Fabric OS™
Version 2.0

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Brocade Communications Systems, Incorporated

Note Regarding Applicability of Fabric OS™ to Hewlett-Packard

The *Fabric OS* manual describes the operation of the SilkWorm 2400 and 2800 switch. The following describes the extent to which this manual is applicable to Hewlett-Packard.

References to the following are not applicable:

- Model numbers
- Optional licensing information
- Part numbers
- Copper

The front matter (Notices, TOC, Preface) is applicable, with the following exceptions:

- Related Publications – Hewlett-Packard part numbers are as follows: *Hardware Reference Manual* A5624-90902, *Fabric OS* A5624-90903, *Zoning* A5624-90904, *QuickLoop* A5624-90905, *Web Tools User's Guide* A5624-90906, and *SCSI-3 Enclosure Services (SES) User's Guide* A5624-90907.
- Optionally licensed products are standard.

Chapter 1 (Introduction) is applicable, with the following exception:

- Optionally licensed products are standard.

Chapter 2 (Management) is applicable, with the following exception:

- SilkWorm 1000 is Hewlett-Packard's SureStore E Switch F16.

Chapter 3 (Telnet Commands) is applicable.

Chapter 4 (Diagnostics) is applicable.

Appendix A (Glossary) is applicable.

Appendix B (Customer Support) is not applicable. Refer to your Hewlett-Packard support contract for support information.

Appendix C (Error Messages) is applicable.

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CONTENTS

PREFACE

The *Fabric OS Version 2.0 Manual* describes how to use, administer, and maintain the switch.

Audience

The audience for this manual includes:

- Field Technicians
- System Administrators

How this Manual is Organized

The following table describes how the manual is organized.

FOR INFORMATION ON	SEE
Software introduction	*Introduction* on page 1-1
Managing the switch and issuing commands	*Management* on page 2-1
Telnet Commands and examples	*Telnet Commands* on page 3-1
Diagnostics and troubleshooting	*Diagnostics* on page 4-1
Glossary	*Glossary* on page A-1
Customer support and software upgrades	*Customer Support* on page B-1
Error messages	*Error Messages* on page C-1

Related Publications

Other publications that may provide related information include:

- *Fibre Channel Standards*

For detailed information on the Fibre Channel standards, see the Fibre Channel Association web site:

http://www.fibrechannel.com

- SilkWorm 2800 Hardware Reference Manual (53-0001553-01)

1

INTRODUCTION

The Fabric OS manages the operation of the Silkworm 2400 and 2800 switches. A standard set of commands is provided for customizing the switch to a customer's configuration, controlling the switch functions, and monitoring of the switch and fabric during operation.

The Fabric OS provides a set of facilities to:

- Discover the set of connected devices, determine the available data paths through the switches, and automatically configure the fabric.
- Customize one or several switches to tailor the installation to a customer's configuration preferences.
- Configure and manage fabric-wide facilities such as Simple Name Service, Alias Service, and Zoning (optional product)
- Provide a wide array of management interfaces to suit a customer's standard management methodology. SilkWorm 2000 series switches can be remotely managed using telnet, SNMP, SCSI Enclosure Services (SES), or via a Web browser.

Table 1-1 describes basic software features.

Table 1-1 SilkWorm Technical Features

FEATURE	DESCRIPTION
Login (FC)	Explicit Fabric login is supported (public and private).
Probing	Automatic discovery of devices and auto registration with the Fabric Simple Name Service (SNS) For private devices, translation mode is set so that other Fabric attached devices can communicate with them.
ZONING	ZONING (optionally licensed product) is a Fabric management service used to create logical device subsets within a Storage Area Network (SAN) which enables resource partitioning for management and access control.
Buffer-to-buffer credit	Buffer-to-buffer credit for each F_Port can be up to 16 credits.
Time Out Values	Both R_A_TOV (Resource Allocation Time Out Value) and E_D_TOV (Error Detect Time Out Value) are adjustable in 1-millisecond increments via Telnet.
Fabric Name	An automatic Fabric Name assignment method is used in a multi-switch configuration.
Frame Delivery	The switch delivers the frames via the destination F_Port in the same order received by the source F_Port. The in-order frame delivery is maintained within a Fabric of multiple interconnected switches.
Address Assignment	The switch follows the addressing hierarchy defined in the Fibre Channel Standard. The switch port address identifiers are selected using an automatic address assignment protocol. All ports within the switching Fabric (F_Ports, FL_Ports and E_Ports) are assigned address identifiers. Each switch maintains its own address pool. The management of address identifiers and assignment of the address pool to the individual switches are performed by the designated address managers within the Fabric.
Broadcast and Multicast	The system supports up to 256 multicast groups, plus one for broadcast. Any port can be a member of multiple groups. In addition to the unicast routing table, each port has its own multicast routing table. The Alias Server is responsible for setting up and removing multicast groups.
Frame Routing	Self routing of frames between the communicating ports is supported. The path selection in a multiswitch configuration is based on a self-routing protocol.
Management	The switch may be managed via the 2800's front panel, Telnet, the SNMP agent, the SCSI-3 SES agent (optionally licensed product), and the WEB TOOLS (optionally licensed product). The last three entities are accessible via the Internet Protocol over RJ45 100BaseT Ethernet port or any Fibre Channel port. You can use any SNMP-based management product to access the SNMP agent. You may use any supported Web browser to use the WEB TOOLS.
Name Server	The Name Server function is based on the Simple Name Server model defined in the Fibre Channel Standard. This function is provided by the embedded N_Port with the alias address, FFFFFCh, to register address mapping between the Nx_Port 24-bit Fibre Channel physical address (Nx_Port identifier) and the logical addresses such as Worldwide Names, IP addresses, FC-4 device types, and Initial Process Associators. The Name Server also provides the deregistration and query functions from other nodes or Nx_Ports for logical address translations to the corresponding Nx_Port identifiers.
Alias Server	The Alias Server is based on the Fibre Channel Standard. The function is provided by the embedded N_Port with the alias address, FFFFF8h. It manages multicast groups.

2

MANAGEMENT

This chapter contains general information and examples on managing and monitoring the switch. It also discusses compatibility of the Version 2.0 software with previous SilkWorm software releases. The chapter discusses:

- Compatibility with SilkWorm 1000 Series Hardware
- Switch Management Methods
- Hardware Setup for Switch Management
- Managing via Telnet (see Chapter 3, *Telnet Commands* for supported commands)
- Managing with SNMP
- *syslog* Daemon

Compatibility With SilkWorm 1000 Series Hardware

Version 2.0 software executes on the SilkWorm 2000 series hardware only. It will not execute on the SilkWorm 1000 series hardware (SilkWorm and SilkWorm Express). The 2.0 software version is compatible with the SilkWorm 1000 series software, allowing the 2000 family and the 1000 family systems to operate in the same fabric. In order to accomplish this compatibility, the SilkWorm 2000 family system must be configured into a specific addressing mode. This mode is designated “VC Encoded Address Mode”. Invoking this mode is described under the ‘configure’ command described in Chapter 3, *Telnet Commands*. When this compatibility mode is used, the maximum switch count in a fabric is 32 (as opposed to the maximum of 239 switches in a fabric that Version 2.0 software supports). In addition, the maximum number of multicast groups is reduced to 31 from 256.

A second SilkWorm 1000 compatibility mode is also provided. It is a subset of the “VC Encoded Address Mode” and will provide for 100% identical addressing between the Version 2.0 Series 2000 hardware and the 1.6 and later software on the Series 1000 hardware. When this mode is invoked by the command “configure” and the parameter “Disable Translative Mode” is set, the fabric feature designated as translative mode is no longer supported. This mode should only be used when backward compatibility with Series 1000 systems at the address decoding level is required. Only those customers with an installed base of 1000-series hardware and drivers that do port probing need to consider this feature.

Comparing Switch Management Access Methods

The SilkWorm® 2800 switch is managed locally via the front panel buttons and remotely via Telnet, SNMP, web management (optionally licensed product) or SCSI Enclosure Services (optionally licensed product). Front panel management options are discussed in the SilkWorm® 2800 Hardware Reference Manual.

The SilkWorm® 2400 switch is managed remotely via Telnet, SNMP, web management (optionally licensed product), or SCSI Enclosure Services (optionally licensed product). This switch does not have a front panel.

In order to manage a switch, the user must have access to one of the available management methods. The telnet, SNMP and web management tools require that the switch be accessible via a network connection. The network connection can be from the switch ethernet port (out of band) or from fibre channel (in band). The switch must be configured with an IP address to allow for the network connection. Following this section, a detailed description is provided on how to ensure the switch has a valid IP address that will allow for network management. All other hardware related information is contained in the Series 2000 switch Hardware Reference Manuals listed in the preface of this manual.

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 SilkWorm 2800 switch to factory default values use the `configDefault` command, described in *configDefault* on page 3-14 or via the Reset to Default front panel command described in the hardware manual. To reset a SilkWorm 2400 switch to factory default values, see *Resetting Factory Defaults Via a 2400* on page 2-9.

There are several access methods for managing a switch. Table 2-1 summarizes the different management access methods.

Table 2-1 Comparison of Management Access Methods

METHOD	DESCRIPTION	LOCAL	IN-BAND (FIBRE CHANNEL)	OUT-OF-BAND (ETHERNET)
Front panel buttons (SilkWorm 2800)	Managed via front panel buttons on the switch (see hardware manual on use of these buttons and command descriptions)	Yes	No	No
Telnet commands	Managed remotely using Telnet commands	No	Yes	Yes
Managing with SNMP	Managed remotely using Simple Network Management Protocol (SNMP)	No	Yes	Yes
Managing through SES*	Managed SCSI-3 Enclosure Services	No	Yes	No

Table 2-1 Comparison of Management Access Methods

METHOD	DESCRIPTION	LOCAL	IN-BAND (FIBRE CHANNEL)	OUT-OF-BAND (ETHERNET)
Web-based management*	Managed remotely though web	No	Yes	Yes
** SES and Web-based Management are optionally licensed features.*				

Figure 2-1 illustrates the various management access methods.

NOTE: *Before a Telnet connection can be established the switch must have an IP address assigned to it. Use the front panel buttons to assign an IP address (SilkWorm 2800) or connect via the RS-232 port on the SilkWorm 2400 to set the IP address. Details on this are included in the next section.*

Figure 2-1 shows the various methods and communication paths for accessing switch management information.

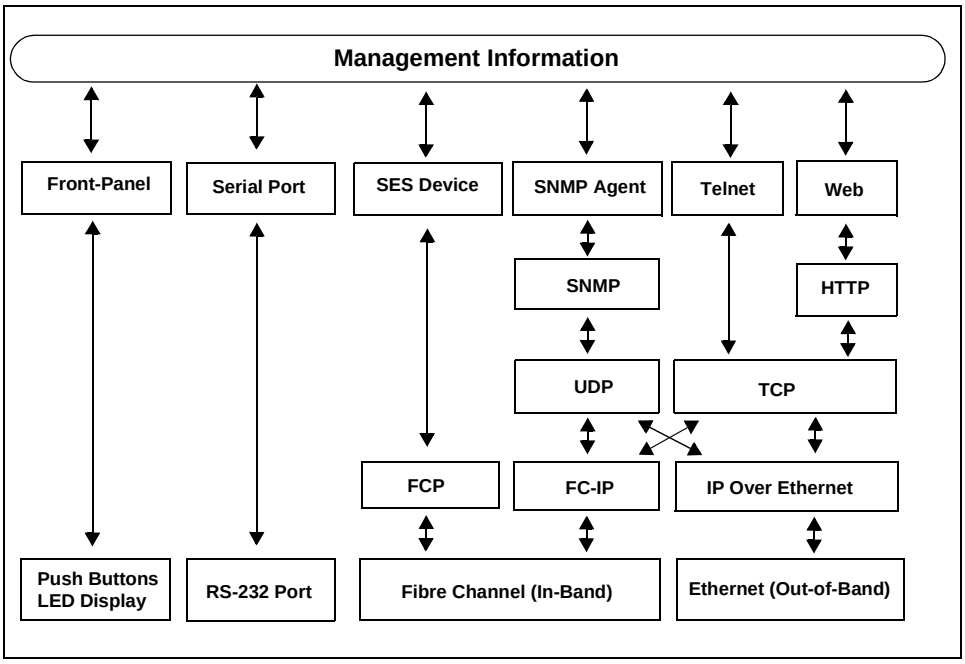

Figure 2-1 Methods for Managing Information

Hardware Setup for Switch Management

To enable a connection to the switch, the switch must have a valid IP address set. Two IP addresses can be set -- one for the external out-of-band ethernet port and one for in-band fibre channel network (IP) access.

Switch IP Address Setup on the SilkWorm 2800

The switch IP addresses can be set from the front panel. [See the hardware reference manual for the SilkWorm 2800 on use of the keys.]

- Select the "Configuration" menu using the right button
  - Scroll down on configuration options until the option "Ethernet IP Address" appears and select this option using the right button
  - Use the left button to move from one IP address value to the next
  - Use the scroll up/down keys to set each of the 4 numeric IP address values
  - When all values are set, press the right button to finish
  - Confirm the IP address is correct (select "Yes" option to store to flash)
  - Switch will store IP address in flash
- Repeat the above steps after selecting the option "Set FC IP Address" from the configuration menu

When the above steps have been completed, the switch is network ready.

> **NOTE:** *To be completely accessible on the network, it may also require setting a netmask and gateway address. Your local network administrator should be consulted to determine if these additional addresses must be set in the switch. Setting these addresses follows the same basic steps outlined above, after selecting the menu options to set these addresses.*

Switch IP Address Setup on the SilkWorm 2400

The SilkWorm 2400 switch does not have a front panel display and push buttons. The switch is shipped from the factory with a default IP address pre-installed on the switch. This IP address is noted on a label on the top front edge of the switch. The address is for the external ethernet connection.

If you can use this address to establish a network connection to the switch, then the address can be changed using a telnet command after connecting to the switch. This is the easiest method of setting a new IP address. However, if you need to set a network address compatible with your network setup prior to being able to connect to the switch, the IP address can be set after connecting to the switch via the front panel RS-232 serial connection.

This connection is provided for two reasons:

1. Setting the IP address when the factory default cannot be used in your network setup
2. Resetting the switch to its initial factory defaults (typically done when the switch passwords have been set and forgotten and it is necessary to get back to a known default password).

Connecting to the serial port requires use of a serial cable and a host system/terminal that allows for serial connection.

Serial Cabling Requirements

The switch uses a standard serial cable with a male 9-pin D-Subminiature connector (but only pins 2, 3 and 5 are required/supported; if 7 is used, this signal must always be driven high, with the following pinouts:

Table 2-2 Cabling Pinouts

PIN	SIGNAL	DESCRIPTION
1		
2	TxData	Transmit Data
3	RxData	Receive Data
4		
5	GND	Logic Ground
6		
7	CTS	Clear to Send
8		
9		

NOTE: *For dust and ESD protection, the switch includes a cover for the serial port. When not in use, the serial port should be covered.*

Serial Port Connection

The serial port settings are:

- 8-bit
- No parity
- One stop bit
- 9600 baud

Figure 2-2 Connections for SilkWorm 2400

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 re-logging in is required. A password is required to login to the serial port session.*

CAUTION *Password checking is skipped only at initial power on. This is so you can log into the switch before setting the password, or if you have forgotten the password, you can reset the switch to factory default values.*

Setting up the RS-232 Link

In order to communicate with the RS-232 port you need the following:

- Host system with a terminal emulation program (e.g. HyperTerminal) or a stand alone terminal
- Serial cable per the specs stated above. The cable should be a DB9 connector type with female connector for the SilkWorm 2400 serial port and an appropriate connector for the host/terminal being used.

Connect the cable between the switch RS-232 port and the host/terminal serial interface. Upon switch power up, the switch will be automatically connected and logged in as `admin`. If the switch is connected after it is powered up, a user login name and password must be supplied.

Setting the IP Address

As the admin user, enter '`ipAddrSet`'. This command will prompt the user for the following:

```
Ethernet IP Address [current address shown]: [enter new address if needed]
Ethernet Subnetmaks [current]: [enter new subnet mask if needed]
Fibre Channel IP Address [current]: [enter new address if needed]
Fibre Channel Subnetmask [current]: [enter new subnet mask if needed]
Gateway Address [current]: [enter new address if needed]
```

If the current value is acceptable, press `Return`. Following entry of these values, the switch can now be accessed via the network connection on the switch. The switch can be managed using Telnet commands.

Managing Via Telnet

To make a successful Telnet connection to a switch, the user needs:

- Switch name or IP address
- Username
- Password

NOTE: *The IP address must be installed using the* `ipAddrSet` *command which can be issued by connecting to the SilkWorm 2400 RS-232 serial port on the front panel (see previous section). Consult with the local network system administrator for a suitable IP address that can be assigned to the switch.*

Any host system that supports telnet can be used to connect to the switch over the Ethernet. If the host supports a name service, the switch name can be used to effect the telnet connection. If name service is not used to register network devices, then the IP address is used to connect to the switch. Examples below:

```
telnet [fc switch name]
telnet 192.168.64.9
```

When the telnet connection is made, the user is prompted for a user name and password. The following section defines the default user names supplied with the switch and the default passwords. Both of these can be changed by the switch administrator.

Default User Name

Each Username has a security level associated with it. Username 3 is the least privileged and the security level goes up to Username 1, which is the most privileged.

Table 2-3 Default User Name

DEFAULT USER NAME	DESCRIPTION
user (username 3)	Gives users access to any commands that do not change a switch state, such as `version`. This level is the recommended level for monitoring switch activity.
admin (username 2)	Gives users access to all 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

1. Log in as `admin`.
2. Issue the command `passwd`.

   Each username (admin, user) is displayed in sequence, allowing the administrator to modify each password and name.
3. Enter a password or name while a user name is displayed to replace the existing password or name.

NOTE: *If you forget the switch password follow the instructions on setting the switch to factory defaults which will reset all passwords to the initial factory settings.*

Resetting Factory Defaults Via a 2400

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

To reset factory defaults

1. Connect a DB9 serial cable from the host serial port or terminal serial line to the switch's RS-232 port.
2. From a Host system running a terminal emulation program or from a terminal, log into the switch.
3. When prompted, enter the userid=admin and the proper password for the admin user.
4. Enter `configDefault` to reset usernames and passwords. See *configDefault* on page 3-14 for command usage.

NOTE: *configDefault does not affect the SNMP agent configuration. To reset SNMP agent configuration, see agtcfgDefault on page 3-2.*

Managing with SNMP

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

This section provides an overview of key concepts about switch management based on Simple Network Management Protocol (SNMP). Additionally, refer to other references and text books on SNMP for more detailed discussions of the protocol and usage.

Within the SNMP model, a manageable network consists of one or more manager systems (or network management stations), and a collection of agent systems (or network elements):

- A manager system runs a management application that monitors and control the network elements
- An agent system is a network device such as a Fibre Channel switch, a hub, or a bridge, that has an agent responsible for carrying out operations requested by the manager. Therefore, an agent is the interface to a managed device.

The manager communicates with an agent using the Simple Network Management Protocol (SNMP). The switch agent supports both SNMP version 1 (SNMPv1) and Community-based SNMP version 2 (SNMPv2C). SNMP allows the following management activities:

- A manager can retrieve management information, such as its identification, from an agent. There are three operations for this activity:
  - SNMP-GET
  - SNMP-NEXT
  - SNMP-BULKGET (SNMPv2C)
- A manager can change management information on the agent. This operation is termed SNMP-SET.
- An agent can send information to the manager without being explicitly polled for. This operation is termed a trap in SNMPv1 or a notification in SNMPv2C. Traps or notifications would alert the manager to events that occur on the agent system, such as reboot. For the rest of the document, the term *trap* is used.

The information on an agent is known as the Management Information Base (MIB). It is an abstraction of configuration and status information. A specific type or class of management information is known as a MIB object or variable. For example, the MIB variable, `sysDescr`, defines the description of an agent system. The existence of a particular value for a MIB object in the agent system is known as a MIB object instance, or simply instance. Some MIB objects have only a single instance for a given agent system. For example, the system description and the instance is denoted as `sysDescr.0`. Other MIB objects have multiple instances. For example, the operational status of each Fibre Channel port on a switch and a particular instance may be denoted as `swFCPortOperStatus.5`".

MIB objects are conceptually organized in a hierarchical tree structure. Each branch in the tree has a unique name and numeric identifier (Figure 2-3). Intermediate branches of the tree serve as a sway to group related MIB objects together. The *leaves* of the tree represent the actual MIB objects. Figure 2-3 illustrates the tree structure, with special attention to the Internet MIB tree and the Fibre Channel MIB tree.

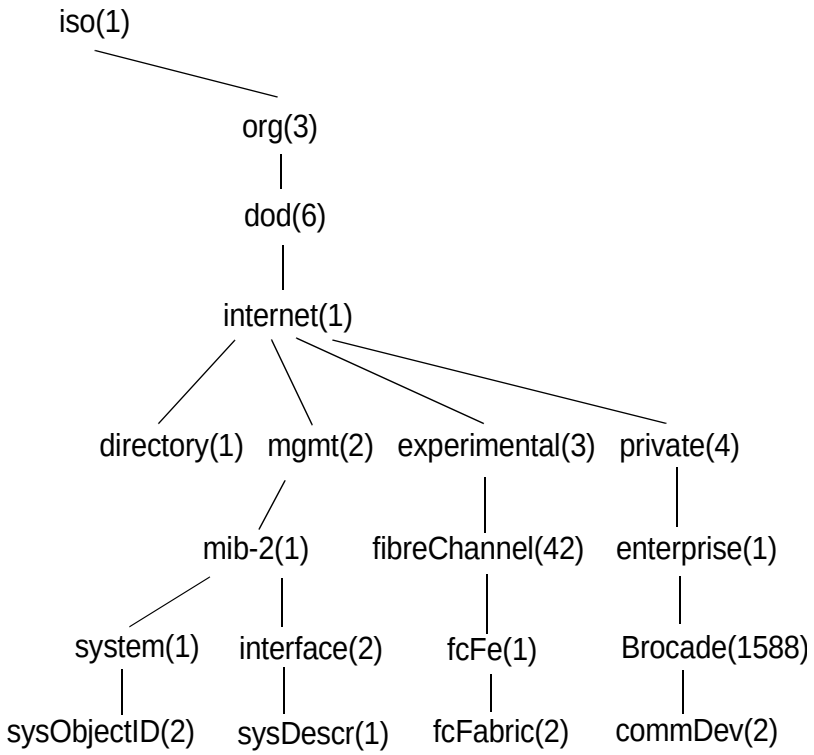

Figure 2-3 MIB Tree

A MIB object is therefore uniquely identified or named by its position in the tree. A full object identifier consists of the identifier of each branch along the path through the tree. For example, the object `sysObjectID` has the full identifier of `1.3.6.1.2.1.1.2`. For readability notation may be used, for example `{system 1}`.

