StorageWorks by Compaq

Fabric Watch Version 2.6

User Guide

Contents

Index

Figures

Tables

About This Guide

This guide is designed to be used as step-by-step instructions for installation and as a reference for operation, troubleshooting, and future upgrades.

Text Conventions

This document uses the following conventions to distinguish elements of text:

Keys	Keys appear in boldface. A plus sign (+) between two keys indicates that they should be pressed simultaneously.
USER INPUT	User input appears in a different typeface and in uppercase
FILENAMES	File names appear in uppercase italics.
Menu Options, Command Names, Dialog Box Names	These elements appear in initial capital letters.
COMMANDS, DIRECTORY NAMES, and DRIVE NAMES	These elements appear in upper case. **NOTE:** UNIX commands are case sensitive and will not appear in uppercase.
Type	When you are instructed to *type* information, type the information **without** pressing the **Enter** key.
Enter	When you are instructed to enter information, type the information and then press the **Enter** key.

Symbols in Text

These symbols may be found in the text of this guide. They have the following meanings.

WARNING: Text set off in this manner indicates that failure to follow directions in the warning could result in bodily harm or loss of life.

CAUTION: Text set off in this manner indicates that failure to follow directions could result in damage to equipment or loss of information.

IMPORTANT: Text set off in this manner presents clarifying information or specific instructions.

NOTE: Text set off in this manner presents commentary, sidelights, or interesting points of information.

Symbols on Equipment

These icons may be located on equipment in areas where hazardous conditions may exist.

Any surface or area of the equipment marked with these symbols indicates the presence of electrical shock hazards. Enclosed area contains no operator serviceable parts.

WARNING: To reduce the risk of injury from electrical shock hazards, do not open this enclosure.

Any RJ-45 receptacle marked with these symbols indicates a Network Interface Connection.

WARNING: To reduce the risk of electrical shock, fire, or damage to the equipment, do not plug telephone or telecommunications connectors into this receptacle.

Any surface or area of the equipment marked with these symbols indicates the presence of a hot surface or hot component. If this surface is contacted, the potential for injury exists.

WARNING: To reduce the risk of injury from a hot component, allow the surface to cool before touching.
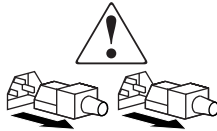
Power Supplies or Systems marked with these symbols indicate the equipment is supplied by multiple sources of power.

WARNING: To reduce the risk of injury from electrical shock, remove all power cords to completely disconnect power from the system.

Any product or assembly marked with these symbols indicates that the component exceeds the recommended weight for one individual to handle safely.

WARNING: To reduce the risk of personal INJURY or damage to the equipment, observe local occupational health and safety requirements and guidelines for manual material handling.

Getting Help

If you have a problem and have exhausted the information in this guide, you can get further information and other help in the following locations.

Compaq Technical Support

In North America, call the Compaq Technical Phone Support Center at 1-800-OK-COMPAQ. This service is available 24 hours a day, 7 days a week.

NOTE: For continuous quality improvement, calls may be recorded or monitored.

Outside North America, call the nearest Compaq Technical Support Phone Center. Telephone numbers for world wide Technical Support Centers are listed on the Compaq website. Access the Compaq website by logging on to the Internet at http://www.compaq.com.

Be sure to have the following information available before you call Compaq:

- Technical support registration number (if applicable)

- Product serial numbers

- Product model names and numbers

- Applicable error messages

- Add-on boards or hardware

- Third-party hardware or software

- Operating system type and revision level

- Detailed, specific questions

Compaq Website

The Compaq website has latest information on this product as well as the latest drivers. You can access the Compaq website by logging on to the Internet at http://www.compaq.com/storage.

Compaq Authorized Reseller

For the name of your nearest Compaq Authorized Reseller:

- In the United States, call 1-800-345-1518.

- In Canada, call 1-800-263-5868.

- Elsewhere, see the Compaq website for locations and telephone numbers.

Chapter **1**

Overview of Fabric Watch

Fabric Watch allows the administrator to monitor key fabric and switch components, making it easy to quickly identify and escalate potential problems. Fabric Watch monitors each component for out-of-boundary values or counters and provides notification when any component exceeds the defined boundaries. The administrator can configure which components, such as error, status, and performance counters, are monitored.

Fabric Watch can be accessed through Web Management Tools, a Telnet interface, an SNMP-based enterprise manager, or by modifying and uploading the Fabric Watch configuration file to the switch.

Fabric Watch monitors the following components:

■ Switch environment (fans, power supplies, and temperature)

■ GBICs

■ Ports (state changes, errors, and performance)

■ Fabric events (such as topology reconfigurations, zone changes)

With Fabric Watch, each switch continuously monitors error and performance counters against a set of defined ranges. This and other information specific to each monitored element is made available by Fabric Watch for viewing, and, in some cases, modification. The set of information about each element is called a *threshold*, and the upper and lower limits of the defined ranges are called *boundaries*.

Threshold Behavior Models

There are three behavior models for thresholds:

- Range Threshold, page 1-2
- Rising/Falling Threshold, page 1-3
- Change Monitor Threshold, page 1-3

Range Threshold

A range threshold tracks whether a fabric element is within a specified range. It includes a minimum and maximum boundary for the area, with buffer zones to prevent repeated events due to oscillation of the value over a threshold boundary. If the value exceeds the low or high threshold boundary, an event is generated. Fabric Watch can also generate events while the value is outside the limits or when it re-enters the prescribed range.

Temperature, as an example of a range threshold, is illustrated in Figure 1–1.
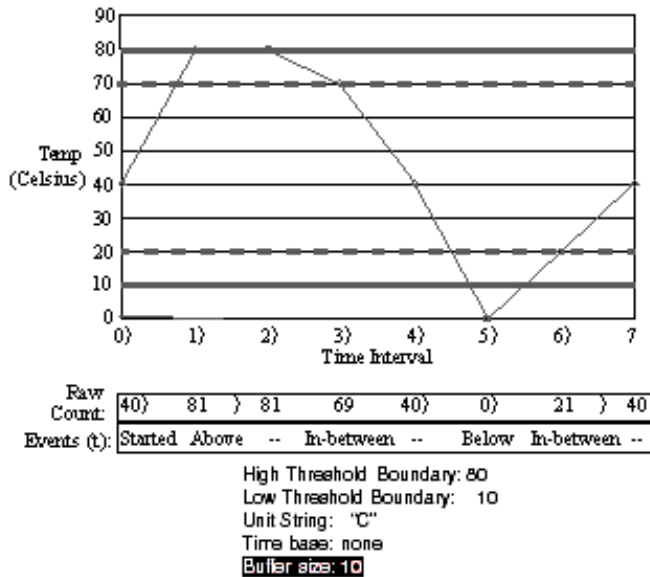
Figure 1–1: Range threshold example

Rising/Falling Threshold

A rising/falling threshold tracks whether an element is on the desired side of a boundary. It includes an upper and lower boundary, and the buffer zones are always 0. Events can be selected for transitions between the boundaries. Rising/falling thresholds are typically used for rate-based counters.

