

# Dell™ PowerVault™ 50F 8-Port Fibre Channel Switch Installation and Troubleshooting Guide

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# Preface: Dell™ PowerVault™ 50F 8-Port Fibre Channel Switch Installation and Troubleshooting Guide

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## Overview

### About This Guide

This guide is intended for anyone who is installing and managing a Dell PowerVault™ 50F 8-Port Fibre Channel Switch. It is to be used by field technicians, hardware and software engineers, and system administrators for monitoring and troubleshooting the switch. The chapters and appendixes are summarized as follows:

- Chapter 1, "Installing the PowerVault™ 50F," provides detailed information to users who are installing a PowerVault™ 50F.
- Chapter 2, "PowerVault™ 50F Topologies," discusses Fabric elements and provides sample topologies.
- Chapter 3, "Managing PowerVault™ 50F," contains information and examples on managing and monitoring the switch.
- Chapter 4, "Introducing PowerVault™ 50F Fibre Channel Switch Manager," provides general information about managing and monitoring the switch using the PowerVault™ 50F Fibre Channel Switch Manager, including everyday management, managing switches remotely, and administrative functions.
- Chapter 5, "PowerVault™ 50F Fibre Channel Switch Manager Operational Concepts," discusses some operational concepts and introduces users to the switch management pages.
- Chapter 6, "Using PowerVault™ 50F Fibre Channel Switch Manager," provides more detail on the switch management pages that are used to operate and monitor the PowerVault™ 50F.
- Chapter 7, "PowerVault™ 50F Commands," contains general operation and diagnosis command information.
- Chapter 8, "Troubleshooting," discusses troubleshooting, diagnostic testing, and error messages.
- Chapter 9, "Repair and Replacement," describes the installation of a GBIC module.
- Chapter 10, "Getting Help," describes the help tools Dell provides to assist you should you have a problem with the computer. It also explains how and when to call Dell for technical assistance. Chapter 10 also includes a Diagnostics Checklist that you can copy and fill out as you perform the troubleshooting procedures. If you need to call Dell for technical assistance, use the completed checklist to tell the Dell technical support representative what procedures you performed to better help the representative give you assistance. If you must return a piece of hardware to Dell, include a filled-out checklist.
- Appendix A, "Error Messages," explains the error message format, error message by firmware module, and other possible errors.

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## Warranty and Return Policy Information

Dell Computer Corporation ("Dell") manufactures its hardware products from parts and components that are new or equivalent to new in accordance with industry-standard practices. For information about the Dell warranty for your system, see the appendix "Warranty, Return Policy, and Year 2000 Statement of Compliance" in the *Dell PowerVault™ 50F 8-Port Fibre Channel Switch User's Guide*.

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## Other Documents You May Need

Besides this *Installation and Troubleshooting Guide*, the following documentation is included with your system:

- The *Dell PowerVault™ 50F 8-Port Fibre Channel Switch User's Guide* introduces the user to the PowerVault™ 50F and includes feature information and specifications.
  - Technical information files—sometimes called "readme" files—may be installed on software media that might have been packaged with your PowerVault™ 50F to provide last-minute updates about technical changes to your switch or advanced technical reference material intended for experienced users or technicians.
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## Notational Conventions

The following subsections describe notational conventions used in this document.

### Notes, Cautions, and Warnings

Throughout this guide, blocks of text may be accompanied by an icon and printed in bold type or in italic type. These blocks are notes, cautions, and warnings, and they are used as follows:



**NOTE:** A NOTE indicates important information that helps you make better use of your computer system.



**CAUTION:** A CAUTION indicates either potential damage to hardware or loss of data and tells you how to avoid the problem.



**WARNING:** A WARNING indicates the potential for bodily harm and tells you how to avoid the problem.

### Typographical Conventions

The following list defines (where appropriate) and illustrates typographical conventions used as visual cues for specific elements of text throughout this document:

- *Keycaps*, the labeling that appears on the keys on a keyboard, are enclosed in angle brackets.

Example: <Enter>

- *Key combinations* are series of keys to be pressed simultaneously (unless otherwise indicated) to perform a single function.

Example: <Ctrl><Alt><Enter>

- *Commands* presented in lowercase bold are for reference purposes only and are not intended to be typed when referenced.

Example: "Use the **format** command to . . . ."

In contrast, commands presented in the Courier New font are part of an instruction and intended to be typed.

Example: "Type `format a:` to format the diskette in drive A."

- *Filenames* and *directory names* are presented in lowercase bold.

Examples: **autoexec.bat** and **c:\windows**

- *Syntax lines* consist of a command and all its possible parameters. Commands are displayed in lowercase bold; variable parameters (those for which you substitute a value) are displayed in lowercase italics; constant parameters are displayed in lowercase bold. The brackets indicate items that are optional.

Example: **del** [*drive:*] [*path*] *filename* [/p]

- *Command lines* consist of a command and may include one or more of the command's possible parameters. Command lines are presented in the Courier New font.

Example: `del c:\myfile.doc`

- *Screen text* is text that appears on the screen of your monitor or display. It can be a system message, for example, or it can be text that you are instructed to type as part of a command (referred to as a *command line*). Screen text is presented in the Courier New font.

Example: The following message appears on your screen:

```
No boot device available
```

Example: "Type `md c:\programs` and press <Enter>."

- *Variables* are placeholders for which you substitute a value. They are presented in italics.

Example: DIMM*x* (where *x* represents the DIMM socket designation).

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# Installing the PowerVault™ 50F Switch: Dell™ PowerVault™ 50F 8-Port Fibre Channel Switch Installation and Troubleshooting Guide

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## Overview

The complete setup for the Dell PowerVault™ 50F Switch includes:

- Unpacking the switch
  - Selecting a location and mounting method
  - Setting up connections
  - Changing default user names/passwords, if desired (see Table 3-2, "[Default Username](#)" for more information)
- 

## Unpacking the PowerVault™ 50F Switch



**NOTE:** Some items may be shipped as part of an over-pack.

While unpacking the switch, check to make sure the following items are included:

- PowerVault™ 50F switch unit
- Power cord
- 3 FL, 1 G modules are installed
- 5 copper Gigabit Interface Converter (GBIC) modules or 4 optical and 1 copper GBIC modules are installed, depending on the switch configuration
- Straight-through serial cable
- *User's Guide* and an *Installation and Troubleshooting Guide*
- Dell PowerVault™ Utilities Diskette
- Installation kit, which includes rubber mounting feet

Save packing materials in case you need to return the switch.

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## Cooling Requirements

Cooling air is drawn into the chassis by the power supply fan and two additional fans, all internal to the switch. Vents exhaust air through the front of the switch.

The combined air flow through the switch is 75 cubic feet per minute (cfpm), with a nominal bulk flow of

15 cfm.



**NOTE:** Do not block the front or rear air vents. The switch must have clear access to ambient air for cooling.

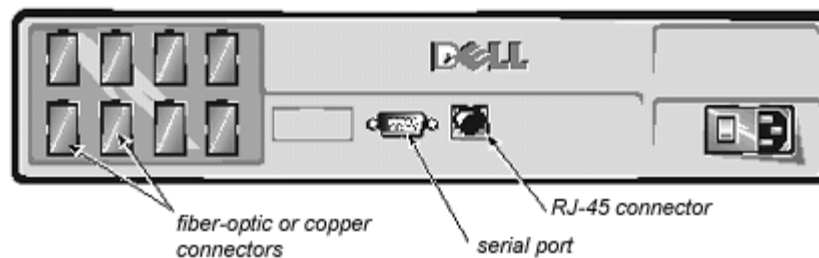
## Power Requirements

Switch power connection is via a switched connector on the switch's front right side, as shown in Figure 1-1. The PowerVault™ 50F Switch power requirements are as follows:

- Properly wired, grounded outlet
- Input voltage: 90-134 volts alternating current (VAC) or 180-257 VAC and IEC 801-5 surge voltage
- Total power: Up to 130 watts (depending on configuration; see [\(Error Messages\)](#), "Specifications" in the *Dell PowerVault™ 50F 8-Port Fibre Channel Switch User's Guide*)
- Input line frequency: 50 to 60 hertz (Hz)

The switch has an autoranging power supply that automatically accepts voltages within its ranges.

**Figure 1-1. PowerVault™ 50F Switch Front View**



**NOTE:** There is no provision for surge protection built into the switch's power supply. An installation should include normal provisions to ensure uninterrupted power.

## Site Location

The switch should be installed in a secure or limited access site to control unauthorized access to the switch's cabling and power connections.

## Installing a GBIC Module with Power On

Each interface card supports two G\_Ports or FL\_Ports, and their respective interchangeable GBIC modules. The GBIC module uses standard SC or HSSDC connectors.

A GBIC module can be inserted while the switch is operational (power on).



**CAUTION:** The GBIC module is keyed so it can be inserted into the interface card in only one way. Do not force the insertion if the GBIC module does not slide in easily.

To install an IBM® GBIC module into an interface card, perform the following steps:

1. Ensure that the locking bar on the front of the IBM GBIC module is to the right side of the GBIC.
2. Insert the GBIC module until its connector is firmly seated into the appropriate port.
3. When firmly seated, lock the GBIC module in the slot by pushing the locking bar to the left side of the GBIC. *Do not* force the locking bar; reseal if necessary.

To install a non-IBM GBIC module into an interface module, perform the following steps:

1. Insert the GBIC module into the appropriate port.
2. Press the GBIC module until its connector is firmly seated.

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## Installing the PowerVault™ 50F in a Rack

The switch has optional mounting hardware for installation in the Dell 19-inch rack. The mounting hardware includes:

- Two slide assemblies (each with an inner and outer race)
- Two stationary brackets
- Two adjustable brackets
- Two L-brackets with captive screws
- Ten 10-32 x 1/4-inch low-profile-head screws
- Four 10-32 x 3/8-inch low-profile-head screws
- Two 10-32 nuts with captive starwashers
- Eight 10-32 x 1/2-inch screws
- Eight tapered washers
- One bezel with captive screws
- One manifold

The following sections describe the tasks required to mount the PowerVault™ 50F Switch in a rack.



**NOTE:** *If the switch has had its rubber mounting feet installed, they must be removed for a rack installation.*

### Rackmount Safety Guidelines

In a rackmount installation, follow these safety guidelines:

- When installing a switch in a closed or multirack assembly, make certain the air temperature, measured at the front panel, does not exceed 35°C during operation.
- Ensure that the airflow available to the switch is at least 300 cfm.
- Verify that the switch installation, both with the slides closed and fully extended, does not unbalance the rack or exceed the rack's mechanical limits.
- Verify that the supply circuit, line fusing, and wire size are adequate. Refer to the switch's nameplate for its power requirements.
- Verify that all equipment installed in the rack has a reliable ground connection. Do not rely on connection to a branch circuit, such as power strips.
- Route and support the power cord to ensure that the switch moves freely on its slides without crimping or damaging the power cord or interfering with other equipment and cabling installed in the rack.

## Installing the Inner Slides

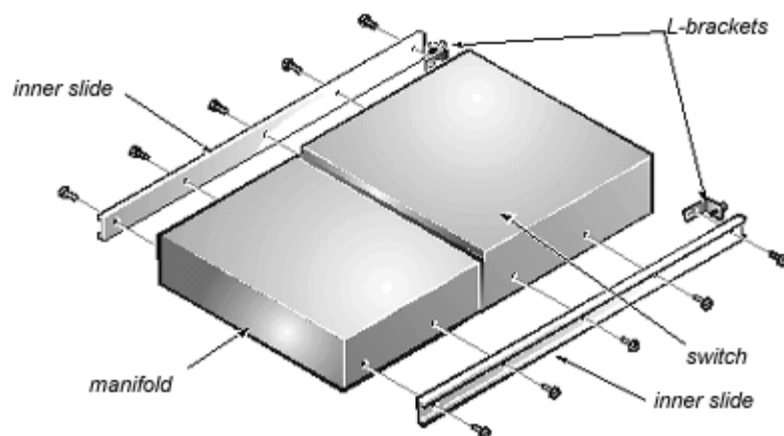
To install the inner slide onto the switch, perform the following steps:

1. Disassemble the inner and outer slides of the slide assembly by fully extending the inner slide, pressing the release, and pulling the slide assembly apart.
2. Align the holes of an inner bearing slide with the holes on the side of the manifold and the switch (see Figure 1-2).

The end of the manifold that has the gasket should be toward the center of the inner bearing slide. Make sure the rivets on the manifold face up. The end of the inner bearing slide that has the two slots should be at the end of the manifold without the gasket.

Align the switch to the inner bearing slide and orient the front of the switch (with the input/output ports) toward the end of the bearing slide with the large hole. The back of the switch will compress the gasket on the manifold.

**Figure 1-2. Attaching the Inner Bearing Slides and L-Brackets**



3. Use four 10-32 x 1/4-inch screws to mount the inner bearing slide to the switch and manifold.
4. Repeat steps 2 and 3 to mount the second inner bearing slide to the other side of the switch and manifold.
5. Using 10-32 x 1/4-inch screws, mount an L bracket, with the captive thumb screws, to each inner slide, as shown in Figure 1-2.

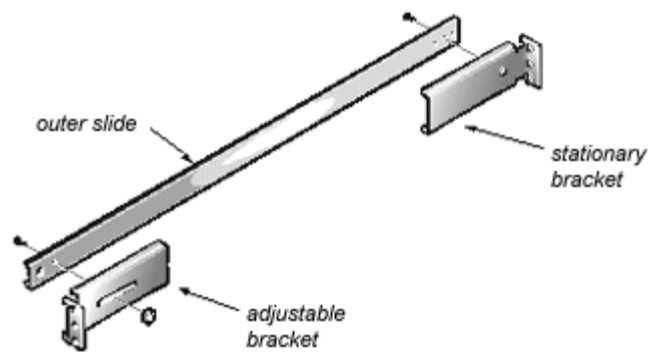
## Installing the Outer Slides

To install the outer slide in the rack, perform the following steps:

1. Use a 10-32 x 1/2-inch screw to mount a stationary bracket to an outer slide, as shown in Figure 1-3.

**Figure 1-3. Attaching Stationary and Adjustable Brackets to an Outer Slide**



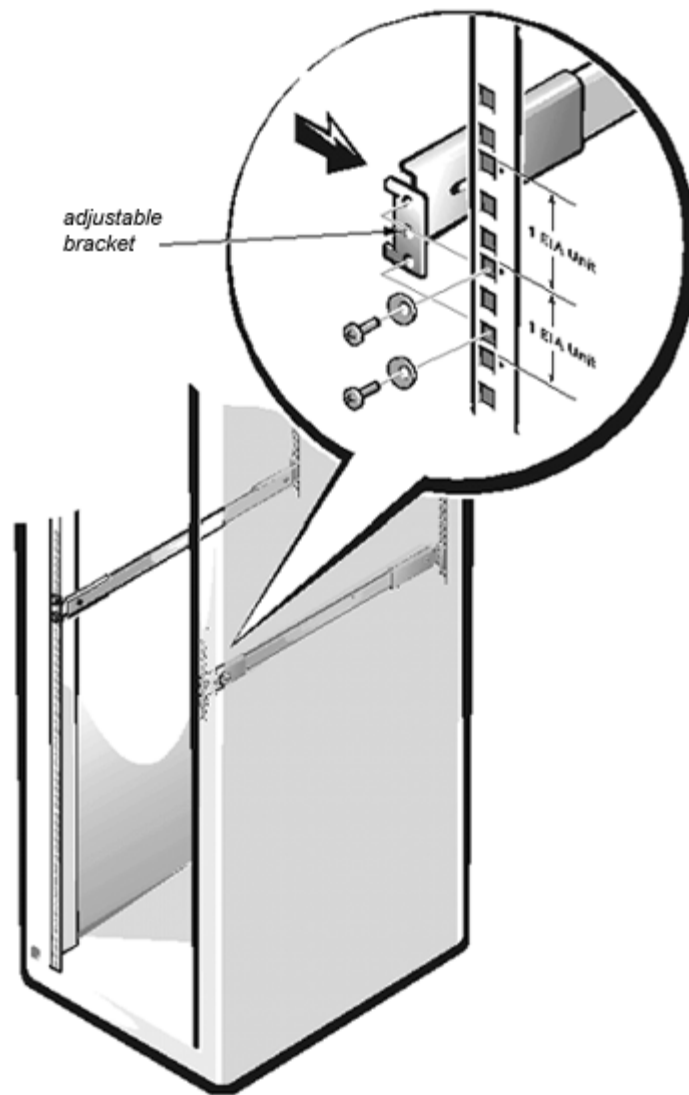


2. Use a 10-32 x 1/2 inch screw and a 10-32 nut with captive star washer to mount an adjustable bracket to the other end of the outer slide, as shown in Figure 1-3. Do not completely tighten the screw.
3. Repeat steps 1 and 2 to mount the remaining stationary and adjustable brackets to the second outer slide.
4. Use four 10-32 x 1/2-inch screws and four tapered washers to mount each outer slide in the rack, as shown in Figure 1-4.
5. The stationary brackets attach to the rear of the rack. The adjustable brackets attach to the front. The screws are threaded through the rack and into the top and bottom holes of the brackets, leaving the middle bracket holes open.



**NOTE:** The slides must be mounted within 1 Electronic Industry Association (EIA) unit. The switch takes up 2 EIA units with the outer bearing slides mounted in the lower of the 2 EIA units.

**Figure 1-4. Mounting the Outer Slides and Bezel on the Rack**



6. Tighten the screws holding the adjustable brackets to the outer slides.

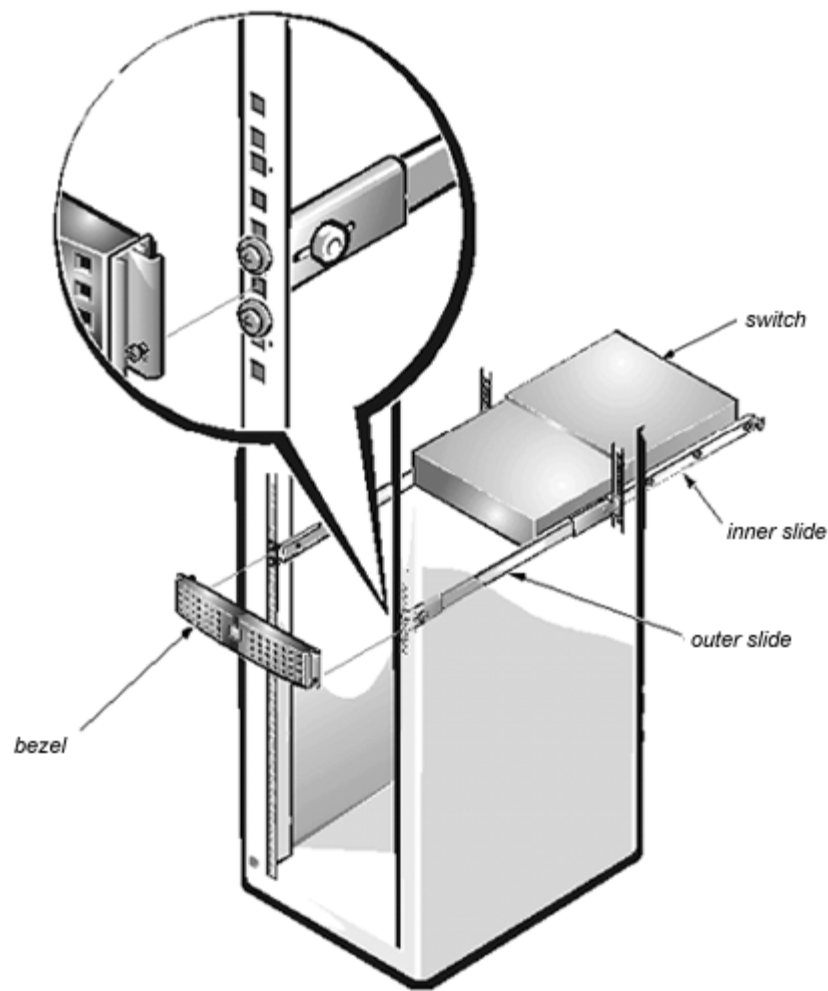
### Installing the Switch in the Rack

To install the switch in the rack, perform the following steps:

1. At the back of the rack, carefully align the switch's inner slides with the outer slides on the rack.

Slide the inner slides into the outer slides and push the switch all the way into the rack, as shown in Figure 1-5. The two safety releases on the slides must be pressed for the switch to slide all the way in.

### Figure 1-5. Installing the Switch in the Rack



2. Tighten the thumbscrews on the L-brackets to secure the switch to the rack.
3. Install the bezel onto the front of the rack, as shown in Figure 1-5.

The captive thumbscrews of the bezel pass through the rail holes and into the middle hole of the adjustable brackets. Adjust the bezel so the manifold slides part way into it.

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## Stand-alone Mounting

The switch is shipped in its stand-alone configuration. Adhesive rubber feet are supplied if the switch is surface-mounted. Installation of the rubber feet is optional, and is not required for proper or safe switch operation.

To install the adhesive rubber feet, perform the following steps:

1. Use the alcohol wipes provided to clean the four depressions at each corner of the chassis bottom. Allow the alcohol to dry.
2. Remove the rubber feet from the backing sheet and place one in each depression.
3. Firmly press the rubber feet in place.



**NOTE:** If rubber feet have been installed, they must be removed before the unit can be installed in a 19-inch rack.

## Fibre Channel Cable Connections

All network cable connections are on the switch's front panel. All recommended cabling supports the switch's 1-Gbps transfer rate, as shown in Table 1-1.

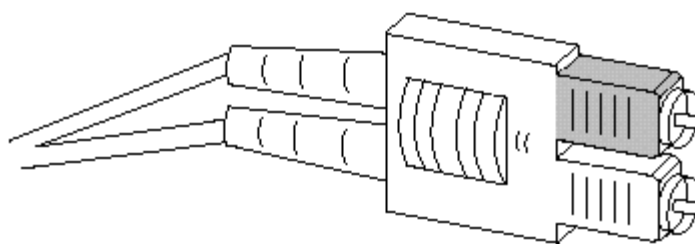
**Table 1-1. Cabling Connections**

Cable type	Cable Specification	Maximum Run Length	GBIC Module
Fiber-optic	<ul style="list-style-type: none"> <li>Duplex SC plug connectors</li> <li>Multimode fiber</li> <li>50 or 62.5 micrometers (<math>\mu\text{m}</math>) core diameter</li> <li>125 <math>\mu\text{m}</math> cladding diameter duplex cable</li> </ul>	500 meters (1641 feet)	770-850 $\mu$ without open fiber control (non-OFC)
Copper	<ul style="list-style-type: none"> <li>Impedance controlled for 150-ohm differential systems</li> <li>Low skew, shielded-quad, 150-ohm cable</li> <li>Polarized interface</li> <li>HSSD receptacle</li> </ul>	12 meters (38 feet)	<ul style="list-style-type: none"> <li>SCA2 printed circuit board (PCB) interface</li> <li>HSSDC input/output (I/O)</li> </ul>

Various lengths of copper and optical cables are available from Dell. These cables have been designed and approved by Dell. Dell recommends the use of these cables to ensure the proper operation of the PowerVault™ 50F.

