.
RX_ID	Responder exchange identifier. A 2-byte field in the frame header that can be used by the responder of the exchange to identify frames as being part of a particular exchange.

S

S_ID	Source ID. Refers to the native port address (24 bit address).
SAN	Storage area network. A network of systems and storage devices that communicate using Fibre Channel protocols. <i>See also</i> fabric .
SAN architecture	The overall design of a storage network solution, which includes one or more related fabrics, each of which has a topology.
SAN port count	The number of ports available for connection by nodes in the entire SAN.
scalability	One of the properties of a SAN: the size to which a SAN topology can grow port and switch counts with ease.
SCN	State change notification. Used for internal state change notifications, not external changes. This is the switch logging that the port is online or is an Fx_Port, not what is sent from the switch to the Nx_Ports.
SCR	State change registration. Extended Link Service (ELS) requests the fabric controller to add the N_Port or NL_Port to the list of N_Ports and NL_Ports registered to receive the Registered State Change Notification (RSCN) Extended Link Service.
SCSI	Small Computer Systems Interface. A parallel bus architecture and a protocol for transmitting large data blocks to a distance of 15 to 25 meters.

SCSI-2	An updated version of the SCSI bus architecture.
SCSI-3	An SCSI standard that defines transmission of SCSI protocol data over different kinds of links.
SDRAM	The main memory for a switch.
sectelnet	A protocol similar to telnet but with encrypted passwords for increased security.
Secure Fabric OS	A separately sold Brocade feature that provides advanced, centralized security for a fabric.
security policy	Rules that determine how security is implemented in a fabric. Security policies can be customized through Brocade Secure Fabric OS or Brocade Fabric Manager.
SEQ_ID	Sequence identifier. A 1-byte field in the frame header change to identify the frames as being part of a particular exchange sequence between a pair of ports.
sequence	A group of related frames transmitted in the same direction between two N_Ports.
sequence initiator	The N_Port that begins a new sequence and transmits frames to another N_Port.
sequence recipient	Serializing/deserializing circuitry. A circuit that converts a serial bit stream into parallel characters, and vice-versa.
serial	The transmission of data bits in sequential order over a single line.
server	A computer that processes end-user applications or requests.
service rate	The rate at which an entity can service requests. <i>See also request rate.</i>
SES	SCSI Enclosure Services. A subset of the SCSI protocol used to monitor temperature, power, and fan status for enclosed devices.
SFF	Small-form-factor. An industry term for a smaller transceiver. <i>See SFP.</i>
SFP	Small-form-factor pluggable. A transceiver used on 2 GB/sec switches that replaces the GBIC.
SFP cable	A cable specifically designed for use with an SFP. Not compatible with GBICs.
SI	Sequence initiative.
SilkWorm	The brand name for the Brocade family of switches.
Simple Name Server (SNS)	A switch service that stores names, addresses, and attributes for up to 15 minutes and provides them as required to other devices in the fabric. SNS is defined by Fibre Channel standards and exists at a well-known address. Also referred to as "directory service" or "Name Server."
Single CP Mode	The -s option of the firmwaredownload command. Using firmwaredownload -s enables Single CP Mode. In the SilkWorm 12000, Single CP Mode enables a user to upgrade a single CP and to select full-install, autoreboot, and autocommit.

Single Mode	The fiber-optic cabling standard for devices up to 10 km apart.
S-Link Service	Facilities used between an N_Port and the fabric, or between two N_Ports, for login, sequence/exchange management, and maintaining connections.
SMF	Single-mode fiber. <i>See</i> LWL .
SMI	Structure of management information. A notation for setting or retrieving SNMP management variables.
SNMP	Simple Network Management Protocol. An Internet management protocol that uses either IP for network-level functions and UDP for transport-level functions, or TCP/IP for both. Can be made available over other protocols, such as UDP/IP, because it does not rely on the underlying communication protocols. <i>See also</i> community (SNMP) .
SNS	Simple Name Server.
SOF	Start of frame. A group of ordered sets that marks the beginning of a frame and indicates the class of service the frame will use.
soft zone	A zone consisting of zone members that are made visible to each other through client service requests. Typically, soft zones contain zone members that are visible to devices using Name Server exposure of zone members. The fabric does not enforce a soft zone. Note that well-known addresses are implicitly included in every zone.
SoIP	SCSI-over-IP.
SONET	Synchronous optical network. A standard for optical networks that provides building blocks and flexible payload mappings.
special character	A 10-bit character that does not have a corresponding 8-bit value but is still considered valid. The special character is used to indicate that a particular transmission word is an ordered set. This is the only type of character to have five 1s or 0s in a row.
SPLD	Simple PLD. Usually, either a PLA or PAL.
SPOF	Single point of failure. Any component in a SAN whose malfunction could bring down the entire SAN.
SQ_ID	Sequence ID. Used to identify and track all of the frames within a sequence between a source (S_ID) and destination (D_ID) port pair.
SRM	Storage resource management. The management of disk volumes and file resources.
SSH	Secure shell. Used starting in Brocade Fabric OS v4.1 to support encrypted telnet sessions to the switch. SSH encrypts all messages, including the client sending the password at login.
Standard Translative Mode	Allows public devices to communicate with private devices that are directly connected to the fabric.
stealth mode	A method used in some switches to simulate Brocade switches using QuickLoop.