The switch's agent supports the following:

- SNMPv1 and SNMPv2c
- Command line utilities to provide access to configure the agent.
- MIB-II system group, interface group, and SNMP group
- Fabric Element MIB
- Vendor-Specific MIBs
- Standard Generic traps
- Enterprise Specific traps

SNMP Transports

The SNMP agent residing on the embedded processor supports UDP/IP over the Ethernet interface or any FC-IP interface, see Figure 2-1. 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 agent supports 3 of these groups. The 8 additional groups do not apply.

The three groups supported include:

1. System group (object ID is {iso, org, dod, internet, mgmt, mib-2, 1})
2. Interfaces group (object ID is {iso, org, dod, internet, mgmt, mib-2, 2})
3. 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:

`sysDescr`	System description: the default value is set as "*Fibre Channel Switch*"
`sysObjectID`	System object identifier vendor's authoritative identification (`1.3.6.1.4.1.1588.2.1.1.1`)
`sysUpTime`	The time since the agent was last initialized
`sysContact`	The identification and contact information for this switch. By default, this is set as "*Field Support*".
`sysLocation`	The switch's physical location. The default setting is "*End User Premise*".

The interface group supports three interface drivers: software loopback, Ethernet, and Fibre Channel IP.

Fabric Element MIB Support

There are five object groups defined:

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

The agent supports all groups, except the Accounting group, which is better supported in the Fibre Channel Port Group of the Vendor Unique MIB.

Vendor Unique MIB

Five groups of MIBs are defined and supported:

- Switch System Group
- Fabric Group
- SNMP Agent Configuration Group
- Fibre Channel Port Group
- Name Server Group

For more information, see Switch MIB and Trap Definitions.

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 agent has reinitialized itself such that the agent's configuration might be altered. This also indicates that the switch has booted.
- 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.

  NOTE: *linkUp and linkDown traps are not associated with removing or adding a Ethernet cable. This is strictly a driver indication that the interface is configured, operational, and available and does not necessarily mean that the physical network cable is affected.*

- authenticationFailure – indicates the agent has received a protocol message that is not properly authenticated. This trap, by default, is disabled but can be enabled via the commands `agtcfgSet, the MIB-II variable or snapEnableAnotherTrap`.

Enterprise Specific Traps

The following Enterprise Specific Traps are supported:

- swFault – indicates the diagnostics detect a fault with the switch.
- swSensorScn – indicates 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 on-line to offline. The VarBind in the Trap Data Unit contains the corresponding instance of the port's operational status.
- swEventTrap - a notification that an event has occurred and its event severity level is at or below the value set in the variable, swEventTrapLevel (see Agent Configuration below). The VarBind in the Trap Data Unit contains the corresponding instance of the event index, time information, event severity level, the repeat count, and description.

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

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

For more information, see Switch MIB and Trap Definitions.

Agent Configuration

The parameters that can be configured include:

- SNMPv1 communities (up to 6)
- trap recipients (1 per community)
- sysName
- sysContact
- sysLocation
- authenticationFailure – indicates the agent has received a protocol message that is not properly authenticated. This trap, by default, is disabled.
- swEventTrap Level- indicates specifies the swEventTrap severity level in conjunction with an event's severity level. When an event occurs and if its severity level is at or below the set value, the SNMP trap, swEventTrap, is sent to configured

recipients. By default, this value is set at 0, implying that no swEventTrap is sent. Possible values are as follows:

- 0 – none
- 1 – critical
- 2 – error
- 3 – warning
- 4 – informational
- 5 – debug

See errShow and Appendix C, *Error Messages* for more information.

These parameters can be changed via the Telnet command, `agtcfgSet` or via SNMP.

Available MIB and Trap Files

You can download the MIB definitions and Enterprise Trap Definitions from:

- From a web browser, connect to http://www.brocade.com/BrocMarket.nsf/Support/Mibs&Rsh

From this url a standard set of switch mib files can be downloaded for the SilkWorm 2000 switches.

NOTE: *The term Port Number is used to number the Fibre Channel ports on a switch. The value is from 0 through 15. In the various MIB definition files, there is the notion of port index, which by convention forbids the use of 0 as its value. For the switch, the port index for Fibre Channel ports range from 1 through 16 respectfully.*

syslog Daemon

A UNIX style *syslog daemon* (*syslogd*) process is supported. *Syslogd* reads system events and forwards system messages to users and/or writes the events to log files according to your system configuration.

Introduction

Syslogd reads system events and forwards system messages to users and/or stores them in log files according to your system configuration. Events are categorized by facility and severity. Please refer to the manual pages on your UNIX system for a list of facilities and severity levels. The log process is used to log errors and system events on the local machine and are sent to a user or system administrator. The daemon is constantly running and ready to receive messages from system processes. The events are logged according to the statements in the configuration file. In addition, *syslogd* is enabled to receive messages from a remote machine. *Syslogd* listens to UDP port 514 for system events. A remote machine does not have to be running UNIX to forward messages to *syslogd*. But it must follow the basic syslog message format standard.

An example entry in a *syslogd* log file is:

```
Jul 18 12:48:00 brocade sendmail[9558]: NOQUEUE: SYSERR(uucp):
/etc/mail/sendmail.cf: line 0: cannot open: No such file or
directory
```

The first two items are the event's date/time (as known by the machine where *syslogd* is running) and the machine name that issued the error. This would be the local machine, if the message is generated by a task running on the same machine as *syslogd*, or a remote machine, if the message was received on UDP port 514. The first two items are always present, all other entries are message specific.

NOTE: *The log file may be located on a different machine and be remotely mounted. So a local error is an error that occurred where syslogd is running, not on the machine where the error log physically resides.*

syslogd applications for NT and Win95 are available at no charge on several FTP servers on the Internet

syslogd Support

Switch firmware maintains an internal log of all error messages. The log is implemented as a circular buffer, with a storage capability of 64 errors. After 64 errors have been logged, the next error message overwrites the messages at the beginning of the buffer.

If configured, the switch sends internal error messages to *syslogd* by sending UDP packet to port 514 on the *syslogd* machine. This allows the storage of switch errors on a *syslogd* capable machine and avoids the limitations of the circular buffer.

syslogd provides system error support via a single log file and can notify a system administrator in real time of error events. Additionally, the daemon provides dial home capability.

Error Message Format

Each error message logged sends the following info:

- Error number (1 for the first error after boot, increments by one with each new error).
- The error message, exactly as it is stored in the error log (and printed via the command `errShow`).

The error message includes the switch that reported the error with the following event information:

- ID of the task that generated the error.
- Name of the task that generated the error.
- Date and time when the error occurred, as seen by the switch. This may be different from the first item in the log file, which is the time as seen by the *syslogd* machine. These two time values are different if the clocks in the switch and in the *syslogd* machine are not in sync.
- The error identifier consisting of a module name, a dash and an error name.
- The error severity.
- Optional informational part.
- Optional stack trace.

Example:

syslogd running on switch `sw9` is sending log events to the UNIX machine called `example`. The following is an example of a `No memory` error generated by the shell. This is a severity 1 (`LOG_CRITICAL`) error. *syslogd* is configured to store the errors in: `/var/adm/silkworm` file.

```
example% egrep sw9 /var/adm/silkworm
Jul 11 16:48:25 sw9 1 0x103d8620 (tShell): Jul 11 16:48:19
Jul 11 16:48:25 sw9Error SYS-NOMEM, 1, No memory
Jul 11 16:48:25 sw9 Traceback:
Jul 11 16:48:25 sw9 _tl+0x40 (0x103a2030)
Jul 11 16:48:25 sw9 _yystart+0x95c (0x1017128c)
Jul 11 16:48:25 sw9 _yyparse+0x694 (0x10172dc4)
Jul 11 16:48:25 sw9 _execute+0xdc (0x1014c06c)
Jul 11 16:48:25 sw9 _shellTask+0x964 (0x1003aea4)
Jul 11 16:48:25 sw9 _shellTask+0x198 (0x1003a6d8)
Jul 11 16:48:25 sw9 _vxTaskEntry+0x10 (0x10114d14)
Jul 11 16:48:25 sw9
```

Message Classification

syslogd messages are classified according to facility and priority (severity code). Thus allowing a system administrator to take different actions depending on the error. The action taken, based on the message's facility and priority, is defined in the syslog configuration file. Example configurations are provided in a following section.

The switch uses the facility `local7` for all error messages sent to the *syslogd*.

UNIX provides eight priorities, whereas the switch provides five severity codes (code `LOG_PANIC (0)` causes a reboot and is not sent to the *syslogd*). The mapping between the switch's severity codes and UNIX *syslogd* priorities is the following (in order of decreasing priorities):

Table 2-4 *syslog* Message Classification

SWITCH	UNIX
LOG_CRITICAL (1)	alert
LOG_ERROR (2)	err
LOG_WARNING (3)	warning
LOG_INFO (4)	info
LOG_DEBUG (5)	debug

Switch configuration

To start the *syslogd* type the following command:

```
syslogdIp <IP address of the syslogd machine>
```

The command with no parameter prints the IP address of the current target syslogd machine. An IP address of `0.0.0.0` disables the forwarding of error messages to *syslogd*. In this case, error messages are still logged internally to the switch, but they are not forwarded to the *syslogd*.

Examples,

Enable and verify *syslogd* support:

```
=> syslogdIp "10.0.0.1"
=> syslogdIp
syslog daemon's address: 10.0.0.1
```

Disable *syslogd* support:

```
=> syslogdIp "0.0.0.0"
=> syslogdIp
syslog daemon's address: 0.0.0.0
```

syslogd configuration

The *syslog* configuration provides the *syslogd* with instructions on how to handle different messages. The following are example entries in a syslog configuration file (`/etc/syslog.conf`), on how to store switch error messages stored in different files. Please refer to the syslog manual pages on your UNIX system for the full documentation of the syslog configuration file. The following entry in `/etc/syslog.conf` causes all messages from the `silkworm` of UNIX priority warning or higher (switch severity `LOG_WARNING` or higher) to be stored in the file `/var/adm/silkworm`.

```
local7.warning          /var/adm/silkworm
```

The following entries in `/etc/syslog.conf` causes the messages from the `silkworm` of UNIX priority alert (switch severity `LOG_CRITICAL`) to be stored in the file `/var/adm/alert`, and all other messages from the switch to be stored in the file `/var/adm/silkworm`.

```
local7.alert        /var/adm/alert
local7.debug        /var/adm/silkworm
```

The `local7` prefix identifies the message from a switch. Note that usually a file must exist and have the proper permission in order for the *syslogd* to write to it.

3

TELNET COMMANDS

This chapter contains information and examples on managing and monitoring the switch via Telnet. The user can configure and operate the switch using the following commands and settings through the Telnet interface.

See Chapter 4, *Diagnostics* for information about the diagnostic commands.

NOTE: *Some Telnet command output varies depending on the switches configuration, licenses and port type.*

agtcfgDefault

This command allows 'admin' to reset the configuration of the SNMP agent to factory defaults.

```
switch:admin> agtcfgDefault
Committing configuration...done.
agent configuration reset to factory default
sw5:admin> 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)
    No trap recipient configured yet
  Community 2: OrigEquipMfr (rw)
    No trap recipient configured yet
  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
sw5:admin>
```

Figure 3-1 Command Example

Table 3-1 Command Field Descriptions

FIELD	Description
sysDescr	The system description (in MIB-II definition). The default value is set as "Fibre Channel Switch".
sysLocation	The location of the system (switch) (in MIB-II). The default value is set as "End User Premise".
sysContact	The contact information for this system (switch). The default value is set as "Field Support".

Table 3-1 Command Field Descriptions(Continued)

swEventTrapLevel	The event trap level in conjunction with the an event's severity level. When an event occurs and if its severity level is at or below the set value, the SNMP trap, swEventTrap, is sent to configured trap recipients. By default, this value is set at 0, implying that no swEventTrap is sent. Possible values are 0 - none 1 - critical 2 - error 3 - warning 4 - informational 5 - debug See errShow for related information.
authTraps	Should the authentication trap, authenticationFailure, be transmitted to configured trap recipient in the event the agent received a protocol message that is not properly authenticated. In the context of SNMPv1 and SNMPv2c, this means that a request contains a community string is not known to the agent. The default value for this parameter is 0 (disabled).

In addition, there are six communities and respective trap recipients supported by the agent. The first three communities are for read-write access (rw) and the last three are for read-only access (ro).

The factory default value for the trap recipient of each community is '0.0.0.0'. The factory default values for the community strings are:

1. 'Secret C0de',
2. 'OrigEquipMfr',
3. 'private',
4. 'public',
5. 'common', and
6. 'FibreChannel'.

agtcfgSet

Figure 3-2 shows the `agtcfgSet` command which is used to set the SNMP agent configuration to a fiber channel switch. The fields are described in Table 3-1.

```
switch:admin> agtcfgSet

Customizing MIB-II system variables ...

At each prompt, do one of the followings:
  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: [FC Switch.]
sysLocation: [End User Premise]
sysContact: [Field Support.]
swEvevtTrapLevel: (0..5) [3]
authTrapsEnabled (true, t, false, f): [true]

SNMP community and trap recipient configuration:
Communit(rw): [Secret C0de]
Trap Recipient's IP address in dot notation: [192.168.1.51]
Community(rw): [OrigEquipMfr]
Trap Recipient's IP address in dot notation: [192.168.1.26]
Community(rw): [private]
Trap Recipient's IP address in dot notation: [0.0.0.0] 192.168.64.68
Community(ro): [public]
Trap Recipient's IP address in dot notation: [0.0.0.0]
Community(ro): [common]
Trap Recipient's IP address in dot notation: [0.0.0.0]
Community(ro): [FibreChannel]
Trap Recipient's IP address in dot notation: [0.0.0.0]
```

Figure 3-2 agtcfgSet Command Example

In addition, there are six communities and respective trap recipients supported by the agent. The first three communities are for read-write access (rw) and the last three are for read-only access (ro).

Note that the factory default value for the trap recipient of each community is '0.0.0.0'. The factory default values for the community strings are:

1. 'Secret C0de',
2. 'OrigEquipMfr',
3. 'private',
4. 'public',
5. 'common', and
6. 'FibreChannel'.

Note that in order for an SNMP Management Station to receive a trap generated by the agent, the administrator must configure a trap recipient value to correspond to the IP address of the Management Station.

agtcfgShow

Figure 3-3 shows the `agtcfgShow` command displays SNMP agent configuration. The fields are described in Table 3-1.

```
switch:admin> agtcfgShow
Current SNMP Agent Configuration
 Customizable MIB-II system variables:
         sysDescr = FC Switch
      sysLocation = End User Premise
       sysContact = Field Support.
 swEventTrapLevel = 3
        authTraps = 1 (ON)

 SNMPv1 community and trap recipient configuration:
   Community 1: Secret C0de (rw)
     Trap recipient: 192.168.1.51
   Community 2: OrigEquipMfr (rw)
     Trap recipient: 192.168.1.26
   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
```

Figure 3-3 agtcfgShow Command Example

aliasShow

Figure 3-4 shows the `aliasShow` command which displays local Alias Server information. If there is no local alias group, a message stating that is displayed. Otherwise, it shows the user the number of alias group entries that has been created with the title:

```
The Local Alias Server has n entries
Alias ID Creator Token [rb, type, grptype, qlfr] Member List
```

The fields are described in Table 3-2.

```
switch:admin> aliasShow
The Local Alias Server has 1 entry
Alias ID Creator Token [rb, type, grptype, qlfr] Member List
fffb01 fffffd  [40, 05, 10, 60000010 12000069] {021200 0208e2}
```

Figure 3-4 aliasShow Command Example

Table 3-2 aliasShow Command Field Descriptions

FIELD	DESCRIPTION
`Alias ID`	This is the multicast address and has the format of FFFBxx, where xx is an odd number starting at 01 - 31. This is the name of the multicast group.
`Creator`	Is the Fibre Channel address ID of the Nx_Port that created this Alias group.
`Creator Token`	Is the Alias Token that has been provided to map to the Alias group and it consists of four sub-fields: • `rb` – Routing bits. • `type` – Upper level application type. • `grptype` – The alias group type, and can only be 10 for multicast. • `qlfr` – Alias Qualifier of the group. These sub-fields are delimited by a pair of square braces. For more information about Alias Token, please refer to FC-PH-2 and FC-GS-2 ANSI standards.
`Member List`	A list of member address IDs, delimited by a pair of curly braces.

configure

Figures 3-5 through 3-7 show the `configure` command which is used to set some of the switch's configuration parameters. This command may not be executed on an enabled switch; you must first disable the switch using the switchDisable command.

The configure command is navigated by entering a series of collapsible top-level menus. Each menu divides up the various switch configuration parameters into logical groupings, which include: fabric parameters, virtual channel parameters, arbitrated loop parameters, and system service parameters.

Each top level menu and its associated sub-menus consists of a text prompt, a list of acceptable values, and the current value (shown in brackets). The current value is used in the absence of an entered value when a carriage return is the only input entered at the prompt, as shown in Figure 3-5. The various configuration items are described in Tables 3-5 through 3-9.

```
switch:admin> configure
Configure...
Fabric parameters (yes, y, no, n): [no]
Virtual Channel parameters (yes, y, no, n): [no]
Arbitrated Loop parameters (yes, y, no, n): [no]
System services (yes, y, no, n): [no]
No changes.
```

Figure 3-5 Top level menus for the configure command.

Entering out-of-range or inappropriate values causes an error message to be displayed to the screen and the original entry prompt to be redisplayed as shown in Figure 3-7.The command may be canceled at any time by sending an interrupt control character (Control-C). In addition, the command may be completed at any time, with the current changes saved, by sending an end-of-file control character (Control-D).

```
switch:admin> configure
Configure...
Fabric parameters (yes, y, no, n): [no] yes
Domain: (1..239) [1]
BB credit: (1..16) [16]
R_A_TOV: (4000..120000) [10000]
E_D_TOV: (1000..5000) [2000]
Data field size: (256..2112) [2112]
Non-SCSI Tachyon Mode: (0..1) [0]
Disable Device Probing: (0..1) [0]
Unicast-only Operation: (0..1) [0]
VC Encoded Address Mode: (0..1) [1]
Disable Translative Mode: (0..1) [1]
Per-frame Route Priority: (0..1) [0]
Virtual Channel parameters (yes, y, no, n): [no] yes
VC Link Control: (0..1) [0]
VC Class 2: (2..5) [2]
VC Class 3: (2..5) [3]
VC Multicast: (6..7) [7]
VC Priority 2: (2..3) [2]
VC Priority 3: (2..3) [2]
VC Priority 4: (2..3) [2]
VC Priority 5: (2..3) [2]
VC Priority 6: (2..3) [3]
VC Priority 7: (2..3) [3]
Arbitrated Loop parameters (yes, y, no, n): [no] yes
Send FAN frames?: (0..1) [1]
System services (yes, y, no, n): [no] yes
rstatd (on, off): [off] on
rusersd (on, off): [off] on
No changes.
```

Figure 3-6 Top level menus and sub-menus for the configure command.

```
switch:admin> configure
Configure...
Fabric parameters (yes, y, no, n): [no] y
Domain: (1..239) [0] 256
integer must be between 1 and 239 - please re-enter
Domain: (1..239) [0]
BB credit: (1..16) [16] one
Input not acceptable, please re-enter
BB credit: (1..16) [16]
R_A_TOV: (4000..120000) [10000]
E_D_TOV: (1000..5000) [2000] 4900
integer must be a multiple of 1000 - please re-enter
E_D_TOV: (1000..5000) [2000] 5000
Data field size: (256..2112) [2112] ^D
Committing configuration...done.
```

Figure 3-7 Behavior of the configure command in the presence of out-of-range or inappropriate inputs.

There are a number of parameters which control the overall behavior and operation of the Fabric. Some of these values, such as the domain, are normally assigned automatically by the Fabric and may be different from one switch to another in the

Fabric. However, other parameters, such as the buffer-to-buffer credit or the time out values, may be changed to suit particular applications or operating environments, but must be in agreement among all switches to allow formation of the Fabric.

The following table defines those settings affecting the Fabric which may be changed.

Table 3-3 Settings

FIELD	TYPE	DEFAULT	RANGE
Domain	Number	1	Varies
BB Credit	Number	16	1 - 16
R_A_TOV	Number	10000	E_D_TOV * 2 to 120000
E_D_TOV	Number	2000	1000 to R_A_TOV / 2
Data Field Size	Number	2112	256 to 2112
Non-SCSI Tachyon Mode	Boolean	0	0 or 1
Disable Device Probing	Boolean	0	0 or 1
VC Encoded Address Mode	Boolean	0	0 or 1
Disable Translative Mode	Boolean	0	0 or 1
Per-frame Route Priority	Boolean	0	0 or 1

A listing of the configurable fabric parameters is shown in Table 3-4.

Table 3-4 Fabric Parameters

FIELD	DESCRIPTION
Domain	The domain number uniquely identifies the switch in a Fabric and may be any value between 1 and 239. Normally, this value is automatically assigned by the Fabric.
BB credit	The buffer-to-buffer (BB) credit represents the number of buffers, in a range from 1 to 16, available to the host. For a complete description of this value, refer to the industry specification Fibre Channel Physical and Signaling Interface (FC-PH).
R_A_TOV	The Resource Allocation Time Out Value (R_A_TOV) is displayed in milliseconds. This variable works with the variable E_D_TOV to determine the switch's actions when presented with an error condition. Allocated circuit resources with detected errors are not released until the time out value has expired. If the condition is resolved prior to the time out, the internal time out clock resets and waits for the next error condition.