An error counter as a rising/falling threshold is illustrated in Figure 1–2.
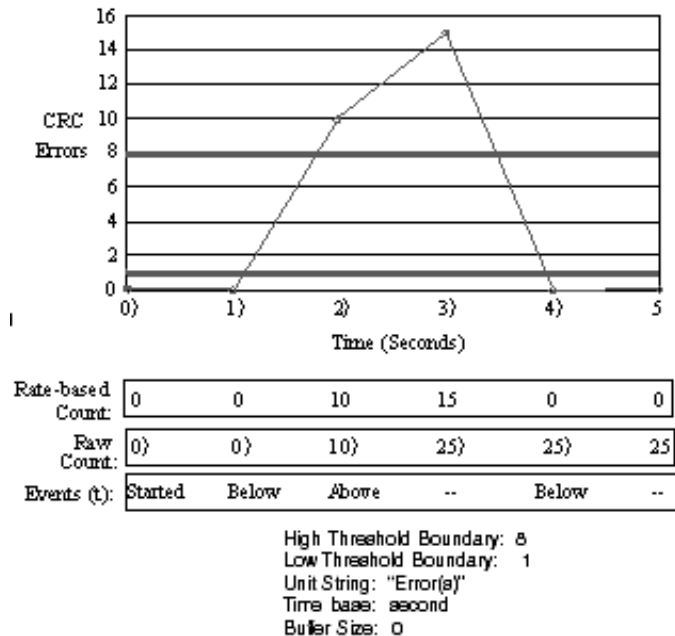
Figure 1–2: Rising/Falling threshold example

Change Monitor Threshold

A change monitor threshold generates events whenever a counter value changes, regardless of the type of change. This type of threshold is usually used to indicate state changes, such as zoning changes. Because change monitor thresholds include no boundaries, no illustration is provided.

Profiles

Fabric Watch includes a complete set of threshold and alarm configuration defaults. In addition, a Fabric Watch profile, specific to your environment, can be downloaded to the switch to customize the configuration. Each profile is for a different purpose, and contains only the configuration information that is different from the default configuration. The default information is always preserved. After loading the profile, specify whether the default or the profile information is used.

A profile may contain the following information:

■ Threshold values: Unit string, time base, lower boundary, upper boundary, buffer size.

■ Alarm values: Change, exceed, below, above, in-between, behavior type.

Classes and Areas

Fabric and switch components are organized into classes, which are groupings of closely related elements. The classes are listed in the left panel of all Fabric Watch views (see Figure 2–3). Table 1–1 lists the seven classes:

Table 1–1: Classes of Fabric and Switch Components

Class	Description
Environmental	Monitors switch environment functions such as temperature, power supply, fan status
GBIC	Monitors operational values for FINISAR smart GBICs
Port	Monitors port error and performance counters
E_Port	Monitors E_Port error and performance counters
F/FL Copper Port	Monitors copper FL/F_Port error and performance counters
F/FL Optical Port	Monitors optical FL/F_Port error and performance counters
Fabric	Monitors key fabric resources such as fabric reconfiguration, zoning changes, new fabric logins

In addition, each class is subdivided into areas, as listed in Table 1–2. The areas are found in the Configure Thresholds tab for each class.

Table 1–2: Fabric Watch Classes and Areas

Class	Area	Description
Environmental	Temperature	Monitors switch temperature.
	Fan	Monitors operation of switch fans.
	Power supply	Monitors status of each power supply.
GBIC	Temperature	Monitors GBIC temperature.
	RX Power	Monitors GBIC receiver power.
	TX Power	Monitors GBIC transmitter power.
	Current	Monitors GBIC current.
Port, E-Port, F/FL Copper Port, and F/FL Optical Port	Link Loss	Monitors link failure for each port.
	Sync Loss	Monitors port sync loss.
	Signal Loss	Monitors port signal loss.
	Protocol Error	Monitors port protocol errors.
	Invalid Words	Monitors port invalid words.
	Invalid CRCs	Monitors port CRC errors.
	State changes	Monitors port state changes.
	RX Performance	Monitors port receive performance.
	TX Performance	Monitors port transmit performance.
	State changes	Monitors copper F/FL_port state changes.
Fabric	Loss of E_Port	Monitors E_Port status.
	Fabric reconfiguration	Monitors fabric configuration changes.
	Segmentation changes	Monitors segmentation changes.
	Domain ID changes	Monitors forcible DOMAIN ID changes.
	Zoning changes	Monitors changes to currently enabled zoning configuration.
	Fabric to QuickLoop changes	Monitors ports to detect changes from fabric to QuickLoop or QuickLoop to fabric.
	Fabric logins	Monitors number of host device fabric logins (flogi).
	GBIC change	Monitors insertion/removal of GBIC.

Chapter **2**

Using Fabric Watch

Installing Fabric Watch

Installing Fabric Watch involves the installation of a license on each switch you want to enable for Fabric Watch. If the switch was shipped with firmware version 2.6, then a license was installed in the switch at the factory. If upgrading to version 2.6, contact your switch supplier to obtain a license key. See Getting Help in the *Fibre Channel SAN Switch Management Guide*.

Using Fabric Watch

Fabric Watch provides the information about each out-of-boundary condition discovered, including the name of the threshold, time base for counter, used to compute rate of change (for example, events per minute) and the number of events.

This section provides the following information:

- User Interfaces, page 2-2
- Threshold Naming Conventions, page 2-4
- Events, page 2-4
- Configuring Thresholds and Alarms, page 2-6

User Interfaces

You can view and modify Fabric Watch settings through Web Management Tools, the telnet interface, an SNMP-based enterprise manager, or the configuration file.

Web Management Tools

To access Fabric Watch from Web Management Tools, see Fabric Watch View, page 3-49, in the *Fibre Channel SAN Switch Management Guide*.

Through Web Management Tools, you can:

■ View fabric and switch events through the fabric-wide Event View.

■ View and modify threshold and alarm configurations through the Fabric Watch view.

■ Upload and download the configuration file through the Config Admin tab in the Switch Admin window.

Telnet Interface

To access specific Fabric Watch commands using Telnet, see Fabric Watch Telnet Commands, page A-140, in the *Fibre Channel SAN Switch Management Guide*.

You can do the following through a Telnet interface:

■ Configure alarms filtering.

■ Show alarms filtering.

■ Initialize all Fabric Watch classes.

■ Modify thresholds and configuration information.

■ Set boundary and alarm level to custom or default.

■ Show thresholds monitored by Fabric Watch.

■ Upload and download the configuration file through the Telnet commands configUpload and configDownload.

SNMP-Based Enterprise Managers

The Fabric Watch configuration information is stored as MIB variables, allowing you to do the following:

■ Query the MIB variable for individual fabric and switch elements.

■ Query and modify threshold and alarm configurations.

■ Receive generated SNMP traps when threshold conditions are met.

Configuration File

To view and modify the threshold and alarm configurations, upload the configuration file from the switch to the host, edit it in a text editor, then download the modified file back to the switch. Ensure a uniform configuration throughout the fabric by distributing the configuration file to all the switches in the fabric.

The configuration file can be uploaded and downloaded through either Web Management Tools (the Config Admin tab in the Switch Admin window) or the Telnet commands configUpload and configDownload. After downloading the file back to the switch, you must either restart the switch or use the Telnet command fwConfigReload to reload the configuration file.

Threshold Naming Conventions

All threshold names consist of three items, with no separators: Abbreviation for the class name, abbreviation for the area name, and index number for the number of the item in the series. For example, the threshold corresponding to the first thermometer in the switch is in the Environment class, Temperature area, and is therefore named envTemp001.