Fiber cable connections are made to the switch's front panel using standard dual SC plug connectors as shown in Figure 1-6.

**Figure 1-6. Dual SC Fiber-Optic Plug Connector**



The connectors are indexed and must be inserted into the GBIC module's connector in proper alignment. In most cases, one of the two connector plugs is a different color to aid in proper connector alignment.

**CAUTION:** Remove the protective plug from the GBIC module. Do not force the fiber-optic plug into the GBIC module as you may damage the connector, the GBIC module, or both. Make certain the fiber surface is free of dust or debris before inserting the connector into the GBIC module.

## Fabric Connections (F\_Port/FL\_Port)

Fabric connections are determined by the number of connected devices, the required bandwidth, and circuit redundancy required to service each connection to and within the Fabric. The F\_Port is the Fabric access

port used to connect an N\_Port (host connection). The FL\_Port is the Fabric access port used to connect NL\_Ports to the switch in a loop configuration.

Refer to "[Sample Fabric Topologies](#)" for some sample Fabric topologies.

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## Expansion Connections (E\_Port)

Expansion (E\_Port) connections are used to interconnect switches within a Fabric. Refer to "[Sample Fabric Topologies](#)" for sample topologies using different E\_Port connections to create different Fabric topologies.

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## Host and Target Connections (N\_Port/NL\_Port)

The connections to the Fabric are through Nx\_Ports. Refer to "[Sample Fabric Topologies](#)" for examples of various hosts and devices connected to Fabrics via their N\_Port connections. The N\_Port (host connection) connects to the F\_Port (Fabric connection). The NL\_Port (arbitrated loop configuration) connects to the FL\_Port (Fabric connection).

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## Ethernet Connection

Connecting an existing Ethernet 10BaseT local area network (LAN) to the switch via the front panel RJ-45 connector gives access to the switch's internal Simple Network Management Protocol (SNMP) agent, allowing remote Telnet and Web access for remote monitoring and testing.



**NOTE:** *The connection is only for Telnet, SNMP agent, and the Web-based server access. No Fabric connection is available via this connection.*

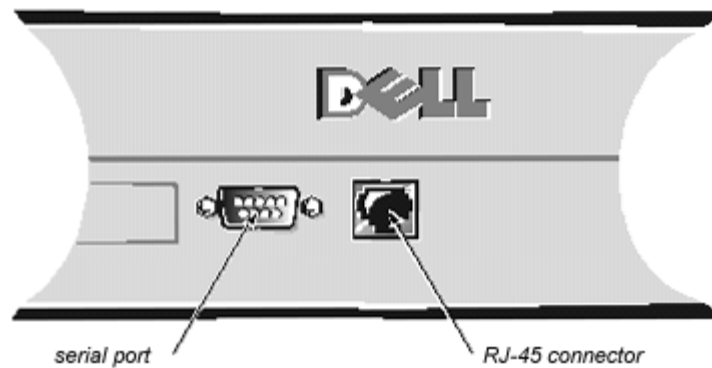
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## Serial Port Connection

The PowerVault™ 50F Switch includes a serial port (see Figure 1-7) used to set the Internet Protocol (IP) address. The serial port is used to set the IP address when setting up or reinitializing a switch. The serial port settings are as follows:

- 8 bit
- No parity
- One stop bit
- 9600 baud
- Hyperterminal
- VT100
- Flow control = Xon/Xoff

### Figure 1-7. Connections for PowerVault™ 50F Switch



**NOTE:** The serial port and Telnet connection are mutually exclusive and there can be only one serial port session active at a time. Telnet takes priority, so the serial port is terminated when a Telnet connection is made. The serial connection is restored after the Telnet session is completed, but you must log in again. A password is required to log in to the serial port session. Password checking is skipped only at initial power on and remains off until log off is done.

## System Configurations

In order to communicate with the RS-232 port, a computer system is required with the following:

- Hyper terminal
- An available COM port

Cables: A straight-through serial cable (DB9 female-to-female) connected between the DB9 serial ports on the computer and switch. See Table 1-2 for pinout requirements. This cable is included in the over-pack, shipped with your PowerVault™ 50F switch.

## Serial Cabling and Emissions Requirements

The PowerVault™ 50F Switch uses a straight-through serial cable with a female 9-pin D-Subminiature connector with the pinouts shown in Table 1-2. Only pins 2, 3, and 5 are required.

**Table 1-2. Cabling Pinouts**

Pin	Signal	Description
1	DCD	Carrier Detect
2	TxDData	Transmit Data
3	RxDData	Receive Data
4	DTR	Data Terminal Ready
5	GND	Logic Ground
6	DSR	Data Set Ready
7	RTS	Request to Send
8	CTS	Clear to Send
9	RI	Ring Indicator



**NOTE:** For dust and electrostatic discharge (ESD) protection, the PowerVault™ 50F Switch includes a cover for the serial port. When not in use, the serial port should be covered.

## Verifying Power-On Self-Test (POST)

When powering on a switch, the switch conducts a series of diagnostic tests including:

- Memory Test
- Port Register Test
- Central Memory Test
- RDRAM Test

As the POST successfully performs each of the tests, the message `Passed` is displayed via the local RS-232 serial port.


After the switch completes the POST, the GBIC module returns to a steady state from the flashing states shown during the tests.

If an amber GBIC module light is displayed, there was a failure on that port during POST. See "[Power-On Diagnostics](#)" for details.

If error conditions are encountered, they are displayed on the local RS-232 serial port after the switch completes the POST. See "[errShow](#)" for details.

## Setting IP Address Using the Serial Port

There is a label on the front panel of the PowerVault™ 50F Switch with IP address and space to include the IP address when it is configured.

 **NOTE:** *This label facilitates identification of the physical switch in maintenance mode.*

The serial port is initially logged on as `Admin` with no password required.

To set the IP address using the serial port, perform the following steps:

1. Connect the DB9 serial cable from the computer's COM port to the switch's RS-232 port.
2. Start the Hyper Terminal by selecting **Programs**—> **Accessories**—> **Hyper Terminal** and then **hyperterm.exe**

Supply a name in the **Connection Description** dialog box.

Enter `Direct to Com <port#>` in the Connect Using dialog box.

The **COM <port#> Properties** dialog box is displayed with the following settings:

- 8-bit
- No parity
- One stop bit
- 9600 baud
- Hyperterminal
- VT100
- Flow control = Xon/Xoff

3. Turn on the switch and read the messages on the screen.
4. Run the **ipAddrSet** command.

## Resetting Factory Defaults

In the event that a user changes a password or IP address, or forgets it, or sets an invalid IP address, the IP address can be reinitialized.

To reset factory defaults, perform the following steps:

1. Connect the DB9 serial cable from the computer's COM port to the switch's RS-232 port.
2. Start the Hyper Terminal by selecting **Programs**—> **Accessories**—> **Hyper Terminal**, and then **hyperterm.exe**.

Supply a name in the **Connection Description** dialog box.

Enter `Direct to Com <port#>` in the **Connect Using** dialog box.

The **COM <port#> Properties** dialog box is displayed with the following settings:

- 8-bit
- No parity
- One stop bit
- 9600 baud
- Hyperterminal
- VT100
- Flow control = Xon/Xoff

3. Turn on the switch and read the messages on the screen.
4. Run the **flashDefault** command.

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# PowerVault™ 50F Topologies: Dell™ PowerVault™ 50F 8-Port Fibre Channel Switch Installation and Troubleshooting Guide

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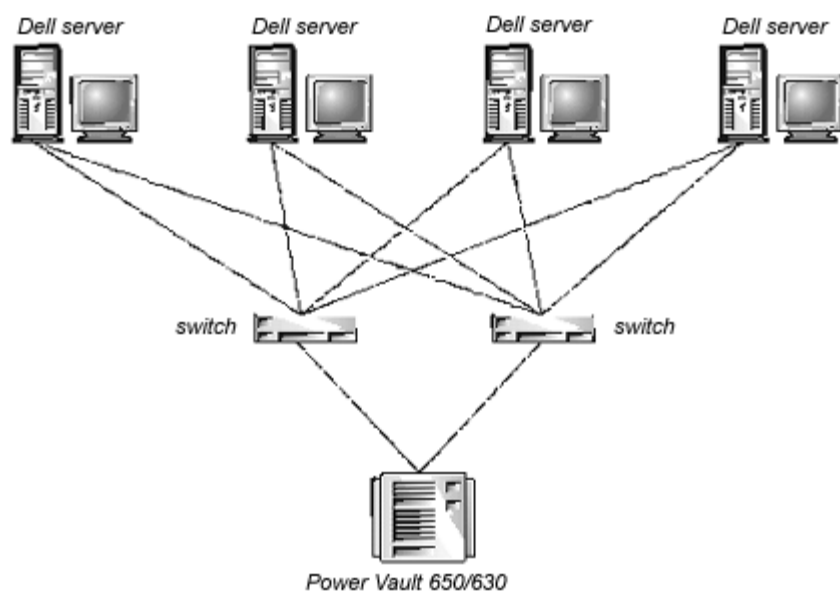
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## Overview

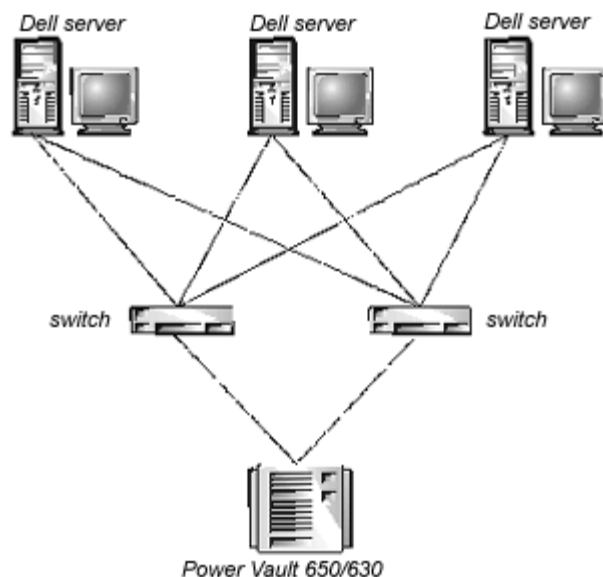
Figures 2-1, 2-2, and 2-3 show the topologies supported by Dell. The PowerVault™ 50F Switch has the capability of supporting other topologies, but they have not been validated and are currently not supported by Dell.

These configurations require the use of Dell OpenManage™ Storage Consolidation software. See the documentation that came with the Dell OpenManage™ Storage Consolidation software for installation and operating instructions.

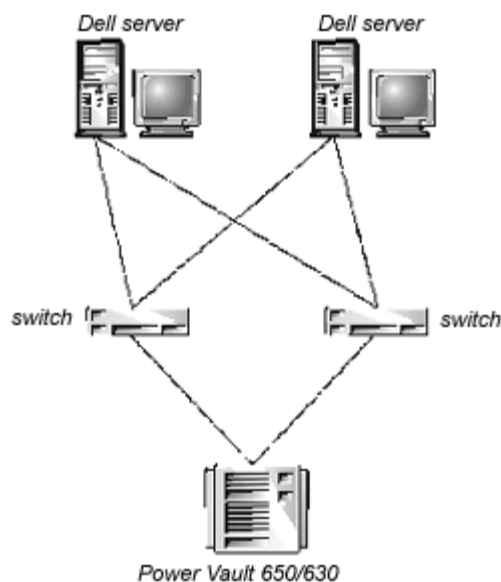
**Figure 2-1. Topology Example 1**



**Figure 2-2. Topology Example 2**



**Figure 2-3. Topology Example 3**



Fabric performance depends on numerous factors. This chapter discusses some key factors, but is not a complete catalogue of variables to consider when structuring a Fabric.

This chapter includes:

- Fabric elements
- Sample Fabric topologies

## Fabric Elements

Each Fabric is unique, and the elements that determine the Fabric's structure include:

- Class of frames in the Fabric
- Type of host adapters connected to the Fabric
- Bandwidth requirements supported by the Fabric
- Topology of the switches in the Fabric
- Requirements for redundancy and fault tolerance

Regardless of the topology used, the switch's extremely low message latency minimizes Fabric message handling time that results in a high-performance Fabric.

## Routing Cost

All Inter Switch Links (ISLs) have a default cost of 1000. The cost of a path between any two switches in the Fabric is the sum of the costs of all ISLs. The switches that comprise the Fabric always choose the lowest cost path through the Fabric to forward frames from the source switch to the destination switch.

When constructing a multiswitch configuration, called a cascaded Fabric, a frame entering the Fabric may pass through eight switches before exiting the Fabric. The switch does not enforce the eight-switch limit. It is your responsibility to ensure that the seven-hop limit is not exceeded. The command **uRouteShow** provides information regarding the cost of the shortest path to another switch from which you can derive the number of hops. The cost should not exceed 7000 (7 x 1000).

A Fabric using Dell switches in cascaded topologies should be configured to deliver the required bandwidth and fault tolerance with all connections made within the seven-hop maximum limit.

## Configuring Switches

When configuring switches in a Fabric, optimize the Fabric performance based on the most significant expected use.



**NOTE:** Except for unique identifiers such as the switch name, domain name, and IP address, all switches in a Fabric must have the same firmware configuration. Switches that are configured differently are isolated from the Fabric.

Cascaded topologies using multiple switches give switching system designers a powerful, flexible set of resources to create high-performance, robust storage area networks (SAN), or data center backbone.

## Loop Support

The FL\_Port interface card enables any Fabric-connected device to communicate with public or private fibre channel disks or other device types.



**NOTE:** Loops may contain any combination of public or private loop devices.

## Public Operation

In public operation, all loop devices are accessible to all other Fabric-connected devices and loop devices within the Fabric. The loop devices behave the same as devices attached directly to the Fabric.

## Private Operation

Dell's FL\_Port translative mode allows private devices on a local loop to communicate with Fabric-attached devices and vice versa. Fabric-attached devices can be either N\_Ports attached to G\_Ports or public NL\_Ports attached to other FL\_Ports.

Logically, private and Fabric-attached devices that communicate to a loop appear to be devices on the same loop as the private devices. Each Fabric-attached device uses an unassigned AL\_PA from the local loop. When private devices on a local loop and Fabric-attached devices communicate, the FL\_Port automatically

translates between private and public addresses.

The FL\_Port translative mode supports up to 32 Fabric-attached devices (one is reserved for the Fabric) appearing on each local loop of private devices, subject to the limit of 126 devices on a loop (the total of private and Fabric-attached devices).

Private devices are registered to the Simple Name Server (SNS), so the Fabric-attached devices can query SNS for their addresses and initiate communication.



**NOTE:** The translative mode is automatically enabled with the FL\_Port card and no user intervention is necessary to configure the translative mode.

## Sample Fabric Topologies

The following Fabric topology samples show several different conceptual topology models. Each installation has a unique topology that is determined by the characteristics of the connected devices and your performance objectives.

In the following samples, only the single switch Fabric solution shows connections to the Fabric. The switch numbering scheme is:

Interface cards	1	2	3	4
Ports	0	2	4	6
	1	3	5	7

### Single-Switch Fabric

The simplest Fabric consists of a single-switch topology as shown in Figure 2-4.

**Figure 2-4. Single-Switch Topology Sample**

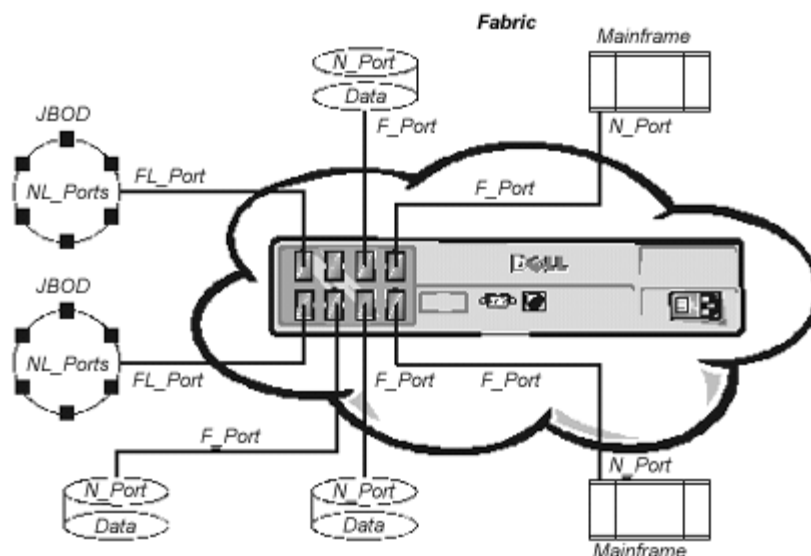


Figure 2-4 shows the switch's F\_Ports and FL\_Ports and the corresponding N\_Port and NL\_Port connections on the device side. The switch connections are shown as they would be in a physical

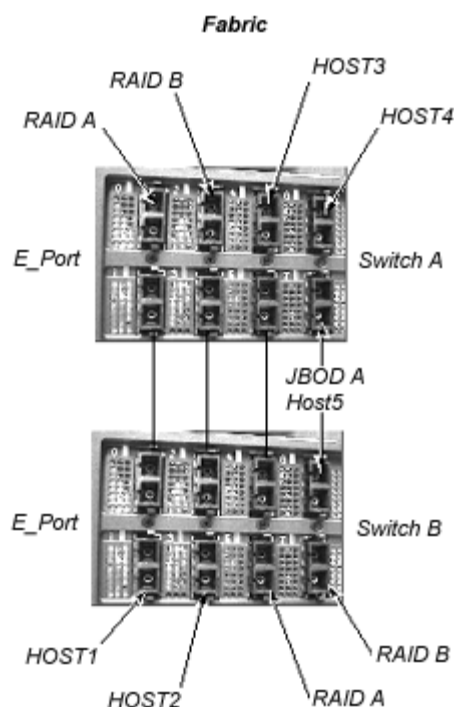
installation. Functionally, the switch becomes a Fabric with every device connected to every other device by the Fabric.

Each connection is full duplex with transmissions up to 1 Gbps bandwidth simultaneously, in both directions, between the Fabric and Fabric-connected devices.

## Two-Switch Sample Topology

The two-switch topology increases the number of connectivities and aggregate Fabric bandwidth, as shown schematically in Figure 2-5. The switches are shown physically connected although the connections are transparent in the Fabric. Functionally, the devices appear to be connected together directly.

**Figure 2-5. Fabric Topology Sample With Three Connections Between Two Switches**



When a Fabric is initiated, or when a new switch is added to the Fabric, the switches determine a least-cost path for each destination switch. This is done dynamically each time the Fabric configuration changes and the results are stored in the switch's internal routing tables.



**NOTE:** After a path has been determined, it is not rerouted, even though traffic volume may change over time, for each path to maintain in-order delivery. If the link fails, the path is rerouted.

## Increasing Local Bandwidth within the Fabric

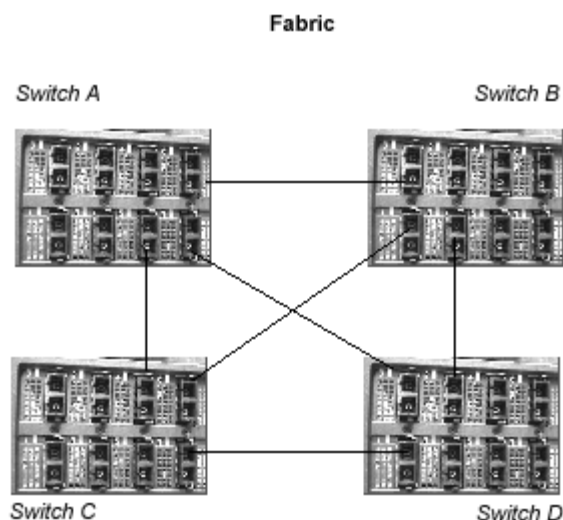
In Figure 2-5, three connections are shown between Switch A and Switch B. This gives an aggregate bandwidth of six Gbps - three 1-Gbps, full-duplex connections. Increasing bandwidth between switches is done by adding additional connections between the switches.

In addition to the bandwidth, redundant connections between the switches in Figure 2-5 provide a high-bandwidth, fault-tolerant Fabric.

## Four-Switch Sample Topology

Figure 2-6 shows a four-switch topology that adds additional paths to the Fabric topology, increasing the Fabric's reliability, bandwidth, fault tolerance, and connections.

**Figure 2-6. Four-Switch Fabric Topology Sample**

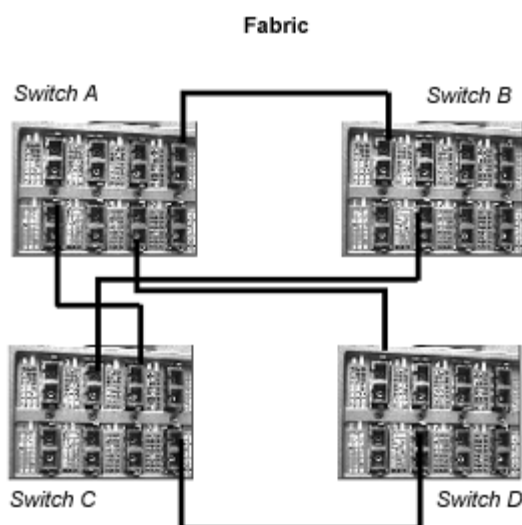


For example, the shortest path between switch A and switch D would be the direct path AD. If this path were to fail, the connection would then be automatically routed through either switch B or C with a path of ABD or ACD.

In Figure 2-6, ports 6 and 7 on the interface module in position 4 of switch A are used for connection to switch B and switch D. If the interface module failed, traffic to switch B, C, and D would all have to be rerouted between the interface modules in the third position on switches A and C.

A more robust solution is to have all connections distributed across available interface cards in each switch, giving an alternate configuration as shown in Figure 2-7.

**Figure 2-7. Four-Switch Fabric Topology Sample**



If bandwidth or fault tolerance is a concern, each of the paths shown in Figure 2-7 could have a parallel connection.

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# Managing the PowerVault™ 50F Switch: Dell™ PowerVault™ 50F 8-Port Fibre Channel Switch Installation and Troubleshooting Guide

[Overview](#) • [Comparing Switch Management Methods](#) • [Managing Via Telnet](#) • [Managing with SNMP Under Dell OpenManage™ and the PowerVault™ 50F Switch Manager](#)

## Overview

This chapter contains general information and examples on managing and monitoring the switch. The following are discussed:

- Switch management methods
- Managing via Telnet
- Managing with SNMP under Dell OpenManage™ and the PowerVault™ 50F Switch Manager



**NOTE:** You must assign an Internet Protocol (IP) address to the switch via the local RS-232 serial port before you can access some of the management methods described.