storage	A device used to store data, such as a disk or tape.
switch	A fabric device providing bandwidth and high-speed routing of data via link-level addressing.
switch name	The arbitrary name assigned to a switch.
switch port	A port on a switch. Switch ports can be E_Ports, F_Ports, or FL_Ports.
switch-to-switch authentication	The process of authenticating both switches in a switch-to-switch connection using digital certificates. <i>See also authentication, digital certificate.</i>
SWL	Short wavelength. A type of fiber-optic cabling that is based on 850 nm lasers and supports 1.0625 GB/sec. link speeds. Can also refer to the type of GBIC or SFP. <i>See also LWL.</i>
syslog	Syslog daemon. Used to forward error messages.
T	
T10	A standards committee chartered with creating standards for SCSI.
T11	A standards committee chartered with creating standards for Fibre Channel.
target	A storage device on a Fibre Channel network.
TCP/IP	Transmission Control Protocol / Internet Protocol.
telnet	A virtual terminal emulation used with TCP/IP. "Telnet" is sometimes used as a synonym for the Brocade Fabric OS CLI.
throughput	The rate of data flow achieved within a cable, link, or system. Usually measured in bps (bits per second, or b/sec). <i>See also bandwidth.</i>
tiering	The process of grouping particular SAN devices by function and then attaching these devices to particular switches or groups of switches based on that function.
Time Server	A Fibre Channel service that allows for the management of all timers.
topology	As it applies to Fibre Channel technology, the configuration of the Fibre Channel network and the resulting communication paths allowed. There are three possible topologies: <ul style="list-style-type: none"> Point to point. A direct link between two communication ports. Switched fabric. Multiple N_Ports linked to a switch by F_Ports. Arbitrated loop. Multiple NL_Ports connected in a loop.
TPC	Third-party copy. A protocol for performing tape backups without using server resources.
transceiver	A device that converts one form of signaling to another for transmission and reception; in fiber optics, optical to electrical.

Translative Mode A mode in which private devices can communicate with public devices across the fabric.

trap (SNMP) The message sent by an SNMP agent to inform the SNMP management station of a critical error. *See also [SNMP](#).*

trunking In Fibre Channel technology, a feature that enables distribution of traffic over the combined bandwidth of up to four ISLs between adjacent switches, while preserving in-order delivery.

trunking group A set of up to four trunked ISLs.

trunking ports The ports in a set of trunked ISLs.

TS Time Server.

U

U_Port Universal port. A switch port that can operate as a G_Port, E_Port, F_Port, or FL_Port. A port is defined as a U_Port when it is not connected or has not yet assumed a specific function in the fabric.

ULP Upper-level protocol. The protocol that runs on top of Fibre Channel. Typical upper-level protocols are SCSI, IP, HIPPI, and IPI.

ULP_TOV Upper-level timeout value. The minimum time that an SCSI ULP process waits for SCSI status before initiating ULP recovery.

WAN Wide area network.

W

watchdog A software daemon that monitors Fabric OS modules on the kernel.

WDM Wavelength division multiplexer. Allows multiple wavelengths to be combined or filtered on a single cable.

well-known address As it pertains to Fibre Channel technology, a logical address defined by Fibre Channel standards as assigned to a specific function and stored on the switch.

workstation A computer used to access and manage the fabric. Also referred to as a "management station" or "host."

WWN World Wide Name. An identifier that is unique worldwide. Each entity in a fabric has a separate WWN.

Z

zone A set of devices and hosts attached to the same fabric and configured as being in the same zone. Devices and hosts within the same zone have access to others in the zone but are not visible to any outside the zone.

zone configuration	A specified set of zones. Enabling a configuration enables all zones in that configuration. <i>See also defined zone configuration, enabled zone configuration.</i>
zoning	A feature in fabric switches or hubs that allows segmentation of a node by physical port, name, or address.

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