■ Abbreviations for the class name (alpha characters, lower case), as follows:

Table 2–1: Class Name Abbreviations

Class	Abbreviation
Fabric	fabric
Environment	env
Port	port
E_Port	eport
F/FL_Port (Optical)	fopport
F/FL_Port (Copper)	fcuport
GBIC	gbic

■ Abbreviation for the area name (alpha characters, title case). For example, "Temp" for the Temperature area.

■ Index number for the number of the item within the series. Consists of three numbers, for example: 000 for the first port, 001 for the next, etc. Index numbers for the Fabric, Port, E_Port, F/FL_Port (Optical), F/FL_Port (Copper), and GBIC classes begin with 000, and index numbers for the Environment class begin with 001.

Events

An event is generated each time a boundary, as defined by the threshold, is crossed. Boundaries are not inclusive, so events are generated only when a boundary is exceeded, not when the monitored value has only reached them. If the event has an assigned alarm, an alarm is also generated. The alarm can be designated as an SNMP trap, an entry in the switch error log, locking of the port log, or a combination of these options.

The Watched check box in the GUI is used for configuring Threshold Element Monitoring state (enable/disable monitoring). Examples of Threshold Elements include an E_Port, a GBIC or a fan. If there are six fans in the switch, there will be six Threshold Elements shown in the Fan drop down list. By highlighting one of the Fans in the drop down list and either selecting or deselecting the Watched check box, the user will be able to enable or

disable monitoring of that fan. Enabling monitoring means events will be sent when cross-boundary behavior occurs with that Threshold Element. Disabling Monitoring means that no event will be sent out. If one of the Threshold Element objects is physically removed, Fabric Watch will raise an event. As a result of this removal, that particular Threshold Element will disappear from the drop down list. Conversely, adding a Threshold Element will cause the new Threshold Element to appear in the drop down list.

Event policies control the generation of events, and can be configured for either triggered events or continuous events.

Triggered Events

A triggered event results in a single event when a boundary is exceeded. The event is not generated again until the threshold value has returned within the boundaries and then once again exceeded them. For example, if the switch temperature exceeds the upper boundary, a triggered event is generated at the point the boundary is crossed, but is not repeated while the temperature remains above the upper boundary.

The following events can be generated as triggered events (see Table 2–2):

<div align="center">Table 2–2: Triggered Events</div>

Event	Description
Started	The start point of the state machine. No alarm is generated.
Below	Counter is below the lower boundary. Must be preceded by a start, above, or in-between event.
Above	Counter is above the upper boundary. Must be preceded by a start, below, or in-between event.
Exceeded	Whenever the sensor value crosses a high boundary, low boundary, high buffer boundary, or low buffer boundary, the exceeded event will be generated.
Changed	Counter value has changed.
In-between	Counter falls below the upper boundary minus buffer, or rises above the lower boundary plus buffer. Must be preceded by an above or below event. If the buffer is set to zero, this event is suppressed.

Continuous Events

A continuous event results in an event at each time interval from when the boundary is initially exceeded until the threshold value has returned within the boundaries (i.e., temperature or fan rpms). For example, if port utilization is above the upper boundary, a new event is generated at each behavior interval until utilization falls below the upper boundary. The following events can be generated as continuous events (see Table 2–3):

Table 2–3: Continuous Events

Event	Description
Started	No alarm is generated.
Below	Counter is below the lower boundary.
Above	Counter is above the upper boundary.
Exceeded	Counter is below the lower boundary or above the upper boundary. Accompanies a below or above event.
Changed	Counter has changed.
NOTE: The difference between triggered events and continuous events is that the new trigger mode state is dependent upon the previous state. The continuous events are not. That is why continuous events do not include the "In-Between" event.	

Configuring Thresholds and Alarms

The configuration of thresholds and alarms can be divided into two categories: threshold values and threshold area values.

Threshold Values

Threshold values apply to the specific threshold. They are not stored in the configuration file, and return to the default values if the switch is rebooted. The following threshold values can be modified (see Table 2–4):

Table 2–4: Threshold Values

Value	Description
Status	Can be enabled or disabled. Enabled by default.
Behavior type	Allows setting of the event policy to triggered or continuous. Set to triggered by default.
Behavior interval	The interval between the same type of alarm. Applies only to continuous events. The default interval is 1 second.

Threshold Area Values

Threshold area values include boundaries and alarms, and apply to all the thresholds within an area. Changes are stored in the configuration file. There are two types of threshold area values:

■ Boundaries, (see Table 2–5)

■ Alarms, (see Table 2–6)

The following boundary information can be modified :

Table 2–5: Boundaries

Boundary	Description
Unit string	Represents unit value. Only the default unit strings are supported by Fabric Watch.
Time base	Time period within which a specified event is measured. Can be from one second to one day. Shorter time periods are more sensitive to fluctuations and therefore will provide more detailed information.
Low boundary	Minimum value. An event is generated if the element value falls below this boundary.
High boundary	Maximum value. An event is generated if the element value rises above this boundary.
Buffer size	Size of buffer set up to decrease generation of in-between events due to oscillation of the element value over a boundary.

An *event* is considered to have occurred when conditions break out of acceptable ranges. One or more alarms (alarm mechanisms) are generated, if the relevant threshold has been configured. Each event can generate one or more alarms.

There are three types of alarms (see Figure 2–6):

Table 2–6: Alarms

Type	Description
Switch Event Log Entry (System Log)	The internal error log maintains a record of the event, up to a maximum of 64 entries. If configured to do so, error log entries are forwarded to the SYSLOGD facility.
SNMP Trap	The following information is forwarded to an SNMP management station: ■ Name of the element ■ Class, area, and index of the threshold ■ Type of event generated ■ Element value ■ New state of element
Locking of the Port Log (Port Log Lock)	This alarm freezes the switch port log to retain detail information about a problem. Typically, this alarm type is used in conjunction with the switch event log entry.

If you are working from Web Management Tools or another graphical user interface (GUI), then the Alarm Mechanisms dialog box (Figure 2–1) displays after you make a configuration change and apply it,. The alarms can be selected or deselected. Multiple alarm mechanisms can be selected.

Figure 2–1: Alarm Mechanisms dialog box

Fabric Watch Views

The Fabric Watch graphical user interface (GUI) is divided into two sections: classes (left-hand panel), and tabs (right-hand panel). Classes denote the SAN components which you can monitor. Tabs allow you to view alarm notifications, set thresholds, and view current settings.

When you access Fabric Watch, you will be asked to enter your User Name and Password. Defaults are:

User Name: admin
Password: password

The Alarm Notifications tab displays switch environment information as the default view. This view is a split window.

■ The left panel is an organizational tree showing all Fabric Watch classes, regardless of which tab is selected.

■ The right panel shows the three tabs: Alarm Notifications, Configure Thresholds, and Current Settings.

❏ Alarm Notifications: For all classes, the same columns are displayed in this tab. The columns are described in Table 2–7:

Table 2–7: Alarm Notifications Tab

Column	Description
Name	Displays the name of the monitored area, for example, fan, thermal sensor, port state, or fabric information.
State	Defines the current operating characteristics of the monitored area: Normal or Faulty.
Reason	Displays the threshold type used to monitor the current operating state of the area: Out-Ranged, Above, Below, In-Between or Changed.
Old Value	Threshold element previous reading.
New Value	Threshold element current reading.
Time	Time that the current reading was taken.

❏ Configuring Thresholds: The information in this tab changes depending on the class for which you are configuring thresholds.

NOTE: The selections for all four port options (Port, E-Port, F.FL Copper Port, and F/FL Optical Port) are the same.

