

# **HP 12-Port 4X Fabric Copper Switch Support Guide**

## **HP-UX Server Networking**

**for HP Fabric Clustering System version 1.0**



**Manufacturing Part Number: AB286-90002**

**April 2004**

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## About This Document

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## Intended Audience

This document is not a tutorial.

## New and Changed Documentation in This Edition

The HP Fabric Clustering System is a new product.

## Publishing History

**Table 1** Publishing History Details

Document Manufacturing Part Number	Operating Systems Supported	Supported Product Versions	Publication Date
AB286-90002	11i v2	1.0	April 2004

## What's in This Document

- Chapter 1 Introduction to Technology provides a brief and high-level overview of the HP Fabric for InfiniBand™ clustering system, the HP Fabric Clustering System architecture.
- Chapter 2 **Hardware Overview** provides detailed information on the adapter, switch and cable hardware components of the HP Fabric Clustering System.
- Chapter 3 **Installation Planning** contains installation information for HP Fabric Clustering System, including; Overview, HP Fabric Clustering System Product, Planning the Fabric, and IPoIB.
- Chapter 4 **Installing HP Fabric Clustering System** provides the installation procedure for the HP Fabric Clustering System, and installs the Switch, Host Channel Adapter (HCA), cables, cable guide, and gets the system up and running.
- Chapter 5 **Administration and Management** discusses the administration and management of your HP Fabric Clustering System.
- Chapter 6 **Monitoring and Troubleshooting** discusses monitoring and troubleshooting your HP Fabric Clustering System.
- Appendix A **Specifications** details the HP 12-port 4x Fabric Copper Switch specifications.
- Appendix B **HP 12-Port 4X Fabric Copper Switch Commands** details some of the commands available to manage the switch.

Appendix C      **How to Use Windows HyperTerminal** provides information to allow you to remotely administer and manage your HP Fabric Clustering System Copper Switch from a Windows system.

## Typographical Conventions

This document uses the following conventions.

<i>audit</i> (5)	An HP-UX manpage. In this example, <i>audit</i> is the name and <i>5</i> is the section in the <i>HP-UX Reference</i> . On the web and on the Instant Information CD, it may be a hot link to the manpage itself. From the HP-UX command line, you can enter “man <i>audit</i> ” or “man <i>5 audit</i> ” to view the manpage. See <i>man</i> (1).
<i>Book Title</i>	The title of a book. On the web and on the Instant Information CD, it may be a hot link to the book itself.
<b>KeyCap</b>	The name of a keyboard key. Note that <b>Return</b> and <b>Enter</b> both refer to the same key.
<i>Emphasis</i>	Text that is emphasized.
<b>Bold</b>	Text that is strongly emphasized.
<b>Bold</b>	The defined use of an important word or phrase.
ComputerOut	Text displayed by the computer.
<b>UserInput</b>	Commands and other text that you enter.
Command	A command name or qualified command phrase.
<i>Variable</i>	The name of a variable that you may replace in a command or function or information in a display that represents several possible values.
[ ]	The contents are optional in formats and command descriptions. If the contents are a list separated by  , you must choose one of the items.
{ }	The contents are required in formats and command descriptions. If the contents are a list separated by  , you must choose one of the items.
...	The preceding element may be repeated an arbitrary number of times.
	Separates items in a list of choices.

## Related Documents

Additional information about HP Fabric Clustering System for InfiniBand can be found within *docs.hp.com* in the *networking and communications* collection, under *Fabric Clustering System for InfiniBand*.

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# 1 Introduction to Technology

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## Understanding the HP Fabric Clustering System

### HP Fabric Clustering System

The HP Fabric Clustering System provides a high-performance InfiniBand computing environment intended for use for applications sensitive to latency, bandwidth, and CPU-consumption.

InfiniBand is an RDMA-interconnect. Remote Direct Memory Access (RDMA) technology allows cooperating endnodes to expose their local memory buffers for direct data placement by peer endnodes (including loop back operation) over reliable communication fabrics (fabrics may be internal, such as an endnode backplane, or external, such as an I/O attached device / fabric). RDMA technology reduces the performance constraints imposed by memory subsystem bottlenecks on networked computing systems.

Readers are advised also to consult the InfiniBand specifications found at <http://www.infinibandta.org> for more information on the technology.

## Understanding InfiniBand

This section provides a brief and high-level overview of the InfiniBand architecture.

### What is InfiniBand?

InfiniBand is supported by HP as a fabric for high-performance technical computing clusters.

InfiniBand is a point-to-point, switched I/O fabric architecture. It was created to meet the increasing demands of the data center, and allows data centers to harness server computing power by delivering an I/O fabric that provides reliable low latency communication both from one server to another server, and between server and their shared I/O resources.

InfiniBand technology refers to both a communications and management infrastructure that increases the communication speed between CPUs, devices within servers, and subsystems located throughout a network. It defines a switched communications fabric that allows many devices to concurrently communicate with high-bandwidth and low latency in a protected, easily managed environment.

### InfiniBand Advantages

Infiniband addresses four problems:

- Application to application latency.
- Application CPU consumption.
- Network bandwidth.
- Fabric Management.

### InfiniBand Capabilities

InfiniBand is a standard-based interconnect that enables:

- High-bandwidth, 10 Gbps connectivity
- Extremely low-latency Remote Direct Memory Access (RDMA)

### InfiniBand Transport Services

The InfiniBand transport-service types include:

- Reliable Connection
- Unreliable Connection
- Reliable Datagram
- Unreliable Datagram

HP only supports Reliable Connected and Unreliable Datagram transports in its fabric product.

## Fabric Subnet Manager

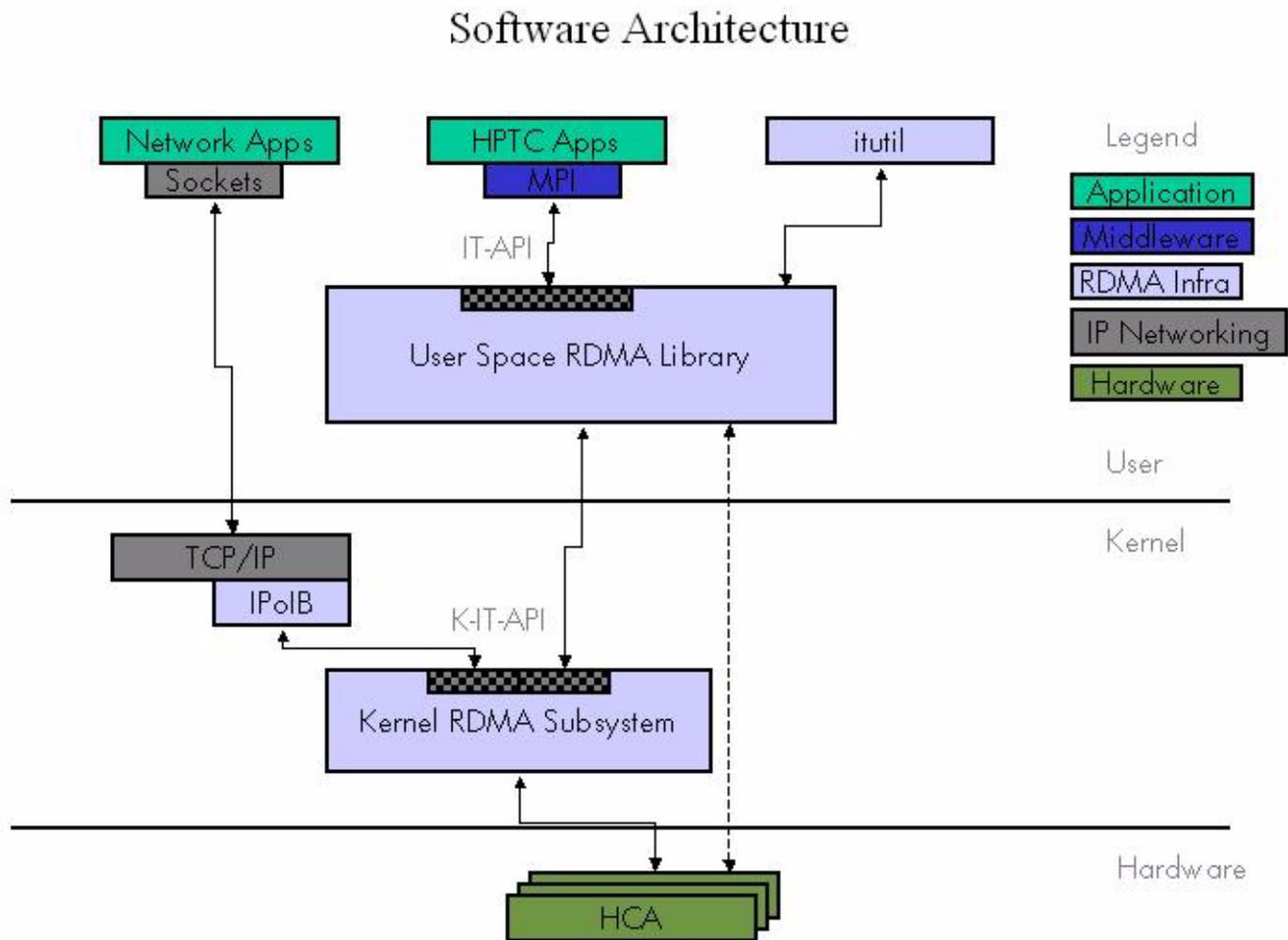
The fabric Subnet Manager (SM) configures and maintains fabric operations. There can be multiple Subnet Managers, but only one master. HP supports the use of an SM on the switch as well as a host-based SM used only for point-to-point configurations.

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## About the HP Fabric Clustering System Software Suite

The HP Fabric Clustering System Software Suite supports the following upper-layer protocols: MPI and IPoIB. The following is an architectural drawing of an InfiniBand software stack for HP-UX called HP Fabric Clustering System.

**Figure 1-1** HP Fabric Clustering System Software Architecture



## **MPI**

MPI stands for Message-Passing Interface, an industry standard for developing portable message-passing applications. HP MPI provides developers of technical applications with an application programming interface (API) and software library to support parallel, message-passing applications that are efficient, portable and flexible.

For more information on HP MPI, consult <http://www.hp.com/go/mpi>.

## **IPoIB**

For more information on IPoIB, consult <http://www.ietf.org/html.charters/ipoib-charter.html>.

IPoIB allows the IP applications to utilize the HP Fabric Clustering System. IPoIB is configured like a normal Ethernet interface. During the installation process, IPoIB interfaces are automatically added to the network configuration. These correspond to the ports on the HCA.

## **Itutil**

The HP-UX Interconnect Transport utility, `itutil`, is a CLI (command line interface) to administer and manage HP-UX RDMA infrastructure and HP Fabric Clustering System.

## **IT-API**

The Interconnect Transport API, IT-API, is an industry standard API for RDMA-capable transports including InfiniBand.

For more information on IT-API, consult <http://www.opengroup.org/icsc>.

## **User-Space RDMA Library**

The User-Space RDMA Library exposes the IT-API interface and provides user-space access to the RDMA hardware. Support for HP Fabric Clustering System only is provided.

## **HCA**

The HP Fabric Clustering System Host Channel Adapter (HCA) for InfiniBand™ is the RDMA-capable network interface card.

## **Kernel RDMA Subsystem**

The Kernel RDMA Subsystem provides access to an extended IT-API for kernel applications such as IPoIB. Support for HP Fabric Clustering System only is provided.

---

## **2 Hardware Overview**

This chapter provides detailed information on the adapter, switch and cable hardware components of the HP Fabric Clustering System.

HP Fabric Clustering System hardware consists of host-based interface adapter cards, interconnect cables, and optional switches. HP Fabric Clustering System software consists of HP-UX drivers and user-space components as well as firmware on adapters and switches. Currently, copper-based cabling and connectors are supported on the fabric hardware.

---

## HP Fabric Clustering System Hardware Components

This section describes the various HP Fabric Clustering System products. For more information on HP Integrity server systems that support HP Fabric Clustering System products, see the *HP Fabric Clustering System Release Notes* available at <http://www.docs.hp.com/en/netcom.html#Fabric%20Clustering%20System%20for%20InfiniBand>.

---

**NOTE** This document uses the term **HP Fabric Clustering System** to refer to the hardware and software that form the HP Fabric Clustering System cluster interconnect product.

The term **HP Fabric Clustering System** refers to the following copper-based hardware components:

- AB286A HP PCI-X 2-port 4X Fabric (HPC) Adapter
- AB291A HP 12-port 4X Fabric Copper Switch
- The AB346A, AB353A, AB347A 4x Fabric Copper Cable

---

### Host Channel Adapter

The Host Channel Adapter (HCA) is as follows:

- AB286A PCI-X 133Mhz adapter with 2 (two) 4X Fabric copper interfaces

**Figure 2-1** Host Channel Adapter



## Switch

The switch is as follows:

- AB291A 12-port 4X Fabric Copper Switch

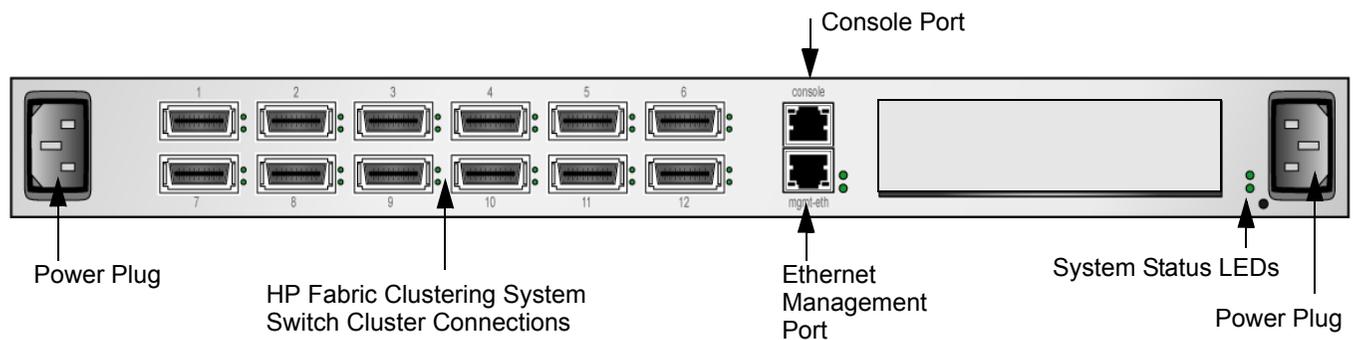
**Figure 2-2 Switch Front**



**Figure 2-3 Rear View of Switch**



**Figure 2-4 Stylized View of Switch Connectors**



## Other Product Elements

Other elements of the HP Fabric Clustering System product family:

- HP 4X Fabric copper cables
  - AB346A 5 meter 4X Fabric Copper Cable
  - AB353A 7 meter 4X Fabric Copper Cable
  - AB347A 10 meter 4X Fabric Copper Cable
- The software consists of HP-UX drivers and user-space components as well as firmware on adapters and switches.
- The software supports Remote Direct Memory Access (RDMA). RDMA provides higher bandwidth, lower CPU overhead, and lower latency (the time a message takes to get from one point to another).

---

## **3 Installation Planning**

This document contains the following sections that give HP Fabric Clustering System installation information:

- Planning the Cluster

## Planning the Cluster

This section contains the following general guidelines and protocol-specific considerations for planning HP Fabric Clustering System clusters that run HP-MPI or TCP/UDP/IP applications.

- “Preliminary Considerations” on page 20
- “Features, Parameters and Supported Configurations for HP-MPI and TCP/UDP/IP Applications” on page 20

### Preliminary Considerations

Before assembling a fabric physically, do the following to address all of the appropriate issues:

- Step 1.** Read “What is InfiniBand?” on page 12, to get a basic understanding of InfiniBand and HP Fabric Clustering System components.
- Step 2.** Read this chapter, *Planning the Cluster*, to gain an understanding of protocol specific configuration guidelines for HP-MPI and TCP/UDP/IP applications.
- Step 3.** Decide the number of nodes that will be interconnected in the fabric.
- Step 4.** Decide the type of HP server for each node (for a list of supported HP servers, see the *HP Fabric Clustering System Release Notes* available at:  
<http://www.docs.hp.com/en/netcom.html#Fabric%20Clustering%20System%20for%20InfiniBand>.)
- Step 5.** Determine the network bandwidth requirements for each node.
- Step 6.** Determine the number of adapters needed for each node.
- Step 7.** Decide the topology of the fabric.
- Step 8.** Determine how many switches will be used based on the number of nodes in the fabric. The only configuration that can be supported without a switch is the point-to-point (node-to-node) configuration. HP Fabric Clustering System supports meshed switches:
- Step 9.** Draw the cable connections from each node to switches (if the fabric will contain switches).

### Features, Parameters and Supported Configurations for HP-MPI and TCP/UDP/IP Applications

The following sections in this chapter define HP Fabric Clustering System functionality for HP-MPI applications and TCP/UDP/IP applications.

### HP Fabric Clustering System Applications

InfiniBand is an industry standard high performance cluster and I/O interconnect architecture. HP Fabric Clustering System provides reliable, high speed, low latency, low CPU overhead, transport services to applications running on the HP-UX operating system.

InfiniBand was jointly developed by a large number of contributors. For details on InfiniBand, see the InfiniBand Trade Association (IBTA) web site, “<http://www.infinibandta.org>”.

When used as a clustering interconnect, InfiniBand significantly enhances the performance of parallel and technical computing applications.

HP Fabric Clustering System architecture provides a shortcut that bypasses several layers in the typical protocol stack, boosting link performance and lowering latency. By avoiding interruptions and buffer copying in the protocol stack, communication task processing is optimized.

The IETF has developed a draft standard that enables the use of TCP/IP and UDP/IP over HP Fabric Clustering System transports. The standard is referred to in this document as IPoIB.

### Application Availability

The following are the two families of applications that can use the HP Fabric Clustering System interface:

- Technical Computing Applications that use the HP Message Passing Interface (HP-MPI).  
HP MPI is a native implementation of version 2.0 of the Message-Passing Interface Standard. It has become the industry standard for distributed technical applications and is supported on most technical computing platforms.
- TCP/IP and UDP/IP Applications using the IETF IPoIB draft standard for IP protocol over InfiniBand transport.

### Supported Features

The following are HP Fabric Clustering System features:

Diagnostics: Supported

You can run diagnostics to obtain information on many of the components for HP Fabric Clustering System using the `itutil` command.

For information on HP Fabric Clustering System Switch diagnostics, see “Troubleshooting the HP Fabric Clustering System Network” on page 122.

### Non-Supported Features

The following are non-supported HP Fabric Clustering System features:

OnLine Addition and Replacement (OLAR): Not Supported

The OLAR feature, which allows the replacement or addition of adapter cards while the system (node) is running, is not supported for the HP Fabric Clustering System product.

ServiceGuard: Not Supported

Within a cluster, ServiceGuard groups application services (individual HP-UX processes) into packages. ServiceGuard requires a heartbeat LAN to monitor the nodes in a cluster. ServiceGuard is not supported for the HP Fabric Clustering System product.

High Availability (HA): Not Supported

No High Availability features are provided with the HP Fabric Clustering System product.

Transparent Local Failover: Not Supported

Link and/or adapter failure is terminal for applications running on the HP server node.

Dynamic Resource Utilization (DRU): Not Supported

Addition of new Fabric resources (node, cable or switch) to a cluster running an HP Fabric Clustering System application is not supported.

Load Balancing: Not Supported

The HP Fabric Clustering System product has no support capability to balance the load across all available resources in the cluster, including nodes, adapter cards, links, and multiple links between switches.

## Configuration Parameters

This section discusses the maximum limits for Fabric configurations. There are numerous variables that can impact the performance of any particular Fabric configuration. For more information on specific Fabric configurations for applications, see “Fabric Supported Configurations” on page 22.

- HP Fabric Clustering System is supported only on rx1600, rx2600, rx4640, rx5670, rx7620, rx8620, and Integrity Superdome servers running 64-bit HP-UX 11i.v2.

- Maximum Supported Nodes and Adapter Cards

HP recommends creating switched Fabric cluster configurations with a maximum of 64 nodes.

In point-to-point configurations running HP Fabric Clustering System applications, only two servers may comprise a cluster. More than one adapter card may be used per server, though.

---

**NOTE** HP-MPI is constrained to support only a single port per node in a point-to-point configuration. Use of more than one port will cause the MPI application to abort.

---

A maximum of 8 fabric adapter cards are supported per instance of the HP-UX operating system. The actual number of adapter cards a particular node is able to accommodate also depends on slot availability and system resources. See node specific documentation for details.

- Maximum Number of Switches

You can interconnect (mesh) the 12-port copper switches in a single Fabric cluster. HP recommends meshing a maximum of three 12-port copper switches but no software constraints are imposed on using more. In the event additional ports are needed, HP recommends using a high-port count switch.

- Trunking Between Switches (multiple connections)

Trunking between switches can be used to increase bandwidth and cluster throughput. Trunking is also a way to eliminate a possible single point of failure. The number of trunked cables between nodes is only limited by port availability. To assess the effects of trunking on the performance of any particular Fabric configuration, consult the whitepapers available on the HP documentation website.

- Maximum Cable Lengths

The longest supported cable is 10 meters. This constrains the maximum distance between servers and switches or between servers in node-to-node configurations.

## Fabric Supported Configurations

Multiple Fabric configurations are supported to match the performance, cost and scaling requirements of each installation.

In the section, “Configuration Parameters” on page 22, the maximum limits for Fabric hardware configurations were outlined. This section discusses the Fabric configurations that HP supports. These recommended configurations offer an optimal mix of performance and availability for a variety of operating environments.

There are many variables that can impact the HP Fabric Clustering System performance. If you are considering a configuration that is beyond the scope of the following HP supported configurations, contact your HP representative.

**Point-to-Point Configuration** You can interconnect large servers like the HP Superdome to run HP-MPI and TCP/UDP/IP applications.

Point-to-point connections between HP servers support the performance benefits of HP Fabric Clustering System without investing in HP Fabric Clustering System Switches. This is a good solution in small configurations where the benefits of a switched fabric cluster might not be required (see configuration A in Figure 3-1).

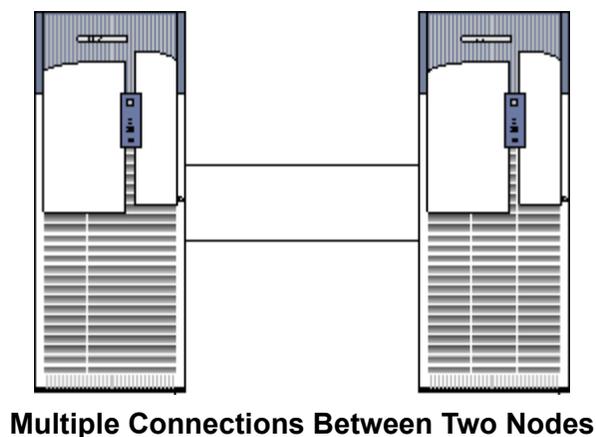
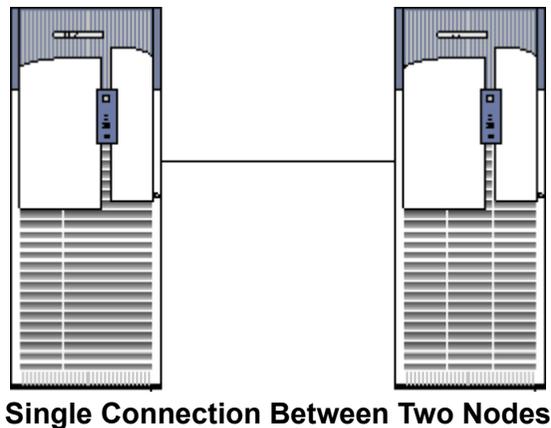
Multiple fabric adapters may be installed in HP servers and also be connected in point-to-point fashion (see configuration B in Figure 3-1).

---

**NOTE** In this release, HP-MPI is constrained to support only a single port per server node, so Configuration B may not be used.

---

**Figure 3-1 Fabric Point-to-Point Configuration**



**Switched Configuration** Where greater numbers of nodes need to be connected, HP recommends the use of the AB291A 12-port 4X Fabric Copper Switch.

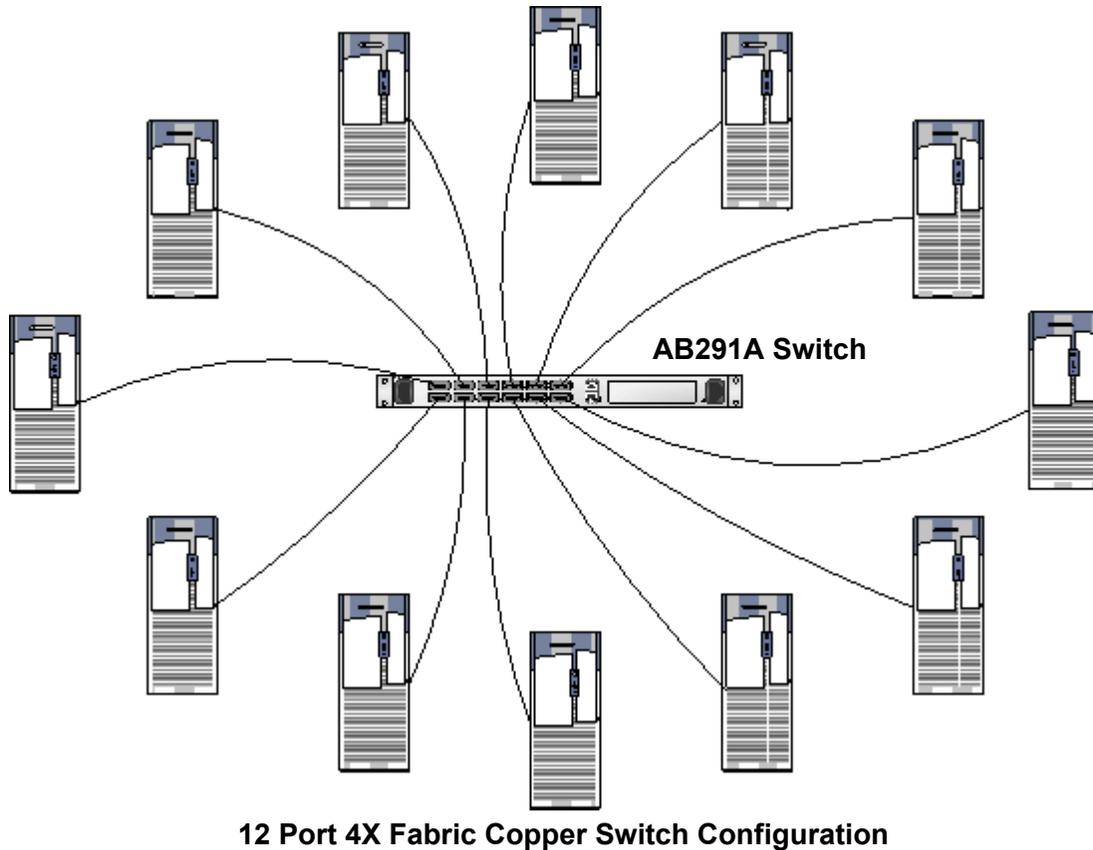
For simple configurations with up to 12 end nodes, a single AB291A 12-port 4X Fabric Copper Switch is sufficient (see Figure 3-2).

Where larger numbers of nodes are required, HP recommends cascading AB291A 12-port 4X Fabric Copper Switches (see Figure 3-3) to create at most an 18-node fabric. Other topologies are possible but are not recommended.

