Brocade® Web Tools

User's Guide

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Preface

Brocade Web Tools is an optionally licensed product, and requires a valid license key to function. It is supported for the SilkWorm series of switches with Fabric OS™ v2.6 or later installed.

This software uses the Java Open JCE Framework, part of the resulting software is shareware made available by the Australian Business Access (ABA). The software is available for download at http://www.wumpus.com.au/crypto/aba.html.

About This Guide

This guide provides the following information:

Chapter 1 Introducing Brocade Web Tools	Overview of *Brocade Web Tools* and a summary of the information available through *Web Tools*.
Chapter 2 Installing Brocade Web Tools	System requirements and instructions for installing and launching *Brocade Web Tools.*
Chapter 3 Using Brocade Web Tools	Information about and instructions for using each of the windows in *Brocade Web Tools*.

Related Publications

Related product information can be found in the following Brocade publications:

Title

- Fabric OS Reference
- Fabric Watch User's Guide
- Distributed Fabrics User's Guide
- QuickLoop User's Guide
- Brocade Zoning User's Guide
- SES User's Guide

Information about fibre channel standards and the fibre channel industry in general can be found on the Fibre Channel Industry Association web site, located at:

`http://www.fibrechannel.com`

Getting Help

Contact your switch supplier for technical support. This includes hardware and software support, all product repairs, and ordering of spare components.

Be prepared to provide the following information to the support personnel:

- Switch serial number
- Switch worldwide name
- Topology configuration
- Output from the `supportShow` Telnet command
- Operating system and version installed on the workstation
- Name and version of web browser installed on workstation
- Java™ Plug-in version installed on workstation
- Detailed description of the problem
- Troubleshooting steps already performed

Getting Software Updates

Contact your switch supplier for software updates and maintenance releases. New switch firmware can be installed from the following host operating systems:

- UNIX (Solaris)
- Windows 2000
- Windows NT
- Windows 98
- Windows 95

Utility programs to facilitate loading firmware from the listed operating systems and MIB files for switch management by SNMP are available at the following URL:

http://secure.brocade.com/index.html

These files can also be accessed through the following steps:

1. Launch your web browser and enter:

   `http://www.brocade.com`.
2. Click to expand **Partners** in the left margin, then click **Partner Login**.
3. Click **Login Now**.
4. Enter your login and password and click **Login**.
5. Click **MIBs and RSH Utilities** (under **Technical Support** in the left margin).

Introducing Brocade Web Tools

Chapter 1

This chapter provides the following information:

Overview

Web Tools provides a graphical interface that allows the administrator to monitor and manage entire fabrics and individual switches and ports from a standard workstation. It is an optionally licensed product that runs on Fabric OS v2.6. All switches in the fabric are displayed in the main window of Web Tools, including switches that do not have a Web Tools license. However, only switches that have a Web Tools license installed can be managed through Web Tools (other switches must be managed through telnet or SES).

Capabilities

The ability to monitor and manage the entire fabric

- The status of all switches in the fabric
- Access to event logs for entire fabric
- Zoning functions (optionally licensed)
- Access to the Name Server Table
- Telnet functions
- Switch beaconing for rapid identification in large fabric environments
- Loop diagnostics and query and control of loop interfaces to aid in locating faulty devices
- Ability to name and zone QuickLoops

The ability to monitor manage individual switches

- Summary information about each switch
- Access to event logs for individual switches
- Switch configuration and administration
- Ability to upgrade Fabric OS and license key administration
- Report capability for switch configuration information

The ability to monitor and manage individual ports

- Port status
- Information about GBIC (Gigabit Interface Converter) Serial IDs
- Information about connected devices
- Loop information
- Port performance including frame counts (frames in, frames out) and error counts

Concepts

Security

Secure Fabric OS offers the optional ability to introduce security measures to protect a fabric through a variety of set policies.

For information on enabling and managing Secure Fabric OS, refer to the *Security User's Guide.*

Using Security with Web Tools

To use Security with Web Tools:

- Telnet must be used initially to set up security. Once security is enabled you must use Brocade Secure Telnet to access a switch.
- It is possible to configure the fabric in such a way that Web Tools is unable to access most of the switches. In this case Web Tools can only be used in a reduced mode without most monitoring features and lacking many of the administrative launch points.
- The use of security policies is optional. A fabric is able to operate without any security policy in force.

Views Available in Brocade Web Tools

Web Tools provides access to and information about the fabric through a number of separate windows, making it possible to view several aspects of the fabric at the same time.

Initial Display Upon Launching Web Tools:

Fabric View Displays a control panel that provides access to fabric-wide options, a panel for each switch in the fabric, plus a legend that explains the meaning of the background colors on the **Switch** icons. Each panel contains an icon that represents the switch itself, in addition to icons for Switch Events and the Administrative and Telnet interfaces. The background color of the switch icon represents the status of that particular switch or Integrated Fabric (as defined by the legend provided in the window).

Note: Switch status is calculated approximately once per second; however the initial calculation does not occur until 30-60 seconds after the switch is booted. It is calculated from the state of data structures in the switch, and stored as the variable “switchStatus”.

For all statuses that are based on errors per time interval, any errors will cause the status to show faulty until the entire sample interval has passed.

Accessible from Fabric View:

Fabric Events View Displays the error log for the fabric, which is the combination of the error logs of all the switches in the fabric. Accessed by clicking on the **Fabric Events** icon on the control panel.

Fabric Topology View Displays physical configuration, including active domains, paths, and routing information. Accessed by clicking on the **Fabric Topology** icon on the control panel.

Name Server Table View Displays the Name Server Table for the fabric. Use to view information about the devices attached to the fabric. Accessed by clicking on the **Name Server** icon on the control panel.

Zone Administration View Provides an interface to Brocade Zoning, including zone settings, zone aliases, QuickLoops, Fabric Assists, and zone configurations. Accessed by clicking on the **Zone Admin** icon on the control panel. A switch must have a Zoning license for this interface to be available.

Summary View/Detail View Toggles between summarized and detailed versions of Fabric View.

Switch View Displays information about individual switches, including a real-time view of switch status. Accessed by clicking on the **Switch** icon on a switch panel. The Switch View is also the launch point for the Switch Events View, Telnet Interface, Fabric Watch View, Administrative Interface, Performance View, and Port Information View. It includes icons that display the status of the switch fans, temperature monitors, and beacon.

Switch Events View	Displays the error log for the switch. Accessed by clicking on the **Events** icon on the switch panel. This view can also be accessed through Switch View (see *Switch Events View* on page 1-4).
Telnet Interface	Provides an interface for using Telnet commands for switch diagnostics, troubleshooting, and fabric management. Accessed by clicking on the **Telnet** icon on the switch panel. This view can also be accessed through Switch View (see *Telnet Interface* on page 1-4).
Administrative Interface	Provides an interface for performing functions such as upgrading firmware versions or reconfiguring a switch. Accessed by clicking on the **Admin** icon on the switch panel. This view can also be accessed through Switch View (see *Administrative Interface* on page 1-4).

Accessible From Switch View:

Port Information View	Displays statistics and status for the selected port, GBIC, or loop. Also provides options for managing loops. Accessed by clicking on the icon for the relevant port in Switch View.
Power Supply Status	The **Power Supply** icons on the switch graphic indicate the number of power supplies present, and the LED on the power supply indicates the status of the power assemblies.
Switch Events View	Displays the error log for the switch. Accessed by clicking on **Events** in Switch View. This view can also be accessed through Fabric View (see *Fabric View* on page 1-3).
Telnet Interface	Provides an interface for using Telnet commands for switch diagnostics, troubleshooting, and detailed fabric management. Accessed by clicking on **Telnet** in Switch View. This view can also be accessed through Fabric View (see *Fabric View* on page 1-3).
Fabric Watch View	Monitors fabric elements and displays error and performance counter status, issuing an alert when conditions are out of acceptable ranges. Accessed by clicking on **Watch** in Switch View. A switch must have a Fabric Watch license for this interface to be available.
Fan Icon	The color of this icon indicates the number of fans in the switch that are within normal range (see the color legend in Fabric View).
Administrative Interface	Provides an interface for performing functions such as upgrading firmware versions or reconfiguring a switch. Accessed by clicking on **Admin** in Switch View. This view can also be accessed through Fabric View (see *Fabric View* on page 1-3).
Performance View	Graphically portrays real-time data throughput for each port and displays total switch bandwidth utilization. Accessed by clicking on **Perf** in Switch View.
Beacon Icon	Click to turn the beacon, which is an indicator light on the front panel of the switch, on or off. Appearance of icon indicates whether beacon is lit.
Temperature Icon	The color of this icon indicates the number of temperature sensors in the switch that are within range (see the color legend in Fabric View).

Installing Brocade Web Tools

Chapter 2

This chapter provides the following information:

Requirements

The workstation and the switch must both meet specific requirements for the correct installation and operation of Web Tools.

Switch Requirements

Web Tools 2.6 can be used to manage switches that:

- Are in the SilkWorm 2xxx family (SilkWorm 2010, 2040, 2050, 2100, 2210, 2240, 2250, 2400, and 2800).
- Use Fabric OS v2.6.

Workstation Requirements

The following items are required for the correct installation and operation of Web Tools:

Item	Option
Operating System	• Solaris 2.6.1 or later • Windows 98 or 2000 • Windows NT 4.0
Adequate RAM (required for Windows operating systems only)	• 128 MB for fabrics of 10 switches or less • 256 MB for fabrics containing more than 10 switches • 512 MB for fabrics containing up to 20 switches • Additional memory may be required for better performance in fabrics containing more than 20 switches.
5 MB of free disk space	
Web browser	• Netscape Communicator 4.7x or later. • Internet Explorer 5.0 or later. **Note:** The browser must be configured to work with Web Tools. For information about how to do this, see *Installing a Web Browser* on page 2-2.
The correct version of the Java Plug-in for the operating system	• Windows 98, NT, or 2000: Java Plug-in version 1.2.2-008. • Internet Explorer on Windows Platform: Java Plug-in version 1.3.1-01a, is recommended. • Solaris: Java Plug-in version 1.2.2-02 for Solaris, including the Java Plug-in patch created by Sun for Solaris.

Installation

To prepare Web Tools to manage your fabric, perform the following steps:

- Install one of the supported web browsers on the workstation, if one is not already installed.
- Configure the web browser for use with Web Tools.
- Install the required Java Plug-in on the workstation, if it is not already installed.
- Install a Web Tools v2.6 license on each switch that is to be managed from Web Tools.
- Exit and relaunch the browser

Installing a Web Browser

If not already installed, install one of the following browsers:

- Netscape Communicator 4.7x or later (available at `http://www.netscape.com`).
- Internet Explorer 5.0 or later (available at `http://www.microsoft.com`).

Configuring the Web Browser

Specific browser settings are required for the correct operation of Web Tools with either Netscape Communicator or Internet Explorer.

Configuring Netscape Communicator

The web browser cache must be cleared after the installation of Fabric OS v2.6. Some browsers use local cache copies of jar files and/or image files to improve performance (depending on the options selected in browser), which can cause incorrect display in Web Tools.

To remove cached files from Netscape Communicator:

1. Select **Edit > Preferences**.
2. Click **Advanced** in the left text box to expand it, then click **Cache**.
3. On the Cache panel, click **Clear Memory Cache**.
4. Click **Clear Disk Cache**.
5. Click **OK**.
6. Exit and relaunch the browser.

Configuring Internet Explorer

Correct operation of Web Tools with Internet Explorer requires clearing the browser cache after installation, and specifying the appropriate settings for browser refresh frequency and process model.

- The browser cache must be cleared after the installation of Fabric OS v2.6. The browser may use local cache copies of jar files and/or image files to improve performance (depending on options selected in browser), which can cause incorrect display.

  To remove cached files from Internet Explorer:

  1. Select **Internet Options** from the **View** menu
  2. Select the **General** tab.
  3. Click **Delete Files...** (under “Temporary Internet Files”).
  4. Click **OK**, then exit and relaunch the browser.

- Browser pages must be refreshed at every visit to ensure the correct operation of the Switch Admin feature.

  To set the refresh frequency:

  1. Select **Internet Options** from the **View** menu if using Internet Explorer 4.x, or from the **Tools** menu if using 5.x.
  2. Select the **General** tab and click **Settings** (under “Temporary Internet Files”).
  3. Under “Check for newer versions of stored pages”, select “Every visit to the page”.

- The correct Browser Process Model must be selected.

To select the Browser Process Model:

1. Select **View** > **Internet Options**
2. Select the **Advanced** tab and click to expand the Browsing category.
3. Select “Browse in a new process” under “Browsing”.

Installing the Java Plug-in on the Workstation

A Java Plug-in must be installed on the workstation for the correct operation of Web Tools. The required version depends on the operating system.

Installing the Java Plug-in on Solaris

Solaris workstations require both the Java Plug-in version 1.2.2-02 for Solaris and the patch created by Sun Microsystems for use with the Java Plug-in on Solaris.

To install the Java Plug-in on Solaris:

1. Locate the Java Plug-in on the internet, such as at the Sun Microsystems website.
2. Follow the instructions to install the Java Plug-in for Solaris.
3. Open the .cshrc file and set the path to the Java Plug-in executable file. For example, the following could be added to the .cshrc file:

```
NPX_PLUG-IN_PATH=/opt/NSCPcom/plug-in
export NPX_PLUG_IN_PATH
```

To install the patch on Solaris:

1. Go to the website at http://access1.sun.com, use the SEARCH option, enter the string “108593” in the search field, and press <Enter>.
2. Follow the link to download the patch, and exit the browser when done.
3. Install the patch and reboot the system.
4. Relaunch the browser and enter the switch's IP Address.

Installing the Java Plug-in on Windows 98, 2000 or NT

Windows 98, 2000 and NT workstations require Java Plug-in version 1.2.2-008. For IE users on Windows, Java Plug-in 1.3.1-01a is recommended.

To determine the version of the Java Plug-in installed on Windows 98, NT, or 2000, and install if necessary:

1. Launch the Java Plug-in Control Panel from **Start** > **Programs** > **Java Plug-in Control Panel** and turn on the Java Console.
2. Launch the web browser, enter the name or IP address of a switch running Fabric OS v2.6 or later, and press Enter.

   The switch launches the Java Plug-in console, which displays the Java Plug-in version currently installed.
3. Determine whether the correct Java Plug-in version is installed, and install if necessary:
   - If the correct version is installed, Web Tools is ready to use.
   - If no Java Plug-in is installed, point the browser towards a switch running Fabric OS v2.6, follow the link to the Sun Microsystems website, download the correct Java Plug-in, then double-click the downloaded file to install the plug-in.
   - If an outdated version is currently installed, uninstall it, relaunch the browser, enter the address of a switch running Fabric OS v2.6, follow the link to the Sun Microsystems website, and download the new Java Plug-in.

Installing a Web Tools License on the Switch

Web Tools can be installed either through Telnet or over the web. Installation of Web Tools involves the installation of a license on each switch that will be managed from Web Tools.

To determine whether a license is already installed on a switch, follow the instructions provided under *Launching Brocade Web Tools* on page 3-7. If a license is not installed, contact your switch supplier to obtain a license key.

Installing a Web Tools License using Telnet

To install Web Tools through telnet:

1. Log onto the switch by Telnet (refer to the *Fabric OS Reference* for more information), using an account that has administrative privileges.

   To determine whether a Web Tools license is already installed on the switch, type:

   ```
   licenseShow
   ```

   on the Telnet command line.

   A list displays, showing all the licenses currently installed on the switch.

   Example:

   ```
   admin> licenseShow
    1A1AaAaaaAAAA1a:
    Release v2.6
    Zoning license
    SES license
    QuickLoop license
   ```

   If the Web Tools license is not included in the list or is incorrect, continue with step 3.

2. Enter the following on the command line:

   ```
   licenseAdd “key”
   ```

   where “`key`” is the license key (do not include the double quotes). The license key value is case-sensitive, and must be entered exactly as given.

3. Verify the license was added by entering the following on the command line:

   ```
   licenseShow
   ```

   If the Web Tools license is listed, the feature is available. If the license is not listed, repeat step step 3.

   Note: The Java Plug-in must also be installed on the client machine to access Web Tools.

Installing a Web Tools License using the Web

If none of the switches in the fabric have a Web Tools license, a license dialog automatically displays when you access any of the switches over the web. If the fabric already contains at least one licensed switch, you can use Web Tools to view and license other switches from the licensed switch.

To install the first license through the web:

1. Launch the web browser, enter the switch name or IP address in the **Location/Address** field and press Enter.

   Example:

   `http://111.222.33.1`

   If a license is already installed on the switch, Web Tools launches. If no license is installed, a license dialog displays.

2. If the license dialog displays, follow the instructions provided.

To install additional licenses through the web:

1. Launch the web browser and enter the name or IP address of the licensed switch in the **Location/Address** field, and press Enter.

   Example:

   `http://111.222.33.1`

   Web Tools opens, displaying the Fabric View.

2. Click the icon for the switch you want to license.

   A licensing window displays.

3. Follow the instructions provided.

Launching Brocade Web Tools

You can launch Web Tools once the license is installed on the switch and the Java Plug-in is installed on the client machine.

To launch Web Tools:

1. Launch the web browser.
2. Enter the switch name or IP address in the **Location/Address** field and press Enter.

   Example:

   `http://`switch name/ and press `<Enter>`.

   Web Tools launches, displaying the default view, Fabric View. For more information about Fabric View, see *Fabric View* on page 3-1.

Chapter

3

Using Brocade Web Tools

This chapter describes the views and interfaces available through Web Tools, which consist of the following:

Note: Switches can be accessed through different methods, such as through the Front Panel, Telnet, SNMP, and the web, any of which can occur simultaneously. To verify that modifications are correctly applied, ensure that the switch is modified from only one connection at a time.

Fabric View

The Fabric View is the first web page that displays when you connect to a switch, and it provides access to specific information about each switch, in addition to other options and a legend explaining the colors used to indicate switch status. Every switch in the fabric, including any unlicensed switches, is represented by a switch panel in Fabric View. However, only switches with a Web Tools license can be managed from Web Tools. To add a license for an unlicensed switch, click the corresponding **Switch** icon in Fabric View, and a license window automatically displays.

To launch Web Tools and access Fabric View:

1. Launch the web browser.
2. Enter the switch name or IP address in the **Location/Address** field and press **Enter**.

   ```
   http://switch name
   ```

   Note: This switch is assumed to be the local domain.
   For information specific to a QuickLoop to be available, the QuickLoop switch must be the host domain.

   Web Tools launches, displaying Fabric View.