❏ Current settings: Review the current settings for each class and area with the information provided by this tab.

NOTE: The selections for all four port options (Port, E-Port, F.FL Copper Port, and F/FL Optical Port) are the same.

Drag your cursor over the left border of the Alarm Notifications panel until the pointer becomes a double-ended arrow (see Figure 2–2). Resize the panel so that you can see both panels.
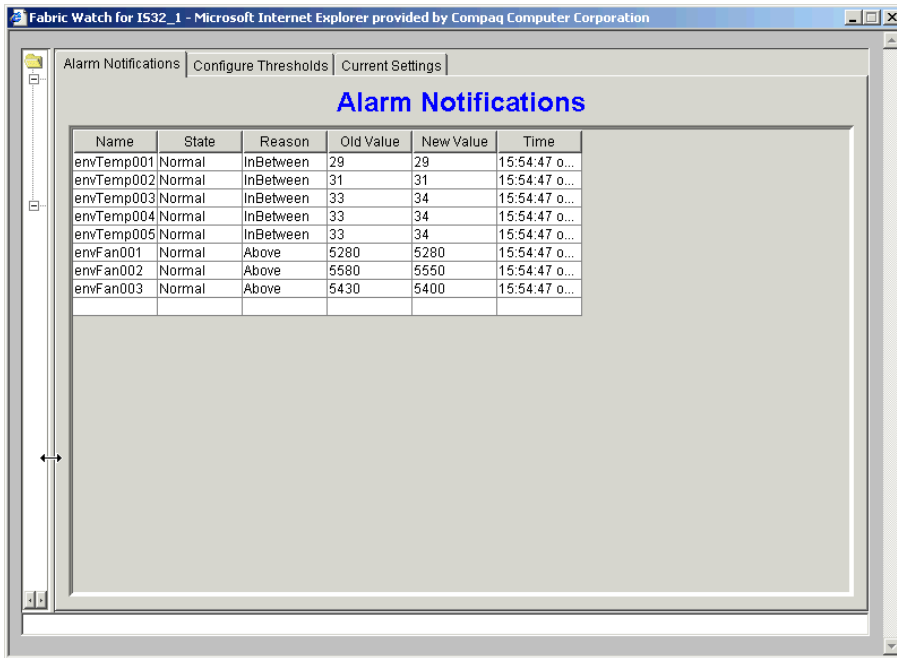

Figure 2–2: Default Fabric Watch view

Environmental Class

Access tabs in Environmental class to monitor and configure thresholds for switch environment functions such as temperature, power supply and fan status.

Use the Alarm Notifications tab (Figure 2–3) to view environmental information about the switch.

Figure 2–3: Environmental class, Alarm Notifications tab

Use the Environmental Thresholds tab (Figure 2–4) to set event policies (triggered or continuous events), boundaries, alarm mechanisms, threshold type (outranged, above, in-between, below, or changed), and whether or not you want the specified area watched. Table 2–8 describes the areas in the Environmental Thresholds tab.
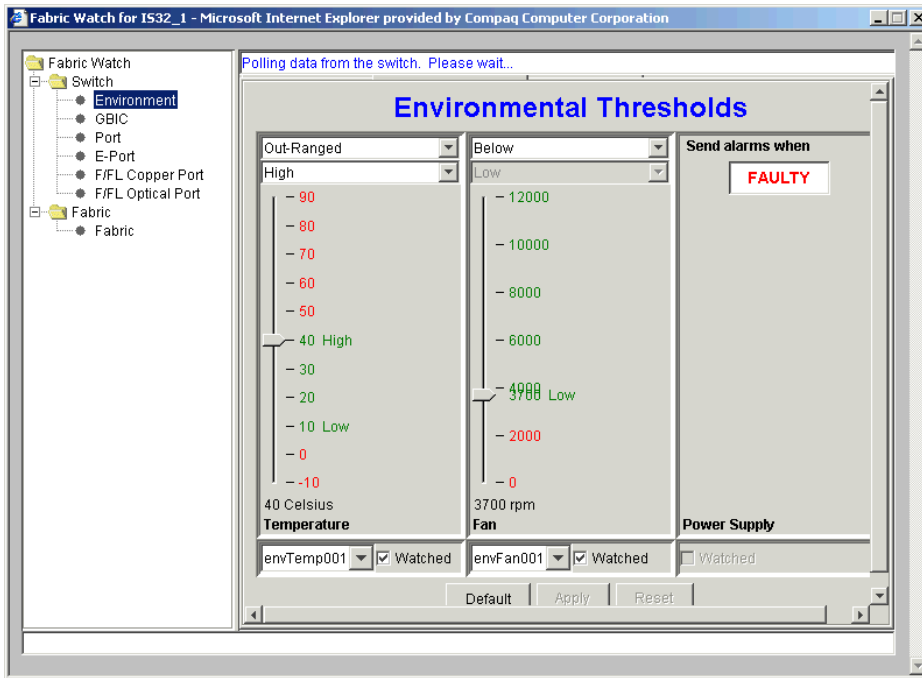
Figure 2–4: Environmental class, Configuration Thresholds tab

Table 2–8: Environmental Class, Configurations Thresholds Tab

Column/Field	Description
Temperature Column	
Threshold Type dropdown list	Select the threshold type from this dropdown list. Options are: ■ Out-Ranged: Any value outside the selected High/Low range will trigger an event. ■ Above: Any value above the selected threshold will trigger an event. ■ In-Between: Any value within the selected High/Low range will trigger an event. ■ Below: Any value below the selected threshold will trigger an event. ■ Changed: A change in the counter will trigger an event.
High/Low dropdown list	For threshold types Out-Ranged and In-Between, select High to set the high threshold, then select Low to set the low threshold. This dropdown list is not an option for other threshold types.
Scale	Select the temperature, in Celsius.

Table 2–8: Environmental Class, Configurations Thresholds Tab (Continued)

Column/Field	Description
Area dropdown list	Select an area for which you want to configure thresholds. In Figure 2–4, there are five temperature monitors. When you select any one of them (i.e., envTemp001) and set thresholds, the same configuration will automatically apply itself to the other temperature monitors in the switch.
Watched checkbox	Select or deselect this checkbox to specify whether you want this area monitored.
Fan Column	
Threshold Type dropdown list	Same as above.
High/Low dropdown list	Same as above
Scale	Select the rotations per minute (rpm).
Area dropdown list	Select an area for which you want to configure thresholds. In Figure 2–4, there are three fans. When you select any one of them (i.e., envFan001) and set thresholds, the same configuration will automatically apply itself to the other fans in the switch.
Watched checkbox	Select or deselect this checkbox to specify whether you want each area monitored. If you want each area monitored, you must choose the area from the dropdown list, and select the Watched checkbox each time.
Power Supply Column	
Send alarms when toggle field	Select Faulty or OK to specify whether you want to be notified when the power supply is in the acceptable range (OK) or outside the acceptable range (FAULTY).

After you make changes to the configuration, select one of the buttons at the bottom of the window (see Figure 2–5).

■ Default: Resets configuration to factory defaults. Select Apply after Default.

■ Apply: Applies current settings to the specified class, then requests Alarm Mechanism (see Figure 2–1).

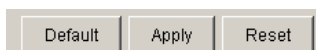■ Reset: Settings are returned to last saved configuration.