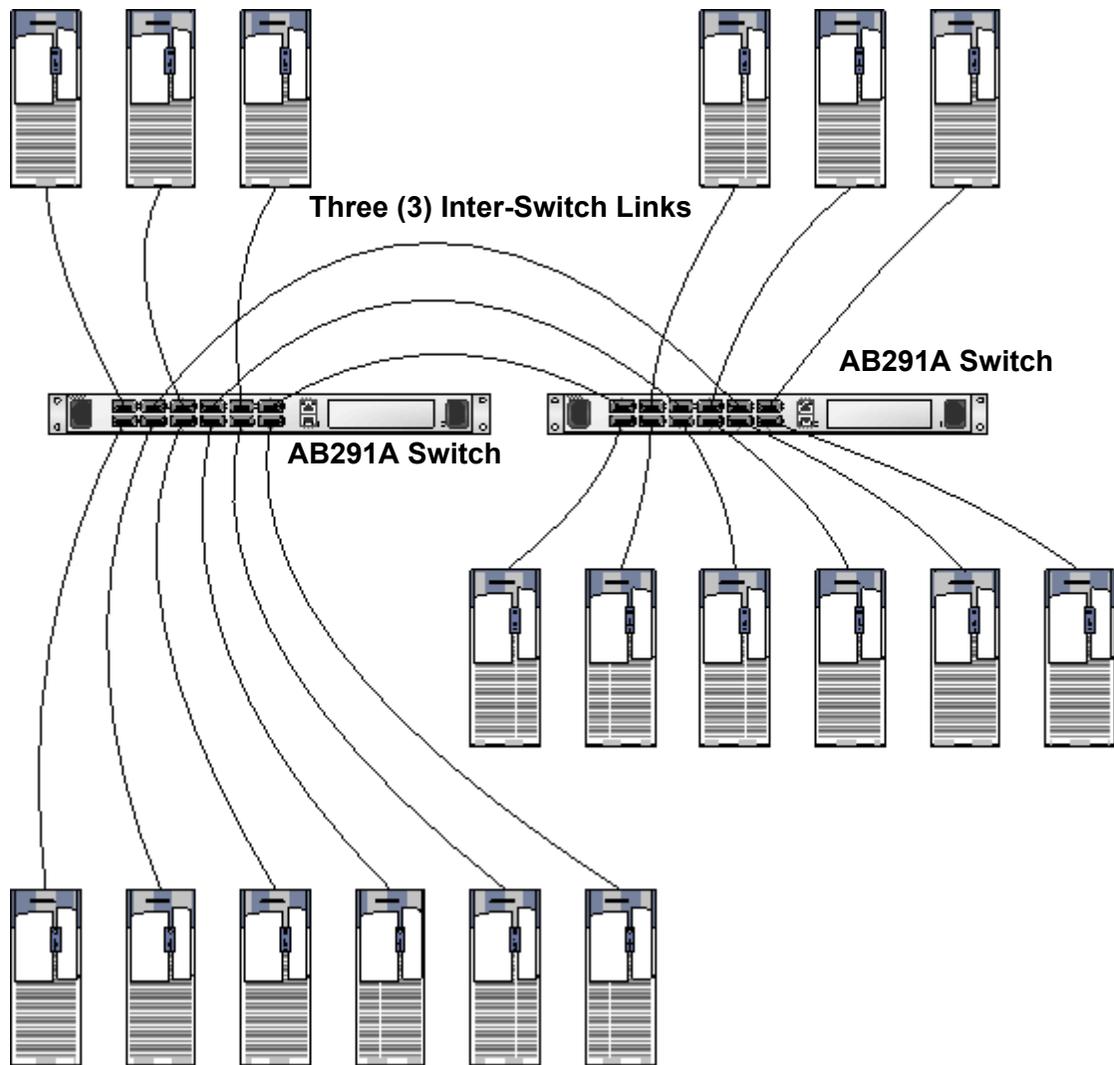
For larger configurations, HP recommends the use of a high-port count switch. Contact your HP representative for information on such a product.

Sample Configurations

**Figure 3-2**      **Single 12-port AB291A Switch**

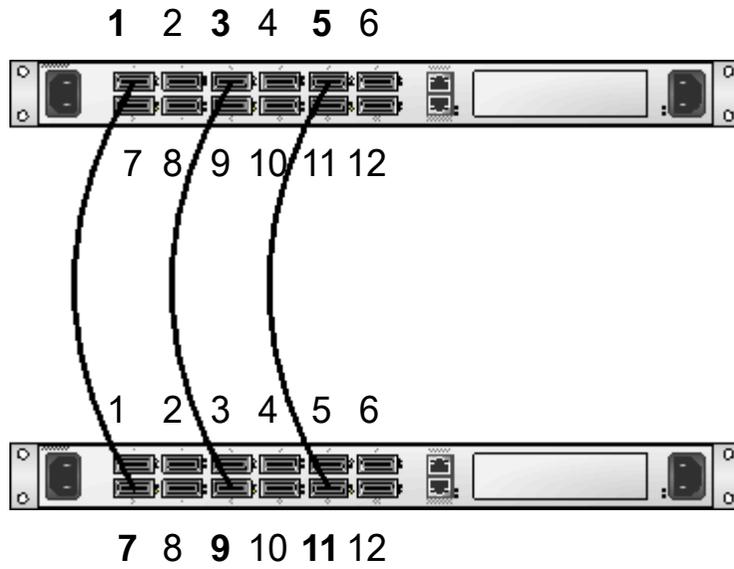


**Figure 3-3 18-port Cascaded AB291A Switch Configuration**



**18 Port Cascaded Switch Configuration**

**Figure 3-4**      **2 Switch Cascade**



---

## 4 Installing HP Fabric Clustering System

The installation procedure for the HP Fabric Clustering System installs the Switch, Host Channel Adapter (HCA), cables, cable guide, and gets the system up and running.

---

### HP Fabric Clustering System Installation Prerequisites

Before installing HP Fabric Clustering System, ensure that the following hardware and software prerequisites are met:

- Check the *HP Fabric Clustering System Release Notes* for known problems, required patches, or other information needed for installation, available at <http://www.docs.hp.com> in the Networking & Communications section.
- Confirm that the adapter and software is supported on the HP Integrity server and IO slot chosen, see the *HP Fabric Clustering System Support Matrix*, available at <http://www.docs.hp.com> in the Networking & Communications section.
- Determine where the switch is to be installed and which servers are to have an HCA installed.
- To use the Internet Protocol over InfiniBand (IPoIB) protocol, certain patches are required, along with installing the IPoIB software itself, see “Internet Protocol over InfiniBand (IPoIB)” on page 37 (optional).
- The installed version of IP Filter must be higher than “B9901AA A.03.05.06 HP IPFilter 3.5alpha5”, see “IP Filter Product” on page 119 for symptoms.
- Check the cluster configuration plan for information on where to install adapters, switches, and cable guides, and where cables are to be routed.

For more information about the configuration plan, please refer to the *Planning the Cluster* section of the *HP Fabric Clustering System Support Guide*.

- Check the HP Integrity server's documentation to determine if additional tools may be required for component installation.
- For specific instructions on adapter installation, see system-specific documentation on “installing networking adapters” for each type of HP Integrity server that adapters will be installed into.
- None of the On-Line Add or Replace (OL\*) features are currently supported for the Fabric HCA.
- Confirm that there are cables of proper length to make connections in the fabric (adapter to adapter, adapter to switch, or switch to switch).
- HP Fabric Clustering System software suite software media is available. It is included on CD or available on the web through <http://www.software.hp.com>.
- Confirm that HP-UX super-user privileges are available; they are necessary to complete the installation.
- Confirm that the `/usr/bin`, `/usr/sbin`, `/sbin`, and `/opt/rdma/bin` directories are in your PATH by logging in as root and using the `echo $PATH` command.
- Confirm that the HP-UX operating system is the correct version, HP-UX 11i v2. Use the `uname -a` command to determine the HP-UX version of your system.

For more information about the required operating system versions, see *HP Fabric Clustering System Release Notes*.

### Information Available on the Host Channel Adapter

If you are collecting information from the adapter before installation for inventory purposes, there is a GUID number on the card. This number can also be obtained through the HP-UX fabric utilities, but if recording information for inventory, include the GUID number as well, as it is unique for each adapter. The GUID will have a format such as: **00:05:ad:00:00:00:02:40**

---

## Install HP Fabric Clustering System Adapters

---

**CAUTION** Adapters contain electronic components that can easily be damaged by small amounts of electricity. To avoid damage, follow these guidelines:

- Store adapters in their anti-static plastic bags until installation.
  - Work in a static-free area, if possible.
  - Handle adapters by the edges only. Do not touch electronic components or electrical traces.
  - Use the disposable grounding wrist strap provided with each adapter. Follow the instructions included with the grounding strap.
  - Use a suitable ground—any exposed metal surface on the computer chassis.
- 

### Installing the Host Channel Adapter

The adapter comes pre-configured. You do not have to set any jumpers or connectors.

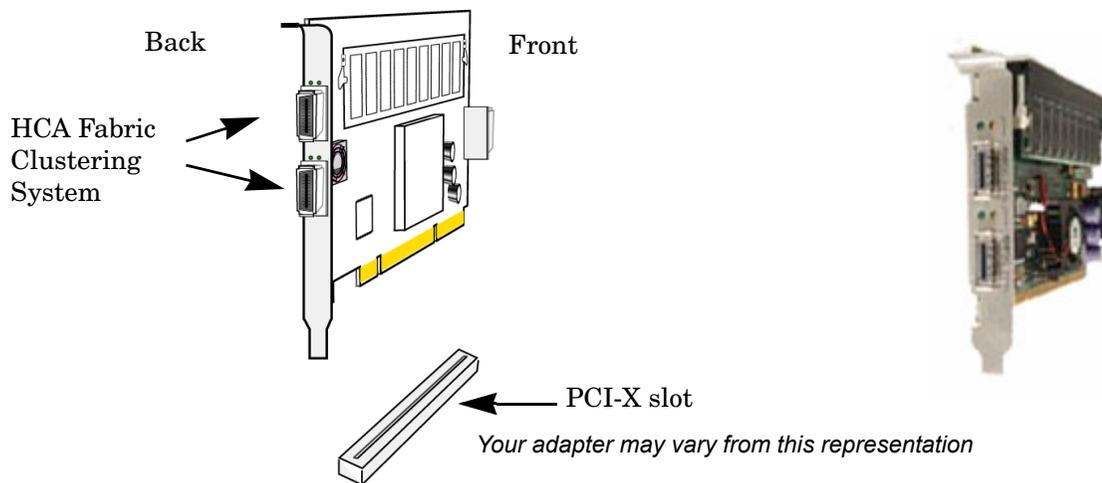
**Step 1.** Access the system card bay

- If the system is running, shut it down by executing: `shutdown -h`. Respond “y” to the continue to shutdown prompt.
- Wait for the system to shut down completely, and then power off the system by pressing the system off button. Ensure that the system is grounded.
- Open the system to gain access to the PCI backplane.
- Insert the card into the highest performance PCI-X slot available.

**Step 2.** Install the card

- Slide the adapter edge-connector into the PCI-X slot until it is fully seated.
- Secure the card and reassemble the system.

**Figure 4-1** Inserting the Host Channel Adapter



---

## Install the HP Fabric Clustering System Software

This section describes the steps necessary to install HP Fabric Clustering System software. The software must be installed on each instance of the HP-UX operating system in the fabric.

**Step 1.** Log on to the system as root.

**Step 2.** Insert the software media into the appropriate drive. If the software is being loaded from a CD-ROM, go to step 3; otherwise, go to step 4. The software can also be located at <http://www.software.hp.com>.

**Step 3.** Mount the CD-ROM drive by using the following command at the command prompt:

```
$ mount device_name
```

where *device\_name* is the name assigned to the CD-ROM drive.

**Step 4.** Run the `swinstall` program using the following command:

```
$ /usr/sbin/swinstall
```

This opens the **Software Selection** window.

**Step 5.** Change the Source Host Name, if necessary, and then enter the mount point of the drive in the Source Depot Path field. Select the **OK** button to return to the **Software Selection** window.

**Step 6.** The **Software Selection** window now contains a list of available software to install.

**Step 7.** Highlight the HP Fabric Clustering System for InfiniBand software:

**IB4X-00 -> B.11.23.01 PCI-X InfiniBand; Supptd HW=AB286A**

Choose **Mark for Install** from the **Actions** menu; this chooses the highlighted software.

You can also install the IPoIB software at this time as it is part of this same bundle to enable it to be functional. It can also be installed later if you choose to not install it now.

**Step 8.** From the **Actions** menu, select the **Install...** menu, and then choose **Install**. This begins product installation and opens the **Install Analysis** window.

**Step 9.** Select the **OK** button in the **Install Analysis** window when the Status field displays a **Ready** message.

**Step 10.** Select the **YES** button in the **Confirmation** window to start software installation.

`swinstall` loads the fileset, runs the control script for the filesets, and builds the kernel. When the processing is finished, the **Status** field displays a **Ready** message. Select **Done** and then the **Note** window opens.

**Step 11.** Select the **OK** button in the **Note** window to reboot. The user interface disappears and the system reboots.

When the system comes back up, log on to the system as root and view the `/var/adm/sw/swagent.log` and `/var/adm/sw/swinstall.log` files to view error or warning messages that may have occurred during the installation.

**Step 12.** Verify that all installed fabric adapters have a software state of **CLAIMED**, by running the `ioscan -fk -C ib` command.

---

## Switch - Rack Installation

### Requirements

In addition to the accessories provided with the switch, you should have:

- A T-10 Torx driver and a Phillips #2 screw driver.
- A second person for the installation.

### Rack Mount Preparation

Prior to mounting the switch in a rack:

1. Check the slot in the rack for 1U clearance.
2. Open the box, remove the switch, rail brackets, and parts bag.
3. Place the switch on a secure, clean surface.

4. Open the plastic bag containing mounting parts and locate:

- (12) Torx screws for attaching the rails to the switch
- (8) screws and clips for attaching the rails to the rack.

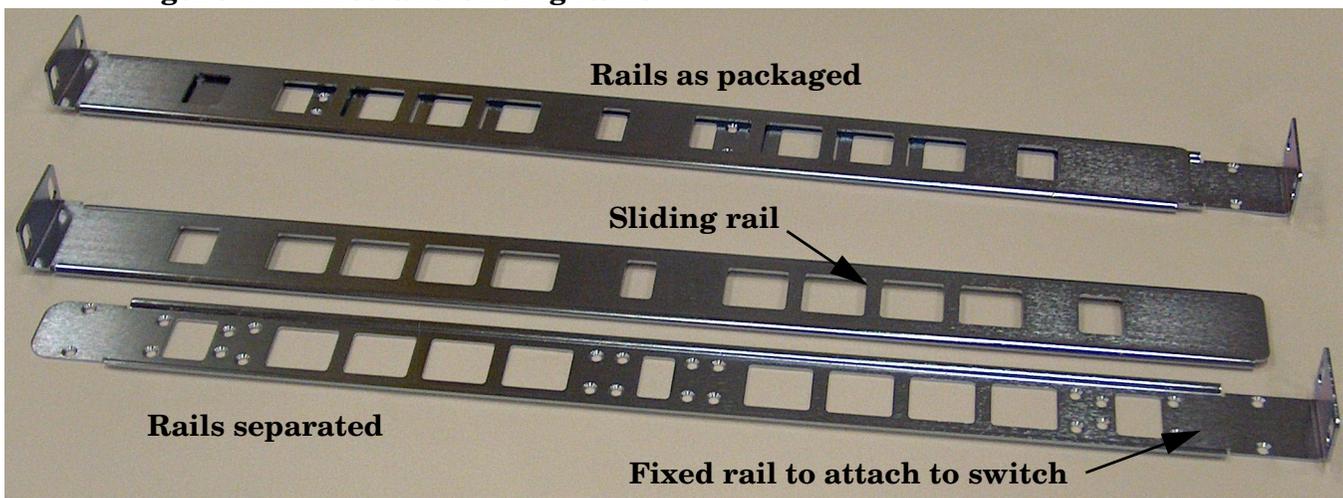
---

**NOTE** It is highly recommend that two people install the switch, but it can be installed with one, however it may be difficult to support and align the switch correctly in the rack rails with only one person.

---

**Step 1.** Take one set of sliding brackets and separate them. Each side arrives with the sliding rail assembled to a fixed rail. They need to be separated prior to attaching to the switch.

**Figure 4-2 Fixed and Sliding Rails**

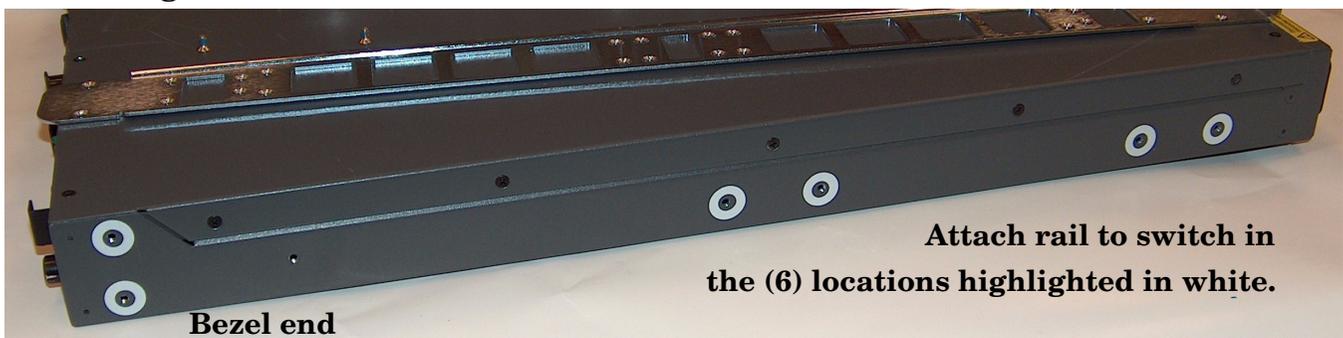


**Step 2.** To install the switch with the bezel to the front of the rack, install with the flange at the front of the switch. You can also mount the flange toward the back if you want to mount the switch backward in the rack such that the service-side is forward.

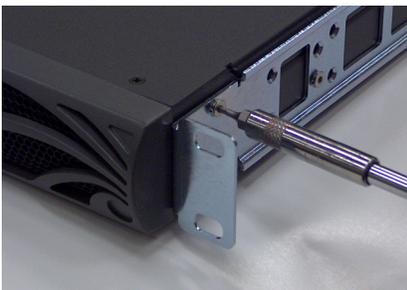
Attach the rail with 6 screws to each side of the switch in the locations shown in Figure 4-3

Screw locations are the same in the switch regardless of rail orientation.

**Figure 4-3 Rail-to-Switch Attachment Locations**



**Figure 4-4 Attach Rail to Switch**



**Step 3.** Repeat steps Steps 1 and 2 on the other side of the switch.

The two sliding rails should still be unattached.

**Step 4.** Loosely attach the switch with one screw through the front of each rail.

---

**CAUTION** Temporarily support the switch until the sliding rails are attached.

---

**Figure 4-5 Loosely Attach Rail to Rack**



---

**CAUTION** Do not let the switch hang unsupported from only the fixed rail flanges.

---

**Step 5.** Fit the sliding rails over the fixed rails with the flanges facing outward until the flanges meet the rack.

**Figure 4-6 Fit Sliding Rail over Fixed Rail**



**Figure 4-7 Fit Sliding Rail to Rack**



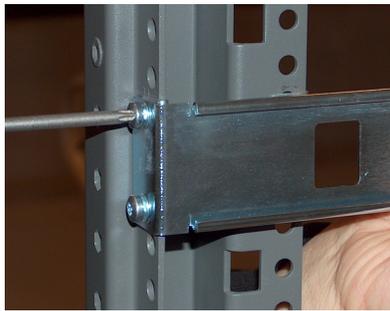
**Step 6.** Attach the rails to the rack, both sides as shown in Figure 4-8.

---

**CAUTION** Keep switch supported until rail is attached to the rack.

---

**Figure 4-8 Attach Sliding Rail to Rack**



**Step 7.** Securely attach all rails to the rack.

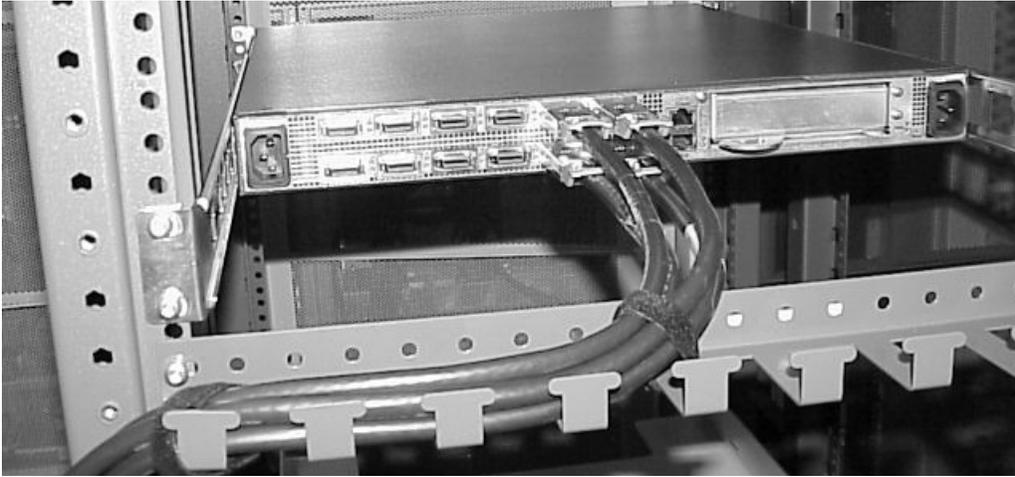
---

## Attach Cable Guides & Cables

The Fabric cables are high performance impedance-controlled cables with protective shielding, and due to the thickness and stiffness of the cables, HP recommends that Cable Guides be installed prior to attaching cables to minimize stress on the connectors for both switch and HCA cabling.

The Fabric cables should be securely attached to the rack enclosure. HP recommends the use of the included E7723-60003 Cable Guide Installation Kit mounted in a horizontal fashion as depicted below in Figure 4-9. A second Cable Guide is included and it can be installed in the horizontal or vertical position to better guide & support the cables for either the switch or HCA. Cable Guide Installation Instructions are provided as a separate document included with the Cable Guides.

**Figure 4-9 Cable Guide with Cables**

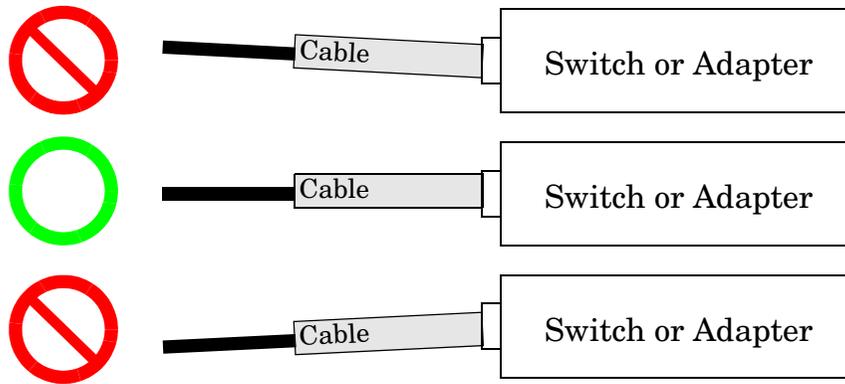


**Attach Cables**

The connectors include a latching mechanism. The latching and unlatching mechanism varies by manufacturer, and prior to installing cables, familiarize yourself with how to engage and disengage the latch. Attach cables to switches and HCAs assuring that the latch is engaged on each connection.

Do not attempt to make sharp bends or folds in the cables. Care should be taken such that the mounting of the cable to switch or adapter does not place unnecessary stress on the connection as depicted below:

**Figure 4-10 Correct & Incorrect Cable Installation**



**Attach to other Fabric devices:**

1. Be sure you have attached a connector cable to the adapter. Push the connector in until you hear it click.
2. Attach the free end of the cable to a compatible fabric switch or adapter.

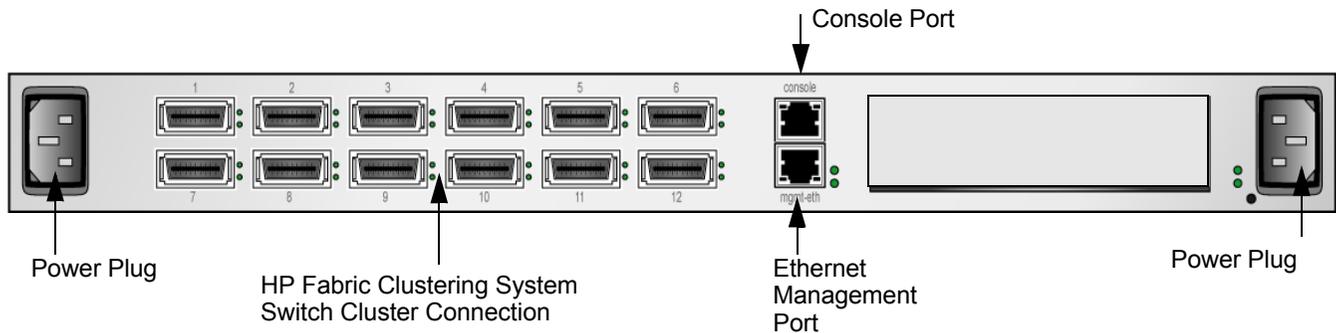
The following table lists the cables that you can use with HP Fabric Clustering System.

**Table 4-1 Cable Products**

AB346A	5 meter 4X Fabric Copper Cable
AB353A	7 meter 4X Fabric Copper Cable
AB347A	10 meter 4X Fabric Copper Cable

## Power on the chassis

**Figure 4-11 Switch - Rear Connection Layout**



Use only the power cable provided with your 4X Fabric Copper Switch system.

Inspect the power cord and determine if it provides the proper plug and is appropriately certified for use with your electrical system. Discard the cord if it is inappropriate for your country's electrical system and obtain the proper cord, as required by your national electrical codes or ordinances.

Grounding is supplied by the ground-prong on the 3-prong power plug.

- Do not attach a separate ground cable.
- Do not use adapter plugs.
- Do not remove the ground prong from the cable.
- Ensure the ground connection on the power supply is correct and functioning before applying power to the chassis.

Remove the two power cords, UL rated 10 Amps/125 VAC or greater, from the shipping package.

Plug the other end of each AC power cable into a 90-132VAC power outlet operating at 47-63Hz.

Insert the power cords to the power jacks on the rear of the chassis. The system will automatically boot up. You can watch the running status via the serial console.

The chassis automatically starts and boots. Use the correct external power-source. Attach the chassis only to approved power sources, as indicated by the electrical ratings label. If you are unsure of the correct power-source to use, contact your HP support personnel or your local power company.

Check the LEDs on the front of the Fabric Copper Switch. When the system first powers up, it performs a power-on self test. Refer to "LED Color, Behavior, and Meaning".

Because the Fabric Copper Switch is designed to provide uninterrupted service, it does not have separate on/off switches. To turn off the system, remove the power cords.

---

## Switch Setup

The information in this section focuses on the software and firmware aspects of the initial set-up.

---

**NOTE** The HP Fabric Clustering System Switch may be used without being managed, however HP recommends configuring an IP address on the Ethernet Management port as detailed below.

---

## Connect Cables to Switch

A kit for connecting a PC (or other system) to the switch for initial configuration is included with the switch, and consists of:

- MX-9-1 DB-9 (plug) to RJ-45 adapter
- FS-10-1 DB-9 (receptacle) to RJ-45 adapter
- RJ-45 rollover cable

### Attaching a Serial Console Cable

Connect a PC or terminal to the console port of the switch using a straight-through cable; use the straight-through M/F serial cable, which is provided in the package. The serial port has a RJ-45 console connector.

For detailed information on how to connect the serial console cable, please see the documentation included with the serial cable kit.

### Connecting to Other Devices

This section describes how to connect the system to other network devices. HP Fabric Clustering System Switch devices can be connected to HP Fabric Clustering System servers, or other HP Fabric Clustering System Switches.

The Fabric Copper Switch modules support the following types of connectors:

- Management ports:
- Serial console port: RJ-45 connector.
- Ethernet Management port: RJ-45 jack for unshielded twisted-pair connections.