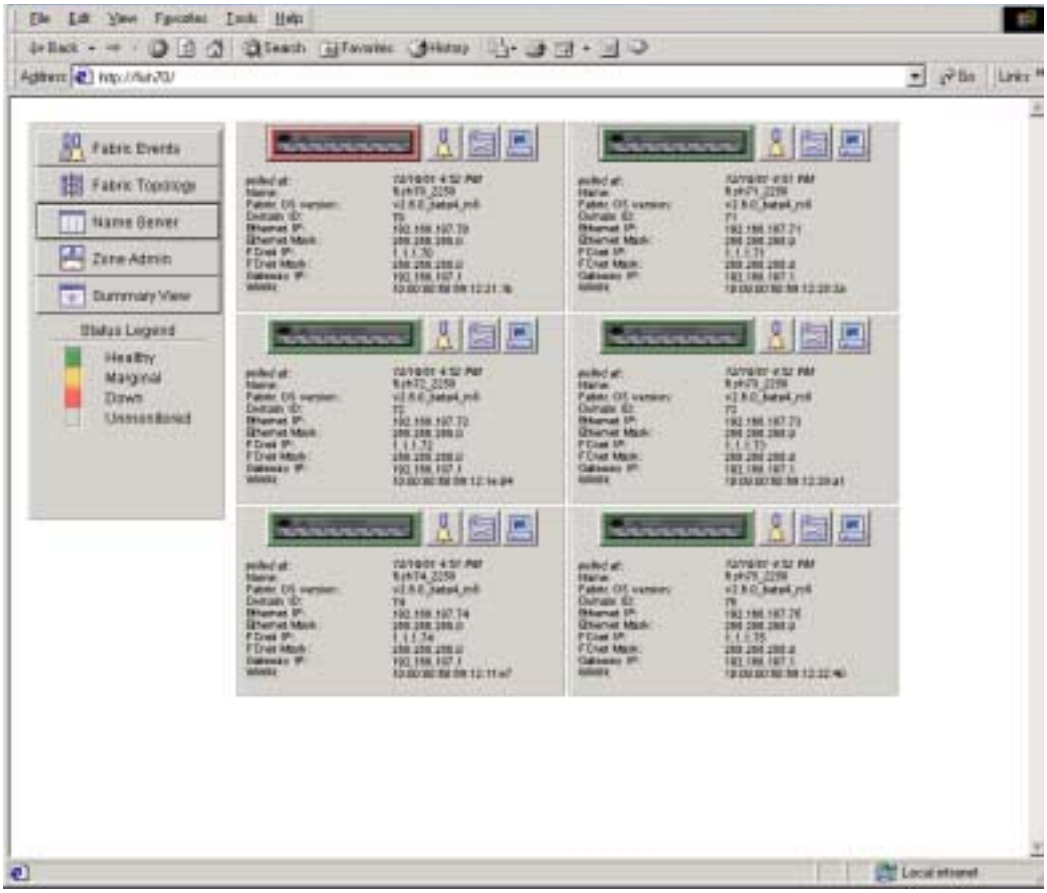

Figure 3-1 Fabric View

Following is a description of the items visible in Fabric View.

The Control Panel (on the left side of Figure 3-1 on page 3-2)

Fabric Events

Click to open Fabric Events View (for information about this view, see *Fabric Events View* on page 3-4).

Fabric Topology

Click to open Fabric Topology View (for information about this view, see *Fabric Topology View* on page 3-6).

Name Server

Click to open Name Server Table View (for information about this view, see *Name Server Table View* on page 3-8).

Zone Admin

Click to open Zone Administration View. Available only if a Brocade Zoning license is installed (for information about this view, see *Zone Administration View (Optional Software)* on page 3-10).

Summary/Detail View

Toggle to view either the Summary or Detail version of Fabric View. The Summary version shows abbreviated switch panels (see Figure 3-2 on page 3-4). The default view is Detail.

Status legend

Defines meaning of colors visible in the background of the switch icons. Each color indicates a different operational state:

Green	Healthy
Yellow	Marginal (mix of good and faulty readings)
Red	Down (more than two faulty readings)
Gray	Unknown or unmonitored

If no data is available from a switch, the most recent background color remains displayed.

Note: For all statuses that are based on errors per time interval, any errors will cause the status to show faulty until the entire sample interval has passed.

The Switch Panel (on the right side of Figure 3-1 on page 3-2)

Switch

Click to open Switch View for the switch. Each switch type is represented by a different icon. The background color around the icon indicates the status of the switch (for information about this view, see *Switch View* on page 3-19).

Events

Click to open Switch Events View to display the switch events log (for information about this view, see *Switch Events View* on page 3-23).

Admin

Click to open Switch Administration View (for information about this view, see *Administrative Interface* on page 3-41).

Telnet

Click to launch the Telnet Interface for the switch (for information about this view, see *Telnet Interface* on page 3-59).

polled at:* or *unreachable since:	Time of the last status check, or if currently unavailable, the time of the last successful status check.
Name:	The name of the switch.
Fabric OS version:	Version of Fabric OS installed on the switch.
Domain ID:	A number that uniquely identifies the switch within the fabric.
Ethernet IP:	Ethernet IP address.
Ethernet Mask:	Ethernet subnetmask.
FCnet IP:	Fibre channel IP address.
FCnet Mask:	Fibre channel subnetmask.
Gateway IP:	Gateway IP address.
WWN:	Unique numeric identifier for the switch; assigned by manufacturer.

Following is a picture of Fabric View with the Summary View selected:

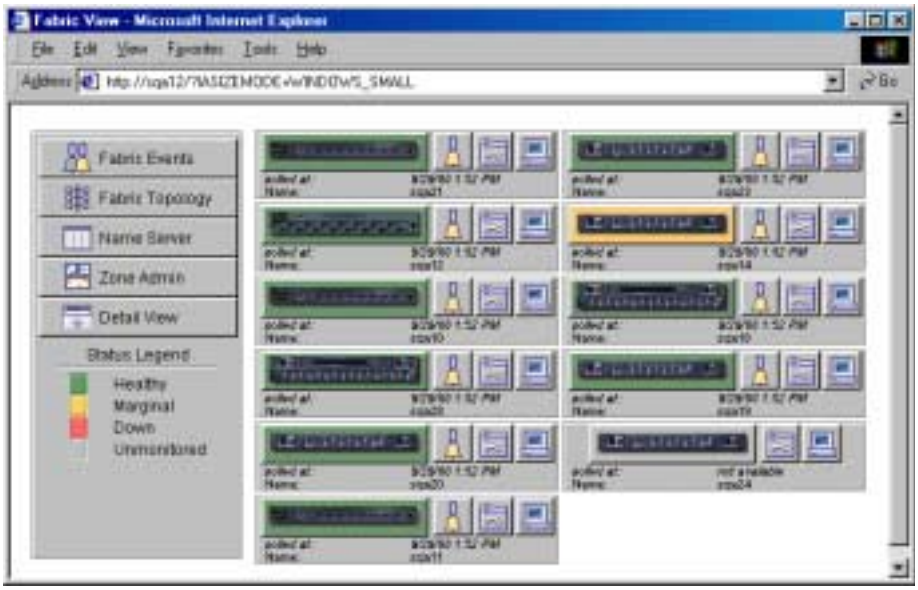

Figure 3-2 Summary Version of Fabric View

Fabric Events View

The Fabric Events View provides a running log of events for all switches in the fabric.

To access Fabric Events View:

1. Launch the web browser.
2. Enter the switch name or IP address in the **Location/Address** field and press **Enter**.

   `http://switch name`

   Web Tools launches, displaying Fabric View.

3. Click **Fabric Events**.

   The Fabric Events View displays.

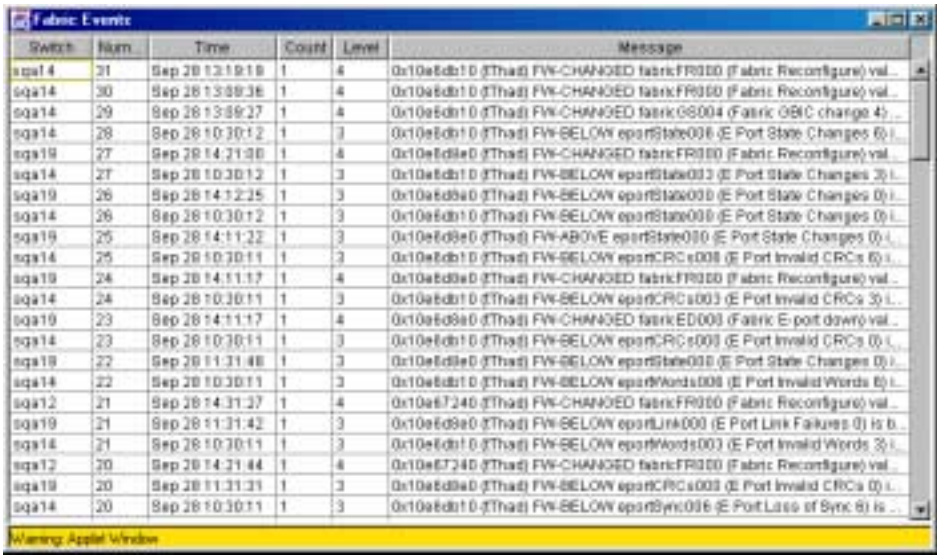

Figure 3-3 Fabric Events View

Note: To sort the events by a particular column, click the column header. To resize a column, drag the column divider.

Following is a description of the columns in the Fabric Events view:

Switch	Name of switch.
Num... (number)	Event number for affected switch.
Time	Time of event.
Count	Number of consecutive occurrences of same event.

Level	Severity level of event:
	`0 panic (switch reboots)`
	`1 critical`
	`2 error`
	`3 warning`
	`4 information`
	`5 debug`

Message	Description of event.

Fabric Topology View

The Fabric Topology View summarizes the physical configuration of the fabric from the perspective of the “local domain” (the domain of the switch entered as a URL in the web browser). This includes information about the “destination domains” (all other domains in the fabric) and the paths between each destination domain and the local domain.

To access Fabric Topology View:

1. Launch the web browser.
2. Enter the switch name or IP address in the **Location/Address** field and press **Enter**.

   `http://switch name`

   Note: The switch entered into the web browser is identified by WEB TOOLS as the local domain.

   Web Tools launches, displaying Fabric View.
3. Click **Fabric Topology**.

   The Fabric Topology View displays.

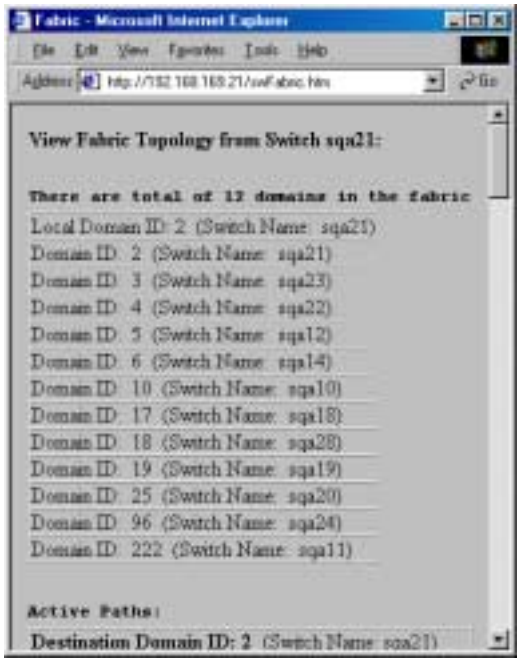

Figure 3-4 Fabric Topology View

The window can be scrolled downwards to display information about the individual paths between the local switch and each of the other switches in the fabric.

Figure 3-5 Fabric Topology View, Scrolled Downwards

Following is a description of the fields in the Fabric Topology View.

View Fabric Topology from Switch [switch name]:	Lists the switch in the domain that is assumed to be the local domain.
There are a total of [n] domains in the fabric.	The number of domains in the fabric.
Local domain ID:	A number that uniquely identifies the local switch within the fabric, and the name of the switch.
Domain ID:	A number that uniquely identifies the switch within the fabric, and the name of the switch.
Active Paths:	This line is followed by information about each destination domain, including information about each of the paths between that domain and the local domain.
Destination Domain ID:	The ID of the destination domain that is described in the lines following the ID. This information and the two lines following it display for each destination domain in the fabric.
Destination's Worldwide Name:	The WWN of the destination domain.
Number of Paths:	The number of active paths between the destination domain and the local domain.
Path Number:	The number assigned to the specific path described in the table that follows this information. This information and the following table display for each path for which the domain described above is the destination.

Output Ports	The number of output ports on the path between the destination domain and the local domain.
Input Ports	The number of input ports on the path between the destination domain and the local domain.
Hop Count	The number of hops (interswitch links) between the local domain and the destination domain.
Metric	Metrics for traffic flow along the path.
Flag	The flag assigned to the path.

Name Server Table View

The Name Server Table View provides the name server entries listed in the Simple Name Server database. This includes all name server entries for the fabric, not only those that are local to the local domain. Each row in the table represents a different device.

To access Name Server Table View:

1. Launch the web browser.
2. Enter the switch name or IP address in the **Location/Address** field and press **Enter**.

   `http://switch name`

   Web Tools launches, displaying Fabric View.
3. Click **Name Server**.

The Name Server Table View displays.

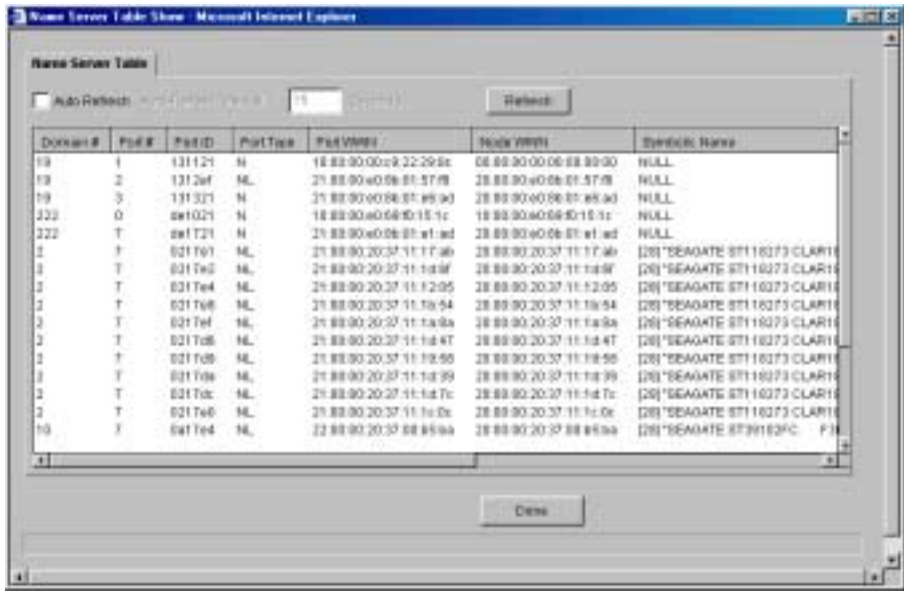

Figure 3-6 Name Server Table View

Note: To sort the events by a particular column, click the column header. To resize a column, drag the column divider.

The following fields are included in the Name Server Table View:

Auto Refresh	Check to enable Auto Refresh or uncheck to disable.
Auto Refresh Interval	If Auto Refresh is checked, enter the number of seconds for the refresh interval.
Refresh	Click to refresh the window immediately.
Done	Click to close the window.

The Name Server Table also includes the following columns:

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 ID	The port ID of the device (24-bit hexadecimal value).
Port Type	The port type of the device (N for fabric direct attached port or NL for fabric direct attached loop port).
Port WWN	The worldwide name of the device port.
Node WWN	The worldwide name of the device node.
Symbolic Name	The symbolic name of the device assigned through the SCSI INQUIRY command.
FC4 Types	The fibre channel FC4 layer types supported by the device, such as IP or FCP.
COS	The fibre channel classes of service supported by the device.

Fabric Port Name	The name of the fabric port in use by the device.
Port IP Address	The IP address of the fabric port.
Hard Address	The hard address of the fabric port.
Member of Zones	The zones to which this device belongs. This column updates when the table is refreshed. To view updated zoning information, close and reopen the Name Server Table.

Zone Administration View (Optional Software)

A Brocade Zoning license and administrative privileges are required to access this view. If a switch or device is added or removed from the network, it is necessary to save the changes and relaunch the Zone Administration view for the changes to take effect.

If security is enabled on a switch, this option may not be accessible for the following reasons

- Zoning Administration is permitted on Primary FCS switches only (when Security is enabled).
- The Zoning button is invisible on non-Primary FCS switches.

Administering Brocade Zoning

When administering Brocade Zoning, the following steps are recommended:

1. Define zone aliases to establish groupings.
2. Add zone members.
3. Place zones into one or more zone configurations.
4. Enable one of the zone configurations (only one can be enabled at a time).

The following methods can be used to add members to a zone. Each method corresponds to a zoning “mode”, and the combination of the methods corresponds to an additional mode. Once a mode is selected, all zoning operations must correspond to that mode, and any zones, aliases, and configuration files which do not cannot be selected.

Port Level Zoning	Zoning by physical domain/port number. All alias, zoning, and configuration file operations must be performed using port. Aliases, zones, and configuration files which have objects other than ports cannot be selected or operated on.
WWN Level Zoning	Zoning by WWNs only. All alias, zoning, and configuration file operations must be performed by WWNs. Aliases, zones, and configuration files which have objects other than WWNs cannot be selected or operated on.
Device Level Zoning	Zoning by Quick Loop device. All alias, zoning, and configuration file operations must be on AL_PAs in a QuickLoop. Aliases, zones, and configuration files which have objects other than AL_PAs in a QuickLoop cannot be selected or operated on.
Mixed Level Zoning	Zoning by physical domain/port number, WWN, or AL_PA. With mixed level zoning, any object can be selected to be a member of a zone, alias, or configuration file. This mode is supported for backward compatibility with all SilkWorm 2000 series switches.

For more information about using Brocade Zoning, see the *Brocade Zoning User’s Guide*.

To access the Zone Administration View:

1. Launch the web browser.
2. Enter the switch name or IP address in the **Location/Address** field and press **Enter**.

   `http://switch name`

   This switch is assumed to be the local domain.Web Tools launches, displaying Fabric View.
3. Click **Zone Admin**.

   The Zone Administration View displays (see Figure 3-7 on page 3-12).

   Note: For information specific to QuickLoop to be available, the QuickLoop switch must be the local domain.

Following is a list of the tabs provided in the Zone Admin View, and the pages on which they are described:

- *Alias Tab* on page 3-12
- *Zone Tab* on page 3-13
- *QuickLoop Tab* on page 3-15
- *Fabric Assist Tab* on page 3-16
- *Config Tab* on page 3-18

Alias Tab

You can use the Alias tab to create and manage aliases for devices in the fabric. An alias can have one or more members, including switches, ports, WWNs, and QuickLoop AL_PAs.

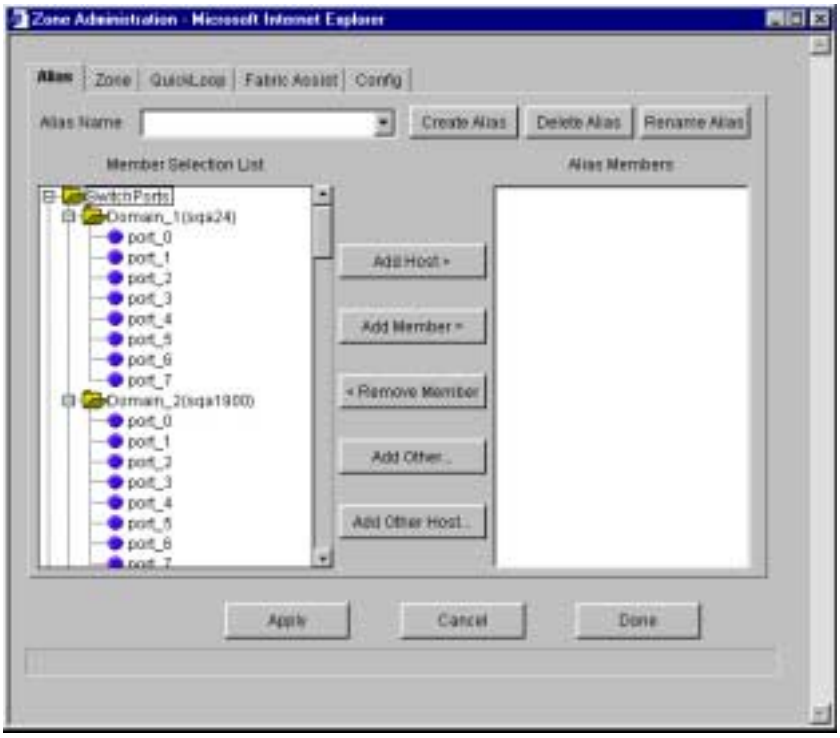

Figure 3-7 The Alias tab in the Zone Administration View

Following is a description of the fields on the Alias tab:

Alias Name	To modify an existing alias, select an alias name.
Create Alias	Click to create a new alias. A dialog displays in which you can enter the name of the new alias. All names must be unique and contain no spaces.
Delete Alias	Click to delete the alias selected in the Alias Name field. Deleting an alias automatically removes it from all zones.
Rename Alias	Click to rename the alias selected in the Alias Name field. A dialog displays in which you can edit the alias name. Renaming an alias automatically renames it in all zones.
Member Selection List	A list of potential alias members, including switches, ports, WWNs, QuickLoop AL_PAs, and Fabric Assists.
Add Member	Click to add the item selected in the Member Selection List to the Alias Members list. You can add individual ports or an entire switch. If a switch is added, all ports on the switch are added. To add a device WWN, select either a node WWN (folder icon) or port WWN (blue circle icon) from the WWN sub-tree.