## Comparing Switch Management Methods

The switch is managed locally via a computer running a terminal program attached to the RS-232 serial port and remotely via Telnet or Web management (PowerVault™ 50F Switch Manager).

Before changing any of the factory default settings, become familiar with the operations described in this chapter including both the switch's functions and interactive characteristics. To reset a switch to factory default values, see "[Resetting Factory Defaults](#)".

There are several access methods for managing a switch. Table 3-1 summarizes the different management methods.

**Table 3-1. Comparison of PowerVault™ 50F Switch Management Methods**

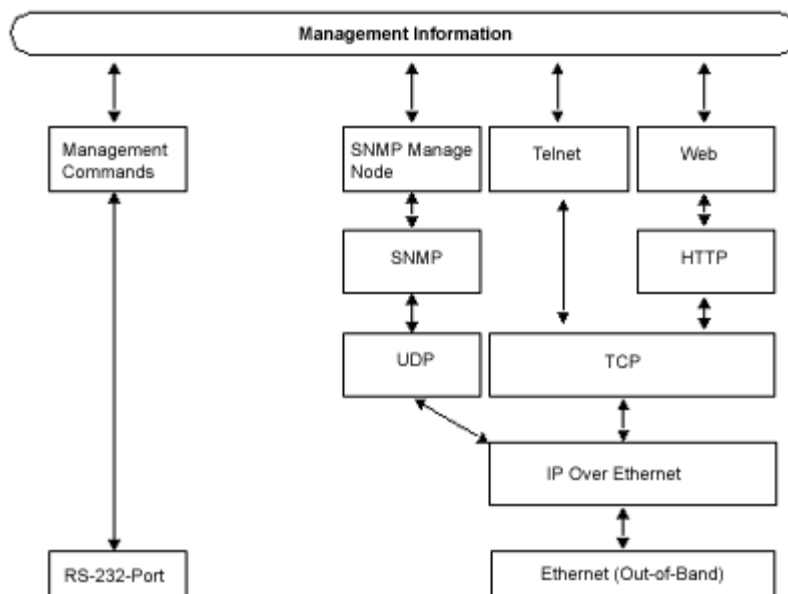
Method	Description	Local	Out-of-band (Ethernet)
Serial port	Managed via RS-232 serial port located on the switch	Yes	No
Telnet commands	Managed remotely using Telnet commands	No	Yes
Managing with SNMP	Managed remotely using Simple Network Management Protocol (SNMP)	No	Yes
PowerVault™ 50F Fibre Channel Switch Manager	Managed remotely through web	No	Yes

Figure 3-1 shows the various methods and communication paths for accessing switch management



information.

**Figure 3-1. Methods for Managing PowerVault™ 50F Switch Information**



## Managing Via Telnet

To make a successful Telnet connection to a switch, the following is required:

- Switch name or IP address
- Username
- Password



**NOTE:** The IP address must be set using the **ipAddrSet** command, which can be issued by connecting to the RS-232 serial port on the front panel. See "[Setting IP Address Using the Serial Port](#)" for more information.

Consult with the local network system administrator for the IP address that is assigned to the switch.

The serial port and Telnet connection are mutually exclusive and there can be only one serial port session active at a time. Telnet takes priority, so the serial port is terminated when a Telnet connection is made. The serial connection is restored after the Telnet session is completed but re-logging in is required. A password is required to login to the serial port session. Password checking is skipped only at initial power on and remains off until log off is done.

## Default Username

Each Username has a security level associated with it. Username 3 is the least privileged and the security level goes up to Username 0, which is the most privileged.

**Table 3-2. Default Username**

Default Username	Description
other (Username 3)	Gives users access to execute commands ending in <b>Show</b> , such as <b>dateShow</b> .

user (Username 2)	Gives users access to all <b>Show</b> commands plus any commands in the help menu that do not change a switch state, such as <b>version</b> . This level is the recommended level for <i>monitoring</i> switch activity.
admin (Username 1)	Gives users access to all <b>Show</b> commands, plus any commands in the help menu. Most switch administration is performed at this level.

The system administrator may assign different usernames than those listed, if desired. The user at a particular security level, however, has the same privileges regardless of the name assigned.

## Changing Passwords

The initial default password for all usernames is **password**. Change the default passwords during installation to meet the Fabric's security requirements.

To change user passwords, perform the following steps:

1. Log in as admin.
2. Issue the command **passwd**.
3. Each username (admin, user, other) is displayed in sequence, allowing the administrator to modify each password and name.
4. Enter a password or name while a username is displayed to replace the existing password or name.



**NOTE:** If you lose the password, contact Dell Technical Support.

## Managing with SNMP Under Dell OpenManage™ and the PowerVault™ 50F Switch Manager

The resident SNMP manage node allows remote switch management via IP over Ethernet and Fibre Channel interfaces.

Dell Openmanage integrates the PowerVault™ 50F Switch through HP OpenView Network Node Manager Special Edition (NNM SE) in a Windows NT environment. You can use Dell OpenManage™ to manage this device. If you have a PowerVault™ 50F Switch connected in your network, it will be automatically discovered as a node in the node submap of HP OpenView NNM SE. In order to launch the PowerVault™ 50F Switch Management Application, double-click on the discovered FC-Switch node to access the expanded node submap, and then double click on the **Switch Management Application** icon.

Refer to your *HP OpenView Network Node Manager Special Edition 1.4 with Dell OpenManage™ HIP 3.4 User's Guide* for more information on Dell OpenManage.

The switch's manage node supports the following:

- SNMPv1 manager
- Command line utilities to provide access to and command the manage node
- MIB-II system group, interface group, and SNMP group
- Fabric Element MIB
- Vendor-Specific MIBs
- Standard Generic traps

## SNMP Transports

The SNMP manage node residing on the embedded processor supports UDP/IP over the Ethernet interface or any FC-IP interface (see [Figure 3-1](#)). This transport provides an immediate Plug and Play support for the switch once the IP address has been assigned.

## MIB-II Support

There are eleven groups of objects specified in MIB-II. The switch's SNMP manage node supports three of these groups. The eight additional groups do not apply.

The three groups supported include the following:

- System group (object ID is {iso, org, dod, internet, mgmt, mib-2, 1})
- Interfaces group (object ID is {iso, org, dod, internet, mgmt, mib-2, 2})
- SNMP group (object ID is {iso, org, dod, internet, mgmt, mib-2, 11})

The following variables are modifiable via the SNMP set command, given an appropriate community with read-write access.

<i>sysDescr</i>	System description: the default value is set as Fibre <b>Channel Switch</b>
<i>sysObjectID</i>	System object identifier vendor's authoritative identification ( <b>1.3.6.1.4.1.1588.2.1.1.1</b> )
<i>sysUpTime</i>	The time since the manage node was last initialized
<i>sysContact</i>	The identification and contact information for this system. By default, this is set as <b>Field Support</b> .
<i>sysLocation</i>	The node's physical location. The default setting is <b>End User Premise</b> .

The interface group supports three interface drivers: software loopback, Ethernet, and Fibre Channel IP. Dell is not currently supporting Fibre Channel IP.

## Fabric Element MIB Support

The following five object groups are defined:

- Configuration group
- Operation group
- Error group
- Accounting group
- Capability group

The manage node supports all groups.

## PowerVault™ 50F Switch Vendor Unique MIB

The following five object groups are defined:

- PowerVault™ 50F System Group
- Fabric Group
- SNMP manage node Configuration Group
- Fibre Channel Port Group

## Name Server Group

### Generic Traps

Setting up the switch's SNMP connection to an existing managed network allows the network system administrator to receive the following generic traps:

- coldStart — indicates the manage node has reinitialized itself such that the manage node's configuration can be altered.
- warmStart — indicates the manage node has reinitialized itself, but no configuration has changed.
- linkDown — indicates an IP interface (Ethernet, loop back, or embedded N\_Port) has gone down and is not available.
- linkUp — indicates an IP interface (Ethernet, loop back, or embedded N\_Port) has become available.
- authenticationFailure — indicates the manage node has received a protocol message that is not properly authenticated. This trap, by default, is disabled but can be enabled via the command **agtcfgSet**

### Enterprise Specific Traps

Three Enterprise Specific Traps are supported:

- swFault — indicates that the diagnostics detect a fault with the switch.
- swSensorScn — indicates that an environment sensor changes its operational state (for example, a fan stops working). The VarBind in the Trap Data Unit contains the corresponding instance of the sensor status.
- swFCPortScn — a notification that a Fibre Channel Port changes its operational state (for instance, the Fibre Channel Port goes from online to offline). The VarBind in the Trap Data Unit contains the corresponding instance of the port's operational status.



**NOTE:** *SNMP swFCPortScn traps are generated on GBIC insertion and removal even though the state remains offline.*

### Manage Node Configuration

*Changes to SNMP from either Telnet or SNMP are not displayed in SNMP until the switch is rebooted running. This is due to SNMP running from cache while the active settings are running from the flash PROM.*

The configurable parameters include the following:

- SNMPv1 communities (up to 6)
- Trap recipients (1 per community)
- sysName
- sysLocation
- authenticationFailure — indicates the manage node has received a protocol message that is not properly authenticated. This trap, by default, is disabled but can be enabled via the command **agtcfgSet**.

The sysX parameters can be configured via the **SNMPv1 SET** command with an appropriate community. These parameters can be configured via a Telnet connection, using the command **agtcfgSet**.



**NOTE:** *A change in the first two configuration parameters takes effect only after rebooting the switch.*

## Name Server

The fibre channel protocol (FCP) inquiry data obtained by device probing may now be obtained from the Name Server by retrieving the port symbolic name.

Common Transport (CT) requests and responses including Name Server are recorded in the *portLog*. A typical trace is shown as follows, where port 4 logs in to the Name Server and issues command 217. It receives an Accept (8002).

```
Jun 15 16:00:21.899 tReceive  Rx3  4  116
22ffffffc,00210413,03000000
Jun 15 16:00:21.899 tSwitch   Tx3  4  116
23210413,00ffffffc,02000000
Jun 15 16:00:21.933 tNSd     ctin  4  fc
00030217,00210413,00000100
Jun 15 16:00:21.933 tNSd     ctout 4  fc 00008002
Jun 15 16:00:21.933 tNSd     Tx3  4  0
03210413,00ffffffc
```

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# Introducing PowerVault™ 50F Fibre Channel Switch Manager: Dell™ PowerVault™ 50F 8-Port Fibre Channel Switch Installation and Troubleshooting Guide

[Overview](#) • [Everyday Management](#) • [Managing Switch\(es\) Remotely](#) • [Switch Management Tools](#) • [Administrative Functions](#)

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## Overview

Use the PowerVault™ 50F Fibre Channel Switch Manager (Web interface) to log onto a switch from a host with a Java-enabled Web browser via the Internet or Intranet to remotely manage a Server-Storage Area Network (SAN) composed of switches and other SAN devices. PowerVault™ 50F Fibre Channel Switch Manager allows you to dynamically interact with any switch in the SAN to monitor status and performance. You use the available information to make overall topology decisions (for example, increasing a path's bandwidth due to data saturation). Additionally, you can change a switch's configuration or download firmware. The Administrative Interface and Telnet provide the means to make administrative changes, and security is enforced by username and encrypted password.

This chapter discusses the following information about managing and monitoring a switch using PowerVault™ 50F Fibre Channel Switch Manager:

- Everyday management
  - Managing switch(es) remotely
  - Switch management tools (five screens)
  - Administrative functions (two screens)
- 

## Everyday Management

Everyday management includes the following range of tasks:

- Monitoring port and switch operations
  - Evaluating port, switch, and network performance
  - Gathering statistics
  - Troubleshooting problems
  - Configuring the switch and the network topology
- 

## Managing Switch(es) Remotely

Using the PowerVault™ 50F Fibre Channel Switch Manager and a familiar Web browser, you can manage a complex SAN, comprising multiple switches, as follows:

- Switch identification in network
- Fabric topology/routing information
- Switches/ports general configuration

- Real-time graphical switch/port status and statistics report
    - Port performance shown graphically (polled up to 2.5 seconds depending on operating system and browser used)
    - Four minutes of aggregate bandwidth throughput (polled up to 2.5 seconds depending on operating system and browser used) shown graphically, scaled dynamically, based on activity
    - Management with security protection via:
      - Graphical User Interface (GUI)
      - Management by Telnet commands (Telnet session)
  - Screen views
    - Five for monitoring and gathering information
    - Two for administrative interfaces
  - Help functions
    - Pop-up help for error conditions
    - Glossary help
    - Online help HTML pages
  - Interface
    - Out-of-band via a 10BaseT Ethernet connection
- 

## Switch Management Tools

The management tools provide five screens, as described in the following subsections.

### Fabric View Page

The Fabric View Page shows the number of network switches and confirms worldwide names, domain IDs, and switch names, if applicable.

### Fabric Topology View Page

The Fabric Topology View Page shows the physical configuration including active domains, paths and routing information. For example, the hop count which is the number of switches that handle a data frame from origination through to the destination.

### General Switch View Page

The General Switch View Page displays switch enclosure information, confirms general switch information, and includes GUI buttons for quick access to the Administrative Interface, Telnet, and the Performance View.

The front panel identifies the type of interface module installed in each switch slot, the industry media (GBIC, or Gigabit Interface Converter) used by the ports, and each port's light-emitting diode (LED) status. From this view, more information is available about the switch by moving to either the Performance View or the Port Detail View.

## **Performance View Page**

The Performance View Page graphically shows real-time data throughput for each port and switch bandwidth utilization.

The two types of performance data shown are the throughput of each port and total switch throughput. Bandwidth utilization is critical information needed to make decisions about optimizing performance, for instance, if one port begins to handle a disproportionate amount of traffic.

## **Port Detail View Page**

The Port Detail View Page shows statistics and general information for all ports, including LED status.

The Port Detail View appears for whatever port you select in the General Switch View. Once in this view, every port for that switch may be viewed sequentially, by selecting its file folder. Each folder's tab replicates the port's LED status which allows you to monitor all port status at the same time. Port details include statistics about frames, interrupts, and errors that are helpful when troubleshooting.

---

## **Administrative Functions**

The administrative functions provide two screens for secured interfaces, as described in the following subsections:

### **Administrative Interface Page**

The Administrative Interface Page is used to perform routine functions, such as upgrading firmware versions, changing passwords, or switch reconfigurations.

### **Telnet Interface Page**

The Telnet Interface Page uses Dell's superset of Telnet commands (configuration, diagnostics, displaying, and routing) for switch diagnostics, troubleshooting, and management.

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# PowerVault™ 50F Fibre Channel Switch Manager Operational Concepts: Dell™ PowerVault™ 50F 8-Port Fibre Channel Switch Installation and Troubleshooting Guide

[Overview](#) • [Using the Web Interface](#) • [Fabric View Page](#) • [Fabric Topology View Page](#) • [General Switch View Page](#) • [Port Detail View Page](#) • [Performance View Page](#) • [Administrative Interface Page](#) • [Telnet Interface Page](#)

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## Overview

This chapter discusses the PowerVault™ 50F Fibre Channel Switch Manager operational concepts. When using the PowerVault 50F Fibre Channel Switch Manager, note the following:

- Clickable areas are highlighted with a hint displayed in the left-side bottom bar of your browser when the mouse is positioned over them.
  - When making changes in the admin page, the **Response Page** shows whether each individual configuration change was committed or rejected.
  - Java is disabled in some versions of Netscape and must be enabled by checking both **Enable Java** and **Enable Java Script** buttons in the **Preferences/Advanced** menu.
  - Netscape or Internet Explorer may hang with Java applications on Microsoft™ Windows NT™ after SP3 due to True Color. To resolve this problem, either change the NT display settings to other than True Color, or download the hotfix to modify **win32k.sys**. The hotfix is available from Microsoft Technical Support.
  - When a **Fabric Topology View Page** is already open, clicking the **Fabric Topology** button from the **Fabric View Page** will not cause the **Fabric Topology View Page** to rise to the top as the active window. In this situation, use the taskbar to reactivate the **Fabric Topology View Page**.
  - When a **Port Detail View Page** is already open, clicking a port button from the **General Switch View Page** will not cause the **Port Detail View Page** to rise to the top as the active window. In this situation, use the taskbar to reactivate the **Port Detail View Page**.
  - When a **Performance View Page** is already open, clicking the **Perform** button from the **General Switch View Page** will not cause the **Performance View Page** to rise to the top as the active window. In this situation, use the taskbar to reactivate the **Performance View Page**.
- 

## Using the Web Interface

The Web interface switch management system provides a Graphical User Interface (GUI) for users to display Fabric topology, general switch information, port traffic statistics and throughput performance. The GUI enables switch administrators to configure the switch and its ports.

### Controlling the Web Interface

When you position the cursor over an object (such as a port or the thermometer) and click, an informational screen is displayed. In some instances, you can change the definitions by completing text fields (see "[Administrative Interface Page](#)" for more information).

---

## Fabric View Page

The **Fabric View Page** is the first Web page displayed (see "[Fabric View Page](#)" for details). This is a global page and shows all switches present that comprise the Fabric. Note that switch in the Fabric can show the overall Fabric view; therefore, it is not critical which switch is accessed initially.

The **Fabric View Page** uses switch names to connect to individual switches. This means you give each switch a unique name (see Table 6-5 for information on how to use the **switchName** command), and this name should match the correct Internet Protocol (IP) address by the name resolution protocol in use by the Web client (NIS, DNS, etc.).

If a switch name is not recognized by the name resolution protocol, it may be accessed by typing in its IP address from the **Fabric View Page** (double-click on the switch image while pressing down the <Shift> key to open a dialog box and enter the IP address or host name).

## Fabric Topology View Page

The **Fabric Topology View Page** shows the physical configuration, including active domains and paths, and routing information (see "[Fabric Topology View Page](#) ").

## General Switch View Page

The **General Switch View Page** shows a graphic representation of the switch's front panel (see "[General Switch View Page](#)" for details). Normal long-term monitoring is conducted from this page, which provides a real-time view of each switch's overall health and status in the Fabric. Note that if a switch has a problem, a pop-up message is displayed explaining what problem has been detected.

## Port Detail View Page

The **Port Detail View Page** provides statistics for each port (see "[Port Detail View Page](#) " for details). The page features cascaded folders, one for each port. Each folder has a tab on the top to show the port number and a status light to tell the port state.

## Performance View Page

The **Performance View Page** displays port and switch throughput in bytes per second (see "[Performance View Page](#)" for details). Each port is numbered and throughput for the entire switch is displayed under the individual port readings.

## Administrative Interface Page

The **Administrative Interface Page** is used to enable (or disable) the switch or ports (see "[Administrative Interface Page](#)" for details). Change switch name, date/time, IP addresses, user name, passwords, download flash, and reboot switch via this page. Only users with admin privilege can access this page. Any changes made through this page may fundamentally change the switch/port status and its role in the fabric.

## Telnet Interface Page

The **Telnet Interface Page** allows you to launch a Telnet session directly from your Web browser. Only

users with admin or user privilege can access this page, and the **Telnet Interface Page** is not in the help menu. See the *Dell PowerVault™ 50F Fibre Channel Switch User's Guide* for detailed information and supported Telnet commands. To launch a Telnet session click the **Telnet** button in the **General Switch View Page**.



**NOTES:** Users with user (via Telnet) or admin level privilege can access these pages. The user level is more restrictive and cannot perform configuration commands. The administrative page via a browser can only be accessed from the admin level; all other accesses are rejected.

*HotJava browsers do not support Telnet commands.*

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# Using PowerVault 50F Fibre Channel Switch Manager: Dell™ PowerVault™ 50F 8-Port Fibre Channel Switch Installation and Troubleshooting Guide

[Overview](#) • [Fabric View Page](#) • [Fabric Topology View Page](#) • [General Switch View Page](#) • [Port Detail View Page](#) • [Performance View Page](#) • [Administrative Interface Page](#) • [Installing and Running rshd.exe](#) • [Pop-up Help Dialog Box](#)

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## Overview

This chapter contains general information and examples on managing and monitoring the switch via the PowerVault™ 50F Fibre Channel Switch Manager. The following topics are discussed:

- [Fabric View Page](#)
  - [Fabric Topology View Page](#)
  - [General Switch View Page](#)
  - [Port Detail View Page](#)
  - [Performance View Page](#)
  - [Administrative Interface Page](#)
- 

## Fabric View Page

The **Fabric View Page** displays the switches in a grid. The lines between switches represent what the Fabric knows about a switch, but do not indicate connectivity or how the switch is connected to the Fabric.

Double-click on a switch to display the **General Switch View Page** to provide additional switch information.

Selecting the **Fabric Topology** button displays a **Fabric Topology View Page**.

---

## Fabric Topology View Page

The Fabric topology is viewed from the host domain (or host switch), which is initially requested from the Web browser. This page is broken up into two figures and shows the physical configuration including active domains, paths, and routing information (for example, the hop count which is the number of switches that handle a data frame from origination to the destination). See Table 6-1 for field details.

The first item that appears in this page is a list of active domains (or switches) in the Fabric. Following the active domain list is a table unfolding the views of active paths from the host domain to all remote domains in the Fabric. This table is grouped by domains. The worldwide name and Internet Protocol (IP) address are included under each domain. Each active path table displays host switch output port number, host switch input port number, the hop count and metrics (costs) from the host domain to the remote domain, and the path flag.

### Table 6-1. Fabric Topology Field

Field	Description
List of Active Domains in the Fabric	Displays the number of active domains in the Fabric including switch names and switch domain ID.
List of Active Paths by Domain	Displays the domain ID associated with the switch name. Worldwide Name (WWN), and total number of paths by domain. Each path is displayed including: <ul style="list-style-type: none"> <li>• Output ports</li> <li>• Input ports</li> <li>• Metric</li> <li>• Flag</li> </ul>

## General Switch View Page

The **General Switch View Page** displays when you query the switch from the **Fabric View Page** (see Table 6-2 for field descriptions). A photographic quality switch is displayed on the browser. The switch picture displays the ports, light-emitting diodes (LEDs), general switch information, temperature, fans and buttons for administration functions, Telnet session, and performance view.

The **admin** button links to the system administration pages where you can disable/enable a port depending on the appropriate authentication (see Table 6-5 and "Administrative Interface Page" in this chapter for more information). The **performance** button links to the **Performance View Page** (see "[Performance View Page](#)" for more information). The Telnet button launches a Telnet session (see "[Telnet Interface Page](#)").

Under normal conditions, the browser's lower-right corner holds animated thermometers and spinning fans. The color and blinking speed of the port LEDs are updated every 1 to 2.5 seconds depending on the operating system and browser used. Warning messages show up in a pop-up window automatically if problems occur (for example, temperature exceeding maximum value, a fan stops rotating, or a port state becomes problematic). Pushbuttons are placed in the bottom of the warning message pop-up window. Those buttons are connected to a separate browser providing basic troubleshooting guides.