Table 3-4 Fabric Parameters(Continued)

FIELD	DESCRIPTION
E_D_TOV	Error Detect Time Out Value (E_D_TOV) is displayed in milliseconds. This timer is used to flag a potential error condition when an expected response is not received (an acknowledgment or reply in response to packet receipt, for example) within the set time limit. If the time for an expected response exceeds the set value, then an error condition is met.
Data field size	This specifies the largest possible value, in bytes, for the size of a type 1 (data) frame. The switch advertises this value to other switches in the Fabric during construction of the Fabric as well as to other devices when they connect to the fabric. Setting this to a value smaller than 2112 may result in decreased performance.
Non-SCSI Tachyon Mode	When set, multiple sequences from different sources are interleaved to Tachyon-based controllers at Sequence boundaries rather than at frame boundaries, resulting in better performance from Tachyon-based controllers.Set this mode when there are no Tachyon-based SCSI host adapters connected to the Fabric.
Disable Device Probing	When this is set, devices that do not register themselves with the Name Server will not be present in the Name Server data base. Set this mode only if the switch's N_Port discovery process (PLOGI, PRLI, INQUIRY) causes some attached device to fail.
VC Encoded Address Mode	When this mode is set, frame source and destination addresses utilize an address format compatible with first-generation switches. Set this mode only if the Fabric includes such switches.
Disable Translative Mode	The setting is only relevant if VC Encoded Address Mode is also set. When set, this maintains explicit address compatibility with first- generation switches. However, enabling this feature also disables translative/phantom addressing. Set this mode only if hardware or software systems are attached to the Fabric which explicitly rely on a specific frame address format.
Per-frame Route Priority	In addition to the eight virtual channels used in frame routing priority, support is also available for per-frame based prioritization. When set, the virtual channel ID will be used in conjunction with a frame header to form the final virtual channel ID. [Under configShow this paramter is listed as fabric.ops.mode.useCsCtl]

The switch provides the ability to tune the switch in a specific application, by configuring the parameters for the switch's eight virtual channels. Note that the first two virtual channels are reserved for the switch's internal functions and are not user-configurable.The default virtual channel settings have already been optimized for switch

performance. Changing the default values, if properly selected, may improve switch performance somewhat, but may also severely degrade performance. You should not change these settings without fully understanding the effects of those changes.

Table 3-5 Virtual Channel Parameters

FIELD	DESCRIPTION	DEFAULT
VC Link Control	This changes the virtual channel used for N_Port-generated, Class 2 link control frames (ACKs, P_BSYs, and P_RJTs). 0 - Force N_Port-generated link control frames to be sent back using a Class 2 data virtual channel. 1 - Force N_Port-generated link control frames to be sent back using a virtual channel normal reserved for Fabric-internal traffic.	0
VC Class 2	Sets the virtual channel used for class 2 frame traffic. May be set to virtual channel 2, 3, 4, or 5.	2
VC Class 3	Sets the virtual channel used for class 3 frame traffic. May be set to virtual channel 2, 3, 4, or 5.	3
VC Multicast	Sets the virtual channel used for multicast frame traffic. Verify that the multicast channel has the frame class priority set to the frame class of the expected traffic.	7
VC Priority 2-7	The numbers displayed show the priorities assigned to each of the switch's virtual channels. Allowed values are 2 or 3, indicating that the channel gives priority to either Class 2 or Class 3 frame traffic, respectively.	2 or 3

Table 3-6 Arbitrated Loop parameters

FIELD	DESCRIPTION	DEFAULT
Send FAN frames?	Fabric Address Notification (FAN) frames are sent by the Fabric to notify public loop devices about their node ID and address. 0 - No, do not send Fabric Address Notification frames. 1 - Yes, send Fabric Address Notification frames.	1
Always send RSCN?	Following the completion of loop initialization, a remote state change notification (RSCN) is issued only when F_Ports detect the presence of new devices or the absence of preexisting devices. When this feature is set, a RSCN will always be issued following the completion of loop initialization, regardless of the presence or absence of new or preexisting devices.	0

Table 3-7 System Services

FIELD	DESCRIPTION	DEFAULT
rusersd	Dynamically enables or disables a server that returns information via remote procedure calls (RPC) about the user logged into the system. The information returned includes: the user login name, the system name, the login protocol or type, login time, idle time, and remote login location (if applicable). The retrieval of this information is supported by a number of operating systems which support RPC. On most UNIX-based systems (HP-UX, Irix, Linux, Solaris, etc.) the command to retrieve the information is `rusers`. Please see your local system documentation for the appropriate usage of the `rusers` or equivalent command.	Off
rstatd	Dynamically enables or disables a server that returns information via remote procedure calls (RPC) about system operation information. The protocol provides for a wide-range of system statistics; however, only the Ethernet interface statistics and system up time are supported. The retrieval of this information is supported by a number of operating systems which support RPC. On most UNIX-based systems (HP-UX, Irix, Linux, Solaris, etc.) the commands to retrieve the information are `rup` and `rsysinfo`. Please see your local system documentation for the appropriate usage of the `rup`, `rsysinfo`, or equivalent commands.	Off

configDefault

The configDefault command is used to reset some of the switch configuration values to their factory default values. In addition, this command configures the switch to boot from it's internal firmware if it has been previously configured to boot from the network.This command may not be executed on an enabled switch; you must first disable the switch using the switchDisable command.

switch:admin> configDefault
Committing configuration...done.

Because some configuration parameters are cached by the switch, it is recommended that switch be rebooted immediately following the execution of the configDefault, otherwise unexpected behavior may result. With the exception of the following, all configuration parameters are reset to their default values:

- World Wide Name
- Ethernet MAC address
- Ethernet IP address and subnetmask
- IP gateway address
- OEM customization
- SNMP configuration
- Zoning configuration
- License keys
- System name

configShow

The configShow command can be used to display the current settings of many of the switch's configurable parameters. Figure 3-8 shows the operation of the command.The output of the command is broken up into two sections; the first displays the switch's boot settings and the second displays other configuration parameters, most of which are set from the configure command.

```
switch:admin> configShow
Ethernet address: 0:60:69:0:60:10
Nvram data: fei(0,0)host:/usr/switch/firmware e=192.168.1.2 g=192.168.1.254
u=user tn=switch
Type <CR> to continue, Q<CR> to stop:
diag.postDisable:
1fabric.domain: 1
fabric.ops.BBCredit: 16
fabric.ops.E_D_TOV:2000
fabric.ops.R_A_TOV:10000
fabric.ops.dataFieldSize:2112
fabric.ops.mode.fcpProbeDisable:0
fabric.ops.mode.isolate:0
fabric.ops.mode.tachyonCompat: 0
fabric.ops.mode.unicastOnly: 0
fabric.ops.mode.useCsCtl:0
fabric.ops.mode.vcEncode:0
fabric.ops.vc.class.2: 2
fabric.ops.vc.class.3: 3
fabric.ops.vc.config: 0xc0
fabric.ops.vc.linkCtrl: 0
fabric.ops.vc.multicast:7
fc4.fcIp.address:0.0.0.0
fc4.fcIp.mask: 0.0.0.0
fcAL.fanFrameDisable: 0
fcAL.useAltBBCredit: 0
lcdContrast: 128
licenseKey:none
rpc.rstatd:0
rpc.rusersd:0
```

Figure 3-8 Example of the configShow command.

NOTE: *The entry shown for lcdContrast is set at the time of switch manufacture and is not user-configurable in the field.*

date

Figure 3-9 shows the `date` command which displays the system date and time. You can also set the date as shown below:

To set the date

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

   NOTE: *The date function does not support daylight saving time.*

```
switch:admin> date
Sun Jan  1 00:00:00 2000
switch:admin> date "0608112401"
Mon Jun 1 11:24:00 2001
```

Figure 3-9 date Command Example

errDisplayFilter

The `errDisplayFilter` command allows you to specify the minimum error level to be reported on the SilkWorm 2800 switch only. Error level values are from 1 - 5.

```
switch:admin> errDisplayFilter
```

Figure 3-10 errDisplayFilter Command Example

Errors of severity lower than 4 are available for display in the error log.

errDump

The `errDump` command prints the contents of the error log with no page breaks. Figure 3-12 displays an example.

```
switch:admin> errDump

Error 02
--------
0x103dc470 (tSilkworm): Apr  9 10:41:06
    Error SENSOR-FAILED, 3, sensor 7 (Fan 2) is below minimum

Error 01
--------
0x103dc470 (tSilkworm): Apr  9 10:40:51
    Error DIAG-TIMEOUT, 1,
  Port 2 receive timeout.
```

Figure 3-11 errDump Command Example

errShow

Figure 3-12 shows the `errShow` command which displays all detected errors, one error at a time. The error log stores the last 32 error types sensed by the switch. The log shows:

- Error number (01-64)
- Date and time of the first occurrence each error type was sensed
- Total number of occurrences of each error type

  NOTE: *The maximum number of occurrences 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 Messages* on page C-1 for a detailed explanation of each error type, its probable cause, and suggested corrective actions.

The following information is displayed in Figure 3-12:

- The switch detected two errors.
- The task ID and task name that incurred the error (task names are displayed using the `i` command). For example, `0x10fc92f0 (tSilkWorm)`.
- 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.

```
switch:admin> errShow

Error 02
--------
0x103dc470 (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
--------
0x103dc470 (tSilkworm): Apr  9 10:40:51
    Error DIAG-TIMEOUT, 1,
  Port 2 receive timeout.

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

Figure 3-12 errShow Command Example

fabricShow

Figure 3-13 shows the `fabricShow` command which displays a list of switches and multicast alias groups in a fabric. The fields are described in Table 3-8.

```
switch:admin> fabricShow
Switch ID   Worldwide Name           Enet IP Addr    FC IP Addr      Name
-------------------------------------------------------------------------
  0: fffc40 10:00:00:60:69:00:10:63  192.168.1.1     0.0.0.0         "sw1"
  1: fffc41 10:00:00:60:69:00:0a:12  192.168.1.2     0.0.0.0         "sw2"
  2: fffc42 10:00:00:60:69:00:01:b4  192.168.1.3     0.0.0.0        >"sw3"
```

Figure 3-13 fabricShow Command Example

Table 3-8 fabricShow Command Field Descriptions

FABRIC ELEMENT	DESCRIPTION
`switch n`	Each line shows: • The switch's domain ID (1 - 239) • The switch's embedded port ID • The switch's WorldWide Name • The switch's Ethernet and FC IP addresses • The switch's symbolic name (a ">" indicates the Principal switch in the Fabric)
`multicast alias group`	Each line shows: • The alias group number (01-31) • The alias group ID • The alias token Alias groups are only created on demand by requests to the alias server, typically no groups are listed.

fastboot

Figure 3-14 shows the `fastboot` command which is a *warm* reboot that bypasses POST and takes about one minute to reboot the switch. The switch may be in any operational state (enabled or disabled) before rebooting.

```
switch:admin> fastboot
Rebooting...
```

Figure 3-14 fastboot Command Example

firmwareDownload

Figure 3-15 shows the `firmwareDownload` 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, Windows95 or NT host. For a Unix host, no special software is needed. For Windows95 or NT, utility software is required (see Appendix B for further information). Firmware download is via RCP command running on top of TCP between the switch and the host.

To Download Firmware from a Unix Host

1. You must first download the firmware from the supplier or your switch. Contact your switch supplier to obtain the latest maintenance update or ugrade of switch software. Note: when obtaining software from an ftp site be sure to transfer data in a binary mode. Start a Telnet session to a switch. The command format is:

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

2. Login as “admin”

   ```
   login: admin
   ```

   Issue the following command:

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

   For example:

   ```
   firmwareDownload "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, the file name is a path to the new firmware file

3. The RSH server validates the user and delivers the file to the switch where it is stored in flash memory.

4. Reboot the switch to initiate the new firmware.

Windows95 and NT procedure

1. You must first download the firmware from the supplier or your switch. Contact your switch supplier to obtain the latest maintenance update or ugrade of switch software. Note: when obtaining software from an ftp site be sure to transfer data in a binary mode.

2. Download the following two utilities (see Appendix B for a url source for these files):

   ```
   cat.exe rshd.exe
   ```

3 In a DOS window, enter: `rshd` [to execute the RSH daemon]

4 Follow steps 2-5 under *To Download Firmware from a Unix Host* on page 3-22.

NOTE: *When downloading with firmwareDownload to a switch you MUST use Unix directory addressing. For example, from NT it would be C:/firmware/v2.0, not PC directory addressing which is C:\firmware\v2.0.*

```
switch:admin> firmwareDownload "host","user","c:/firmware/v2.0
  1159196+194916+876016, csum 7eca
writing flash 0......
writing flash 1......
  download complete
```

Figure 3-15 firmwareDownload Command Example

h

Figure 3-16 shows the h command which 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.

NOTE: *The shell history is reset by a reboot.*

```
switch:admin> h
 11  date
 12  dateShow
 13  switchName
 14  date "0117130198"
 15  nsShow
 16  fabricShow
 17  portDisable 5
 18  portEnable 5
 19  portLogShow 100
 20  h
 21  portShow 5
 22  portStatsShow 5
 23  ipAddrShow
 24  diagShow
 25  switchDisable
 26  switchShow
 27  portLoopbackTest
 28  portShow 5
 29  diagShow
 30  switchEnable
```

Figure 3-16 h Command Example

help

Figure 3-17 shows the help command which prints a list of commands in alphabetical order, with additional lists of “grouped” commands:

NOTE: *The help display changes depending on the login user level, license key, switch model and will display only those commands that are available to the current user, licensed products and front panel commands for a SilkWorm 2800 model only. This example shows admin level commands.*

- General Commands
- Diagnostic Commands
- Routing Commands
- Licensed Commands (See *Related Publications* in the Preface for more information)
  - ZONING Commands
  - WEB TOOLS Commands
  - Quick Loop Commands

If you enter help followed by specific command, you receive information about that command. for example:

```
switch:admin>help date
Print/set the system date and time
```

.

```
switch:admin> help
agtcfgDefault           reset SNMP agent to factory defaults
agtcfgSet               Set SNMP agent configuration
agtcfgShow              Print SNMP agent configuration
aliasShow               Print Alias Server information
configure               Set switch config parameters
configShow              Print switch config parameters
configDefault           Reset config to factory default
date                    Print/set the system date and time
errDisplayFilter        Set min error level to be reported
errDump                 Print error log (no page breaks)
errShow                 Print error log
fabricShow              Print fabric membership info
fanShow                 Print fan status
fastboot                Reboot this switch, bypassing POST
firmwareDownload        Download firmware into switch
h                       Print shell history
help                    Print this list
i                       Print task summary
ifShow                  Print network interface information
ipAddrSet               Set ethernet and FC IP addresses
ipAddrShow              Print ethernet and FC IP addresses
login                   Login as a new user
logout                  Logout from remote session

nsAllShow               Print global Name Server information
nsShow                  Print local Name Server information
passwd                  Set usernames and passwords
portDisable             Disable a specified port
portEnable              Enable a specified port
portErrShow             Displays error summary for all ports
portLogClear            Clear port activity log
portLogDump             Print port log (no page breaks)
portLogShow             Print port activity log
portPerfShow            Print port throughput numbers
portShow                Print state of specified port
portStatsShow           Print hardware statistics
psShow                  Print power supply status
reboot                  Reboot this switch
syslogdIp               Print/set syslog daemon IP address
switchDisable           Disable this switch
switchEnable            Enable this switch
switchName              Print/set this switch's name
switchShow              Print switch and port status
tempShow                Print temperature readings
uptime                  Print switch's operational time
version                 Print firmware version
diagHelp                Print diagnostic help info
licenseHelp             Print licensing help info
```

Figure 3-17 help Command Example

i

Figure 3-18 shows the `i` command which prints a currently running task summary. The fields are described in Table 3-9.

```
switch:admin> i

  NAME        ENTRY       TID     PRI   STATUS      PC       SP     ERRNO  DELAY
---------- ------------ -------- --- ---------- -------- -------- ------- -----
tExcTask   _excTask     10ff7d30   0 PEND       101787a8 10ff8080  3d0001     0
tLogTask   _logTask     10ff5db0   0 PEND       101787a8 10ff6100       0     0
tRestart   _restartTask 10fc7d50   0 PEND       101787a8 10fc80d0       0     0
tShell     _shellTask   10fb4590   1 READY      1015f720 10fb4800  1c0001     0
tRlogind   _rlogind     10fcdee0   2 PEND       1015c140 10fce5d0       0     0
tTelnetd   _telnetd     10fcbf50   2 PEND       1015c140 10fcc3c0       0     0
tTelnetOutT_telnetOutTa 10ee1200   2 READY      1015c140 10ee1800       0     0
tTelnetInTa_telnetInTas 10edfc60   2 READY      1015c044 10ee02e0       0     0
tTimers    _timerTask   10fc5210  10 PEND       101787a8 10fc5590       0     0
tErrLog    _errLogTask  10fc67b0  20 PEND       101787a8 10fc6b30      23     0
tNetTask   _netTask     10ff01f0  50 READY      1015d1e0 10ff05c0       0     0
tSwitch    _switchTask  10fc92f0  80 PEND+T     101787a8 10fc96f0  3d0004    42
tPBmenu    _menuTask    10fc1d60  90 PEND       101787a8 10fc2120       0     0
tReceive   _portRxTask  10fbe5c0 100 PEND       101787a8 10fbe940       0     0
tTransmit  _portTxTask  10fbd020 100 PEND       101787a8 10fbd3a0       0     0
tFabric    _fabricTask  10fa6dc0 100 PEND       101787a8 10fa7180  3d0004     0
tFspf      _fspfTask    10fa1cc0 100 PEND       101787a8 10fa2040       0     0
tFcph      _fcphTask    10fab5d0 120 PEND+T     101787a8 10fab950  3d0004     5
tFcp       _fcpTask     10fa9620 150 PEND+T     101787a8 10fa99a0  3d0004   405
tSnmpd     10162500     10f9deb0 150 PEND       1015c140 10f9ec00       0     0
tHttpD     _STARTUP_Web 10f8ed00 150 PEND       1015c140 10f8f1c0       0     0
tNSd       _ns_svr      10f7e680 150 PEND       101787a8 10f7ea10       0     0
tASd       _as_svr      10f2e320 150 PEND       101787a8 10f2e6a0       0     0
```

Figure 3-18 i Command Example

Table 3-9 i Command Field Descriptions

FIELD	DESCRIPTION
Name	Task name
Entry	Task entry point ID
TID	Task ID
PRI	Task priority

Table 3-9 i Command Field Descriptions

FIELD	DESCRIPTION
Status	• READY - Task is not waiting for any resource other than the CPU. • PEND - Task is blocked due to the unavailability of some resource. • DELAY - Task is asleep for some duration. • SUSPEND - Task is unavailable for execution (but not delayed or pended). • DELAY - +S Task is both delayed and suspended. • PEND - +S Task is both pended and suspended. • PEND - +T Task is pended with a timeout. • PEND - +S+T Task is pended with a timeout, and also suspended. • DEAD - Task no longer exists.
PC	Program counter
SP	Stack pointer
ERRNO	Last error number generated by this task
Delay	For pending tasks, the amount of time a task has been waiting to execute

ifShow

Figure 3-19 shows the `ifShow` command which prints network interface information. The display includes three sections organized by interface:

- `ei` – Ethernet 10/100BaseT port
- `lo` – loopback interface
- `fc` – Fibre Channel. This section is omitted if IP over Fibre Channel is not configured.

```
switch:admin> ifShow
ei (unit number 0):
     Flags: (0x63) UP BROADCAST ARP RUNNING
     Internet address: 192.168.90.241
     Broadcast address: 192.168.90.255
     Netmask 0xffffff00 Subnetmask 0xffffff00
     Ethernet address is 00:60:69:00:60:11
     Metric is 0
     Maximum Transfer Unit size is 1500
     64293 packets received; 1679 packets sent
     0 input errors; 0 output errors
     0 collisions
lo (unit number 0):
     Flags: (0x69) UP LOOPBACK ARP RUNNING
     Internet address: 127.0.0.1
     Netmask 0xff000000 Subnetmask 0xff000000
     Metric is 0
     Maximum Transfer Unit size is 4096
     0 packets received; 0 packets sent
     0 input errors; 0 output errors
     0 collisions
fc (unit number 0):
     Flags: (0x63) UP BROADCAST ARP RUNNING
     Internet address: 192.168.65.241
     Broadcast address: 192.168.65.255
     Netmask 0xffffff00 Subnetmask 0xffffff00
     Ethernet address is 00:60:69:00:60:11
     Metric is 0
     Maximum Transfer Unit size is 1500
     0 packets received; 0 packets sent
     0 input errors; 0 output errors
     0 collisions
```

Figure 3-19 ifShow Command Example

ipAddrSet

Figure 3-20 shows the `ipAddrSet` command which is used to set the switch's Ethernet IP Address, Ethernet Subnetmask, Fibre Channel IP Address, Fibre Channel Subnetmask, and Gateway Address. The fields are described in Table 3-10.

```
switch:admin> ipAddrSet
Ethernet IP Address [192.168.90.241]:
Ethernet Subnetmask [none]:
Fibre Channel IP Address [192.168.65.241]:
Fibre Channel Subnetmask [none]:
Gateway Address [192.168.90.1]:
```

Figure 3-20 ipAddrSet Command Example

NOTE: *Consult your network administrator for the appropriate IP adress(es), subnetmask.(s) and gateway address.The Ethernet and Fibre Channel IP addresses should NOT be set to the same values.*

Table 3-10 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. Enter a valid IP address.
Fibre Channel Subnetmask	The Fibre Channel subnetmask for the switch.The default is none. The default subnetmask value is none.
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.

After each prompt the current value is shown inside brackets, the user may type one of the following:

- The <return> key to keep the current value;
- An IP address in conventional dot ('.') notation;
- The word "none" (no quotes);
- Control-C to cancel any changes;
- Control-D to accept any changes but to skip remaining input

A final prompt asks whether to set IP addresses to the new values now. Typing 'y' installs the new values; typing 'n' delays the changes until the next switch reboot. If the Ethernet IP address being used to telnet to the switch is changed and the user types 'y', then the telnet session is closed.

ipAddrShow

Figure 3-21 shows the `ipAddrShow` command which is used to display the switch's IP addresses. The fields are described in Table 3-10.

```
switch:admin> ipAddrShow
Ethernet IP Address: 192.168.90.241
Ethernet Subnetmask: none
Fibre Channel IP Address: 192.168.65.241
Fibre Channel Subnetmask: none
Gateway Address: 192.168.90.1
```

Figure 3-21 ipAddrShow Command Example

login

Figure 3-22 shows the `login` command which allows a user to login to the switch with a different user name and password, without first logging out. If the user is connected via a telnet or rlogin session, then the session left open unlike using the logout command.

This command is typically used to gain access to commands that are not allowed at the current user level.

```
switch:user> login
login:admin
Password:
switch:admin>
```

Figure 3-22 login Command Example

logout

Figure 3-23 shows the `logout` command which allows a user to logout from a telnet, rlogin or serial port session. Telnet and rlogin connections are closed, the serial port returns to the "login:" prompt.