Remove Member	Click to remove the selected member selected from the [Alias name] Members list.
Add Other	Click to add a WWN, switch port, QuickLoop AL_PA, or Fabric Assist that is not available in the Member Selection List.
Alias Members	The member list of the alias selected in the **Alias Name** field. The name of this list depends on the name of the selected alias. If no alias is selected, the name displays as “null Members”.
Apply	Click to apply all changes made since the Zone Administration View was opened, including changes made on other tabs in the view. Changes cannot be cancelled once applied.
Cancel	Click to cancel all changes made since changes were last applied, and to exit the Zone Administration View. Changes cannot be cancelled once they are applied.
Done	Click to apply all changes made since the Zone Administration View was opened and to exit the Zone Administration View.

Zone Tab

You can use the Zone tab to create and manage zones. A zone can have one or multiple members, and can include switches, ports, WWNs, aliases, and QuickLoop AL_PAs.

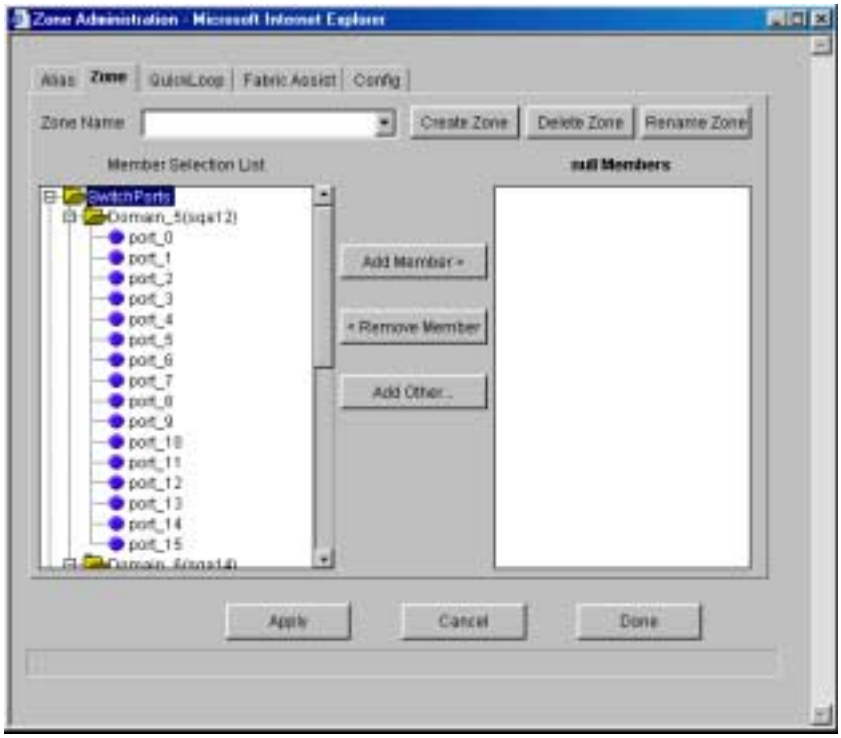

Figure 3-8 The Zone tab in the Zone Administration View

Following is a description of the fields on the Zone tab.

Zone Name	To modify an existing zone, select a zone name.
Create Zone	Click to create a new zone. A dialog displays in which you can enter the name of the new zone. All names must be unique and contain no spaces.
Delete Zone	Click to delete the zone selected in the Zone Name field. Deleting a zone automatically removes it from all zone configurations.
Rename Zone	Click to edit the name of the zone selected in the Zone Name field. A dialog displays in which you can edit the name of the zone.
Member Selection List	A list of potential zone members, including switches, ports, WWNs, aliases, QuickLoop AL_PAs, and Fabric Assists.
Add Member	Click to add the member selected in the Member Selection List to the Zone Members list. If an entire switch is selected, all ports on the switch are added to the zone. You can also select individual ports. To add a device WWN, select either a node WWN (folder icon) or port WWN (blue circle icon) from the WWNs sub-tree. To add an alias to the zone, select it from the Aliases sub-tree (the alias must already exist).
Remove Member	Click to remove the selected member from the [Zone name] Members list.
Add Other	Click to add a WWN, switch, port, or QuickLoop AL_PA that is not listed in the Member Selection List.
[Zone name] Members	The members of the zone selected in the **Zone Name** field. The name of this list depends on the name of the selected zone. If no zone is selected, the name displays as “null Members”.
Apply	Click to apply all changes made since the Zone Administration View was opened, including changes made on other tabs in the view. Changes cannot be cancelled once they are applied.
Cancel	Click to cancel all changes since the changes were last applied and to exit Zone Administration. Changes cannot be cancelled once they are applied.
Done	Click to apply all changes made since the Zone Administration View was opened and to exit the Zone Administration View.

QuickLoop Tab

A QuickLoop license is required to use this tab. You can use the QuickLoop tab to create and manage QuickLoops if used in conjunction with Brocade Zoning. For information on managing the QuickLoop feature separately, see *Loop Tab* on page 3-31.

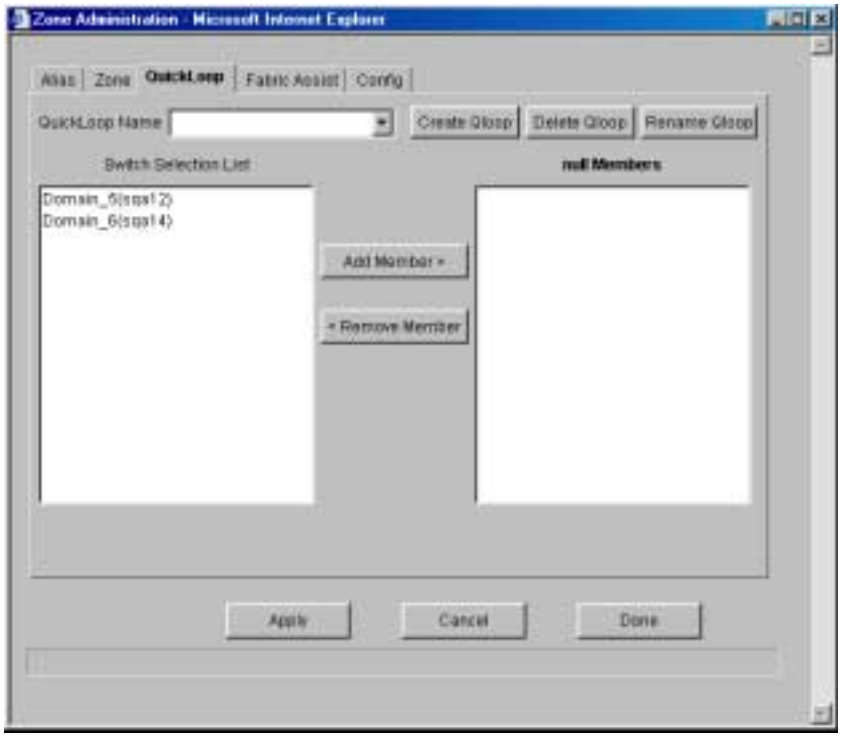

Figure 3-9 The QuickLoop tab in the Zone Administration View

Following is a description of the fields on the QuickLoop tab.

QuickLoop Name	To modify an existing QuickLoop, select a QuickLoop name.
Create Qloop	Click to create a new QuickLoop. A dialog displays in which you can enter the name of the new QuickLoop. All names must be unique and contain no spaces.
Delete Qloop	Click to delete the QuickLoop selected in the QuickLoop Name field. Deleting a QuickLoop automatically removes it from all aliases, zones, and zone configurations, including the associated AL_PAs.
Rename Qloop	Click to edit the name of the QuickLoop selected in the QuickLoop Name field. A dialog displays in which you can edit the name of the QuickLoop.
Switch Selection List	A list of the switches available to add to the QuickLoop.
Add Member	Click to add the switch selected in the Switch Selection List to the QuickLoop Members list.
Remove Member	Click to remove the selected member from the QuickLoop name Members list.

[*QuickLoop name*] Members	A list of the members of the QuickLoop currently selected in the **QuickLoop Name** field. The name of this list depends on the name of the selected QuickLoop. If no QuickLoop is selected, the name displays as “null Members”.
Apply	Click to apply all changes made since the Zone Administration View was opened, including changes made on other tabs in the view. Changes cannot be cancelled once they are applied.
Cancel	Click to cancel all changes since the changes were last applied and to exit Zone Administration. Changes cannot be cancelled once they are applied.
Done	Click to apply all changes made since the Zone Administration View was opened and to exit the Zone Administration View.

Fabric Assist Tab

You can use the Fabric Assist tab to create and manage Fabric Assists. A QuickLoop license is required to use this tab.

For more information about Fabric Assist, see the QuickLoop User’s Guide.

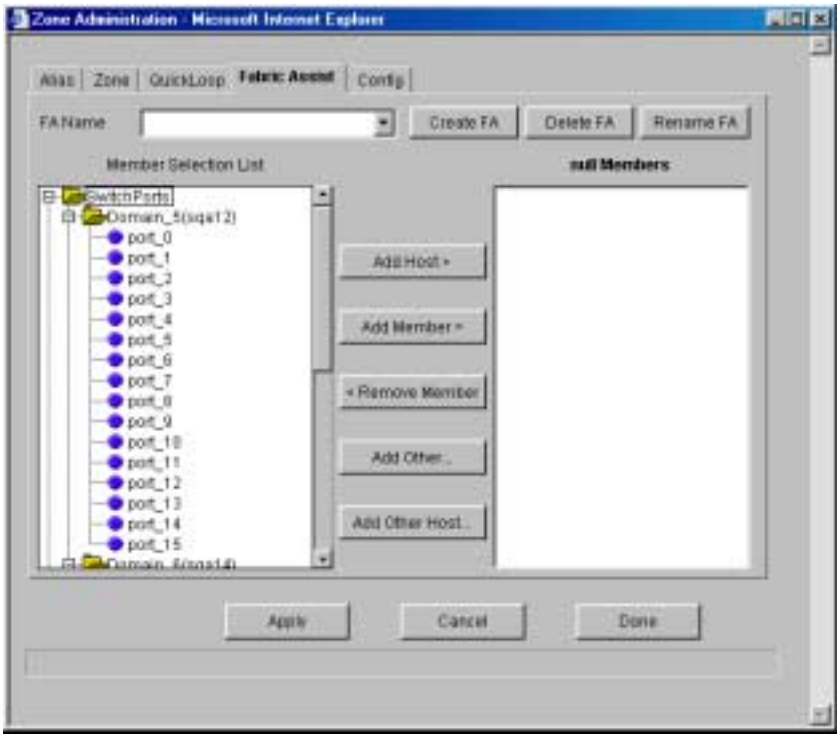

Figure 3-10 The Fabric Assist Tab in the Zone Administration View

Following is a description of the fields on the Fabric Assist tab.

FA Name	To modify an existing Fabric Assist, select a Fabric Assist name.
Create FA	Click to create a new Fabric Assist. A dialog displays in which you can enter the name of the new Fabric Assist. All names must be unique and contain no spaces.
Delete FA	Click to delete the Fabric Assist selected in the FA Name field. Deleting a Fabric Assist automatically removes it from all aliases, zones, and zone configurations, including the associated AL_PAs.
Rename FA	Click to edit the name of the Fabric Assist selected in the FA Name field.
Member Selection List	A list of members available to add to the Fabric Assist.
Add Host	Click to add the selected item as a host to the [Fabric Assist name] Members list. Only a domain port or a WWN can be added as a host.
Add Member	Click to add the member selected in the Member Selection List to the [Fabric Assist name] Members list.
Remove Member	Click to remove the selected member from the [Fabric Assist Name] Members list.
Add Other	Click to add the member selected in the Member Selection List to the [Fabric Assist name] Members list. Click to add an unlisted domain port or WWN.
Add Other Host	Click to add a host to the [Fabric Assist name] Members list. Click to add an unlisted domain port or WWN. Click to add an unlisted domain port or WWN as a host.
[Fabric Assist name] Members	A list of the members that belong to the Fabric Assist currently selected in the FA Name field. The name of this list depends on the name of the Fabric Assist selected. If no Fabric Assist is selected, the name displays as “null Members”.
Apply	Click to apply all changes made since the Zone Administration View was opened, including changes made on other tabs in the view. Changes cannot be cancelled once they are applied.
Cancel	Click to cancel all changes since the changes were last applied and to exit Zone Administration. Changes cannot be cancelled once they are applied.
Done	Click to apply all changes made since the Zone Administration View was opened and to exit the Zone Administration View.

Config Tab

You can use the Config tab to create and manage zone configurations. Zone configurations allow you to enable or disable a group of zones at the same time.

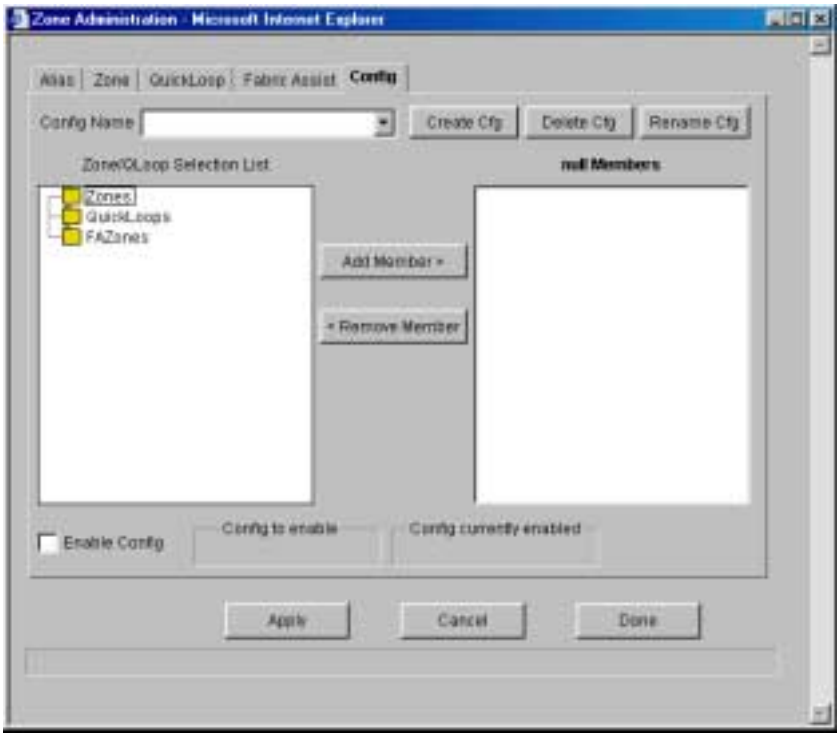

Figure 3-11 The Config tab in the Zone Administration View

Following is a description of the fields on the Config tab.

Config Name	To modify an existing configuration, select a configuration name.
Create Cfg	Click to create a new configuration. A dialog displays in which you can enter the name of the new configuration. All names must be unique and contain no spaces.
Delete Cfg	Click to delete the configuration selected in the Config Name field.
Rename Cfg	Click to edit the name of the configuration selected in the Config Name field.
Zone/QLoop Selection List	A list of the zones and QuickLoops available to add to the configuration.
Add Member	Click to add the switch selected in the Zone/QLoop Selection List to the Configuration Members list.
Remove Member	Click to remove the selected member from the [Configuration name] Members list.
[Configuration name] Members	The members of the configuration selected in the Config Name field. The name of this list depends on the selection. Only one configuration can be enabled at a time; if none are enabled, zoning is not active in the fabric.
Enable Config	Select to enable the configuration selected in the Config Name field.

Disable Zoning	Select to disable the configuration selected in the Config Name field.
Save Config	Select to save the configuration selected in the Config Name field without enabling or disabling.
Config to enable	Displays the name of the configuration that is currently selected for enabling. This configuration can be enabled by clicking **Apply**.
Config currently enabled	Displays the name of the currently enabled configuration. Only one configuration can be enabled at a time.
Apply	Click to apply all changes made since the Zone Administration View was opened, including changes made on other tabs in the view. Changes cannot be cancelled once they are applied.
Cancel	Click to cancel all changes since they were last applied and to exit the Zone Administration View. Changes cannot be cancelled once applied.
Done	Click to apply all changes made since the Zone Administration View was opened and to exit the Zone Administration View.

Switch View

The Switch View represents the front panel of the switch, and displays when you click a **Switch** icon in Fabric View. This view provides information about the overall status of the switch and the status of the individual elements in the switch. The information displayed is as close as possible to a real-time view of switch status. If the switch is not functioning properly, a message explains the problem detected.

Note: Switch status is stored as the variable “switchStatus”, and is calculated approximately once per second; however the initial calculation does not occur until 30-60 seconds after the switch is booted.

To access Switch View:

1. Launch the web browser.
2. Enter the switch name or IP address in the **Location/Address** field and press **Enter**.

   Example: `http://switch name`

   Web Tools launches, displaying Fabric View.
3. Click the **Switch** icon.

The Switch View displays.

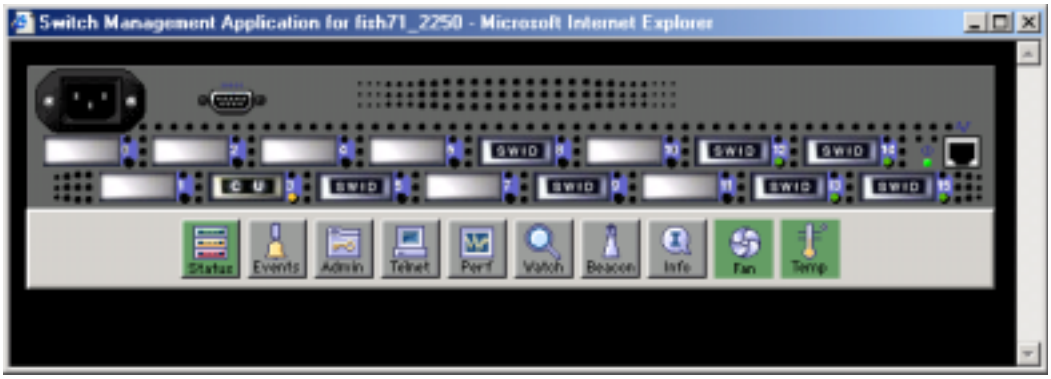

Figure 3-12 The Switch View

Following is a description of the items and information available in Switch View.