## Setting up the Switch

### Configuring Basic Connectivity

To configure the system, you must first assign an IP address to a management port. This is accomplished via the Command Line Interface (CLI). The CLI is a text-based interface that is initially accessed using a serial console. The CLI is described in “CLI Overview” on page 59.

HP Fabric Clustering System Switch devices are not assigned an IP address prior to leaving the factory. You need to assign an IP address using the CLI and the serial console. After you assign an IP address, you can access the system through a Telnet or SSH session.

### Configuring an Out-Of-Band Ethernet Management IP Address

To configure an out-of-band Ethernet management IP address:

- Step 1.** Make sure that the HP Fabric Clustering System Switch is attached to a PC or terminal via the serial port. Refer to Appendix C, “How to Use Windows HyperTerminal,” on page 291
- Step 2.** Open a terminal emulation program, such as HyperTerminal for Windows, and set the session parameters as follows:
- Baud: 9600 b/s
  - Data Bits: 8

- Parity: None
- Stop Bits: 1
- Flow control: None

**Step 3.** At the Login: prompt, enter the username and password. The default is super and super.

```
Login: super
Password: super
HP-IB>
```

**Step 4.** At the CLI prompt, enter enable. This enters the privileged-execute mode.

```
HP-IB> enable
```

**Step 5.** Enter configure to enter the global-configuration mode.

```
HP-IB# configure
HP-IB(config)#
```

**Step 6.** Set the IP address and netmask. The following address is an example.

```
HP-IB(config)# interface mgmt-ethernet
HP-IB(config mgmt-ethernet)# ip address 10.10.0.22 255.255.255.0
```

**Step 7.** Set the default gateway address. This address is an example.

```
HP-IB(config mgmt-ethernet)# gateway 10.10.0.1
```

**Step 8.** Enable the management port

```
HP-IB(config mgmt-ethernet)# no shutdown
```

**Step 9.** Test IP connectivity by pinging the management station

```
HP-IB(config mgmt-ethernet)# exit all
HP-IB> ping 10.10.0.3
sending 5 ICMP Echos to 10.10.0.10, 56 data bytes
!!!!

Success rate is 100 percent (5/5)
round-trip min/avg/max = 0.000000/0.000000/0.000000 ms
HP-IB>
```

**Step 10.** You must save the configuration persistently by using the copy command.

```
HP-IB(config mgmt-ethernet)# exit
HP-IB# copy running-config startup-config
```

---

## Internet Protocol over InfiniBand™ (IPoIB)

### When to use IPoIB

You should install IPoIB if you are planning to run TCP/IP and UDP/IP applications within your HP Fabric Clustering System. The TCP/IP and UDP/IP applications can run over IPoIB interfaces. The IPoIB implementation is based on the IETF IPoIB standards being drafted by IETF. For more information about the IPoIB standards, visit the IETF web site at <http://www.ietf.org>.

There are important differences in technology between IPoIB and Ethernet. These should be considered to decide the best use of IPoIB within your HP Fabric Clustering System:

- Setting promiscuous mode over IPoIB interfaces is not supported
- Setting link layer parameters link link address, MTU etc. on IPoIB interfaces is not supported
- DLPI RAW mode applications or DLPI connection oriented applications are not supported

## Installation Pre-requisites

For a fully functional IPoIB implementation, the following additional software must be installed:

- TOUR product bundle (A.02.00 Transport Optional Upgrade Release for B.11.23)
- DLPI patch PHNE\_30242
- NetTL patch PHNE\_30451
- SAM patch PHCO\_29666 (optional)
- IP Filter product version A.03.05.09 or A.03.05.06.V2. The latest version of the IP Filter product is available on the web site <http://www.software.hp.com>.

TOUR is a transport software bundle that provides TCP/IP transport stack hooks to a variety of transport protocols, including IPoIB over an HP Fabric Clustering System network. The DLPI patch is required for the IPoIB driver to register IPoIB interfaces. Both the TOUR bundle and the DLPI patch allow for configuration of IPv4 and IPv6 addresses using the `ifconfig` utility. Additionally, the TOUR bundle and DLPI patch contain other tools used for administration and management of IPoIB. As an option, SAM will perform the same function as the `ifconfig` utility, but through a GUI.

Once the TOUR bundle, DLPI patch and the IPoIB driver are installed, the node will automatically create IPoIB links to the HP Fabric Clustering System. One IPoIB interface is created for every port installed on the system.

## Enabling the IPoIB Interface

### ifconfig Command

Description: This command enables or disables an IPoIB interface, configuring the link to the HP Fabric Clustering System.

Syntax: `ifconfig lan9000`

Example: `# lan9000`

Output Example:

```
lan9000: flags=843<UP,BROADCAST,RUNNING,MULTICAST>  
        inet 100.99.99.53 netmask fffff800 broadcast 100.99.103.255
```

```
hptem052 1010: ifconfig lan9000 inet6  
lan9000: flags=4800841<UP,RUNNING,MULTICAST,PRIVATE,ONLINK>  
        inet6 fe80::202:c902:0:77d prefix 10
```

---

## 5 Administration and Management

The HP-UX Host and 4X Fabric Copper Switch each have a unique set of tools for administration and management of their respective components within the HP Fabric Clustering System.

- “HP-UX Host Administration and Management”
- “Switch Administration and Management”

---

## HP-UX Host Administration and Management

This section describes the `itutil` and `nettl` tools, which are used to manage the HP-UX Host in the HP Fabric Clustering System. In addition, there is a separate section describing the administration and management of IPoIB. For information on managing the switch, refer to “Switch Administration and Management” on page 59.

- “Using Itutil”
- “Using NetTL”
- “IPoIB Administration and Management”

### Using Itutil

Itutil is a tool used to manage the RDMA infrastructure which exposes the industry standard IT-API and InfiniBand on HP-UX. `itutil` provides detailed information about HP Fabric Clustering System-configured hosts, such as interface status and statistics and system connectivity. Commands are grouped into two major categories: Administrative and Managing. Each command option is described in a task-based format, providing commands and available options, syntax, and syntax and output examples. `itutil` is located in `/opt/rdma/bin` directory.

#### Summary of Itutil Command Options

Optional parameters are available so you can filter `itutil` output. The following table describes the different command options:

**Table 5-1** Itutil Command Options

itutil	Description
	Displays basic details about all interfaces on a given host. To filter results, specify an interface name with the <code>-i</code> option or the transport type with the <code>-t</code> option, or both.
<code>-c</code>	Displays Reliable Connection details for specified interface adapters.
<code>-d</code>	Allows for download of trace or performance firmware onto the adapter. The default firmware on the adapter is performance.
<code>-h</code>	Displays help screen.
<code>-i</code>	Restricts all subsequent options to a single interface. Use this command alone or in combination with options <code>-s</code> , <code>-r</code> , <code>-c</code> or <code>-T</code> to filter your <code>itutil</code> results.
<code>-l</code>	Tests link-level connectivity of a remote port specified with a GID.
<code>-n</code>	Sends the “count” number of link-loop packets to the GID specified in <code>-l</code> option.
<code>-r</code>	Resets statistics for specified interface adapters.
<code>-R</code>	Resets the adapter.
<code>-s</code>	Displays device and transport specific statistics for specified interface adapters.
<code>-t</code>	Displays only adapters with the designated transport type. The only supported transport type is IB.
<code>-T</code>	Displays list of end-nodes that are reachable from specified interface adapters.

## Itutil Syntax

The following syntax must be used with `itutil` command options:

```
/opt/rdma/bin/itutil [-srcT] [-i interface_name][-t transport_type]
/opt/rdma/bin/itutil -d trace/notrace interface_name
/opt/rdma/bin/itutil [-n count] -l GID interface_name spigot_id
/opt/rdma/bin/itutil -R interface_name"
```

## Itutil Administrative Commands

Use these basic commands to either display the help screen or reset the adapter.

### Displaying Help

Description: This option displays help screen.

Syntax: `itutil [-h]`

Example: `# itutil -h`

Output Example:

```
itutil -h
```

```
Usage: itutil [-srcT] [-i "interface_name"][-t "transport_type"]
itutil -d trace/notrace "interface_name"
itutil [-n count] -l "network_addr" "interface_name" "spigot_id"
-h      Display this message
-R      Reset Interface Adapter
-s      Display detailed Interface Adapter Statistics
-c      Display detailed IT Reliable Connection Information
-T      Display Topology
-d      Download firmware or dump the firmware trace buffer
-l      Send linkloop equivalent packet to Network Address specified
-n      Number of linkloop packets to be sent
-i      Show information only for the specified Interface Adapter
-t      Show information only for the specified Transport
-r      Reset Interface Adapter Statistics
```

### Resetting the Adapter

Description: This option resets the adapter.

---

**NOTE** You must be superuser to execute this option.

---

Syntax: `itutil [-R] [interface_name]`

Example: `# itutil -R ib0`

---

**NOTE** If there are applications that are using the adapter, you have the choice of force-resetting the adapter or exiting without resetting the adapter.

---

## Itutil Management Commands

You can get the status of and statistics associated with various components of the fabric clustering system. Gathering statistics can help to identify potential problems and manage optimization of the system.

### Displaying Details of all Configured Interfaces

Description: Without any options set, the `itutil` command displays the basic details of all HP Fabric Clustering System-configured host interfaces.

Syntax: `itutil`

Syntax Example: `itutil`

Output Example:

```
=====
Number of Interface Adapters on this node: 1
=====
      Interface Adapter Name : ib0
                H/W Path   : 0/4/1/0/0/0
                Transport Type : IT_IB_TRANSPORT
      IT API Version Number : 1.0
      IA Software Version Number : 1.0
      IA Firmware Version Number : 3.1.0
                Firmware Type : Performance
IA supported transport service types : IT_RC_SERVICE

      Number of Spigots(Ports) on IA : 2

Spigot specific Information

      Spigot identifier : 1
      Spigot online : YES
      Num Network Addresses : 1
      Primary Network Address : fe80::ca07:2001

      Spigot identifier : 2
      Spigot online : NO
      Num Network Addresses : <Unassigned>
=====
```

### Restricting Options to One Interface

Description: This parameter restricts all subsequent parameter options to only a single interface adapter.

Syntax: `itutil -i [interface_name]`

Syntax Example: `itutil -i ib0`

Output Example:

```
=====
Number of Interface Adapters on this node: 1
=====
      Interface Adapter Name : ib0
                H/W Path : 0/4/1/0/0/0
          Transport Type : IT_IB_TRANSPORT
      IT API Version Number : 1.0
    IA Software Version Number : 1.0
    IA Firmware Version Number : 3.1.0
                Firmware Type : Performance
IA supported transport service types : IT_RC_SERVICE

      Number of Spigots(Ports) on IA : 2

Spigot specific Information

      Spigot identifier : 1
        Spigot online : YES
    Num Network Addresses : 1
    Primary Network Address : fe80::ca07:2001

      Spigot identifier : 2
        Spigot online : NO
    Num Network Addresses : <Unassigned>
=====
```

### Displaying Interfaces with Specified Transport Type

Description: This parameter only displays interfaces of a specific transport type. The only supported transport type with this version of the product is IB.

Syntax: `itutil -t [transport_type]`

Syntax Example: `itutil -t IB`

Output Example:

```
=====
Number of Interface Adapters on this node: 1
=====
      Interface Adapter Name : ib0
                H/W Path   : 0/4/1/0/0/0
          Transport Type   : IT_IB_TRANSPORT
      IT API Version Number : 1.0
    IA Software Version Number : 1.0
    IA Firmware Version Number : 3.1.0
                Firmware Type : Performance
IA supported transport service types : IT_RC_SERVICE

      Number of Spigots(Ports) on IA : 2

Spigot specific Information

      Spigot identifier : 1
        Spigot online  : YES
    Num Network Addresses : 1
Primary Network Address : fe80::ca07:2001

      Spigot identifier : 2
        Spigot online  : NO
    Num Network Addresses : <Unassigned>
=====
```

### Displaying Statistics

Description: This parameter displays statistics for all specified adapters. In the example below, the HP Fabric Clustering System interface adapter is specified as `ib0` and defined with the `-i` parameter. If an adapter is not specified using the `-i` parameter, the `-s` command displays statistics for each HP Fabric Clustering System interface configured on the host.

---

**NOTE**      The transport statistics are the same as those defined in Chapter 10 of IBA 1.1 Vol 1.  
              Link/physical statistics are the same as the PortCounter attribute defined in Chapter 16 of the IBA 1.1 Vol 1.

---

Syntax: `itutil -s [-i interface name|-t transport type]`

Syntax Example: `itutil -s -i ib0`

Output Example:

```
=====
Number of Interface Adapters on this node: 1
=====
      Interface Adapter Name : ib0
                H/W Path   : 0/4/1/0/0/0
          Transport Type   : IT_IB_TRANSPORT
      IT API Version Number : 1.0
    IA Software Version Number : 1.0
    IA Firmware Version Number : 3.1.0
                Firmware Type : Performance
IA supported transport service types : IT_RC_SERVICE

      Number of Spigots(Ports) on IA : 2

Spigot specific Information

      Spigot identifier : 1
      Spigot online    : YES
    Num Network Addresses : 1
    Primary Network Address : fe80::ca07:2001

      Spigot identifier : 2
      Spigot online    : NO
    Num Network Addresses : <Unassigned>

=====

Adapter Statistics :

=====

Transport Statistics
-----

      Responder - number of local length errors : 0
      Requester - number of local length errors : 0
    Responder - number of local QP operation errors : 0
    Requester - number of local QP operation errors : 0
      Responder - number of local protection errors : 0
      Requester - number of local protection errors : 0
        Responder - number of WR flushed errors : 0
        Requester - number of WR flushed errors : 0
    Requester - number of memory window bind errors : 0
      Requester - number of bad response errors : 0
      Responder - number of local access errors : 0
    Requester - number of remote invalid request errors : 0
      Requester - number of remote access errors : 0
      Requester - number of remote operation errors : 0
    Requester - number of transport retries exceeded errors : 0
      Requester - number of RNR nak retries exceeded errors : 0
      Requester - number of remote aborted errors : 0
```

```
Responder - number of out of sequence requests received : 0
Requester - number of out of sequence Naks received : 0
Responder - number of bad multicast packets received : 0
      Num silent UD drops due to RNR : 0
      Number of CQ overflows : 0
      Number of EQ overflows : 0
      Number of bad doorbells : 0
```

---

Link/Physical Statistics

---

```
Spigot identifier : 1
      Link Symbol Errors : 0
      Link Error Recovery : 0
      Link Down : 0
      Receive Errors : 0
      Receive Remote Phy Errors : 0
      Transmit Discards : 0
      Transmit Constraint Errors : 0
      Receive Constraint Errors : 0
      Local Link Integrity Errors : 0
      Excessive Buffer Overrun Errors : 0
      VL15 packets Discards : 0
      Transmit Data(bytes) : 0
      Receive Data(bytes) : 0
      Transmit Packets : 0
      Receive Packets : 0
```

---

### Resetting Statistics

Description: This parameter resets statistics for all specified adapters. If an adapter is not specified using the `-i` parameter, the `-r` command resets statistics for every HP Fabric Clustering System interface configured on the host.

---

**NOTE** You must be logged in as super user to execute this command.

---

Syntax: `itutil -r [-i interface name|-t transport type]`

Syntax Example: `itutil -r`

Output Example:

Successfully reset the transport and performance counters on the IA "ib0"

## Displaying Connectivity Information Using Itutil

### Displaying Reliable Connection Details

Description: This parameter displays reliable connection details for all specified adapters. If an adapter is not specified using the `-i` parameter, the `-c` command displays reliable connection details for every HP Fabric Clustering System interface configured on the host.

Syntax: `itutil -c [-i interface name|-t transport type]`

Syntax Example: `itutil -c`

Output Example:

```
=====
Number of Interface Adapters on this node: 1
=====

General Information:
=====

                Interface Adapter Name : ib0
                        H/W Path      : 0/4/1/0/0/0
                Transport Type       : IT_IB_TRANSPORT
                IT API Version Number : 1.0
                IA Software Version Number : 1.0
                IA Firmware Version Number : 3.1.0
                        Firmware Type  : Performance
IA supported transport service types : IT_RC_SERVICE

                Number of Spigots(Ports) on IA : 2

Spigot specific Information
                Spigot identifier : 1
                        Spigot online : YES
                Num Network Addresses : 1
                Primary Network Address : fe80::ca07:2001

                Spigot identifier : 2
                        Spigot online : NO
                Num Network Addresses : <Unassigned>
=====

Connection Information :
=====

                Connection State : TIMEWAIT
                        Adapter Name : ib0
                                Process ID : Process Exited
                Connection EVD <pi,ci> : <0x1, 0x1>
                        Connection Type : Active
```

```
Service ID : 0x10000ce10000c017
Local Communication ID : 0x1
Remote Communication ID : 0x2
Local QPN : 0x40d
Remote QPN : 0x40e
Local Start PSN : 0x21
Remote Start PSN : 0x21
```

=====

---

**NOTE** This is a partial view of the `itutil -c` command output..

---

## Displaying the List of End-Nodes

Description: This parameter displays the list of end-nodes that are reachable for all specified adapters (i.e. the Topology of the cluster). If an adapter is not specified using the `-i` parameter, the `-T` command displays the topology information for every HP Fabric Clustering System interface configured on the host.

Syntax: `itutil -T [-i interface name|-t transport type]`

Example: `itutil -T`

Output Example:

```
=====
Number of Interface Adapters on this node: 1
=====

      Interface Adapter Name : ib0
                H/W Path   : 0/4/1/0/0/0
          Transport Type   : IT_IB_TRANSPORT
      IT API Version Number : 1.0
      IA Software Version Number : 1.0
      IA Firmware Version Number : 3.1.0
                Firmware Type : Performance
IA supported transport service types : IT_RC_SERVICE

      Number of Spigots(Ports) on IA : 2

Spigot specific Information

      Spigot identifier : 1
      Spigot online    : YES
      Num Network Addresses : 1
      Primary Network Address : fe80::ca07:2001

      Spigot identifier : 2
      Spigot online    : NO
      Num Network Addresses : <Unassigned>

=====

Topology information for online spigots :
=====

Spigot identifier : 1
Spigot Primary LID : 0xa
Primary Network Address : fe80::ca07:2001
Configuration : Point-to-Point

      Primary Remote LID : 0xb
Primary Remote Network Addr : fe80::2:c901:8a0:8a11
      Node Description : iblp0091

      Primary Remote LID : 0xa
```

**HP-UX Host Administration and Management**

Primary Remote Network Addr : fe80::ca07:2001

Node Description : iblp0088

=====

### Testing Link-level Connectivity

This option is similar to the `linkloop` command for LAN interfaces. If the `-n` option is not specified, the default value for “count” is 1. Setting the count to 0 will result in `itutil` sending packets indefinitely until an interrupt signal is received.

Description: This parameter tests link-level connectivity with the remote port specified with the GID (Global Identifier) for transport type IB.

---

**NOTE** The GID of an adapter port is displayed using either the `itutil` or `itutil -i` commands as the “Primary Network Address”.

---

Syntax: `itutil [-n count] -l GID interface_name spigot_id`

Syntax Example: `itutil -l fe80::2:c901:8a0:8a11 ib0 1`

Output Example:

```
Testing connectivity to Network Address 0x<fe80::2:c901:8a0:8a11>
from IA "ib0", spigot id "1"
```

Linkloop Succeeded.

### Testing Link-level Connectivity with a Specified Number of Packets

This option is similar to the `linkloop` command for LAN interfaces. If the `-n` option is not specified, the default value for “count” is 1. Setting the count to 0 will result in `itutil` sending packets indefinitely until an interrupt signal is received.

Description: The `-n` parameter sends a specified “count” number of linkloop packets to the GID specified in the `-l` parameter.

Syntax: `itutil [-n count] -l GID interface_name spigot_id`

Syntax Example: `itutil -n 5 -l fe80::2:c901:8a0:8a11 ib0 1`

Output Example:

```
Testing connectivity to Network Address 0x<fe80::2:c901:8a0:8a11>
from IA "ib0", spigot id "1"
```

Linkloop Succeeded.

### Viewing the Itutil Manpage

If you want to view the `itutil` man page, you must first add `/opt/rdma/share/man` to your `MANPATH` environment variable. To view the man page for `itutil`, type this:

```
man itutil
```

## Using NetTL

The Network Tracing and Logging facility (NetTL) is a troubleshooting tool used to gather information on network activity by logging events and tracing inbound and outbound packets.

---

**NOTE** This section is an overview of the NetTL facility as it relates to IB and IPoIB. For more detailed information on the NetTL facility, refer to the `nettl` manpage.

---

### Starting Logging and Tracing

Description: This command starts logging and tracing using the NetTL facility.

Syntax: `nettl -st`

Syntax Example: `nettl -st`

Output Example:

```
Initializing Network Tracing and Logging...  
Done.
```

### Displaying Logging Levels

Description: This command displays logging levels using the NetTL facility.

Syntax: `nettl -ss`

Syntax Example: `nettl -ss`

Output Example:

Logging Information:

```
Log Filename: /var/adm/nettl.LOG*  
Max Log file size(Kbytes): 1000 Console Logging: On  
User's ID: 0 Buffer Size: 8192  
Messages Dropped: 0 Messages Queued: 0
```

```
Subsystem Name: Log Class:  
NS_LS_LOGGING ERROR DISASTER  
NS_LS_NFT ERROR DISASTER  
NS_LS_LOOPBACK ERROR DISASTER  
NS_LS_NI ERROR DISASTER  
NS_LS_IPC ERROR DISASTER  
NS_LS_SOCKREGD ERROR DISASTER  
NS_LS_TCP ERROR DISASTER  
NS_LS_PXP ERROR DISASTER  
NS_LS_UDP ERROR DISASTER  
NS_LS_IP ERROR DISASTER  
NS_LS_PROBE ERROR DISASTER  
NS_LS_DRIVER ERROR DISASTER  
NS_LS_RLBD ERROR DISASTER  
NS_LS_BUFS ERROR DISASTER  
NS_LS_CASE21 ERROR DISASTER  
NS_LS_ROUTER21 ERROR DISASTER  
NS_LS_NFS ERROR DISASTER  
NS_LS_NETISR ERROR DISASTER  
NS_LS_NSE ERROR DISASTER
```

NS_LS_STRLOG	ERROR DISASTER
NS_LS_TIRDWR	ERROR DISASTER
NS_LS_TIMOD	ERROR DISASTER
NS_LS_ICMP	ERROR DISASTER
FILTER	ERROR DISASTER
NAME	ERROR DISASTER
NS_LS_IGMP	ERROR DISASTER
FORMATTER	ERROR DISASTER
STREAMS	ERROR DISASTER
PCI_FDDI	ERROR DISASTER
GELAN	ERROR DISASTER
BTLAN	ERROR DISASTER
INTL100	ERROR DISASTER
NS_LS_IPV6	ERROR DISASTER
NS_LS_ICMPV6	ERROR DISASTER
DLPI	ERROR DISASTER
NS_LS_LOOPBACK6	ERROR DISASTER
IGELAN	ERROR DISASTER
IETHER	ERROR DISASTER
SYSADMIN	ERROR DISASTER
IB	ERROR DISASTER
IPOIB	ERROR DISASTER

Tracing Information:

Trace Filename:

Max Trace file size(Kbytes): 0

No Subsystems ActiveInitializing Network Tracing and Logging...

Done.

---

**NOTE** By default, only ERROR and DISASTER logging classes are displayed with the `nettl -ss` command. To enable INFORMATIVE, WARNING and ERROR logging classes, use the procedure outlined below.

---

### Enabling INFORMATIVE, WARNING and ERROR Logging Classes

Description: This command displays INFORMATIVE, WARNING and ERROR logging classes using the NetTL facility.

Syntax: `nettl -l [log class] -e [subsystem]`

where [log class] can be one of these: i (INFORMATIVE); w (WARNING) or e (ERROR)

Syntax Example: `nettl -l i w e -e IPOIB`

### Stopping Logging and Tracing

Description: This command stops logging and tracing using the NetTL facility.

Syntax: `nettl -sp`

Syntax Example: `nettl -sp`

---

**NOTE** This command will stop logging and tracing using the NetTL facility for IPoIB and all other subsystems.

---

### Viewing Log Records

Description: Use this command to view log records using the NetTL facility.