The thermometer indicates the highest temperature from the last data sample. Click on the thermometer to display the temperature readings from all five switch sensors.

**Table 6-2. General Information Fields**

Field	Description
WWN	The switch's WWN is unique numeric identifier for each switch and is assigned by the manufacturer. A numbering scheme administrated globally ensures that this WWN is unique to this switch.
Domain ID	The domain ID 0 to 31. This number uniquely identifies the switch in a Fabric.
Role	The three possibilities for role including: <ul style="list-style-type: none"> <li>• Principal-The principal switch as defined in FC-SW.</li> <li>• Subordinate-This switch is enabled and not the principal switch.</li> <li>• Disabled-The switch is disabled.</li> </ul>
State	The switch state. Possible values include Online, Offline, Testing, and Faulty.

Firmware	The firmware version.
EtherIP	The default Ethernet IP address is a temporary number derived from the switch's WWN. You must enter a valid IP address.
Ether NM	The default Ethernet subnetmask value is none.
Gateway	The default gateway address is 0.0.0.0. You must enter a valid gateway address, if required.
The following fields are not currently supported:	
FC IP	The default Fibre Channel IP address is a temporary number derived from the switch's WWN. You must enter a valid IP address.
FC NM	The default Fibre Channel subnetmask is none.

On the left side of the display, the upper half shows port and LED status and the lower half contains general switch information. Selecting the label on each text field displays a pop-up dialog that explains the field.

In the switch picture, the blinking green lights indicate problem status and solid black indicates no device attached. Each port module is a clickable hyperlink that takes you to a third page, the **Port Detail View Page** (see Table 6-3 and "Port Detail View Page" in this chapter for more information). Each port includes the port number, a status LED, and port detail information.

If a port card is not installed, a solid black rectangle is displayed and the port status is indicated as `No_Card`. If the interface is installed but no Gigabit Interface Converter (GBIC) is present, a silver rectangle is displayed and the port status is indicated as `No_Module`.

If the port contains a GBIC, one of the following is shown:

- For copper GBICs, a graphic representation of a copper GBIC with the letters "CU"
- For shortwave fiber GBICs, a graphic representation of a GBIC with the letters "S" and "W"
- For longwave fiber GBICs, a graphic representation of a GBIC with the letters "L" and "W"
- If the port is on an arbitrated loop, the letters "F/L" are displayed in an oval between the ports associated with the card.
- If the port has failed, the port is outlined in amber to indicate a failure.

The color and flash speed of each LED, as described in Table 6-3, indicates port status.

**Table 6-3. Port LED Status Indicators**

Port LEDs	Definition
No light showing	No signal (no module, no cable) for media interface LEDs, power not applied for power indicator LED.
Steady yellow	Receiving signal, but not yet online. If the port transitions to this state while being monitored, the application presents you with a dialog recommending a course of action.
Slow yellow	Disabled (result of diagnostics or portDisable command). Flashes every 2 seconds. The application presents you with a dialog recommending a course of action.
Fast yellow	Error, fault with port. Flashes every 1/2 second. The application presents a dialog recommending a course of action.
Steady green	Online (connected with device over cable).
Slow green	Online, but segmented (loopback cable or incompatible switch) flash every 2 seconds.
Fast green	Internal loopback (diagnostic). Flashes every 1/2 second.
Flickering	Online and frames flowing through port.

green

## Port Detail View Page

The **Port Detail View Page** features eight cascaded folders. Each folder has a tab on the top to show the port number and a status light to tell the port state (disabled or enabled with the same light as described in Table 6-3). The port information is updated once per second. However, the time interval may be as long as 2.5 seconds depending on the browser used. By monitoring the eight tabs, a system administrator can evaluate each port state. The default top folder displayed on this page is for the port number checked from the **General Switch View Page**. Clicking a tab brings the corresponding port folder to the front.

Below the folders is a pushbutton linked to the **Administrative Interface Page** (see "[Administrative Interface Page](#)" for more information) where port enable/disable can be performed. A pushbutton is linked to the **Performance View Page** (see "[Performance View Page](#)" for more information) where port and switch throughput data is plotted. A **Done** pushbutton is used to exit from the page.

Each port folder contains general port status information such as the port number, port type (E-Port, G-Port), port WWN name, and some detailed information, such as the number of interrupts, number of link failures, number of parity errors, number of time-outs, and the size of free buffer.

The LED located in the upper-right corner in each tab resembles the port LED in the switch front panel.

**Table 6-4. Port Detail View Page Fields**

Field	Description
Port Number	The port number
Port Status	The port state follows the GBIC type. The possible port states include: <ul style="list-style-type: none"> <li>• No_Card - No card present in this switch slot</li> <li>• No_Module - No GBIC module in this port</li> <li>• No_Light - The module is not receiving signal</li> <li>• No_Sync - The module is receiving light but is out of sync</li> <li>• In_Sync - The module is receiving light and is in sync</li> <li>• Laser_Flt - The module is signaling a laser fault (defective GBIC)</li> <li>• Port_Flt - The port has been marked faulty (defective GBIC, cable, or device)</li> <li>• Diag_Flt - The port failed diagnostics (defective G_Port or FL_Port card or motherboard)</li> <li>• Online - The port is up and running</li> <li>• Lock_Ref - The port locking to the reference signal</li> </ul>
Port Type	The port type (E_Port, G_Port or FL_Port).
Port Module (or GBIC Module)	The GBIC type follows the port number. The four GBIC types include: <ul style="list-style-type: none"> <li>• - - no GBIC present</li> <li>• sw - shortwave GBIC</li> <li>• lw - longwave GBIC</li> <li>• cu - copper GBIC</li> </ul>
Port Worldwide Name	The Worldwide Name for this port.
Interrupts	Total number of interrupts.
Unknown	Number of unknown interrupts.
Lli	Number of low level interface (LLI) interrupts.
Proc_rqrd	Number of interrupts with processing (CPU) required.
Timed_out	Number of timed out interrupts.

Rx_flushed	Number of flushed transmissions.
Tx_unavail	Number of interrupted transmissions.
Free_buffer	Number of buffer interrupts.
Overrun	Number of buffer overruns.
Suspended	Number of suspended interrupts.
Parity_err	Number of parity errors.
Frjt	Number of frame rejected.
Fbsy	Number of frames busy.
Link_Failure	Number of link failure.
Loss_of_sync	Loss of synchronization.
Protocol_err	Protocol error.
Invalid_word	Invalid word (encoding errors inside of frames).
Invalid_crc	Invalid CRC in a frame.
Delim_err	Delimiter error (order set)
Address_err	Address ID error (S_ID D_ID)
Lr_in	Link reset in (primitive sequence). Does not apply to FL_Port.
Lr_out	Link reset out (primitive sequence). Does not apply to FL_Port.
Ols_in	Offline resent in (primitive sequence). Does not apply to FL_Port.
Ols_out	Offline resent out (primitive sequence). Does not apply to FL_Port.

---

## Performance View Page

The **Performance View Page** displays port and switch throughput (in bytes per second). The first eight graphs show the port throughput for port number 0 through 7. Throughput for the entire switch is displayed in the long rectangular graph at the bottom.

The horizontal axis represents time elapsed. The port throughput graphs hold up to 60 seconds of performance data. The switch throughput graph at the bottom holds up to 4 minutes of performance data. The vertical axis in each graph shows throughput (in bytes per second). It is automatically scaled depending on the switch activity. The display is updated roughly once per second.

The total throughput value is the throughput sum for all ports. The throughput number represents the number of bytes received plus the number of bytes transmitted each second. Note that, because the switch also *transmits* all data it receives, the total throughput for the switch could, alternately, be stated as one-half (1/2) of the throughput sum of all ports.

---

## Administrative Interface Page

Only users with admin privilege can access the **Administrative Interface Page**. Any changes made through this may fundamentally change the switch/port status and its role in the fabric. Check and input boxes are provided for you to type in the changes. Submit buttons are used to apply the changes. You can enable (or disable) the switch or ports (8). Change switch name, IP addresses, user name, passwords, download flash, and reboot switch via this page. Table 6-5 provides field information for the **Administrative Interface Page**.

**Table 6-5. System Administration Fields**



Category	Field	Description
Switch Administration	Switch Disabled	If the box is checked, the switch is disabled. It may need to be enabled after firmware upgrades, maintenance, and diagnostic tests. To enable the switch, click the check box to remove the check and select the <b>Commit Configuration Changes</b> button.
	Switch Domain	The switch domain text box displays or sets the switch domain. To update the switch domain, enter the new domain and select the <b>Commit Configuration Changes</b> button.
	Switch Name	The switchName text box displays or sets the switch's name. To update the switch name, enter the new name and select the <b>Commit Configuration Changes</b> button.
Network Administration	Ethernet IP	The IP address for the Ethernet connection to the switch. The default IP address is a temporary number derived from the switch's WWN. Refer to the network administrator for the appropriate IP address.
	Ethernet Subnetmask	The default subnetmask value is none. Refer to the network administrator for the appropriate subnet mask value to enter.
	Gateway	The gateway address. Refer to the network administrator for the appropriate gateway address value to enter.
	Fibre Channel IP	The Fibre Channel IP address. The default IP address is a temporary number derived from the switch's WWN. Refer to the network administrator for the appropriate IP address. (Not currently supported.)
	Fibre Channel Subnetmask (not currently supported)	The default subnetmask value is none. Refer to the network administrator for the appropriate subnet mask value to enter.
Switch Port Configuration	Port Number	The port number on a particular switch.
	Port Disabled	If the box is checked, the port is disabled. It may need to be enabled after maintenance and diagnostic tests. To enable the port, click the check box and select the <b>Commit Configuration Changes</b> button.
Commit Configuration Changes		Applies administrative changes.
Switch User Administration	Change User Name	Only users with admin level can change user name for <i>admin</i> and <i>user</i> .
	Change Password	To change passwords, enter new password. A valid password must contain 8 to 40 characters.
	Verify Password	For new passwords, re-enter the password for verification.
Commit Username and Password Changes		Applies administrative changes.
Reset		Resets the display to previous defaults.

Flash Download	Host Name or Host IP  Remote User Name	The host name or Host IP address of the source host where the binary firmware file resides. Note that <b>rshd.exe</b> must be running on the host system before a download is attempted.  The remote user name of the source host where the binary firmware file resides.
	Download File From  Download Flash Now  Reboot This Switch Now	The absolute directory path and filename from the source host where the binary firmware file resides. Note that you must use forward slashes (/) when downloading firmware from a Windows NT system.  Downloads firmware into flash memory.  Pressing this button causes the switch to immediately exit all current processes and states.

## Installing and Running rshd.exe

To run the remote shell daemon, perform the following steps:

1. Run the **setup.exe** file on the *Dell PowerVault™ Utilities Diskette* to install the **rshd.exe** and **cat.exe** utility files on the hard disk.
2. Click **Start** and then click **Programs**.
3. In the program list, click **Dell OpenManage™ PowerVault™ Manager—> PowerVault™ 50F Utilities—> rshd**.

The remote shell daemon starts. The **cat.exe** is run from the **rshd.exe** file

4. After **rshd.exe** completes the download, stop **rshd.exe** by pressing <Ctrl-C>. To minimize any security exposure, the remote shell daemon should be terminated.

## Pop-up Help Dialog Box

The **Pop-up Help** dialog box displays all glossary help and warning messages in a single pop-up dialog box instead of one pop-up per message. This pop-up dialog box can contain up to 100 entries, each with a time stamp. The top item is deleted sequentially in order to display a new message when over 100 entries are recorded. A single click on each item brings up a separate browser displaying glossary help or troubleshooting information. The history is maintained upon browser reload/refresh. The history is cleared upon exiting from the browser.

Browser reload/refresh closes all pop-up windows (**Help** dialog box, **Performance** window and Port Detail window) properly without leaving orphan windows for the operating system to handle.

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# PowerVault™ 50F Commands: Dell™ PowerVault™ 50F 8-Port Fibre Channel Switch Installation and Troubleshooting Guide

[Overview](#) • [General Commands](#) • [Diagnostic Commands](#) • [Routing \(Show\) Commands](#)

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## Overview

This chapter contains information and examples on managing and monitoring the switch via Telnet, including:

- General Commands
- Diagnostic Commands

The user can configure, operate, and test the switch using the following commands and settings through the Telnet interface.

---

## General Commands

The following general commands allow you to control basic switch operations.

### **agtcfgSet**

Figure 7-1 shows the **agtcfgSet** command which is used to set the Simple Network Management Protocol (SNMP) manage node configuration to a fiber channel switch. The fields are described in Table 7-1.

### **Figure 7-1. agtcfgSet Command Example**

```
=> agtcfgSet
```

```
Customizing MIB-II system variables ...
```

```
At each prompt, do one of the following:
```

- o <Return> to accept current value,
- o enter the appropriate new value,
- o <Control-D> to skip the rest of configuration, or
- o <Control-C> to cancel any change.

```
To correct any input mistake:
```

```
<Backspace> erases the previous character,
```

```
<Control-U> erases the whole line,
```

```
sysDescr: [Fibre Channel Switch.]
```

```
sysLocation: [End User Premise]
```

```
sysContact: [Field Support.]
```

```
swEventTrapLevel: (0..5)[0]
```

```
authTrapsEnabled (true, t, false, f): [false]
```

```
SNMP community and trap recipient configuration:
```

```
Community: [Secret C0de]
```

```
Trap Recipient's IP address in dot notation: [0.0.0.0]
```

```
Community: [OrigEquipMfr]
```

```
Trap Recipient's IP address in dot notation: [0.0.0.0]
```

```
Community: [private]
```

```
Trap Recipient's IP address in dot notation: [0.0.0.0]
```

```
Community: [public]
```

```
Trap Recipient's IP address in dot notation: [0.0.0.0]
```

```
Community: [common]
```

```
Trap Recipient's IP address in dot notation: [0.0.0.0]
```

```
Community: [FibreChannel]
```

```
Trap Recipient's IP address in dot notation: [0.0.0.0]
```

```
value = 0 = 0x0
```

## agtcfgShow

Figure 7-2 shows the **agtcfgShow** command, which prints SNMP manage node configuration. The fields are described in Table 7-1.

### Figure 7-2. agtcfgShow Command Example

```

=> agtcfgShow
Current SNMP Agent Configuration
Customizable MIB-II system variables:
    sysDescr = Fibre Channel Switch.
    sysLocation = End User Premise
    sysContact = Field Support.
swEventTrapLevel = 0
    authTraps = 0 (OFF)

SNMPv1 community and trap recipient configuration:
Community 1: Secret C0de (rw)
    Trap recipient: 192.168.1.62
Community 2: OrigEquipMfr (rw)
    Trap recipient: 192.168.11.172
Community 3: private (rw)
    No trap recipient configured yet
Community 4: public (ro)
    No trap recipient configured yet
Community 5: common (ro)
    No trap recipient configured yet
Community 6: FibreChannel (ro)
    No trap recipient configured yet
value = 0 = 0x0

```

**Table 7-1. agtcfgShow Command Example**

Field	Description
sysDescr	System description: the default value is set as <b>Fibre Channel Switch</b>
sysLocation	The node's physical location. The default setting is End User Premise.
sysContact	The identification and contact information for this system. By default, this is set as <b>Field Support</b>
authTraps	Trap authentication. Possible values include 0 (OFF), 1 (ON)
SNMPv1 community and trap recipient configuration	This example shows six communities available with which to register and define the recipients of SNMP traps. The recipient is the host, which has SNMP management installed. Values include read and write (rw) and read only (ro).
swEventTrapLevel	Determines the level at which the action of adding an entry to the error log will generate a trap. Possible values are 0 (OFF), 1, 2, 3, 4, or 5. When set to a valid value above 0, a trap is generated when an entry is made to the error log at or below the value set. The error log is viewed using the errShow command.

## aliasShow

Figure 7-3 shows the **aliasShow** command, which prints local Alias Server information. If there is no local alias group, a message stating that is displayed.

**Figure 7-3. aliasShow Command Example**

### *aliasShow*

Figure 7-3 shows the **aliasShow** command, which prints local Alias Server information. If there is no local alias group, a message stating that is displayed.

```

=> aliasShow
The Local Alias Server has 1 entry
Alias ID Creator Token [rb, type, grptype, qlfr] Member I
fff01 fffffd [40, 05, 10000060 69000015] {2d0113 2d08:

```

## date

Figure 7-4 shows the **date** command, when entered by itself, displays the system date and time. You can also set the date as follows:

1. Type the command followed by the date in the format mmddHHMMyy where:
  - mm is month
  - dd is date
  - HH is hour
  - MM is minutes
  - yy is year
2. Press <Enter> to set date and time.



**NOTE:** The date function does not support daylight saving time. The firmware is year 2000 compliant.

### Figure 7-4. date Command Example

```
=> date

Mon Jul  7 08:48:01 1997
value = 25 = 0x19

=> date "0608112498"
Mon Jun  8 11:24:00 1998
```

## dateShow

Figure 7-5 shows the **dateShow** command which prints system and firmware dates. The fields are described in Table 7-2.

### Figure 7-5. dateShow Command Example

#### *dateShow*

Figure 7-5 shows the **dateShow** command which prints system and firmware dates. The fields are described in Table 7-2.

```
=> dateShow
Current date:   Thu Oct 15 10:46:40 1998
Booted at:     Wed Oct  7 07:32:58 1998
Firmware date: Tue Oct  6 17:07:51 PDT 1998
Flash date:    Tue Oct  6 17:08:06 PDT 1998
Boot prom date: Tue Sep  8 15:33:34 PDT 1998
value = 44 = 0x2c = ','
```

**Table 7-2. dateShow Command Field Descriptions**

Fabric Element	Description

Current date	Date and time the command was entered.
Booted at	Last date and time the switch was booted.
Firmware date	Date and time the firmware currently running on the switch was built.
Flash time	Date and time the firmware resident in flash memory was built. This firmware will be used on the next boot.
Boot prom date	Date and time the boot PROM was updated.

## errDump

The **errDump** command prints the contents of the error log with no page breaks. See Figure 7-6 for a log display example.

## errShow

Figure 7-6 shows the **errShow** command which displays all detected errors. The error log stores the last 32 error types sensed by the switch. The log shows:

- Error number (01-32)
- Date and time of the first occurrence each error type was sensed
- Total number of occurrences of each error type



**NOTE:** *The maximum error number is 999.*

- Error type
- Error level for each error type
  - 0-Panic (when this level is reached, the switch automatically reboots and the display no longer shows the error)
  - 1-Critical
  - 2-Error
  - 3-Warning
  - 4-Debug

Refer to "[Error Message Formats](#)" for a detailed explanation of each error type, its probable cause, and suggested corrective actions.

The following information is displayed in Figure 7-6:

- The switch detected two errors.
- The task ID and task name that incurred the error (task names are displayed using the `i` command).
- The error type, date and time, the error level, and description.
- If there is more than one occurrence of an error type, the number of occurrences is shown in brackets following the error date and time.

### Figure 7-6. errShow Command Example

```
=> errShow
Error 02
-----
Ox103dc470 (tSilkworm): Apr  9 10:41:06
    Error SENSOR-FAILED, 3, sensor 7 (Fan 2) is below
    minimum
Type <CR> to continue, Q<CR> to stop:

Error 01
-----
Ox103dc470 (tSilkworm): Apr  9 10:40:51
    Error DIAG-TIMEOUT, 1,
    Port 2 receive timeout.
Type <CR> to continue, Q<CR> to stop:
value = 1 = 0x1
```

## fabricShow

Figure 7-7 shows the **fabricShow** command, which displays a list of switches and multicast alias groups in a Fabric. The fields are described in Table 7-3.

### Figure 7-7. fabricShow Command Example

#### *fabricShow*

Figure 7-7 shows the **fabricShow** command, which displays a list of switches and multicast alias groups in a Fabric. The fields are described in Table 7-3.

```
=> fabricShow
Switch ID      Worldwide Name          Enet IP Addr    FC IP Addr      Name
-----
  1: fffc41 10:00:00:50:59:00:00:19  192.168.1.113  0.0.0.0
"sw25"

value = 1 = 0x
```

**Table 7-3. fabricShow Command Field Descriptions**

Fabric Element	Description
switch n	Each line shows: <ul style="list-style-type: none"> <li>The switch's domain ID (0-31)</li> <li>The switch's embedded port ID</li> <li>The switch's Worldwide Name</li> <li>The switch's Ethernet and FC IP addresses</li> <li>The switch's name (a "&gt;" indicates the Principle switch in the Fabric)</li> </ul>
multicast alias group	Each line shows: <ul style="list-style-type: none"> <li>The alias group number (0-30)</li> <li>The alias group ID</li> <li>The alias token</li> </ul> <p>Alias groups are only created on demand by requests to the alias server; typically no groups are listed.</p>

## fastboot



Figure 7-8 shows the **fastboot** command which is a *warm* reboot that bypasses power-on self-test (POST).

### Figure 7-8. fastboot Command Example

```
=> fastboot
value = 0 = 0x0
```

### flashDefault

Figure 7-9 shows the **flashDefault** command, which resets the switch to the factory default configuration values.

This command may not be executed on an operational switch. You must first disable the switch using the **switchDisable** command.

### Figure 7-9. flashDefault Command Example

```
=> flashDefault
value = 0 = 0x0
```

**flashDefault** also configures the switch to boot from its flash proms (removes any network boot parameters), erases the SNMP database, and erases the Zoning database. If any changes have been made to the SNMP configuration or Zoning configuration from the default values, then the factory default does not take effect until the next reboot because the values are stored in cache.

For this reason it is recommended to always reboot the switch immediately after **flashDefault**.

**flashDefault** does not change the switches identity: Worldwide Name, Ethernet IP address and subnetmask, gateway address, symbolic name, or license keys.

This command should be used with care; **flashDefault** restores the configurable parameters to factory default values, as follows:

- Switch modes: *tachyon*, *isolated*, *notypes*, *nomcast*, *nopost*
- FC parameters: *domain*, *BB\_credit*, *RA\_TOV*, *ED\_TOV*
- FL\_Port parameters: *collection method*, *credit*, *FAN frames*
- Virtual channel parameters
- *syslogd* IP address
- Fibre channel IP address and subnetmask
- Display error level
- Original equipment manufacturer (OEM) customizing
- Static paths
- Usernames and passwords

### flashDownload

Figure 7-10 shows the **flashDownload** command which is used to download firmware into flash memory. This command *can* be executed on an operational switch. A reboot is required to initiate the new firmware after the download has completed.

Firmware can be downloaded from either a UNIX® host, Windows® 95, or Windows NT host. For a UNIX host, no special software is needed. For Windows 95 or NT, the Dell PowerVault™ Utilities Diskette provides

a daemon to support a remote shell (RSH). Firmware download is via RCP command running on top of TCP between the switch and the host.