Port icons 	The letters in the Port icon indicate the GBIC (Gigabit Interface Converter) type, as follows:	
	blank	No GBIC present
	SW	Short wave GBIC
	LW	Long wave GBIC
	CU	Copper GBIC
	SWID	Short wave serial ID GBIC
	LWID	Long wave serial ID GBIC
	CUID	Copper serial ID GBIC
	A yellow outline around a port icon indicates port failure. For detailed port information, click the **Port** icon to see the Port Information View.	
Port numbers (on the right of each port)	The number of the port.	
LED Status Indicators **(round light next to each port)**	The color indicates the status of the port.	.
	No light -	No device attached.
	Steady yellow -	Receiving light, but not online; check cable connections.
	Slowly flashing yellow	Disabled (diagnostics or portDisable command).
	Rapidly flashing yellow	Error, fault with port.
	Steady green -	Online (connected with device by cable).
	Slowly flashing green	Internal loopback (diagnostic)
	Rapidly flashing green	Online and transmitting/ receiving frames.
	Flickering green	
Power supply 	Removable power assemblies are updated to show presence/absence and status of each:	
	Green -	Power supply present and operational.
	Red X -	Power supply present but not operational.
	Cover plate -	Power supply absent or not fully plugged in.

Events 	Click to access Switch Events View.	
Telnet 	Click to launch a Telnet session.	
Fabric Watch (optional software) 	Click to access Fabric Watch, if a license is installed.	
Fan 	The background color of the button indicates the overall status of the fans:	
	Green -	Healthy
	Yellow -	Marginal (mix of good and faulty readings)
	Red -	Down (more than two faulty readings)
	Gray -	Unknown or unmonitored
Admin 	Click to display the Administrative Interface where you can perform switch management functions.	
Perf 	Click to display the Performance View where you can monitor switch performance.	
Beacon 	Click to turn on the beaconing function. If on, this icon shows beams of light. The beaconing function helps to physically locate a switch by sending a signal to the specified switch, resulting in an LED light pattern flashing from side to side on the switch.	
Temp 	Click to display temperature readings from all switch thermo sensors. The background color of the button indicates the overall temperature status:	
	Green -	Healthy
	Yellow -	Marginal (mix of good and faulty readings)
	Red -	Down (more than two faulty readings)
	Gray -	Unknown or unmonitored
WWN	Unique numeric identifier for each switch; assigned by manufacturer.	
Domain ID	Number that uniquely identifies the switch in a fabric.	

Role	Indicates the current role of the switch.	
	Principal -	The principal switch as defined by FC_SW protocol.
	Subordinate -	Enabled but not the principal switch.
	Disabled -	Disabled
State	Indicates the current state of the switch, which may be online, offline, testing, or faulty.	
Firmware	Fabric OS version.	
Serial #:	The serial number of the switch being viewed.	
Ether IP	Ethernet IP address.	
Ether NM	Ethernet netmask value.	
FC IP	Fibre channel IP address.	
FC NM	Fibre channel netmask value.	
Gateway	IP address of default gateway. Must be properly set to access switch from other networks.	

Switch Events View

The Switch Events View displays a running log of events for the selected switch.

To access Switch Events View:

1. Launch the web browser.
2. Enter the switch name or IP address in the **Location/Address** field and press **Enter**.

   Example: `http://switch name`

   Web Tools launches, displaying Fabric View.
3. Click the **Switch** icon.

   The Switch View displays.
4. Click the **Events** icon.

The Switch Events View displays.

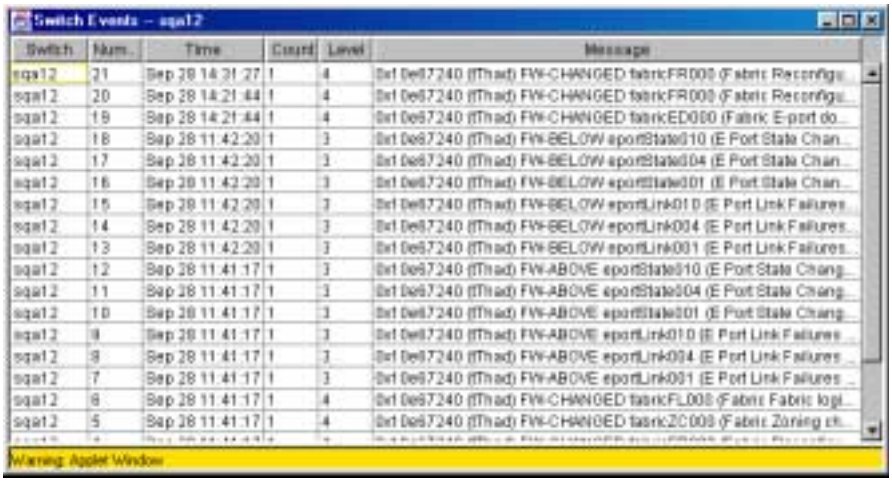

Figure 3-13 Switch Events View

Note: To sort the events by a particular column, click the column header. To resize a column, drag the column divider.

Following is a description of the columns in Switch Events View.

Switch	Name of switch.
Num...	Event number.
Time	Time of event.
Count	Number of back-to-back occurrences of same event.
Level	Severity level of event: 0 panic (switch reboots) 1 critical 2 error 3 warning 4 information 5 debug
Message	Description of event.

Port Information View

The Port Information View displays statistics for the selected port. This information is automatically updated when the view is opened, and is also refreshed periodically while the view remains open.

To access Port Information View:

1. Launch the web browser.
2. Enter the switch name or IP address in the **Location/Address** field and press **Enter**.

   Example: `http://switch name`

Web Tools launches, displaying Fabric View.

3. Click the **Switch** icon in Fabric View.

   The Switch View displays.

4. Click a **Port** icon.

   The Port Information View displays.

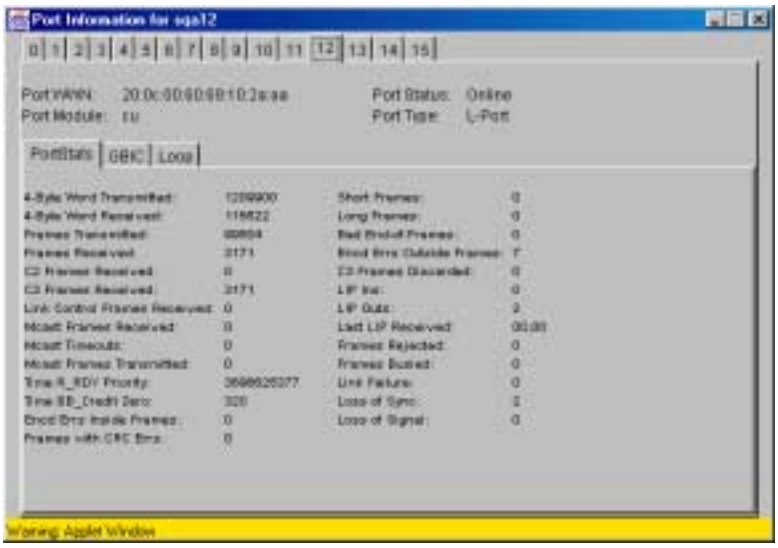

Figure 3-14 Port Information View

The following tabs are available in Port Information View, and are described on the listed pages:

- *PortStats Tab* on page 3-28
- *GBIC Tab* on page 3-29
- *Loop Tab* on page 3-31

Following is a description of the fields that are visible in Port Information View regardless of which tab is selected.

Port World Wide Name	World Wide Name (WWN) of this port.
Port Module	The GBIC type, as follows:

--	No GBIC present
SW	Short wave GBIC
LW	Long wave GBIC
CU	Copper GBIC
SWID	Short wave serial ID GBIC
LWID	Long wave serial ID GBIC
CUID	Copper serial ID GBIC

Port Status The current status of the port.

No_Module	No GBIC module is in this port.
No_Light	Module is not receiving light.
No_Sync	Module is receiving light but out of sync.
In_Sync	Module is receiving light and in sync.
Laser_Flt	Module signaling a laser fault (defective GBIC).
Port_Flt	Port is marked faulty (defective GBIC, cable, or device).
Diag_Flt	Port failed diagnostics.
Online	Port is up and running.
Lock_Ref	Port is locking to reference signal.

Note: Removing a cable from an E_Port temporarily generates errors, causing the status to show as faulty. The status returns to healthy when the sample interval has passed (the default interval is 1 minute).

Port Type The type of port.

E_Port	Switch link port
G_Port	Generic port
U_Port	Universal port
F_Port	Fabric port
FL_Port	Fabric loop port
L_Port	Loop port

PortStats Tab

The PortStats tab provides information about transmission speed, reception speed, and the volume of traffic through the selected port.

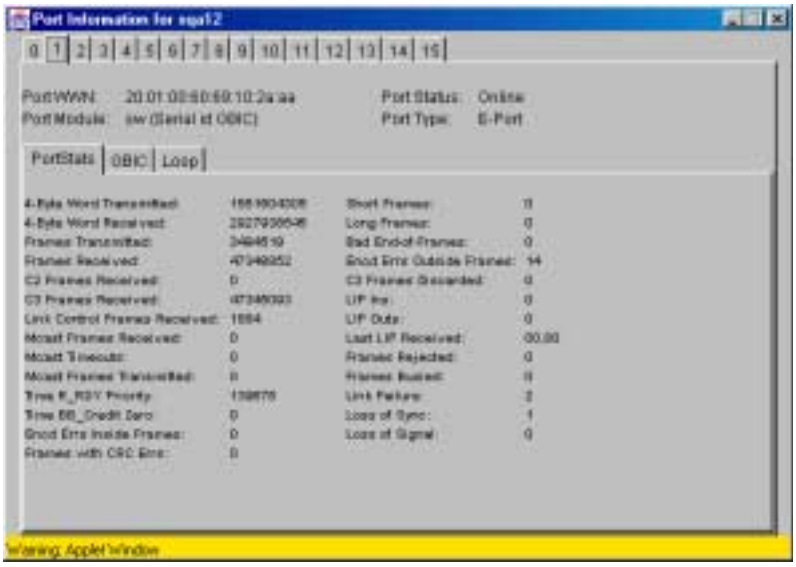

Figure 3-15 The PortStats tab in the Port Information View

Following is a description of the fields on the PortStats tab:

4-Byte Word Transmitted	Number of four-byte words transmitted.
4-Byte Word Received	Number of four-byte words received.
Frames Transmitted	Number of frames transmitted.
Frames Received	Number of frames received.
C2 Frames Received	Number of class 2 frames received.
C3 Frames Received	Number of class 3 frames received.
Link Control Frames Received	Number of link control frames received.
Mcast Frames Received	Number of multicast frames received.
Mcast Time-outs	Number of multicast timeouts.
Mcast Frames Transmitted	Number of multicast frames transmitted.
Time R_RDY Priority	Number of times R_RDY has priority over frames to be sent.
Time BB_Credit Zero	Number of times BB_Credit went to zero.
Encd Errs Inside Frames	Number of encoding errors inside frames.
Frames with CRC Errs	Number of frames with CRC errors.
Short Frames	Number of frames shorter than minimum.
Long Frames	Number of frames longer than maximum.
Bad End-of-Frames	Number of frames with faulty end-of-frames.

Encd Errs Outside Frames	Number of frames with encoding errors outside frames.
C3 Frames Discarded	Number of class 3 frames discarded.
LIP Ins	Number of LIPs received.
LIP Outs	Number of times loop initialized by FL_Port.
Last LIP Received	Last LIP received: AL_PD, AL_PS.
Frames Rejected	Number of F_RJTs sent.
Frames Busied	Number of F_BSYs sent.
Link Failure	Number of times NOS received/sent.
Loss of Sync	Number of times loss of sync occurred.
Loss of Signal	Number of times loss of signal occurred.

GBIC Tab

The GBIC tab provides information about the GBIC (Gigabit Interface Converter) installed in the selected port. The information displayed depends on the type of GBIC installed:

Standard GBIC	Module type (short wave, long wave, copper, etc.).
Serial ID GBIC and manufacturer.	Module type, plus extended information about capabilities, interfaces,
Smart Finisar GBIC	All of the above information, plus GBIC active status.

If the port does not contain a GBIC, the following information displays: “Not a serial ID GBIC. No GBIC info available.”

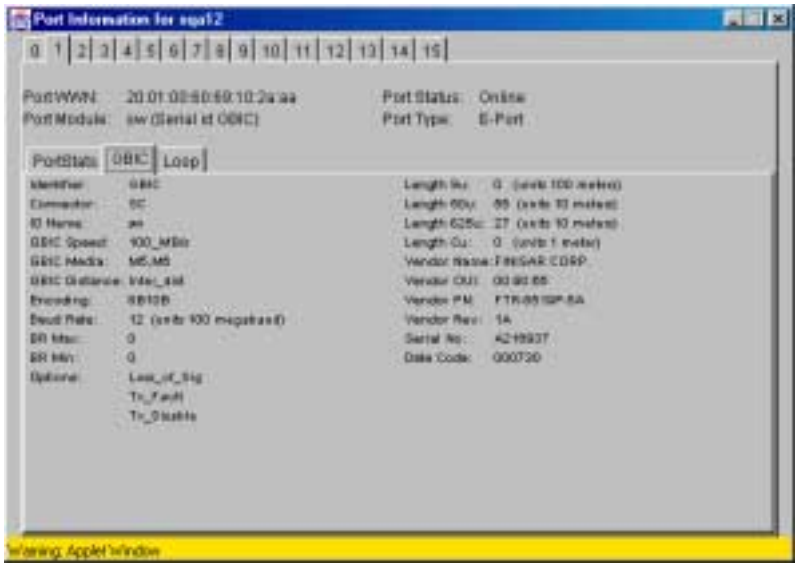

Figure 3-16 The GBIC Tab in the Port Information View

Following is a description of the fields on the GBIC tab:

Identifier Indicates the type of serial transceiver, which can be GBIC or on-board.

Connector Indicates the external connector type, which can be one of the following:

- SC
- Style-1 Copper
- Style-2 Copper
- BNC/TNC
- Coaxial

ID Name Indicates the GBIC module type:

- -- No GBIC present
- sw - Short wave GBIC
- lw - Long wave GBIC
- cu - Copper GBIC
- swid - Short wave serial ID GBIC
- lwid - Short wave serial ID GBIC
- cuid - Short wave serial ID GBIC

GBIC Speed Indicates the GBIC speed, which can be 100, 200, or 400 MB/sec.

GBIC Media Indicates the transmission media, which can be:

- SM - single mode
- M5 - multi-mode, 50u
- M6 - multi-mode, 62.5u
- TV - video coax
- MI - miniature coax
- TP - shielded twisted pair
- TW - twin axial pair

GBIC Distance Indicates the length of the fibre channel link, which can be long distance, intermediate distance, or short distance.

Encoding Indicates the serial encoding mechanism, which can be 8B10B, 4B5B, NRZ, or Manchester.

Baud Rate Nominal baud rate in units of 100 Megabyte.

BR Max Upper limit at which GBIC meets its specifications (in units of 1 percent above nominal baud rate).

BR Min Lower limit at which GBIC meets its specifications (in units of 1 percent below nominal baud rate).

Options	May indicate any of the following: • Loss of Signal • Loss of Signal Inverted • Transmission Fault • Transmission Disable
Length 9u	Length of link using single mode fibre.
Length 50u	Length of link using 50um multi-mode fibre.
Length 625u	Length of link using 62.5um multi-mode fibre.
Length Cu	Minimum length of link using copper cable.
Vendor Name	Name of vendor.
Vendor OUI	Unique identifier for vendor.
Vendor P/N	Vendor part number.
Vendor Rev	Vendor revision number.
Serial No.	Vendor serial number.
Date Code	Vendor date code.
Smart GBIC Data (only displays if a smart GBIC is present):	
Temperature	Module temperature (in Centigrade).
Rx Power	Received optical power in micro Watts.
Tx Power	Transmitted optical power in micro Watts (longwave only).
Current	Laser diode drive current in mAmps.

Loop Tab

The Loop tab provides information about any loop on the port, including the following:

- Loop statistics
- Local AL_PA statistics
- QuickLoop looplet statistics (if a QuickLoop license is available and the port is a member of the QuickLoop)
- QuickLoop statistics (if a QuickLoop license is available and the port is a member of the QuickLoop)

If the port is not a loop-enabled port, the following information displays: “Not an L_Port. No loop info available.”

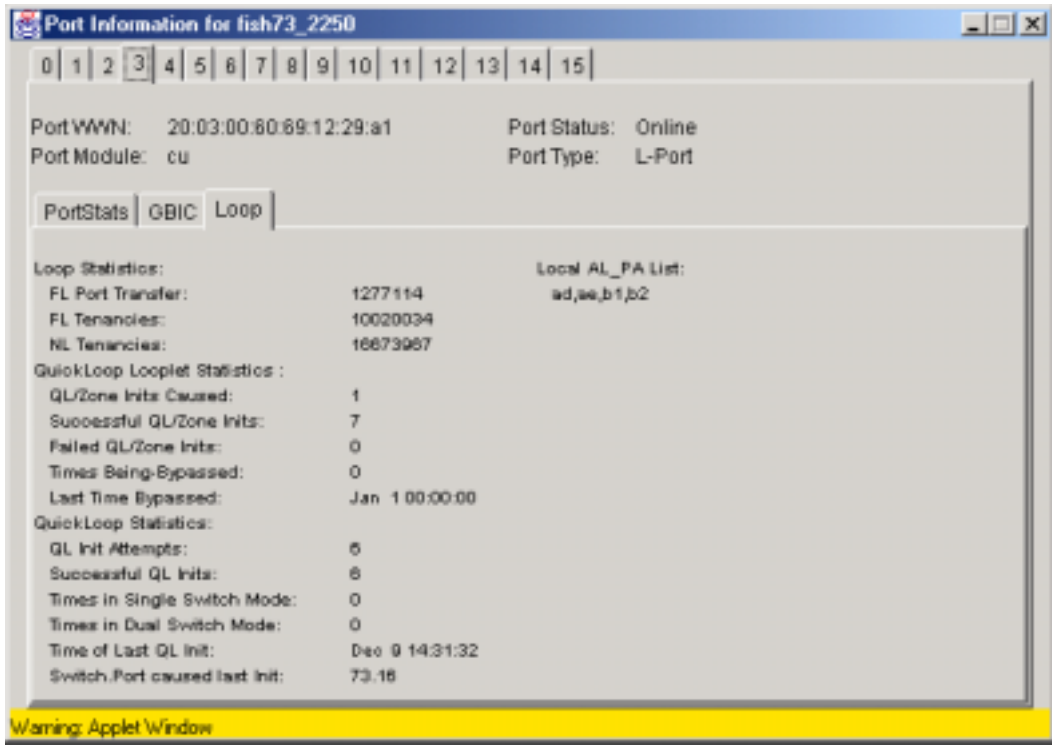

Figure 3-17 The Loop tab in the Port Information View

Following is a description of the fields on the Loop tab:

FL Port Transfer	Displays number of times FL_Port used transfer state.
FL Tenancies	Displays the number of times FL_Port opens loop tenancy.
NL Tenancies	Displays the number of times NL_Port opens loop tenancy.
Number of QL/Zone Inits Caused	Displays number of times looplet has caused QuickLoop to be initialized.
Number of Successful QL/ Zones Inits	Displays number of times looplet has successfully initialized.
Number of Failed QL/Zone Inits	Displays number of times looplet failed to successfully initialize.
Number of Times Being Bypassed	Displays number of times looplet was not included as part of QuickLoop.
Last Time bypassed	Displays time that looplet was last bypassed.
Local AL_PA List	Displays list of AL_PAs associated with devices connected to loop.
Number of QL Init Attempts	Displays number of times QuickLoop attempted initialization.
Number of Successful QL Inits	Displays number of time QuickLoop successfully initialized.