Syntax: `netfmt /var/adm/nettl.LOG000`

Syntax Example: `netfmt /var/adm/nettl.LOG000`

Output Example:

```
-----IPoIB Driver-----
Timestamp           : Sun Mar 14 MST 2004 23:55:09.523125
Process ID          : [ICS]                Subsystem           : IPOIB
User ID ( UID )    : -1                   Log Class           : INFORMATIVE
Device ID           : 9001                 Path ID             : 0
Connection ID      : 0                     Log Instance        : 0
~~~~~
<4002> lan9001 has a new link attached to it with port number 2,
      P_key value 0xffff and HCA ib0
```

### IB Tracing

#### Enabling Packet Tracing for IB

Description: This command enables packet tracing of specified packet type using the NetTL tracing facility.

Syntax: `nettl -tn all -e [subsystem] -f [trace_name]`

Syntax Example: `nettl -tn all -e IB -f ib.TRC000`

#### Disabling Packet Tracing for IB

Description: This command disables packet tracing for IPoIB traffic.

Syntax: `nettl -tf -e [subsystem]`

Syntax Example: `nettl -tf -e IB`

### IPoIB Tracing

#### Enabling Packet Tracing for IPoIB

Description: This command enables packet tracing of specified packet type using the NetTL tracing facility.

Syntax: `nettl -tn all -e [subsystem] -f [trace_name]`

Syntax Example: `nettl -tn all -e IPOIB -f ipoib.TRC000`

#### Disabling Packet Tracing for IPoIB

Description: This command disables packet tracing for IPoIB traffic.

Syntax: `nettl -tf -e [subsystem]`

Syntax Example: `nettl -tf -e IPOIB`

## IPoIB Administration and Management

IPoIB is managed using the following tools:

- ifconfig
- lanadmin
- lanscan

### ifconfig Command

#### Enabling the IPoIB Interface

Description: This command enables or disables an IPoIB interface, configuring the link to the HP Fabric Clustering System.

Syntax: `ifconfig lan9000`

Syntax Example: `lan9000`

Output Example:

```
lan9000: flags=843<UP,BROADCAST,RUNNING,MULTICAST>
        inet 100.99.99.53 netmask fffff800 broadcast 100.99.103.255

# 1010: ifconfig lan9000 inet6
lan9000: flags=4800841<UP,RUNNING,MULTICAST,PRIVATE,ONLINK>
        inet6 fe80::202:c902:0:77d prefix 10
```

### lanadmin Commands

#### Displaying IPoIB Interface Information

Description: This command prints IPoIB interface information for a given `ipoib_ppa`, or interface.

Syntax: `lanadmin -x if_info [ipoib_ppa]`

Syntax Example: `lanadmin -x if_info 9000`

Output Example:

```
Interface PPA Number = 9000
Partition Key       = 0xffff
Q Key               = 0x0000000b
MAC Addr            = 0x0000040cfe8000000000000000000000ca025001
```

#### Displaying IPoIB Interface Link-Level Information

Description: This command prints IPoIB port level information for a given `ipoib_ppa`.

Syntax: `lanadmin -x link_info [ipoib_ppa]`

Syntax Example: `lanadmin -x link_info 9000`

Output Example:

```
Interface PPA Number           = 9000
with total (up+down) num of links = 1
Link[0]: HCA = ib0, Port = 1, State = UP
Link[0]: HCA's Hardware Path = 0/5/1/0/0/0
Link[0]: QPN = 0x00040c, GID = 0xfe800000000000000000000000ca025001, LID = 0x000a
```

### Displaying all Available IPoIB Interfaces

Description: This command prints all IPoIB interfaces with some detailed information.

Syntax: `lanadmin -x all_if_info [any_ipoib_ppa]`

Syntax Example: `lanadmin -x all_if_info 9000`

Output Example:

PPA	PKey	Port	HCA	Hardware path
9000	0xffff	1	ib0	0/4/1/0/0/0
9001	0xffff	2	ib0	0/4/1/0/0/0

### Displaying IPoIB Interface MAC Address

Description: This command displays the MAC address of a given `ipoib_ppa`.

Syntax: `lanadmin -a [ipoib_ppa]`

Syntax Example: `lanadmin -a 9000`

Output Example:

Station Address = 0x0000040cfe8000000000000000000000ca025001

### Displaying IPoIB Interface Speed

Description: This command displays the speed of a given `ipoib_ppa`.

Syntax: `lanadmin -s [ipoib_ppa]`

Syntax Example: `lanadmin -s 9000`

Output Example:

Speed = 10000000000

### Displaying IPoIB Interface Statistics

Description: This command displays statistics for a given `ipoib_ppa`.

Syntax: `lanadmin -g [ipoib_ppa]`

Syntax Example: `lanadmin -g 9000`

Output Example:

LAN INTERFACE STATUS DISPLAY  
Wed, Feb 18, 2004 18:24:04

PPA Number	= 9000
Description	= lan9000 Hewlett-Packard IPoIB interface
Type (value)	= infiniband(33)
MTU Size	= 2044
Speed	= 10000000000
Station Address	= 0x0000040cfe8000000000000000000000ca025001
Administration Status (value)	= up(1)
Operation Status (value)	= up(1)
Last Change	= 100
Inbound Octets	= 3712805542
Inbound Unicast Packets	= 2163666
Inbound Non-Unicast Packets	= 856

```
Inbound Discards           = 0
Inbound Errors             = 0
Inbound Unknown Protocols = 34
Outbound Octets            = 1401857242
Outbound Unicast Packets  = 1138461
Outbound Non-Unicast Packets = 7404
Outbound Discards         = 41
Outbound Errors           = 0
Outbound Queue Length     = 0
Specific                   = 0
```

### lanadmin Command Help

There are two help options available for the lanadmin command:

- Brief Help
- Extended Help

#### Brief Help

Description: This command displays an abbreviated version of help for the lanadmin command.

Syntax: lanadmin -x -h [ipoib\_ppa]

Syntax Example: lanadmin -x -h 9000

Output Example:

```
lanadmin [-x if_info <ipoib_ppa>]
          [-x link_info <ipoib_ppa>]
          [-x all_if_info <ipoib_ppa>]
```

Use the "-H" sub-option for extended help.

#### Extended Help

Description: This command displays a detailed version of help for the lanadmin command.

Syntax: lanadmin -x -H [ipoib\_ppa]

Syntax Example: lanadmin -x -H 9000

Output Example:

```
lanadmin [-x if_info <ipoib_ppa>]
          [-x link_info <ipoib_ppa>]
          [-x all_if_info <ipoib_ppa>]
```

```
if_info: display ipoib interface parameter
link_info: display ipoib interface's link information
all_if_info: display all ipoib interface's information
```

#### lanadmin Options Not Supported

The following lanadmin options are examples for options not supported by IPoIB interfaces and the errors displayed.

Setting the MAC address of the interface to default:

```
lanadmin -A default 9000
Old Station Address          =
0x0000040cfe80000000000000002c90200001001
change_phys_addr: unable to change physical address
```

Setting the MAC address of the interface:

```
lanadmin -A 0x0000040cfe80000000000000002c90200001111 9000
Old Station Address          =
0x0000040cfe80000000000000002c90200001001
change_phys_addr: unable to change physical address
```

Resetting the MTU of interface to default:

```
lanadmin -R 9000
Old MTU Size                 = 2044
Unable to reset MTU size: errno = 252
```

Set the MTU of the interface:

```
lanadmin -M 1500 9000
Old MTU Size                 = 2044
Unable to change MTU size: errno = 252
```

Set the speed of the interface:

```
lanadmin -S 100000000 9000
Old Speed                    = 10000000000
Unable to change speed: errno = 252
```

## lanscan Command

### Displaying Link Configuration

Description: This command displays major number, hardware and IPoIB interface status. The command also displays the IPoIB PPA, interface name, station address and hardware status.

Syntax: lanscan

Syntax Example: lanscan

Output Example:

Hardware Path	Station Address	Crd In#	Hdw State	Net-Interface Name	NM ID	MAC Type	HP-DLPI Support	DLPI Mjr#
0/0/3/0	0x00306E4A93BA	0	UP	lan0 snap0	1	ETHER	Yes	119
0/1/2/0	0x00306E4A92AF	1	UP	lan1 snap1	2	ETHER	Yes	119
IPOIB0	0x0000040DFE8*	9000	UP	lan9000 snap9000	3	IB	Yes	119
IPOIB1	0x0000040CFE8*	9001	UP	lan9001 snap9001	4	IB	Yes	119

---

**NOTE** Station Addresses (MAC addresses) containing a "\*" are truncated.

---

## Switch Administration and Management

This section gives an overview of the Command Line Interface (CLI), which is used to manage only the switch in the HP Fabric Clustering System. For information on managing the HP-UX host, refer to “HP-UX Host Administration and Management” on page 40.

This section consists of the following section:

- “CLI Overview”
- “Using the CLI”
- “Advanced Switch Setup”
- “Configuration, Image, and Log Files”
- “Administering the System”

### CLI Overview

The HP Fabric Clustering System Switch can be used without being managed. If necessary, you can manage the switch using its Command Line Interface (CLI) - a text-based interface accessible through a direct serial connection, Telnet over IP, or SSH over IP. Refer to “Manage the System” on page 63.

### Using the CLI

This section provides a general overview of using the CLI. It describes how to start a CLI session, how to enter commands, and how to display online help. Details about individual commands are presented elsewhere in this document.

This section describes the following:

- Starting A CLI Session
- Entering CLI Modes
- Exiting CLI Modes
- Command Abbreviation
- Command-Line Editing
- Exiting the CLI Session
- Entering Card and String Information
- Attaching a PC or Terminal

### Starting A CLI Session

The CLI login prompt is automatically displayed in a terminal window when you connect the serial port of a computer to the Serial-Console port. It is also displayed when you Telnet or SSH to a configured Ethernet Management port. Log in as the user with the appropriate permissions for what you wish to do. The user account you use determines your level of access. super, admin, and guest are the default user accounts.

**Table 5-2 Privilege Level**

User Log-in	Privileges
super	The super user has unrestricted privileges. Use this account for initial configuration. This user may view and modify a configuration, as well as administer user accounts and access privileges. This user configures the console and management ports for initial chassis setup. The default password is super.
admin	The admin user has general read-write privileges. This user may view and modify the current configuration. However, the admin user can change only its own user information, such as the admin password. The default password is admin.
guest	The guest user has read-only privileges. This user may only view the current configuration. The guest user cannot make any changes during the CLI session. This user is disabled by default. The default password is guest.

In addition to the default user accounts described above, there are administrative “roles” that may be assigned to individual user accounts. Roles allow granular levels of privileges. For example, you can create separate HP Fabric Clustering System administrators, who only have access to specific subsystems. The system combines multiple roles with read and read-write access for flexible control.

The unrestricted administrator (super) is responsible for assigning these roles. Network administrators are given read-only and read-write access to each of the three network types. The different roles are:

**Table 5-3 Roles**

Role	Description
ib-ro	InfiniBand read-only access.
ib-rw	InfiniBand read-write access.
unrestricted-rw	Read-write access to all network configuration commands.

For information about configuring user accounts and roles, refer to “Creating User Accounts” on page 90.

---

**NOTE** The CLI is case-sensitive. Be sure to enter all text in the case shown.

---

At the CLI prompt, enter the appropriate user name and password at the CLI prompt to log in as the admin user. For example,

```
Login: super  
Password: xxxxx  
HP-IB>
```

You are logged in as an administrator and are ready to view and configure the CLI configuration.

---

**NOTE** Up to three concurrent CLI sessions are allowed at a time.

---

## Entering CLI Modes

The CLI has four command modes

- user-execute mode
- privileged-execute mode
- global-configuration mode
- sub-command mode

The commands you can enter depend upon the current command mode and who you log in as. You may enter a question mark (?) at the CLI prompt to list the commands appropriate for the current mode and user identity.

All CLI sessions begin in the user-execute mode. This mode provides commands for viewing some of the system configuration and some user information. Guest users may only work in the user-execute mode.

The user-execute mode is also the entry point to the privileged-execute mode. The privileged-execute mode can view the entire system configuration and all user information. It is used to perform some high-level administrative tasks, such as saving the current configuration and setting the system clock. It is also the access point to the global-configuration and sub-command modes. You must enter the privileged-execute mode before entering the configuration modes. This is done simply by entering the enable keyword after starting the CLI session. Note that administrative and unrestricted users may enter the privileged-execute mode.

```
# telnet HP-IB
Login: super
Password: xxxx
HP-IB> enable
HP-IB#
```

Mode changes are reflected in changes to the CLI prompt. Going from the user-execute to privileged-execute mode, the prompt changes from:

```
HP-IB>
```

to

```
HP-IB#.
```

You enter the global-configuration mode from the privileged-execute mode. The global-configuration mode is used to configure everything except system interface cards and their ports. The global-configuration mode configures system-level attributes, such as SNMP, SNMP agents, and the networks. To enter the global-execute mode, enter the config keyword while in the privileged-execute mode.

```
HP-IB# configure
HP-IB(config)#
```

Going from the privileged-execute to global-configuration mode, the prompt changes from:

```
HP-IB#
```

to

```
HP-IB(config)#.
```

The final mode is sub-command mode. Anything to do with the HP Fabric Clustering System is done in this mode. This mode is used to assign IP addresses to interface ports, set connection speeds, set connection types, and other settings.

To enter the sub-command mode from the global-configuration mode, enter the interface keyword, the type of interface to be configured, and then identify the specific card or ports to be configured.

For example, to enter the sub-command mode for an Ethernet card, ports 1 through 4.

```
HP-IB(config)# interface ethernet 4/1-4/4
HP-IB(config-if-ether-4/1-4/4)#
```

The commands you enter when in the sub-command mode are applied to the specified cards and ports.

### Exiting CLI Modes

Most commands are mode-dependent. For example, you can only configure clock settings in the global-configuration mode. To configure the system, you will have to enter and exit CLI modes. The exit command is used to return to the previous mode.

```
HP-IB(config-if-fc-5/1)# exit
HP-IB(config)# exit
HP-IB#
```

You may also enter the exit command with the all argument to return to the privileged-execute mode in one step.

To leave the global-configuration mode and return to the user-execute mode, enter the exit and the disable commands.

For example:

```
HP-IB(config)# exit
HP-IB# disable
HP-IB>
```

### Using Command Completion

The system provides command completion by way of the [Tab] key. If you enter a partial command and press the [Tab], the CLI will complete the command and place the cursor at the end of the command.

To facilitate command entry, CLI commands do not have to be entered in their entirety. You may enter just enough of each command or argument to make it uniquely identifiable.

For example:

```
HP-IB(config)# trace ?
  app
HP-IB(config)# trace app ?
app <1-28>
```

```
app numbers:
cli           = 1
ospf          = 2
rip           = 3
snmp-agent    = 4
stp           = 5
vlan          = 6
vrrp          = 7
ib            = 8
fc            = 9
chas-mgr      = 10
port-mgr      = 11
```

tcp	= 12
notifier	= 13
ip-mgr	= 14
fib-mgr	= 15
srp-mgr	= 16
srp-agent	= 17
watchd-mgr	= 19
watchd-agent	= 20
port-agent	= 21
ip-agent	= 22
fib-agent	= 23
card-agent	= 25
ib-sm	= 26
diag-mgr	= 27
diag-agent	= 28

---

**NOTE** Command completion only works for commands; it is not effective for keywords.

---

### Command Abbreviation

To facilitate command entry, CLI commands do not have to be entered in their entirety. You may enter just enough of each command or argument to make it uniquely identifiable.

For example:

```
HP-IB(config)# fc ?
  srp                - Configure FC SRP
  srp-global         - Configure FC SRP-global parameters
HP-IB(config)# fc srp- ?
  enable            - Enable FC SRP
  gateway-portmask-pol - Configure FC SRP-global gateway-portmask-policy
  itl               - Configure FC SRP-global ITL
  lun-policy        - Configure FC SRP-global lun-policy
  target-portmask-poli - Configure FC SRP-global target portmask policy
HP-IB(config)# fc srp- gate ?
  restricted        - Configure FC SRP gateway-portmask-policy restricted
HP-IB(config)# fc srp- gate res ?
<cr>
HP-IB(config)# fc srp- gate res
```

In the preceding example, `srp-` is short for `srp-global`, `gate` is short for `gateway-portmask-pol`, and `res` is short for `restricted` (some gateway functions are not supported by HP Fabric Clustering System for InfiniBand).

### Quick Help

You can enter the question mark (?) at the CLI prompt to display one of three types of user information.

- Step 1.** Enter a question mark (?) at the CLI prompt at any time to display the commands you can execute. Only the commands appropriate to the current mode and user login are displayed.
- Step 2.** You may also enter part of a command string, followed by a space and a question mark, to display the choices for completing that command string.

**Step 3.** You may also enter part of a command string, followed by a space and a question mark, to display the choices for completing that command string.

---

**NOTE** Information displayed depends upon if you log in as a guest, administrative, or unrestricted user. All choices and information are displayed to the unrestricted user, whereas less is displayed to the administrative user because the administrative user is not allowed to perform certain tasks, like configuring the Ethernet Management or management-IB ports. The guest user is shown the least because the guest user is only allowed to view a small portion of the configuration. Most of the examples shown throughout this book are done as an unrestricted user.

---

You may enter just enough of each command or argument to make it uniquely identifiable, followed by a space and a question mark to display the arguments and keywords you need to continue the command line.

For example:

```
HP-IB(config)# i? <-- display all keywords that start with "i"
Configure Commands:
  ib          - IB subnet manager configuration
  ib-agent    - Configure IB agent settings
  interface   - Select an interface to configure
  ip          - Global IP configuration subcommands
HP-IB(config)# in? <-- display all keywords that start with "in"
  interface   <-- only 1 keyword starts with "in"
HP-IB(config)# in ? <-- display the arguments to "interface"
  ethernet   - Configure Ethernet interfaces
  fc         - Configure Fibre Channel interfaces
  gateway    - Configure Gateway settings
  ib         - Configure InfiniBand interfaces
  mgmt-ethernet - Configure Ethernet Management port
  mgmt-ib    - Configure Infiniband Management port
HP-IB(config)# in <-- waits for you to complete the "interface"
                  command string
```

---

**NOTE** Information displayed depends upon if you log in as a guest, administrative, or unrestricted user. All choices and information are displayed to the unrestricted user, whereas less is displayed to the administrative user because the administrative user is not allowed to perform certain tasks, like configuring the Ethernet Management or management-IB ports. The guest user is shown the least because the guest user is only allowed to view a small portion of the configuration. Most of the examples shown throughout this book are done as an unrestricted user.

---

You may enter just enough of each command or argument to make it uniquely identifiable, followed by a space and a question mark to display the arguments and keywords you need to continue the command line.

For example:

```
HP-IB(config)# i? <-- display all keywords that start with "i"
Configure Commands:
  ib          - IB subnet manager configuration
  ib-agent    - Configure IB agent settings
  interface   - Select an interface to configure
  ip          - Global IP configuration subcommands
```

```

HP-IB(config)# in? <-- display all keywords that start with "in"
  interface          <-- only 1 keyword starts with "in"
HP-IB(config)# in ? <-- display the arguments to "interface"
  ethernet          - Configure Ethernet interfaces
  fc                 - Configure Fibre Channel interfaces
  gateway           - Configure Gateway settings
  ib                 - Configure InfiniBand interfaces
  mgmt-ethernet     - Configure Ethernet Management port
  mgmt-ib           - Configure Infiniband Management port
HP-IB(config)# in   <-- waits for you to complete the "interface"
                    command string

```

After displaying the help information, the system enters the command string up to the question mark on the input line and waits for you to complete the string. You do not have to retype the string.

If there is no space between a partially-entered command string and the question mark, a list of possible completions are displayed, as shown above.

When enough characters have been entered to uniquely identify a command or keyword in a command string, you may leave it as-is, enter a space, and then add additional keywords or arguments, or you can press the <Tab> key to complete the commands or keywords to improve readability.

## Command-Line Editing

Command-line editing is used to modify a command line you have just entered or a command line that had been entered previously in the current CLI session. Command strings are displayed on the command line when you:

- enter the strings manually
- use quick-help
- scroll through the command history

The CLI supports a variety of ways to move about and edit the currently displayed command line. These are listed in the table below.

**Table 5-4 Key Stroke Shortcuts**

key	description
<Ctrl>a	Move to beginning of line.
<Ctrl>b	Move cursor left one character.
<Ctrl>d	Delete current character.
<Ctrl>e	Move to end of line.
<Ctrl>f	Move cursor right one character.
<Ctrl>k	Delete from cursor to the end of the line.
<Ctrl>l	Refresh input line.
<Ctrl>n	Get next command from history.
<Ctrl>p	Get previous command from history.
<Ctrl>q	Return to use-execute mode. If a command is currently entered on the command line, execute the command before returning to user-execute mode.
<Ctrl>t	Transpose current and previous character.

**Table 5-4 Key Stroke Shortcuts (Continued)**

key	description
<Ctrl>u	Delete text up to cursor.
<Ctrl>w	Delete word up to cursor.
<Ctrl>z	Return to user-privileged mode.
<Esc>b	Move back one word.
<Esc>c	Convert rest of word to uppercase.
<Esc>d	Delete remainder of word.
<Esc>f	Move forward one word.
<Esc>l	Convert rest of word to lowercase.
down-arrow (i)	Get next command from history.
up-arrow (h)	Get previous command from history.
left-arrow (f)	Move cursor left one character.
right-arrow (g)	Move cursor right one character.

**Exiting the CLI Session**

To exit the CLI session, return to the user-execute or privileged-execute mode, and enter the logout command. The CLI session is terminated and you are returned to the CLI login prompt.

For example:

```
HP-IB(config-if-fc-5/1)# exit all
HP-IB> logout
Login:
```

---

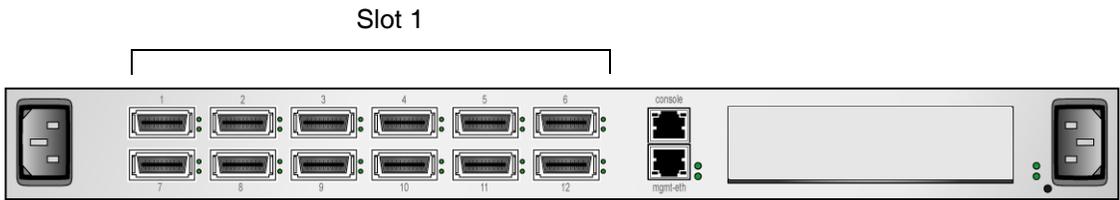
**NOTE** If you use Telnet or SSH to run a remote CLI session, the connection is dropped when you log out, or vice-versa.

---

**Specifying the Card/Port**

In many cases, you are asked to identify the card and/or the ports on a card to which to apply configuration commands. This section describes how to refer to slots and ports for configuration via the CLI.

**Figure 5-1 Slot/Port Notation for the HP Fabric Clustering System Switch**



Many CLI commands allow you to enter

- a card (or slot)#/port# pair

- a range of pairs
- a list of pairs
- or the keyword, “all”.

**Card/Port pairs** A card#/port# (sometimes referred to as the slot#/port#) pair is a slash-separated (/) pair of numbers.

The first number indicates the interface card and the second number is a port on that interface.

**Ranges** A range is a dash-separated (-) set of two card#/port# pairs.

- A range may span multiple cards.
- Card and port numbers in a range must both be in ascending order. That is, specify the lower card number in the first card#/port# pair and the higher card number in the second card#/port# pair.
- Do not insert spaces between elements in the range.

For example:

3/2-4/3 indicates all the ports starting at card 3, port 2, up to and including card 4, port 3. (This example assumes that cards 3 and 4 are of the same interface type.)

On the HP Fabric Clustering System Switch:

```
2/2-2/4
```

indicates ports 2 through 4 on card 2.

**Lists** A list is a comma-separated (,) set of two or more card#/port# pairs.

- Sequencing of pairs in the list is not important. You may specify pairs in any order you wish, however, the data returned is displayed in numerical sequence with the lowest card#/port# pair first.
- Do not insert spaces between elements in the list.

For example:

3/1,3/3,4/3 indicates ports 1 and 3 on interface card 3 and port 3 on interface card 4. (This example assumes that cards 3 and 4 are of the same interface type.)

**The “all” Keyword** The all keyword indicates all the ports of all the cards of a specific type of interface. That is, all Fabric interface cards.

## Using the Documentation

The command descriptions in the following chapters are structured in a way we hope provides quick access to the information you seek. Each command description is broken into subsections so you can go directly to the desired information. The subsections are described below.

**Synopsis** The Synopsis subsection provides a terse description of the command.

**Syntax** The Syntax subsection provides the command syntax.

- Text in regular courier text is a literal that are entered exactly as shown.
- Italicized courier text indicates a variable that is replaced with an actual value.
- Text enclosed within square brackets ([ ]) are options to the command that do not have to be included on the command line for the command to work.

- The pipe character (|) indicates a choice where one argument must be entered.

The following are a few syntax examples:

```
terminal length int
```

```
no ntp server-one | server-two | server-three
```

```
fc srp itl guid ext t_wwpn fc_lun [policy]
```

Input strings such as device names and descriptions are usually assumed to be contiguous without any intervening spaces or blanks. In the event you wish to enter a multi-word string, enclose the string within double-quotes (“ ”), otherwise each word in the string is parsed as a separate argument and will result in a syntax violation.

The syntax examples are followed by descriptions of each argument on the command line.

**Command Modes** The Command Modes subsection indicates the command mode you must be to execute the command.

**Privilege Level** The Privilege Level subsection indicates the user permissions that are required to execute the command. For example, there are commands that only an unrestricted read-write user (e.g., super) can execute that a user with general read-write permissions (e.g., admin) cannot.

**Usage Guidelines** The Usage Guidelines subsection supplies additional information and details for executing the command.

**Examples** The examples section shows actual command entry and the results of executing it.

For example:

```
HP-IB# show interface gateway 5
=====Gateway Information=====
      gateway : 5
        name  : 5/0
        type   : fc-gateway
        desc   : 5/0 (320)
last-change : none
      mtu     : 0
admin-status : up
oper-status  : up
HP-IB#
```

**Defaults** The Defaults subsection lists command defaults.

**Related Commands** Provides hypertext links to other related commands.

## Advanced Switch Setup

### Configuring the System Hostname

The system allows you to assign a hostname to the system for management purposes.

To assign a hostname name to the management port:

**Step 1.** Start a CLI session.

**Step 2.** Enter the privileged-user mode.

```
HP-IB> enable
HP-IB#
```

**Step 3.** Enter the global-configuration mode.

```
HP-IB# configure
HP-IB(config)#
```

**Step 4.** Enter the `hostname` command with the name you wish to assign.

The `hostname` command assigns a convenient name to the system that shows up at the CLI prompt.

```
HP-IB(config)# hostname MyHost
```

---

<b>NOTE</b>	This command also changes the CLI prompt. The new hostname is applied immediately, however, the prompt does not change until you change modes. For example, the prompt changes when you exit the global-configuration mode.
-------------	---

---

### Testing Network Connectivity

Refer to “Connect Cables to Switch” on page 36 for information regarding connecting network devices.

After you install network cables, you can verify connectivity by pinging those devices from the CLI or pinging between attached hosts.

**Pinging an IP address** To verify the device recognizes and successfully links HP Fabric Clustering System-attached hosts, enter the `ping` command on one host and specify the IP address of another connected host.

```
# ping 10.2.65.50
PING 10.2.0.50 (10.2.0.50) from 10.2.0.41 : 56(84) bytes of data.
64 bytes from 10.2.0.50: icmp_seq=0 ttl=64 time=164 usec
64 bytes from 10.2.0.50: icmp_seq=1 ttl=64 time=144 usec
...
...
6 packets transmitted, 6 packets received, 0% packet loss
round-trip min/avg/max/mdev = 0.135/0.147/0.164/0.017 ms
#
```

To verify the switch device can reach a host on the network, enter either the user-execute or privileged-execute mode, then enter the `ping` command.

```
HP-IB# ping 10.10.253.47
Sending 5 ICMP Echos to 10.10.253.47, 56 data bytes
!!!!
Success rate is 100 percent (5/5)
```

### Setting User Levels and Passwords

HP Fabric Clustering System Switch devices support multiple users with granular levels of access control. An administrator is assigned a user name and password, which is also associated with a unique SNMP community string. User names and passwords are used for CLI access.

For initial configuration, log in as the unrestricted user. The default unrestricted username for the CLI is `super` and the default password is `super`.

For security purposes, since multiple users exist on the system, it is highly recommended to change the default passwords after initial configuration. See “Community Strings” on page 94 and “Understanding Usernames and Passwords” on page 90 for more information. Logging Onto the System

You can manage the HP Fabric Clustering System Switch system using the following methods:

- Command Line Interface (CLI) - a text-based interface accessible through a direct serial connection, Telnet over IP, or SSH over IP.
- SNMP - Simple Network Management Protocol. A simple request/response protocol that communicates management information between two types of SNMP software entities: SNMP applications (also called SNMP managers) and SNMP agents.

### Logging Onto the System

You can manage the system using the following methods:

- Command Line Interface (CLI) - a text-based interface accessible through a direct serial connection, Telnet over IP, or SSH over IP.

**Logging On Through the CLI** Once you have configured an IP address on the management port, you can log on through the CLI through a direct serial connection, a Telnet session, or an SSH session. The Telnet and SSH session can be initiated over IP using a terminal emulation client, such as Hyper Terminal for Windows.

**Logging On Through SNMP** Any Network Manager running the Simple Network Management Protocol (SNMP) can manage the system, if the Management Information Base (MIB) is installed correctly.

**Supported MIBs** In addition to private MIBs, the system supports the standards MIBs listed below.

- RFC2665: Ethernet-Like MIB
- RFC1213: MIB2
- RFC2863: The Interface Group
- RFC2096: IP Forward MIB
- IB SM - Draft InfiniBand Subnet Manager
- IB SMA - Draft InfiniBand Subnet Management Agent

### Management Methods

This chapter provides the following required information to begin managing the system:

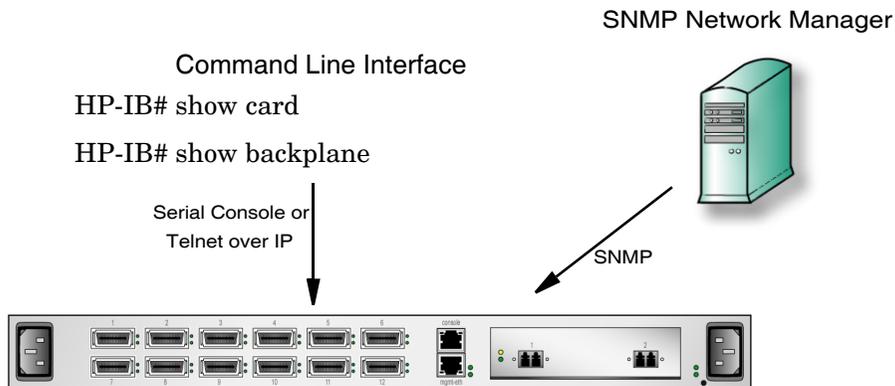
- “Management Methods” on page 70
- “Managing Through the CLI” on page 71

Use the following methods to manage the switch system:

- Run the Command Line Interface (CLI) from a terminal or workstation using one of two options:
- Direct serial-console connection or Telnet or SSH session over a TCP/IP network
- Run an SNMP Network Manager over a TCP/IP network.

- Manage the system out-of-band through the serial console or Ethernet management port, or in-band through the Fabric ports.

**Figure 5-2 Management Methods**



## Managing Through the CLI

**Direct Serial-Console Connection** Refer to the Console Cable kit, which is included with your console cable for information regarding setting up the physical serial-console connection.

**Remote Telnet Login** You can Telnet to the Management-Ethernet port on the box from a host on the same network as the Management-Ethernet port, or from any host with a route to the Management-Ethernet network.

To run the CLI remotely:

- Step 1.** Open a terminal or terminal emulator window. For example: from the command line, enter the `telnet` command with the IP address, or network name, of the Management-Ethernet port.