To download the firmware, perform the following steps:

1. Run the **setup.exe** file on the Dell PowerVault™ Utilities Diskette to install the **rshd.exe** and **cat.exe** utility files on the hard disk.
2. Click **Start** and then click **Programs**.
3. In the program list, click **Dell OpenManage™ PowerVault™ Manager** → **PowerVault™ 50F Utilities** → **rshd**.

The remote shell daemon starts. The **cat.exe** is run from the **rshd.exe** file

4. After **rshd.exe** completes the download, stop **rshd.exe** by pressing <Ctrl-C>. To minimize any security exposure, the remote shell daemon should be terminated.
5. Start a Telnet session to a switch. The command format is:

```
telnet [switch IP address]
```

6. Log in as "admin."

```
login: admin
```

Issue the following command:

```
flashDownload ["host name/IP address"], ["user name"], ["filename"]
```

For example:

```
=> flashDownload "192.111.2.1", "johns", "/tmp/os/v1.6"
```



**NOTE:** The host name is the host name or is the host IP address, the username is a valid host username, and the file name is a path to the new firmware file,

7. The RSH server validates the user and delivers the file to the switch where it is stored in flash memory, as shown.

```
writing flash 0 .....
```

```
writing flash 1 .....
```

8. Reboot the switch to initiate the new firmware.

### Figure 7-10. flashDownload Command Example

```
=> flashDownload "host","user","/temp/v1.6"
1159196+194916+876016
writing flash 0 .....
```

```
writing flash 1 .....
```

```
download complete
value = 0 = 0x0
```

### flashSet

The **flashSet** values are preset by Dell and should not be changed.

The **flashSet** command is used to set the switch's configuration parameters. This command may not be executed on an operational switch. You must first disable the switch using the **switchDisable** command.

## flashShow

The **flashShow** command prints the switch's configuration status. The display shows remote host and flash configuration information for flash-0 and flash-1 (a mirrored image of flash-0 and included as a fail safe device). Table 7-4 describes the command fields.

**Table 7-4. flashShow Command Field Descriptions**

Field	Description
Ethernet address	Switch's Ethernet MAC address for an Ethernet connection
Nvram data:	Remote host information including Ethernet interface
fl-0	Flash 0 data
fl-1	Flash 1 data contained on the CPU board
version	Reserved (this is not a firmware version)
domain	The domain number. This number uniquely identifies the switch in a Fabric
syslogd_ip	The system log daemon IP address
fc_ip_addr	The Fibre Channel IP address
fc_ip_mask	The Fibre Channel IP subnetmask
bb_credit	The buffer to buffer credit
df_size	The receive data field size
r_a_tov	The resource allocation time out value
e_d_tov	The error detect time out value
op_mode	Operating mode
vc_link_ctl	Virtual channel link control
vc_class2	Virtual channel class 2
vc_class3	Virtual channel class 3
vc_multicast	Virtual channel multicast
vc_tmap	Virtual channel time out map
vc_priorities	The numbers displayed show the priorities assigned to each of the switch's virtual channels. Positions 1 and 2, starting at the left of the display, are fixed and display 0 or 1. The first position a 0 shows and indicates that this virtual channel, assigned to handle internal switch traffic, has the highest priority. This priority value cannot be changed. The second position, indicated with a 1, shows the priority assigned by the virtual channel link control. The third through eighth positions can have only a 2 or a 3, indicating that the channel gives priority to either Class 2 frame traffic or to Class 3 frame traffic.
csum	Checksum
text off	Text offset in flash
text addr	Text address in RAM
text size	Text size (bytes)
data off	Data offset in flash
data addr	Data address in RAM
data size	Data size (bytes)
magic	The magic number represents the maximum frame size

tsum	Test checksum
dsum	Data checksum
hsum	Header checksum

## h

The **h** command prints the shell history of the previous 20 commands. The older commands are replaced by new commands. The shell history is similar to the UNIX Korn shell history facility with a built-in line editor (similar to UNIX vi) that allows previously typed commands to be edited.

The shell history is reset by a reboot.

## help



**NOTE:** The help display changes depending on the login user level and will display only those commands that are available to the current user. This example shows admin level commands. Route and license commands are not supported by Dell.

The **help** command prints a list of commands in alphabetical order, with an additional lists of "grouped" commands as follows:

- General commands
- Diagnosis commands
- Routing (Show) commands
- License commands



**NOTE:** In addition, commands for optionally licensed products are only displayed if the appropriate license key has been installed.

## i

The **i** command prints a currently running task summary. The **i** command is for diagnostic purposes is run only when requested by Dell Technical Support.

## ifShow

The **ifShow** command prints network interface information. The display includes three sections organized by interface:

- **ei** - Ethernet 10-BaseT port
- **lo** - loopback interface
- **fc** - Fibre Channel. This section is omitted if IP over Fibre Channel is not configured

## ipAddrSet

The **ipAddrSet** command is used to set the switch's IP addresses. The fields are described in Table 7-5.



**NOTE:** Consult your network administrator for the appropriate subnetmask.

**Table 7-5. ipAddrSet Command Field Descriptions**

Field	Description
Ethernet IP Address	The default IP address on a new switch is a temporary number derived from the switch's WWN. Enter a valid IP address.
Ethernet Subnetmask	The Ethernet subnetmask value. The default subnet mask value is none. Refer to the network administrator for the appropriate subnet mask value to enter here.
Fibre Channel IP Address	The Fibre Channel IP address for the switch. (Not currently supported.)
Fibre Channel Subnetmask	The Fibre Channel subnetmask for the switch. The default is none. (Not currently supported.)
Gateway IP Address	The gateway IP address. The default gateway address on a new switch is none. You must enter a valid gateway address, if required.

## login

The **login** command logs in a user from a remote host. If a user is already logged in, the command logs out the user and allows a new user login.

## logout

The **logout** command logs out from a remote session.

## nsAllShow

The **nsAllShow** command displays a list of PIDs of nodes connected to the Fabric. The **nsAllShow** command optionally takes an integer parameter, the value of the FC-PH type. For example, **nsAllShow 8** shows all SCSI-FCP nodes. If the parameter is not provided, then Nx\_Ports are displayed.

## nsShow

The **nsShow** command displays the local name server information. If there is no local information, a message stating that is displayed.

Only local entries are displayed.

## passwd

The **passwd** command is used to set usernames and passwords.

The command syntax is `passwd [ "user name" ]`

The optional parameter *<user name>* is a double-quoted, valid user name.

If the current password is incorrect, the command exits without saving any changes. If the number of retry attempts is exceeded, the command either steps to the next user or exits, saving any changes made thus far.

## Special Inputs

- <Enter> - Accepts the default value (if applicable) and moves to the next prompt.
- <Ctrl-C> - Aborts the **passwd** command immediately and ignores all changes made.
- <Ctrl-D> - Entered alone at a prompt without any preceding input, terminates the **passwd** command and writes all changes to flash memory.

## portDisable

Figure 7-11 shows the **portDisable** command, which is used to disable a specific port. Devices attached to a disabled port cannot communicate with the Fabric. The command syntax is `portDisable <port #>`.

### Figure 7-11. portDisable Command Example

```
=> portDisable 2
value = 0 = 0x0
```

## portEnable

Figure 7-12 shows the **portEnable** command, which is used to enable a specific port. The command syntax is `portEnable <port #>`.

### Figure 7-12. portEnable Command Example

```
=> portEnable 2
value = 0 = 0x0
```

## portLogClear

Figure 7-13 shows the **portLogClear** command, which clears the data from the port log. The command syntax is `portLogClear`.

### Figure 7-13. portLogclear Command Example

```
=> portLogClear
value = 0 = 0x0
```

## portLogDump

The **portLogDump** command prints the port log without page breaks. The command syntax is `portLogDump`. The **portLogDump** command is for diagnostic purposes and is run only when requested by Dell Technical Support.

## portLogShow

The **portLogShow** command displays the switch activity associated with a Fabric login (ext. Link Service request to a Fabric F\_Port, 22ffffffe), followed by a Port login (ext. Link Service request to the management server, 22ffffffa), and a SES Inquiry request (unsolicited command to the management server, 06ffffffa). Note the initial handshake between the F\_Port and the Host Bus Adapter. The **portLogShow** command is for diagnostic purposes and is run only when requested by Dell Technical Support.

## portPerfShow

The **portPerfShow** command displays the throughput for all ports. The output is terminated by typing <Enter> or <Ctrl-C>. The throughput number represents the number of bytes received plus the number of bytes transmitted and is displayed as bytes/second (B/s). Throughput numbers are shown either as bytes/second, kilobytes/second (the number is followed by 'k') or megabytes/second (the number is followed by 'm'). This information is used to monitor port performance.

One line is printed per second summarizing the traffic on all ports.

## portShow

The **portShow** command prints a summary of all ports. The command syntax is `portShow <port#>`. The fields are described in Table 7-6.

**Table 7-6. portShow Command Field Descriptions**

Type	Field	Description
Port Definition	portFlags	The bitmap port status.
	portType	The port type (G_port or FL_Port).
	portState	The port SNMP state. Values include Online/Offline.
	portPhys	The port physical state - Insync.
	portScn	The port LED state.
	portRegs	Pointer of hardware register.
	portData	Pointer to driver private data.
	portId	The port address ID.
	portWwn	The port worldwide name.
Interrupt Statistics	Interrupts	Total number of interrupts.
	Unknown	Number of unknown interrupts.
	Lli	Number of low level interface (LLI) interrupts.
	Proc_rqrd	Number of interrupts with processing (CPU) required.
	Timed_out	Number of timed out interrupts.
	Rx_flushed	Number of flushed transmissions.
	Tx_unavail	Number of interrupted transmissions.
	Free_buffer	Number of buffer interrupts.
	Overrun	Number of buffer overruns.
	Suspended	Number of suspended interrupts.
	Parity_err	Number of parity errors.
Error Statistics	Link_failure	Number of link failures.
	Loss_of_sync	Loss of synchronization.
	Loss_of_sig	Loss of signal (no light).
	Protocol_err	Protocol error.
	Invalid_word	Invalid word (encoding errors inside of frames).
	Invalid_crc	Invalid CRC in a frame.
	Delim_err	Delimiter error (order set).
	Address_err	Address id error (S_ID D_ID).
	Lr_in	Link reset in (primitive sequence). Does not apply to FL_Port.
	Lr_out	Link reset out (primitive sequence). Does not apply to FL_Port.

Ols_in	Offline resent in (primitive sequence). Does not apply to FL_Port.
Ols_out	Offline resent in (primitive sequence). Does not apply to FL_Port.
Frjt	Number of frames rejected.
Fbsy	Number of frames busy.

## portStatsShow

The **portStatsShow** command, when used with a port number, gives a static view of port status when the switch executed the command. For example, to update the command and check if an error count is increasing, reissue the **portStatsShow** command to capture another snapshot.

The command syntax is `portStatsShow <port#>`. The fields are described in Table 7-7.

**Table 7-7. portStatsShow Command Field Descriptions**

Field	Description
stat_wtx	Number of 4-byte words transmitted from the port.
stat_wrx	Number of 4-byte words received by the port.
stat_ftx	Number of frames transmitted from the port.
stat_frx	Number of frames received by the port.
stat_c2_frx	Number of Class 2 frames received.
stat_c3_frx	Number of Class 3 frames received.
stat_lc_rx	Number of link control frames received.
stat_mc_rx	Number of multicast frames received.
stat_mc_to	Number of timeouts reported for multicast frames. A single frame could cause this counter to increment if it timed out for each multiple destination.
stat_mc_tx	Number of multicast frames transmitted.
tim_rdy_pri	The amount of time (measured in proprietary ticks) that R_RDY transmission has higher priority than frame transmission.
tim_txcrd_z	Time that this port cannot transmit frames due to a transmit buffer-to-buffer credit of zero.
er_enc_in	Received data: the number of 8b/10b encoding errors that have occurred inside frame boundaries. This counter is generally a nonzero value, although occasional errors may occur on a normal link and give a zero result. (Minimum compliance with the link bit error rate specification on a link continuously receiving frames would cause approximately one error every 20 minutes.)
er_crc	Received frames: the number of CRC errors detected.
er_trunc	Received frames: the number of frames that were shorter than the minimum Fibre Channel frame size (i.e., a header with no payload).
er_toolong	Received frames: the number of frames that were longer than the maximum Fibre Channel frame size (i.e., a header with a 2,112-byte payload).
er_bad_eof	The number of frames received with a badly formed end-of-frame.
er_enc_out	Receive link: the number of 8b/10b encoding errors recorded outside frame boundaries. This number may become nonzero during link initialization but indicates a problem if it increments faster than the allowed link-bit error rate (approximately once every 20 minutes).
er_disc_c3	Receive link: the number of Class 3 frames discarded. Class 3 frames can be discarded due to timeouts or invalid/unreachable destinations. This quantity could increment at times during normal operation but might be used for diagnosing problems in some situations.

## reboot



The **reboot** command reboots the switch to the stored configuration in flash memory.

## syslogdIp

The **syslogdIp** command sets or displays the switch's system log daemon IP address.

The command syntax is `syslogdIp <"ip address">`. This command is not currently supported

## switchDisable

The **switchDisable** command is used for diagnostic tests, similar maintenance functions, or replacing a faulty switch.

You can observe and verify this process by watching the front panel LEDs change color from green to slow flashing amber as each port goes inactive.

## switchEnable

The **switchEnable** command enables the switch and provides Fabric information. The switch may need to be enabled after maintenance and diagnostic tests.

You can observe and verify this process by watching the front panel LEDs change color from green to slow flashing amber as each port goes inactive.

## switchName

Figure 7-14 shows the **switchName** command which displays *or* sets the switch's name. If a new name is specified and it is enclosed in quotes "" the command sets the switch to that name. If no new name is included, the command displays the switch's name.

### Figure 7-14. switchName Command Example

```
=> switchName `sw3`

sw3
value = 0 = 0x0
```

The command syntax is `switchName <"name-of-switch">`.

The **switchName** command prints the name of the current switch. By supplying an argument, the user may set the name of the current switch.

Certain restrictions apply to the length and format of the switch name. Specifically, the name of the switch:

- May not exceed 20 characters in length.
- May not contain characters other than 'a-f', 'A-F', '0-9' or '\_' (the underscore character), the first character excepted.
- Must have the first character be among 'a-f' or 'A-F'.

## switchShow

The **switchShow** command prints switch and port status. The fields are described in Table 7-8.

**Table 7-8. switchShow Command Field Descriptions**

Field	Description
switchName	The switch name.
switchRole	There are three possibilities for switchRole including: <ul style="list-style-type: none"> <li>• Principal — The principal switch as defined in FC-SW</li> <li>• Subordinate — This switch is enabled and not the principal switch</li> <li>• Disabled — The switch is disabled.</li> </ul>
switchDomain	The domain ID of this switch: 0 to 31.
switchID	The domain ID of this switch's embedded port: hex ffc00 to ffc7f.
switchWwn	The Worldwide Name of this switch. The WWN is a unique identifier for each switch and is assigned by the manufacturer. A numbering scheme administrated globally ensures that this WWN is unique to each switch.
switchState	The state of this switch: Online, Offline, Testing, or Faulty.
Port Number	One line per port is printed after the switch summary. Each line shows the port number: 0 to 7, the GBIC type, the port state, and a comment field.
GBIC type	The GBIC type follows the port number. The four GBIC types include: <ul style="list-style-type: none"> <li>• -- - No GBIC present</li> <li>• sw - Shortwave GBIC</li> <li>• lw - Longwave GBIC</li> <li>• cu - Copper GBIC</li> </ul>
Port state	The port state follows the GBIC type. The possible port states include: <ul style="list-style-type: none"> <li>• No_Card - No card present in this switch slot</li> <li>• No_Module - No GBIC module in this port</li> <li>• No_Light - The module is not receiving light</li> <li>• No_Sync - The module is receiving light but is out of sync</li> <li>• In_Sync - The module is receiving light and is in sync</li> <li>• Laser_Flt - The module is signaling a laser fault (defective GBIC)</li> <li>• Port_Flt - The port has been marked faulty (defective GBIC, cable, or device)</li> <li>• Diag_Flt - The port failed diagnostics (defective G_Port or FL_Port card or motherboard)</li> <li>• Online - The port is up and running</li> <li>• Lock_Ref - The port locking to the reference signal</li> </ul>
Comment field	The comment field follows the port state. The possible comments include: <ul style="list-style-type: none"> <li>• Disabled - The port is disabled</li> <li>• Loopback - The port is in loopback mode</li> <li>• E_Port - The WWN and switch name of the other switch is shown, the use of this ISL is shown (see FC_SW)</li> <li>• F_Port - The WWN of the N_Port is shown</li> <li>• G_Port - The port is online but is not yet an E_Port or F_Port</li> <li>• L_Port - The port is connected to an arbitrated loop</li> </ul>

**tempShow**

The **tempShow** command shows the switch's temperature as measured by five sensors on the motherboard.

## version

The **version** command fields are described in Table 7-9.

**Table 7-9. version Command Field Descriptions**

Field	Description
VxWorks version	VxWorks operating environment version used on the processor
Firmware version	Firmware version
Made on	Firmware release date and time

## diagHelp

The **diagHelp** command displays the diagnostic help commands available for troubleshooting switch problems (see "Diagnostic Commands").

## licenseHelp

The PowerVault™ 50F Switch is shipped with licenses enabled. These license commands are provided in the event that software upgrades are made available in the future.

## routeHelp

Route commands are not currently supported by Dell.

---

## Diagnostic Commands

Diagnostic commands enable you to monitor, test, and evaluate the switch.

### centralMemoryTest

Figure 7-15 shows the **centralMemoryTest** command, which is used to check the motherboard's memory. A diagnostic pattern is written and read from memory to ensure that all memory is functioning properly.

This command may not be executed on an operational switch. Before issuing **centralMemoryTest**, disable the switch using the **switchDisable** command.

### Figure 7-15. centralMemoryTest Command Example

```
=> centralMemoryTest

Running Central Memory Test... passed.
value = 0 = 0x0
=>
```

If the test does not detect an error there is no output. If an error is detected one of the following messages are displayed:

**DIAG-CMEM, 1**

Central Memory Error, bufline 0xXXXX offset 0xXXXX is 0xXXXX sb

**Probable cause:** Motherboard failure  
**Action:** Replace the switch

**DIAG-CMRS, 1**

Central Memory Read Short, expected nn bytes, read nn bytes (Starting from Bufline 0xxx, offset 0xxx)

**Probable cause:** Motherboard failure  
**Action:** Replace the switch

**DIAG-CMTO, 1**

Central Memory Timeout, port 16 mem\_ctl register bit 0 stuck high.



**NOTE:** Port 16 is the embedded port.

**Probable cause:** Motherboard failure  
**Action:** Replace the switch

**crossPortTest**

This test is run in a Dell factory environment only.

**portLoopbackTest**

Figure 7-16 shows the **portLoopbackTest** command, which is used to validate the data path to the optical interface and is intended to verify that the G\_port or FL\_Port interface card is error free. This is an internal test and checks all of the switch's internal firmware and circuitry.

The command syntax is `portLoopbackTest nFrames`

This command may not be executed on an operational switch. Before issuing **portLoopbackTest**, disable the switch using the **switchDisable** command

If you do not include the nFrames parameter, the loopback test runs continuously until you press <Enter> again. If the test does not find an error, there is no output. You can choose to continue the test, view statistics, or view an error log. Table 7-10 shows the loopback errors message fields.

While the test is running, all interface module front panel LEDs rapidly flicker green, indicating that the test is finding no errors and is processing.

**Figure 7-16. portLoopbackTest Command Example**

```

=> portLoopbackTest
Running Port Loopback Test ...

Diagnostics Status: 000:02:07:01
port#:  2  3  6  7 16
diags:  OK  OK  OK  OK  OK
state:  UP  UP  UP  UP  UP
   st2:      2546 frTx      2546 frRx      0 LLI_errs.
   st3:      2546 frTx      2546 frRx      0 LLI_errs.
   st6:      2546 frTx      2546 frRx      0 LLI_errs.
   st7:      2546 frTx      2546 frRx      0 LLI_errs.
   st16:     2546 frTx      2546 frRx      0 LLI_errs.
Central Memory OK
Total Diag Frames Tx: 23814
Total Diag Frames Rx: 23814
Diags: (Q)uit, (C)ontinue, (S)tats, (L)og: s
aborted.
value = 1048576 = 0x100000

```

**Table 7-10. ortLoopbackTest Command Field Descriptions**

Field	Description
Diagnostics Status	The duration of the portLoopbackTest.
port#	The port number.
diags	Possible values include OK, BAD.
state	Possible values include UP (active), DN (inactive).
st0-16	The tested ports. The display shows the diagnostics frames are transmitted and received and Low Level Interface counts (LLI_errs).
Central Memory Status	The central memory status. Possible values include OK, FAULTY.
Total Diag Frames Tx	The total diagnostics frames transmitted (Tx) since boot. This number usually corresponds to the total frames received (Rx), but may differ because of failure modes.
Total Diag Frames Rx	The total diagnostics frames received (Rx) since boot. This number usually corresponds to the total frames transmitted (Tx), but may differ because of failure modes.

If an error is found, one or more of the following error messages is displayed.

One of the following register names is displayed in the following error message with the message replacing the term (*regname*) in the error message.

- Enc\_in - Encoding error, inside frame
- CRC\_err - Cyclic redundancy check on frame failed
- TruncFrm - Truncated frame
- FrmTooLong - Frame too long
- BadEOF - Bad end of file
- Enc\_out - Encoding error, outside frame
- BadOrdSet - Bad symbol on fiber-optic cable
- DiscC3 - Discarded Class 3 frames

## DIAG-ERRSTAT, 1

Port N rename error counter is nnnn sb 0

<b>Probable cause:</b>	Failure of G_Port and FL_Port ASIC
<b>Action:</b>	Replace the switch
<b>Probable cause:</b>	Failure of interface module
<b>Action:</b>	Replace the switch
<b>Probable cause:</b>	Failure of GBIC module connector
<b>Action:</b>	Replace GBIC module

### DIAG-TIMEOUT, 1

Port N receive timeout.

<b>Probable cause:</b>	Failure of G_Port and FL_Port ASIC
<b>Action:</b>	Replace the switch
<b>Probable cause:</b>	Failure of interface module
<b>Action:</b>	Replace the switch
<b>Probable cause:</b>	Failure of GBIC module connector
<b>Action:</b>	Replace GBIC module

### DIAG-DATA, 1, PortX:pass nn

Frame Tx4->Rx4 payload byte offset nn is 0xXX sb 0xXX  
 (CMEM: SOF@ bufline/offset 0xXXXX/0xXX, error @ physical 0xXXXX/0xXX  
 Only one bad byte -- or -- Last bad byte at offset nn.