Figure 2–5: Default/Apply/Reset buttons

The Current Settings tab (Figure 2–4) provides a summary of the configuration for the specified class, in each area:

- Temperature (summary for each temperature monitor)
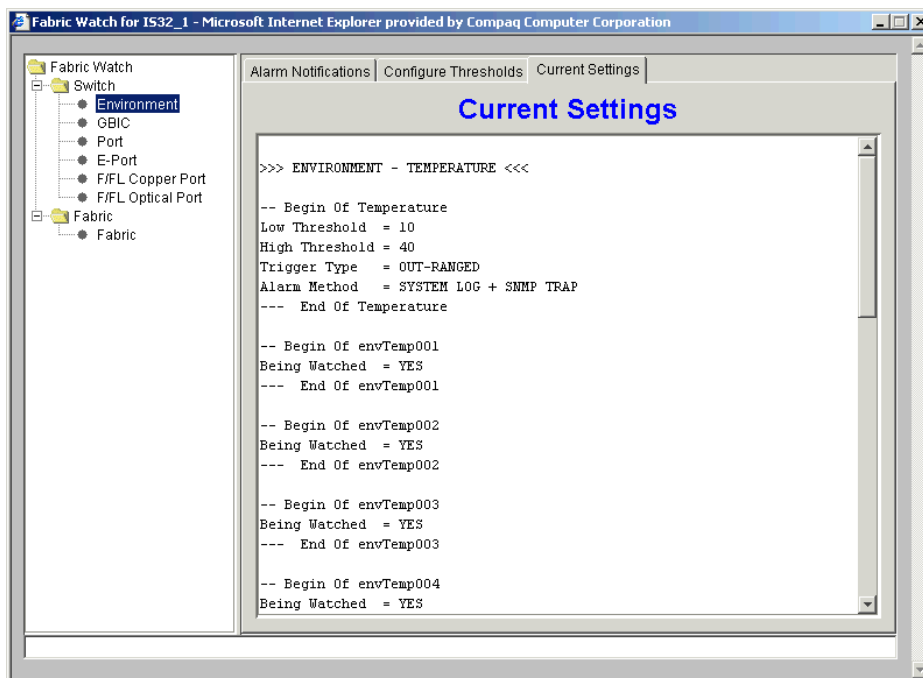
- Fan (summary for each fan).

- Power Supply

Figure 2–6: Environmental class, Current Settings tab

GBIC Class

Access tabs in the GBIC class to monitor and configure thresholds for temperature, receiver power, transmitter power and current.
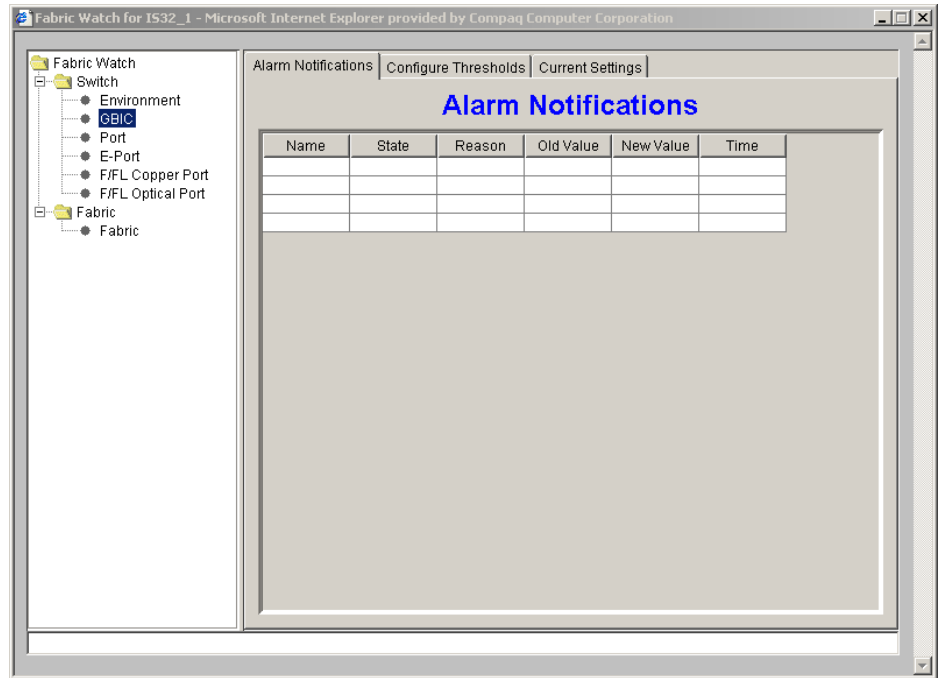
Use the Alarm Notifications tab (Figure 2–7) to view GBIC information.

Figure 2–7: GBIC class, Alarm Notifications tab

Use the GBIC Thresholds tab (Figure 2–8) to set event policies (triggered or continuous events), boundaries, alarm mechanisms, threshold type (outranged, above, in-between, below, or changed), and whether or not you want the specified area watched. Table 2–9 describes the areas in the GBIC Thresholds tab.
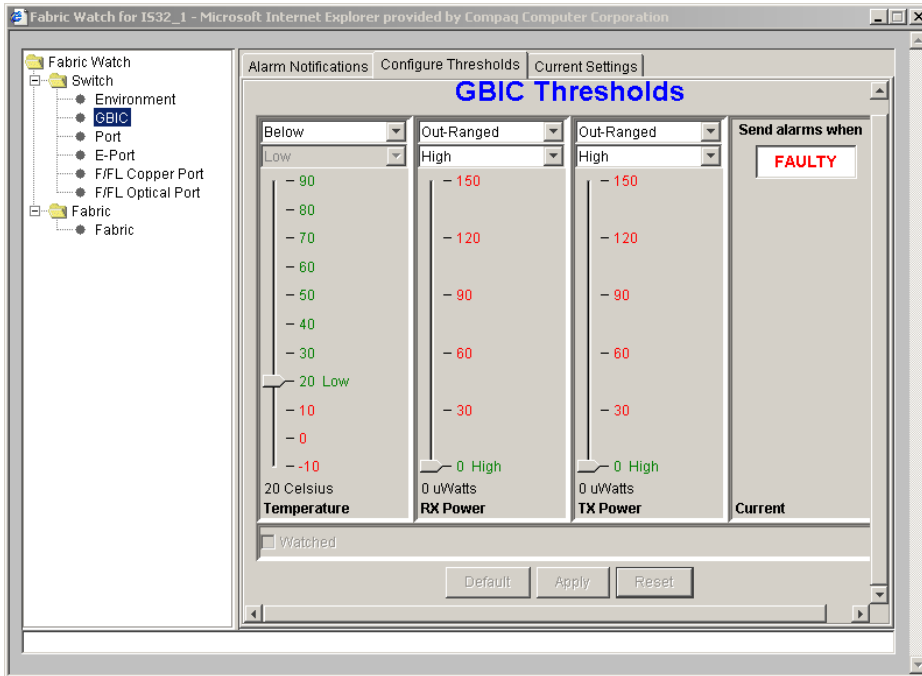
Figure 2–8: GBIC class, Configure Thresholds tab

Table 2–9: GBIC Class, Configurations Thresholds Tab

Column/Field	Description
Temperature Column	

Column/Field	Description
Temperature Column	
Threshold Type dropdown list	Select the threshold type from this dropdown list. Options are: ■ Out-Ranged: Any value outside the selected High/Low range will trigger an event. ■ Above: Any value above the selected threshold will trigger an event. ■ In-Between: Any value within the selected High/Low range will trigger an event. ■ Below: Any value below the selected threshold will trigger an event. ■ Changed: A change in the counter will trigger an event.
High/Low dropdown list	For threshold types Out-Ranged and In-Between, select High to set the high threshold, then select Low to set the low threshold. This dropdown list is not an option for other threshold types.
Scale	Select the temperature, in Celsius.
RX Power and TX Power Column	
Threshold Type dropdown list	Same as above.
High/Low dropdown list	Same as above
Scale	Select the micro Watts. In the GBIC class, area RX Power and TX Power stand for power received and power transmitted by the laser diode in the GBIC. The default setting was derived from the first qualified GBIC specification and is set up by the lower level code, such as the Fabric Watch Daemon. For different GBICs, please refer manufacturer's specification.
Current Column	
Send alarms when toggle field	Select Faulty or OK to specify whether you want to be notified when the current is in the acceptable range (OK) or outside the acceptable range (FAULTY).