```
# telnet 10.0.0.47
```

The CLI login prompt (`Login:` ) is displayed.

- Step 2.** Enter a CLI user name.

The CLI password prompt (`Password:` ) is displayed.

- Step 3.** Enter the CLI user password.

The prompt changes to `HP-IB>` to indicate a successful login. The system is now ready to receive CLI commands.

**Remote SSH Login** HP Fabric Clustering System Switch OS supports SSH2 for secure, encrypted login to the CLI. SSH is enabled by default, and does not require additional configuration.

To login via SSH, use an SSH client (e.g. Putty) to port 22.

## Configuration, Image, and Log Files

This chapter provides the required information to manage the Configuration, Image, and Log files on the system.

## Configuration, Image, and Log File Overview

The following sections describe how to use the important files in the HP Fabric Clustering System Switch OS file system.

The file system uses three basic file types:

- Configuration files
- Image Files
- Log Files

### Configuration Files

A configuration file is a text file that stores a list of CLI commands. The main configuration file is called `startup-config`. This file stores all of the CLI commands necessary to completely configure a box from a factory, default state. This configuration file can be copied, backed up, and modified.

Whenever configuration changes are made via the CLI, a CLI command is temporarily saved in a virtual configuration file called `running-config`. If the administrator wishes to save these changes permanently, this file is “copied” into the `startup-config` file.

Any number of configuration files can be stored. For convenience and rapid configuration, files can also maintain a partial list of CLI commands. These can also be copied into `running-config` for immediate use or `startup-config` for persistent use across reboots.

### Image Files

Image files are stored in the system flash memory as a single complete file with a “.img” extension. Each image file contains all the operating software (application software and firmware/microcode) needed by the various cards that can be installed into the system.

The system cannot use an image file directly to boot-up to system. The image file must first be installed. The installation process automatically unbundles the image file and distributes the software components to each card in the system. Users do not have to be aware of individual software components. The user simply executes one CLI command to install an image file. Information on the `install` command can be found at “install” on page 266.

When an image file is installed, the image file is expanded into a “system image”. The system image is what the user will refer to in order to specify what software version the system show use to boot-up each card in the system.

The system only has enough flash memory to store:

- one image file (active)
- one system image (inactive)
- one recovery image

Occasionally, the user will have to manually delete either an image file or a system image from the system to make room for new software. Detailed information on the `delete` command can be found at “delete” on page 254.

- **Active Image**

The term “Active Image” refers to the current System Image. An installed, or “active” image has gone through the entire upgrade process. The System-Image usually has a slash (/) in its name. Do not modify or delete the installed system-image.

- **Inactive Image**

An inactive image is one that has been downloaded, but has not been installed; therefore it is not the active, or “system” image.

The HP Fabric Clustering System Switch OS can only store one inactive image. Delete inactive images through the CLI (refer to page 78).

- **Recovery Image**

The Recovery Image is a default image that comes installed on the system. The Recovery Image can be used to quickly restore operation to the system if an image upgrade should fail.

### Log Files

Log files: Text files that record activity, including configuration changes. Depending on size, log files are rotated and compressed. The system checks the size of the active log file hourly, and when it exceeds 1 MByte, the active log file, `ts_log`, is closed, compressed, and renamed `ts_log.1.gz`. Other `ts_log.x.gz` files are incremented by 1.

Log files can also be exported from the system by using the `copy` command.

### Image Files

**Understanding the Upgrade Process** Only cards with an oper-status of “up” are updated. If a card is down when you run `install`, or a card is added after running `install`, bring up the card and run `install` again. Specify the same image file. If the image is already installed on a card, that card is skipped. Be sure to specify `boot-config` again so that all cards know to boot off the same system image.

**About Copying/Downloading the Image** Upgrading the HP Fabric Clustering System Switch OS requires several steps, which are described in the following sections. One of the steps will be to copy the image before installing it.

There are options when copying the image into the system:

**Table 5-5 Copying/Downloading Image Options**

Method: CLI
FTP (see page 75)
TFTP (see page 76)

Once the image has been copied via the chosen method, refer to “4. Install a New Image” on page 77.

**Image Upgrade Procedure Summary** The system upgrade process is summarized in the following steps:

- Step 1.** Set up the hardware connection for the upgrade.
- Step 2.** Verify the installed system-image version number.
- Step 3.** Download an image file from a network-accessible ftp server.  
or  
Download an image file remotely from a tftp server.
- Step 4.** Install the new system-image.
- Step 5.** Configure the CLI to use the appropriate configuration file the next time it reboots.
- Step 6.** If you have made any configuration changes, save the current configuration so you can restore the configuration after rebooting the system.

**Step 7.** Reboot the system.

**1. Set-Up the Hardware Connection** For detailed information about the HP Fabric Clustering System Switch hardware, refer to “Switch Setup” on page 35.

There are two types of hardware connections that can be used to download a new image to the system.

- Out-of-Band connection  
Connect the server to the switch ethernet management port, if a connection does not already exist.
- In-Band connection

Use a 4x copper cable to connect from an HP Fabric Clustering System-enabled host to a Fabric port on the HP Fabric Clustering System Switch system.

**2. Check the Image Version** This section describes how to use the Command Line Interface (CLI) to copy the software that runs the system.

Refer to “Deleting Images Through the CLI” on page 78

**Step 1.** Enter the privileged-execute mode.

```
HP-IB> enable
HP-IB#
```

**Step 2.** Enter the `dir image` command.

Note the names of the installed system-images and image files displayed in the `file-name` column.

If there are already three images installed, there will not enough space for the new image to copy and install. Delete an existing older image before copying the new image (refer to “Deleting System Images and Image Files” on page 78).

```
HP-IB# dir image

=====
Existing Boot-Images on System
=====
slot date-created          size      file-name
-----
1   Tue Jan 13 10:24:35 2004  18905824  HP-AB291A-Release-1.1.3hp-build023.img
1   Sun Feb 22 10:24:44 2004  18932637  HP-AB291A-Release-1.1.3hp-build025.img
1   Sun Feb 22 10:29:45 2004  13085184  Release-1.1.3hp/build025
HP-IB#
```

**Step 3.** Check the installed system-image used to boot the system with the `show boot-config` command.

```
HP-IB# show boot-config

=====
System Boot Configuration
=====
slot-id : 1
sw-version : Release-1.1.3hp/build025
last-image-source : Release-1.1.3hp/build025
primary-image-source : Release-1.1.3hp/build025

HP-IB#
```

**Step 4.** Check that the system image is synchronized across all installed cards.

```
HP-IB# show card-inventory all

=====
                        Card Resource/Inventory Information
=====
      slot-id : 1
      used-memory : 46808 (kbytes)
      free-memory : 81004 (kbytes)
      used-disk-space : 67719 (kbytes)
      free-disk-space : 34660 (kbytes)
      last-image-source : Release-1.1.3hp/build025
      primary-image-source : Release-1.1.3hp/build025
      image : Release-1.1.3hp/build025
      cpu-descr : PPC 440GP Rev. C - Rev 4.129 (pvr 4012 0481)
      fpga-firmware-rev : 6
      ib-firmware-rev : 5.1.0

HP-IB#
```

**Step 5.** (Optional) The system can only hold one installed image, and one uninstalled image. If there are more than two images on your system, delete any extraneous images before proceeding with an installation.

**3. Copy/Download the Image** There are two ways that the software can be downloaded from the CLI:

- Through an FTP server (page 75).
- Through a TFTP server (page 76).

#### Download From an FTP Server

Use FTP to download new image files to the HP Fabric Clustering System Switch system. Uninstalled system-image files always end with a .img extension. Directory management is automatically performed on the switch system, so do not include path information for files on the switch chassis.

**Step 1.** (optional) If you are using In-Band Management, configure the IP management interface (if you have not already done so).

```
HP-IB> enable
HP-IB# config
HP-IB(config)# interface mgmt-ether
HP-IB(config-if-mgmt-ethernet)#ip address 10.3.102.8. 255.255.0.0
HP-IB(config-if-mgmt-ethernet)#gateway 10.3.0.1
HP-IB(config-if-mgmt-ethernet)#no shutdown
HP-IB(config-if-mgmt-ethernet)# exit
HP-IB (config) # exit
```

**Step 2.** Verify that you have a working ftp server connection, and that you have a user account on the ftp server.

```
$ftp 10.10.0.5
username:Example
password:xxxxxx
ftp>
```

**Step 3.** In the privileged-execute mode, enter the copy command with the source, destination, and FTP user information.

Syntax:

```
HP-IB> enable
HP-IB# copy ftp://user-name:password@source-IP-address/source-image-file-path-name
image:destination-file-name
```

Enter path, user-name and password information.

This information authenticates you to the server, which is specified in source-IP-address.

- Include the full path to the file.
- Set the file-system to image when copying image files.

```
HP-IB# copy
ftp://root:infini@15.13.113.96/tmp/HP-AB291A-Release-1.1.3hp-build020.img
image:HP-AB291A-Release-1.1.3hp-build020.img
      operation completed successfully
HP-IB#
```

**Step 4.** Continue on to “4. Install a New Image” on page 77 to make the image active.

#### Download From a TFTP Server

Use TFTP to download new image files to the system. Uninstalled system-image files always end with a .img extension. Directory management is automatically performed on the system, so do not include path information for files on the chassis.

**Step 1.** (optional) If you are using In-Band Management, configure the IP management interface (if you have not already done so).

```
HP-IB> enable
HP-IB# config
HP-IB(config)# interface mgmt-ether
HP-IB(config-if-mgmt-ethernet)#ip address 10.3.102.8. 255.255.0.0
HP-IB(config-if-mgmt-ethernet)#gateway 10.3.0.1
HP-IB(config-if-mgmt-ethernet)#no shutdown
HP-IB(config-if-mgmt-ethernet)# exit
HP-IB (config) # exit
```

**Step 2.** In the privileged-execute mode, enter the copy command with the remote system and path information.

The “remote system” must be the IP address of the TFTP server.

Syntax:

```
HP-IB> enable
HP-IB# copy tftp://<remote-system>/<filepath> <filesystem>:<filename>

HP-IB# copy tftp://@10.10.20.78/tftp dir/HP-AB291A-Release-1.1.3hp-build020.img
      image:HP-AB291A-Release-1.1.3hp-build020.img
      *****operation completed successfully
HP-IB#
```

**Step 3.** (Optional) View the images by using the dir image command.

```
HP-IB# dir image
=====
                        Existing Boot-Images on System
=====
slot date-created          size      file-name
-----
1   Mon Aug 11 22:41:19 2003  29830309  HP-AB291A-Release-1.1.3hp-build020.img
```

**4. Install a New Image** After downloading the image file to the chassis controller, it must be installed. The `install` command installs the specified image file into the system.

To install an image file:

**Step 1.** In the privileged-execute mode, enter `install image:file`.

`image` specifies the file resides in the image file-system. `file` is the name of the image file to install.

Image files must reside in the image file-system and the file name must have the `.img` extension.

Syntax:

```
HP-IB#install image:image-file-name
```

```
HP-IB# install image:HP-AB291A-Release-1.1.3hp-build020.img Proceed with install?
[yes(default) | no]
***** operation completed successfully
```

The name of the image file will change after it is installed.

**NOTE** Only cards with an `oper-status` of “up” are updated. If a card is down when you run `install`, or a card is added after running `install`, bring up the card and run `install` again. Specify the same image file. If the image is already installed on a card, that card is skipped. Be sure to run `boot-config` again so that all cards know to boot off the same system-image.

View a card’s status by using the `show card` command. For information regarding installing a new card, refer to “Installing the Host Channel Adapter” on page 28.

**5. Specify a New Boot Image** After a system-image is installed on the system chassis, specify the system-image to use the next time it reboots. Use the `boot-config` command with the name of the system-image.

**Step 1.** Find the name of your new system image by listing all the image files on the chassis. Enter the `dir image` command.

```
HP-IB# dir image
```

```
=====
                        Existing Boot-Images on System
=====
slot date-created          size      file-name
-----
1   Tue Jan 13 10:24:35 2004 18905824 HP-AB291A-Release-1.1.3hp-build023.img
1   Sun Feb 22 10:24:44 2004 18932637 HP-AB291A-Release-1.1.3hp-build025.img
1   Sun Feb 22 10:29:45 2004 13085184 Release-1.1.3hp/build025
HP-IB#
```

**Step 2.** Copy the displayed system-image (this will be pasted into the `boot-config` command).

**Step 3.** Specify the new boot image.

Enter `boot-config primary-image-source`, then paste the copied image file name.

Syntax:

```
boot-config primary-image-source image-directory-name
```

```
HP-IB# con
HP-IB(config)#
HP-IB(config)# boot-config primary-image-source Release-1.1.3hp/build025
```

**Step 4.** Show the new system -image.

```
HP-IB# show boot-config
```

```
=====
                        System Boot Configuration
=====
      slot-id : 1
      sw-version : Release-1.1.3hp/build025
      last-image-source : Release-1.1.3hp/build025
      primary-image-source : Release-1.1.3hp/build025
```

**6. Reboot the System** “Rebooting the System” on page 97

The complete reboot process is also described in the Admin chapter ().

**Step 1.** Once the system is configured to use the new image, reboot the system.

Once the reboot process is initiated, the system checks for unsaved changes to the configuration.

If the configuration has been modified but not saved, you will be prompted to save the configuration.

If you enter `yes`, the changes made during the current CLI session are saved to `startup-config` and used when the system comes back up. You can also use the `copy running-config startup-config` command in EXEC mode to save the configuration.

If you have dual-controllers in your chassis, see also “Reboot the System Through the CLI” on page 98.

```
HP-IB# reload
System configuration is modified. Save? [yes(default) | no | filename] yes
Proceed with reload? [yes(default) | no]
```

---

**CAUTION** Do not power cycle the system during the reboot process.

---

**Step 2.** Verify that the system has finished initializing.

Attempt to telnet to the system and enter the `show card` command. Wait until the card status displays “normal”.

As the system powers-up, it uses the new image to configure internal hardware and software.

**Deleting System Images and Image Files**

**Deleting Images Through the CLI**

Up to two image files may be saved on the system. Older versions of image files will have to be removed before you can add more.

You cannot copy or install more than the maximum number of image files or system-images. The `delete` command is used to remove installed system-images and image files. The `delete` command may also be used with the `syslog` and `config` keywords to remove system log and configuration files.

The syntax of the `delete` command is

```
delete image:file
```

`Image` is the type of file system (`image`, `syslog`, `config`). The file-system must be appropriate for the type of file you are deleting.

`file` is the name of the file or system-image to be removed.

Enter the file name exactly as displayed by the `dir` command.

## Troubleshooting an Image Upgrade

### Error Message and Resolution Example

The following example shows a typical error message and its resolution.

```
HP-IB# install image:image:HP-AB291A-Release-1.1.3hp-build025.img
Error: Not enough space on card 1 to perform installation
HP-IB# delete image:HP-AB291A-Release-1.1.3hp-build023.img
Delete file HP-AB291A-Release-1.1.3hp-build023? [yes(default) | no]
*****
HP-IB# install image:image:HP-AB291A-Release-1.1.3hp-build025.img
***** operation completed successfully
HP-IB#
```

### File Management

The management of these files is performed automatically. Each file type is stored separately, in separate file systems. All files share the 128 MB of flash memory. The names of the file systems are:

- syslog files

Stores log files

- image files

Stores system image files.

- config files

Stores configuration files.

### Listing Configuration, Image, and Log Files

To list the configuration files currently stored on the system:

Enter the `dir` command with the `config` keyword. For example:

```
HP-IB# dir config
=====
Existing Configurations on System
=====
slot date-created          size    file-name
-----
1    Tue Jan 14 23:19:55 2003   9110    startup-config2
1    Tue Jan 14 00:11:04 2003  13925   startup-config
HP-IB#
```

Similarly, to list the log and image files currently stored on the system, enter the `dir` command with the `syslog` or `image` keywords.

### Viewing Configuration Files

There are two ways to view configuration files. You may enter the `show config` command to display the current system configuration or enter the `more` command to display the contents of a specific configuration file. The `show config` command is described in “show config” on page 143. The `more` command is described in this section.

To view the contents of a configuration file on the system:

Enter the `more` command, followed by `config:` and the name of a configuration file.

```
HP-IB# more config:sup-config
! Release-1.1.3hp/build023
! Mon Jan 12 19:49:38 2003
enable
config terminal
```

## Viewing Log Files

The contents of the active log-file may be viewed using the `show logging` and `more` commands. The `show logging` command displays the entire active log-file or log entries as they are being entered in the active log-file. The `more` command displays the contents of a specified log file, including the active log-file.

It is recommended you set the terminal page length to 0 when using the `end` argument. Otherwise, you will have to keep pressing the **space** bar to continue each time the maximum display length is reached. Refer to “show logging” to set the number of lines displayed as you scroll through the log data.

**NOTE:** Do not change the window size after you have set the page length; changing the window size would cause the terminal length to be overwritten by the actual size of the window.

---

**NOTE** You cannot view the compressed GNU-zip (.gz) log files that reside on the controller. You must upload the files to a network host, then unzip them and view them on the host.

To display the tail-end of the active log-file and display new log entries as they occur,

Enter the `show` command with the `logging` and `end` keywords.

```
HP-IB# show logging end
```

```
Feb 24 07:35:45 hp-lt ib_sm.x[668]: [INFO]: Successfully add pgid
fe8000000000000000000000ca001002 to mgid ff12401bffff0000000000000000001, mlid
0xc002
Feb 24 07:35:46 hp-lt ib_sm.x[665]: [INFO]: Configuration caused by multicast
membership change
```

The `show logging` command with the `end` argument locks the terminal window to display log data much like the UNIX `tail -f` command. To stop displaying log entries and resume control of the terminal screen, enter **<Ctrl> C**. When using the `show logging` command without the `end` argument, log text is displayed a page at a time, as set by the `terminal length` parameter.

## Saving Configuration Files

You should save the current configuration as you achieve major configuration milestones so it is recreated when the chassis reboots. If you do not save the current configuration, all the changes you make during the current CLI session are lost when the system reboots.

The file used to configure the chassis upon reboot is `startup-config` in the `config` file-system. If you want to restore the configuration to its factory-default, delete the `startup-config` file.

## Saving for System Reboot

In the CLI, to save the current configuration so it is used to reboot the system:

**Step 1.** Enter the `copy` and `running-config` commands:

```
HP-IB# copy system:running-config config:startup-config
```

You may abbreviate the command line by omitting `system:` and `config:` because these two are internally aliased to `system:running-config` and `config:startup-config`, respectively.

```
HP-IB# copy running-config startup-config
```

### Saving the Backup Configuration

**CLI** The file is stored in the `config` file-system and will not be used to boot the system.

In the CLI, to save the current configuration so it is stored in the file-system but not used to boot the system, enter

```
HP-IB# copy running-config config:fname
```

where `fname` is any name except `startup-config`.

### Specifying the Configuration to Use at System Reboot

**Specify a New Boot Image Through the CLI** After a system-image is installed on the system chassis, specify the system-image to use the next time it reboots. Use the `boot-config` command with the name of the system-image.

**Step 1.** Find the name of your new system image by listing all the image files on the chassis. Enter the `dir image` command.

```
HP-IB# dir image
=====
                        Existing Boot-Images on System
=====
slot date-created          size      file-name
-----
1   Tue Feb 25 16:14:15 2003  23198989  Release-1.1.3hp/build023
```

**Step 2.** Copy the displayed system-image (this will be pasted into the `boot-config` command).

**Step 3.** Specify the new boot image.

Enter `boot-config primary-image-source`, then paste the copied image file name.

Syntax:

```
boot-config primary-image-source image-directory-name
```

Example:

```
HP-IB# configure
HP-IB(config)# boot-config primary-image-source Release-1.1.3hp/build023
HP-IB(config)# exit
```

**Step 4.** Show the new system image.

```
HP-IB# show boot-config
=====
                        System Boot Configuration
=====
slot-id : 1
sw-version : Release-1.1.3hp/build023
last-image-source : Release-1.1.3hp/build023
primary-image-source : Release-1.1.3hp/build023
```

## Saving and Copying Files

HP Fabric Clustering System Switch OS allows administrators to save files to and from the system, as well as between files, using the CLI `copy` command. You may download and install image and configuration files from an FTP server to the system chassis.

Download image files to upgrade switch system firmware and download configuration files to quickly replicate a desired configuration. Upload configuration and log files to maintain backups and troubleshoot the system.

Files are copied across the network using the File Transfer Protocol (FTP). As such, part of the `copy` command requires you to include your network user name and password, as well as the host DNS name or IP address.

**Download and Upload Capabilities** Image files: Download only. No upload.

Config files: Download and upload

Log files: Upload only

**The copy Command** The `copy` command may be executed in the privileged-execute mode only.

The syntax for copying a remote file to the local system is:

```
copy ftp://usr:passwd@host/loc fs:file
```

or

for copying a local file to a remote host,

```
copy fs:file ftp://usr:passwd@host/loc
```

The arguments to the `copy` command are described below.

**Table 5-6 Copy Command Descriptions**

argument	description
usr	Network user name for executing the FTP command on the specified host . The user name is always followed by a colon (:).
passwd	Network password for executing the FTP command on the specified host . The password is always followed by the “at” character (@). A password is sent as-is, without encryption, to the target host; however, the system, and connected hosts should be protected behind a firewall.
host	IP address or DNS name of the remote host system. The host is always followed by a slash.
loc	Location of the file. The format of the path is appropriate for the host system (e.g., forward slashes on Linux systems or back-slashes on Windows systems). Path information may not be supported by your FTP server. If this is the case, copy files to and from your top-level home directory and omit any path information.

**Table 5-6 Copy Command Descriptions (Continued)**

argument	description
fs	HP Fabric Clustering System Switch file-system. This is an internal directory that is identified by name only. The file-systems are <code>config</code> , <code>images</code> , and <code>syslog</code> . The specified file-system must be appropriate for the type of file being copied. For example, if an attempt is made to copy a configuration file from the <code>syslog</code> file-system, an error is returned because the name of the file is not appropriate for the file-system. The file-system specification is always followed by a colon (:).
file	Name of the configuration, image, or log file to be copied. The file-name convention is: configuration files end in “.cfg”, image files begin with “build”, and log files begin with “ts_log”. (The .cfg extension is optional.)

---

**NOTE** The `copy` and `show logging` commands are the only CLI commands which recognize `<Ctrl>-c`. You may enter `<Ctrl>-c` during the uploading/downloading process to terminate file transfer in the event network transfer hangs.

---

Examples of copying files to and from the chassis are shown below. The first example shows copying a remote image file onto the chassis. The second example shows copying a local configuration file to a remote FTP server.

```
HP-IB# copy
ftp://anonymous:taj@15.1.162.207/ib/HP-AB291A-Release-1.1.3hp-build023.img
image:HP-AB291A-Release-1.1.3hp-build023.img
operation completed successfully
HP-IB
```

```
HP-IB# copy config:startup-config2 ftp://anonymous:taj@15.1.162.207/startup-config2
operation completed successfully
HP-IB
```

### Downloading Files to the System

To copy a configuration file, use the `copy` command. For example, to copy a config file (example: `config_021215.cfg`) from the home directory of the user `anonymous` to the `config` file-system, enter a script such as:

```
HP-IB# copy
ftp://anonymous:taj@15.1.162.207/ib/HP-AB291A-Release-1.1.3hp-build023.img
image:HP-AB291A-Release-1.1.3hp-build023.img
operation completed successfully
```

```
HP-IB# dir image
=====
Existing Boot-Images on System
=====
slot date-created          size      file-name
-----
1   Mon Nov 17 14:20:09 2003  18911083 HP-AB291A-Release-1.1.3hp-build019.img
```

```
1 Mon Nov 17 14:20:09 2003 18911083 HP-AB291A-Release-1.1.3hp-build021.img
1 Mon Nov 17 14:27:51 2003 13082624 Release-1.1.3hp/build021
```

HP-IB#

---

**NOTE** You can only download image and configuration files. Log files cannot be downloaded.

---

Image files require additional processing. Though they have been copied onto the chassis, image files must be installed before they can be used to initialize the system. For information about installing image files, refer to “Image Files” on page 73.

### Deleting Configuration, Image, and Log Files

The system manages available storage by rotating and compressing logs files. As a new log file is generated, the oldest log file is discarded. Also, the controller limits the user to two uninstalled image files.

This section describes how to proactively manage available space by deleting files.

**Deleting Configuration Files** To remove a configuration file:

**Step 1.** Log in as the unrestricted user.

**Step 2.** Enter the privileged-user mode.

```
HP-IB> enable
HP-IB#
```

**Step 3.** Determine the configuration files in memory.

```
HP-IB# dir config
=====
Existing Configurations on System
=====
slot      date-created          size      file-name
-----
1         Mon Dec 9 11:12:29 2002      58        check.cfg
1         Wed Dec 11 19:00:45 2002      38        ftpfile.cfg
1         Fri Nov 15 17:58:26 2002     1792      ip-back.cfg
1         Fri Oct 18 14:36:53 2002      223       ip-config.cfg
1         Mon Dec 9 11:42:18 2002     106       running_config.cfg
1         Thu Dec 5 21:37:27 2002     106       running_config2.cfg
1         Fri Nov 15 13:22:45 2002     7213      srp-all.cfg
1         Fri Nov 15 12:49:07 2002     2561      srp-config.cfg
1         Wed Dec 4 19:52:16 2002     2361      srp-whole.cfg
1         Wed Nov 13 16:48:10 2002     348       system-name.cfg
HP-IB#
```

**Step 4.** Enter the delete command to remove a configuration file.

The syntax of the delete command is:

```
delete config: file
```

where, file is the name of a configuration file. Enter the name exactly as shown by the dir command. The config keyword and colon (:) are mandatory and indicate the configuration file-system. For example:

```
HP-IB# delete config:ip-back.cfg
*****
HP-IB#
```

**Step 5.** Verify that you had successfully removed the configuration file.

```
HP-IB# dir config
=====
Existing Configurations on System
=====
slot      date-created          size      file-name
-----
1         Mon Dec  9 11:12:29 2002     58       check.cfg
1         Wed Dec 11 19:00:45 2002     38       ftpfile.cfg
1         Fri Oct 18 14:36:53 2002    223      ip-config.cfg
1         Mon Dec  9 11:42:18 2002    106      running_config.cfg
1         Thu Dec  5 21:37:27 2002    106      running_config2.cfg
1         Fri Nov 15 13:22:45 2002   7213     srp-all.cfg
1         Fri Nov 15 12:49:07 2002   2561     srp-config.cfg
1         Wed Dec  4 19:52:16 2002   2361     srp-whole.cfg
1         Wed Nov 13 16:48:10 2002    348     system-name.cfg
HP-IB#
```

**Deleting Log Files** To remove a log file

**Step 1.** Log in as the unrestricted user.

**Step 2.** Enter the privileged-user mode.

```
HP-IB> enable
HP-IB#
```

**Step 3.** Display the log files that are in memory.

```
HP-IB# dir syslog
=====
Existing Syslog-files on System
=====
slot date-created          size      file-name
-----
1     Wed Nov 26 11:19:25 2003  849964   ts_log
1     Tue Oct 21 16:00:03 2003   50373    ts_log.1.gz
1     Tue Sep 23 13:00:04 2003   54514    ts_log.2.gz
1     Fri Sep 12 17:00:03 2003   45265    ts_log.3.gz
```

**Step 4.** Enter the delete command to remove a log file.

The syntax of the delete command is:

```
delete syslog:file | dir
```

where, file is the name of a log file. Enter the name exactly as shown by the dir command. The syslog keyword and colon (:) are mandatory and indicate the logging file-system. For example:

```
HP-IB# delete syslog:ts_log.3.gz
Delete file ts_log.3.gz? [yes(default) | yes]
```

**Step 5.** Verify that you had successfully removed the log file.