The commands "exit" and "quit" are accepted as synonyms for logout, as is a Control-D typed at the beginning of a line.

```
switch:admin> logout
Connection closed.
```

Figure 3-23 logout Command Example

nsAllShow

The `nsAllShow` command which displays the (24-bit Fibre Channel) port IDs of all devices in all switches in the Fabric. The `nsAllShow` command optionally takes an integer parameter, the value of the FC-PH type. The possible values for FC4Type are:

- 5 - FC-IP
- 8 - SCSI-FCP

For example, `nsAllShow 8` shows all SCSI-FCP nodes. If the parameter is not provided, then all Nx_Ports are displayed.

```
 sw2k:admin> nsAllShow
12 Nx_Ports in the Fabric {
011000 011200 0118e2 0118e4 0118e8 0118ef 021200 021300
 0214e2 0214e4 0214e8 0214ef
   }

   sw2k:admin> nsAllShow 5
   2 FC-IP Ports in the Fabric {
     011200 021200
   }

   sw2k:admin> nsAllShow 8
   8 FCP Ports in the Fabric {
   0118e2 0118e4 0118e8 0118ef 0214e2 0214e4 0214e8 0214ef
   }
```

nsShow

Figure 3-24 shows the nsShow command which displays local Name Server information, which includes information about devices connected to this switch, and cached information about devices connected to other switches in the Fabric.

The message “There is no entry in the Local Name Server” is displayed if there is no information in this switch, but there still may be devices connected to other switches in the Fabric. The command nsAllShow shows information from all switches. Otherwise, it informs the user the number of Name Service entries that have been created with the title:

```
The Local Name Server has n entries
Type Pid COS PortName NodeName TTL(sec)
```

Each subsequent line of output shows the value of each field as described in Table 3-13. There may be additional lines if the device has registered any of the following information (the switch will automatically register SCSI Inquiry data for FCP target devices): FC4s supported, IP address, IPA, port and node symbolic names.

There are six major columns of information for each entry.

Table 3-11 Command Field Descriptions

Type	The port type with one of the following values: • 'N 'indicating that this is an N_Port • 'NL'indicating that is an NL_Por
Pid	The address ID of the port in hexadecimal
COS	The Class of Service supported by the port
PortName	The Port World_wide_Name
NodeName	The Node World_wide_Name associated with the port
TTL	The 'time-to-live' value of the entry; this is typically set to not-applicable (na) for a local entry. Occasionally, an entry might be a cached version of a remote port (that is, not directly connect to this switch). In that case, the value will be the number of seconds before the cached entry expires and gets deleted from the local database. Note also that a cached entry would have an '*' at the beginning.

NOTE: *Only local entries are displayed.*

```
switch:admin> nsShow
    The Local Name Server has 7 entries {
Type Pid    COS     PortName                NodeName            TTL(sec)
*N   011200; 2,3;10:00:00:60:69:00:ab:ba;10:00:00:60:69:00:ab:ba; 60
     FC4s: FCIP
N    021200; 2,3;10:00:00:60:69:00:03:19;30:00:00:60:69:00:03:19; na
     FC4s: FCIP
N    021300; 3;10:00:00:60:69:00:02:d6;20:00:00:60:69:00:02:d6; na
NL   0214e2; 3;21:00:00:fa:ce:00:21:1e;20:00:00:fa:ce:00:21:1e; na
     FC4s: FCP [STOREX  RS2999FCPH3     MT09]
NL   0214e4; 3;21:00:00:fa:ce:00:21:e1;20:00:00:fa:ce:00:21:e1; na
     FC4s: FCP [STOREX  RS2999FCPH3     CD09]
NL   0214e8; 3;21:00:00:fa:ce:04:83:c9;20:00:00:fa:ce:04:83:c9; na
     FC4s: FCP [STOREX  RS2999FCPH3     NS09]
NL   0214ef; 3;21:00:00:ad:bc:04:6f:70;20:00:00:ad:bc:04:6f:70; na
     FC4s: FCP [STOREX  RS2999FCPH3     JB09]
     }
```

Figure 3-24 nsShow Command Example

passwd

Figure 3-25 shows the `passwd` command which is used to set user names and passwords.

```
switch:admin> passwd

username 1 [admin]:
"admin" password:
username 2 [user]:
"user" password:
username 3 [other]:
```

Figure 3-25 passwd Command Example

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

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

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

Special Inputs

- Return Key – 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.

Examples

The following is a list of possible examples:

1 Invalid user name.

```
switch:admin> passwd "nobody"
passwd: nobody is not a valid user name.
```

2 Invalid command usage.

```
switch:admin> passwd ""
Usage: passwd [username]
```

3 Permission denied.

```
switch:admin> passwd "root"
passwd: Permission denied.
```

4 Just change the user name.

```
switch:admin> passwd "admin"
New username [admin]: maint
```

```
Old password:
passwd: Password unchanged.

Committing configuration...done.
```

5 Change the user name and password.

```
maint> passwd "maint"
New username [maint]: admin
Old password:
New password:
Re-enter new password:

Committing confirguration...done.
```

6 Skip through the prompts w/o changes.

```
switch:admin> passwd
New username [admin]:
Old password:
passwd: Password unchanged.
New username [user]:
Old password:
passwd: Password unchanged.
New username [other]:
```

7 Surpass failure limit, then cancel the command.

```
switch:admin> passwd
New username [admin]:
Old password:
New password:
Re-enter new password:
passwd: Passwords do not match; try again.
New password:
Re-enter new password:
passwd: Passwords do not match; try again.
New password:
Re-enter new password:
passwd: Number of failure attempts exceeded.
New username [user]: ^C
```

8 Change the user name and then finish with Ctrl-D.

```
switch:admin> passwd
New username [admin]: maint
Old password: ^D

Committing confirguration...done.

maint>
```

portDisable

Figure 3-26 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 #>`.

```
switch:admin> portDisable 2
```

Figure 3-26 portDisable Command Example

portEnable

Figure 3-27 shows the `portEnable` command which is used to enable a specific port. The command syntax is `portEnable <port #>`.

```
switch:admin> portEnable 2
```

Figure 3-27 portEnable Command Example

portErrShow

Figure 3-28 shows the portErrShow command that displays an error summary for all ports. One output line is displayed per port, and shows error counters in ones, thousands (the number is followed by 'k'), or millions (the number is followed by 'm'). The fields are described in Table 3-12. The figure shows an eight port switch where port six has a high number of errors and should be examined.

```
switch:admin> portErrShow
      frames  enc  crc  too  too  bad  enc disc link loss loss frjt fbsy
     tx   rx   in  err shrt long  eof  out   c3 fail sync  sig
   ------------------------------------------------------------------------
0:    0    0    0    0    0    0    0    0    0    0    0    1    0    0
1:  2.5m  38    0    0    0    0    0    2    0    0    1    1    0    0
2:    0    0    0    0    0    0    0    0    0    0    0    1    0    0
3:   95k  15k  0    0    0    0    0    3    0    0    1    0    0    0
4:    0    0    0    0    0    0    0    0    0    0    0    1    0    0
5:    0    0    0    0    0    0    0    0    0    0    0    1    0    0
6:   61k  48    2   15    0    0    0   3k    0    0    2    0    0    0
7:    0    0    0    0    0    0    0    0    0    0    0    1    0    0
```

Figure 3-28 portErrShow Command Example

Table 3-12 portErrShow Command Field Descriptions

FIELD	DESCRIPTION
frames tx	Frames transmitted.
frames rx	Frames received.
enc in	Encoding errors inside of frames.
crc err	Frames with CRC errors.
too shrt	Frames shorter than minimum.
too long	Frames longer than maximum.
bad eof	Frames with bad end-of-frame delimiters.
enc out	Encoding error outside of frames.
disc c3	Class 3 frames discarded.
link fail	Link failures (LF1 or LF2 states).
loss sync	Loss of synchronization.
loss sig	Loss of signal.
frjt	Frames rejected with F_RJT.
fbsy	Frames busied with F_BSY.

portLogClear

Figure 3-29 shows the `portLogClear` command which clears the data from the port log. The command syntax is `portLogClear.`

```
switch:admin> portLogClear
```

Figure 3-29 portLogclear Command Example

portLogDump

Figure 3-30 shows the `portLogDump` command which prints the port log without page breaks. The command syntax is `portLogDump`.

```
switch:admin> portLogDump
time                task        event port  cmd  args
------------------------------------------------------
Oct  7 07:33:38.066  tSwitch     Tx3      3 2112  02fffffd,00fffffd,4723bcbc
Oct  7 07:33:38.083  tReceive    Rx3      3 2112  02fffffd,00fffffd,4723bcbc
Oct  7 07:33:38.083  tSwitch     ioctl    3   80  a,0
Oct  7 07:33:38.083  tSwitch     Tx3      5 2112  02fffffd,00fffffd,4723bcbc
Oct  7 07:33:38.083  tReceive    Rx3      5 2112  02fffffd,00fffffd,4723bcbc
Oct  7 07:33:38.083  tSwitch     ioctl    5   80  a,0
Oct  7 07:33:38.083  tSwitch     Tx3      7 2112  02fffffd,00fffffd,4723bcbc
Oct  7 07:33:38.099  tReceive    Rx3      7 2112  02fffffd,00fffffd,4723bcbc
Oct  7 07:33:38.099  tSwitch     ioctl    7   80  a,0
Oct  7 07:33:41.049  tSwitch     disable  0       2
Oct  7 07:33:41.083  tSwitch     pstate   2  OL1
Oct  7 07:33:41.583  tSwitch     start            0
Oct  7 07:33:41.599  tSwitch     pstate   0  LF2
Oct  7 07:33:41.599  tSwitch     pstate   1  LF2
Oct  7 07:33:41.599  tSwitch     pstate   2  OL1
Oct  7 07:33:41.599  tSwitch     pstate   3  LF2
Oct  7 07:33:54.216  tSwitch     enable  16       0
Oct  7 07:33:55.266  tSwitch     errlog         3  FANS-1_FAILED
```

Figure 3-30 portLogDump Command Example

`portLogDump 1,1` will print the port event log that has been saved in the non-volatile memory. When reporting a panic-related problem, a user should always include the `portLogDump 1,1` output.

portLogShow

Figure 3-31 shows the `portLogShow` command which displays the switch activity associated with a Fabric login (ext. Link Service request to a Fabric F_Port, `22fffffe`), followed by a Port login (ext. Link Service request to the management server, `22ffffa`), and a SES Inquiry request (unsolicited command to the management server, `06ffffa`). Note the initial handshake between the F_Port and the Host Bus Adapter. The fields are described in Table 3-13.

```
switch:admin> portLogShow
time                  task        event port  cmd  args
-----------------------------------------------------
Jun 15 16:00:21.899  tReceive    pstate       2  OL2
Jun 15 16:00:21.899  tReceive    pstate       2  LR3
Jun 15 16:00:21.899  tReceive    pstate       2   AC
Jun 15 16:00:21.899  interrupt   scn          2    2
Jun 15 16:00:21.899  interrupt   scn          2    1
Jun 15 16:00:21.899  tFspf       ioctl        2   ab    ffffff,16
Jun 15 16:00:21.899  tFspf       ioctl       16   ab    ffffff,2

Jun 15 16:00:21.899  tReceive    Rx3         2  116    22fffffe, 00000000, 04000000
Jun 15 16:00:21.899  tReceive    ioctl        2   a2    210213,2
Jun 15 16:00:21.899  tReceive    scn          2    6
Jun 15 16:00:21.899  tFspf       ioctl        2   ac    0,0
Jun 15 16:00:21.899  tFspf       ioctl        2   aa    ffffff,16
Jun 15 16:00:21.899  tFspf       ioctl       16   aa    ffffff,2
Jun 15 16:00:21.899  tFspf       ioctl        2   ad    0,0
Jun 15 16:00:21.899  tFspf      Tx3          2  116    23210213, 00fffffe, 02000000

Jun 15 16:00:21.899  tReceive    Rx3          2  116    22fffffa, 00210213, 03000000
Jun 15 16:00:21.899  tSwitch     Tx3          2  116    23210213, 00fffffa, 02000000
Jun 15 16:00:21.899  tFcp       Tx3          2  116    22210213, 00fffc41, 03000000

Jun 15 16:00:21.899  tReceive    Rx3          2   32    06fffffa, 00210213, 00000000
Jun 15 16:00:21.899  tFcp       Tx3          2   36    01210213, 00fffffa, 0d000302
Jun 15 16:00:21.899  tFcp       Tx3          2   24    07210213, 00fffffa, 00000000
```

Figure 3-31 portLogShow Command Example

Table 3-13 portLogShow Command Field Descriptions

FIELD	DESCRIPTION
Time	The event's date and time in milliseconds.
Task	The task name that logged the event, or "interrupt" if the event was recorded from interrupt level code.
Event	The possible switch events include: • start – the switch first starts running. • disable – a port is disabled. • enable – a port is enabled. • ioctl – a port I/O control is executed. • Tx – a frame is transmitted. • Rx – a frame is received. • scn – a state change notification is posted. • pstate – a port changes physical state. • ctin - a CT based requested is received. • ctout - a CT based requested is transmitted. • loopscn - a loop state is changed.
Port	Either the port number of the affected port, or the last byte of a well-known address (e.g. fc for the well-known Name Server address).
cmd	The cmd field represents different values depending on the task and event. The following definitions are included: • For ioctl events, cmd is the I/O control command code. More explanations are provided shortly. • For Tx and Rx events, cmd is the payload size. • For scn events, cmd is the new state. • For pstate events, the new physical state. • For ctin events, cmd consists of two 2-byte sub-fields. More explanations are provided shortly. • For ctout events, cmd consists of two 2-byte sub-fields. More explanations are provided shortly. • For loopscn events, the new loop state.
pstate	For pstate events, the cmd field entries in upper case are *Fibre Channel ANSI Standard (FC-PH)* as follows: • AC - Active State • LR1 - Link Reset: LR Transmit State • LR2 - Link Reset: LR Receive State • LR3 - Link Reset: LRR Receive State • LF1 - Link Failure: NOS Transmit State • LF2 - Link Failure: NOS Receive State • OL1 - Offline: OLS Transmit State • OL2 - Offline: OLS Receive State • OL3 - Offline: Wait for OLS State

Table 3-13 portLogShow Command Field Descriptions(Continued)

FIELD	DESCRIPTION
ioctl	For ioctl events, the following is a summary of frequently used entries: • a1 - port is an E_Port • a2 - port is an F_Port • a3 - port is segmented • a4 - domain name is known • a5 - port enable • a6 - port disable • a7 - link reset • a8 - add unicast route • a9 - delete unicast route • aa - add multicast route • ab - delete multicast route • ac - unicast routing table done • ad - multicast routing table done • ae - add a phantom device • af - remove a phantom device For ctin event, the first sub-field indicates whether "argument 1" and "argument 2" would be valid: • 0000 no argument 1 and 2 • 0001 argument 1 is valid • 0003 arguments 1 and 2 are valid For ctout event, the cmd field consists of two 2-byte sub-fields, similar to ctin. The second sub-field should contain a CT command code indicating an accept or reject: • 8001 reject • 8002 accept
args	The args field represents different values depending on the task and event. The following definitions are included: • For ioctl events, the I/O control arguments. • For Tx and Rx events, the first two header words and the first payload word. • For ctin events, the args field generally represents the first and second words of the CT payload where they are valid. Note however, in the case where an IP address is involved and if it is an IPv4 address, then this field will show the value of the IPv4 address, which is neither the first nor second word of the CT payload. • For ctout events, if the event is associated with an accept, then the args field generally represents the first and second words of the CT payload. In the case where an IP address is involved and if it is an IPv4 address, then this field will show the value of the IPv4 address, which is neither the first nor second word of the CT payload. • If the event is associated with a reject or busy, the args field contains the reject reason and explanation code.
loopscn	For loopscn events: • OLP - Offline (disconnected or nonparticipating) • LIP - LIP sent (if the next argument is 8xxx) or received (if the next argument contains the lower two bytes of the LIP Primitive Sequence received), port entered OPEN-INIT state. • LIM - FL_Port is elected as LIM. • BMP - AL_PA bitmap is collected by the FL_Port. • ERR - An error occurred during the loopinit process, such as a loss of sync. • OLD - Port entered OLD_PORT state. • TMO - Loopinit timed out.

portPerfShow

Figure 3-32 shows the `portPerfShow` command which displays the throughput for all ports. The output is terminated by typing Return 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') of 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.

```
switch:admin> portPerfShow
   0    1    2    3    4    5    6    7
   0    0    0    0    0    0    0   76m
  96    0   96    0    0   96    0   76m
   0    0    0    0    0    0    0   75m
```

Figure 3-32 portPerfShow Command Example

portShow

Figure 3-33 shows the `portShow` command which prints a summary of all ports. Some information varies with the switch model and port type. The command syntax is `portShow <port#>`. The fields are described in Table 3-14.

```
switch:admin> portShow 1
portFlags: 0x30053       PRESENT ACTIVE G_PORT U_PORT NOELP LED
portType:  3.1
portState: 1    Online
portPhys:  6    In_Sync
portScn:   1    Online
portRegs:  0x80020000
portData:  0x10fba040
portId:    011100
portWwn:   20:01:00:60:69:00:60:11

Interrupts:   150        Link_failure: 2          Frjt:         0
Unknown:      73         Loss_of_sync: 2          Fbsy:         0
Lli:          20         Loss_of_sig:  1
Proc_rqrd:    1          Protocol_err: 0
Timed_out:    0          Invalid_word: 0
Rx_flushed:   0          Invalid_crc:  0
Tx_unavail:   0          Delim_err:    0
Free_buffer:  0          Address_err:  0
Overrun:      1          Lr_in:        4
Suspended:    0          Lr_out:       4
Parity_err:   0          Ols_in:       2
                         Ols_out:      8
```

Figure 3-33 portShow Command Example

Table 3-14 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.

Table 3-14 portShow Command Field Descriptions(Continued)

TYPE	FIELD	DESCRIPTION
	portWwn	The port worldwide name.
Interrupt Statistics	Interrupts	Total number of interrupts.
	Unknown	Number of interrupts not counted in all other categories.
	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	Delimeter 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

Figure 3-34 shows 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#>`.

```
switch:admin> portStatsShow 2
stat_wtx        1379589 4-byte words transmitted
stat_wrx        473913  4-byte words received
stat_ftx        114957  Frames transmitted
stat_frx        40      Frames received
stat_c2_frx     0       Class 2 frames received
stat_c3_frx     34      Class 3 frames received
stat_lc_rx      3       Link control frames received
stat_mc_rx      0       Multicast frames received
stat_mc_to      0       Multicast timeouts
stat_mc_tx      0       Multicast frames transmitted
tim_rdy_pri     599970  Time R_RDY high priority
tim_txcrd_z     0       Time BB_credit zero
er_enc_in       0       Encoding errors inside of frames
er_crc          0       Frames with CRC errors
er_trunc        0       Frames shorter than minimum
er_toolong      0       Frames longer than maximum
er_bad_eof      0       Frames with bad end-of-frame
er_enc_out      74670   Encoding error outside of frames
er_disc_c3      0       Class 3 frames discarded
open            0       loop_open
transfer        0       loop_transfer
opened          0       FL_Port opened
starve_stop     0       tenancies stopped due to starvation
fl_tenancy      0       number of times FL has the tenancy
nl_tenancy      0       number of times NL has the tenancy
frame_nozone    0       frames rejected due to zone protection
```

Figure 3-34 portStatsShow Command Example

Table 3-15 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.
open	loop_open:the number of times FL_Port entered the OPEN state.
transfer	loop_transfer:the number of times FL_Port entered the TRANSFER state.

Table 3-15 portStatsShow Command Field Descriptions(Continued)

FIELD	DESCRIPTION
opened	FL_Port opened:the number of times FL_Port entered the OPENED state.
starve_stop	Loop tenancies stopped due to starvation
fl_tenancy	Number of times FL_Port has the loop tenancy
nl_tenancy	Number of times NL_Port has the loop tenancy
frame_nozone	Number of frames rejected due to zone protection

psShow

Figure 3-35 show the `psShow` command which displays the power supply status and manufacture information. The format of the display varies according to the switch model and number of power supplies present.

```
switch:admin> psShow
Power Supply 1 is OK
9835,DH000000208,60-0000734-01, A,00001, E108302A,01, 803350
Power Supply 2 is OK
9839,DH000000253,60-0000734-01, A,00001, E108302A,01, 803522
```

Figure 3-35 psShow Command Example

The status of each supply is shown in Table 3-16

Table 3-16 Power Supply Status

STATUS	DESCRIPTION
OK	Power supply present and functioning correctly.
Absent	Power supply not present.
Faulty	Power supply is present but faulty (no power cable, power switch turned off, fuse blown, or other internal error).

After the status line, a power supply identification line may be shown. If present, this line contains manufacture date, part numbers, serial numbers, and other information.

reboot

Figure 3-36 shows the `reboot` command which reboots the switch to the stored configuration in flash memory and takes about 1 1/2 minutes. The switch maybe in any operational state (enabled or disabled) before rebooting.

While the switch is rebooting, the telnet session is closed and all Fibre Channel ports become inactive. If the switch was part of a Fabric, the remaining switches reconfigure.

```
switch:admin> reboot
Rebooting...
```

Figure 3-36 reboot Command Example

switchDisable

Figure 3-37 shows the `switchDisable` command which is used to take the switch offline for diagnostic tests, 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.

```
switch:admin> switchDisable
```

Figure 3-37 switchDisable Command Example

switchEnable

Figure 3-38 shows the `switchEnable` command enables the switch and provides Fabric information. The switch may need to be enabled after maintenance and diagnostic tests.

The switch is enabled with a Fabric domain ID of 1. After the Fabric is reconfigured this switch is the principle address manager that is capable of assigning domain IDs to other switches in the same Fabric.

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

```
switch:admin> switchEnable
value = 0 = 0x0
10  9  8  7  6  5  4  3  2  1
fabric: Principal switch
fabric: Domain 1
```

Figure 3-38 switchEnable Command Example

switchName

Figure 3-39 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.

```
switch:admin> switchName "sw3"
Updating flash...
```

Figure 3-39 switchName Command Example

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.

NOTE: *This command is only available to admin-level users.*

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

- May not exceed 19 characters in length.
- May not contain characters other than 'a-z', 'A-Z', '0-9' or '_' (the underscore character), the first character excepted.
- Must have the first character be among 'a-z' or 'A-Z'.