After you make changes to the configuration, select one of the buttons at the bottom of the window (see Figure 2–9).

■ Default: Resets configuration to factory defaults. Select Apply after Default.

■ Apply: Applies current settings to the specified class, then requests Alarm Mechanism (see Figure 2–1).

■ Reset: Settings are returned to last saved configuration.

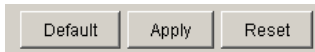Figure 2–9: Default/Apply/Reset buttons

The Current Settings tab (Figure 2–10) provides a summary of the configuration for the GBIC class, in each area:

■ Temperature

■ RX Power

■ TX Power

■ Current
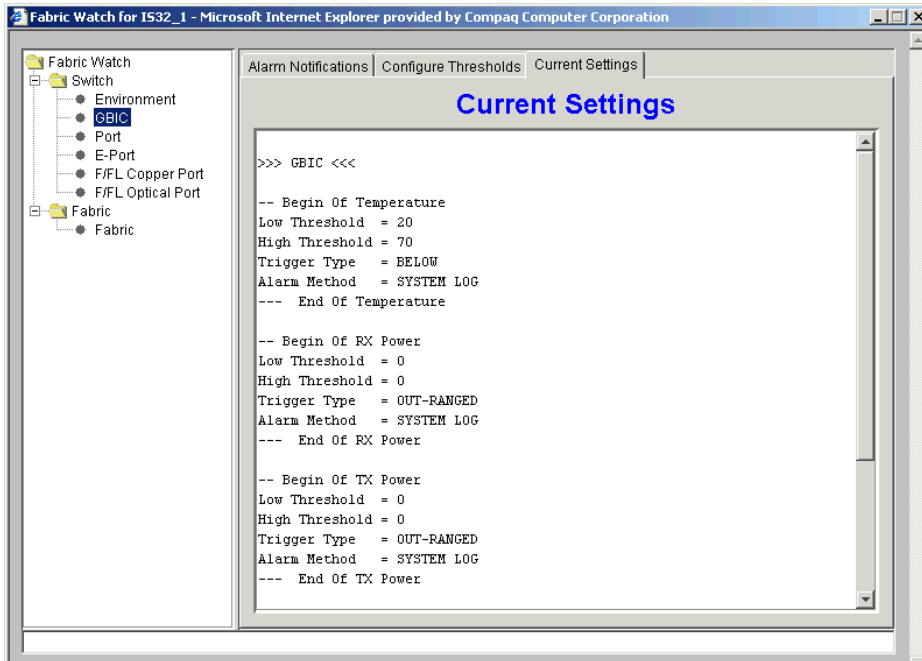
Figure 2–10: GBIC class, Current Settings tab

Port, E-Port, F/FL Copper Port, and F/FL Optical Port Classes

The views for Port, E-Port, F/FL Copper Port (not supported by Compaq) and F/FL Optical Port all contain the same columns and fields. Therefore, all four classes are covered in this section. The term "Port" is used generically to refer to any port class.

Access tabs in the Port classes to monitor and configure port performance thresholds such as link failure, loss of synchronization, loss of signal, protocol errors, invalid word transmission, CRC errors, transmit and receive performance, and state changes.

Use the Alarm Notifications tab (Figure 2–11) to view port information.

Figure 2–11: All Port classes, Alarm Notifications tab

Use the Port Thresholds tab (Figure 2–12) to set the number of occurrences acceptable for each area and port being watched. Table 2–9 describes the areas in the Port Thresholds tab.
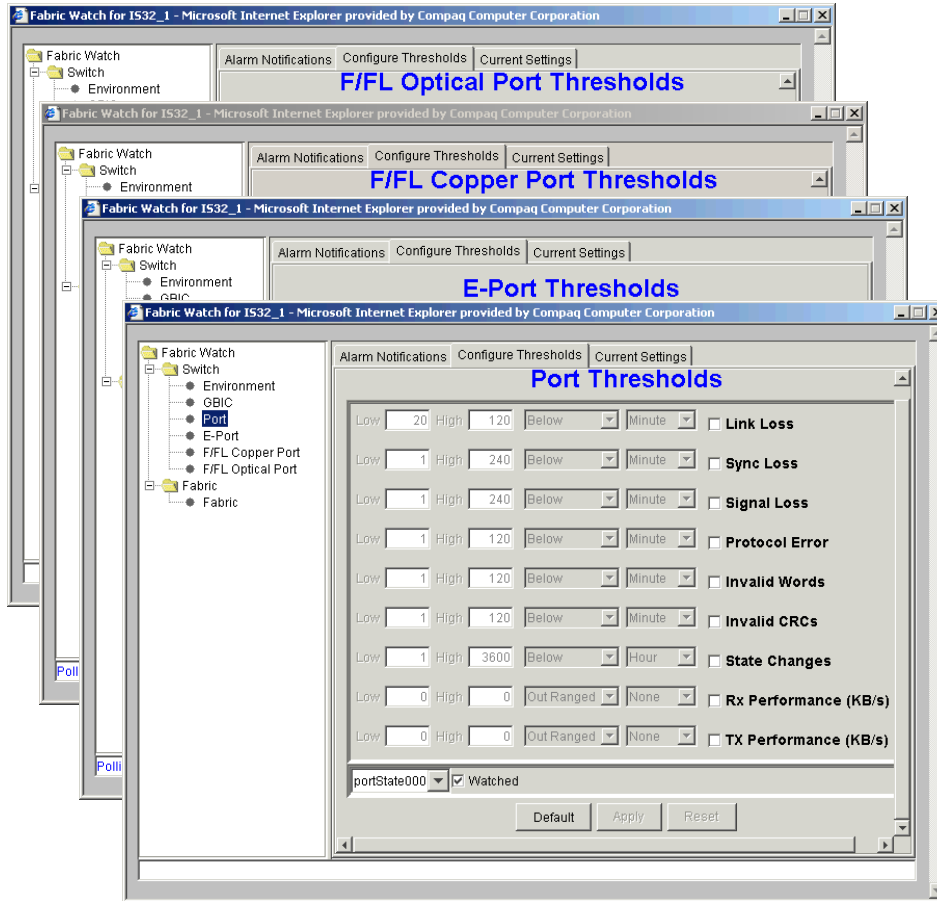

Figure 2–12: All Port classes, Configure Thresholds tab

Table 2–10: All Port Classes, Configure Thresholds Tab

Field	Description
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 dropdown list	Select the threshold type from this dropdown list. Options are: ■ Out-Ranged: Any value outside the selected High/Low range will trigger an event. ■ Above: Any value above the selected threshold will trigger an event. ■ In-Between: Any value within the selected High/Low range will trigger an event. ■ Below: Any value below the selected threshold will trigger an event. ■ Changed: A change in the counter will trigger an event.
Threshold Sampling Rate	Select the time period for interval for which you want the port monitored. Options are: ■ None ■ Second ■ Minute (default) ■ Hour ■ Day
portState dropdown list	Select the port number for which you want to configure thresholds (i.e., portState000 or eportState000 refer to the first port in the switch).
Watched checkbox	Select or deselect this checkbox to specify whether you want each port monitored. If you want each port monitored, you must choose the port from the dropdown list, and select the Watched checkbox each time.
Areas	
NOTE: Select the checkbox adjacent to an area, then configure high, low, type and rate.	
Link Loss	Monitor error rate of each port.
Sync Loss	Monitor port synchronization errors.
Signal Loss	Monitor port signal loss.
Protocol Error	Monitor port protocol errors.
Invalid Words	Monitor port invalid words.
Invalid CRCs	Monitor CRC (cyclic redundancy check) errors.