```
HP-IB# dir syslog
=====
Existing Syslog-files on System
=====
slot date-created          size      file-name
-----
1   Wed Nov 26 11:19:25 2003  849964   ts_log
1   Tue Oct 21 16:00:03 2003   50373    ts_log.1.gz
1   Tue Sep 23 13:00:04 2003   54514    ts_log.2.gz
```

**Deleting Image Files** To remove an uninstalled image file:

**Step 1.** Log in to the CLI as a super user.

**Step 2.** Enter the privileged-user mode.

```
HP-IB> enable
HP-IB#
```

**Step 3.** Determine the currently installed system-images.

```
HP-IB# dir image
=====
Existing Boot-Images on System
=====
slot date-created          size      file-name
-----
1   Mon Nov 17 14:20:09 2003  18911083 HP-AB291A-Release-1.1.3hp-build019.img
1   Mon Nov 17 14:20:09 2003  18911083 HP-AB291A-Release-1.1.3hp-build021.img
1   Mon Nov 17 14:27:51 2003  13082624 Release-1.1.3hp/build021

HP-IB#
```

**Step 4.** Enter the delete command to remove an image file with a .img extension.

You cannot delete the system-image that booted the system because it is the actively being used. The syntax of the delete command is:

delete image: image file | system image

where the `image` keyword and colon (`:`) are mandatory, and indicate the image file-system. `image file` is the name of an image file and `system image` is the name of an installed system-image. Enter either an image file name or installed system-image. Enter the name exactly as shown by the `dir` command. For example:

```
HP-IB# delete image:HP-AB291A-Release-1.1.3hp-build019.img <- image file
Delete file HP-AB291A-Release-1.1.3hp-build019.img? [yes/no] y
*****
HP-IB#
```

**Step 5.** Verify that you had successfully removed the system-image or image file.

```

HP-IB# dir image
=====
Existing Boot-Images on System
=====
slot      date-created                size      file-name
-----
1   Mon Nov 17 14:20:09 2003  18911083 HP-AB291A-Release-1.1.3hp-build021.img
1   Mon Nov 17 14:27:51 2003  13082624 Release-1.1.3hp/build021
HP-IB#

```

## Managing Log Files

HP Fabric Clustering System Switch devices log essential information to facilitate system audits and troubleshooting. These log files should be checked to locate performance bottlenecks and error conditions. Logs are saved on flash memory, and are rotated based on user-definable settings. Logs can be uploaded via FTP to an FTP server for archiving off-box viewing.

**Event Message Types** There are five types of event messages stored in the logs:

- **CONFIG** - Used to log user configuration changes.
- **INFO** - Used to log informational events. No user action is needed. (e.g., card insertion/removal, port up/down).
- **WARN** - Used to log warning conditions. An abnormal condition was detected. The condition may have been self-corrected by the system or some user action may be needed.
- **ERROR** - Used to log an error condition. An error condition was detected. Some user action is required. (e.g., the system is low in memory - the user may have to disable some features).
- **FATAL** - Used to log fatal condition. A fatal error condition was detected. There is nothing the user can do to fix the problem (except rebooting the device).

## Understanding the Log Format

HP Fabric Clustering System Switch devices use the following log format.

```

      A          B          C          D          E          F
+-----+-----+-----+-----+-----+-----+
Aug 21 16:57:17 host  chassis_mgr.x[4614]:[INFO]:  card 4 booting-up
Aug 21 16:59:17 host  chassis_mgr.x[4614]:[WARN]:  resetting card
Aug 21 16:59:17 host  chassis_mgr.x[4614]:[FATAL]: port not responding

```

A: Timestamp

B: Name of card that generated the message

C: Application that generated the message

D: The process-id of the application

E: The type of event message

F: The message text

## Uploading Log Files

Log files may be uploaded to an FTP server using the CLI. This section describes file upload using CLI.

**Uploading Files Using the CLI** To copy a local log file to a remote network host:

**Step 1.** Enter `enable` command to change to the privileged-execute mode.

```
HP-IB> enable
HP-IB#
```

**Step 2.** Enter the `dir` command with the appropriate keyword to display the existing files of the desired type.

Keywords are `config`, `image`, `syslog`. In this case, include the `syslog` keyword.

```
HP-IB# dir syslog
=====
Existing Syslog-files on System
=====
slot date-created          size      file-name
-----
1   Tue Jan 21 19:20:09 2003  469593   ts_log
1   Tue Jan 21 11:00:03 2003   74119    ts_log.1.gz
HP-IB#
```

---

**NOTE** The size of the active log file is checked hourly. When it exceeds 1 MByte, the active log file, `ts_log`, is closed, compressed, and renamed `ts_log.1.gz`. Other `ts_log.x.gz` files are incremented by 1. If there is already a `ts_log.7.gz` file, it is discarded and `ts_log.6.gz` becomes `ts_log.7.gz`. It is recommended that you back up the log files on a regular basis.

---

**Step 3.** Enter the `copy` command with the name of the file, FTP user-authentication, and the file destination, in the following format:

```
HP-IB# copy ftp://syslog:ts_log anonymous:password 10.3.0.83:ts_log
* operation completed successfully
HP-IB#
```

The example above copies a file of the type `syslog`. This command copies the local log file, `ts_log`, to the FTP server `10.3.0.83`. The file is placed in the top of the user `anonymous`' home directory. You may include path information within your user home directory if the FTP server allows it. Typically, this is not permitted so it is recommended that you upload and download files using your top-level home directory.

The arguments to the `copy` command are described in “copy” on page 252.

## Administering the System

This chapter provides the following required information to perform Administrative duties on the system.

### Switching User Identity

One of the following scenarios may make it necessary to change your user identity during a CLI session:

- you created a new user account and you want to verify the access privileges

- you have multiple administrative user-accounts and you want to switch to another administrative area

To change your user identity:

**Step 1.** Enter the user-execute or privileged-execute mode.

**Step 2.** Enter the login command with the name of a system user.

```
HP-IB# login admin
```

**Step 3.** Enter the user password.

After you enter the password, you are logged in as the specified user in the user-execute mode.

```
Password: xxxxxx
```

```
HP-IB>
```

## Notifying Users

User notification commands send text messages to the terminal screens of all CLI users or to individual users. These are convenient utilities for notifying everyone of an impending reboot or to notify single users about special issues that apply only to them.

**Broadcasting Messages to Users** Message broadcasting is an important feature to forewarn all CLI users that some major event is about to take place, such as bringing down a network for administration. A broadcast message is sent to every active CLI session on the system chassis.

Enclose multi-word messages within double-quotes. Single-word messages do not require double-quotes. Only the unrestricted user may broadcast messages.

```
HP-IB# broadcast "message"
```

### Syntax

The message identifies the sender, followed by the message text.

For example, if you send this:

```
HP-IB# broadcast "Switch going down in 10 minutes."
```

everyone, including the user who sent the message, receives this:

```
HP-IB#
```

```
Broadcast message from super
```

```
Switch going down in 10 minutes.
```

**Sending Messages to Individual Users** The `write` command is used to send a message to a single user. Check that the user is logged in before attempting to write to their terminal. Use the `show user user_name` command to verify the user is logged in.

```
HP-IB> show user anonymous
```

```
=====
                                User Information
=====
      username : anonymous
      access-level : readwrite
      admin-status : enabled
      status : active
      num-logins : 1
      num-unsuccessful-logins : 6
```

```

last-login : Thu Oct 10 09:13:10 2002
last-unsuccessful-login : Thu Oct 10 09:12:32 2002
HP-IB> write waldo "Connection to FC array 15 is now working."
HP-IB>

```

### Creating User Accounts

**About User Accounts** A user account is used to control who gains access to the system. Access can be achieved through the CLI (console, telnet, SSH) and SNMP. CLI access is authorized through a password validation. SNMP access is authorized through a community-string validation.

User accounts can be added, deleted, and modified as needed. Up to 15 user accounts are supported. Only user(s) that have the unrestricted ReadWrite permission level can add, delete, and modify user accounts. Each system is preconfigured with 3 factory default user accounts.

Each user account can be administratively enabled and disabled as needed. The user can disable a user account without having to delete it from the system.

Each user account is uniquely identified by an ascii string that can be up to 20 characters long. No two user accounts can have the same user name.

In order for users to initiate an administration session, the User has to supply login credentials. The credentials supplied depend upon the interface being used.

The access system associates the following key elements:

- Username - Creates a unique username in the system.
- Password
- Community String - Unique string used for the SNMP Network Managers.
- Privilege Level - Allows combinations of different privileges.

The CLI uses username and password. Granular access rights are given by privilege level.

**Understanding Usernames and Passwords** CLI users enter standard username and password information to begin a CLI session. By default, you may log on as one of three users, super, admin, or guest. The user names are shown in the table below.

**Table 5-7 Default User Names, Passwords and Privileges**

User Name	Passwords	privileges
super	By default, the password is "super". The default community string is "secret".	The super user has unrestricted privileges. Use this account to manage any part of the system. This user may view and modify a configuration, as well as administer user accounts and access privileges. This user configures the console and management ports for initial chassis setup.
admin	By default, the password is "admin". The default community string is "private".	The admin user has general read-write privileges. This user may view and modify the current configuration. However, the admin user can change only its own user information, such as the admin password.

**Table 5-7 Default User Names, Passwords and Privileges (Continued)**

User Name	Passwords	privileges
guest (disabled by default)	The default password is "guest". The default community string is "public".	The guest user has read-only privileges. This user may only view the current configuration. The guest user cannot make any changes during the CLI session.

**Setting or Changing a Password**

- Step 1.** Log in to the CLI as a super user. Use the default username and password if they have not already been changed (refer to page 91).
- Step 2.** Enter the privileged-user mode.
- Step 3.** Enter the global-configuration mode.
- Step 4.** Enter the username command and the password keyword to change the user account and user password.  
  
Use the default user name and password if they have not already been changed (refer to page 91).  
  
The user name and password are alphanumeric strings of up to 34 characters each.
- Step 5.** Repeat step 4 to change additional usernames and passwords.
- Step 6.** Exit the global-configuration mode.
- Step 7.** Use the show user command to verify changes.

```

Login: super
Password: xxxxx
HP-IB> enable
HP-IB# configure
HP-IB(config)# username ib-admin password ibadmin
HP-IB(config)# username ib-admin community-string ib-commstr
HP-IB(config)#

```

**Displaying User Information** To display the information of configured users:

- Step 1.** Log in to the CLI as a super user.  
  
Only a user with unrestricted privileges may view user information.
- Step 2.** Enter the show user all command to display current user information.

```

HP-IB> show user all
=====
                                User Information
=====
      username : admin
      password  : hp
      snmp-community : justatest
      permission-level : ib-rw
      admin-status : enabled
      num-logins  : 0

```

```
num-unsuccessful-logins : 0
    last-login :
last-unsuccessful-login :
...
...
...
    username : super
    password : super
    snmp-community : secret
    permission-level : unrestricted-rw
    admin-status : enabled
    num-logins : 1
num-unsuccessful-logins : 0
    last-login : Tue Nov 19 10:03:47 2002
last-unsuccessful-login :
HP-IB>
```

**Adding New Users** To add a new user account for CLI access:

**Step 1.** Log in as the unrestricted user.

Only a user with unrestricted permissions may add new user accounts.

```
HP-IB# Login: super
Password: xxxx
HP-IB>
```

**Step 2.** Enter the privileged-user mode.

```
HP-IB> enable
HP-IB#
```

**Step 3.** Enter the global-configuration mode.

```
HP-IB# configure
HP-IB(config)#
```

**Step 4.** Create the user account and user password.

The user name and password are alphanumeric strings up to 34 characters each.

```
HP-IB(config)# username ib-admin password ib-passwd
```

where `ib-admin` is the name assigned to this user account, `password` is a mandatory keyword, and `ib-passwd` is the password for this user account.

**Step 5.** Assign an SNMP community string to the new user account.

If you do not want users to have SNMP access to the switch system, do not assign them a community string. By default, a new user account has a null or empty community string.

```
HP-IB(config)# username ib-admin community-string ib-commStr
```

where, `ib-admin` is the name of the user account, `community-string` is a mandatory keyword. `ib-commStr` is the SNMP community string for this user account.

**Step 6.** Assign access privileges.

By default, the new user account has read-only access.

**Step 7.** Enter multiple access privileges in the order shown in “Setting Administrative Roles” on page 95.

```
HP-IB(config)# username ib-admin privilege ib-rw
```

where, `ib-admin` is the name of the user account, `privilege` is a mandatory keyword, and `ib-rw`, `ip-ethernet-ro`, and `fc-rw` are access privileges. Valid access privileges are described in “Setting Administrative Roles” on page 95.

All new user accounts are now enabled and ready for use.

**Step 8.** Exit the global-configuration mode.

**Step 9.** View the new user account information.

```
HP-IB(config)# exit
HP-IB# show user ib-admin
```

```
=====
                                User Information
=====
      username : ib-admin
      password : ib-passwd
      snmp-community : ib-commStr
      permission-level : ib-rw
      admin-status : enabled
      num-logins : 0
      num-unsuccessful-logins : 0
      last-login :
      last-unsuccessful-login :
HP-IB#
```

### Deleting a User Account

**Step 1.** Log in as the unrestricted user.

Only a user with unrestricted permissions may create and modify user accounts.

```
HP-IB# Login: super
Password: xxxx
HP-IB>
```

**Step 2.** Enter the privileged-user mode.

```
HP-IB> enable
HP-IB#
```

**Step 3.** Enter the global-configuration mode.

```
HP-IB# configure
HP-IB(config)#
```

**Step 4.** Enter the `username` command with the name of the user, and the `no` keyword.

For example:

```
HP-IB(config)# username ib-admin no
```

**User Account Configuration Commands** Use the following commands and keywords to administer User Accounts:

**Table 5-8 User Account Administrative Commands**

Command	Task
username user password passwd	Creates a new user account.
username user no	Deletes a user account.
username user community-string	Assigns a community string to a user account.
username user no-community-string	Removes a community string from a user account.
username user privilege priv1 [priv2] [priv3] Example: ib-ro, ib-rw, ip-ethernet-ro, ip-ethernet-rw, fc-ro, fc-rw, unrestricted-rw	Assigns one or more permission level(s) to a user account. Refer to Table 5-10 on page 95 for a list of privilege levels.
username user no permission	Assigns a default permission level to a user.
username user enable	Administratively enables a User Account.
username user disable	Administratively disables a User Account.

**Community Strings**

**Changing Community Strings** Use the CLI to set or change SNMP community strings. If you do not want users to have SNMP access to the system, remove their community string.

To change community strings:

**Step 1.** Log in as the unrestricted user.

Only a user with unrestricted permissions may create and modify user accounts. However, any user with write access (administrative and unrestricted) can remove their own community string.

```
Login: super
Password: xxxx
HP-IB>
```

**Step 2.** Enter the privileged-user mode.

```
HP-IB> enable
HP-IB#
```

**Step 3.** Enter the global-configuration mode.

```
HP-IB# configure
HP-IB(config)#
```

**Step 4.** Enter the username command with the name of the user, the community-string keyword, and the new community string to assign this user.

```
HP-IB(config)# username ib-admin community-string ib-commStr
```

In the example above, `ib-admin` is the name of the user, `community-string` is a mandatory keyword. `ib-commStr` is the SNMP community string the user will have to use to execute other SNMP functions.

## Using DNS Services

**About DNS Services** The chassis must be told where to locate Domain Name Servers (DNS) so that it can contact these servers. The chassis uses these servers to resolve hostnames to IP addresses.

## Setting Administrative Roles

**About Roles and Privileges** Roles allow granular levels of privileges. The system combines multiple roles with read and read-write access for flexible control. These roles are enforced with the CLI.

The unrestricted administrator (super) is responsible for assigning these roles. Network administrators are given read-only and read-write access to each of the three network types.

**Table 5-9 Information Accessible with IB Read/Write or IP Ethernet ReadOnly Permission**

MIB Name	Permission levels that have access:
ipNetToMediaTable	ibReadOnly, ibReadWrite, ipEthernetReadOnly, ipEthernetReadWrite
tsIbSdpFilterTable	ibReadOnly, ibReadWrite, ipEthernetReadOnly, ipEthernetReadWrite
tsIbSdpTcpConnTable	ibReadOnly, ibReadWrite, ipEthernetReadOnly, ipEthernetReadWrite
tsIbSdpConnTable	ibReadOnly, ipEthernetReadOnly
tsIbSdpGlobal	ibReadOnly, ibReadWrite, ipEthernetReadOnly, ipEthernetReadWrite
tsIbSdpGlobal	ibReadOnly, ibReadWrite, ipEthernetReadOnly, ipEthernetReadWrite, fcReadOnly, fcReadWrite

**Understanding Permission Levels** The following table displays the different access-levels.

**Table 5-10 Description of Access Levels**

Level	Description
ib-ro	InfiniBand read-only access.
ib-rw	InfiniBand read-write access.
unrestricted-rw	Read-write access to all network configuration commands.

## Changing Privilege Access-Levels

**Step 1.** Log in as the unrestricted user.

Only a user with unrestricted permissions may create and modify user accounts.

```
-360# Login: super
Password: xxxx
HP-IB>
```

**Step 2.** Enter the privileged-user mode.

```
HP-IB> enable
HP-IB#
```

**Step 3.** Enter the global-configuration mode.

```
HP-IB# configure
HP-IB(config)#
```

**Step 4.** Enter the `username` command with the name of the user, the privilege keyword, and the privileges to assign this user. For example:

```
HP-IB(config)# username ib-admin privilege ib-rw ip-ethernet-ro fc-rw
```

In the example above, `ib-admin` is the name of the user account, `privilege` is a mandatory keyword, and `ib-rw`, `ip-ethernet-ro`, and `fc-rw` are access privileges.

---

**NOTE** When you change a user's privileges, all the old privileges are removed and replaced with the new privilege(s). If the user had multiple privileges, include the other privileges on the command line when you make the change. Privileges are order-dependent. Enter them in the same order as shown in the table above.

---

**Example** The following example gives a user read-write access to InfiniBand and Ethernet configuration commands.

```
Login: super
Password: xxxx
HP-IB> enable
HP-IB# configure
HP-IB(config)# username IB_admin privilege ib-rw ip-ethernet-rw fc-ro
HP-IB(config)# exit
HP-IB# show user IB_admin
=====
User Information
=====
      username : IB_admin
      password : $1$LZHfW06k$6LSXKZ7adbkC6/WXXBTAF/
      snmp-community : IB_admin
      permission-level : ib-rw, ip-ethernet-rw, fc-ro
      admin-status : enabled
      num-logins : 0
      num-unsuccessful-logins : 0
      last-login :
      last-unsuccessful-login :
HP-IB#
```

### Setting the System Clock

Maintaining accurate time is important for statistics and auditing. The system chassis provides an on-board system clock to save the time settings across reboots. Time is maintained in one of two ways:

- An on-board system clock
- External NTP servers

Time is set at the factory, and can be manually set. To ensure accurate synchronization, it is recommended to use an external NTP server. This enables logs to be synchronized with other management systems.

Time or NTP servers may be configured in the CLI. In the CLI, time may be set manually using the `clock` command and NTP servers may be specified using the `ntp` command. This section describes these methods.

**Setting Time Through the CLI** Note: If you have an NTP server configured, it is recommended that you use the process described in: “Setting the NTP Servers to Maintain the System Clock” on page 97.

To set the system clock in the CLI:

**Step 1.** Login to the CLI as the `super` user.

**Step 2.** Enter `enable` to enter the privileged-execute mode.

```
HP-IB> enable
HP-IB#
```

**Step 3.** Enter the `clock` command, followed by the `set` keyword and the time and date in the format

`hh : mm : ss dd mm yy`. For example:

```
HP-IB# clock set 19:22:10 25 03 03
```

**Step 4.** Save your configuration.

```
HP-IB# copy running-config startup-config
```

### Setting the NTP Servers to Maintain the System Clock

Accurate time is important in network statistics. You can set the time manually or use the Network Time Protocol to synchronize the system with the rest of your network.

It is recommended that you use Network Time Protocol (NTP) servers to set the system clock. Synchronizing the switch system clock with NTP servers ensures accurate time and only has to be configured once. The NTP servers synchronize the clock upon reboot and at specified intervals.

**CLI Procedure** Use the following procedure to synch the system clock with an external NTP server clock.

**Step 1.** Login to the CLI as the `super` user.

**Step 2.** Enter `enable` to enter the privileged-execute mode.

```
HP-IB> enable
HP-IB#
```

**Step 3.** Enter `configure` to enter the global-configuration mode.

```
HP-IB# configure
HP-IB(config)#
```

**Step 4.** Enter the `ntp` command with the “`server-one`” keyword, and the IP address of the NTP server to use as the primary server. For example:.

```
HP-IB(config)# ntp server-one 10.0.3.110
```

**Step 5.** (Optional) Specify backup NTP servers using the same command syntax, except replacing `server-one` with `server-two` and `server-three`.

```
HP-IB(config)# ntp server-two 10.0.3.111
HP-IB(config)# ntp server-three 10.0.3.112
```

**Step 6.** Save your configuration.

```
HP-IB(config)# exit
HP-IB# copy running-config startup-config
```

### Rebooting the System

The CLI is used to reinitialize the system chassis and interface cards.

- “Reboot the System Through the CLI” on page 98

---

**NOTE** Do not remove the power cord to reboot the system.

---

### Reboot the System Through the CLI

**Step 1.** Enter the CLI `reload` command in privilege EXEC mode. For example

```
HP-IB> enable
HP-IB# reload
System configuration has been modified. Save?
[yes(default)/no/*.cfg] yes
Proceed with reload? [confirm]
HP-IB#
Connection to host lost.
```

---

**NOTE** If you have dual-controllers in your chassis, you can use the `reload no-failover` option. This forces both Controllers to be rebooted simultaneously, and does not allow a failover to the Standby Controller. “Reboot the System Through the CLI” on page 98

---

---

## **6 Monitoring and Troubleshooting**

This chapter discusses monitoring and troubleshooting your HP Fabric Clustering System. The HP-UX Host and HP Fabric Clustering System Switch each have a unique set of tools for monitoring and troubleshooting their respective components within the HP Fabric Clustering System. Therefore, this chapter contains the following sections:

## Diagnosing Problems

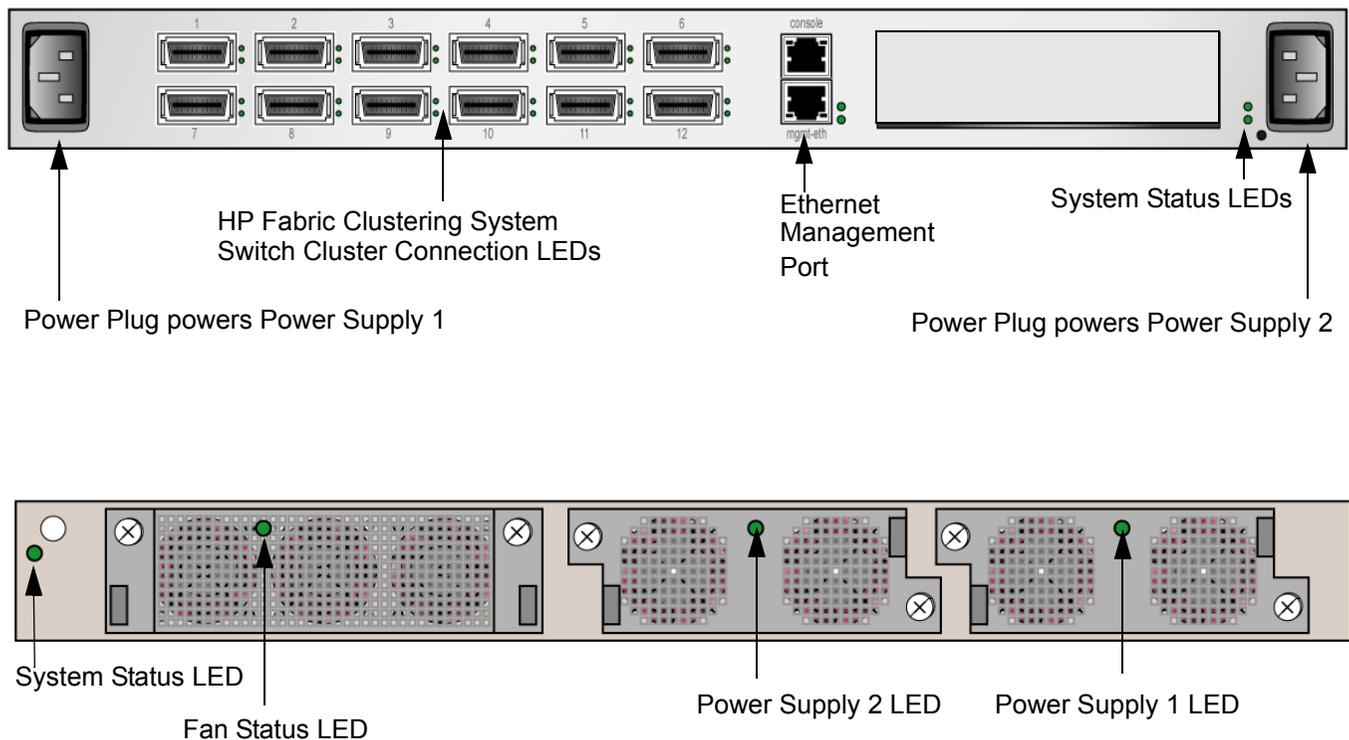
This section provides useful guidelines to determine which component within your HP Fabric Clustering System is at fault. Follow the LED descriptions to determine the faulty component, and then proceed to the appropriate component troubleshooting section.

The power supply, system, and fan LEDs are located on the front of the HP Fabric Clustering System Switch. The back contains Fabric Cluster Connection LEDs, Ethernet Management Port LEDs, and a duplicate of the System Status LED.

- “LED Color, Behavior, and Meaning”
- “Determining Whether the HCA or Cable is Faulty”
- “Determining if the Switch is Faulty”
- “Next Steps”

### LED Color, Behavior, and Meaning

**Figure 6-1** Switch LED Locations



The following sections explain the possible colors and the corresponding meaning of the various LEDs on the Fabric HCA and switches.

### HP Fabric Clustering System Switch Cluster Connection & HCA Connection LEDs

Normal operation is indicated by solid color logical link LED (green - switch, yellow - HCA), and a flashing green physical link LED.

The top LED indicates a logical link has taken place. A logical link is established when the subnet manager makes a sweep, and must be established to use the port.

If the connection from switch port to the corresponding HCA in the remote node is operational, the "Logical Link" LED shows as solid color (green - switch, yellow - HCA), and the "Physical Link" LED shows as solid green.

The bottom LED indicates a physical link has occurred. A physical link requires that the drivers on the attached HP Fabric Clustering System host have been installed and are running.

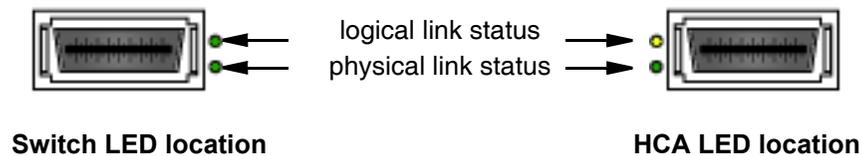
If data is flowing between the switch port to the corresponding HCA in the remote node, the "Logical Link" LED shows as flashing. Note that data does not start to flow until HP Fabric Clustering System initialization has occurred.

If either the "Logical Link" or the "Physical Link" LED is off, the HCA is not operational.

The bottom LED indicates a physical link has occurred. A physical link requires that the drivers on the attached HP Fabric Clustering System host have been installed and are running.

If the HCA is not operational and needs to be replaced, see "Install HP Fabric Clustering System Adapters" on page 28.

**Figure 6-2 The Fabric HCA Interface LEDs**



**Table 6-1 HCA & Switch Connection LED Colors and Meanings**

LED	Color	Meaning	Notes
Logical Link Status	Solid yellow (HCA) Solid green (switch)	Indicates a logical link has been established.	A logical link is established when the subnet manager recognizes the HCA during an HP Fabric Clustering System probe.
(top)	None	HCA is not operational.	<ul style="list-style-type: none"> <li>• The subnet manager did not recognize the HCA during an HP Fabric Clustering System probe.</li> <li>• The HP-UX host machine is not operational.</li> <li>• HP Fabric Clustering System software has not been installed on the HP-UX host machine.</li> <li>• A Fabric HCA is installed in a slot in the HP-UX host machine, but the cable is attached incorrectly or no cable is attached at all.</li> <li>• The HCA is bad.</li> <li>• The cable is bad.</li> <li>• The switch port is bad (if the adapter is connected to a switch). Note that if a switch port is bad, and (for some reason) you cannot use a different port on the switch, you must replace the entire HP Fabric Clustering System Switch. However, you first should try turning the switch's power off and then back on by unplugging both of the power cables.</li> <li>• The HCA is connected to a non-operational adapter in the remote node (in a node-to-node configuration).</li> </ul>

**Table 6-1 HCA & Switch Connection LED Colors and Meanings (Continued)**

LED	Color	Meaning	Notes
Physical Link Status  (bottom)	Flashing green	Data is flowing from HCA to switch port or remote HCA.	Note that data does not start to flow until HP Fabric Clustering System initialization has occurred.
	Solid green	Connection from HCA to switch port or remote HCA is operational.	
	None	HCA is not operational.	<ul style="list-style-type: none"> <li>• The drivers on the attached HP Fabric Clustering System host are not installed or not running.</li> <li>• The HP-UX host machine is not operational.</li> <li>• HP Fabric Clustering System software has not been started on the HP-UX host machine.</li> <li>• A Fabric HCA is installed in a slot in the HP-UX host machine, but the cable is attached incorrectly or no cable is attached at all.</li> <li>• The HCA is bad.</li> <li>• The cable is bad.</li> <li>• The switch port is bad (if the adapter is connected to a switch). Note that if a switch port is bad, and (for some reason) you cannot use a different port on the switch, you must replace the entire HP Fabric Clustering System Switch. However, you first should try turning the switch's power off and then back on.</li> <li>• The HCA is connected to a non-operational adapter in the remote node (in a node-to-node configuration).</li> </ul>

### HP Fabric Clustering System Switch System Status

On the front of the HP Fabric Clustering System Switch are LEDs that indicate system, fan, and power status.

System status LED is on the front left side of the switch, and is duplicated on the back of the switch on the right side (facing the rear).

The system status LED indicates overall system health. It indicates the overall system status for power, fans, temperature, and electronics. Check this LED first in the event of a suspected system fault.

**Table 6-2            Interpreting the System Status LEDs**

Color	Description
solid green	System running with no detected errors.
blinking green (1/2sec. interval)	System is initializing after application of power or system reset.
slow blink, alternating green/yellow (4 sec. interval)	LED test following application of power (16 seconds).
solid yellow	System error detected. Power, fans, or electronics may be at fault.
off	No system power or LED failure.

The following command can be used on the switch to obtain System Status information from the CLI.