NOTE: *It is suggested that switch names be unique in a cascaded environment.*

switchShow

Figure 3-40 shows the `switchShow` command which prints switch and port status. The fields are described in Table 3-17.

```
switch:admin> switchShow
switchName:     open146
switchType:    3.1
switchState:    Online
switchRole:     Principal
switchDomain:   1
switchId:       fffc41
switchWwn:      10:00:00:60:69:00:04:64
port  0: sw  Online     FL-Port  1 private, 1 phantom
port  1: --  No_Module  G-Port
port  2: sw  No_Light   G-Port
port  3: sw  Online     FL-Port  1 private, 1 phantom
port  4: --  No_Module
port  5: sw  Online     E-Port  10:00:00:60:69:00:00:12 "sw1" (upstream)
port  6: sw  No_Light
port  7: sw  No_Light
port  8: sw  No_Light
port  9: sw  Online     E-Port  10:00:00:60:69:00:01:b4 "sw3" (downstream)
port 10: sw  No_Light
port 11: sw  No_Light
port 12: sw  No_Light
port 13: sw  No_Light
port 14: sw  No_Light
port 15: sw  No_Light
```

Figure 3-40 switchShow Command Example

Table 3-17 switchShow Command Field Descriptions

FIELD	DESCRIPTION
switchName	The switch name.
switchType	model.motherboard revision level, where the model number is as follows: 1=SilkWorm 1000 series 2=SilkWorm 2800 3=SilkWorm 2400
switchState	The state of this switch: Online, Offline, Testing or Faulty.
switchRole	There are three possibilities for switchRole including: • Principle–the principal switch as defined in FC-SW • Subordinate–this switch is enabled and is a subordinate switch • Disabled–the switch is disabled.
switchDomain	The domain ID of this switch: 0 to 31 or 1 to 239.
switchID	The domain ID of this switch's embedded port: hex fffc00 to fffc7f.

Table 3-17 switchShow Command Field Descriptions(Continued)

FIELD	DESCRIPTION
switchWwn	The World Wide Name of this switch. The WWN is a unique identifier for each switch and is assigned by the manufacturer. A numbering scheme administrated globally assures that this WWN is unique to each switch.
Port Number	One line per port is printed after the switch summary. Each line shows the port number: 0 to 15, the GBIC type, the port state and a comment field.
GBIC type	The GBIC type follows the port number. The four GBIC types include: • -- – no GBIC present • sw – shortwave GBIC • lw – longwave GBIC • cu – copper GBIC • id – serial ID
Port state	The port state follows the GBIC type. The possible port states include: • No_Card – no card present in this switch slot • No_Module – no GBIC module in this port • No_Light – the module is not receiving light • No_Sync – the module is receiving light but is out of sync • In_Sync – the module is receiving light and is in sync • 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 or FL_Port card or motherboard) • Online – the port is up and running • Lock_Ref – the port locking to the reference signal • Testing - running diagnostics
Comment field	The comment field follows the port state. The possible comments include: • Disabled – the port is disabled • Loopback – the port is in loopback mode • E_Port – the WWN and switch name of the other switch is shown, the use of this ISL is shown (see FC_SW) • F_Port – the WWN of the N_Port is shown • G_Port – the port is online but is not yet an E_Port or F_Port • L_Port – the port is connected to an arbitrated loop

syslogdIp

Figure 3-41 show the `syslogdIp` command which sets or displays the switches system log daemon IP address.

The command syntax is `syslogdip <“ip address”>.`

```
switch:admin> syslogdIp

syslog daemon’s address: 0.0.0.0
```

Figure 3-41 syslogdIp Command Example

tempShow

Figure 3-42 shows the `tempShow` command which shows the switch's temperature as measured by five sensors on the motherboard.

```
switch:admin> tempShow
 31   27   28   27   33  Centigrade
 87   80   82   80   91  Fahrenheit
```

Figure 3-42 tempShow Command Example

uptime

The `uptime` command can be used to display the amount of time the switch has been in operation (also known as up time), the total cumulative amount of up time since the switch was first powered-on, the date and time of the last reboot, and the reason for the last reboot. Figure 3-9 shows the operation of the uptime command. Possible reasons for reboot and a brief description are listed in Table 3-6.

```
switch:admin> uptime
Up for:3 days, 18:35
Powered for: 30 days, 16:05
Last up at: Mon Jan 11 16:17:29 1999
Reason:Reboot
```

Figure 3-43 Example of the uptime command.

For up and powered-on times less than 60 seconds, the display granularity is by the second. For times greater than 60 seconds, the display granularity is by the minute. In addition, the formatting of the output adjusts based on the amount of time. See Appendix C, *Error Messages* for reboot reasons.

version

Figure 3-44 shows the `version` command which displays firmware version information and build dates. The fields are described in Table 3-18.

```
switch:admin> version
VxWorks version: 5.3.1
Firmware version: v2.0
Made on: Thu Nov 19 16:18:29 PST 1998
Flash:     Mon Dec 28 15:34:05 PST 1998
BootProm:  Thu Oct 1 13:34:29 PDT 1998
```

Figure 3-44 version Command Example

Table 3-18 version Command Field Descriptions

FIELD	DESCRIPTION
VxWorks version	VxWorks operating environment version used on the processor
Firmware version	Switch Firmware version
Made on	Firmware release date and time
Flash	The build date of the firmware stored in flash memory
BootProm	The build date of the firmware stored in the boot prom

diagHelp

Figure 3-45 shows the `diagHelp` command which displays the diagnostic help commands available for troubleshooting switch problems, see Chapter 4, *Diagnostics*.

```
switch:admin> diagHelp

ramTest                 System DRAM diagnostic
portRegTest             Port register diagnostic
centralMemoryTest       Central memory diagnostic
cmiTest                 CMI bus connection diagnostic
camTest                 Quickloop CAM diagnostic
portLoopbackTest        Port internal loopback diagnostic
sramRetentionTest       SRAM Data Retention diagnostic
cmemRetentionTest       Central Mem Data Retention diagostic
crossPortTest           Cross-connected port diagnostic
spinSilk                Cross-connected line-speed exerciser
diagClearError          Clear diag error on specified port
diagDisablePost         Disable Power-On-Self-Test
diagEnablePost          Enable Power-On-Self-Test
setGbicMode             Enable tests only on ports with GBICs
supportShow             Print the switch info for debugging
diagShow                Print diagnostic status information
```

Figure 3-45 diagHelp Command Example

licenseHelp

Figure 3-46 shows the `licenseHelp` command which displays the commands used to administer license keys. Each switch can save one license key which will enable one or more optionally-licensed products. The license key is unique for every switch..

```
switch:admin> licenseHelp

licenseAdd              Add a license key to this switch
licenseRemove           Remove a license key from this switch
licenseShow             Show current license key
```

Figure 3-46 licenseHelp Command Example

NOTE: *If you issue a licenseAdd you delete any license key if already installed.*

License Commands

License commands allow you enable and disable the use of optional products.

licenseAdd

Figure 3-47 shows the `licenseAdd` command which adds a license key to the switch. Some features of the switch and of the Fabric are optional licensed products. An example is WebTools which allows the Fabric to be managed through the worldwide web. Without a license key installed, the licensed product will not function.

A license key is a string of approximately 16 upper and lower case letters and digits. Case is significant. The key is an encrypted form of the switch's ID an the products licensed to run on this switch.

The license key must be entered into the switch exactly as issued. If mistyped, the license key may be accepted, but licensed products won't function. If possible, use cut and paste to avoid typos. After entering the key, use the licenseShow command to check for correct function. If no licensed product are shown, then the key is invalid.

After entering a license key, the licensed product is available immediately, the switch need not be rebooted.

```
sw5:admin> licenseAdd"bQebzbRdScRfc0iK"
adding license key "bQebzbRdScRfc0iK"
Committing configuration...done.
```

Figure 3-47 licenseAdd Command Example

licenseRemove

Figure 3-48 shows the `licenseRemove` command which removes an existing license key from the switch. Some features of the switch and of the Fabric are optional licensed products. An example is WebTools which allows the Fabric to be managed through the Worldwide Web. Without a license key installed, the licensed product won't function.

The existing license key must be entered as an operand exactly as shown by licenseShow, including case. If possible, use cut and paste to avoid typos.

After removing the license key, the switch must be rebooted.With no license key, licenseShow displays "No licenses".

```
sw5:admin> licenseRemove"bQebzbRdScRfc0iK"
removing license key"bQebzbRdScRfc0iK"
Committing Configuration...done.
```

Figure 3-48 licenseRemove Command Example

licenseShow

Figure 3-49 shows the `licenseShow` command which displays the current license keys, and a list of the licensed products that are enabled by these keys, or displays "No licenses" if no license key is installed or is invalid.

Some features of the switch and of the Fabric are optional licensed products. An example is WebTools which allows the Fabric to be managed through the worldwide web. Without a license key installed, the licensed product won't function.

A license key is a string of approximately 16 upper and lower case letters and digits. Case is significant. The key is an encrypted form of the switch's ID an the products licensed to run on this switch.

```
sw5:admin> licenseShow

bQebzbRdScRfc0iK:
     Web license
    Zoning license
SybbzQQ9edTzcc0X:
    Fabric license
```

Figure 3-49 licenseShow Command Example

routeHelp

Figure 3-50 shows the `routeHelp` command which displays the routing help commands, see *Routing Commands* on page 3-68.

```
switch:admin> routeHelp

bcastShow               Print broadcast tree information
fspfShow                Print FSPF global information
interfaceShow           Print FSPF interface information
iodReset               Truns off the in-order delivery optio
iodSet                 Turns on the in-order delivery option
LSDbShow                Print Link State Database entry
mcastShow               Print multicast tree information
nbrStateShow            Print neighbor's summary information
topologyShow            Print paths to domain(s)
uRouteConfig            Configure static unicast route
```

Figure 3-50 routeHelp Command Example

Routing Commands

Routing commands allow you to view switch routing information.

bcastShow

Figure 3-51 shows the `bcastShow` command which displays broadcast tree information, and all ports that are currently transmitting and receiving broadcast frames. This command is used to understand routes the broadcast frames take through the Fabric.

The fields are described in Table 3-19. A bit set indicates that the corresponding port belongs to a specific set. For instance, the bitmap value 0x00010003 means that port 0, port 1 and port 16 (the embedded port) are members of the set..

```
switch:admin> bcastShow

Group   Member Ports    Member ISL Ports        Static ISL Port

----------------------------------------------------------------
 256     0x00000100        0x00000000              0x00000000
```

Figure 3-51 bcastShow Command Example

Table 3-19 bcastShow Bitmap Field Descriptions

BITMAP FIELD	DESCRIPTION
Group	The multicast group.
`Member Ports`	All ports currently transmitting or receiving broadcast frames.
`Member ISL Ports`	Ports that belong to the interswitch broadcast distribution tree, as selected by the dynamic broadcast path selection protocol. These are all E_Ports, and this set is a subset of m_port. Broadcast frames use these ports to reach all Fabric switches and to enter into the switch. Some of the E_Ports on a switch may not be part of this set, since the broadcast paths must constitute a tree.
`Static ISL Ports`	Ports that belong to the interswitch broadcast distribution tree, as configured through the shell. This field is normally 0x00000000.

fspfShow

Figure 3-52 shows the `fspfShow` command which displays Fibre Channel Shortest Path First (FSPF) information. The fields are described in Table 3-20.

```
switch:admin> fspfShow

version         = 2
domainID        = 1
isl_ports       = 0x00000000
minLSArrival    = 3
minLSInterval   = 5
LSoriginCount   = 0
startTime       = 18656
fspfQ           = 0x10fa44e0
fabP            = 0x10fa4d60
agingTID        = 0x10f7e4c0
agingTo         = 10000
lsrDlyTID       = 0x10f6e4f0
lsrDelayTo      = 5000
lsrDelayCount   = 0
ddb_sem         = 0x10fa44b0

fabP:
event_sch       = 0x0
lsrRefreshCnt   = 0
```

Figure 3-52 fspfShow Command Example

Table 3-20 fspfShow Command Field Descriptions

FIELD	DESCRIPTION
version	The version of the FSPF protocol.
domainID	The local switch's domain ID.
isl_ports	A bitmap field that shows all local switch E_Ports.
startTime	The time the FSPFstarted, in milliseconds from boot.
other	The other fields represent internal FSPF variables.

interfaceShow

Figure 3-53 shows the `interfaceShow` command which displays FSPF interface information. This includes static information about the port (for example, variables allocated even when a port is down), and “neighbor” information which includes variables associated with the remote switch connected to the port. A FSPF interface corresponds to an E_Port. The static information fields are described in Table 3-21. neighbor information fields are described in Table 3-22

With no parameters, it shows the information for all switch interfaces.

The command syntax is `interfaceShow <port#>`

```
switch:admin> interfaceShow
idbP            = 0x10f7e560
Interface 10 data structure:

nghbP           = 0x0
ifNo            = 0
cost            = 1000
delay           = 1
lastScn         = 5
lastScnTime     = Mar 20 16:09:49.199
upCount         = 0
lastUpTime      = Mar 20 16:09:49.199
downCount       = 2
lastDownTime    = Mar 20 16:09:46.516
downReason      = 2
iState          = DOWN

Type <CR> to continue, Q<CR> to stop:
Neighbor 10 data structure:

state               = NB_ST_FULL
nghbCap             = 0x0
nghbId              = 239
idbNo               = 10
remPort             = 10
nflags              = 0x3
initCount           = 1
&dbRetransList      = 0x10e83530
&lsrRetransList     = 0x10e83540
&lsrAckList         = 0x10e83550
inactTID            = 0x10e83200
helloTID            = 0x10e834c0
dbRtxTID            = 0x10e833d0
lsrRtxTID           = 0x10e82cb0
inactTo             = 80000
helloTo             = 20000
rXmitTo             = 5000
nCmdAcc             = 132
nInvCmd             = 0
nHloIn              = 122
nInvHlo             = 0
nLsuIn              = 5
nLsaIn              = 5
attHloOut           = 123
nHloOut             = 123
attLsuOut           = 5
nLsuOut             = 5
attLsaOut           = 5
nLsaOut             = 5
```

Figure 3-53 interfaceShow Command Example

Table 3-21 interfaceShow Command Static Field Descriptions

FIELD	DESCRIPTION
idbP	The current neighbor state. Its value must be NB_ST_FULL for the ISL to forward frames to the adjacent switch. Other values may be transitory, however if a value is retained for more than ten seconds, contact Technical Support.
nghbP	Neighbor capabilities has a value of 0.
ifNo	The port number. It should be identical to the value specified in the command line.
cost	The cost of sending a frame over the ISL connected to this port. The value 1000 indicates a 1 Gbps link.
delay	The conventional delay incurred by a frame transmitted on this ISL. It is required by the FSPF protocol, and is a fixed value.
lastScn	Last State Change Notification received on this interface.
lastScnTime	Time the last SCN was received.
upCount	The number of times this interface initialized (the transition number from an offline to E_Port state).
lastUpTime	Last time this interface came up.
downCount	Number of times this interface went down.
lastDownTime	Last time this interface went down.
downReason	Reason (SCN) for the interface going down.
iState	The current interface state. It must be UP in order for the ISL to forward frames to the adjacent switch.

Table 3-22 Neighbor Data Structure Field Descriptions

FIELD	DESCRIPTION
state	The current state of the neighbor. Its value must be NB_ST_FULL in order for the ISL to be used to forward frames to the adjacent switch.
nghbCap	Neighbor capabilities. Currently always 0.
nghbId	The domain ID of the neighbor (adjacent) switch.
idbNo	The port #, it should be equal to ifNo.
remPort	The port # on the remote switch connected to this port.
inactTo	The inactivity time out, in ms. When this timeout expires, the adjacency with the neighbor switch is considered broken. When that happens, new paths are computed to all the possible destination switches in the fabric.

Table 3-22 Neighbor Data Structure Field Descriptions(Continued)

FIELD	DESCRIPTION
helloTo	The Hello timeout. When this timeout expires, an Hello frame is sent to the neighbor switch through this port.
rXmitTo	The retransmit timeout. It is used to reliably transmit topology information to the neighbor switch. If an acknowledge is not received within rXmitTo, a frame is retransmitted.
nCmdAcc	The total number of command accepted from the neighbor switch. It includes Hellos, Link State Updates and Link State Acknowledges.
nInvCmd	The number of invalid commands received from the neighbor switch. These are commands with a version higher than the one running on the local switch. The current version is 1, and there is no version 0.
nHloIn	The number of Hello frames received from the neighbor switch.
nInvHlo	The number of invalid Hello frames received from the neighbor switch. These are Hello frames with invalid parameters.
nLsuIn	The number of Link State Updates received from the neighbor switch.
nLsaIn	The number of Link State Acknowledges received from the neighbor switch.
attHloOut	The number of attempted transmissions of Hello frames to the neighbor switch.
nHloOut	The number of Hello frames transmitted to the neighbor switch.
attLsuOut	The number of attempted transmissions of Link State Updates to the neighbor switch.
nLsuOut	The number of Link State Updates transmitted to the neighbor switch.
attLsaOut	The number of attempted transmissions of Link State Acknowledges to the neighbor switch.
nLsaOut	The number of Link State Acknowledges transmitted to the neighbor switch.
other	The other fields represent internal FSPF variables.

iodReset

Figure 3-54 shows the `iodReset` command which turns off the in-order delivery option. This command allows out-of-order delivery of frames during fabric topology changes.

This is the default behavior, and allows fast rerouting after a fabric topology change.

```
switch:admin> iodReset
```

Figure 3-54 iodReset Command Example

iodSet

shows the `iodSet` command which insures that frames will not be delivered out-of-order, even during fabric topology changes. In a stable fabric, frames are always delivered in order, even when the traffic between switches is shared among multiple paths. However, when some topology change occurs in the fabric, for instance, a link goes down, traffic is rerouted around the failure. In general, there is no guarantee in this case that some frame, queued behind a congested link, will not be delivered after a frame that has been transmitted later, but is now taking the new path.

This command should be used with care, because it will cause a delay in the establishment of a new path when a topology change occurs. Only if there are devices connected to the fabric that do not tolerate occasional out-of-order delivery of frames, should this command be used.

The default behavior is for the in-order delivery option to be off.

```
switch:admin> iodSet
```

LSDbShow

Figure 3-55 shows the `LSDbShow` command which displays domain Link State Database entries. The database record for any Fabric switch can be displayed from any switch. It also gives the same information regardless of switch used to run it (unless there is a database update in progress, which occurs every 30 minutes in a stable network).

Every switch keeps a database of topology information associated with itself and the other fabric switches. The topology information for a switch consists of all neighbors that are in NB_ST_FULL state, and the associated port numbers.

This replicated database remains in sync at all times, so that every switch in the Fabric has the same topology view. The topology database, in turn, is used to compute the path from a switch to all other Fabric switches.

With no parameters the command shows all the Link State Records in the database. The fields are described in Table 3-23.

The command syntax is `LSDbShow <domain ID>`

```
Domain = 1 (self), Link State Database Entry pointer = 0x10361770
lsrP= 0x1035ba20
earlyAccLSRs= 0
ignoredLSRs= 12
lastIgnored= 001:20:54:24.566 (161664)
installTime= 0x60341 (394049)
lseFlags= 0xa
uOutIfs= 0x80
uPathCost= 1000
uHopsFromRoot= 1
mOutIfs= 0x0
parent= 0x1039c030
mPathCost= 0
mHopsFromRoot= 0

Link State Record:
Link State Record pointer = 0x1035ba20
lsAge= 1145
reserved= 0
type= 1
options= 0x0
lsId= 0
advertiser= 0
incarn= 0x80000c0a
length= 108
chksum= 0x3fb9
linkCnt = 5,flags = 0x0
LinkId = 5, out port = 0, rem port = 7, cost = 1000, costCnt = 0, type = 1
LinkId = 5, out port = 2, rem port = 9, cost = 1000, costCnt = 0, type = 1
LinkId = 5, out port = 7, rem port = 12,cost = 1000, costCnt = 0, type = 1
LinkId = 2, out port = 12,rem port = 4, cost = 1000, costCnt = 0, type = 1
LinkId = 3, out port = 13,rem port = 7, cost = 1000, costCnt = 0, type = 1
```

Figure 3-55 LSDbShow Example

Table 3-23 LSDbShow Command Field Descriptions

FIELD	DESCRIPTION
'self'	Indicates that domain 1 is the local switch's domain ID.
installTime	This is the database entry for domain 1. The keyword installTime is the time when this database record was installed, in milliseconds from boot. Values are in hexadecimal and decimal format.
lsAge	The record age in seconds since installation time. Records are refreshed throughout the Fabric every 30 minutes, this value should never exceed 3600. When lsAge reaches the value 1800, the record is flushed from the Fabric if the switch that is described by the LSR is functioning and is connected to the fabric.
options	Options is currently set to 0.
lsId	The record's Link State ID, equal to the switch's domain ID as described by the record.
incarn	The incarnation number. When a record is refreshed, every 30 minutes, its incarnation number is incremented by 1. If data in the record changes (for example, if an E_Port on a switch goes offline), the switch described by that record issues a new instance, and increments the incarnation number by 1.
length	The total record length.
chksum	The record checksum. It includes all fields except lsAge.
linkCnt	The link count, is the number of neighbors in NB_ST_FULL state that are adjacent to the switch described by this record. The linkCnt field is followed by a number of lines equal to the link count.
output port	Output port is the ISL port number connecting the neighbor switch.
linkID	The neighbor switch's domain ID.
rem port	The port on the remote switch that the local port (out port) is connected to
costCnt	Cost is the cost of sending a frame over the ISL connected to this port. It is the same value as the cost in the neighbor data structure of the switch described by this record. It is always 0
type	always 1

mcastShow

Figure 3-56 shows the `mcastShow` command. Without parameters it shows multicast tree information for all the multicast groups. With a parameter (group number) it show information about one multicast group only:

```
switch:admin> mcastShow 256

Group   Member Ports    Member ISL Ports        Static ISL Ports

------------------------------------------------------------------
 256     0x00000100        0x00000000              0x00000000
```

Figure 3-56 mcastShow Command Example

nbrStateShow

Figure 3-57 and Figure 3-58 shows the `nbrStateShow` command which displays neighbor's summary information. This information can also be retrieved using `interfaceShow`. The command provides essential information to determine the Fabric topology in a concise way. By using this command, you can discover the domain ID of all switches adjacent to the local switch, and the port number on the local and remote switch. The fields are described in Table 3-23.

With no parameters it shows the neighbor's state summary for all the neighbors instead of neighbor connected to port 0 only.