Table 2–10: All Port Classes, Configure Thresholds Tab (Continued)

Field	Description
State Changes	Monitor port state changes, for example, online, offline, testing, or faulty.
RX Performance	Monitor receive performance in kilobytes per second.
TX Performance	Monitor transmit performance in kilobytes per second.

After you make changes to the configuration, select one of the buttons at the bottom of the window (see Figure 2–12).

■ Default: Resets configuration to factory defaults. Select Apply after Default.

■ Apply: Applies current settings to the specified class, then requests Alarm Mechanism (see Figure 2–1).

■ Reset: Settings are returned to last saved configuration.

Figure 2–13: Default/Apply/Reset buttons

The Current Settings tab (Figure 2–14) provides a summary of the configuration for each port selected in each of the following areas:

■ Link Loss

■ Sync Loss

■ Signal Loss

■ Protocol Error

■ Invalid words

■ Invalid CRCs

■ State Changes
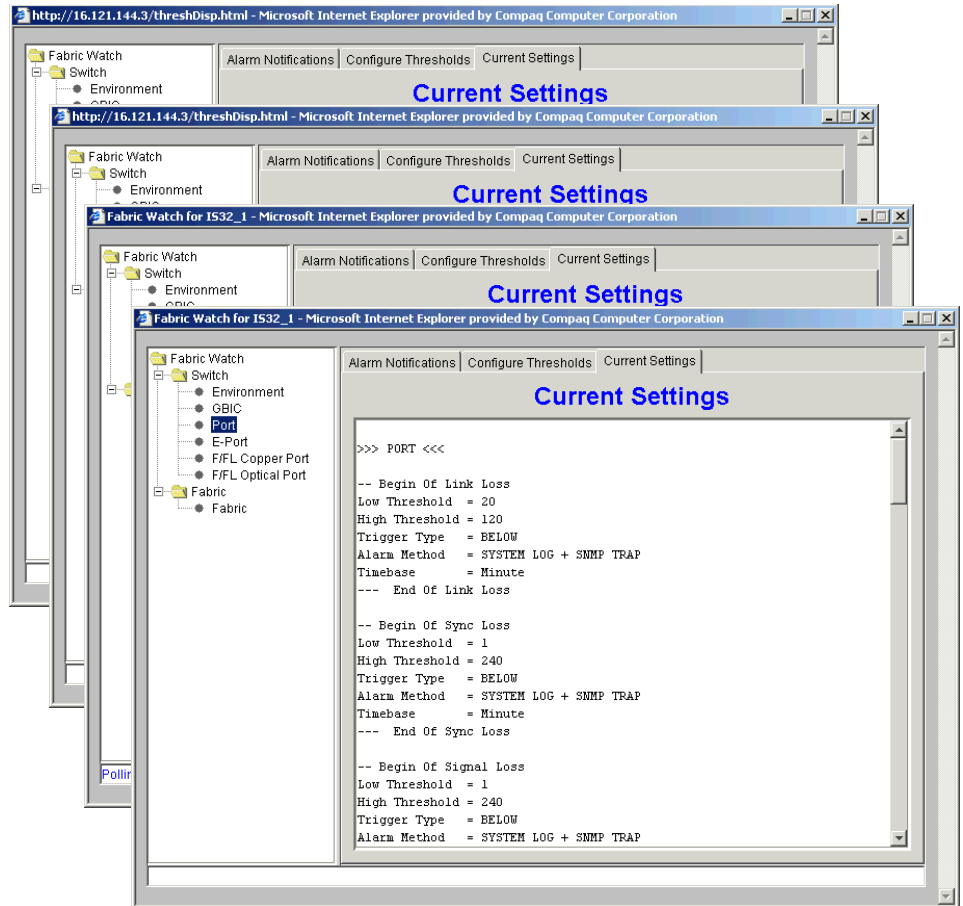
■ RX Performance

■ TX Performance

Figure 2–14: All Port classes, Current Settings tab

Fabric Class

Access tabs in the Fabric class to monitor and configure thresholds for fabric-wide events such as changes in configuration, segmentation, domain ID, zoning, QuickLoop, or GBICs.

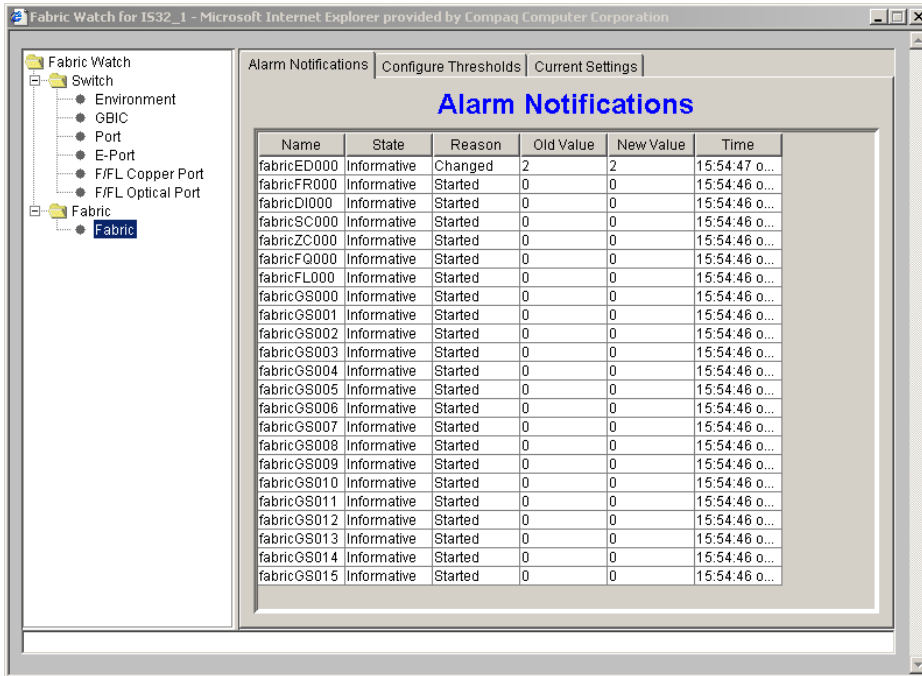Use the Alarm Notifications tab (Figure 2–15) to view information about the fabric.