```
HP-IB# show sensor
=====
Sensor Information
=====
sensor   oper-status   temperature (c)
-----
1/1      up            42
12/1     up            36
HP-IB#
```

### Power Supply Troubleshooting

Both power supply modules connect internally to the same power bus. If one power supply module fails, the other immediately takes over. A power supply module may be hot-swapped without any disruption in power. Check the status indicators of both power supply modules. Power Supply 1 is against the side of the switch, and Power Supply 2 is between Power Supply and the Fan module.

Power supply status LEDs are on the front located in the middle of each power supply, and are visible through the mesh of the bezel. If a power supply needs to be replaced, see “Replacing a Power Supply Module” on page 124.

**Table 6-3            Interpreting the Power Supply LEDs**

color	description
green (DC OK)	On (green) indicates DC outputs from power supply within regulated limits. Off indicates DC output out of location.

**Table 6-3 Interpreting the Power Supply LEDs (Continued)**

color	description
green (AC OK)	On (green) indicates AC input is present. Off indicates AC input is not present.

The following command can be used on the switch to show power supply status from the CLI, and shows an example of a failed Power Supply.

```
HP-IB# show power
=====
Power-supply Information
=====
ps      type      oper-status  utilization  voltage
-----
1       AC        up           55           12
2       AC        failure      na           12
```

---

**NOTE** It is possible that with a failed power supply, the System Status LED is yellow, and the Power Supply LED stays green.

---

### Fan Troubleshooting

The fan status light is located on the front in the middle of the fan tray, and the LED is visible through the mesh of the bezel. The fan module contains three fans. The system requires at least two fans to remain operational. If the fan needs to be replaced, see “Replacing a Fan Tray” on page 123.

**Table 6-4 Fan LED Interpretation**

color	indication
green	Blowers running with no detected errors.
yellow	Fan error detected.
off	No system power or LED failure.
slow blink, alternating green/yellow (4 sec. interval)	LED test following application of power (16 seconds).

The following command example can be used on the switch to determine individual fan status from the CLI.

```
HP-IB> show fan
=====
Fan Information
=====
fan  oper-status  speed
-----
1    up          80
2    up          68
3    up          74
```

## Determining Whether the HCA or Cable is Faulty

If you suspect that either a Fabric HCA or a cable attached to it is faulty, follow these steps to determine which component needs replacing:

**Step 1.** Disconnect the cable from the Fabric HCA.

**Step 2.** Attach a known good cable to both ports of the HCA.

**Step 3.** Determine if the HCA is faulty:

If the HCA is functioning correctly, the "Logical Link" shows as solid yellow and the "Physical Link" shows as solid green.

**Step 4.** If the HCA is faulty, you must replace it (see "Install HP Fabric Clustering System Adapters" on page 28.)

If the HCA is not faulty, assume that the cable is faulty and you must replace it.

## Determining if the Switch is Faulty

If you suspect that an HP Fabric Clustering System Switch is faulty, follow the steps below to determine if the switch needs replacing.

**Step 1.** Disconnect the cable from the switch port you suspect is faulty.

**Step 2.** Attach a known good cable to two ports of the switch.

**Step 3.** Determine if the port is faulty:

If the port is functioning correctly, the port's LED shows as solid or blinking green.

If the port is faulty, the port's LED is off.

Repeat Steps 1 through 3 for all ports on the switch, to determine if any of them are faulty.

Step 4. If any one of the ports on the switch is faulty, do not use it. Use a known good port if one is available. If no good ports are available, you must replace the switch.

## Next Steps

If, after reviewing the above diagnostic information, and you've determined that a hardware component is not at fault and you are still having problems, it is most likely a software configuration or communication issue. Proceed to the appropriate advanced troubleshooting section for either the HP-UX Host or the HP Fabric Clustering System Switch. If you have not isolated the problem to either of these areas, proceed first with the HP-UX Host (includes HCA) troubleshooting section and then continue on to the HP Fabric Clustering System Switch troubleshooting section.

If you've configured your HP Fabric Clustering System system to use IPoIB, refer to "Monitoring and Troubleshooting IPoIB" on page 115.

---

## Monitoring and Troubleshooting the HP-UX Host

This section contains monitoring and troubleshooting information for the software configuration and communication of HCAs within the HP Fabric Clustering System.

### HP-UX Host Troubleshooting Procedure

**Step 1.** Ensure adapters are claimed by the host.

**Run `ioscan`.**

Description: `ioscan` displays information about I/O devices on the host, including the software state of adapters. In the example below, options are applied to the command to display only fabric adapters.

Syntax example: `ioscan -fkC ib`

Output example:

Class	I	H/W Path	Driver	S/W State	H/W Type	Description
ib	0	0/4/1/0/0/0	ib_t	CLAIMED	INTERFACE	HP InfiniBand HCA

**Step 2.** Ensure that each adapter has the latest version of supported firmware. If it does not, you must update the firmware.

**Run `itutil`.**

Description: `itutil` displays details about fabric adapters on the host, which include the firmware version. The firmware version number is displayed in the output line item “IA Firware Version Number.”

Syntax example: `itutil`

Output example:

```
=====  
Number of Interface Adapters on this node: 1  
=====  
  
Interface Adapter Name : ib0  
H/W Path : 0/4/1/0/0/0  
Transport Type : IT_IB_TRANSPORT  
IT API Version Number : 1.0  
IA Software Version Number : 1.0  
IA Firmware Version Number : 3.1.0  
Firmware Type : Performance  
IA supported transport service types : IT_RC_SERVICE
```

---

**NOTE** This is a partial view of the `itutil` command output pertaining to this step in the troubleshooting procedure. For more information on the `itutil` command, see “Using Itutil” on page 40.

---

**Step 3.** Ensure that each adapter port is connected and has an associated network address.

**Run `itutil`.**

Description: `itutil` displays details about fabric adapters on the host, which include the connection status and network address. The connection status is displayed in the output line item “Spigot Online.” The associated network address is displayed in the output line item “Primary Network Address.”

---

**NOTE** The example below shows two ports, or spigots. Spigot 1 is a properly connected port because the “Spigot Online” is set to “YES” and the “Primary Network Address” is displayed. Spigot 2 is not properly connected because the “Spigot Online” is set to “NO” and the “Primary Network Address” is not displayed.

---

Syntax example: `itutil`

Output example:

```
Number of Spigots(Ports) on IA : 2
```

```
Spigot specific Information
```

```
Spigot identifier : 1
Spigot online : YES
Num Network Addresses : 1
Primary Network Address : fe80::ca07:2001
```

```
Spigot identifier : 2
Spigot online : NO
Num Network Addresses : <Unassigned>
```

```
=====
```

**Step 4.** View the topology of the host to ensure that connectivity is configured as expected.

**Run `itutil -T`.**

Description: `itutil -T` displays the topology of fabric adapters on the host. Ensure that the “Configuration”, “Primary Remote Network Address” and “Node Description” output line items all contain the appropriate information for your configuration type. For more information on HP Fabric Clustering System configuration types, see “Features, Parameters and Supported Configurations for HP-MPI and TCP/UDP/IP Applications” on page 20.

---

**NOTE** The example below shows a point-to-point configuration type with a remote connection to two nodes on the fabric. The “Configuration” output line is “Point-to-point” and there are two different “Primary Remote LIDs”, Primary Network Addresses” and “Node Descriptions” listed.

---

Syntax example: `itutil -T`

Output example:

```
=====
Topology information for online spigots :
=====
      Spigot identifier : 1
      Spigot Primary LID : 0xa
Primary Network Address : fe80::ca07:2001
      Configuration : Point-to-Point

      Primary Remote LID : 0xb
Primary Remote Network Addr : fe80::2:c901:8a0:8a11
      Node Description : iblp0091

      Primary Remote LID : 0xa
Primary Remote Network Addr : fe80::ca07:2001
      Node Description : iblp0088
=====
```

---

**NOTE** This is a partial view of the `itutil -T` command output pertaining to this step in the troubleshooting procedure. For more information on the `itutil` command, see “Using Itutil” on page 40.

---

**Step 5.** Check communication path between nodes.

**Run `itutil -l`.**

Description: `itutil -l` tests the connectivity path between nodes on the fabric. If two nodes are having a problem communicating, run this command to verify that the path between the two nodes is functional.

---

**NOTE** The example below shows a host successfully connecting to a remote node with the display message “Linkloop Succeeded.”

---

Syntax example: `itutil -l fe80::2:c901:8a0:8a11 ib0 1`

Output example:

```
Testing connectivity to Network Address 0x<fe80::2:c901:8a0:8a11>
from IA "ib0", spigot id "1"
```

```
Linkloop Succeeded.
```

**Step 6.** Check adapter transport and performance statistics.

**Run itutil -s.**

Description: `itutil -s` displays statistics for fabric adapters, including transport and performance statistics.

---

**NOTE** The example below shows one possible statistic result with the error value set to 1. The rest of the statistic results show no unusual statistic reports because the error values are equal to 0.

---

Syntax example: `itutil -l fe80::2:c901:8a0:8a11 ib0 1`

Output example:

```

=====
Adapter Statistics :
=====
Transport Statistics
-----

    Responder - number of local length errors : 0
    Requester - number of local length errors : 0
    Responder - number of local QP operation errors : 0
    Requester - number of local QP operation errors : 0
    Responder - number of local protection errors : 0
    Requester - number of local protection errors : 0
    Responder - number of WR flushed errors : 0
    Requester - number of WR flushed errors : 0
    Requester - number of memory window bind errors : 0
    Requester - number of bad response errors : 0
    Responder - number of local access errors : 0
    Requester - number of remote invalid request errors : 0
    Requester - number of remote access errors : 0
    Requester - number of remote operation errors : 0
    Requester - number of transport retries exceeded errors : 0
    Requester - number of RNR nak retries exceeded errors : 0
    Requester - number of remote aborted errors : 0
    Responder - number of out of sequence requests received : 0
    Requester - number of out of sequence Naks received : 0
    Responder - number of bad multicast packets received : 0
    Num silent UD drops due to RNR : 0
    Number of CQ overflows : 0
    Number of EQ overflows : 0
    Number of bad doorbells : 0

-----
Link/Physical Statistics
-----

    Spigot identifier : 1

    Link Symbol Errors : 0
    Link Error Recovery : 0
    Link Down : 0

```

```
Receive Errors : 0
Receive Remote Phy Errors : 0
Transmit Discards : 0
Transmit Constraint Errors : 0
Receive Constraint Errors : 0
Local Link Integrity Errors : 0
Excessive Buffer Overrun Errors : 0
VL15 packets Discards : 0
Transmit Data(bytes) : 0
Receive Data(bytes) : 0
Transmit Packets : 0
Receive Packets : 0
```

=====

---

**NOTE** This is a partial view of the `itutil -s` command output pertaining to this step in the troubleshooting procedure. For more information on the `itutil -s` command, see “Using Itutil” on page 40.

---

**Step 7.** Check connection details.

**Run `itutil -c`.**

Description: `itutil -c` displays reliable connection details for specified fabric adapters.

---

**NOTE** For more information on the Communication Management States (Connection States), refer to Chapter 12 in the IBA Volume I specification t <http://www.infinibandta.org/specs>.

---

Syntax example: `itutil -c fe80::2:c901:8a0:8a11 ib0 1`

Output example:

=====

Connection Information :

=====

```
Connection State : TIMEWAIT
Adapter Name : ib0
Process ID : Process Exited
Connection EVD <pi,ci> : <0x1, 0x1>
Connection Type : Active
Service ID : 0x10000ce10000c017
Local Communication ID : 0x1
Remote Communication ID : 0x2
Local QPN : 0x40d
Remote QPN : 0x40e
Local Start PSN : 0x21
Remote Start PSN : 0x21
```

```
Connection State : TIMEWAIT
  Adapter Name : ib0
    Process ID : Process Exited
Connection EVD <pi,ci> : <0x1, 0x1>
  Connection Type : Passive
    Service ID : 0x10000ce10000c017
Local Communication ID : 0x2
Remote Communication ID : 0x1
  Local QPN : 0x40e
  Remote QPN : 0x40d
  Local Start PSN : 0x21
  Remote Start PSN : 0x21
```

```
Connection State : TIMEWAIT
  Adapter Name : ib0
    Process ID : Process Exited
Connection EVD <pi,ci> : <0x1, 0x1>
  Connection Type : Active
    Service ID : 0x3e9
Local Communication ID : 0x3
Remote Communication ID : 0x3
  Local QPN : 0x40f
  Remote QPN : 0x40f
  Local Start PSN : 0x21
  Remote Start PSN : 0x21
```

```
Connection State : TIMEWAIT
  Adapter Name : ib0
    Process ID : Process Exited
Connection EVD <pi,ci> : <0x1, 0x1>
  Connection Type : Active
    Service ID : 0x3e9
Local Communication ID : 0x4
Remote Communication ID : 0x2
  Local QPN : 0x410
  Remote QPN : 0x40e
  Local Start PSN : 0x21
  Remote Start PSN : 0x21
```

```
Connection State : ESTABLISHED
  Adapter Name : ib0
    Process ID : 18698
Connection EVD <pi,ci> : <0x1, 0x1>
  Connection Type : Active
    Service ID : 0x3e9
Local Communication ID : 0x5
Remote Communication ID : 0x5
  Local QPN : 0x411
  Remote QPN : 0x411
  Local Start PSN : 0x21
  Remote Start PSN : 0x21
  QP State : READY_TO_SEND
```

```

Remote LID : 0xb
Remote Network Address : 0x<fe80::2:c901:8a0:8a11>
Next PSN : 0x93171
Last Acked PSN : 0x9316d
Expected PSN : 0x31090
Last Sent MSN : 0x31071
Expected MSN : 0x3106f
Send CQN : 0x90 <pi, ci> = <0x8, 0x8>
Recv CQN : 0x91 <pi, ci> = <0x1, 0x1>

```

=====

---

**NOTE** This is a partial view of the `itutil -c` command output pertaining to this step in the troubleshooting procedure. For more information on the `itutil -c` command, see “Using Itutil” on page 40.

---

**Step 8.** Check `nettl` logs.

**Viewing Log Records**

Description: Use this command to view log records using the NetTL facility.

Syntax: `netfmt /var/adm/nettl.LOG000`

Syntax Example: `netfmt /var/adm/nettl.LOG000`

**Sample `nettl` Log Messages**

Description: *Port failure.*

```

-----InfiniBand Subsystem-----
Timestamp          : Tue Mar 23 PST 2004 12:06:32.966536
Process ID         : 2343
User ID ( UID )   : 0
Device ID         : -1
Connection ID     : 0
Subsystem          : IB
Log Class         : ERROR
Path ID           : 0
Log Instance      : 65535

```

File `ib_common_api.c`: Line 711:

`ib0 : IB SM: port 1 DOWN`

Received notification from the adapter that the link went down.  
Please ensure that the cable is connected securely to the port and the device on the other end is functional.

Description: *Firmware download failure.*

```

-----InfiniBand Adapter-----
Timestamp          : Tue Mar 23 PST 2004 12:06:32.966545
Process ID         : 2343
User ID ( UID )   : 0
Device ID         : -1
Connection ID     : 0
Subsystem          : IB_T
Log Class         : DISASTER
Path ID           : 0
Log Instance      : 65535

```

File `ib_common_api.c`: Line 712:

`0/4/1/0/0/0 : FW download failed: -1  
Error accessing FLASH memory  
Contact HP Support`

Description: *Attempt to add more devices than supported by InfiniBand.*

```
-----InfiniBand Adapter-----
Timestamp          : Tue Mar 23 PST 2004 12:06:32.966547
Process ID         : 2343                Subsystem          : IB_T
User ID ( UID )   : 0                   Log Class           : ERROR
Device ID         : -1                   Path ID             : 0
Connection ID     : 0                   Log Instance        : 65535
-----
File ib_common_api.c: Line 714:

-- ib_tvr attach: existing HCAs are more than 8
There is an attempt to add more devices than supported
Do not add any more devices to the system
```

**Step 9.** If none of the previous steps helped to resolve your problem, contact your HP Support Representative.

## Monitoring and Troubleshooting IPoIB

Troubleshooting IPoIB is accomplished using existing HP network management tools, which are included with the TOUR and DLPI software bundles (see “Internet Protocol over InfiniBand” (IPoIB)” on page 37.) The following tools and commands are available:

- nettl
- linkloop

### nettl Sample Log Output

#### Sample IB Logs

The following are examples of nettl log output:

```
-----InfiniBand Subsystem-----@#%
Timestamp           : Tue Mar 23 PST 2004 12:06:32.966536
Process ID          : 2343
User ID ( UID )    : 0
Device ID           : -1
Connection ID       : 0
Subsystem           : IB
Log Class           : ERROR
Path ID            : 0
Log Instance        : 65535
-----
```

File ib\_common\_api.c: Line 711:

```
ib0 : IB SM: port 1 DOWN
```

```
Received notification from the adapter that the link went down.
Please ensure that the cable is connected securely to the port and
the device on the other end is functional.
```

```
-----InfiniBand Adapter-----@#%
Timestamp           : Tue Mar 23 PST 2004 12:06:32.966545
Process ID          : 2343
User ID ( UID )    : 0
Device ID           : -1
Connection ID       : 0
Subsystem           : IB_T
Log Class           : DISASTER
Path ID            : 0
Log Instance        : 65535
-----
```

File ib\_common\_api.c: Line 712:

```
0/4/1/0/0/0 : FW download failed: -1
Error accessing FLASH memory
Contact HP Support
```

```
-----InfiniBand Adapter-----@#%
Timestamp           : Tue Mar 23 PST 2004 12:06:32.966547
Process ID          : 2343
User ID ( UID )    : 0
Device ID           : -1
Connection ID       : 0
Subsystem           : IB_T
Log Class           : ERROR
Path ID            : 0
Log Instance        : 65535
-----
```

File ib\_common\_api.c: Line 714:

```
-- ib_tvr attach: existing HCAs are more than 8
```

There is an attempt to add more devices than supported  
Do not add any more devices to the system

```
-----InfiniBand Adapter-----@#%
Timestamp           : Tue Mar 23 PST 2004 12:06:32.966548
Process ID          : 2343                Subsystem           : IB_T
User ID ( UID )    : 0                    Log Class           : ERROR
Device ID           : -1                   Path ID             : 0
Connection ID       : 0                    Log Instance        : 65535
```

File ib\_common\_api.c: Line 715:

QP corruption detected..QPN 23 has problems  
Potential data corruption in IB library or system ran out of IB resources  
Try again with less load

===== LOG File Summary =====

Node: iblp0094  
HP-UX Version: B.11.23 U Machine Type: ia64  
Total number of messages: 4

Messages dropped: 0 Data dropped(bytes): 0

First Message Last Message  
Time: 12:06:32.966536Time: 12:06:32.966548  
Date: 03/23/04Date: 03/23/04

Message distribution:

Disaster:	1	Error:	3
Warning:	0	Informative:	0

~~~~~Message distribution by Subsystem~~~~~

|                    |                                  |
|--------------------|----------------------------------|
| Subsystem Name: IB | Group Name: InfiniBand Subsystem |
| Disaster: 0        | Error: 1                         |
| Warning: 0         | Informative: 0                   |

|                      |                                |
|----------------------|--------------------------------|
| Subsystem Name: IB_T | Group Name: InfiniBand Adapter |
| Disaster: 1          | Error: 2                       |
| Warning: 0           | Informative: 0                 |

**Sample IPoIB Logs Viewing Trace Packets in Raw Format**

Description: Use this command to view trace packet in "raw" format using the NetTL facility.

Syntax: netfmt [file\_name]

Syntax Example: netfmt ipoib.TRC000

Output Example:

```
^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^IPoIB Driver^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^@#%
Timestamp           : Tue Feb 24 MST 2004 16:03:55.924206
Process ID          : [ICS]                Subsystem           : IPOIB
```

```
User ID ( UID )      : -1                Trace Kind         : PDU IN TRACE
Device ID           : 9000              Path ID            : -1
Connection ID      : 0
Location           : 00123
```

```
~~~~~
Received 128 bytes via IPoIB  Tue Feb 24 16:03:55.924206 MST 2004
  pid=[ICS]   interface=[9000]
  Dest  : 00-ff-ff-ff-ff-12-40-1b-ff-ff-00-00-00-00-00-00-ff-ff-ff-ff
  Source: 00-00-04-0d-fe-80-00-00-00-00-00-00-00-00-00-00-ca-02-50-02
  0: 45 00 00 54 08 6b 40 00 01 01 ee 3a c0 01 01 02  E..T.k@.....:....
 16: c0 01 01 ff 08 00 aa ac 30 54 00 01 40 3b d8 5b  .....0T..@;.[
 32: 00 0e 19 56 08 09 0a 0b 0c 0d 0e 0f 10 11 12 13  ...V.....
 48: 14 15 16 17 18 19 1a 1b 1c 1d 1e 1f 20 21 22 23  ..... !"#
 64: 24 25 26 27 28 29 2a 2b 2c 2d 2e 2f 30 31 32 33  $%&'()*+,-./0123
 80: 34 35 36 37 -- -- -- -- -- -- -- -- -- -- --  4567.....
```

### Viewing Trace Packets in Nice Format

Description: Use this command to view trace packet in “nice” format using the NetTL facility.

Syntax: netfmt -N[file\_name]

Syntax Example: netfmt -N ipoib.TRC000

```
^^^IPoIB Driver^^@#%
Timestamp           : Tue Feb 24 MST 2004 16:03:55.924206
Process ID          : [ICS]                Subsystem          : IPOIB
User ID ( UID )    : -1                Trace Kind         : PDU IN TRACE
Device ID           : 9000              Path ID            : -1
Connection ID      : 0
Location           : 00123
~~~~~
===== IPoIB =====
Source : 00-00-04-0d-fe-80-00-00-00-00-00-00-00-00-00-00-ca-02-50-02
Dest   : 00-ff-ff-ff-ff-12-40-1b-ff-ff-00-00-00-00-00-00-ff-ff-ff-ff
TRACED LENGTH: 128
Date   : Tue Feb 24 16:03:55.924206 MST 2004
===== IP Header (inbound -- [ICS]) =====
Source: 192.1.1.2 (C) Dest: 192.1.1.255(C)
      len: 84      ttl: 1      proto: 1      cksum: 0xee3a      id: 0x86b
      flags: DF    tos: 0x0    hdrlen: 20    offset: 0x0      optlen: 0
----- ICMP Header -----
type: ECHO          chksum: 0xaaac      id: 12372      seq: 1
code: none
----- User Data -----
  0: 40 3b d8 5b 00 0e 19 56 08 09 0a 0b 0c 0d 0e 0f  @;. [...V.....
 16: 10 11 12 13 14 15 16 17 18 19 1a 1b 1c 1d 1e 1f  .....
 32: 20 21 22 23 24 25 26 27 28 29 2a 2b 2c 2d 2e 2f  !"# $%&'()*+,-./
 48: 30 31 32 33 34 35 36 37 -- -- -- -- -- -- -- --  01234567.....
```

## Linkloop Command

### Checking Connectivity Between Two Interfaces

Description: This command is used to check the connectivity from one IPoIB interface to another IPoIB interface. Use the destination IPoIB interface's MAC address when using this command.

Syntax: `linkloop -i [ipoib_ppa][destination ipoib_MAC address]`

Syntax Example: `linkloop -i 9000 0x0000040cfe8000000000000000002c90200001001`

---

**NOTE** The following output is an example of a successful connection between two interfaces.

---

Output Example:

```
Link connectivity to LAN station: 0x0000040cfe80000000000000000002c90200001001
-- OK
```

---

**NOTE** The following output is an example of an unsuccessful connection attempt between two interfaces.

---

Output Example:

```
linkloop -i 9000 0x0000040cfe80000000000000000002c90200012345
Link connectivity to LAN station: 0x0000040cfe80000000000000000002c90200012345
error: get_msg2 getmsg failed, errno = 4
-- FAILED
  frames sent          : 1
  frames received correctly : 0
  reads that timed out   : 1
```

### Known Problems

This section describes known problems with IPoIB, including corresponding symptoms and workarounds.

#### NetTL

- **Description:** IPoIB PPA instance numbers start at 9000, but the current NetTL tool does not support interfaces whose PPA instance numbers are greater than 255.

When running a trace on the system, the correct PPA number is provided, but when formatting trace packets for a specific PPA (known as filtering), you need to make an adjustment in the request to obtain the proper information.

**Symptoms:** Unless a specific PPA instance number is adjusted by subtracting 9000, the trace request will not work as expected.