The command syntax is `nbrStateShow` to list all neighbors.

```
switch:admin> nbrStateShow

Local Domain ID: 1

Local Port     Domain     Remote Port     State
-------------------------------------------------------
     0            2            0        NB_ST_FULL
     1            2            1        NB_ST_FULL
     2            2            2        NB_ST_FULL
     4            5            4        NB_ST_FULL
     5            5            5        NB_ST_FULL
     7            5            6        NB_ST_FULL
```

Figure 3-57 nbrStateShow Command Example

The command syntax is nbrStateShow <port number> to list the neighbor on the specified port.

```
switch:admin> nbrStateShow 1

Local Domain ID: 1

Local Port     Domain     Remote Port     State
-------------------------------------------------------
     1            2            1        NB_ST_FULL

value = 1 = 0x1
```

Figure 3-58 nbrStateShow Command Example

Table 3-24 nbrStateShow Command Field Descriptions

FIELD	DESCRIPTION
Local Port	Corresponds to idbNo in the neighbor data structure.
Domain	Corresponds to nghbId in the neighbor data structure.
Remote Port	Corresponds to remPort in the neighbor data structure.
State	The neighbor's current state. Its value must be NB_ST_FULL for the ISL to forward frames to the adjacent switch. Other values may be transitory, however if a value is retained for more than ten seconds, contact Technical Support.

topologyShow

Figure 3-59 and Figure 3-60 shows the `topologyShow` command which displays all paths to a domain including:

- Output port(s) used to route frames to the domain
- The routing cost to reach the domain
- The input ports routed through the output port

The FSPF protocol supports equal cost multipaths, so there could be multiple 'parallel' paths between two switches.

The command syntax is `topologyShow` to list all domains.

```
switch:admin> topologyShow

Local Domain ID: 3

Domain    Metric    Hops    Out Port    In Ports    Flags    Name
------------------------------------------------------------------
   1       2000       2         2      0x00000050     D      "open348"
                      2         1      0x00000020     D
                      2         0      0x00000080     D

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

   4       3000       3         2      0x00000050     D      "open375"
                      3         1      0x00000020     D
                      3         0      0x00000080     D
```

Figure 3-59 topologyShow Command Example 1

The command syntax is `topologyShow <domain ID>` to list the specified domain.

```
switch:admin> topologyShow 1

Local Domain ID: 3

Domain    Metric    Hops    Out Port    In Ports    Flags    Name
------------------------------------------------------------------
   1       2000       2         2      0x00000050     D      "open148"
                      2         1      0x00000020     D
                      2         0      0x00000080     D
```

Figure 3-60 topologyShow Command Example 2

uRouteConfig

This command allows you to select the destination traffic's path on a source-port basis.

`admin>uRouteConfig <PORT>, <DOMAIN>, <OUTPUT PORT>`

After using this command, traffic coming in from the PORT addressed to a DOMAIN is forwarded through the OUTPUT PORT. Make sure that the output port is a viable path for reaching the domain.

The PORT can be an E-Port or an F_Port. If it is an E_Port, make sure that no routing loops are created.

If the OUTPUT PORT is not an E_Port, the route is allocated dynamically to a different path, if one is available, as if this was a regular route. If the OUTPUT PORT goes down, the route is treated as a regular route and is allocated to a different path, again, if one is available. When the OUTPUT PORT comes back up, the port is rerouted back to the static route.

Load sharing continues, taking into account static routes when counting the number of routes that are allocated to a path, acting only on regular, non-static routes.

If PORT has a static route, the *flags* field in uRouteShow is set to *S* instead of *D*. Note that this does not affect the *flags* field in the topologyShow command. The latter still shows *D* unless a static path is configured.

```
switch:admin>uRouteConfig 2,2,4
committing configuration...done.
```

Figure 3-61 uRouteConfig Command Example

uRouteRemove

This command removes the previous static route configuration.

```
switch:admin>uRouteRemove <PORT>, <DOMAIN>
```

uRouteShow

Figure 3-62 shows the `uRouteShow` command which displays the port's unicast routing information which is the output port used to forward frames from a port to the domain. Only one output port is used to forward frames from one input port to a destination domain.

The command `uRouteShow` now has three different syntax options:

- `uRouteShow <port #>, <domain ID>` – displays the route for port <port #> to domain <domain ID>
- `uRouteShow <port #>` – displays the route for port <port #> to all the active domains in the fabric
- `uRouteShow` – displays the route for all the ports on the switch to all the active domains in the fabric

In addition, in all three formats `uRouteShow` shows for each route, the domain ID of the next hop and the port # on the next hop.

```
switch:admin> uRouteShow

Local Domain ID: 1

In Port    Domain    Out Port    Metric    Hops    Flags    Next (Dom, Port)
------------------------------------------------------------------------------
   0          5          7        1000       1       D            5,6
              6          7        2000       2       D            5,6
              7          7        3000       3       D            5,6
              8          7        4000       4       D            5,6
              9          7        5000       5       D            5,6

   1          5          5        1000       1       D            5,5
              6          5        2000       2       D            5,5
              7          5        3000       3       D            5,5
              8          5        4000       4       D            5,5
              9          5        5000       5       D            5,5

   2          5          4        1000       1       D            5,4
              6          4        2000       2       D            5,4
              7          4        3000       3       D            5,4
              8          4        4000       4       D            5,4
              9          4        5000       5       D            5,4

value = 1 = 0x1
```

Figure 3-62 uRouteShow Command Example

4

DIAGNOSTICS

This chapter discusses diagnostic testing via telnet commands. See Appendix C, *Error Messages* for the error messages generated by these tests.

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.

You perform diagnostics using either the SilkWorm 2800 switch's front panel controls or commands via a Telnet session. The front panel and Telnet diagnostics overlap in function but are mutually exclusive. You can, for example, start a diagnostic from Telnet, and monitor the results from both the front panel display and Telnet.

If a test is started using the front panel, you can monitor the test progress, but cannot control the test through Telnet. If you start a test using telnet, attempting to control the test via the front panel may lock up the switch and require a reboot.

The actual tests performed by the front panel and via a telnet are identical. Because the front panel displays a two line limit, more detailed test results can be displayed via Telnet.

NOTE: *Refer to the SilkWorm 2800 Hardware Reference Manual for details on the Front Panel.*

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 the motherboard and their 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 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.*

Post Tests

The following table lists the diagnostic tests automatically run during POST.

Table 4-1 POST Tests

TEST	BRIEF DESCRIPTION	PAGES
Memory Test	Checks CPU RAM memory.	*ramTest* on page 4-5
Port Register Test	Checks the ASIC registers & SRAMs.	*portRegTest* on page 4-5
Central Memory Test	Checks the motherboard SRAMs.	*centralMemoryTest* on page 4-5
CMI Conn Test	Checks the CMI bus between ASICs	*cmiTest* on page 4-6
CAM Test	Checks the CAM	*camTest* on page 4-6
Port Loopback Test	Checks all of the switch's hardware: frames transmitted, are looped back, and received	*portLoopbackTest* on page 4-7

POST behaves differently depending on the boot method. A power cycle (power off & power on) is considered a cold boot. All other boots from a powered-on state (per reboot, panic, etc.) are considered warm boots.

POST execution per cold boot executes the long version of ramTest. POST execution per warm boot executes a shorter version of ramTest. Boot time with POST varies depending on the boot method.

A switch rebooted with POST disabled will generate the DIAG-POST_SKIPPED error log message.

Diagnostic Commands

The following tests are available from the switch's local Telnet port:

- Switch Offline (`switchDisable`)
- Memory Test (`ramTest`)
- Port Register Test (`portRegTest`)
- Central Memory Test (`centralMemoryTest`)
- CMI Conn Test (`cmiTest`)
- CAM Test (`camTest`)
- Port Loopback Test (`portLoopbackTest`)
- Cross Port Test (`crossPortTest`)
- Spin Silk Test (`spinSilk`)
- SRAM Data Retention Test (`sramRetentionTest`)
- CMem Data Retention Test (`cmemRetentionTest`)
- Switch Online (`switchEnable`)

NOTE: *See Appendix C, Error Messages for the actual error message descriptions.*

Table 4-2 Offline and Online Test

OFFLINE TESTS	OFFLINE & ONLINE TESTS
portRegTest	ramTest
centralMemoryTest	crossPortTest
cmiTest	
sramRetentionTest	
cmemRetentionTest	
camTest	
portLoopbackTest	
spinSilk	

ramTest

Figure 4-1 shows the `ramTest` command which is used to check CPU RAM memory. This test validates proper memory function.

```
switch:admin> ramTest

Running System DRAM Test ..... passed.
```

Figure 4-1 ramTest Command Example

Related error messages: DIAG-MEMORY, DIAG-MEMSZ, DIAG-MEMNULL

portRegTest

Figure 4-2 shows the `portRegTest` command which is used to check each register and static memory located on the motherboard. 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 accessed.

```
switch:admin> portRegTest

Running Port Register Test .... passed.
```

Figure 4-2 portRegTest Command Example

Related error messages: DIAG-REGERR, DIAG-REGERR_UNRST, DIAG-BUS_TIMEOUT

centralMemoryTest

Figure 4-3 shows the `centralMemoryTest` command which is used to check the Central Memory in each ASIC as follows:

- The built-in-self-repair (BISR) circuit in each ASIC chip does not report failure to repair bad cells (bisr test).
- The data cells can be uniquely written and read correctly (data write/read test).
- The data in any one asic can be read from any other ASIC (asic-asic test_).
- Bad parity can be detected and flagged in the error register and interrupt posted (parity error test).
- Buffer number error can be detected and flagged in the error register and interrupt posted (buffer number error test).

- Chip number error can be detected and flagged in the error register and interrupt posted (chip number error test).

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

```
switch:admin> centralMemoryTest

Running Central Memory Test ... passed.
```

Figure 4-3 centralMemoryTest Command Example

Related error messages: DIAG-CMBISTRO, DIAG-CMBISRF, DIAG-LCMTO, DIAG-LCMRS, DIAG-LCMEM, DIAG-LCMEMTX, DIAG-CMNOBUF, DIAG-CMERRTYPE, DIAG-CMERRPTN, DIAG-PORTABSENT, DIAG-BADINIT, DIAG-TIMEOUT

cmiTest

Figure 4-4 shows the `cmiTest` command which verifies that control messages can be correctly sent from any ASIC to any ASIC. It also tests that the checksum check is ok.

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

```
switch:admin> cmiTest

Running CMI Test .............. passed.
```

Figure 4-4 cmiTest Command Example

Related error messages: DIAG-BADINIT, DIAG-INTNIL, DIAG-CMISA1, DIAG-CMINOCAP, DIAG-CMIINVCAP, DIAG-CMIDATA, DIAG-CMICKSUM

camTest

Figure 4-5 shows the `camTest` command that verifies that the SID translation required by QuickLoop and implemented using content addressable memories (cam) are functioning correctly.

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

```
switch:admin> camTest

Running CAM Test .............. passed.
```

Figure 4-5 camTest Command Example

Related error messages: DIAG-CAMINIT, DIAG-CAMSID, DIAG-XMIT

portLoopbackTest

Figure 4-6 shows the `portLoopbackTest` command that verifies the intended functional operation of the switch by sending frames from each port's transmitter back to the same port's receiver via an internal hardware loopback. It tests the switch circuitry up to the serial output of the ASIC.

The loopback point chosen by portLoopbackTest depends on what kind of GBIC module is present. If a GBIC other than an optical SWL or LWL GBIC is present, the test loops back only at the input (rather than the output) of the serial link. Copper and unknown GBIC types fall within this category.

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 Return 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 4-3 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.

```
switch:admin> portLoopbackTest

Running Port Loopback Test ....

Diags: (Q)uit, (C)ontinue, (S)tats, (L)og: s

Diagnostics Status:  Sun Jan  1 00:00:00 2000

port#:   0   1   2   3   4   5   6   7
diags:  OK  OK  OK  OK  OK  OK  OK  OK
state:  UP  UP  UP  UP  UP  UP  UP  UP

  lm0:       4654 frTx       4654 frRx          0  LLI_errs.
  lm1:       4654 frTx       4654 frRx          0  LLI_errs.
  lm2:       4654 frTx       4654 frRx          0  LLI_errs.
  lm3:       4654 frTx       4654 frRx          0  LLI_errs.
  lm4:       4654 frTx       4654 frRx          0  LLI_errs.
  lm5:       4654 frTx       4654 frRx          0  LLI_errs.
  lm6:       4654 frTx       4654 frRx          0  LLI_errs.
  lm7:       4654 frTx       4654 frRx          0  LLI_errs.

Central Memory OK
Total Diag Frames Tx: 38032
Total Diag Frames Rx: 39232

Diags: (Q)uit, (C)ontinue, (S)tats, (L)og: q
 aborted
```

Figure 4-6 portLoopbackTest Command Example

Table 4-3 portLoopbackTest Command Field Descriptions

FIELD	DESCRIPTION
Diagnostics Status	The title header displays the time diagShow was executed.
port#	The port number.
diags	Port's current diagnostic status. Possible values include OK, BAD.
state	Port's current state. Possible values include UP (active), DN (inactive).
lm0-7 (8-port) lm0-15 (16-port)	The frame counts of active ports. The display shows the number of frames transmitted and received and Low Level Interface counts (LLI_errs).
Central Memory Status	Central Memory status. Possible values include OK, FAULTY.

Table 4-3 portLoopbackTest Command Field Descriptions(Continued)

FIELD	DESCRIPTION
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.

Related error messages: DIAG-INIT, DIAG-PORTDIED, DIAG-XMIT, DIAG-TIMEOUT, DIAG-ERRSTAT, DIAG-STATS, DIAG-DATA, DIAG-PORTABSENT

sramRetentionTest

Figure 4-7 shows the `sramRetentionTest` command which is used to verify that data written into the ASIC memories are retained and that data bits do not “drop” when read after some amount of delay since the write.This command may not be executed on an operational switch. Before issuing `sramRetentionTest`, disable the switch using the `switchDisable` command.

```
switch:admin> sramRetentionTest
Running SRAM Retention Test ... passed.
```

Figure 4-7 sramretentionTest Command Example

Related error messages: DIAG-REGERR, DIAG-REGERR_UNRST, DIAG-BUS_TIMEOUT

cmemRetentionTest

Figure 4-8 shows the `cmemRetentionTest` command which is used to verify that data written into the SRAMs that make up the central memory are retained and that data bits do not “drop” when read after some amount of delay since the write.

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

```
switch:admin> cmemRetentionTest
Running cmemRetention Test .. passed.
```

Figure 4-8 cmemretentionTest Command Example

Related error messages: DIAG-LCMEM, DIAG-LCMRS, DIAG-LCMTO

crossPortTest

Figure 4-10 shows the `crossPortTest` command. The crossPortTest verifies the intended functional operation of the switch by sending frames from each port's transmitter via the GBIC and external cable and back to another port's receiver. It exercises the entire path of the switch.

Figure 4-9 is a recommended connection when executing the crossPortTest. The cables need not be connected as such. A Port can be connected to any port in the same switch provided the connection is of the same technology; meaning copper ports must connect to copper ports, SW ports to SW ports and LW ports to LW ports.

.

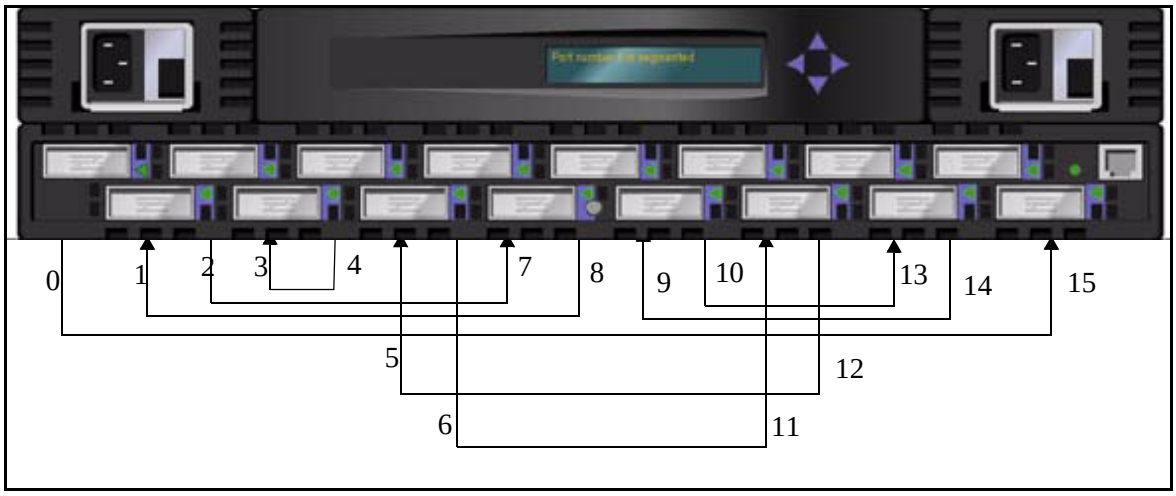

Figure 4-9 Switch Setup to Run Cross Port Test

NOTE: *All ports on the switch must be connected if GBIC mode is disabled, or else the switch shows an error condition. When running the cross port test, you must set the operating mode value to 0 or 1. Modes 2 and 3 do not send out the ELP used to discover switches. If the ELP is not sent, the switch does not know the port is connected to another port on the same switch and the test fails.*

The crossPortTest behaves differently according to the modes activated as follows:

1 switchEnable'd or switchDisable'd mode:

a ONLINE mode:

In the ONLINE mode where the switch is enabled prior to executing the test; it will only test ports which are cable loopbacked to ports in the same switch. Ports connected outside of the switch under test are ignored. To run, the test must find at least one port (if singlePortAlso is active) or two ports (if singlePortAlso is not active -- default) cable loopbacked to each other. If this criteria is not met, the test will complain with the following message in the telnet shell:

```
Need at least 1 port(s) connected to run this test.
                OR
Need at least 2 port(s) cross-connected to run this test.
```

b OFFLINE mode:

In the OFFLINE mode where the switch is disabled prior to executing the test; it tests and expects that all ports are cable loopbacked to similar ports in the same switch. If one or more ports are found not connected, it will complain and abort the test.

The test determines which port is connected to which port by transmitting frames. As such if any pair of ports are not properly connected for various reasons (improperly seated GBICs or cables, bad GBICs or cables, or improper connection of SWL to LWL, etc.), the test will complain with the following message in the telnet shell:

```
One or more ports is not active, please doublecheck fibres on all
        ports.
```

2 singlePortAlso mode:

The singlePortAlso mode is specified by executing crossPortTest with the second argument a value of 1 as follows:

```
sw:admin> crossPortTest 0, 1
```

In this mode, crossPortTest allows a port to be cable loopbacked to itself (port M is connected to port M) in addition to the cross connection supported (port M is connected to port N). This can be used to isolate bad ports.

3 GBIC mode:

The GBIC mode is activated by executing the following command prior to executing crossPortTest:

```
sw:admin> setGbicMode 1
```

When activated, only ports with GBICs present are included in the crossPortTest's list of ports to test. For example if only ports 0 and 3 are stuffed with GBICs and the GBIC mode is activated, crossPortTest limits its testing solely to ports 0 & 3.

The state of the GBIC mode is saved in flash. It stays activated (even after reboots or power cycles) until it is disabled as follows:

```
sw:admin> setGbicMode 0
```

An example mode of operation would be to disable the switch, set the GBIC mode to 1, and execute crossPortTest with singlePortAlso activated. The crossPortTest would then limit its testing to:

- only ports which are stuffed with GBICs
- all GBIC'ed ports properly cable loopbacked
- allow ports to be connected to itself (single port connections)

The command syntax is `crossPortTest <nFrames>, <0 or 1>`, where

- `<nFrames>` determines the number of frames to run

  If you do not include the `<nFrames>` parameter the test runs until you press Return.

- `<0 or 1>` determines if a single port looped back to itself is allowed:
  - `0` – default, not allowed
  - `1` – allowed

```
switch:admin> crossPortTest

Running Cross Port Test ............
switchName:     JR-6011
switchType:     3.1
switchState:    Testing
switchRole:     Disabled
switchDomain:   1 (unconfirmed)
switchId:       fffc01
switchWwn:      10:00:00:60:69:00:60:11
port  0: sw  Testing    Loopback->1
port  1: sw  Testing    Loopback->0
port  2: sw  Testing    Loopback->7
port  3: sw  Testing    Loopback->6
port  4: sw  Testing    Loopback->5
port  5: sw  Testing    Loopback->4
port  6: sw  Testing    Loopback->3
port  7: sw  Testing    Loopback->2

Port SNMP      Physical   Flags
--------------------------------
  0: Testing   In_Sync    PRESENT ACTIVE E_PORT G_PORT U_PORT SEGMENTED CBL_LB LOGIN
  1: Testing   In_Sync    PRESENT ACTIVE E_PORT G_PORT U_PORT SEGMENTED CBL_LB LOGIN
  2: Testing   In_Sync    PRESENT ACTIVE E_PORT G_PORT U_PORT SEGMENTED CBL_LB LOGIN
  3: Testing   In_Sync    PRESENT ACTIVE E_PORT G_PORT U_PORT SEGMENTED CBL_LB LOGIN
  4: Testing   In_Sync    PRESENT ACTIVE E_PORT G_PORT U_PORT SEGMENTED CBL_LB LOGIN
  5: Testing   In_Sync    PRESENT ACTIVE E_PORT G_PORT U_PORT SEGMENTED CBL_LB LOGIN
  6: Testing   In_Sync    PRESENT ACTIVE E_PORT G_PORT U_PORT SEGMENTED CBL_LB LOGIN
  7: Testing   In_Sync    PRESENT ACTIVE E_PORT G_PORT U_PORT SEGMENTED CBL_LB LOGIN
  8: Testing   UNKNOWN    PRESENT ACTIVE G_PORT
```

Figure 4-10 crossPortTest Command Example

Related error messages: DIAG-INIT, DIAG-PORTDIED, DIAG-XMIT, DIAG-TIMEOUT, DIAG-ERRSTAT, DIAG-STATS, DIAG-PORTWRONG, DIAG-DATA, DIAG-PORTABSENT

spinSilk

Figure 4-11 and Figure 4-12 shows the `spinSilk` command which is used to verify the intended functional operation of the switch by sending frames from each port's transmitter via the GBIC and external cable, and back to another port's receiver at the full hardware speed of 1Gb/s. It exercises the entire path of the switch.

Because the CPU is not comparing data on each frame as with the other two frame tests, the `DIAG-DATA` error is never reported during spinSilk. However, the other error messages defined for `crossPortTest` and their corresponding probable causes and actions are applicable to the spin silk test.

The operation of spinSilk is affected by the state of the GBIC mode. The GBIC mode is activated by executing the following command prior to executing crossPortTest:

```
switch:admin> setGbicMode 1
```

When activated, only ports with GBICs present are included in the spinSilk's list of ports to test. For example if only ports 0 and 3 are stuffed with GBICs and the GBIC mode is activated, spinSilk limits its testing solely to ports 0 & 3.