Fabric Watch View (Optional Software)

You can use Fabric Watch View to monitor fabric elements for potential problem conditions. This feature requires an active Fabric Watch license. For detailed information about Fabric Watch, see the *Fabric Watch User's Guide*.

To access Fabric Watch View:

1. Launch the web browser.
2. Enter the switch name or IP address in the **Location/Address** field and press **Enter**.

   Example: `http://switch name`

   Web Tools launches, displaying Fabric View.
3. Click the **Switch** icon.

   The Switch View displays.
4. Click the **Watch** icon.

   The Fabric Watch View displays, with the Alarm Notifications tab (described in the following section) selected by default.

Fabric Watch View contains the following tabs:

- Alarm Notifications
- Configure Thresholds
- Current Settings

In addition, an organizational tree appears on the left, showing all the Fabric Watch areas regardless of which tab is selected. To expand or contract a folder in the tree, double-click the folder.

Alarm Notifications Tab

You can use the Alarm Notifications tab to view and customize the Fabric Watch notifications. You can either accept the default notifications or select the Custom option and specify the type of notification (Syslog, SNMP_Trap, or Port log lock) for each type of event.

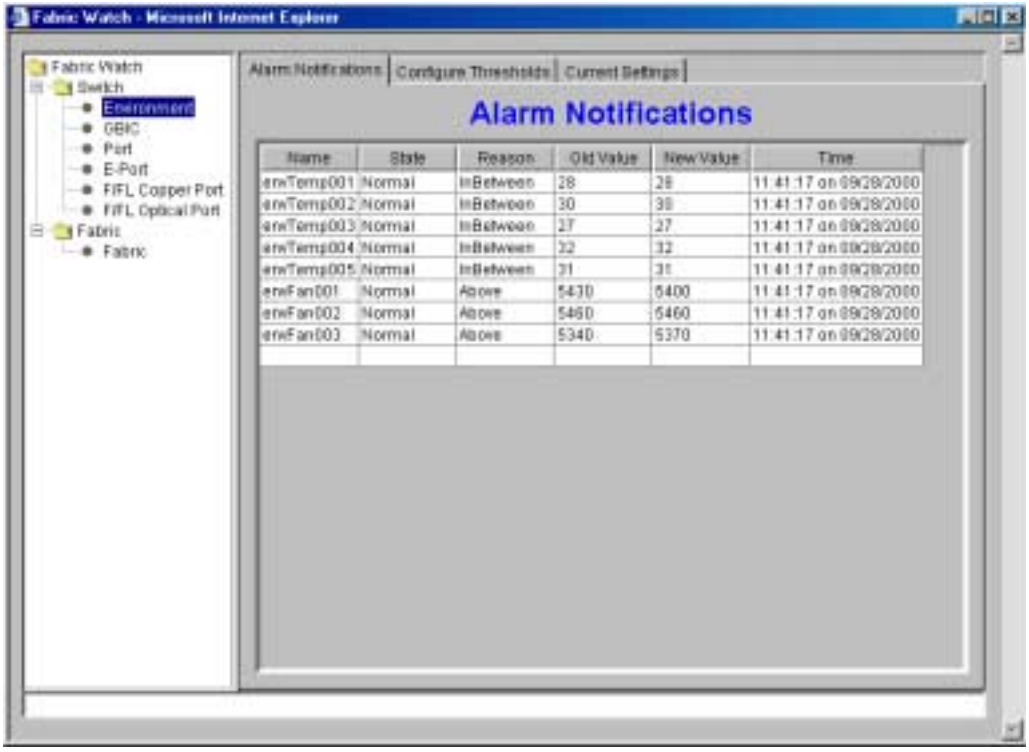

Figure 3-18 The Alarm Notifications Tab in the Fabric Watch View

Configure Thresholds

You can use the Configure Thresholds tab to view and configure Fabric Watch thresholds for the Fabric Watch class currently selected in the organizational tree on the left side of the window.

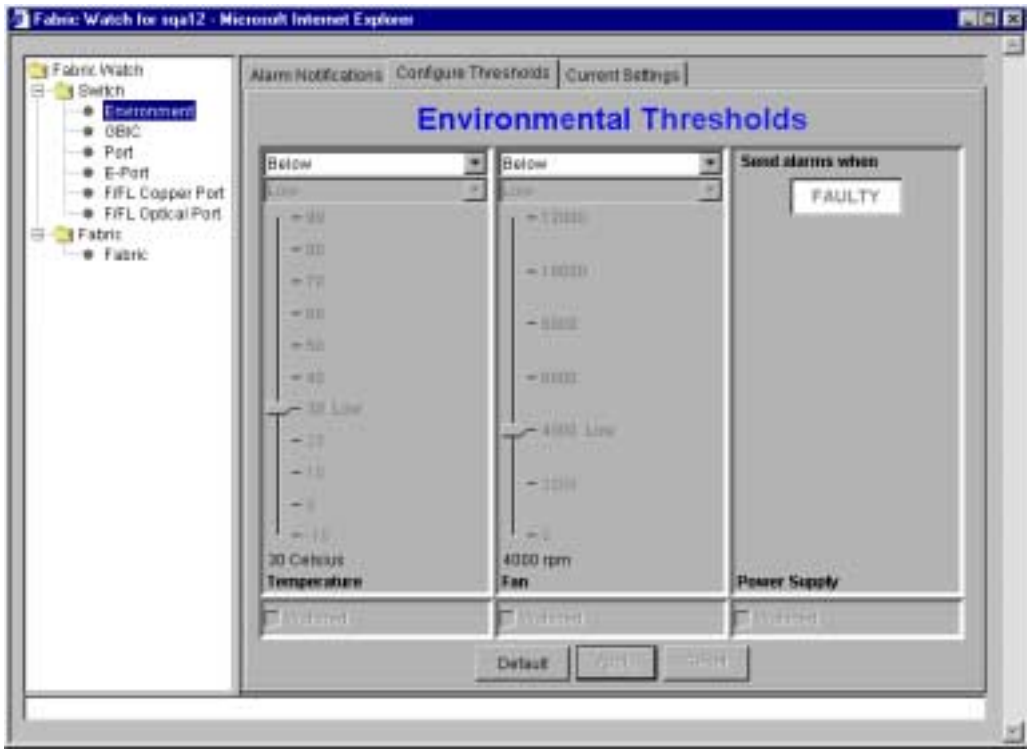

Figure 3-19 The Configure Threshold tab with the Environment class selected in the Fabric Watch View

The Configure Threshold display changes according to the **class** and **area** selected in the organizational tree. However, the Configure Thresholds tab always contains the following buttons:

Default Click to return settings to default values.

Apply Click to apply the values specified in the current display. When **Apply** is clicked after a change, the following dialog displays:

Figure 3-20 The Alarm Mechanism dialog box

To continue, select the type of alarm you want and click **Apply**.

Reset Click to undo the last changes that were applied.

Thresholds for the Environmental and GBIC Classes

The Environmental and GBIC classes both display a separate column for each area (see Figure 3-19 on page 3-35).

The columns for the *Temperature*, *Fan*, *RX Power*, and *TX Power* areas contain the following items:

Threshold Type drop-down list	Select the threshold type (outranged, above, in-between, below, changed).
High/Low drop-down list	Select to enter the high and low settings for the threshold type selected in the Threshold Type drop-down list (not available for all areas).
Scale	Specify the point at which you want to set the specified threshold.
Area drop-down list	Select a Fabric Watch area.
Watched checkbox	Check or uncheck to specify whether you want this area watched (not available for all areas).

The columns for the *Power Supply* and *Current* areas contain the following item:

"Send alarms when" box	Use this text box to specify whether you want to be notified when the area is in the acceptable range (OK) or is faulty (FAULTY).

Thresholds for the Remaining Classes

The Port, E_Port, F/FL Copper Port, F/FL Optical Port classes display the following fields for each area (Link Loss, Sync Loss, Signal Loss, Protol Error, Invalid Words, Invalid CRCs, State Changes, RX Performance, TX Performance):

Low text box	Enter the lowest number of occurrences that are acceptable.
High text box	Enter the highest number of occurrences that are acceptable.
Threshold Type drop-down list	Select the type of threshold.
Time period drop-down list	Select the time period you want applied to frequency measurements.

The thresholds for the Port class are displayed in the following figure:

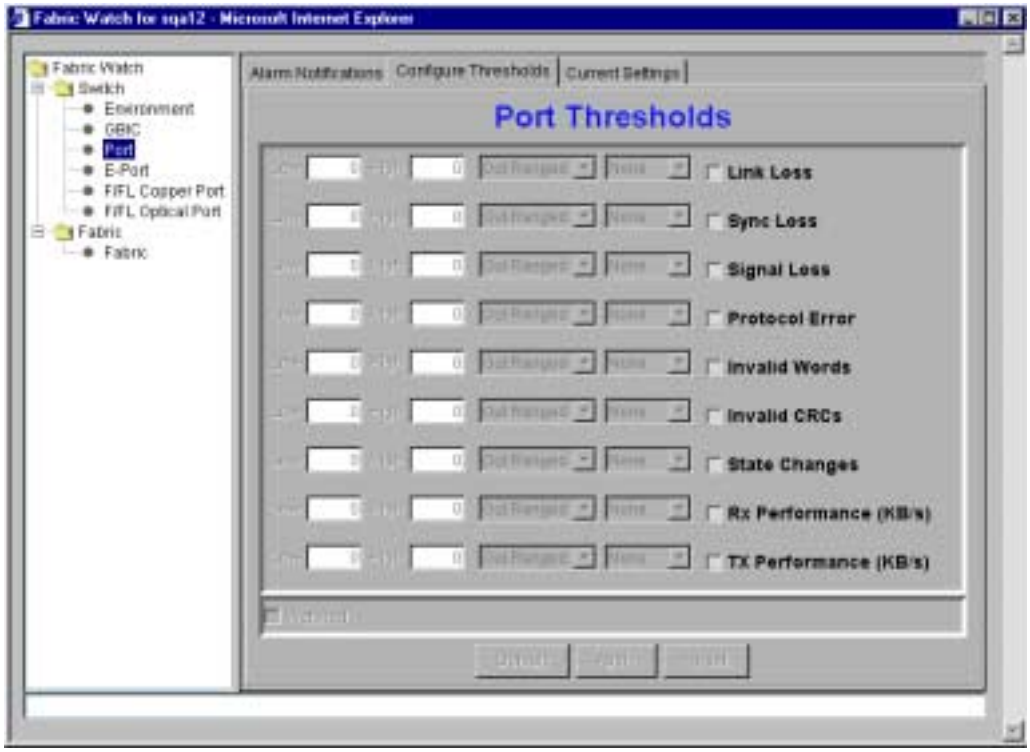

Figure 3-21 The Configure Threshold tab with the Port class selected in Fabric Watch View

Current Settings Tab

The Current Settings tab allows you to view the current Fabric Watch threshold parameters for the area selected in the Fabric Watch tree.

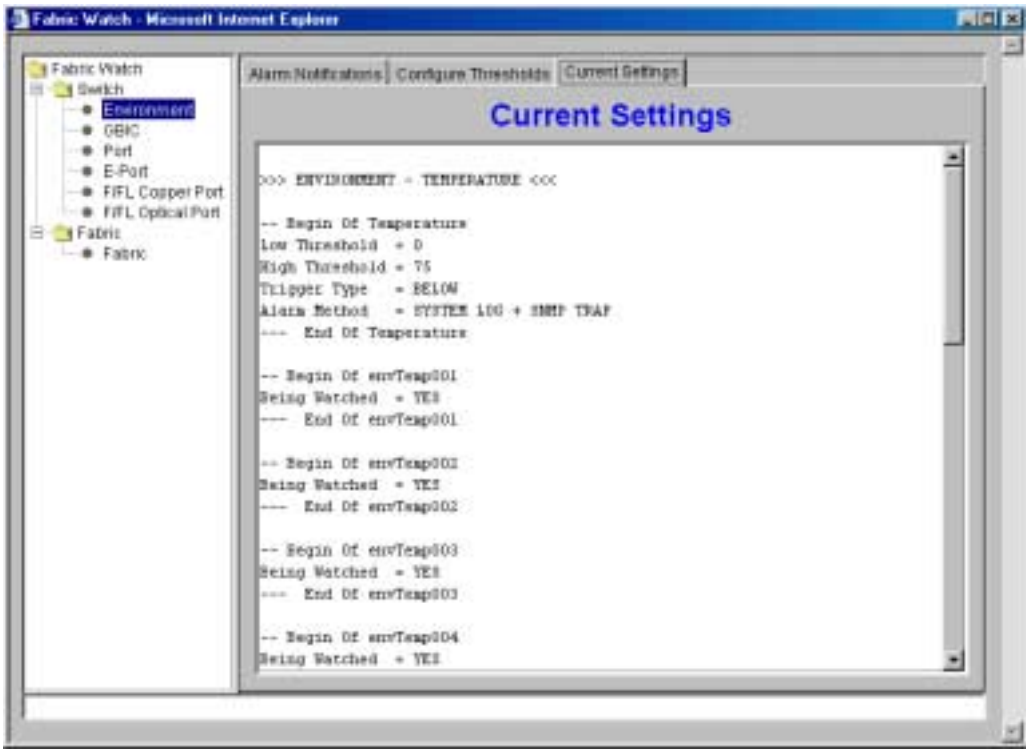

Figure 3-22 The Current Settings Tab in the Fabric Watch View

Performance View

The Performance View graphically displays throughput (megabytes per second) for each port and also for the entire switch. “Port throughput” is the number of bytes received at a port plus the number of bytes transmitted. “Switch throughput” is the sum of the throughput for all the ports.

To access Performance View:

1. Launch the web browser.
2. Enter the switch name or IP address in the **Location/Address** field and press **Enter**.

   Example: `http://switch name`

   Web Tools launches, displaying Fabric View.
3. Click the **Switch** icon.

   The Switch View displays.
4. Click the **Performance** icon.

The Performance View displays.

Figure 3-23 Performance View

In addition to the port graphs, a graph for the entire switch is provided at the bottom of the window. Resizing the window changes the size and shape of all the individual graphs.

In both the port and switch graphs, the horizontal axis represents elapsed time and the vertical axis represents throughput. Each port graph contains up to 60 seconds of performance data, and the switch graph at the bottom of the view can contain up to four minutes of data.

Administrative Interface

The Administrative Interface provides access to the administrative functions though the following tabs:

Note: The Administrative Interface requires administrative privileges. Once an administrative login is entered, administrative privileges remain available until the web browser is exited.

To access the Administrative Interface:

1. Launch the web browser.
2. Enter the switch name or IP address in the **Location/Address** field and press **Enter**. For example: `http://switch name`

   Web Tools launches, displaying Fabric View.
3. Click the **Admin** icon on the switch panel.

The Enter Network Password or Encrypted Password dialog box displays. The Encrypted Password dialog box displays only if you have security enabled on the switch. For information on enabling security on the switch, refer to the *Secure Fabric OS User's Guide* or the *FOS Reference*.

Figure 3-24 The Enter Network Password Dialog Box

Figure 3-25 The Encrypted Password Window

4. Enter your user name and password. The logon account must have administrative privileges.
5. Click **OK**.

   The Administrative Interface displays, with the Switch Admin tab selected by default.

Switch Admin Tab

You can use the Switch Administration tab to change IP information, enable/disable a switch, change the domain, change the switch name, see which ports are enabled, and enable/disable individual ports.

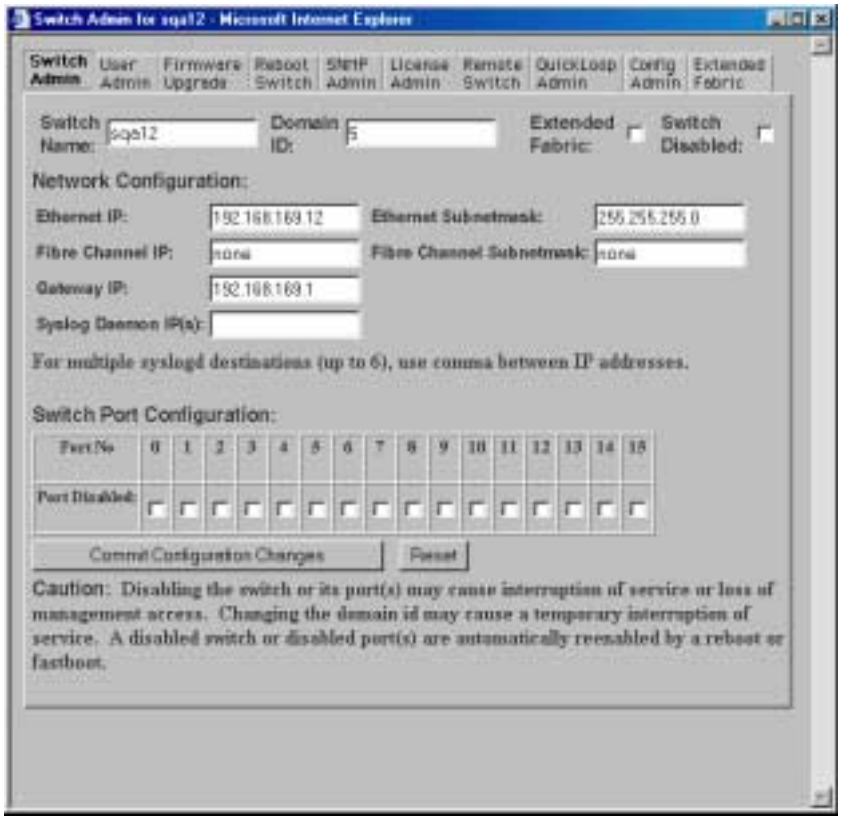

Figure 3-26 Switch Administration Tab

Following is a description of the fields on the Switch Administration tab:

Switch Name	Displays or sets the switch name. To change name, enter new name in this field.
Domain ID	Displays or sets switch domain ID. Domain IDs must be unique within a fabric. To change domain ID, enter new domain ID in this field. Use a number from 1 to 239 for normal operating mode (FCSW compatible) and a number from 0 to 31 for VC encoded address format mode (backward compatible to SilkWorm 1000 series).
Extended Fabric	Check to allow ports to be configured for long distance, or uncheck to turn the option off.
Switch Disabled	Check to disable the switch, or uncheck to enable the switch.
Ethernet IP	Displays or sets IP address for Ethernet connection to switch.

Ethernet Subnetmask	Displays or sets Ethernet subnetmask. Default value is none. Contact network administrator for value to enter. If changed, restart browser.
Fibre Channel IP	Displays or sets fibre channel IP address.
Fibre Channel Subnetmask	Displays or sets fibre channel subnetmask. If changed, restart browser.
Gateway IP	Displays or sets gateway IP address. Contact network administrator for IP address. If changed, restart browser.
Syslog Daemon IP	Displays or sets destination station IP address for sending events using syslog protocol to host. Contact network administrator for IP address. If messages are not to be sent, enter `none` or leave blank. Maximum of six IP addresses. Enter multiple addresses as a list, for example `192.16864.35, 192.16862.36`, etc.
Port No	Port number.
Port Disabled	If the box is checked, the port is disabled. To enable the port, uncheck the box.
Commit Configuration Changes	Click to apply changes made.
Reset	Click to reset all fields to values present when Switch Administration was launched.

User Admin Tab

Use the User Admin tab to rename accounts or change passwords.

Security

If security is enabled on the switch, you may not be able to access this tab for the following reason:

- Password modification is allowed on Primary FCS switches only.