<b>Probable cause:</b>	Failure of motherboard
<b>Action:</b>	Replace the switch
<b>Probable cause:</b>	Failure of interface module
<b>Action:</b>	Replace the switch
<b>Probable cause:</b>	Failure of GBIC module connector
<b>Action:</b>	Replace GBIC module

### DIAG-STATS, 1

(rename) counter wrong on port nn, is nn sb nn

<b>Probable cause:</b>	Failure of G_Port and FL_Port ASIC
<b>Action:</b>	Replace the switch
<b>Probable cause:</b>	Failure of Interface module
<b>Action:</b>	Replace the switch

### DIAG-INIT, 1, portLB: pass nn

Port N failed to go active after initialization

<b>Probable cause:</b>	Failure of G_Port and FL_Port ASIC
<b>Action:</b>	Replace the switch
<b>Probable cause:</b>	Failure of interface module
<b>Action:</b>	Replace the switch
<b>Probable cause:</b>	Failure of GBIC module connector
<b>Action:</b>	Replace GBIC module

**Probable cause:** Failure of motherboard  
**Action:** Replace the switch

### DIAG-PORTDIED, 1, portLb: pass nn

Port N was active but went inactive (offline).

**Probable cause:** Failure of G\_Port and FL\_Port ASIC  
**Action:** Replace the switch  
**Probable cause:** Failure of interface module  
**Action:** Replace the switch

### DIAG-XMIT-1, portX: pass nn

Cannot transmit frame from port N, fcRequest returns nn

**Probable cause:** Failure of GBIC module connector  
**Action:** Replace GBIC module  
**Probable cause:** Failure of Interface module  
**Action:** Replace the switch  
**Probable cause:** Failure of G\_Port and FL\_Port ASIC  
**Action:** Replace the switch

## portRegTest

Figure 7-17 shows the **portRegTest** command which is used to check each register located on the motherboard and interface card(s) chips. Registers are set under firmware control and are used to control the hardware route selection and other internal hardware functions.

This command may not be executed on an operational switch. Before issuing **portRegTest**, disable the switch using the **switchDisable** command

This test validates that all registers can be successfully addressed.

### Figure 7-17. portRegTest Command Example

```
=> portRegTest
Running Port Register Test .... passed.
value = 0 = 0x0
```

If the test does not find an error, there is no output. If an error is found, the following messages are displayed:

### DIAG-REGERR,1

```
Port N,"regname" Register Error, is 0xXXXX sb 0xXXXX
(regOffset 0xXXXX, physical address 0xXXXX, with 0xXXXX mask)
```

In this error message, one of the following descriptions replaces the term (regname).

- WordsRx - Words received
- FramesTx - Frames transmitted
- FramesRx - Frames received
- Cl2FrmRx - Class 2 frames received

- CI3FrmRx - Class 3 frames received
- LinkCtlFRx - Link-control frames received
- MCastRx - Multicast received
- RDY\_XmitPri - Number of times R\_RDY has transmit priority higher than frames
- Credit - No transmit credit available



**NOTE:** These register names are the most probable to be displayed in the port register test error message, however there are other possible register names.

**Probable cause:** A port register test error message is probably caused by:

- Failure of the G\_Port and FL\_Port ASIC
- Failure of the interface module — Interface module connector

**Action:** Replace the switch

## ramTest

Figure 7-18 shows the **ramTest** command, which is used to check microprocessor random-access memory (RAM). The switch ships with 2 megabytes (MB) of RAM. This test validates proper memory function.

### Figure 7-18. ramTest Command Example

```
=> ramTest

Running System DRAM Test .... passed
value = 0 = 0x0
```

If the test does not find an error, there is no output. If an error is found, the following message is displayed:

### DIAG-MEMORY, 0

```
Memory Error-address 0xXXXX is 0xXXXX sb 0xXXXX
```

**Probable cause:** CPU board failure

**Action:** Replace the switch

## rdramTest

Figure 7-19 shows the **rdramTest** command, which is used to check the memory on the FL\_Port interface cards. A diagnostic pattern is written and read from memory to ensure all RDRAM memory is properly functioning.

This command may not be executed on an operational switch. Before issuing **rdramTest**, disable the switch using the **switchDisable** command.

### Figure 7-19. rdramTest Command Example



```
=> rDramTest
```


```
Running Rambus DRAM Test .....
rDramTest 1/1: 25% DONE (Pass 1/1, WR) ,
rDramTest 1/1: 50% DONE (Pass 1/1, RD) ,
rDramTest 1/1: 75% DONE (Pass 1/1, WR INV) ,
rDramTest 1/1: 100% DONE (Pass 1/1, RD INV) ,
rDramTest 1/1: passed.
value = 0 = 0x0
```

## spinSilk

The command is run only when requested by Dell Technical Support.


## diagClearError

The **diagClearError** command clears diagnostic errors detected on a specified port while running POST. The command syntax is `diagClearError <port #>;` without this parameter all errors are cleared.

 **NOTE:** When you issue this command it resets the port but does not clear the error log.

## diagDisablePost

The **diagDisablePost** command disables POST processing. The boot time without POST processing is approximately 25 to 30 seconds.

 **NOTE:** Dell recommends that POST processing always be executed to ensure the operational status of the switch during the power on stage.

## diagEnablePost

The **diagEnablePost** command enables POST processing. The choice remains in effect across power cycles until toggled by the user. The boot time with POST processing is approximately 60 to 65 seconds. The factory default enables POST processing.

## diagShow

Figure 7-20 shows the **diagShow** command, which summarizes the diagnostics results run since the switch was last booted, including POST results. The fields are described in Table 7-11.

The command also allows you to loop on the command. For example, **diagShow 4** executes **diagShow** every 4 seconds continuously unless stopped by pressing <Enter>. This may be used to isolate a bad GBIC. A port with a changing `LLI_errs` value is prefixed by `***` in the display. The following example shows two passes, the first pass without an error on the line `st11` (in bold) and the second pass shows an error on the line `st11` (in bold). The screen shows:

- Each port number diagnostic status (OK/BAD) and port state (up (online)/down (offline))
- Frames transmitted (frTx), frames received (frRx), and Low Level Interface error count (LLI\_errs) for active ports
- Central memory status (OK/FAULTY)
- Total diagnostics frames transmitted (Tx) and received (Rx) since boot, which are normally the same,

but may differ because of failure modes.

Port 16 is the embedded port.

## Figure 7-20. diagShow Command Example

```
=> diagShow 4

Diagnostics Status: Thu Jul 30 11:08:26 1998
port#:  0  1  2  3  4  5  6  7  16
diags:  OK OK OK OK OK OK OK OK OK
state:  UP UP UP UP UP UP UP UP UP
st0:    4 frTx      4 frRx      1 LLI_errs. <looped-1>
st1:    4 frTx      4 frRx      7 LLI_errs. <looped-0>
st2:    4 frTx      4 frRx      7 LLI_errs. <looped-3>
st3:    4 frTx      4 frRx     14 LLI_errs. <looped-2>
st4:    5 frTx      5 frRx     18 LLI_errs. <looped-3>
st5:    6 frTx      6 frRx    270303 LLI_errs. <looped-4>
st6:    4 frTx      4 frRx      5 LLI_errs. <looped-5>
st7:    4 frTx      4 frRx     13 LLI_errs. <looped-6>
st16:   0 frTx      0 frRx       2 LLI_errs.

Central Memory OK
Total Diag Frames Tx: 0
Total Diag Frames Rx: 0
```

```
Diagnostics Status: Thu Jul 30 11:08:30 1998
port#:  0  1  2  3  10 11 12 13 16
diags:  OK OK OK OK OK OK OK OK OK
state:  UP UP UP UP UP UP UP UP UP
st0:    4 frTx      4 frRx      1 LLI_errs. <looped-1>
st1:    4 frTx      4 frRx      7 LLI_errs. <looped-0>
st2:    4 frTx      4 frRx      7 LLI_errs. <looped-3>
st3:    4 frTx      4 frRx     14 LLI_errs. <looped-2>
st4:    5 frTx      5 frRx     18 LLI_errs. <looped-3>
**st5:  6 frTx      6 frRx    3028342**LLI_errs. <looped-4>
st6:    4 frTx      4 frRx      5 LLI_errs. <looped-5>
st7:    4 frTx      4 frRx     13 LLI_errs. <looped-6>
st16:   0 frTx      0 frRx       2 LLI_errs.

Central Memory OK
Total Diag Frames Tx: 0
Total Diag Frames Rx: 0
Diags: (Q)uit, (C)ontinue, (S)tats, (L)og: q
value = 0 = 0x0
```

**Table 7-11. diagShow Command Field Descriptions**

Field	Description
Diag Port Status	The port status
port#	The port number
diags	Possible values include OK, BAD.
state	Possible values include UP (online), DN (offline.)
st0-16	The tested chips. The display shows the diagnostics frames are transmitted and received and Low Level Interface counts (LLI_errs).  Note that port 16 is the embedded port.
Central Memory Status	The central memory status. Possible values include OK, FAULTY.
Total Diag Frames Tx	The total diagnostics frames transmitted (Tx) since boot. This number usually corresponds to the total frames received (Rx) but may differ because of failure modes.
Total Diag	

Frames Rx

The total diagnostics frames received (Rx) since boot. This number usually corresponds to the total frames transmitted (Tx) but may differ because of failure modes.

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## Routing (Show) Commands

Routing commands allow you to view switch routing information. Route commands are not currently supported by Dell.

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# Troubleshooting: Dell™ PowerVault™ 50F 8-Port Fibre Channel Switch Installation and Troubleshooting Guide

[Overview](#) • [Diagnostic overview](#) • [Status and activity indicators](#)

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## Overview

This chapter discusses troubleshooting, diagnostic testing, and error messages, including the following sections:

- Diagnostic overview
  - Status and activity indicators
- 

## Diagnostic Overview

The switch is designed for maintenance-free operation. When there is a suspected failure, the switch has self-diagnostic capabilities to aid in isolating any equipment or Fabric failures.

The switch supports power-on self-tests (POSTs) and diagnostic tests. The diagnostic tests determine the switch's status and isolate problems.

Telnet commands are used to determine the switch's status, error conditions, and switch operating statistics.

## Issuing Telnet Commands

Telnet commands (see "[PowerVault™ 50F Commands](#)") are available to determine the switch's status, error conditions, and switch operating statistics.

The diagnostic procedures are completed using commands during a Telnet session.

## Isolating a System Fault

Various loopback paths are built into the switch hardware for diagnostic purposes. A loopback path test within the switch verifies the proper internal Fibre Channel port logic functions and the paths between the interfaces and central memory.

The switch's diagnostics also support external loops, which include interface cards and their Gigabit Interface Converter (GBIC) modules in cross-port configurations. These port-to-port diagnostics allow checking installed fiber cables and port fault isolation.

## Removing Power

After all data transferring processes external to the switch are completed, removing power from the switch does not disrupt the Fabric.



**NOTE:** Error messages are stored in random-access memory (RAM) and are lost when power is removed from the switch. Access the error message log to view and note any error messages before removing power from the switch.

## Status and Activity Indicators

The following status activity indicators applies to G\_Port and FL\_Port interface cards.



**NOTE:** FL\_Port interface cards have an additional green light-emitting diode (LED) (visible from the front of the switch) to identify them from G\_Port interface cards.

### Front-Panel LED Power Indicators

The color and flash speed of the power LED, as described in Table 8-1, indicates the switch's status.

**Table 8-1. Front-Panel LED Status Indicators**

Front-Panel LEDs	Definition
No light showing	Power not applied.
Steady power LED	Normal power-on indicator.
Flashing power	Switch failed POST and is not functioning, although power is applied.

### Front-Panel LED Port Indicators

The color and flash speed of each port's LED, as described in Table 8-2, indicates the individual port's status.

**Table 8-2. Front-Panel LED Status Indicators**

Front-Panel LEDs	Definition
No light showing	No light or signal carrier (no module, no cable) for media interface LEDs.
Steady yellow	Receiving light or signal carrier, but not yet online.
Slow yellow	Disabled (result of diagnostics or <b>portDisable</b> command). Flashes every 1/2 second.
Fast yellow	Error, fault with port. Flashes every 1/2 second.
Steady green	Online (connected with device over cable).
Slow green	Flashes every 2 seconds. Interswitch link; the port is physically online, but the Fabric remains segmented due to an incompatible switch or switch firmware.
Fast green	Internal loopback (diagnostic). Flashes every 1/2 second.
Flickering green	Online and frames flowing through port.

### Initialization Steps

At power-on or reset, the following steps are executed:

1. Preliminary POST diagnostics.
2. VxWorks operating system initialization.
3. Hardware initialization (resets, internal addresses assigned to G\_Port and FL\_Port ASICs, serial port initialized, front panel initialized).
4. Full POST.
5. Link initialization; receiver/transmitter negotiation to bring connected ports online.
6. Fabric analysis; the switch checks for ports connected to other Fabric elements. If there are other Fabric elements connected, it identifies the master switch.
7. Address assignment; after the master switch is identified, port addresses may be assigned. Each switch tries to keep the same addresses that were previously used. These are stored in the switch's configuration flash PROM.
8. Routing table construction; after addresses are assigned, the unicast routing tables are constructed.
9. Enable normal N\_Port operation.

## Power-on Diagnostics

If a malfunction is discovered during the POST process, it is written to the system error log and is available for analysis via a Telnet session. (See "[diagShow](#)" and "[errShow](#)" for details.)

If the malfunction prohibits the switch from completing the boot process (fatal error), the switch stops the boot process.



**NOTE:** A switch boot failure indicates the switch must be taken offline to be either repaired or replaced.

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# Repair and Replacement: Dell™ PowerVault™ 50F 8-Port Fibre Channel Switch Installation and Troubleshooting Guide

[Overview](#)

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## Overview

This chapter covers the recommended and supported field repair and replacement for the switch.



**NOTE:** Any switch repair or part replacement that is not explained in this chapter must be performed at a factory authorized repair facility.

The PowerVault™ 50F has no user-serviceable components except for the GBIC modules. For repair other than the GBIC modules, the entire switch must be replaced in the event of failure.

## Installing a GBIC Module

The dual channel interface card accepts two GBIC modules. These modules are installed and removed by sliding into the interface card from the front of the unit.



**NOTE:** The GBIC module is installed after the interface card has been installed in the chassis. You cannot install an interface card if it has a GBIC module installed.

To replace an IBM GBIC module into an interface card

1. On the front of the remove the GBIC module by swinging the locking bar to the right side and remove the module.
2. Insert the GBIC module until its connector is firmly seated into the appropriate port.
3. When firmly seated, lock the GBIC module in the slot by pushing the locking bar to the left side of the GBIC. DO NOT force the locking bar, reseal if necessary.

or

To replace a non-IBM GBIC module into an interface card

1. Attach the GBIC extractor tool to the GBIC module.
2. Pull the GBIC module out of the connector.
3. Insert and press the GBIC module until its connector is firmly seated.



**NOTE:** The GBIC module is keyed so it can be inserted in only one way. Do not force the insertion if the module does not slide in easily.

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# Getting Help: Dell™ PowerVault™ 50F 8-Port Fibre Channel Switch Installation and Troubleshooting Guide

[Overview](#) • [Technical Assistance](#) • [Help Tools](#) • [Problems With Your Order](#) • [Product Information](#) • [Returning Items for Warranty Repair or Credit](#) • [Before You Call](#) • [Dell Contact Numbers](#)

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## Overview

This chapter describes the tools Dell provides to help you when you have a problem with your PowerVault™ 50F. It also tells you when and how to call Dell for technical or customer assistance.

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## Technical Assistance

If you need assistance with a technical problem, perform the following steps:

1. Make a copy of the Diagnostics Checklist (found later in this chapter), and fill it out.
2. Use Dell's extensive suite of online services available at Dell's World Wide Web site (**www.dell.com**) for help with installation and troubleshooting procedures.

For more information, refer to "World Wide Web on the Internet" found later in this chapter.

3. If the preceding steps have not resolved the problem and you need to talk to a Dell technician, call Dell's technical support service.

When prompted by Dell's automated telephone system, enter your Express Service Code to route the call directly to the proper support personnel. If you do not have an Express Service Code, open the **Dell Accessories** folder, double-click the **Express Service Code** icon, and follow the directions.



**NOTE:** Dell's Express Service Code system may not be available in all countries.

For instructions on using the technical support service, refer to "[Technical Support Service](#)" and "[Before You Call](#)".

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## Help Tools

Dell provides a number of tools to assist you. These tools are described in the following sections.



**NOTE:** Some of the following tools are not always available in all locations outside the continental U.S. Please call your local Dell representative for information on availability.

## World Wide Web

The Internet is your most powerful tool for obtaining information about your system and other Dell products. Through the Internet, you can access most of the services described in this chapter, including AutoTech,



TechFax, order status, technical support, and product information.

From Dell's World Wide Web home page ([www.dell.com](http://www.dell.com)), click the **Support** icon, and click **Support Your Dell**. Enter your service tag number (or, if you have one, your Express Service Code) and click **Submit**. If you don't have your service tag or Express Service Code available, you can also select support information by system.

Everything you need to know about your system is presented on the system support page, including the following tools and information:

- Technical information — Details on every aspect of your system, including hardware specifications.
- Self-diagnostic tool — A system-specific troubleshooting application for resolving many system-related issues by following interactive flowcharts.
- Drivers, files, and utilities — The latest drivers and BIOS updates to keep your system functioning at its best.
- Component support — Technical information, documentation, and troubleshooting tips for different system components.
- Online Communications Center — Tool for submitting requests for both technical and non-technical information on Dell products. Avoid telephone delays by receiving an e-mail response to your request for information if your system is not functioning properly or if you have questions regarding your system's hardware or operation.

Dell can be accessed electronically using the following addresses:

- World Wide Web

**[www.dell.com/](http://www.dell.com/)**

**[www.dell.com/intl/apcc/](http://www.dell.com/intl/apcc/)** (for Asian/Pacific countries only)

**[www.euro.dell.com](http://www.euro.dell.com)** (for Europe only)

- Anonymous file transfer protocol (FTP)

**[ftp.dell.com/](ftp://ftp.dell.com/)**

Log in as `user: anonymous`, and use your e-mail address as your password.

- Electronic Support Service

**[support@us.dell.com](mailto:support@us.dell.com)**

**[apsupport@dell.com](mailto:apsupport@dell.com)** (for Asian/Pacific countries only)

**[support.euro.dell.com](mailto:support.euro.dell.com)** (for Europe only)

- Electronic Quote Service

**[sales@dell.com](mailto:sales@dell.com)**

**[apmarketing@dell.com](mailto:apmarketing@dell.com)** (for Asian/Pacific countries only)

- Electronic Information Service

**[info@dell.com](mailto:info@dell.com)**

## AutoTech Service

Dell's automated technical support service—AutoTech—provides recorded answers to the questions most

frequently asked by Dell customers.

When you call AutoTech, you use your touch-tone telephone to select the subjects that correspond to your questions. You can even interrupt an AutoTech session and continue the session later. The code number that the AutoTech service gives you allows you to continue your session where you ended it.

The AutoTech service is available 24 hours a day, seven days a week. You can also access this service through the technical support service. For the telephone number to call, refer to "[Dell Contact Numbers](#)".

### **TechFax Service**

Dell takes full advantage of fax technology to serve you better. Twenty-four hours a day, seven days a week, you can call the Dell TechFax line toll-free for all kinds of technical information.

Using a touch-tone phone, you can select from a full directory of topics. The technical information you request is sent within minutes to the fax number you designate. For the TechFax telephone number to call, refer to "[Dell Contact Numbers](#)".

### **TechConnect BBS**

Use your modem to access Dell's TechConnect bulletin board service (BBS) 24 hours a day, seven days a week. The service is menu-driven and fully interactive. The protocol parameters for the BBS are 1200 to 19.2K baud, 8 data bits, no parity, 1 stop bit.

### **Automated Order-Status System**

You can call this automated service to check on the status of any Dell products that you have ordered. A recording prompts you for the information needed to locate and report on your order. For the telephone number to call, refer to "[Dell Contact Numbers](#)".

### **Technical Support Service**

Dell's industry-leading hardware technical-support service is available 24 hours a day, seven days a week, to answer your questions about Dell hardware.

Our technical support staff pride themselves on their track record: more than 90 percent of all problems and questions are taken care of in just one toll-free call, usually in less than 10 minutes. When you call, our experts can refer to records kept on your Dell system to better understand your particular question. Our technical support staff use computer-based diagnostics to provide fast, accurate answers to questions.

To contact Dell's technical support service, first refer to the section titled "[Before You Call](#)" and then call the number for your country as listed in "[Dell Contact Numbers](#)".

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## **Problems With Your Order**

If you have a problem with your order, such as missing parts, wrong parts, or incorrect billing, contact Dell Computer Corporation for customer assistance. Have your invoice or packing slip handy when you call. For the telephone number to call, refer to "[Dell Contact Numbers](#)".

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## Product Information

If you need information about additional products available from Dell Computer Corporation, or if you would like to place an order, visit Dell's World Wide Web site at [www.dell.com/](http://www.dell.com/). For the telephone number to call to speak to a sales specialist, refer to "[Dell Contact Numbers](#)".

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## Returning Items for Warranty Repair or Credit

Prepare all items being returned, whether for repair or credit, as follows:

1. Call Dell to obtain an authorization number, and write it clearly and prominently on the outside of the box.

For the telephone number to call, refer to "[Dell Contact Numbers](#)".

2. Include a copy of the invoice and a letter describing the reason for the return.
3. Include a copy of the Diagnostics Checklist indicating the tests you have run and any error messages reported by the Dell Diagnostics.
4. Include any accessories that belong with the item(s) being returned (power cables, software diskettes, guides, and so on) if the return is for credit.
5. Pack the equipment to be returned in the original (or equivalent) packing materials.

You are responsible for paying shipping expenses. You are also responsible for insuring any product returned, and you assume the risk of loss during shipment to Dell Computer Corporation. Collect-on-delivery (C.O.D.) packages are not accepted.

Returns that are missing any of the preceding requirements will be refused at our receiving dock and returned to you.

---

## Before You Call



**NOTE:** Have your Express Service Code ready when you call. The code helps Dell's automated-support telephone system direct your call more efficiently.

Remember to fill out the Diagnostics Checklist (Figure 10-1). If possible, turn on your system before you call Dell for technical assistance and call from a telephone at or near the system. You may be asked to type some commands at a keyboard, relay detailed information during operations, or try other troubleshooting steps possible only at the system itself. Make sure the system documentation is available.



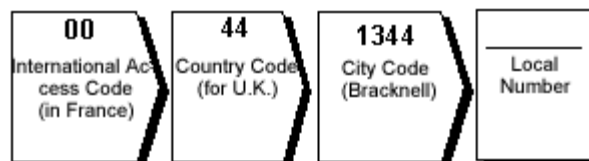
**WARNING:** If you need to remove the computer covers, be sure to first disconnect the computer system's power and modem cables from all electrical outlets.