The state of the GBIC mode is saved in flash. It stays activated (even after reboots or power cycles) until it is disabled as follows:

```
sw:admin> setGbicMode 0
```

An example mode of operation would be to disable the switch, set the GBIC mode to 1, and execute spinSilk which would limit its testing to:

- only ports which are stuffed with GBICs
- all GBIC'ed ports must properly cable loopbacked

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

NOTE: *When running the Spin Silk Test, you must set the operating mode value to 0 or 1. Modes 2 and 3 do not send out the ELP used to discover switches. If the ELP is not sent, the switch does not know the port is connected to another port on the same switch and the test fails. Using operating mode 0 when running spinSilk is preferred.*

The command syntax is `spinSilk nMillions,` where:

- `nMillions` is the number of frames for the test to execute expressed in millions of frames.

If you do not include the `nMillions` parameter, the spinSilk test runs until <return> is pressed.

```
switch:admin> spinSilk 2

Running Spin Silk .............
One moment please ...
switchName:     SR-7371
switchType:     2.2
switchState:    Testing
switchRole:     Disabled
switchDomain:   1 (unconfirmed)
switchId:       fffc01
switchWwn:      10:00:00:60:69:00:73:71
port  0: cu  Testing    Loopback->15
port  1: sw  Testing    Loopback->11
port  2: sw  Testing    Loopback->7
port  3: lw  Testing    Loopback->4
port  4: lw  Testing    Loopback->3
port  5: sw  Testing    Loopback->9
port  6: sw  Testing    Loopback->14
port  7: sw  Testing    Loopback->2
port  8: sw  Testing    Loopback->13
port  9: sw  Testing    Loopback->5
port 10: sw  Testing    Loopback->12
port 11: sw  Testing    Loopback->1
port 12: sw  Testing    Loopback->10
port 13: sw  Testing    Loopback->8
port 14: sw  Testing    Loopback->6
port 15: cu  Testing    Loopback->0
Transmitting ... done.
Spinning ...
port 15 Rx/Tx 1 of 2 million frames.
port  0 Rx/Tx 1 of 2 million frames.
port  1 Rx/Tx 1 of 2 million frames.
port  2 Rx/Tx 1 of 2 million frames.
port  3 Rx/Tx 1 of 2 million frames.
port  4 Rx/Tx 1 of 2 million frames.
port  5 Rx/Tx 1 of 2 million frames.
port  6 Rx/Tx 1 of 2 million frames.
port  7 Rx/Tx 1 of 2 million frames.
port  8 Rx/Tx 1 of 2 million frames.
port  9 Rx/Tx 1 of 2 million frames.
port 10 Rx/Tx 1 of 2 million frames.
port 11 Rx/Tx 1 of 2 million frames.
port 12 Rx/Tx 1 of 2 million frames.
port 13 Rx/Tx 1 of 2 million frames.
port 14 Rx/Tx 1 of 2 million frames.
port  8 Rx/Tx 2 of 2 million frames.
port  9 Rx/Tx 2 of 2 million frames.
port 10 Rx/Tx 2 of 2 million frames.
port 11 Rx/Tx 2 of 2 million frames.
port 12 Rx/Tx 2 of 2 million frames.
port 13 Rx/Tx 2 of 2 million frames.
port 14 Rx/Tx 2 of 2 million frames.
port 15 Rx/Tx 2 of 2 million frames.
port  0 Rx/Tx 2 of 2 million frames.
port  1 Rx/Tx 2 of 2 million frames.
port  2 Rx/Tx 2 of 2 million frames.
port  3 Rx/Tx 2 of 2 million frames.
port  4 Rx/Tx 2 of 2 million frames.
port  5 Rx/Tx 2 of 2 million frames.
port  6 Rx/Tx 2 of 2 million frames.
port  7 Rx/Tx 2 of 2 million frames.
(SCREEN CONTINUED ON NEXT PAGE)
(SCREEN CONTINUED ON NEXT PAGE)
```

Figure 4-11 spinSilk Command Example 2 (Part 1)

```
Diagnostics Status:  Thu Jul 30 14:43:36 1998
port#:   0   1   2   3   4   5   6   7   8   9  10  11  12  13  14  15
diags:  OK  OK  OK  OK  OK  OK  OK  OK  OK  OK  OK  OK  OK  OK  OK  OK
state:  UP  UP  UP  UP  UP  UP  UP  UP  UP  UP  UP  UP  UP  UP  UP  UP
   lm0:    2044334 frTx    2053602 frRx          0  LLI_errs.  <looped-15>
   lm1:    2046987 frTx    2049307 frRx          0  LLI_errs.  <looped-11>
   lm2:    2046259 frTx    2050415 frRx          0  LLI_errs.  <looped-7>
   lm3:    2048907 frTx    2038532 frRx          0  LLI_errs.  <looped-4>
   lm4:    2038717 frTx    2049093 frRx          0  LLI_errs.  <looped-3>
   lm5:    2049555 frTx    2052277 frRx          0  LLI_errs.  <looped-9>
   lm6:    2048260 frTx    2047600 frRx          0  LLI_errs.  <looped-14>
   lm7:    2051407 frTx    2047246 frRx          0  LLI_errs.  <looped-2>
   lm8:    2055484 frTx    2048350 frRx          0  LLI_errs.  <looped-13>
   lm9:    2053018 frTx    2050297 frRx          0  LLI_errs.  <looped-5>
   lm10:   2048345 frTx    2048404 frRx          0  LLI_errs.  <looped-12>
   lm11:   2051282 frTx    2048962 frRx          0  LLI_errs.  <looped-1>
   lm12:   2048944 frTx    2048885 frRx          0  LLI_errs.  <looped-10>
   lm13:   2049535 frTx    2056672 frRx          0  LLI_errs.  <looped-8>
   lm14:   2049481 frTx    2050141 frRx          0  LLI_errs.  <looped-6>
   lm15:   2056950 frTx    2047666 frRx          0  LLI_errs.  <looped-0>

 Central Memory OK
 Total Diag Frames Tx: 130432
 Total Diag Frames Rx: 134752
```

Figure 4-12 spinSilk Command Example 2 (Continued)

Related error messages: DIAG-INIT, DIAG-PORTDIED, DIAG-XMIT, DIAG-PORTSTOPPED, DIAG-ERRSTAT, DIAG-ERRSTATS, DIAG-PORTABSENT

diagClearError

Figure 4-13 shows the `diagClearError` command which clears diagnostic errors detected on a specified port. The command syntax is `diagClearError <port #>`, without this parameter all errors are cleared.

NOTE: *Issuing this command does not clear the error log.*

```
switch:admin> diagClearError
```

Figure 4-13 diagClearError Command Example

diagDisablePost

Figure 4-14 shows the `diagDisablePost` command which disables POST processing. The boot time without POST processing is approximately 50 ~ 55 seconds (based on a SilkWorm 2800) for warm or cold boots. A switch rebooted without POST will generate the DIAG-POST_SKIPPED error.

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

```
switch:admin> diagDisablePost
Committing configuration...done.
On next reboot, POST will be skipped.
```

Figure 4-14 diagDisablePost Command Example

diagEnablePost

Figure 4-15 shows the `diagEnablePost` command which enables POST processing. The choice remains in effect across power cycles until toggled by the user. The boot time with POST processing is approximately 110 ~ 120 seconds for warm POST and 165 ~ 175 seconds (based on a SilkWorm 2800) for cold POST.The factory default enables POST processing.

```
switch:admin> diagEnablePost
Committing configuration...done.
On next reboot, POST will be executed.
```

Figure 4-15 diagEnablePost Command Example

diagShow

Figure 4-16 shows the `diagShow` command which summarizes the diagnostics results since the switch was last booted, including POST results. The fields are described in Table 4-3.

The command also allows you to loop on the command. For example, `diagShow 4` executes `diagShow` every 4 seconds continuously unless stopped by pressing Return. This may be used to isolate a bad GBIC. A port with a changing *LLI_errs* value is prefixed by `"**"` in the display. The example below shows 2 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:

NOTE: *Port 16 is the embedded port.*

```
switch:admin> diagShow

Diagnostics Status:  Sun Jan  1 00:00:00 2000

port#:   0   1   2   3   4   5   6   7   8   9  10  11  12  13  14  15
diags:  OK  OK  OK  OK  OK  OK  OK  OK  OK  OK  OK  OK  OK  OK  OK  OK
state:  UP  UP  UP  UP  UP  UP  UP  UP  UP  UP  UP  UP  UP  UP  UP  UP

lm0:   39624101 frTx   40128685 frRx          0  LLI_errs.  <looped-15>
lm1:   39309877 frTx   40007305 frRx          0  LLI_errs.  <looped-11>
lm2:   39750791 frTx   39885106 frRx          0  LLI_errs.  <looped-6>
lm3:   39501243 frTx   40065867 frRx          0  LLI_errs.  <looped-4>
lm4:   40066092 frTx   39501463 frRx          0  LLI_errs.  <looped-3>
lm5:   40075160 frTx   40257190 frRx          0  LLI_errs.  <looped-8>
lm6:   39886034 frTx   39751716 frRx          0  LLI_errs.  <looped-2>
lm7:   39989371 frTx   39960595 frRx          0  LLI_errs.  <looped-12>
lm8:   40257892 frTx   40075855 frRx          0  LLI_errs.  <looped-5>
lm9:   39154671 frTx   40250787 frRx          0  LLI_errs.  <looped-14>
lm10:  39767848 frTx   39798346 frRx          0  LLI_errs.  <looped-13>
lm11:  40009605 frTx   39312144 frRx          0  LLI_errs.  <looped-1>
lm12:  39961890 frTx   39990666 frRx          0  LLI_errs.  <looped-7>
lm13:  39799377 frTx   39768879 frRx          0  LLI_errs.  <looped-10>
lm14:  40252478 frTx   39156315 frRx          0  LLI_errs.  <looped-9>
lm15:  40132745 frTx   39628100 frRx          0  LLI_errs.  <looped-0>

Central Memory OK
Total Diag Frames Tx: 419264
Total Diag Frames Rx: 447200
```

Figure 4-16 diagShow Command Example

Table 4-4 diagShow Command Field Descriptions

FIELD	DESCRIPTION
Diagnostics Status	The title header displays the time diagShow was executed.
port#	The port number.
diags	Port's current diagnostic status. Possible values include OK, BAD.
state	Port's current state. Possible values include UP (active), DN (inactive).
lm0-7 (8-port) lm0-15 (16-port)	The frame counts of active ports. The display shows the number of frames transmitted and received and Low Level Interface counts (LLI_errs).
Central Memory Status	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.

setGbicMode

The GBIC mode, when enabled, forces `crossPortTest` or `spinSilk` to limit its testing to only those ports whose GBICs are detected present.

To enable GBIC mode, execute:

```
switch:admin> setGbicMode 1
```

Figure 4-17 setGbicMode 1 Command Example

To disable GBIC mode, execute:

```
switch:admin> setGbicMode 0
```

Figure 4-18 setGbicMode 0 Command Example

supportShow

`supportShow` prints the switch's information for debugging purposes. It executes the following commands in the order shown:

- version
- tempShow
- psShow
- licenseShow
- diagShow
- errDump
- switchShow
- portFlagsShow
- portErrShow
- mqShow
- portSemShow
- portShow
- portRegShow
- portRouteShow
- fabricShow
- topologyShow
- qlShow
- nsShow
- nsAllShow
- cfgShow
- configShow
- faultShow
- traceShow
- portLogDump

```
switch:admin> supportShow
VxWorks:  5.3.1

Firmware:  v2.0_beta3

Made on:   Fri Mar 19 16:29:55 PST 1999

Flash:     Fri Mar 19 16:30:19 PST 1999

BootProm:  Tue Dec 29 17:32:38 PST 1998

none:

No licenses

28   29   30   29   27  Centigrade

82   84   86   84   80  Fahrenheit

Power Supply #1 is absent

Power Supply #2 is OK
```

Figure 4-19 supportShow Command Example

Command syntax: `supportShow <firstPort>, <lastPort>, <numLog>`

Table 4-5 supportShow Field Descriptions

FIELD	DESCRIPTION
firstPort	First port of range of ports to dump information. The default (if no operand is specified) is to print state of port 0. If only firstPort is specified, only the info for firstPort is printed.
lastPort	Last port of range of ports to dump info. If firstPort is specified but lastPort is not specified, it defaults to printing firstPort only for the port based commands (portShow, portRegShow, portRouteShow).
nLog	Number of lines of portLogDump to print: 0 means dump all lines (default) N means dump the last N lines <0 means skip portLogDump

Diagnostic Error Messages

Error messages are stored in volatile RAM and are lost whenever power is removed from the switch. Access the error message log to view error messages before removing power from the switch.

Error messages are available both via the switch's front panel RS-232 serial port and through a Telnet session. These messages are also stored in the system log and are displayed when the `errShow` command is executed.

NOTE: *If you run the `portStatsShow` or the `diagShow` command prior to running a test on the switch, errors may appear as a result of the normal synchronization process. These errors should be addressed if the number of errors found increases when running the `portStatsShow` command again.*

Where multiple probable cause and corrective actions are listed following an error message, they are listed with the most probable first and the least probable last.

If any port fails during a diagnostic test, it is marked `BAD` in the status display and is ignored (not tried) until the system is rebooted.

To re-test a port which has been marked `BAD`, clear the port and set to OK using the `diagClearError (port#)` command. This command clears the port status only and does not clear the logs or change the port's condition. The `diagClearError (port#)` command should only be used during diagnostic procedures to reset a bad port for re-test.

For more detailed error message information, see Appendix C, *Error Messages*.

A

GLOSSARY

The following terms relate to the switch and Fibre Channel connections.

Definition of Terms

Alias Server — A Fabric software facility that supports multicast group management.

Arbitrated Loop — The FC Arbitrated Loop (FC-AL) is a standard defined on top of the FC-PH standard. It defines the arbitration on a loop where several FC nodes share a common medium.

Community (SNMP) — An SNMP community is a relationship between an SNMP agent and a set of SNMP managers that defines authentication, access control, and proxy characteristics.

Credit — Credit, applied to a switch, is a numeric value that represents the maximum number of receive buffers provided by an F_Port or FL_Port to its attached N_Port or NL_Port respectively such that the N_Port or NL_Port may transmit frames without over-running the F_Port or NL_Port.

Class 2 — In Class-2 service, the Fabric and destination N_Port provide connectionless service with notification of delivery or nondelivery between the two N_Ports.

Class 3 — Class-3 service provides a connectionless service without notification of delivery between N_Ports. The transmission and routing of Class-3 frames is the same as for Class-2 frames.

Domain_ID — The domain number uniquely identifies the switch in a Fabric. This switch domain ID is normally automatically assigned by the switch and may be any value between 0 and 31. This number may also be assigned manually.

E_Port — A port is designated an E_Port when it is used as an interswitch expansion port to connect to the E_Port of another switch to build a larger switch Fabric.

E_D_TOV (Error Detect Time Out Value) — E_D_TOV (Error-Detect Time-Out Value) defines the time the switch waits for an expected response before declaring an error condition.

Fabric — The name applied to a network resulting from the interconnection of switches and devices comprised of high-speed fiber connections. A Fabric is an active, intelligent, nonshared interconnect scheme for nodes.

FL_Port — The FL_Port is the Fabric access port used to connect NL_Ports to the switch in a loop configuration.

F_Port — The F_Port is the Fabric access port used to connect an N_Port.

FSPF — Fibre-Channel shortest path first.

GBIC — Gigabit Interface Converter. A removable serial transceiver module designed to provide gigabaud capability for Fibre Channel (FC) and other protocols that use the same physical layer.

G_Port — A G_Port is a generic switch port that can operate either as an E_Port or an F_Port. A port is defined as a G_Port, for example, when it completes Link Initialization Protocol after entering the OLD_Port state.

Interswitch Link (ISL)	ISL is a fiber link between two switches
Loop	A loop is a configuration of devices (for example, JBODs) connected to the Fabric via and FL_Port interface card.
Multicast	Multicast is used when multiple copies of data are to be sent to designated multiple destinations.
N_Port	The N_Port is the designation of an equipment port connected to the Fabric.
NL_Port	The NL_Port is the designation of an equipment port connected to the Fabric in a loop configuration via an FL_Port.
Power-on self-test (POST)	The POST is a series of self-tests which run each time the unit is booted or reset.
R_A_TOV (Resource Allocation Time Out Value)	R_A_TOV is used to time out operations that depend on the maximum possible time that a frame could be delayed in a Fabric and still be delivered.
Isolated E_Port	ISL is online but not operational between switches because of overlapping domain ID or nonidentical parameters such as E_D_TOVs.
Simple Network Management Protocol (SNMP)	SNMP is a TCP/IP protocol that generally uses the User Datagram Protocol (UDP) to exchange messages between a management information base and a management client residing on a network. Since SNMP does not rely on the underlying communication protocols, it can be made available over other protocols, such as UDP/IP.
SNMPv1	The original standard for SNMP is now referred to as SNMPv1.
Tachyon	Fibre Channel controller that focuses on arbritrated loop topologies for cost-effective Fibre Channel mass storage designs. TACHYON family architecture is a complete hardware-based design that delivers on the true performance capabilities of Fibre Channel.
Trap (SNMP)	A trap is a mechanism for SNMP agents to notify the SNMP management station of significant events.
Unicast	Unicast routing provides one or more optimal path(s) between any of two switches that make up the Fabric. This is for a single copy of the data to be sent to designated destinations.
U-Port	A U_Port is a generic switch port that can operate either as an E_Port, F_Port or FL_Port. A port is defined as a U_Port, for example, when it is not connected or has not yet assumed a specific function in the Fabric.
Worldwide Name (WWN)	A WWN uniquely identifies a switch on local and global networks.

B

CUSTOMER SUPPORT

Support for your switch can be obtained from the supplier of your switch. Please contact the supplier to report hardware or software problems. The supplier is also the correct source for switch repairs or for supplying spare components.

Support Tool and Problem Reporting

Included in the switch software is a command that will provide a display of a variety of information that is helpful in diagnosing switch related problems. This command is: *suppportShow*. This command can be entered into a telnet session command window and the results should be saved and supplied to your support contact.

To assist your support team with diagnosing a resolution please have the following data available when you call for support:

- switches serial number
- error code(s)
- symptoms
- topology configuration
- output from *supportShow* command

Additionally, if you have a general switch question please have an open Telnet connection or front panel access prior to placing your telephone call.

Receiving Software Updates

Your switch supplier is also your source for software updates. Contact your switch supplier to obtain a maintenance update or upgrade for your switch software. When software is received it can be downloaded to the switch using the firmwareDownload command described in this manual. Utility programs that need to be installed on an NT or Windows 95 host to allow for download from those operating environments can be obtained by accessing the following url:

http://www.brocade.com/BrocMarket.nsf/Support/Mibs&Rsh

Download of new firmware is supported without any special utilities on most Unix host environments (the remote shell (rsh) and cat utilities are used in download).

SilkWorm MIBs and Trap Definitions

For detailed MIBs and Trap Definitions information see:

- MIB Definition Files
- Enterprise Specific Trap Definitions

Download the MIB definitions and Enterprise Traps Definition from:

http://www.brocade.com/BrocMarket.nsf/Support/Mibs&Rsh

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ERROR MESSAGES

This appendix explains the error message format and possible errors. This section includes:

- System error message formats
- Diagnostic error message formats
- Error message tables

System Error Message Formats

There is one error message format for the switch 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 64 messages are held in a buffer. If the 64 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 E-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 date and timestamp.

  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. In Figure 1, Error 02 represents a system error and Error 01 represents a diagnostic error. Only diagnostic errors are assigned error numbers.

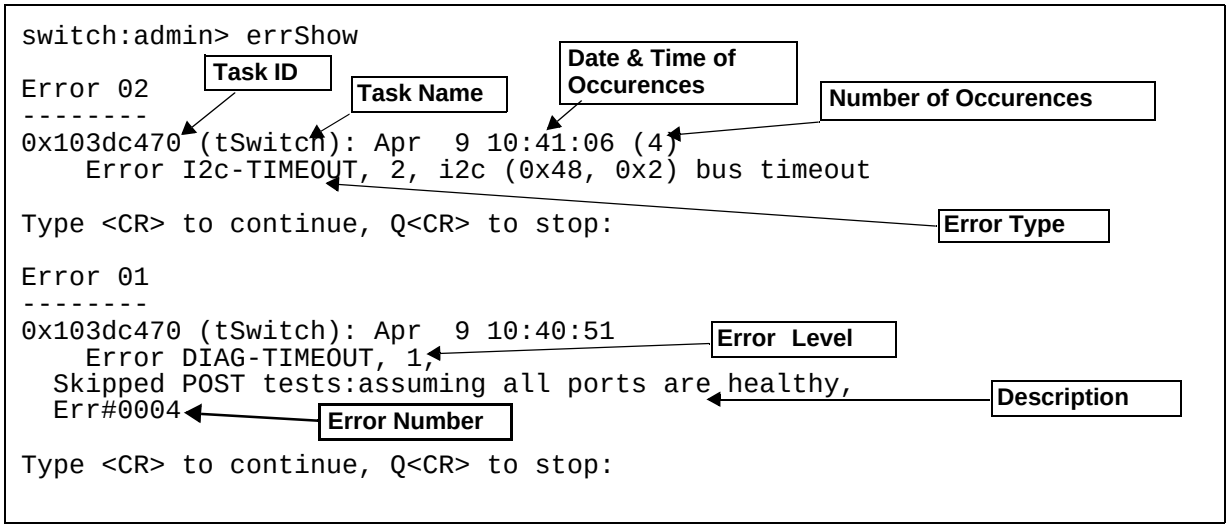

Figure E-1 errShow Command Example

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”).

Diagnostic Error Message Formats

If any port fails during a diagnostic test, it is marked BAD in the status display.

To retest a port which has been marked BAD, clear the port and set to OK using the `diagClearError (port#)` command. This command clears the port status only and does not clear the logs or change the port's condition. The `diagClearError (port#)` command should only be used during diagnostic procedures to reset a bad port for retest.