The following dialog box will appear when an attempt is made to access the User Admin tab from a Primary FCS switch:

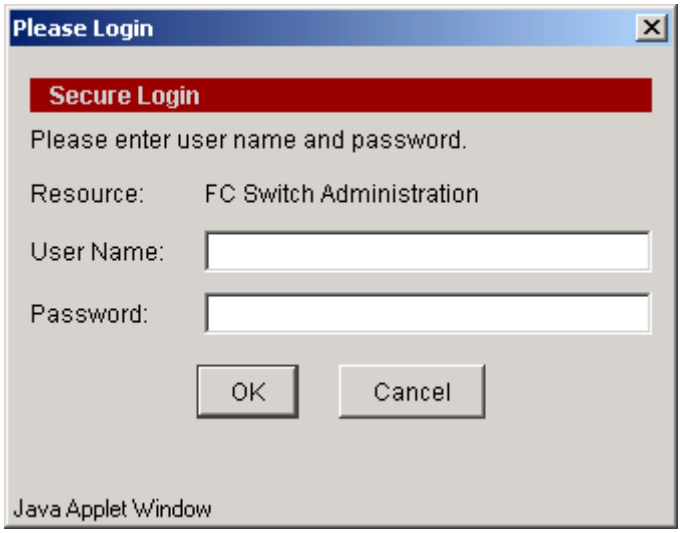

Figure 3-27 Secure Login Window

For more information about security, see the *Secure Fabric OS User's Guide*, the *Fabric OS Reference* and the *Fabric OS Procedure's Guide*.

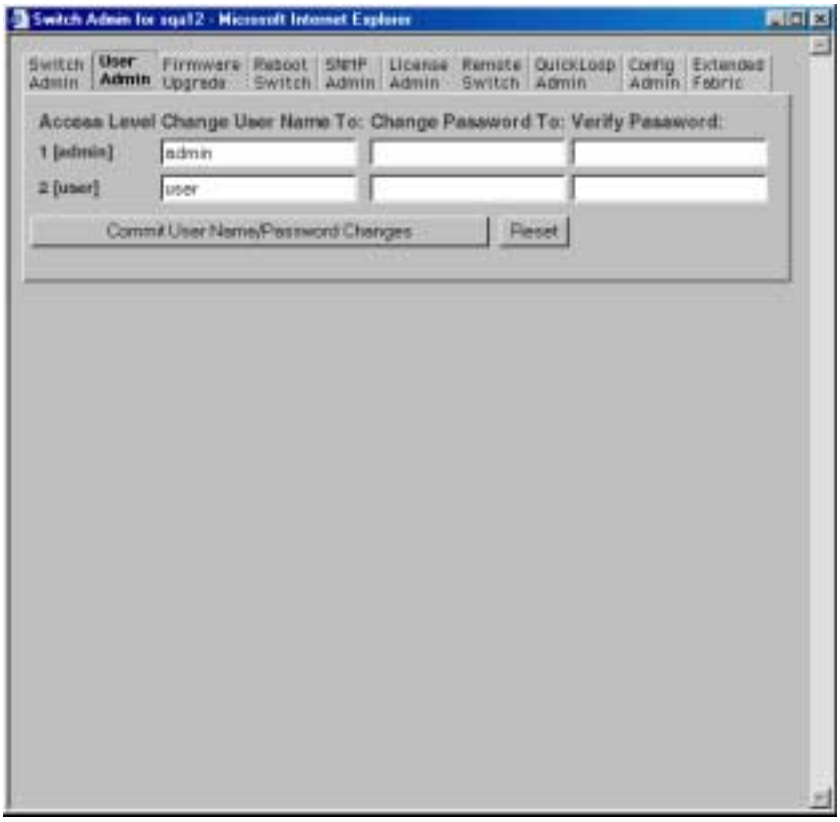

Figure 3-28 User Administration Tab on a Non-Secure Switch

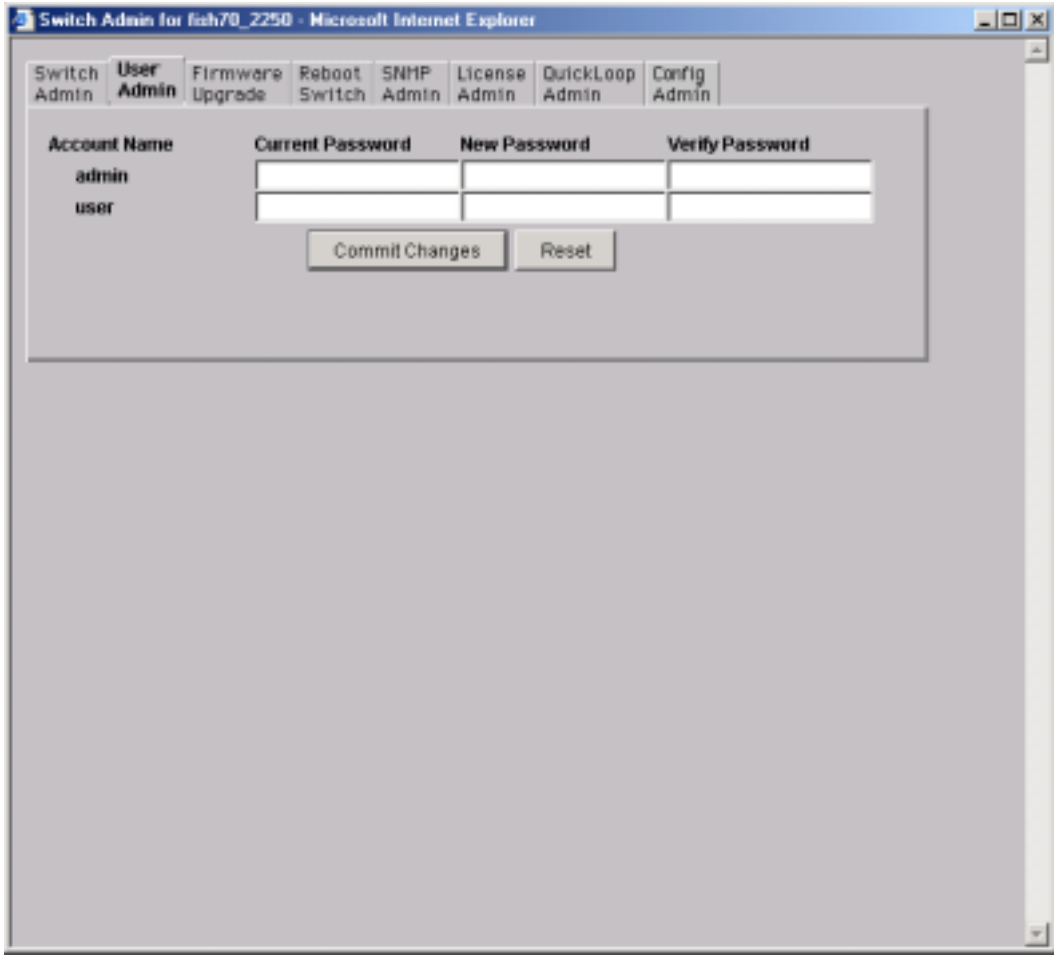

Figure 3-29 User Admin Tab on a Primary Switch

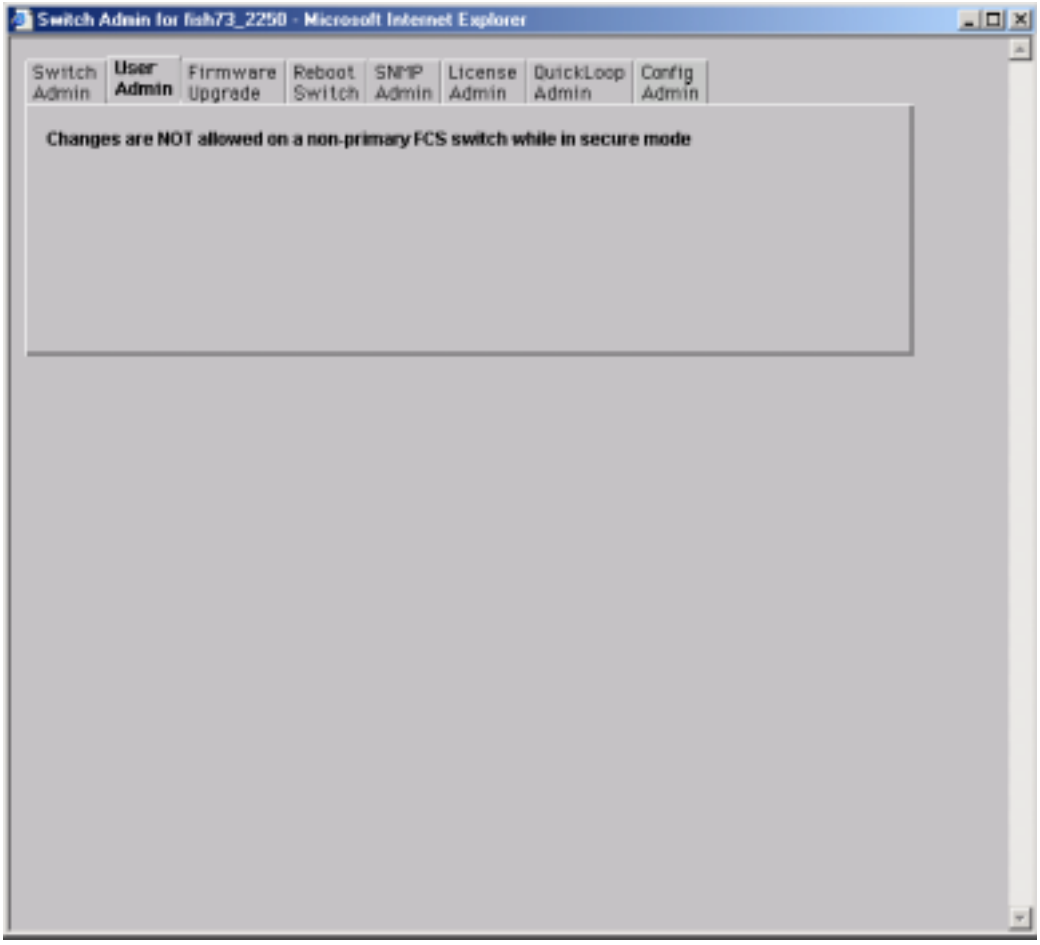

Figure 3-30 User Admin Tab on a Non-Primiary Switch with Secure Mode Enabled

Following is a description of the fields on the User Administration tab:

Access Level	Access level required - Admin or User
Change User Name To	Enter new user name.
Change Password To	Enter new password.
Verify Password	Re-enter password to verify.
Commit User Name/ Password Changes	Click to apply changes made.
Reset	Click to reset all fields to values set at last submission.

Firmware Upgrade Tab

You can use the Firmware Upgrade tab to download firmware upgrades.

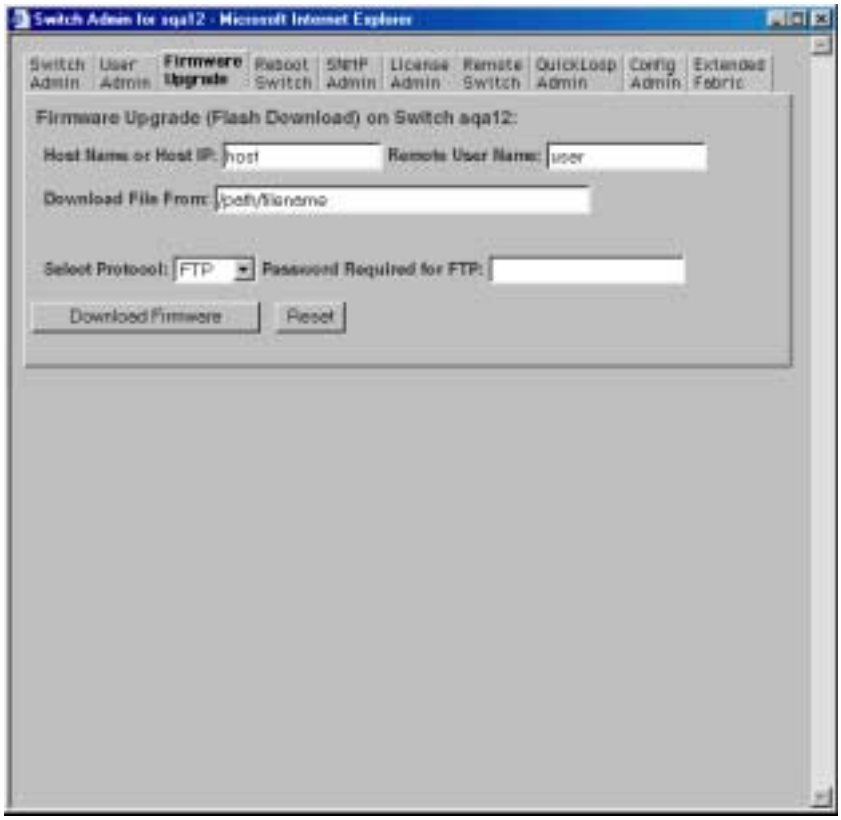

Figure 3-31 Firmware Upgrade Tab

Following is a description of the fields on the Firmware Upgrade tab:

Host Name or Host IP:	Displays or sets host name or host IP address.
Remote User Name:	Displays or sets remote user name.
Download File From:	Enter path name for firmware download.
Select Protocol:	Select the protocol for the download.
Password Required for FTP:	Enter a password if FTP was selected as the protocol.
Download Firmware	Click to download firmware.
Reset	Click to reset all fields to values present when Firmware Upgrade was launched.

Reboot Switch Tab

You can use the Reboot Switch tab to reboot or fast boot the switch or to disable POST (Power On Self Test) for future reboots.

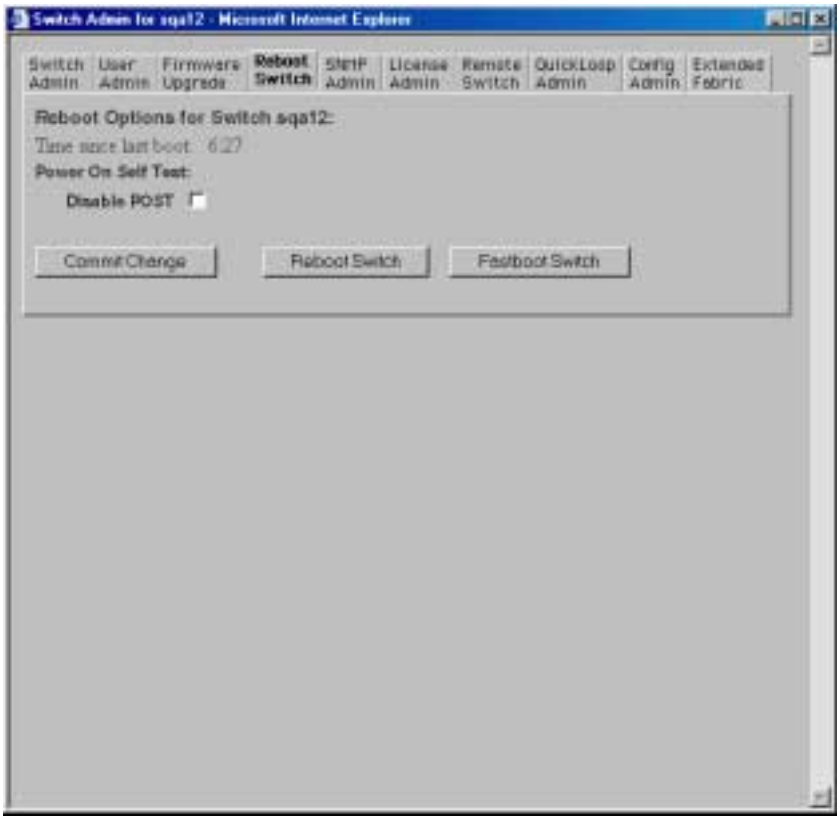

Figure 3-32 Reboot Switch Tab

Following is a description of the fields on the Reboot Switch tab:

Disable POST	Check to disable POST for future reboots, or uncheck to enable POST.
Commit Change	Click to save settings.
Reboot Switch	Click to reboot the switch. **Note:** In the event that downloaded firmware is corrupt, the software will not allow the switch to be rebooted. In this case, the Reboot Switch button will not appear.
Fastboot Switch	Click to perform a fast reboot. A fastboot bypasses POST. (It is the same as a reboot with POST disabled.) **Note:** In the event that downloaded firmware is corrupt, the software will not allow the switch to be rebooted. In this case, the Fastboot Switch button will not appear.

SNMP Admin Tab

Use the SNMP Admin tab to set SNMP options.

Security

If security is enabled on the switch, you may not be able to configure certain areas of the SNMP window for the following reason:

- Community String modifications are permitted on Primary FCS switches only.

For more information about security, refer to the *Secure Fabric OS User's Guide*, the *Fabric OS Reference Guide* and the *Fabric OS Procedure's Guide*.

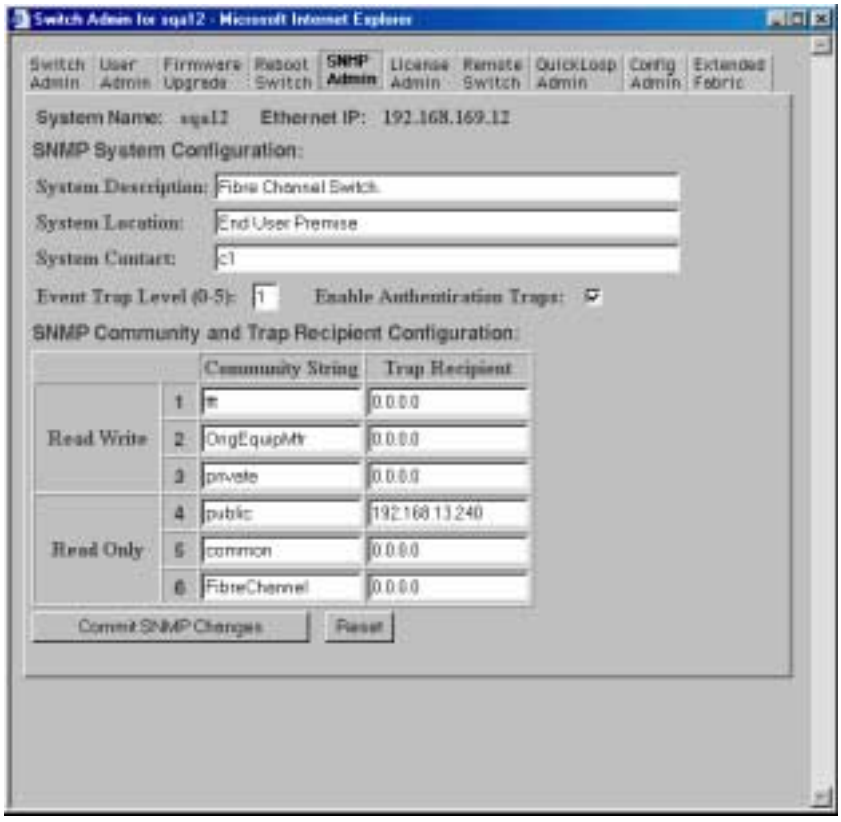

Figure 3-33 SNMP Administration Tab

Following is a description of the fields on the SNMP Administration tab:

System Description	Displays or sets system description. Default is Fibre Channel Switch.
System Location	Displays or sets location of switch. Default is End User Premise.
System Contact	Displays or sets contact information for switch. Default is Field Support.
Event Trap Level	Sets severity level (0 - 5) of switch events that prompt SNMP traps. Default is 0.