## Figure 10-1. Diagnostics Checklist

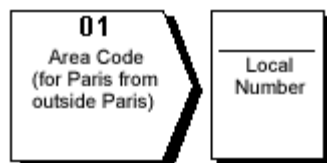
<b>Diagnostics Checklist</b>	
Name: _____	Date: _____
Address: _____	Phone number: _____
Service tag (bar code on the back of the system): _____	
Express Service Code: _____	
Return Material Authorization Number (if provided by Dell support technician): _____	
Operating system and version: _____	
Peripherals: _____	
_____	
_____	
Expansion cards: _____	
_____	
_____	
Are you connected to a network?	<input type="checkbox"/> <input type="checkbox"/>
Network, version, and network card: _____	
Programs and versions: _____	
_____	
_____	
_____	
Error message, beep code, or diagnostic code: _____	
Description of problem and troubleshooting procedures you performed: _____	
_____	
_____	

## Dell Contact Numbers

When you need to contact Dell, use the telephone numbers, codes, and electronic addresses provided in [Tables 10-1](#) and [10-2](#). Table 10-1 provides the various codes required to make long-distance and international calls. Table 10-2 provides local telephone numbers, area codes, toll-free numbers, Web site and e-mail addresses, if applicable, for each department or service available in various countries around the world. If you are making a direct-dialed call to a location outside of your local telephone service area, determine which codes to use (if any) in Table 10-1 in addition to the local numbers provided in Table 10-2. For example, to place an international call from Paris, France to Bracknell, England, dial the international access code for France followed by the country code for the U.K., the city code for Bracknell, and then the local number as shown in the following illustration.



To place a long-distance call within your own country, use area codes instead of international access codes, country codes, and city codes. For example, to call Paris, France from Montpellier, France, dial the area code plus the local number as shown in the following illustration.



The codes required depend on where you are calling from as well as the destination of your call; in addition, each country has a different dialing protocol. If you need assistance in determining which codes to use, contact a local or an international operator.



**NOTE:** Toll-free numbers are for use only within the country for which they are listed. Area codes are most often used to call long distance within your own country (not internationally)—in other words, when your call originates in the same country you are calling.

**Table 10-1. International Dialing Codes**

Country (City)	International Access Code	Country Code	City Code
Australia (Sydney)	0011	61	2
Austria (Vienna)	900	43	1
Belgium (Brussels)	00	32	2
Brunei	—	673	—
Canada (North York, Ontario)	011	—	Not required
Chile (Santiago)	—	56	2
China (Xiamen)	—	86	592
Czech Republic (Prague)	00	420	2
Denmark (Horsholm)	009	45	Not required
Finland (Helsinki)	990	358	9
France (Paris) (Montpellier)	00	33	(1)(4)
Germany (Langen)	00	49	6103
Hong Kong	001	852	Not required
Ireland (Bray)	16	353	1
Italy (Milan)	00	39	2
Japan (Kawasaki)	001	81	44

Korea (Seoul)	001	82	2
Luxembourg	00	352	—
Macau	—	853	Not required
Malaysia (Penang)	00	60	4
Mexico (Colonia Granada)	95	52	5
Netherlands (Amsterdam)	00	31	20
New Zealand	00	64	—
Norway (Lysaker)	095	47	Not required
Poland (Warsaw)	011	48	22
Singapore (Singapore)	005	65	Not required
South Africa (Johannesburg)	09/091	27	11
Spain (Madrid)	07	34	1
Sweden (Upplands Vasby)	009	46	8
Switzerland (Geneva)	00	41	22
Taiwan	002	886	—
Thailand	001	66	—
U.K. (Bracknell)	010	44	1344
U.S.A. (Austin, Texas)	011	1	Not required

**Table 10-2. Dell Contact Numbers**

Country (City)	Department Name or Service	Area Code	Local Number or Toll-Free Number
<b>Australia</b> (Sydney)	Customer Technical Support (Dell Dimension™ systems only)		1-300-65-55-33
	Customer Technical Support (Other systems)		toll free: 1-800-633-559
	Customer Care		toll free: 1-800-819-339
	Corporate Sales		toll free: 1-800-808-385
	Transaction Sales		toll free: 1-800-808-312
	Fax		toll free: 1-800-818-341
<b>Austria*</b> (Vienna)	Technical Support		0660-8779
	Customer Care	01	660 8056
	Switchboard	01	491 04 0
	Web site: support.euro.dell.com/at		

	E-mail: tech_support_germany@dell.com		
<b>Belgium*</b> (Brussels)	Customer Technical Support	02	481 92 88
	Customer Care	02	481 91 19
	Home/Small Business Sales		toll free: 0800 16884
	Corporate Sales	02	481 91 00
	Fax	02	481 92 99
	Switchboard	02	481 91 00
	Web site: support.euro.dell.com/be E-mail: tech_be@dell.com		
<b>Brunei</b>  <b>NOTE:</b> Customers in Brunei call Malaysia for sales, customer, and technical assistance.	Customer Technical Support (Penang, Malaysia)		810 4966
	Customer Service (Penang, Malaysia)		810 4949
	Transaction Sales (Penang, Malaysia)		810 4955
<b>Canada</b> (North York, Ontario)  <b>NOTE:</b> Customers in Canada call the U.S.A. for access to TechConnect BBS.	Automated Order-Status System		toll free: 1-800-433-9014
	AutoTech (Automated technical support)		toll free: 1-800-247-9362
	Customer Care (From outside Toronto)		toll free: 1-800-387-5759
	Customer Care (From within Toronto)	416	758-2400
	Customer Technical Support		toll free: 1-800-847-4096
	Sales (Direct Sales—from outside Toronto)		toll free: 1-800-387-5752
	Sales (Direct Sales—from within Toronto)	416	758-2200
	Sales (Federal government, education, and medical)		toll free: 1-800-567-7542
	Sales (Major Accounts)		toll free: 1-800-387-5755
	TechConnect BBS (Austin, Texas, U.S.A.)	512	728-8528
TechFax		toll free: 1-800-950-1329	
<b>Chile</b> (Santiago)  <b>NOTE:</b> Customers in Chile call the U.S.A. for sales, customer, and technical assistance.	Sales, Customer Support, and Technical Support		toll free: 1230-020-4823
<b>China</b> (Xiamen)	Customer Service		toll free: 800 858 2437
	Sales		toll free: 800 858 2222
<b>Czech Republic*</b> (Prague)	Technical Support	02	22 83 27 27
	Customer Care	02	22 83 27 11
	Fax	02	22 83 27 14

	TechFax	02	22 83 27 28
	Switchboard	02	22 83 27 11
	Web site: support.euro.dell.com/cz E-mail: czech_dell@dell.com		
<b>Denmark*</b> (Horsholm)  <b>NOTE:</b> Customers in Denmark call Sweden for fax technical support.	Technical Support		45170182
	Customer Care		45170181
	Switchboard		45170100
	Fax Technical Support (Upplands Vasby, Sweden)		859005594
	Fax Switchboard		45170117
	Web site: support.euro.dell.com/dk E-mail: den_support@dell.com		
<b>Finland*</b> (Helsinki)	Technical Support	09	253 313 60
	Customer Care	09	253 313 61
	Fax	09	253 313 99
	Switchboard	09	253 313 00
	Web site: support.euro.dell.com/fi E-mail: fin_support@dell.com		
<b>France*</b> (Paris/Montpellier)	Technical Support (Paris)	01	47 62 68 90
	Technical Support (Montpellier)	04	67 06 62 86
	Customer Care (Paris)	01	47 62 68 92
	Customer Care (Montpellier)	04	67 06 61 96
	TechConnect BBS (Montpellier)	04	67 22 53 04
	Fax (Montpellier)	04	67 06 60 07
	Switchboard (Paris)	01	47 62 69 00
	Switchboard (Montpellier)	04	67 06 60 00
	Web site: support.euro.dell.com/fr E-mail: web_fr_tech@dell.com		
<b>Germany*</b> (Langen)	Technical Support	06103	971-200
	Technical Support Fax	06103	971-222
	Preferred Accounts Customer Care	06103	971-420
	Preferred Accounts Customer Care Fax	06103	971-544
	Customer Care	06103	971-500
	TechConnect BBS	06103	971-666
	Switchboard	06103	971-0
	Web site: support.euro.dell.com/de E-mail: tech_support_germany@dell.com		



<b>Hong Kong</b>	Technical Support		toll free: 800 96 4107
	Customer Service (Penang, Malaysia)		810 4949
	Transaction Sales		toll free: 800 96 4109
	Corporate Sales		toll free: 800 96 4108
<b>Ireland*</b> (Bray)  <b>NOTE:</b> Customers in Ireland call the U.K. for Home/Small Business customer assistance.	Customer Technical Support		1-850-543-543
	Customer Care	01	204 4026
	Home/Small Business Customer Care (Bracknell, U.K.)		0870 906 0100
	Sales		1-850-235-235
	SalesFax	01	286 2020
	Fax	01	286 6848
	TechConnect BBS	01	204 4711
	TechFax	01	204 4708
	Switchboard	01	286 0500
	Web site: support.euro.dell.com/ie E-mail: dell_direct_support@dell.com		
<b>Italy*</b> (Milan)	Technical Support	2	57782.690
	Customer Care	2	57782.555
	Sales	2	57782.411
	Fax	2	57503530
	Switchboard	2	57782.1
	Web site: support.euro.dell.com/it E-mail: support_italy@dell.com		
<b>Japan</b> (Kawasaki)	Technical Support		toll free: 0088-22-7890
	Technical Support (Server)		toll free: 0120-1984-35
	Technical Support (Dimension and Inspiron)		toll free: 0120-1982-56
	Technical Support (WorkStation, OptiPlex, and Latitude)		toll free: 0120-1984-39
	Customer Care	044	556-4240
	Direct Sales	044	556-3344
	Commercial Sales	044	556-3430 556-3440
	Switchboard	044	556-4300
<b>Korea</b> (Seoul)  <b>NOTE:</b> Customers in Korea call Malaysia for	Technical Support		toll free: 080-200-3800
	Transaction Sales		toll free: 080-200-3600
	Corporate Sales		toll free: 080-200-3900

<i>customer assistance.</i>	Customer Service (Penang, Malaysia)		810 4949
	Fax		394 3122
	Switchboard		287 5600
<b>Latin America</b>  <b>NOTE:</b> Customers in Latin America call the U.S.A. for sales, customer, and technical assistance.	Customer Technical Support (Austin, Texas, U.S.A.)	512	728-4093
	Customer Service (Austin, Texas, U.S.A.)	512	728-3619
	Fax (Technical Support and Customer Service) (Austin, Texas, U.S.A.)	512	728-3883
	Sales (Austin, Texas, U.S.A.)	512	728-4397
	SalesFax (Austin, Texas, U.S.A.)	512	728-4600 728-3772
<b>Luxembourg*</b>  <b>NOTE:</b> Customers in Luxembourg call Belgium for sales, customer, and technical assistance.	Customer Technical Support (Brussels, Belgium)	02	481 92 88
	Home/Small Business Sales (Brussels, Belgium)		toll free: 080016884
	Corporate Sales (Brussels, Belgium)	02	481 91 00
	Customer Care (Brussels, Belgium)	02	481 91 19
	Fax (Brussels, Belgium)	02	481 92 99
	Switchboard (Brussels, Belgium)	02	481 91 00
	Web site: support.euro.dell.com/be E-mail: tech_be@dell.com		
<b>Macau</b>  <b>NOTE:</b> Customers in Macau call Malaysia for customer assistance.	Technical Support		toll free: 0800 582
	Customer Service (Penang, Malaysia)		810 4949
	Transaction Sales		toll free: 0800 581
<b>Malaysia</b> (Penang)	Technical Support		toll free: 1 800 888 298
	Customer Service	04	810 4949
	Transaction Sales		toll free: 1 800 888 202
	Corporate Sales		toll free: 1 800 888 213
<b>Mexico</b> (Colonia Granada)  <b>NOTE:</b> Customers in Mexico call the U.S.A. for access to the Automated Order-Status System and AutoTech.	Automated Order-Status System (Austin, Texas, U.S.A.)	512	728-0685
	AutoTech (Automated technical support) (Austin, Texas, U.S.A.)	512	728-0686
	Customer Technical Support	525	228-7870
	Sales	525	228-7811
			toll free: 91-800-900-37 toll free: 91-800-904-49
	Customer Service	525	228-7878

	Main	525	228-7800
<b>Netherlands*</b> (Amsterdam)	Customer Technical Support	020	5818838
	Home/Small Business Sales		toll free: 0800-0663
	Home/Small Business SalesFax	020	682 7171
	Corporate Sales	020	581 8818
	Corporate SalesFax	020	686 8003
	Fax	020	686 8003
	Switchboard	020	581 8818
	Web site: support.euro.dell.com/nl		
<b>New Zealand</b>	Technical Support (Dell Dimension systems only) (\$2.50 + GST per call)		0900 51010
	Technical Support (Other systems)		0800 446 255
	Customer Service		0800 444 617
	Sales		0800 441 567
	Fax		0800 441 566
<b>Norway*</b> (Lysaker)  <i>NOTE: Customers in Norway call Sweden for fax technical support.</i>	Technical Support		671 16882
	Customer Care		671 16881
	Switchboard		1 16800
	Fax Technical Support (Upplands Vasby, Sweden)		590 05 594
	Fax Switchboard		671 16865
	Web site: support.euro.dell.com/no E-mail: nor_support@dell.com		
<b>Poland*</b> (Warsaw)	Technical Support	22	60 61 99
	Customer Care	22	60 61 99
	Sales	22	60 61 99
	Fax	22	60 61 998
	Switchboard	22	60 61 999
	Web site: support.euro.dell.com/pl E-mail: pl_support@dell.com		
<b>Singapore</b> (Singapore)  <i>NOTE: Customers in Singapore call Malaysia for customer assistance.</i>	Technical Support		toll free: 800 6011 051
	Customer Service (Penang, Malaysia)	04	810 4949
	Transaction Sales		toll free: 800 6011 054
	Corporate Sales		toll free: 800 6011 053
<b>South Africa</b> (Johannesburg)	Technical Support	011	709 7710

	Customer Care	011	709 7710
	Sales	011	706 7700
	Fax	011	709 0495
	Switchboard	011	709 7700
	Web site: support.euro.dell.com/za E-mail: dell_za_support@dell.com		
<b>Southeast Asian/ Pacific Countries</b> (excluding Australia, Brunei, China, Hong Kong, Japan, Korea, Macau, Malaysia, New Zealand, Singapore, Taiwan, and Thailand —refer to individual listings for these countries)	Customer Technical Support, Customer Service, and Sales (Penang, Malaysia)		60 4 810-4810
<b>Spain*</b> (Madrid)	Technical Support		902 100 130
	Corporate Customer Care		902 118 546
	Home/Small Business Customer Care		902 118 540
	TechConnect BBS	91	329 33 53
	Corporate Sales		902 100 185
	Home/Small Business Sales		902 118 541
	Switchboard	91	722 92 00
	Web site: support.euro.dell.com/es E-mail: es_support@dell.com		
<b>Sweden*</b> (Upplands Vasby)	Technical Support	08	590 05 199
	Customer Care	08	590 05 169
	Fax Technical Support	08	590 05 594
	Sales	08	590 05 185
	Web site: support.euro.dell.com/se E-mail: swe_support@dell.com		
<b>Switzerland*</b> (Geneva)	Technical Support		0844 811 411
	Customer Care		0848 802 802
	Fax	022	799 01 90
	Switchboard	022	799 01 01
	Web site: support.euro.dell.com/ch E-mail: swisstech@dell.com		
<b>Taiwan</b>	Technical Support	toll free: 0080 651 226/0800 33 557	
	Customer Service (Penang, Malaysia)	810 4949	
	Transaction Sales	toll free: 0080 651 228/0800 33 556	
<b>NOTE:</b> Customers in Taiwan call Malaysia			

<i>for customer assistance.</i>			
	Corporate Sales		toll free: 0080 651 227/0800 33 555
<b>Thailand</b> <i>NOTE: Customers in Thailand call Malaysia for customer assistance.</i>	Technical Support		toll free: 0880 060 07
	Customer Service (Penang, Malaysia)		810 4949
	Sales		toll free: 0880 060 06
<b>U.K.*</b> (Bracknell)	Technical Support Department		0870-908-0800
	Corporate Customer Care	01344	720206
	Home/Small Business Customer Care		0870-906-0010
	TechConnect BBS		0870-908-0610
	Sales	01344	720000
	AutoFax		0870-908-0510
	Web site: support.euro.dell.com/uk E-mail: dell_direct_support@dell.com		
<b>U.S.A.</b> (Austin, Texas)	Automated Order-Status System		toll free: 1-800-433-9014
	AutoTech (Automated technical support)		toll free: 1-800-247-9362
	<b>Dell Home and Small Business Group:</b>		
	Customer Technical Support (Return Material Authorization Numbers)		toll free: 1-800-624-9896
	Customer Service (Credit Return Authorization Numbers)		toll free: 1-800-624-9897
	<b>National Accounts</b> (systems purchased by established Dell national accounts [have your account number handy], medical institutions, or value-added resellers [VARs]):		
	Customer Service and Technical Support (Return Material Authorization Numbers)		toll free: 1-800-822-8965
	<b>Public Americas International</b> (systems purchased by governmental agencies [local, state, or federal] or educational institutions):		
	Customer Service and Technical Support (Return Material Authorization Numbers)		toll free: 1-800-234-1490
	Dell Sales		toll free: 1-800-289-3355 toll free: 1-800-879-3355
	Spare Parts Sales		toll free: 1-800-357-3355
	DellWare		toll free: 1-800-753-7201
	DellWare FaxBack Service	512	728-1681
	Fee-Based Technical Support		toll free: 1-800-433-9005
Sales (Catalogs)		toll free: 1-800-426-5150	
Fax		toll free: 1-800-727-8320	

TechFax		toll free: 1-800-950-1329
TechConnect BBS	512	728-8528
Switchboard	512	338-4400

\* For technical assistance in this country after normal working hours, use one of the following numbers: (353-1) 204 4008 or (353-1) 286 5908 (English only—the call is rerouted to the U.S.A.).

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# Error Messages: Dell™ PowerVault™ 50F 8-Port Fibre Channel Switch Installation and Troubleshooting Guide

[Overview](#) • [Error Message Formats](#) • [Error Messages by Firmware Module](#)

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## Overview

This appendix explains the error message format, error message by firmware module, and other possible errors.

---

## Error Message Formats

There is one error message format for the PowerVault™ 50F whether you are gathering information from the local RS-232 serial port or using a remote Telnet session.

In all cases, the last error encountered is the first error displayed. Up to 32 messages are held in a buffer. If the 32 message limit is exceeded, the messages are overwritten in a first in, first out sequence.

The **errShow** command displays all detected errors. The output provides additional information over the front panel display. The following information is displayed in [Figure A-1](#):

- There are two errors which have been detected.
- The task ID and task name that incurred the error (task name are displayed using the **i** command).
- The error type, date and time, the error level, and description.
- If there is more than one occurrence of an error type, the number of occurrences is shown in brackets following the error level.



**NOTE:** *The error counter goes to a maximum of 999.*

The display halts after each error is displayed, prompting you to either press <Enter> to continue or type a Q to quit. Continue pressing <Enter> until the prompt (=) is displayed.

## Figure A-1. errShow Command Example

```

=> errShow

Error 02
-----
Ox103dc470 (tSilkworm): Apr  9 10:41:06
      Error SENSOR-FAILED, 3, sensor 7 (Fan 2) is below mi

Type <CR> to continue, Q<CR> to stop:

Error 01
-----
Ox103dc470 (tSilkworm): Apr  9 10:40:51
      Error DIAG-TIMEOUT, 1,
      Port 2 receive timeout.

Type <CR> to continue, Q<CR> to stop:
value = 1 = 0x1

```

To display error messages via Telnet:

1. From the prompt, enter errShow command.
2. To scroll through the error list, type <CR>
3. Scroll through error log (if no errors encountered, the command returns "No Error").

## Error Messages by Firmware Module

Table A-1 shows the error messages organized by module.

**Table A-1. Errors**

Module	Error Severity	Explanation	Action
Flood	INVLSR (3)	An unknown Link State Record has been received from a neighbor switch.	Check that all paths and routing tables are correct using the commands <b>uPathShow &lt;domain&gt;</b> , or <b>uPathAllShow</b> . If the paths are not correct reboot the neighbor switch that sent the wrong data. Check the paths and routes again. If they are still incorrect, reboot the local switch.
	LSRLEN (2)	The local switch is trying to create a Link State Update that exceeds the maximum length.	Check that all paths and routing tables are correct. If they are not, reboot the local switch.
FSPF	BADSRC (3)	The neighbor switch domain ID has changed, without the link going down.	The system automatically recovers.
	INPORT (2)	The input port in the IU received by the path selection task is out of range.	Check that all paths and routing tables are correct. If they are not correct, reboot the local switch.
	MSG (2)	The path selection task has received an unknown message from another task.	Check that all paths and routing tables are correct. If they are not, reboot the neighbor switch. Check the paths and routes again. If they are still incorrect, reboot the local switch.
	REMDOMAIN (2)	The message received from a neighbor switch has a source domain ID out of range.	Check that all paths and routing tables are correct. If they are not, reboot the neighbor switch. Check the paths and routes again. If they are still incorrect, reboot the local switch.



	SCN (3)	The path selection task has received a State Change Notification message that it does not recognize.	Check that all paths and routing tables are correct. If they are not, reboot the local switch.
	VERSION (2)	The FSPF protocol version running on the local switch is lower than a neighbor's switch.	Check the protocol version on both switches using the <b>fspfShow</b> command. If the two versions differ, update the software on the local switch.
HLO	INVHLO (1)	The path selection task has received a HELLO message with an invalid parameters from a neighbor switch.	Check that all paths and routing tables are correct. If they are not, reboot the neighbor switch. Check the paths and routes again. If they are still incorrect, reboot the local switch.
LSDB	LSID (2)	A Link State Record received as part of a Link State Update has an out of range domain ID.	Check that all paths are correct. If any path is missing to any switch in any part of the fabric, reboot the switch with the missing path.
MCAST	ADDBRANCH (2)	A branch is being added to a broadcast or multicast tree, but the parameters are incorrect.	If this is caused by a configuration command, check the parameter values. Otherwise, check the broadcast tree with the <b>bcastShow</b> command. If the tree is incorrect, reboot the local switch.
	ADDPORT (3)	A multicast routing table programming failed.	Run the <b>portLogShow</b> command. Contact Customer Support.
	NOPARENT (2)	An error occurred while computing a broadcast or multicast tree.	Run the <b>LSDbAllShow</b> command. Contact Customer Support.
	NOPARENTLSR (2)	An error occurred while computing a broadcast or multicast tree.	Run the <b>LSDbAllShow</b> command. Contact Customer Support.
	REMPORT (3)	Removing an entry from a multicast routing table failed.	Run the <b>portLogShow</b> command. Contact Customer Support.
	SPFCOST (3)	An error occurred with computing the multicast path tree.	Run the <b>LSDbAllShow</b> command. Contact Customer Support.
NBFSM	NGBRSTATE (2)	An error occurred in the neighbor Finite State	Check the neighbor's state with the <b>nbrStateShow</b> command. If the state is not NB_ST_FULL, force a state change with the <b>portDisable</b> command followed by <b>portEnable</b> . After a few seconds, if the state is not NB_ST_FULL, reboot both the local and remote switches.
UCAST	ADDPATH (1)	A static path configuration failed.	Check command parameters.
	RELICPDB (2)	The path selection task received an E_Port SCN, but the port was already ISL.	Run the <b>ucastAllShow</b> command. Contact customer support.
	SPFCOST(3)	An error occurred with computing the unicast path tree.	Run the <b>LSDAIIShow</b> command. Contact customer support.
MQ	QREAD (1)	A task was unable to receive a message.	Run the command show <b>&lt;queue ID&gt;</b> with the ID of the queue reported in the error. Contact customer support.
	QWRITE (1)	A task was not able to post a message on a queue.	See " <a href="#">MQ-WRITE Error</a> " for more information.
SYS	NOMEM (1)	The system's memory is exhausted.	Reboot the switch. Contact customer support.
	SYSCALL (2)	A system call into VxWorks failed.	Reboot the switch. Contact customer support.
TIMERS	ENQFAIL (1)	An error occurred while setting a timer.	Reboot the switch. Run the commands <b>actTimersShow</b> and <b>timerShow &lt;timer ID&gt;</b> . Contact customer support.
	MSG (3)	The timer task received an unknown message.	Contact customer support.