Figure 2–15: Fabric class, Alarm Notifications tab

Use the Fabric Thresholds tab (Figure 2–16) to set the number of occurrences acceptable for each area. Table 2–11 describes the areas in the Fabric Thresholds tab.
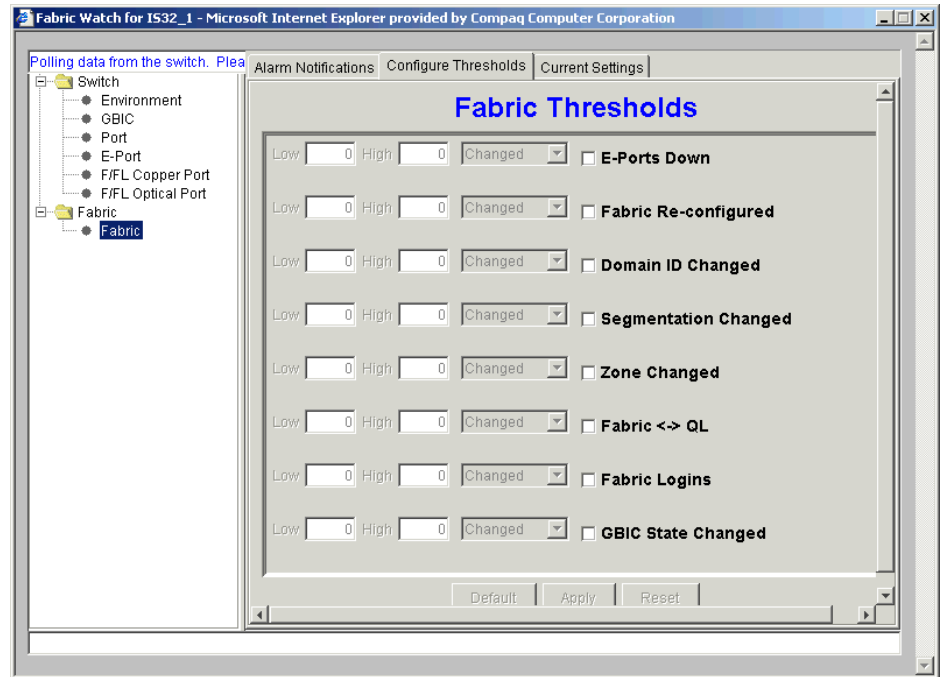

Figure 2–16: Fabric class, Configure Thresholds tab

Table 2–11: Fabric Class, Configure Thresholds Tab

Field	Description
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 dropdown list	Select the threshold type from this dropdown list. Options are: ■ Out-Ranged: Any value outside the selected High/Low range will trigger an event. ■ Above: Any value above the selected threshold will trigger an event. ■ In-Between: Any value within the selected High/Low range will trigger an event. ■ Below: Any value below the selected threshold will trigger an event. ■ Changed: A change in the counter will trigger an event.

Table 2–11: Fabric Class, Configure Thresholds Tab (Continued)

Field	Description
Areas	
NOTE: Select the checkbox adjacent to an area, then configure high, low, and type.	
E-Ports Down	Monitor E-Port status.
Fabric Reconfigured	Monitor changes to fabric configuration.
Domain ID Changed	Monitor forcible domain ID changes.
Segmentation Changed	Monitor segmentation changes.
Zone Changed	Monitor changes to currently-enabled zoning configuration.
Fabric <–>QL	Monitor ports to detect changes from fabric to QuickLoop or QuickLoop to fabric.
Fabric Logins	Monitor number of host device fabric logins (FLOGIs).
GBIC State Changed	Monitor insertion or removal of GBICs.

After you make changes to the configuration, select one of the buttons at the bottom of the window (see Figure 2–17).

■ Default: Resets configuration to factory defaults. Select Apply after Default.

■ Apply: Applies current settings to the specified class, then requests Alarm Mechanism (see Figure 2–1).

■ Reset: Settings are returned to last saved configuration.

Figure 2–17: Default/Apply/Reset buttons

The Current Settings tab (Figure 2–18) provides a configuration summary for each area:

■ E-Ports Down

■ Fabric Reconfigured

■ Domain ID Changed

■ Segmentation Changed

■ Zone Changed

■ Fabric <–> QL

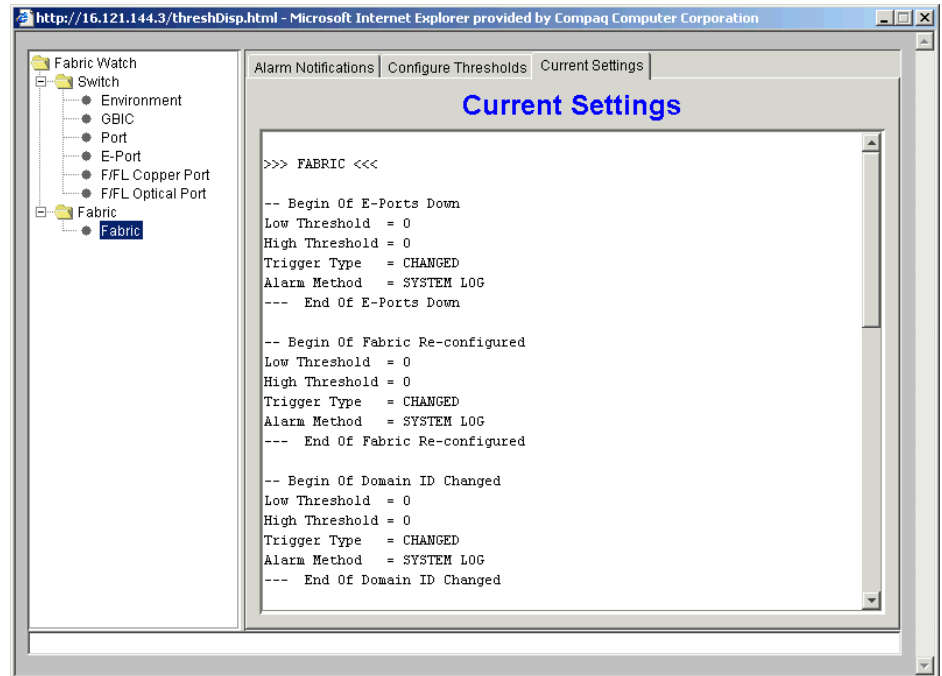■ Fabric Logins

■ GBIC State Changed

```
http://16.121.144.3/threshDisp.html - Microsoft Internet Explorer provided by Compaq Computer Corporation

Fabric Watch                         Alarm Notifications | Configure Thresholds | Current Settings
   Switch
      ● Environment                              Current Settings
      ● GBIC
      ● Port
      ● E-Port                      >>> FABRIC <<<
      ● F/FL Copper Port
      ● F/FL Optical Port           -- Begin Of E-Ports Down
   Fabric                           Low Threshold  = 0
      ● Fabric                      High Threshold = 0
                                    Trigger Type   = CHANGED
                                    Alarm Method   = SYSTEM LOG
                                    ---  End Of E-Ports Down

                                    -- Begin Of Fabric Re-configured
                                    Low Threshold  = 0
                                    High Threshold = 0
                                    Trigger Type   = CHANGED
                                    Alarm Method   = SYSTEM LOG
                                    ---  End Of Fabric Re-configured

                                    -- Begin Of Domain ID Changed
                                    Low Threshold  = 0
                                    High Threshold = 0
                                    Trigger Type   = CHANGED
                                    Alarm Method   = SYSTEM LOG
                                    ---  End Of Domain ID Changed
```

Figure 2–18: Fabric class, Current Settings tab

Index