Enable Authentication Traps	Click on to enable authentication traps; click off to disable (recommended).
Read Write Community String	Displays or sets up to three strings that work with the SNMP `set` command.
Read Only Community String	Displays or sets up to three strings that work with the SNMP `get` or `get-next` command.
Read Write and Read Only Trap Recipients	Displays or sets recipients for traps (usually IP address of SNMP management station).
Commit SNMP Changes	Click to apply changes made.
Reset	Click to reset all fields to values present when SNMP Administration was launched.

To disable the community string or trap recipient fields, leave the fields empty.

License Admin Tab

You can use the License Administration tab to view a list of installed license keys and features or to add or remove licenses.

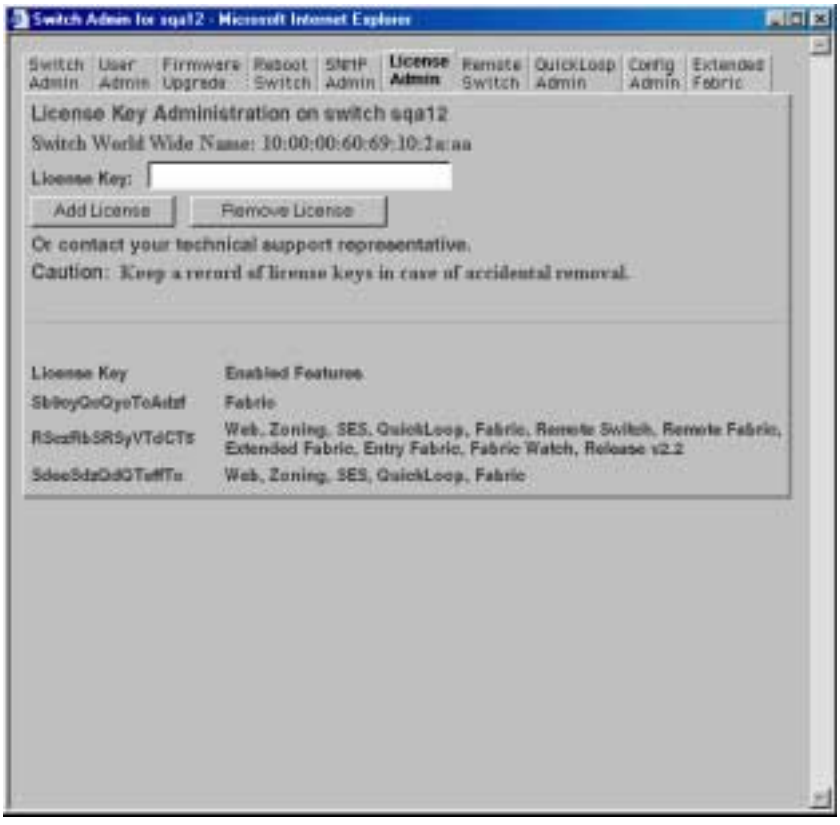

Figure 3-34 License Administration Tab

Following is a description of the fields on the License Administration tab:

License Key	Enter license key to be added or removed.
Add License	Click to add specified license.
Remove License	Click to remove specified license.
Text box	A list of the licenses installed on the switch.

Remote Switch Tab (Optional Software)

You can use the Brocade Remote Switch feature to configure a pair of switches to operate over an extended WAN interface so that they can communicate across an ATM network by using a compatible Fibre Channel to ATM gateway. This feature requires an active Remote Switch sub-license in both switches. For detailed information on the Remote Switch feature, refer to the *Brocade Distributed Fabrics User's Guide*.

You can use the Remote Switch tab to enable or disable the Remote Switch feature on the selected switch.

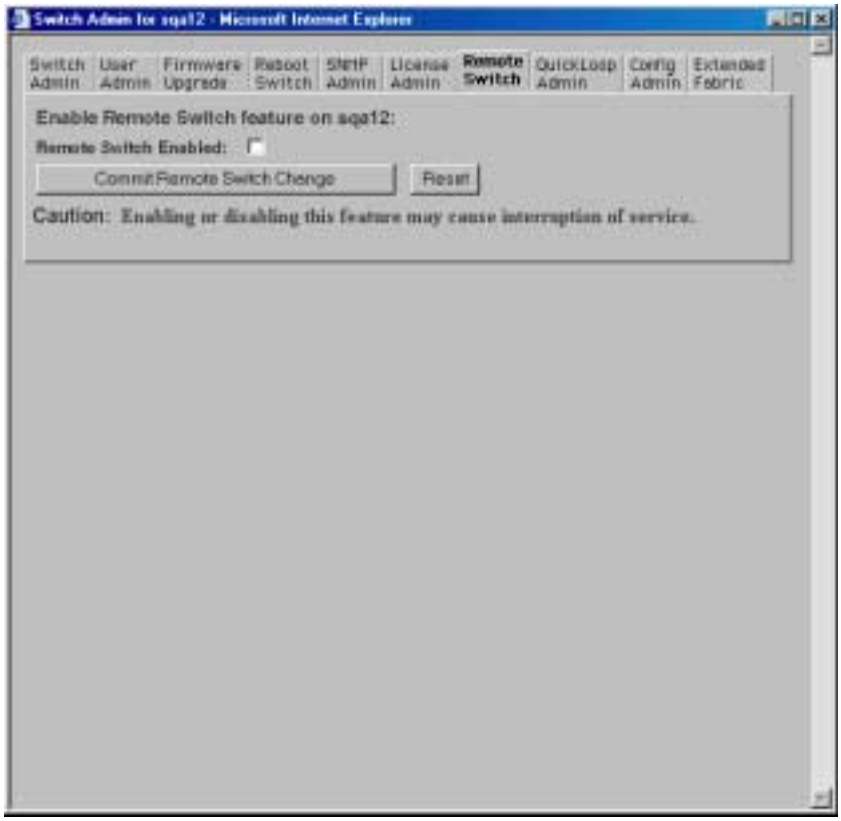

Figure 3-35 Remote Switch Tab

Following is a description of the fields on the Remote Switch tab:

Remote Switch Enabled	Check to enable the Remote Switch feature, or uncheck to disable it.
Commit Remote Switch Change	Click to apply changes made.
Reset	Click to reset all fields to values present when Remote Switch was launched.

QuickLoop Admin Tab (Optional Software)

You can use the QuickLoop Admin tab to manage QuickLoop features. For information about managing the features available when QuickLoop and Brocade Zoning are used together, see *Zone Administration View (Optional Software)* on page 3-10. For detailed information about the QuickLoop feature, refer to the *QuickLoop User's Guide*.

You can use the QuickLoop Administration tab to modify a QuickLoop or set up a partner switch.

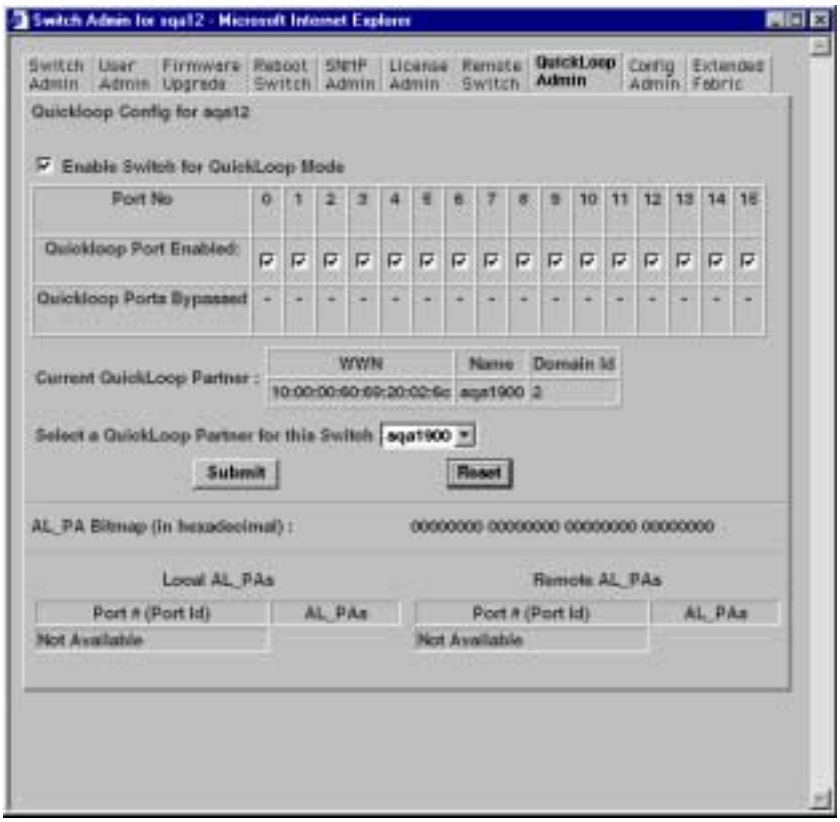

Figure 3-36 QuickLoop Administration Tab

Following is a description of the fields on the QuickLoop Administration tab:

Enable Switch for QuickLoop Mode	Check to enable the switch for QuickLoop, or uncheck to disable the switch for QuickLoop.
Port No	Port number.
QuickLoop Port Enabled	Check to enable the port for QuickLoop, or uncheck to disable the port for QuickLoop.
QuickLoop Ports Bypassed	If checked, indicates a port is currently bypassed.
Current QuickLoop Partner	Displays the current partner switch WWN, domain ID, and switch name of a dual-switch QuickLoop.
Select a QuickLoop Partner for this Switch	Select a switch from the list of switch names currently in the fabric as the partner switch of a dual-switch QuickLoop.
Submit	Click to apply changes made.
Reset	Click to reset all fields to values present when QuickLoop Administration was launched.
AL_PA Bitmap (in hexadecimal)	Displays the AL_PA bitmap at the end of a QuickLoop initialization.
Local AL_PAs	Lists the AL_PAs of devices connected to the local switch.
Remote AL_PAs	Lists the AL_PAs of devices connected to the remote switch in a dual-switch QuickLoop. This information only displays if a partner is configured.

Config Admin Tab

You can use the Config Admin tab to upload the switch configuration file for archiving, or to download a new configuration file from the host.

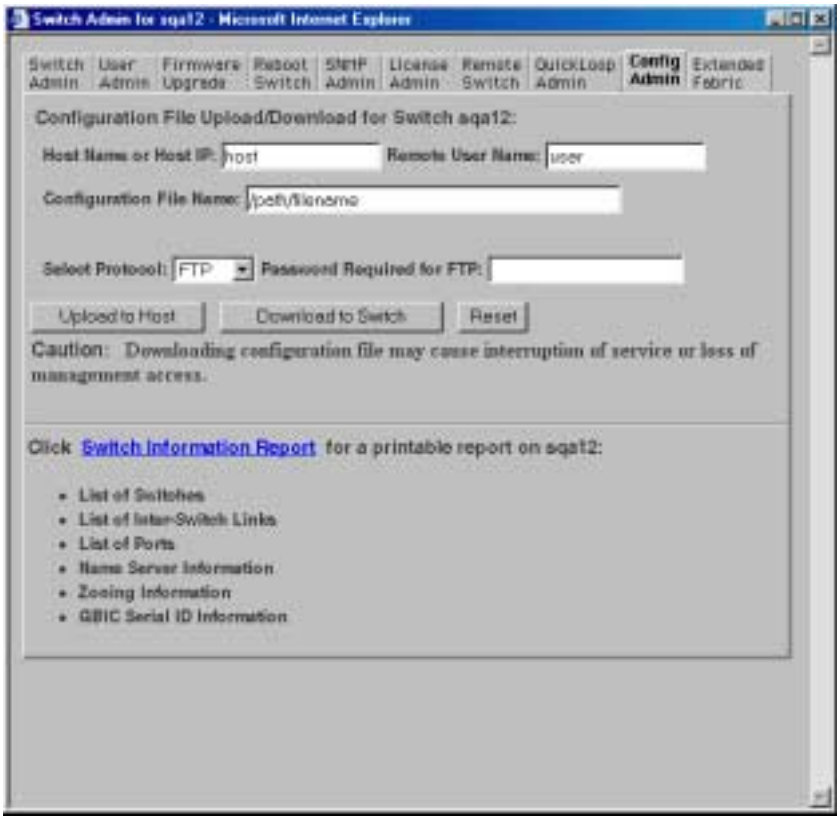

Figure 3-37 Config Admin Tab

Following is a description of the fields on the Config Admin tab:

Host Name or Host IP	Specify the host name or host IP address.
Remote User Name	Specify the remote user name.
Configuration File Name	Specify the name of the configuration file to be uploaded or downloaded.
Select Protocol	Specify FTP or RSHD protocols.
Password Required for FTP	Specify a password if one is required by the host.
Upload to Host	Click to retrieve configuration file from the switch.
Download to Switch	Click to send configuration file to the switch.
Reset	Click to reset all fields to the previously set values.
Switch information Report	Click to open a browser window displaying a status report for the switch. Information can be printed or saved to file.

Switch Information Report

The Switch Information Report can be generated by clicking on the corresponding link on the Config Admin tab in the Switch Admin window. It provides information about all the switches, interswitch links, and ports in the fabric.

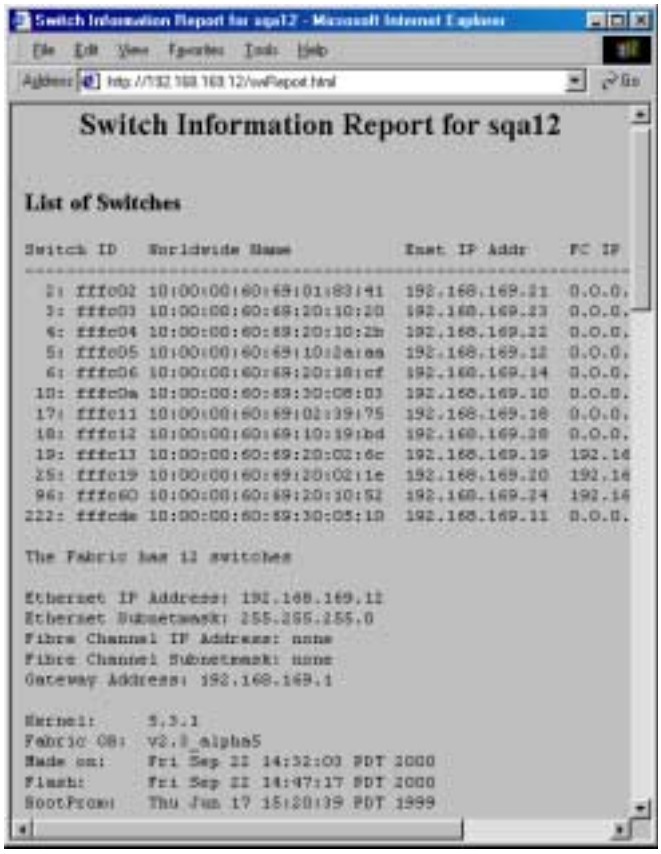

Figure 3-38 Switch Information Report

Extended Fabric Tab (Optional Software)

The Brocade Extended Tab feature allows you to configure ports for a long distance link of up to 100 KM.

For detailed information on this feature, refer to the *Brocade Distributed Fabrics User's Guide*.

You can use the Extended Fabric tab to specify which ports you want to be configured for distance and at what level.

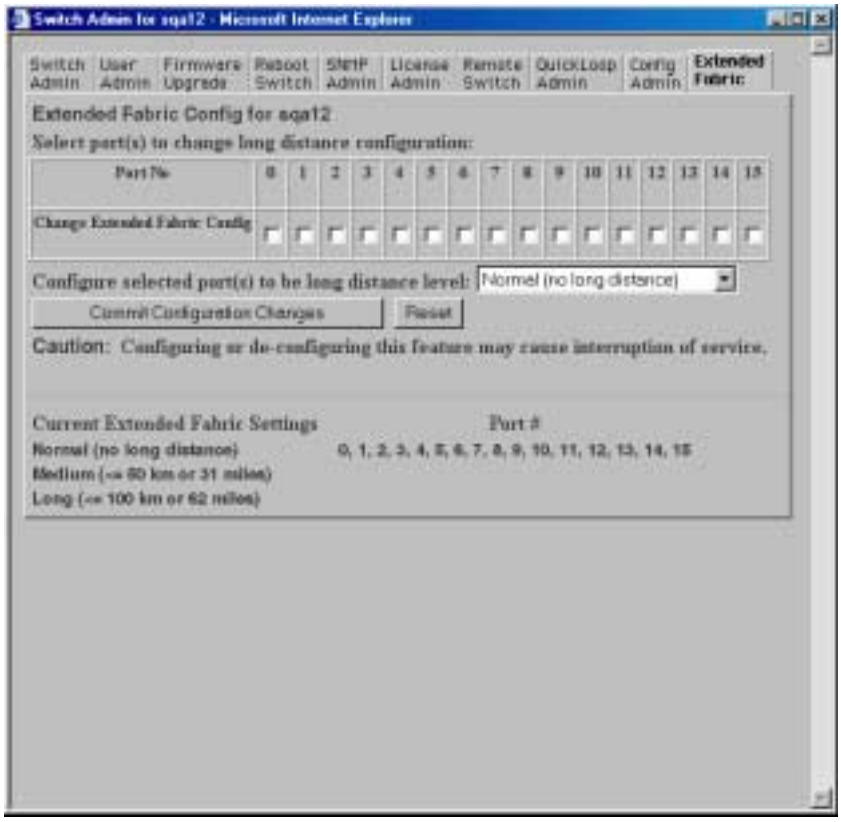

Figure 3-39 Extended Fabric Tab

Following is a description of the fields on the Extended Fabric tab (optional software):

Port No	Port Number.
Change Extended Fabric Configuration	Check to designate the ports for which you want to change the long distance configuration.
Configure selected port(s) to be long distance level	Select the long distance level to be supported for the selected ports: • No long distance • 50 KM • 100 KM
Commit Configuration Changes	Click to apply configuration for Brocade Extended Fabric.
Reset	Click to reset all fields to values present when Brocade Extended Fabric was launched.
Current Extended Fabric Settings	Displays current settings by port number.

Telnet Interface

Only one Telnet session can be active at a time.

Note: The Telnet Interface requires administrative privileges. Once an administrative login is entered, administrative privileges remain available until the web browser is exited.

Security

If security is enabled on the switch, the telnet option will not be accessible for the following reasons:

- Regular Telnet will not be able to access as a switch.
- Secure Telnet must be installed. For information regarding Secure Telnet, refer to the *Secure Fabric OS User's Guide*.
- Telnet functions (due to their administrative nature) must be performed by the host system administrator.
- The URL Telnet://...../ must point to Secure Telnet.

For more information regarding enabling and managing security, refer to the *Secure Fabric OS User's Guide*, the *Fabric OS Reference Guide* or the *Fabric OS Procedures Guide*.

Accessing the Telnet Interface:

1. Launch the web browser.
2. Enter the switch name or IP address in the **Location/Address** field and press **Enter**.

   Example: `http://switch name`

   Web Tools launches, displaying Fabric View.
3. Click the **Telnet** icon on the switch panel.

   If a Telnet session is already active, the following message displays.

4. If this message displays and you want to abort the active session, click **Abort Session**. Otherwise, click **Cancel**.

If there is no active session or it has been aborted, the Enter Network Password or Encrypted Password dialog box appears. The Encrypted Password dialog box displays only if you have security enabled on the switch. For information on enabling security on the switch, refer to the *Secure Fabric OS User's Guide* or the *FOS Reference Guide*.