## Panic Errors

This module includes errors that cause a system panic to occur. A system panic causes the switch to reboot. The PANIC error is stored in flash memory with a stack trace, local stack content and local register content at the time the error occurred.

To view the trace, allow the switch to reboot and issue the **traceShow** command. If the trace was caused by a PANIC error, the first line displays:

```
Reset reasons 0x100: Panic
```

PANIC errors have the highest severity (0).



**NOTE:** Use the **traceShow** command to identify PANIC errors as the **errShow** command is not useful in this case.

**Table A-2. Panic Errors**

Error Severity	Explanation	Action
FREETIMRLSD (0)	A task freed an already free timer.	Issue the <b>traceShow</b> command. Contact customer support.
INCONSISTENT (0)	An internal inconsistency has been detected.	Issue the <b>traceShow</b> command. Contact customer support.
MALLOC (0)	The switch has run out of memory.	Issue the <b>traceShow</b> command. Contact customer support.
MSGQCREATE (0)	A message queue could not be created.	Issue the <b>traceShow</b> command. Contact customer support.
MSGQDELETE (0)	A message queue could not be destroyed.	Issue the <b>traceShow</b> command. Contact customer support.
SEMCREATE (0)	A semaphore could not be created.	Issue the <b>traceShow</b> command. Contact customer support.
SEMDELETE (0)	A semaphore could not be destroyed.	Issue the <b>traceShow</b> command. Contact customer support.
TASKSPAWN (0)	A task could not be created.	Issue the <b>traceShow</b> command. Contact customer support.
TIMEUSECNT (0)	A timer was not released after expiration.	Issue the <b>traceShow</b> command. Contact customer support.
ZOMTIMKILL (0)	An attempt was made to kill a timer that was in `zombie' state.	Issue the <b>traceShow</b> command. Contact customer support.
ZOMTIMSET (0)	An attempt was made to set a timer that was in `zombie' state.	Issue the <b>traceShow</b> command. Contact customer support.

## MQ-QWRITE Error

The software includes several message queues that are used for inter-task communication. Each queue holds a maximum of 64 messages. Under normal operations, a task sends a message to another task on a queue, and occupies a slot in the queue. After the message is received, its slot in the queue is open for another message.

If the receiving task does not run for a period of time, and the sender task sends more than 64 messages to

the same queue before the first message is processed by the receiving task, the queue overflows and the message is discarded. This event causes the `MQ-QWRITE` error to be printed on the display, as well as on the Telnet window, if open. The error is also stored in the error log which can be viewed with the `errShow` command.



**NOTE:** The error log is cleared upon reboot.

There may be several reasons for this error. In some cases, the system may recover without human intervention, however in most cases it will not. In some cases, the error can even indicate a task crash.

These problems can be diagnosed by technical support provided enough information is collected to allow a detailed analysis of the specific case.

The `MQ-QWRITE` error message is shown in Figure A-2 (the front panel displays an abridged version of the message).

### Figure A-2. MQ-QWRITE Error Example

```
Dell_FC_Switch# 0x103fce60 (tTimers): Oct 14 11:07:43
  Error MQ-QWRITE, 1, mqWrite failed,
    queue = 0x103d1d20, msg = 0x103fd3d0,
    errno = 0x3d0002
Traceback:
  _mqWrite+0x44 (0x10065864)
  _mPathAllShow+0x1158 (0x10078498)
```

The most notable parameters are:

- The ID of the task that attempted to send the message (`tTimers` in Figure A-2)
- The queue ID (`0x103d1d20` in Figure A-2)
- The message pointer (`0x103fd3d0` in Figure A-2)

The following commands should be executed, and their output, together with the complete message log should be used when analyzing the error.



**NOTE:** Some of these commands can only be run from the root account.

### Table A-3. Commands to Gather MQ-QWRITE Error Information

Command	Description
<code>i</code>	Lists all the current tasks in the system. Most tasks should be in "READY" or "PEND" state. If any task is in "SUSPEND" state, then a task trace of that task should be run using the <code>tt</code> command.
<code>tt &lt;task name&gt;</code>	Shows the stack trace of the task.
<code>show &lt;queue ID&gt;</code>	Shows information about the queue that overflowed.
<code>d &lt;msg pointer&gt;, 2, 4</code>	Shows the content of the message.
<code>fspfShow</code>	Shows FSPF task's queue ID.
<code>portSemShow</code>	Shows tasks waiting on port semaphores.
<code>spy 5</code>	Shows per-task CPU utilization. This command displays a report every five seconds. At least two reports should be printed, since the first one will indicate that all the CPU is used by the shell.
<code>spyStop</code>	Stops CPU utilization monitoring. This command can be typed in at any time during the monitoring process.

For information on executing these commands, contact Dell Technical Support.

---

## Other Possible Errors

This section explains the other errors that may occur.

### Fan Error Message

Fan has stopped spinning:

Please check the fans inside the switch box.

### Port Error Messages

The GBIC was removed from this port (Solid Black LED):

Please check the switch front panel for GBICs.

Port is receiving no signal (Solid Black LED):

There is no G\_Port board or no GBIC module for this port.

Please check the switch front panel.

Port is receiving signal, but not yet online (Solid Amber LED):

Cable is partially inserted in the port, or the device at the other end of the cable is not functioning properly.

Please check the switch front panel or check the device on the other end of the cable.

Port is disabled (Slow Flashing Amber LED):

The port was disabled by an administrator manually via the front panel, or via one of the management tools.

Port has a fault (Fast Flashing Amber LED):

One or more faulty conditions have occurred:

Laser\_Flt: the module is signaling a laser fault (defective GBIC);

Port\_Flt: the port has been marked faulty (defective GBIC, cable or device)

Diag\_Flt: the port failed diagnostics (defective G\_Port card or motherboard)

Port is OK (Solid Green LED):

The port is online and connected to a device over the cable.

Port is segmented (Slow Flashing Green LED):

Port is online but segmented.

Please check for loopback cable or incompatible switch.

#### Port has an internal loopback (Fast Flashing Green LED):

The port is configured as a loopback port by diagnostics to verify the proper functioning of the internal Fibre Channel port logic and paths between the interface and the central memory. portEnable will put the port back online again.

#### Port is sending data (Flickering Green LED):

The port is online and transmitting/receiving frames.

### **Thermometer Error Message**

#### Temperature out of range:

One or more temperature sensors have exceeded the minimum or maximum allowed temperature reading (Minimum temperature is zero degrees Centigrade, maximum is 750 degrees Centigrade).

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# Dell™ PowerVault™ 50F 8-Port Fibre Channel Switch Installation and Troubleshooting Guide

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*Initial release: 05/25/99*

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# Using PowerVault 50F Fibre Channel Switch Manager: Dell™ PowerVault™ 50F 8-Port Fibre Channel Switch Installation and Troubleshooting Guide

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---

## Overview

This chapter contains general information and examples on managing and monitoring the switch via the PowerVault™ 50F Fibre Channel Switch Manager. The following topics are discussed:

- [Fabric View Page](#)
  - [Fabric Topology View Page](#)
  - [General Switch View Page](#)
  - [Port Detail View Page](#)
  - [Performance View Page](#)
  - [Administrative Interface Page](#)
- 

## Fabric View Page

The **Fabric View Page** displays the switches in a grid. The lines between switches represent what the Fabric knows about a switch, but do not indicate connectivity or how the switch is connected to the Fabric.

Double-click on a switch to display the **General Switch View Page** to provide additional switch information.

Selecting the **Fabric Topology** button displays a **Fabric Topology View Page**.

---

## Fabric Topology View Page

The Fabric topology is viewed from the host domain (or host switch), which is initially requested from the Web browser. This page is broken up into two figures and shows the physical configuration including active domains, paths, and routing information (for example, the hop count which is the number of switches that handle a data frame from origination to the destination). See Table 6-1 for field details.

The first item that appears in this page is a list of active domains (or switches) in the Fabric. Following the active domain list is a table unfolding the views of active paths from the host domain to all remote domains in the Fabric. This table is grouped by domains. The worldwide name and Internet Protocol (IP) address are included under each domain. Each active path table displays host switch output port number, host switch input port number, the hop count and metrics (costs) from the host domain to the remote domain, and the path flag.

### Table 6-1. Fabric Topology Field

Field	Description
List of Active Domains in the Fabric	Displays the number of active domains in the Fabric including switch names and switch domain ID.
List of Active Paths by Domain	Displays the domain ID associated with the switch name. Worldwide Name (WWN), and total number of paths by domain. Each path is displayed including: <ul style="list-style-type: none"> <li>• Output ports</li> <li>• Input ports</li> <li>• Metric</li> <li>• Flag</li> </ul>

## General Switch View Page

The **General Switch View Page** displays when you query the switch from the **Fabric View Page** (see Table 6-2 for field descriptions). A photographic quality switch is displayed on the browser. The switch picture displays the ports, light-emitting diodes (LEDs), general switch information, temperature, fans and buttons for administration functions, Telnet session, and performance view.

The **admin** button links to the system administration pages where you can disable/enable a port depending on the appropriate authentication (see Table 6-5 and "Administrative Interface Page" in this chapter for more information). The **performance** button links to the **Performance View Page** (see "[Performance View Page](#)" for more information). The Telnet button launches a Telnet session (see "[Telnet Interface Page](#)").

Under normal conditions, the browser's lower-right corner holds animated thermometers and spinning fans. The color and blinking speed of the port LEDs are updated every 1 to 2.5 seconds depending on the operating system and browser used. Warning messages show up in a pop-up window automatically if problems occur (for example, temperature exceeding maximum value, a fan stops rotating, or a port state becomes problematic). Pushbuttons are placed in the bottom of the warning message pop-up window. Those buttons are connected to a separate browser providing basic troubleshooting guides.

The thermometer indicates the highest temperature from the last data sample. Click on the thermometer to display the temperature readings from all five switch sensors.

**Table 6-2. General Information Fields**

Field	Description
WWN	The switch's WWN is unique numeric identifier for each switch and is assigned by the manufacturer. A numbering scheme administrated globally ensures that this WWN is unique to this switch.
Domain ID	The domain ID 0 to 31. This number uniquely identifies the switch in a Fabric.
Role	The three possibilities for role including: <ul style="list-style-type: none"> <li>• Principal-The principal switch as defined in FC-SW.</li> <li>• Subordinate-This switch is enabled and not the principal switch.</li> <li>• Disabled-The switch is disabled.</li> </ul>
State	The switch state. Possible values include Online, Offline, Testing, and Faulty.



Firmware	The firmware version.
EtherIP	The default Ethernet IP address is a temporary number derived from the switch's WWN. You must enter a valid IP address.
Ether NM	The default Ethernet subnetmask value is none.
Gateway	The default gateway address is 0.0.0.0. You must enter a valid gateway address, if required.
The following fields are not currently supported:	
FC IP	The default Fibre Channel IP address is a temporary number derived from the switch's WWN. You must enter a valid IP address.
FC NM	The default Fibre Channel subnetmask is none.

On the left side of the display, the upper half shows port and LED status and the lower half contains general switch information. Selecting the label on each text field displays a pop-up dialog that explains the field.

In the switch picture, the blinking green lights indicate problem status and solid black indicates no device attached. Each port module is a clickable hyperlink that takes you to a third page, the **Port Detail View Page** (see Table 6-3 and "Port Detail View Page" in this chapter for more information). Each port includes the port number, a status LED, and port detail information.

If a port card is not installed, a solid black rectangle is displayed and the port status is indicated as `No_Card`. If the interface is installed but no Gigabit Interface Converter (GBIC) is present, a silver rectangle is displayed and the port status is indicated as `No_Module`.

If the port contains a GBIC, one of the following is shown:

- For copper GBICs, a graphic representation of a copper GBIC with the letters "CU"
- For shortwave fiber GBICs, a graphic representation of a GBIC with the letters "S" and "W"
- For longwave fiber GBICs, a graphic representation of a GBIC with the letters "L" and "W"
- If the port is on an arbitrated loop, the letters "F/L" are displayed in an oval between the ports associated with the card.
- If the port has failed, the port is outlined in amber to indicate a failure.

The color and flash speed of each LED, as described in Table 6-3, indicates port status.

**Table 6-3. Port LED Status Indicators**

Port LEDs	Definition
No light showing	No signal (no module, no cable) for media interface LEDs, power not applied for power indicator LED.
Steady yellow	Receiving signal, but not yet online. If the port transitions to this state while being monitored, the application presents you with a dialog recommending a course of action.
Slow yellow	Disabled (result of diagnostics or portDisable command). Flashes every 2 seconds. The application presents you with a dialog recommending a course of action.
Fast yellow	Error, fault with port. Flashes every 1/2 second. The application presents a dialog recommending a course of action.
Steady green	Online (connected with device over cable).
Slow green	Online, but segmented (loopback cable or incompatible switch) flash every 2 seconds.
Fast green	Internal loopback (diagnostic). Flashes every 1/2 second.
Flickering	Online and frames flowing through port.

green

## Port Detail View Page

The **Port Detail View Page** features eight cascaded folders. Each folder has a tab on the top to show the port number and a status light to tell the port state (disabled or enabled with the same light as described in Table 6-3). The port information is updated once per second. However, the time interval may be as long as 2.5 seconds depending on the browser used. By monitoring the eight tabs, a system administrator can evaluate each port state. The default top folder displayed on this page is for the port number checked from the **General Switch View Page**. Clicking a tab brings the corresponding port folder to the front.

Below the folders is a pushbutton linked to the **Administrative Interface Page** (see "[Administrative Interface Page](#)" for more information) where port enable/disable can be performed. A pushbutton is linked to the **Performance View Page** (see "[Performance View Page](#)" for more information) where port and switch throughput data is plotted. A **Done** pushbutton is used to exit from the page.

Each port folder contains general port status information such as the port number, port type (E-Port, G-Port), port WWN name, and some detailed information, such as the number of interrupts, number of link failures, number of parity errors, number of time-outs, and the size of free buffer.

The LED located in the upper-right corner in each tab resembles the port LED in the switch front panel.

**Table 6-4. Port Detail View Page Fields**

Field	Description
Port Number	The port number
Port Status	The port state follows the GBIC type. The possible port states include: <ul style="list-style-type: none"> <li>• No_Card - No card present in this switch slot</li> <li>• No_Module - No GBIC module in this port</li> <li>• No_Light - The module is not receiving signal</li> <li>• No_Sync - The module is receiving light but is out of sync</li> <li>• In_Sync - The module is receiving light and is in sync</li> <li>• Laser_Flt - The module is signaling a laser fault (defective GBIC)</li> <li>• Port_Flt - The port has been marked faulty (defective GBIC, cable, or device)</li> <li>• Diag_Flt - The port failed diagnostics (defective G_Port or FL_Port card or motherboard)</li> <li>• Online - The port is up and running</li> <li>• Lock_Ref - The port locking to the reference signal</li> </ul>
Port Type	The port type (E_Port, G_Port or FL_Port).
Port Module (or GBIC Module)	The GBIC type follows the port number. The four GBIC types include: <ul style="list-style-type: none"> <li>• - - no GBIC present</li> <li>• sw - shortwave GBIC</li> <li>• lw - longwave GBIC</li> <li>• cu - copper GBIC</li> </ul>
Port Worldwide Name	The Worldwide Name for this port.
Interrupts	Total number of interrupts.
Unknown	Number of unknown interrupts.
Lli	Number of low level interface (LLI) interrupts.
Proc_rqrd	Number of interrupts with processing (CPU) required.
Timed_out	Number of timed out interrupts.

Rx_flushed	Number of flushed transmissions.
Tx_unavail	Number of interrupted transmissions.
Free_buffer	Number of buffer interrupts.
Overrun	Number of buffer overruns.
Suspended	Number of suspended interrupts.
Parity_err	Number of parity errors.
Frjt	Number of frame rejected.
Fbsy	Number of frames busy.
Link_Failure	Number of link failure.
Loss_of_sync	Loss of synchronization.
Protocol_err	Protocol error.
Invalid_word	Invalid word (encoding errors inside of frames).
Invalid_crc	Invalid CRC in a frame.
Delim_err	Delimiter error (order set)
Address_err	Address ID error (S_ID D_ID)
Lr_in	Link reset in (primitive sequence). Does not apply to FL_Port.
Lr_out	Link reset out (primitive sequence). Does not apply to FL_Port.
Ols_in	Offline resent in (primitive sequence). Does not apply to FL_Port.
Ols_out	Offline resent out (primitive sequence). Does not apply to FL_Port.

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## Performance View Page

The **Performance View Page** displays port and switch throughput (in bytes per second). The first eight graphs show the port throughput for port number 0 through 7. Throughput for the entire switch is displayed in the long rectangular graph at the bottom.

The horizontal axis represents time elapsed. The port throughput graphs hold up to 60 seconds of performance data. The switch throughput graph at the bottom holds up to 4 minutes of performance data. The vertical axis in each graph shows throughput (in bytes per second). It is automatically scaled depending on the switch activity. The display is updated roughly once per second.

The total throughput value is the throughput sum for all ports. The throughput number represents the number of bytes received plus the number of bytes transmitted each second. Note that, because the switch also *transmits* all data it receives, the total throughput for the switch could, alternately, be stated as one-half (1/2) of the throughput sum of all ports.

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## Administrative Interface Page

Only users with admin privilege can access the **Administrative Interface Page**. Any changes made through this may fundamentally change the switch/port status and its role in the fabric. Check and input boxes are provided for you to type in the changes. Submit buttons are used to apply the changes. You can enable (or disable) the switch or ports (8). Change switch name, IP addresses, user name, passwords, download flash, and reboot switch via this page. Table 6-5 provides field information for the **Administrative Interface Page**.

### Table 6-5. System Administration Fields

Category	Field	Description
Switch Administration	Switch Disabled	If the box is checked, the switch is disabled. It may need to be enabled after firmware upgrades, maintenance, and diagnostic tests. To enable the switch, click the check box to remove the check and select the <b>Commit Configuration Changes</b> button.
	Switch Domain	The switch domain text box displays or sets the switch domain. To update the switch domain, enter the new domain and select the <b>Commit Configuration Changes</b> button.
	Switch Name	The switchName text box displays or sets the switch's name. To update the switch name, enter the new name and select the <b>Commit Configuration Changes</b> button.
Network Administration	Ethernet IP	The IP address for the Ethernet connection to the switch. The default IP address is a temporary number derived from the switch's WWN. Refer to the network administrator for the appropriate IP address.
	Ethernet Subnetmask	The default subnetmask value is none. Refer to the network administrator for the appropriate subnet mask value to enter.
	Gateway	The gateway address. Refer to the network administrator for the appropriate gateway address value to enter.
	Fibre Channel IP	The Fibre Channel IP address. The default IP address is a temporary number derived from the switch's WWN. Refer to the network administrator for the appropriate IP address. (Not currently supported.)
	Fibre Channel Subnetmask (not currently supported)	The default subnetmask value is none. Refer to the network administrator for the appropriate subnet mask value to enter.
Switch Port Configuration	Port Number	The port number on a particular switch.
	Port Disabled	If the box is checked, the port is disabled. It may need to be enabled after maintenance and diagnostic tests. To enable the port, click the check box and select the <b>Commit Configuration Changes</b> button.
Commit Configuration Changes		Applies administrative changes.
Switch User Administration	Change User Name	Only users with admin level can change user name for <i>admin</i> and <i>user</i> .
	Change Password	To change passwords, enter new password. A valid password must contain 8 to 40 characters.
	Verify Password	For new passwords, re-enter the password for verification.
Commit Username and Password Changes		Applies administrative changes.
Reset		Resets the display to previous defaults.

Flash Download	Host Name or Host IP  Remote User Name	The host name or Host IP address of the source host where the binary firmware file resides. Note that <b>rshd.exe</b> must be running on the host system before a download is attempted.  The remote user name of the source host where the binary firmware file resides.
	Download File From  Download Flash Now  Reboot This Switch Now	The absolute directory path and filename from the source host where the binary firmware file resides. Note that you must use forward slashes (/) when downloading firmware from a Windows NT system.  Downloads firmware into flash memory.  Pressing this button causes the switch to immediately exit all current processes and states.

## Installing and Running rshd.exe

To run the remote shell daemon, perform the following steps:

1. Run the **setup.exe** file on the *Dell PowerVault™ Utilities Diskette* to install the **rshd.exe** and **cat.exe** utility files on the hard disk.
2. Click **Start** and then click **Programs**.
3. In the program list, click **Dell OpenManage™ PowerVault™ Manager—> PowerVault™ 50F Utilities—> rshd**.

The remote shell daemon starts. The **cat.exe** is run from the **rshd.exe** file

4. After **rshd.exe** completes the download, stop **rshd.exe** by pressing <Ctrl-C>. To minimize any security exposure, the remote shell daemon should be terminated.

## Pop-up Help Dialog Box

The **Pop-up Help** dialog box displays all glossary help and warning messages in a single pop-up dialog box instead of one pop-up per message. This pop-up dialog box can contain up to 100 entries, each with a time stamp. The top item is deleted sequentially in order to display a new message when over 100 entries are recorded. A single click on each item brings up a separate browser displaying glossary help or troubleshooting information. The history is maintained upon browser reload/refresh. The history is cleared upon exiting from the browser.

Browser reload/refresh closes all pop-up windows (**Help** dialog box, **Performance** window and Port Detail window) properly without leaving orphan windows for the operating system to handle.

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