Some messages contain the following abbreviations:

- sb = Should Be
- er = Bits in error

NOTE: *If you run the `portStatsShow` or the `diagShow` command prior to running a test, errors may appear as a result of the normal synchronization process. These errors should be addressed if the number of errors found increases when running the `portStatsShow` command again.*

Table 1-1 Probable Failure Actions

FAILED TEST	ACTION
ramTest	replace DRAM module or mainboard assembly
portRegTest	replace mainboard assembly
centralMemoryTest	replace mainboard assembly
cmiTest	replace mainboard assembly
cmemRetentionTest	replace mainboard assembly
sramRetentionTest	replace mainboard assembly
camTest	replace mainboard assembly
portLoopbackTest	replace mainboard assembly
crossPortTest	replace mainboard assembly, GBIC or fiber cable
spinSilk	replace mainboard assembly, GBIC or fiber cable

Error Message Numbers

An error number ERR#xxxx appears at the end of an error message. Table 1-2 matches each error number with the test that caused the error and the name of the error. Look up the complete definition of the error name and the actions that will correct it in Table 1-3.

Table 1-2 Error Message Codes Defined

ERROR NUMBER	TEST NAME	ERROR NAME
0001	n/a	DIAG-CLEAR_ERR
0004	n/a	DIAG-POST_SKIPPED
0B15	sramRetentionTest	DIAG-REGERR
0B16		DIAG-REGERR_UNRST
0B0F		DIAG-BUS_TIMEOUT
1F25	cmemRetentionTest	DIAG-LCMRS
1F26		DIAG-LCMTO
1F27		DIAG-LCMEM
0110	ramTest	DIAG-MEMORY
0111		DIAG-MEMSZ
0112		DIAG-MEMNULL
0415	portRegTest	DIAG-REGERR
0416		DIAG-REGERR_UNRST
040F		DIAG-BUS_TIMEOUT
1020	centralMemoryTest	DIAG-CMBISRTO
1021		DIAG-CMBISRF
1025		DIAG-LCMRS
1026		DIAG-LCMTO
1027		DIAG-LCMEM
1028		DIAG-LCMEMTX
1029		DIAG-CMNOBUF
102A		DIAG-CMERRTYPE
102B		DIAG-CMERRPTN
102C		DIAG-INTNOTCLR
103O		DIAG-BADINT
106F		DIAG-TIMEOUT

Table 1-2 Error Message Codes Defined(Continued)

ERROR NUMBER	TEST NAME	ERROR NAME
2030	cmiTest	DIAG-BADINT
2031		DIAG-INTNIL
2032		DIAG-CMISA1
2033		DIAG-CMINOCAP
2034		DIAG-CMIINVCAP
2035		DIAG-CMIDATA
2036		DIAG-CMICKSUM
223B	camTest	DIAG-CAMINIT
223C		DIAG-CAMSID
2640	portLoopbackTest	DIAG-ERRSTAT (ENCIN)
2641		DIAG-ERRSTAT (CRC)
2642		DIAG-ERRSTAT (TRUNC)
2643		DIAG-ERRSTAT (2LONG)
2644		DIAG-ERRSTAT (BADEOF)
2645		DIAG-ERRSTAT (ENCOUT)
2646		DIAG-ERRSTAT (BADORD)
2647		DIAG-ERRSTAT (DISCC3)
264F		DIAG-INIT
265F		DIAG-PORT_DIED
266E		DIAG-DATA
266F		DIAG-TIMEOUT
2660		DIAG-STATS(FTX)
2661		DIAG-STATS(FRX)
2662		DIAG-STATS(C3FRX)
2670		DIAG-PORTABSENT
2671		DIAG-XMIT

Table 1-2 Error Message Codes Defined(Continued)

ERROR NUMBER	TEST NAME	ERROR NAME
3040	crossPortTest	DIAG-ERRSTAT(ENCIN)
3041		DIAG-ERRSTAT(CRL)
3042		DIAG-ERRSTAT(TRUNC)
3043		DIAG-ERRSTAT(2LONG)
3044		DIAG-ERRSTAT(BADEOF)
3045		DIAG-ERRSTATENCOUT)
3046		DIAG-ERRSTAT(BADORD)
3047		DIAG-ERRSTAT(DISC3)
304F		DIAG-INIT
305F		DIAG-PORTDIED
3060		DIAG-STATS (FTX)
3061		DIAG-STATS (FRX)
3062		DIAG-STATS (C3FRX)
306E		DIAG-DATA
306F		DIAG-TIMEOUT
3070		DIAG-PORTABSENT
3071		DIAG-XMIT
3078		DIAG-PORTWRONG

Table 1-2 Error Message Codes Defined(Continued)

ERROR NUMBER	TEST NAME	ERROR NAME
384F	spinSilk	DIAG-INIT
385F		DIAG-PORTDIED
3840		DIAG-ERRSTAT (ENCIN)
3841		DIAG-ERRSTAT (CRC)
3842		DIAG-ERRSTAT (TRUNC)
3843		DIAG-ERRSTAT (2LONG)
3844		DIAG-ERRSTAT (BADEOF)
3845		DIAG-ERRSTAT (ENCOUT)
3846		DIAG-ERRSTAT (BADORD)
3847		DIAG-ERRSTAT (DISCC3)
3870		DIAG-PORTABSENT
3871		DIAG-XMIT
3874		DIAG-PORTSTOPPED

Error Message Tables

Table 1-3 DIAGNOSTIC ERROR MESSAGES

MESSAGE	DESCRIPTION	PROBABLE CAUSE	ACTION
DIAG-BADINT **Err#1030, 2030** [centralMemoryTest, cmiTest]	Port received an interrupt when not expecting one	ASIC failure	Replace mainboard assembly
DIAG-BUS_TIMEOUT **Err#0BoF, 4040F** [portRegTest, sramRetentionTest]	ASIC register or ASIC SRAM did not respond to an ASIC data access	ASIC failure	Replace mainboard assembly
DIAG-CAMINIT **Err#223B** [camTest]	Port failed to initialize due to one of the following reasons: • Switch not disabled • Diagnostic queue absent • Malloc failed • Chip is not present • Port is not in loopback mode • Port is not active	Software operational setup error or mainboard failure	Retry, reboot or replace mainboard assembly
DIAG-CAMSID **Err#223C** [camTest]	ASIC failed SID NO translation test.	ASIC failure	Replace mainboard assembly
DIAG-CLEAR_ERR **Err#0001**	Port's diag error flag (OK or BAD) is cleared.	Informational Only	None required
DIAG-CMBISRF **Err#1021** [centralMemoryTest]	ASIC's Central Memory SRAMs did not complete the BISR within the timeout period	ASIC failure	Replace mainboard assembly
DIAG-CMBISRTO **Err#1020** [centralMemoryTest]	ASIC's Central Memory SRAMs did not complete the BISR within the timeout period	ASIC failure	Replace mainboard assembly
DIAG-CMERRPTN **Err#102B** [centralMemoryTest]	Error detected at the wrong port	ASIC failure	Replace mainboard assembly
DIAG-CMERRTYPE **Err#102A** [centralMemoryTest]	Port got the wrong CMEM error type	ASIC failure	Replace mainboard assembly
DIAG-CMICKSUM **Err#2036** [cmiTest]	CMI message received failed bad checksum test.	ASIC or mainboard failure	Replace mainboard assembly

Table 1-3 DIAGNOSTIC ERROR MESSAGES(Continued)

MESSAGE	DESCRIPTION	PROBABLE CAUSE	ACTION
DIAG-CMIDATA **Err#2035** [cmiTest]	CMI data received did not match data transmitted	ASIC or mainboard failure	Replace mainboard assembly
DIAG-CMIINVCAP **Err#2034** [cmiTest]	Unintended ASIC erroneously got CMI capture flag	ASIC or mainboard failure	Replace mainboard assembly
DIAG-CMINOCAP **Err#2033** [cmiTest]	CMI intended receiver ASIC failed to get CMI capture flag.	ASIC or mainboard failure	Replace mainboard assembly
DIAG-CMISA1 **Err#2032** [cmiTest]	An attempt to send a CMI message from ASIC to ASIC failed.	ASIC failure	Replace mainboard assembly
DIAG-CMNOBUF **Err#1029** [centralMemoryTest]	Port could not get any buffer	ASIC failure	Replace mainboard assembly
DIAG-DATA **Err#266E, 306E** [portLoopbackTest, crossPortTest]	Payload received by port did not match payload transmitted.	mainboard, GBIC module or fiber cable failure	Replace mainboard assembly, GBIC module or fiber cable
DIAG-ERRSTAT **Err#2640-2647, 3040-3047, 3840-3847** [portLoopbackTest, crossPortTest, spinSilk]	Port Error Statistics counter is non-zero, meaning an error was detected when receiving frames. One of the following status errors occurred. • **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	ASIC, mainboard, GBIC module or fiber cable failure	Replace mainboard assembly, GBIC module or fiber cable
DIAG-INIT **Err#264F, 304F, 384F** [portLoopbackTest, crossPortTest, spinSilk]	Port failed to go active in the loopback mode requested.	ASIC, mainboard, GBIC module or fiber cable failure	Replace mainboard assembly, GBIC module or fiber cable

Table 1-3 DIAGNOSTIC ERROR MESSAGES(Continued)

MESSAGE	DESCRIPTION	PROBABLE CAUSE	ACTION
DIAG-INTNIL **Err#2031** [cmiTest]	ASIC failed to get a CMI error (interrupt)	ASIC failure	Replace mainboard assembly
DIAG-INTNOTCLR **Err#102C** [centralMemoryTest]	The interrupt bit could not be cleared.	ASIC failure	Replace mainboard assembly
DIAG-LCMEM **Err#1027** [centralMemoryTest, cmemRetentionTest]	Data read from the Central Memory location did not match data previously written into the same location	ASIC failure	Replace mainboard assembly
DIAG-LCMEMTX **Err#1F27, 1028** [centralMemoryTest]	Central Memory transmit path failure: ASIC 1 failed to read ASIC 2 via the transmit path	mainboard failure	Replace mainboard assembly
DIAG-LCMRS **Err#1F25, 1025** [centralMemoryTest, cmemRetentionTest]	Central Memory Read Short: M bytes requested but got less than M bytes	ASIC failure	Replace mainboard assembly
DIAG-LCMTO **Err#1F26, 1026** [centralMemoryTest, cmemRetentionTest]	Central Memory Timeout: Data transfer initiated did not complete within the timeout period.	ASIC failure	Replace mainboard assembly
DIAG-MEMNULL **Err#0112** [ramTest]	Test failed to malloc.	mainboard failure	Replace mainboard assembly
DIAG-MEMSZ **Err#0111** [ramTest]	Memory size to be tested is less than or equal to zero	mainboard failure	Replace mainboard assembly
DIAG-MEMORY **Err#0110** [ramTest]	Data read from RAM location did not match previously written data into same location	CPU RAM failure	Replace mainboard assembly or DRAM module
DIAG-PORTABSENT **Err#2670, 3070, 3870** [portLoopbackTest, crossPortTest, spinSilk]	Port is not present	ASIC or mainboard failure	Replace mainboard assembly
DIAG-PORTDIED **Err#265F, 305F, 385F** [portLoopbackTest, crossPortTest, spinSilk]	Port was in loopback mode and then went inactive	ASIC, GBIC module or fiber cable failure	Replace mainboard assembly, GBIC module or fiber cable

Table 1-3 DIAGNOSTIC ERROR MESSAGES(Continued)

MESSAGE	DESCRIPTION	PROBABLE CAUSE	ACTION
DIAG-PORTSTOPPED **Err#3874** [spinSilk]	Port is no longer transmitting, as indicated by the Number Of Frames Transmitted counter being stuck at N frames.	ASIC, GBIC module or fiber cable failure	Replace mainboard assembly, GBIC module or fiber cable
DIAG-PORTWRONG **Err#3078** [crossPortTest]	Frame erroneously received by port M instead of the intended port N	ASIC failure	Replace mainboard assembly
DIAG-POST_SKIPPED **Err# 0004** [switch initialization]	POST is skipped. It's message recommended that POST be executed.	Informational Only	None required
DIAG-REGERR **Err#0B15, 0415** [portRegTest, sramRetentionTest]	Data read from ASIC register or ASIC SRAM did not match data previously written into same location	ASIC failure	Replace mainboard assembly
DIAG-REGERR_UNRST **Err#0B16, 0416** [portRegTest, sramRetentionTest]	Port failed to unreset.	ASIC failure	Replace mainboard assembly
DIAG-STATS **Err#2660-2662, 3060 - 3062** [portLoopback Test, crossPortTest]	Port counter value did not match the number of frames actually transmitted. Possible counters reporting: • FramesTx - number of frames transmitted • FramesRx - number of frames received • Cl3FrmRx - number of Class 3 frames received	ASIC, GBIC module or fiber cable failure	Replace mainboard assembly, GBIC module or fiber cable
DIAG-TIMEOUT **Err#266F, 306F, 386F** [portLoopbackTest, crossPortTest, centralMemoryTest]	For portLoopbackTest and crossPortTest: Port failed to receive frame within timeout period For centralMemoryTest: Port failed to detect an interrupt within the timeout period.	ASIC, GBIC module or fiber cable failure	Replace mainboard assembly, GBIC module or fiber cable
DIAG-XMIT **Err#2271, 2671, 3071, 3871** [portLoopbackTest, crossPortTest, spinSilk, camTest]	Port failed to transmit frame	ASIC failure	Replace mainboard assembly

Table 1-4 System Error Messages

Message	Description	Probable Cause	Action
CONFIG CORRUPT	The switch configuration information has become irrevocably corrupted.	OS error	The system automatically resorts to the default configuration settings.
CONFIG OVERFLOW	The switch configuration information has grown too large to be saved or has an invalid size.	OS error	Contact customer support.
CONFIG VERSION	The switch has encountered an unrecognized version of the switch configuration.	OS error	The system automatically resorts to the default configuration settings.
FABRIC, SEGMENTED, LOG_WARNING	Fabric segmented.	• Incompatible fabric parameters/ switches • Conflict zones	Reconfigure fabric or zones. See *configure* on page 3-8
FABRIC, NO_ALIASID, LOG_WARNING	No free multicast alias	Too many multicast groups in use	Remove some of the groups.
FABRIC, BADILS, LOG_WARNING	Bad ISL-ELS size	The ISL-ELS payload is wrong.	Contact customer support
FLASH, BAD_MIRROR, LOG_WARNING	The system's flash memory has encountered an error.	OS error	The system attempts to recover from its mirrored backup. Contact customer support.
RPC, SVC_EXIT	An RPC service daemon has terminated prematurely or unexpectedly.	OS error	Contact customer support.
RPC, SVC_REG	An RPC service daemon could not establish service for a particular protocol handler.	OS error	Contact customer support.
TEMP, 1_FAILED, LOG_WARNING	Switch overheated	Fan Failure	Contact customer support.
TEMP, 2_FAILED, LOG_ERROR	Switch overheated	Fan Failure	Contact customer support.
TEMP, 3_FAILED, LOG_CRITICAL	Switch overheated	Fan Failure	Contact customer support.

Table 1-4 System Error Messages(Continued)

Message	Description	Probable Cause	Action
TEMP, 4_FAILED, LOG_CRITICAL	Switch overheated	Fan Failure	Contact customer support.
TEMP, 5_FAILED, LOG_CRITICAL	Switch overheated	Fan Failure	Contact customer support.
FANS, 1_FAILED, LOG_WARNING	Switch overheated	Fan Failure	Contact customer support.
FANS, 2_FAILED, LOG_ERROR	Switch overheated	Fan Failure	Contact customer support.
FANS, 3_FAILED, LOG_CRITICAL	Switch overheated	Fan Failure	Contact customer support.
FANS, 4_FAILED, LOG_CRITICAL	Switch overheated	Fan Failure	Contact customer support.
FANS, 5_FAILED, LOG_CRITICAL	Switch overheated	Fan Failure	Contact customer support.
FANS, 6_FAILED, LOG_CRITICAL	Switch overheated	Fan Failure	Contact customer support.
POWER, 1_FAILED, LOG_CRITICAL	Switch Power Failure	Power Supply Failure	Contact customer support.
POWER, 2_FAILED, LOG_CRITICAL	Switch Power Failure	Power Supply Failure	Contact customer support.
FCIU, IUBAD, L, S	Invalid IU	OS error	Contact customer support
FCIU, IUCOUNT, L, S	Total number of IUs Count < 0	OS error	Contact customer support
FCPH, EXCHBAD, L, S	Bad exchange	OS error	Contact customer support
FCPH, EXCHFREE, L, S	Unable to free an exchange	OS error	Contact customer support
MQ, QWRITE, L, M	Message queue overflow	Task blocked	Contact customer support
MQ, QREAD, L, M	Message queue unread	OS error	Contact customer support
MQ, MSGTYPE, E, M	Unknown message type	OS error	Contact customer support
SEMA, SEMGIVE, L, M	Unable to give a semaphore	OS error	Contact customer support
SEMA, SEMTAKE, L, M	Unable to take a semaphore	OS error	Contact customer support
SEMA, SEMFLUSH, L, M	Unable to flush a semaphore	OS error	Contact customer support

Table 1-4 System Error Messages(Continued)

Message	Description	Probable Cause	Action
PANIC, TASKSPAWN, LOG_PANIC	task creation failed	OS error	Contact customer support
PANIC, SEMCREATE, LOG_PANIC	Semaphore creation failed	OS error	Contact customer support
PANIC, SEMDELETE, LOG_PANIC	Semaphore deletion failed	OS error	Contact customer support
PANIC, QCREATE, LOG_PANIC	Message queuer failed	OS error	Contact customer support
PANIC, QDELETE, LOG_PANIC	Message queuer deletion failed	OS error	Contact customer support
PANIC, MALLOC, LOG_PANIC	Memory allocation failed	OS error	Contact customer support
PANIC, FREE, LOG_PANIC	Memory free failed	OS error	Contact customer support
PANIC, INCONSISTENT, LOG_PANIC	Data out of sync	OS error	Contact customer support
PANIC, INTCONTEXT, LOG_PANIC	Data out of sync	OS error	Contact customer support
PANIC, ZOMTIMSET, LOG_PANIC	Attempt to set a zombie timer	OS error	Contact customer support
PANIC, ZOMTIMKILL, LOG_PANIC	Zombie timer destroyed	OS error	Contact customer support
PANIC, FREETIMRLSD, LOG_PANIC	Free timer released	OS error	Contact customer support
PANIC, TIMEUSECNT, LOG_PANIC	Timer use count exceeded	OS error	Contact customer support
PANIC, LSDB_CKSUM, LOG_PANIC	Link State Database checksum failed	OS error	Contact customer support
SYS, NOMEM, LOG_CRITICAL	No memory	OS error	Contact customer support
SYS, SYSCALL, LOG_ERROR	System call failed	OS error	Contact customer support
SYS, BADPTR, LOG_ERROR	Bad system pointer	OS error	Contact customer support
SYS, INTRPT, LOG_CRITICAL	Bad system interrupt	OS error	Contact customer support
SYS, FLASHRD, LOG_ERROR	FLASH memory read error	OS error	Contact customer support
SYS, FLASHWR, LOG_ERROR	FLASH memory write error	OS error	Contact customer support

Table 1-4 System Error Messages(Continued)

Message	Description	Probable Cause	Action
TIMERS, ENQFAIL, LOG_CRITICAL	Invalid timeout value	OS error	Contact customer support
TIMERS, MSG,LOG_WARNING	Invalid message	OS error	Contact customer support
FLANNEL, PHANTOM, LOG_WARNING	Port's PLT limit exceeded	OS error	Contact customer support
ASIC, MINI_BUFFER, LOG_WARNING	ASIC Failure	Bad mainboard	Contact customer support
LSDB, LSID, LOG_ERROR	Link State ID 'd out of range	OS error	Contact customer support.
LSDB, NOLOCALENTRY, LOG_CRITICAL	No database entry for local Link State Record	OS error	Contact customer support.
LSDB, NOLSR, LOG_WARNING	No Link State Record for domain	OS error	Contact customer support.
LSDB, MAXINCARN, LOG_WARNING	Local Link State Record reached max incarnation	OS error	Contact customer support.
FLOOD, INVLSU, LOG_WARNING	Discard received LSU	OS error	Contact customer support.
FLOOD, INVLSR, LOG_WARNING	Unknown LSR type	OS error	Contact customer support.
FLOOD, LSRLEN, LOG_ERROR	Excessive LSU length	OS error	Contact customer support.
HLO, INVHLO, LOG_ERROR	Invalid Hello received from port	OS error	Contact customer support.
HLO, HLOTIMEOUT, LOG_ERROR	Incompatible Hello timeout from port	OS error	Contact customer support.
HLO, DEADTIMEOUT, LOG_ERROR	Incompatible Inactivity timeout from port	OS error	Contact customer support.
FSPF, SCN, LOG_WARNING	Illegal SCN	OS error	Contact customer support.
FSPF, NBRCHANGE, LOG_WARNING	Wrong neighbor ID in Hello message from port	OS error	Contact customer support.
FSPF, INPORT, LOG_ERROR	Input port out of range	OS error	Contact customer support.
FSPF, VERSION, LOG_ERROR	FSPF version not supported	OS error	Contact customer support.
FSPF, SECTION, LOG_ERROR	Wrong Section Id	OS error	Contact customer support.

Table 1-4 System Error Messages(Continued)

Message	Description	Probable Cause	Action
FSPF, REMDOMAIN, LOG_ERROR	Remote Domain ID out of range	OS error	Contact customer support.
NBFSM, NGBRSTATE, LOG_ERROR	Wrong input to neighbor FSM	OS error	Contact customer support.
MCAST, ADDPORT, LOG_WARNING	Add port failed	OS error	Contact customer support.
MCAST, REMPORT, LOG_WARNING	Remove port failed	OS error	Contact customer support.
MCAST, ADDBRANCH, LOG_ERROR	Add branch failed	OS error	Contact customer support.
MCAST, REMBRANCH, LOG_ERROR	Remove branch failed	OS error	Contact customer support.
MCAST, NOPARENT, LOG_ERROR	Null parent	OS error	Contact customer support.
MCAST, NOPARENTLSR, LOG_ERROR	Null lsrP	OS error	Contact customer support.
UCAST, ADDPATH, LOG_CRITICAL	Add path failed	OS error	Contact customer support.
UCAST, ADDPORT, LOG_WARNING	Add port failed	OS error	Contact customer support.
UCAST, REMPORT, LOG_WARNING	Remove port failed	OS error	Contact customer support.
UCAST, RRTIM, LOG_CRITICAL	Invalid reroute timer ID	OS error	Contact customer support.
UCAST, SPFCOST, LOG_WARNING	No minimum cost path in candidate	OS error	Contact customer support.
UCAST, RELICPDB, LOG_WARNING	Relic PDB to Domain	OS error	Contact customer support

INDEX

Symbols

A

B

C

D

E

F

G

H

I

L