Figure 3-40 The Enter Network Password dialog box

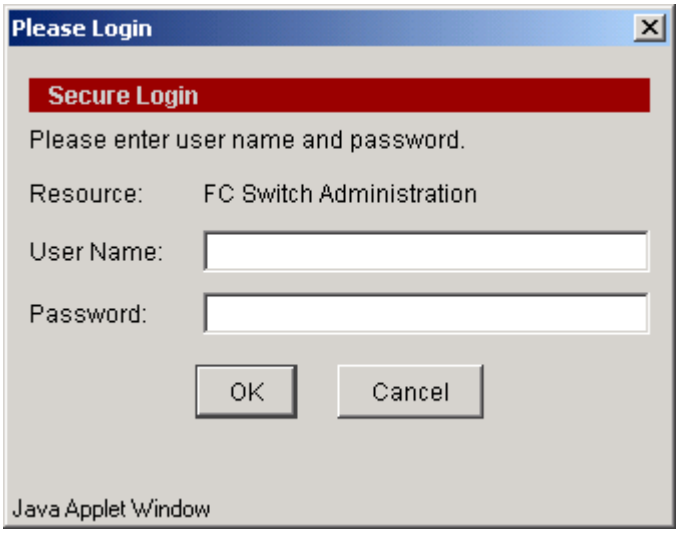

Figure 3-41 Encrypted Password Dialog Box

5. Enter your user name and password (the account used must have administrative privileges).
6. Specify whether you want the password saved.
7. Click **OK**.

The Telnet Interface displays.

Figure 3-42 The Telnet Interface

Glossary

8b/10b Encoding	An encoding scheme that converts each 8-bit byte into 10 bits. Used to balance ones and zeros in high-speed transports.
Address Identifier	A 24-bit or 8-bit value used to identify the source or destination of a frame.
AL_PA	Arbitrated Loop Physical Address; a unique 8-bit value assigned during loop initialization to a port in an arbitrated loop.
Alias Address Identifier	An address identifier recognized by a port in addition to its standard identifier. An alias address identifier may be shared by multiple ports.
Alias AL_PA	An AL_PA value recognized by an L_Port in addition to the AL_PA assigned to the port. See also *AL_PA*.
Alias Server	A fabric software facility that supports multicast group management.
ANSI	American National Standards Institute; the governing body for fibre channel standards in the U.S.A.
API	Application Programming Interface; defined protocol that allows applications to interface with a set of services.
Arbitrated Loop	A shared 100 MBps fibre channel transport structured as a loop. Can support up to 126 devices and one fabric attachment. See also *Topology*.
ASIC	Application Specific Integrated Circuit.
ATM	Asynchronous Transfer Mode; a transport used for transmitting data over LANs or WANs that transmit fixed-length units of data. Provides any-to-any connectivity, and allows nodes to transmit simultaneously.
AW_TOV	Arbitration Wait Time-out Value; the minimum time an arbitrating L_Port waits for a response before beginning loop initialization.
Bandwidth	The total transmission capacity of a cable, link, or system. Usually measured in bps (bits per second). May also refer to the range of transmission frequencies available to a network. See also *Throughput*.
BB_Credit	Buffer-to-buffer credit; the number of frames that can be transmitted to a directly connected recipient or within an arbitrated loop. Determined by the number of receive buffers available. See also *Buffer-to-buffer Flow Control, EE_Credit*.
Beginning Running Disparity	The disparity at the transmitter or receiver when the special character associated with an ordered set is encoded or decoded. See also *Disparity*.
BER	Bit Error Rate; the rate at which bits are expected to be received in error. Expressed as the ratio of error bits to total bits transmitted. See also *Error*.
Block	As applies to fibre channel, upper-level application data that is transferred in a single sequence.

Broadcast The transmission of data from a single source to all devices in the fabric, regardless of zoning. See also *Multicast*, *Unicast*.

Brocade® Distributed Fabrics The combined manual for the software products Brocade Extended Fabrics and Brocade Remote Switch ("Distributed Fabrics" is not a software product). See also *Brocade Extended Fabrics*, *Brocade Remote Switch*.

Brocade Extended Fabrics A Brocade product that runs on Fabric OS and allows creation of a fibre channel fabric interconnected over distances of up to 100 kilometers. See also *Brocade Distributed Fabrics*.

Brocade Fabric Assist A Brocade feature that enables private and public hosts to access public targets anywhere on the fabric, provided they are in the same Fabric Assist zone. This feature is available only when both Brocade QuickLoop and Brocade Zoning are installed on the switch.

Brocade Fabric Manager A Brocade product that works in conjunction with Web Tools to provide a graphical user interface for managing switch groups (such as the SilkWorm 6400) as a single unit, instead of as separate switches. Fabric Manager is installed on and run from a computer workstation.

Brocade Fabric Watch A Brocade product that runs on Fabric OS and allows monitoring and configuration of fabric and switch elements.

Brocade MIB Reference Manual A reference manual that provides descriptions and information about the different Brocade MIB types.

Brocade Performance Monitoring A Brocade product that provides error and performance information to the administrator and end user for use in storage management.

Brocade QuickLoop A Brocade product that makes it possible to allow private devices within loops to communicate with public and private devices across the fabric through the creation of a larger loop.
May also refer to the arbitrated loop created using this software. A QuickLoop can contain a number of devices or looplets; all devices in the same QuickLoop share a single AL_PA space.

Brocade Remote Switch A Brocade product that runs on Fabric OS and enables two SilkWorm 2000 fabric switches to be connected over an ATM (asynchronous transfer mode) connection. This requires a compatible fibre channel to ATM gateway, and can have a distance of up to 10 kilometers between each switch and the respective ATM gateway. See also *Brocade Distributed Fabrics*.

Brocade SES A Brocade product that runs on Fabric OS and allows monitoring, configuring, and maintenance of the Brocade SilkWorm Switch family using SCSI-3 Enclosure Services.

Brocade Web Tools A Brocade product that runs on Fabric OS and provides a graphical interface to allow monitoring and management of individual switches or entire fabrics from a standard workstation.

Brocade Zoning A Brocade product that runs on Fabric OS and allows partitioning of the fabric into logical groupings of devices. Devices in a zone can only access and be accessed by devices in the same zone. See also *Zone*.

Buffer-to-buffer Flow Control Management of the frame transmission rate in either a point-to-point topology or in an arbitrated loop. See also *BB_Credit*.

Cascade	Two or more interconnected fibre channel switches. SilkWorm 2000 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*.
Chassis	The metal frame in which the switch and switch components are mounted.
Circuit	An established communication path between two ports. Consists of two virtual circuits capable of transmitting in opposite directions. See also *Link*.
Class 1	Service that provides a dedicated connection between two ports (also called connection-oriented service), with notification of delivery or nondelivery.
Class 2	Service that provides multiplex and connectionless frame switching service between two ports, with notification of delivery or nondelivery.
Class 3	Service that provides a connectionless frame switching service between two ports, without notification of delivery or nondelivery of data. Can also be used to provide a multicast connection between the originator and recipients, with notification of delivery or nondelivery.
Class F	Connectionless service for control traffic between switches, with notification of delivery or nondelivery of data between the E_Ports.
Class of Service	A specified set of delivery characteristics and attributes for frame delivery.
Comma	A unique pattern (either 1100000 or 0011111) used in 8B/10B encoding to specify character alignment within a data stream. See also *K28.5*.
Community (SNMP)	A relationship between a group of SNMP managers and an SNMP agent, in which authentication, access control, and proxy characteristics are defined. See also *SNMP*.
CRC	Cyclic Redundancy Check; a check for transmission errors included in every data frame.
Credit	As applies to fibre channel, the number of receive buffers available for transmission of frames between ports. See also *BB_Credit*, *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. See also *Route*.
Data Word	Type of transmission word that occurs within frames. The frame header, data field, and CRC all consist of data words. See also *Frame*, *Ordered set*, *Transmission Word*.
Defined Zone Configuration	The set of all zone objects defined in the fabric. May include multiple zone configurations. See also *Enabled Configuration*, *Zone Configuration*.
Disparity	The relationship of ones and zeros in an encoded character. “Neutral disparity” means an equal number of each, “positive disparity” means a majority of ones, and “negative disparity” means a majority of zeros.
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 ID	As applies to SilkWorm switches, a unique number between 1 and 239 that identifies the switch to the fabric and is used in routing frames. Usually automatically assigned by the switch, but can be manually assigned.

E_D_TOV Error Detect Time-out 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 condition is declared. See also *R_A_TOV, RR_TOV.*

E_Port Expansion Port; a type of switch port that can be connected to an E_Port on another switch to create an ISL. See also *ISL*.

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 the exchange of frames across the fabric between source and destination. See also *End-to-end Flow Control*, *BB_Credit*.

EIA Rack A storage rack that meets the standards set by the Electronics Industry Association.

Enabled Zone Configuration The currently enabled configuration of zones. Only one configuration can be enabled at a time. See also *Defined Configuration*, *Zone Configuration*.

End-to-end Flow Control Governs flow of class 1 and 2 frames between N_Ports. See also *EE_Credit*.

Error As applies to fibre channel, a missing or corrupted frame, time-out, loss of synchronization, or loss of signal (link errors). See also *Loop Failure*.

Exchange The highest level fibre channel mechanism used for communication between N_Ports. Composed of one or more related sequences, and can work in either one or both directions.

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. See also *FL_Port*, *Fx_Port*.

Fabric A fibre channel network containing two or more switches in addition to hosts and devices. May also be referred to as a switched fabric. See also *Topology*, *SAN*, *Cascade*.

Fabric Configuration Server One or more designated SilkWorm switches that store and manage the configuration and security parameters for all other switches in the fabric. These switches are designated by WWN, and the list of designated switches is known fabric-wide.

Fabric Name The unique identifier assigned to a fabric and communicated during login and port discovery.

Fabric OS The proprietary operating system on Brocade switches.

FC-AL-3 The Fibre Channel Arbitrated Loop standard defined by ANSI. Defined on top of the FC-PH standards.

FC-FLA The Fibre Channel Fabric Loop Attach standard defined by ANSI.

FCP Fibre Channel Protocol; mapping of protocols onto the fibre channel standard protocols. For example, SCSI FCP maps SCSI-3 onto fibre channel.

FC-PH-1, 2, 3 The Fibre Channel Physical and Signalling Interface standards defined by ANSI.

FC-PI The 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-SW-2 The second generation of the Fibre Channel Switch Fabric standard defined by ANSI. Specifies tools and algorithms for the interconnection and initialization of fibre channel switches in order to create a multi-switch fibre channel fabric.

Fibre Channel Transport A protocol service that supports communication between fibre channel service providers. See also *FSP.*

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. See also *F_Port*, *Fx_Port*.

FLOGI Fabric Login; the process by which an N_Port determines whether a fabric is present, and if so, exchanges service parameters with it. See also *PLOGI*.

Frame The fibre channel structure used to transmit data between ports. Consists of a start-of-frame delimiter, header, any optional headers, the data payload, a cyclic redundancy check (CRC), and an end-of-frame delimiter. There are two types of frames: Link control frames (transmission acknowledgements, etc.) and data frames.

FRU Field-replaceable Unit; a component that can be replaced on site.

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. See also *FSP.*

FSP Fibre Channel Service Protocol; the common protocol for all fabric services, transparent to the fabric type or topology. See also *FS*.

FSPF Fabric Shortest Path First; Brocade's routing protocol for fibre channel switches.

Full-duplex A mode of communication that allows the same port to simultaneously transmit and receive frames. See also *Half-duplex*.

Fx_Port A fabric port that can operate as either an F_Port or FL_Port. See also *F_Port*, *FL_Port*.

G_Port Generic Port; a port that can operate as either an E_Port or 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.

GBIC Gigabit Interface Converter; a removable serial transceiver module that allows gigabaud physical-level transport for fibre channel and gigabit ethernet.

Gbps Gigabits per second (1,062,500,000 bits/second).

GBps GigaBytes per second (1,062,500,000 bytes/second).

Half-duplex A mode of communication that allows a port to either transmit or receive frames at any time, but not simultaneously (with the exception of link control frames, which can be transmitted at any time). See also *Full-duplex*.

Hard Address The AL_PA that an NL_Port attempts to acquire during loop initialization.

HBA Host Bus Adapter; the interface card between a server or workstation bus and the fibre channel network.

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.

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.

Initiator A server or workstation on a fibre channel network that initiates communications with storage devices. See also *Target.*

Integrated Fabric The fabric created by a SilkWorm 6400, consisting of six SilkWorm 2250 switches cabled together and configured to handle traffic as a seamless group.

IOD In-order Delivery; a parameter that, when set, guarantees that frames are either delivered in order or dropped.

ISL Interswitch Link; a fibre channel link from the E_Port of one switch to the E_Port of another. See also *E_Port*, *Cascade*.

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.*

IU Information Unit; a set of information as defined by either upper-level process protocol definition or upper-level protocol mapping.

JBOD Just a Bunch Of Disks; indicates a number of disks connected in a single chassis to one or more controllers. See also *RAID.*

K28.5 A special 10-bit character used to indicate the beginning of a transmission word that performs fibre channel control and signaling functions. The first seven bits of the character are the comma pattern. See also *Comma*.

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 one of two modes:

- *Fabric mode* Connected to a port that is not loop capable, and using fabric protocol.
- *Loop mode* In an arbitrated loop and using loop protocol. An L_Port in loop mode can also be in participating mode or non-participating mode.

See also *Non-participating Mode*, *Participating Mode.*

Latency The period of time required to transmit a frame, from the time it is sent until it arrives.

Link As applies to fibre channel, a physical connection between two ports, consisting of both transmit and receive fibres. See also *Circuit*.

Link Services A protocol for link-related actions.

LIP Loop Initialization Primitive; the signal used to begin initialization in a loop. Indicates either loop failure or resetting of a node.

LM_TOV Loop Master Time-out Value; the minimum time that the loop master waits for a loop initialization sequence to return.

Loop Failure Loss of signal within a loop for any period of time, or loss of synchronization for longer than the time-out value.

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_ID A hex value representing one of the 127 possible AL_PA values in an arbitrated loop.

Looplet A set of devices connected in a loop to a port that is a member of another loop.

LPSM Loop Port State Machine; the logical entity that performs arbitrated loop protocols and defines the behavior of L_Ports when they require access to an arbitrated loop.

LWL Long Wavelength; a type of fiber optic cabling that is based on 1300mm lasers and supports link speeds of 1.0625 Gbps. May also refer to the type of GBIC or SFP. See also *SWL*.

MIB Management Information Base; an SNMP structure to help with device management, providing configuration and device information.

Multicast The transmission of data from a single source to multiple specified N_Ports (as opposed to all the ports on the network). See also *Broadcast, Unicast*.

Multimode A fiber optic cabling specification that allows up to 500 meters between devices.

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. See also *NL_Port, Nx_Port*.

Name Server Frequently used to indicate Simple Name Server. See also *SNS*.

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. See also *N_Port, Nx_Port*.

Node A fibre channel device that contains an N_Port or NL_Port.

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 any received transmissions. This mode is entered if there are more than 127 devices in a loop and an AL_PA cannot be acquired. See also *L_Port, Participating Mode*.

Nx_Port A node port that can operate as either an N_Port or NL_Port.

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 the transport of frames.

Packet A set of information transmitted across a network. See also *Frame*.

Participating Mode A mode in which an L_Port in a loop has a valid AL_PA and can arbitrate, send frames, and retransmit received transmissions. See also *L_Port, Non-participating Mode*.

Path Selection The selection of a transmission path through the fabric. Brocade switches use the FSPF protocol.

Phantom Address An AL_PA value that is assigned to an 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.
PLOGI	Port Login; the port-to-port login process by which initiators establish sessions with targets. See also *FLOGI*.
Point-to-point	A fibre channel topology that employs direct links between each pair of communicating entities. See also *Topology.*
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.
Private NL_Port	An NL_Port that communicates only with other private NL_Ports in the same loop and does not log into the fabric.
Private Device	A device that supports arbitrated loop protocol and can interpret 8-bit addresses, but cannot log into the fabric.
Private Loop	An arbitrated loop that does not include a participating FL_Port.
Protocol	A defined method and a set of standards for communication.
Public NL_Port	An NL_Port that logs into the fabric, can function within either a public or a private loop, and can communicate with either private or public NL_Ports.
Public Device	A device that supports arbitrated loop protocol, can interpret 8-bit addresses, and can log into the fabric.
Public Loop	An arbitrated loop that includes a participating FL_Port, and may contain both public and private NL_Ports.
R_A_TOV	Resource Allocation Time-out Value; the maximum time a frame can be delayed in the fabric and still be delivered. See also *E_D_TOV, RR_TOV.*
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. See also *JBOD*.
Request Rate	The rate at which requests arrive at a servicing entity. See also *Service Rate*.
Route	As applies to a fabric, the communication path between two switches. May also apply to the specific path taken by an individual frame, from source to destination. See also *FSPF.*
Routing	The assignment of frames to specific switch ports, according to frame destination.
RR_TOV	Resource Recovery Time-out Value; the minimum time a target device in a loop waits after a LIP before logging out a SCSI initiator. See also *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.
SAN	Storage Area Network; a network of systems and storage devices that communicate using fibre channel protocols. See also *Fabric*.
Sequence	A group of related frames transmitted in the same direction between two N_Ports.
Service Rate	The rate at which an entity can service requests. See also *Request Rate*.

SFP	Small Form Factor Pluggable; optical transceiver used to convert signals between optical fiber cables and switches.
SI	Sequence Initiative.
SilkWorm	The brand name for Brocade's family of switches
Single Mode	The fiber optic cabling standard that corresponds to distances of up to 10 km between devices.
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. See also *Community (SNMP)*.
SNS	Simple Name Server; 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. May also be referred to as directory service. See also *FS.*
Switch	Hardware that routes frames according to fibre channel protocol and is controlled by software.
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.
SWL	Short Wavelength; a type of fiber optic cabling that is based on 850mm lasers and supports 1.0625 Gbps link speeds. May also refer to the type of GBIC or SFP. See also *LWL*.
Target	A storage device on a fibre channel network. See also *Initiator.*
Tenancy	The time from when a port wins arbitration in a loop until the same port returns to the monitoring state. Also referred to as loop tenancy.
Throughput	The rate of data flow achieved within a cable, link, or system. Usually measured in bps (bits per second). See also *Bandwidth*.
Topology	As applies to fibre channel, the configuration of the fibre channel network and the resulting communication paths allowed. There are three possible topologies: • 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.
Translative Mode	A mode in which private devices can communicate with public devices across the fabric.
Transmission Character	A 10-bit character encoded according to the rules of the 8B/10B algorithm.
Transmission Word	A group of four transmission characters.
Trap (SNMP)	The message sent by an SNMP agent to inform the SNMP management station of a critical error. See also *SNMP.*
Tunneling	A technique for enabling two networks to communicate when the source and destination hosts are both on the same type of network, but are connected by a different type of network.

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.
UDP	User Datagram Protocol; a protocol that runs on top of IP and provides port multiplexing for upper-level protocols.
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 Time-out Value; the minimum time that a SCSI ULP process waits for SCSI status before initiating ULP recovery.
Unicast	The transmission of data from a single source to a single destination. See also *Broadcast*, *Multicast*.
Well-known Address	As pertaining to fibre channel, a logical address defined by the fibre channel standards as assigned to a specific function, and stored on the switch.
Workstation	A computer used to access and manage the fabric. May also be referred to as a management station or host.
WWN	Worldwide Name; an identifier that is unique worldwide. Each entity in a fabric has a separate WWN.
Zone	A set of devices and hosts attached to the same fabric and configured as being in the same zone. See also *Brocade Zoning*. Devices and hosts within the same zone have access permission 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. See also *Defined Configuration*, *Enabled Configuration*.

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