**Workaround:** When filtering on a particular IPoIB instance, like 9005, specify the instance number "5" instead of the actual interface number.

**Filter Example:** In the example below, the filter configuration file may contain the following line to view trace packet information only for IPoIB PPA 9005.

```
formatter filter device_id 5 IPOIB
```

**Workaround Side-effect:** When the subsystem name (IPOIB) is omitted in the filter configuration line shown above, the filtering and hence the packets will be shown for the physical PPA of 5 and also IPOIB PPA of 9005.

- **Description:** IPOIB MAC Address and header is not properly printed when formatting is in “nice” or “terse” format.

**Symptoms:** When formatting trace packet information with “nice” format option, APP packets are not formatted nicely. For “terse” formatting, the packet header is not printed properly.

**Fix:** The problem is fixed in NetTL patch PHNE\_30451.

## IP Filter Product

- **Description:** IPOIB interfaces that are SNAP-configured using the `ifconfig` utility in combination with the IP Filter product being installed, may cause a panic.

**Symptoms:** The system may panic with the IP Filter Product version “B9901AA A.03.05.06 HP IPFilter 3.5alpha5”.

**Workaround:** Update the IP Filter product to the most recent version, which can be found at <http://www.software.hp.com>, and is a free download.

## Monitoring and Troubleshooting the Switch

The CLI can also be used to monitor the system.

### Health Monitoring

The system is a robust product with fail-over protection. In the event a physical component fails, a similar one automatically assumes the load of the failed component.

The physical components should be checked on occasion, particularly if there are problems with the initial setup and configuration.

The HP Fabric Clustering System Switch, and controller may be monitored in several ways. Switch cluster connections and controller cards include a general system LED to indicate the physical health of the card. Card status information may be displayed in the CLI that indicates the success or failure of the boot process.

Ports may be monitored in several ways. You may check a port physically by looking at the port LEDs. You may also open various graph and statistics windows to notice network traffic across the port. If there is no traffic going across what should otherwise be a busy port, refer to status LEDs next to the port or check the physical connections.

Traffic can be analyzed across individual ports or aggregated total across interface cards.

### About Logging and Tracing

In general, two types of messages are generated: Events and Traces.

#### About HP Fabric Clustering System Events

Event messages are generated whenever a significant event occurs in the system, and cannot be turned-off or configured by the user.

The following types of scenarios fall into the Events category.

- A Subnet Manager has been started (created)
- A new Fabric node is in-service
- An existing Fabric node is out-of-service
- A new Fabric multicast group is created
- A new multicast member is added to an existing multicast group
- An existing multicast group is deleted

#### About Tracing

Trace messages are only generated when the user has explicitly enabling tracing for debugging/trouble-shooting purposes. By default, tracing is disabled.

The trace feature has different levels of control to allow the user to dynamically select the amount and/or type of tracing information to be generated.

- Application

Levels of Traces

- Module

- Trace-Level
- Flow

**Application** The number of applications may change between releases. The numbers assigned to applications may also change. Check application and module number assignments using CLI help (i.e.,?) before setting a trace level.

**Module** "Module" is used to specify what module of code (library), in the selected application tracing should be configured for.

The number of modules may change between releases. The numbers assigned to modules may also change. Check module number assignments using CLI help (i.e.,?) before setting trace levels.

**Trace-Level** "Trace-Level" is used to specify the verbosity of the output. You can specify different levels of verbosity to control the amount of the tracing information that is generated.

Trace levels are described in the following table:

**Table 6-5 Trace Level Descriptions**

| Trace Level  | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|--------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| NO_DISPLAY   | No tracing information will be generated. This is the default setting to ensure the best SM performance.                                                                                                                                                                                                                                                                                                                                                   |
| VERY_TERSE   | Not currently used.                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| TERSE        | This level is used to generate the basic flow of MAD packet as it goes through the Subnet Manager state machine. Verbose description will be made to the success or failure of the MAD packet. For example, a PathRecord lookup failure will include description on the cause of the failure (SGID is not found in database, DGID is not found in database, no component is specified in the component mask...) instead of simple success or failure code. |
| VERBOSE      | This level shows the MAD management class header information.                                                                                                                                                                                                                                                                                                                                                                                              |
| VERY_VERBOSE | This level shows the MAD in a decoded format according to HP Fabric Clustering System Switch decoding algorithm.                                                                                                                                                                                                                                                                                                                                           |
| SCREAM       | This level shows the MAD in its raw format.                                                                                                                                                                                                                                                                                                                                                                                                                |

The information at the specified level and below is shown. For example, if you are only interested in seeing information that belongs to the VERBOSE category, you can dynamically set the control to VERBOSE. The trace software will then display information in the VERBOSE, TERSE and VERY\_TERSE categories.

**Flow** "Flow" is used to specify a particular flow in the code. How flows are specified varies, depending on the module.

- 0x1: This flow shows all the Subnet Management (SM) discovery, assignment routing and routing processing.
- 0x2: This flow shows all the Subnet Management Agent (SA) related processing.
- 0x4: This flow shows the trap related processing.
- 0x8: This flow shows the redundancy related processing.

- 0x10: This flow shows the Related Multipack Protocol (RMPP) related processing.
- 0x20: This flow shows the partition management related processing.
- 0x1000: This flow shows the internal state machine (may create more flow for more granularity for path, mcast, ...).
- 0x2000: This flow shows the user configuration management related processing.
- 0x4000: This flow triggers the fabric switch Subnet Manager to take a snap shot of the current logging information for the trace.

For example, use:

- 0x4001 to take a snapshot of the SM logging information.
- 0x4002 to take a snapshot of the SA information.
- 0x8000: This flow triggers the MAD packet to be displayed.

For example, use:

- 0x8002 to display MAD packets and SA related processing.
- 0x8001 to display SM MAD packets and SM related processing.

## Troubleshooting the HP Fabric Clustering System Network

### Ping

As on any IP network, you can use the UNIX ping command to test connectivity between IPoIB fabric-attached hosts. For more information, see “Verifying Connectivity” in Chapter 3.

### Setting Trace Levels

**Enabling Tracing** Tracing is disabled by default. To set a trace level for the purpose of debugging or troubleshooting, perform the following steps:

**Step 1.** Enter global-configuration mode.

```
HB-IB> enable
HB-IB configure
HB-IB(config)
```

**Step 2.** View the trace help output, as the number of applications and modules may have changed.

```
HP-IB(config)# trace app ?
app <1-25>
app numbers:
APP_ID_CLI = 1
APP_ID_OSPF = 2
APP_ID_RIP = 3
APP_ID_IP_AGENT = 22
APP_ID_FIB_AGENT = 23
APP_ID_KERNEL = 24
APP_ID_CARD_AGENT = 25
APP_ID_SM = 26
```

- Step 3.** Set the application value, the module value, the trace level, the flowmask, and the card number on which you want to run a trace.

Refer to “About Logging and Tracing” on page 120.

```
HP-IB(config)# trace app 4 module 36 level very-verbose  
flowmask 0x12 card 2
```

**Disabling Tracing** Tracing is disabled by default. To set a trace level for the purpose of debugging or troubleshooting, perform the following steps:

- Step 1.** Enter global-configuration mode.

```
HP-IB> enable  
HP-IB configure  
HP-IB(config)
```

- Step 2.** Set the application value, the module value, the trace level, the flowmask, and the card number on which you want to run a trace.

The trace level should be set to no display to disable tracing.

Refer to “About Logging and Tracing” on page 120.

```
HP-IB(config) trace app 4 module 36 level no display  
flowmask 0x12 card 2
```

## Replacing Individual Components

This chapter describes how to remove and replace the Field Replaceable Units (FRUs) in the system.

### Replacing a Fan Tray

The fan module contains three fans. The system requires at least two fans to remain operational.

---

**CAUTION** In the event that more than one fans fails, or you want to hot-swap the fan tray, it must be replaced within three minutes.

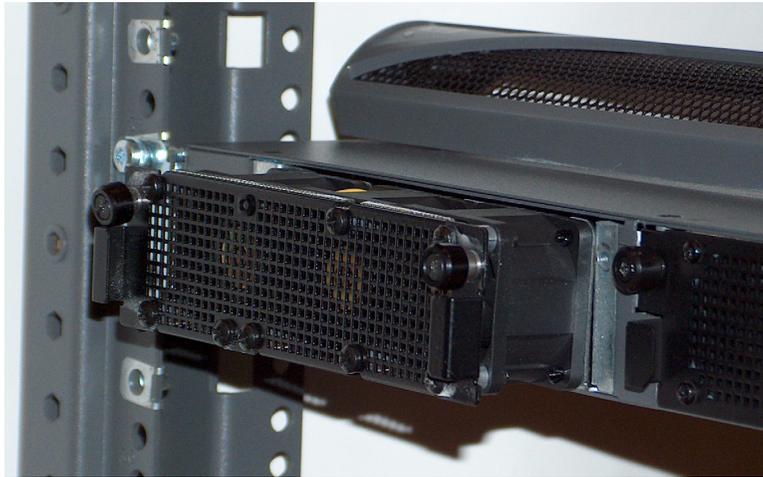
---

The HP Fabric Clustering System Switch fan tray is hot-swappable. You do not need to turn off power to the chassis to replace the fan tray. Access the fan tray from the front of the HP Fabric Clustering System Switch chassis behind the bezel.

To replace a fan tray:

- Step 1.** remove the bezel and unscrew the fan tray screws using a Phillips-head screwdriver.
- Step 2.** Pull the fan toward you until it completely disengages from the chassis, as shown below.
- Step 3.** Insert the replacement fan tray into the open slot until it is fully seated.
- Step 4.** Tighten the two captive panel screws on the front panel to secure the card to the chassis.
- Step 5.** Fasten the fan tray to the chassis.

**Figure 6-3 Fan Removal**



### Replacing a Power Supply Module

HP Fabric Clustering System Switch power supplies are hot-swappable. You have two power supplies installed, you can remove one of them without removing power from the chassis.

The power supplies are located on the front of the chassis. When facing the front, the power modules are located on right and center of the HP Fabric Clustering System Switch chassis.

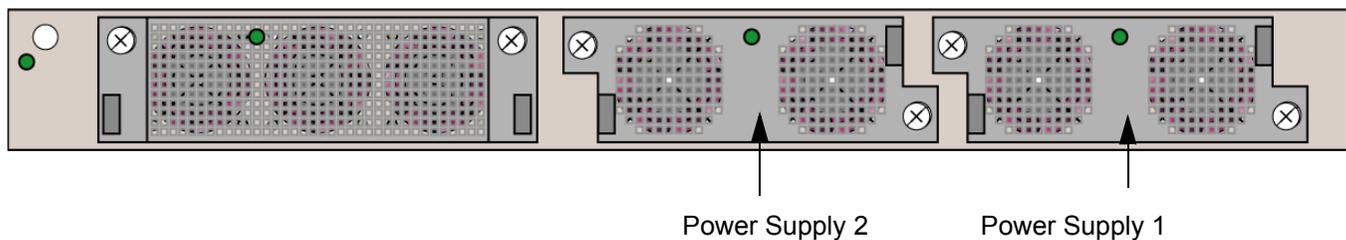
---

**CAUTION** Never place your hand inside an empty card or module bay. You should never have cause to place a hand anywhere inside the HP Fabric Clustering System Switch chassis.

---

- Step 1.** Remove the power cord from the power supply.
- Step 2.** Remove the bezel and unscrew the power supply using a Phillips-head screwdriver.
- Step 3.** Disengage the power supply by pulling it toward you, and slide the power supply out of the chassis.
- Step 4.** Insert the replacement power supply into an open slot until it is fully seated.
- Step 5.** Tighten the two captive panel screws on the front panel to secure the card to the chassis.
- Step 6.** Tighten the retaining screws.

**Figure 6-4 Power Supply Location**



---

# **A Specifications**

This chapter details the HP 12-port 4x Fabric Copper Switch specifications.

## Physical Specifications

### Chassis and Management Interface

**Table A-1 General Specifications**

| Specification                                        | Requirements                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Operating Temperature Ranges                         | 0 to 40C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Operating Humidity Range                             | 20 to 80%, Non-condensing                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Operating Gradient Maximum                           | Maximum per 60 min.: 10%                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Non-Operating Humidity Ranges                        | 5 to 95%, Non-condensing                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Non-Operating Humidity Gradient maximum per 60 min.: | 0.1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Operating Altitude                                   | 0-10,000ft.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Non-Operating Altitude                               | 0-35,000ft                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Environmental                                        | <ul style="list-style-type: none"> <li>• Operating Shock: 5G, 11ms half-sine wave</li> <li>• Vibration: .25G, 5 to 300Hz, 15 minute dwell</li> <li>• Non-Operating Shock: 10G, 11ms half-sine wave</li> <li>• Vibration: 3 axis with the following parameters                             <ul style="list-style-type: none"> <li>— "X and Y axis: 0.0004 G<sup>2</sup> / Hz flat from 5-500Hz ( 0.472 GRMS )</li> <li>— Z-axis: 0.0008 G<sup>2</sup> / Hz flat from 5-500Hz (0.629GRMS)</li> </ul> </li> </ul> |
| Management Interfaces                                | <ul style="list-style-type: none"> <li>• Console RS-232, RJ-45 connector</li> <li>• Ethernet Mgmt Port, RJ-45 connector</li> </ul>                                                                                                                                                                                                                                                                                                                                                                             |

### Electrical Specifications

**Table A-2 Electrical Specifications**

| Specification | Requirement                                                      |
|---------------|------------------------------------------------------------------|
| AC Power      | Power 90-132V AC, 180-264V AC auto-ranging Power dissipation 200 |

### Sound Power Level Measurements

**Table A-3 Power Level Measurements**

| Typical | Maximum |
|---------|---------|
| 40dB    | 43dB    |

---

## **B HP 12-Port 4X Fabric Copper Switch Commands**

This chapter details some of the commands available to manage the switch and are grouped into:

- “Show Commands”
- “IP Commands”
- “HP Fabric Clustering System Commands”
- “Administrative Commands”

## Show Commands

The show commands are used to display user, configuration, network, and status information for the system. All users, such as super and guest, can apply these commands to view the system configuration, with a few exceptions. These exceptions are noted in the respective command descriptions.

**Table B-1 Show Commands**

| Command |                 | Description                                                                                                                                              |
|---------|-----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|
| show    | arp             | Show HP Fabric Clustering System ARP route tables. See “show arp ethernet” on page 129                                                                   |
|         | authentication  | Displays the method of authentication. See “show authentication” on page 131                                                                             |
|         | backplane       | Show the SEEPROM (Serial Electrically Erasable and Programmable Read Only Memory) information for the system backplane. See “show backplane” on page 132 |
|         | boot-config     | Show image and configuration data used to bring-up the chassis. See “show boot-config” on page 134                                                       |
|         | card            | Show card attributes such as type, slot, and status. See “show card” on page 136                                                                         |
|         | card-inventory  | Poll individual system interface cards for their system resources and resident image data. See “show card-inventory” on page 139                         |
|         | clock           | Show the current system time. See “show clock” on page 142                                                                                               |
|         | config          | Show the system:running_config(uration). See “show config” on page 143                                                                                   |
|         | fan             | Show status of the fans maintaining system chassis temperature. See “show fan” on page 145                                                               |
| show    | host            | Show DNS information for the chassis. See “show host” on page 147                                                                                        |
| show    | ib sm           | Show the nodes, ports, and links being managed by the HP Fabric Clustering System subnet manager. See “show ib sm configuration” on page 149             |
|         | ib-agent        | Show subnet management agent settings for the channel adapters and switches on the system fabric. See “show ib-agent channel-adapter” on page 174.       |
| show    | interface ib    | Show status and configuration of HP Fabric Clustering System ports. See “show interface ib” on page 194                                                  |
| show    | ip              | Show IP address and route tables. See “show ip” on page 206.                                                                                             |
| show    | location        | Display the system location. See “show location” on page 208.                                                                                            |
| show    | logging         | Displays the active system log file. See “show logging” on page 209.                                                                                     |
| show    | ntp             | Displays the Network Time Protocol (NTP) servers used to maintain and synchronize the system clock. See “show ntp” on page 211.                          |
| show    | power-supply    | Show power-supply status. See “show power-supply” on page 212.                                                                                           |
| show    | running-status  | Show the running status of the system. See “show running-status” on page 213.                                                                            |
| show    | sensor          | Show system chassis temperature sensor status. See “show sensor” on page 215.                                                                            |
| show    | snmp            | Show SNMP linkUp/linkDown trap receivers. See “show snmp” on page 216.                                                                                   |
| show    | system-services | Show all services. See “show system-services” on page 217                                                                                                |
| show    | terminal        | Show CLI display and login settings. See “show terminal” on page 219.                                                                                    |
| show    | trace           | Show trace settings to debug system application modules. See “show trace” on page 220                                                                    |
| show    | user            | Show current users, permission levels, and login statistics. See “show user” on page 222.                                                                |

**Table B-1 Show Commands (Continued)**

| Command |         | Description                                                                    |
|---------|---------|--------------------------------------------------------------------------------|
| show    | version | Show system software version currently in use. See “show version” on page 224. |

**show arp ethernet**

**Synopsis:**

The show arp ethernet command displays the entries in the Ethernet routing tables.

**Syntax:**

show arp ethernet

**Command Modes:**

User-execute and privileged-execute modes.

**Privilege Level:**

Ethernet read-only user.

**Usage Guidelines:**

ARP connections are dynamically created on an as-needed basis and ARP entries are removed from ARP routing tables when connections are dropped.

**Examples:**

To display the Ethernet ARP table:

```
HP-IB# show arp ethernet
=====
                        ARP Information
=====
port      physical-address    net-address           type
-----
4/1       00:05:ad:00:10:41    20.45.0.1            static
```

**Defaults:**

There are no defaults for this command.

**Related Commands:**

“show arp ethernet” on page 129

“arp ib” on page 227

“show arp IB” on page 130

Show Commands

### show arp IB

**Synopsis:**

The show arp ib command displays the entries in the HP Fabric Clustering System ARP routing tables.

**Syntax:**

```
show arp ib
```

**Command Modes:**

User-execute and privileged-execute modes.

**Privilege Level:**

HP Fabric read-only user.

**Usage Guidelines:**

ARP connections are dynamically created on an as-needed basis and ARP entries are removed from ARP routing tables when connections are dropped.

**Examples:**

To display the HP Fabric Clustering System ARP table:

```
HP-IB# show arp ib
```

```
=====ARP Information=====
=====
port physical-address          net-address          type
-----
4/0 fe:80:00:00:00:00:00:00:02:c9:00:00:13:68:c3:00:00:02 192.168.2.2 static
4/0 fe:80:00:00:00:00:00:00:02:c9:00:00:16:af:d3:00:00:02 192.168.2.3 static
HP-IB#
```

**Defaults:**

There are no defaults for this command.

**Related Commands:**

“arp ib” on page 227

“show arp ethernet” on page 129

## show authentication

### Synopsis:

The `show authentication` command displays the method of authentication.

### Syntax:

```
show authentication
```

### Command Modes:

Privileged-execute modes.

### Privilege Level:

HP Fabric and Ethernet read-only user.

### Usage Guidelines:

Enter the

### Examples:

To display the authentication method:

```
HP-IB# show authentication
```

```
authentication method: local
```

```
-----
```

```
HP-IB#
```

### Defaults:

There are no defaults for this command.

### Related Commands:

“show logging” on page 209

“show location” on page 208

## show backplane

### Synopsis:

The show backplane command lists the SEEPROM (Serial Electrically Erasable and Programmable Read Only Memory) information for the system backplane.

### Syntax:

```
show backplane
```

### Command Modes:

User-execute and privileged-execute modes.

### Privilege Level:

General read-only user.

### Usage Guidelines:

The information displayed comprises various product serial numbers, the base-MAC address, and the chassis identification number. This information is used only by product-support personnel.

The fields in the show backplane output are described in the table below.

**Table B-2 show backplane Command Field Descriptions**

| Field                 | Description                                             |
|-----------------------|---------------------------------------------------------|
| base-mac-addr         | 24-bit base MAC address of this chassis.                |
| chassis-id            | Factory-assigned, 64-bit chassis-identification number. |
| product serial-number | Factory-assigned product serial number.                 |
| pca serial-number     | Printed Circuit Assembly (PCA) serial number.           |
| PCA number            | Printed Circuit Assembly (PCA) assembly number.         |
| fru number            | Field replaceable unit number.                          |

### Examples:

```
HP-IB> show backplane
```

```
=====
                                Backplane Seeprom
=====
base-mac-addr      chassis-id
-----
0:d:9d:fe:a:1c    0xd9dfffffe2a1c
=====
                                Backplane Seeprom
=====
product            pca            pca            fru
serial-number     serial-number  number         number
```

---

USC040200002      CS-0348-000083      95-00021-01-B2      AB291-62001

**Defaults:**

This command has no defaults.

**Related Commands:**

“show boot-config” on page 134

“show card-inventory” on page 139

## show boot-config

### Synopsis:

The show boot-config command lists the image and configuration files that are used to initialize chassis firmware and configure the interfaces.

### Syntax:

```
show boot-config
```

### Command Modes:

User-execute and privileged-execute modes.

### Privilege Level:

General read-only user.

### Usage Guidelines:

This command lists the files that were used to bring-up the system, the files to use the next time the system is rebooted, and the backup files to use in the event that the primary boot files are not available.

The fields in the show boot-config output are described in the table below.

**Table B-3 show boot-config Command Field Descriptions**

| Field                   | Description                                                                                                                                                            |
|-------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| slot-id                 | Slot identifier of the controller card in use. This value is either 1 or 14.                                                                                           |
| sw-version              | Version of the software-image used to initialize chassis components.                                                                                                   |
| last-image-source       | Directory name of the system-image used to initialize chassis components.                                                                                              |
| last-config-source      | Name of the file used to configure chassis interface cards and set system parameters.                                                                                  |
| primary-image-source    | Name and directory location of the system-image to use to initialize chassis components the next time the system reboots.                                              |
| primary-config-source   | Name of the configuration file to use to restore the system configuration the next time the system reboots. This field is affected by the save running-config command. |
| secondary-image-source  | Alternate image directory to use to initialize the system. This file is used if the file specified in primary-image-source is not available.                           |
| secondary-config-source | Alternate configuration file to use to restore the system configuration. This file is used if the file specified in primary-config-source is not available.            |

### Examples:

```
HP-IB# show boot-config
```

```
=====
                        System Boot Configuration
=====

slot-id : 1
sw-version : HP-IBOS-1.1.3/build255
```

```
last-image-source : HP-IBOS-1.1.3/build255
last-config-source : running_config.cfg
primary-image-source : HP-IB-1.1.3/build255
primary-config-source :
secondary-image-source :
secondary-config-source :
```

HP-IB#

**Defaults:**

This command has no defaults.

**Related Commands:**

“show boot-config” on page 134

“show version” on page 224

Show Commands

**show card**

**Synopsis:**

The show card command displays the configuration, status, and EEPROM (Serial Electrically Erasable and Programmable Read Only Memory) information for system interface cards.

**Syntax:**

```
show card {card# | card#-card# | card#,card#,card#... | all}
```

This command has the following arguments:

show card Syntax Description

**Table B-4 show card Command Syntax Descriptions**

| Syntax               | Description                                                                                                 |
|----------------------|-------------------------------------------------------------------------------------------------------------|
| card#                | Refers to an individual slot number.                                                                        |
| card#-card#          | Refers to a range of slot numbers. Displayed in the form card#-card#                                        |
| card#,card#,card#... | Refers to a list of slot numbers in the form card#,card#,...Do not add spaces between elements in the list. |
| all                  | Displays all cards. The CLI defaults to “add” if you only enter the show card command.                      |

**Command Modes:**

User-execute and privileged-execute modes.

**Privilege Level:**

General read-only user.

**Usage Guidelines:**

The fields in the show card output are described in the table below.

**Table B-5 show card Command Field Descriptions**

| Field      | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| slot       | Slot number the card occupies.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| admin type | Type of the interface card, as specified by the administrator. The first two letters indicate the general type of the card such as ib (InfiniBand). This is followed by the number of ports on the card and then the maximum supported network speed. There are two types that do not follow this convention, controller and controllerIb12port4x. controller indicates the type of independent controller card found on both sides of the system chassis. controllerIb12port4x indicates a controller card that piggy-backs onto a 12-port 4X Fabric Copper Switch cluster connections, where each port connection can support speeds up to 4X. controllerIb12port4x is found in system configurations. |
| oper type  | Actual type of the card, as detected by the controller. If there is any conflict between admin type and oper type, the system assumes the type specified by oper type is correct and allows you to configure the card based upon this assumption. If a type mismatch occurs, verify that you are selecting the correct type for the card in the chassis.                                                                                                                                                                                                                                                                                                                                                 |

**Table B-5 show card Command Field Descriptions (Continued)**

| Field                 | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|-----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| admin status          | Administrative status of the interface card, as specified by the administrator. When the system initializes, all interfaces start with admin status in a down state. When a card is disabled, it is powered-off and can no longer process packets. The value is up or down. The no shutdown command in the card configuration mode changes the status to up. shutdown without the no keyword changes the card status to down.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| oper status           | Operational status, as detected by the controller. This is the true status of the interface card based upon self-detection. The value of this read-only field is unknown, up, down, or failure. up indicates the card is ready to be configured. There may be situations when the admin status is up, but the oper status is something else. Both admin status and oper status must be up for you to configure the card.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| oper code             | General state of the interface card. The value is unknown, normal, wrong-image, bootFailed, tooHot, or booting. The Operational State must be normal before the Current Card Status can switch to up. unknown indicates an unsupported interface card - replace the card with a supported card. wrong-image indicates a system-image on the interface card that does not match the system-image on the controller. All cards must run the same system-image as the controller. bootFailed indicates that the system-image was incompletely or incorrectly loaded - if the other interface cards came up successfully, reset the individual card, otherwise, reboot the entire system chassis. tooHot indicates overheating - check that the fans are operational and open Health->Status... to the Sensors tab and note the card temperatures. booting indicates the card is still in the process of loading necessary image data for internal configuration. |
| slot                  | Slot number the card occupies.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| product serial number | Factory-assigned product serial-number.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| pca serial-number     | Printed Circuit-Assembly (PCA) serial-number.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| pca number            | Printed Circuit-Assembly (PCA) assembly-number.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| fru number            | Field-replaceable unit-number.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

**Examples:**

To display the configuration and status information for the card:

```
HP-IB> show card
```

```

=====
                          Card Information
=====
  admin      oper      admin      oper      oper
slot type          type          status    status    code
-----
1  controllerIb12port4x controllerIb12port4x up        up        normal
2  fc2port2G          fc2port2G          up        down      booting
=====
                          Card Boot Information
=====
  boot      boot      boot
slot stage  status    image
-----
1  done      success    Release-1.1.3hp/build020
2  exe       in-progress

```

Show Commands

```
=====
                          Card Seeprom
=====
  product          pca          pca          fru
slot serial-number serial-number number      number
-----
1   USC040200002   CS-0348-000083  95-00021-01-B2  AB291-62001
2   USP3390020FC102B5  PY-0339-000007  95-00008-02-C3  98-00021-01
```

**Defaults:**

“show card” defaults to “show card all”

**Related Commands:**

“boot-config” on page 248

“card” on page 250

## show card-inventory

### Synopsis:

The show card-inventory command polls individual system interface cards for their system resources and the image data residing on the interface card.

### Syntax:

```
show card-inventory {card# | card#-card# | card#,card#,card#... | all}
```

This command has the following arguments:

show card-inventory Syntax Description

**Table B-6 show card-inventory Command Syntax Descriptions**

| Syntax               | Description                                                                                                 |
|----------------------|-------------------------------------------------------------------------------------------------------------|
| card#                | Refers to an individual slot number.                                                                        |
| card#-card#          | Refers to a range of slot numbers. Displayed in the form card#-card#                                        |
| card#,card#,card#... | Refers to a list of slot numbers in the form card#,card#,...Do not add spaces between elements in the list. |
| all                  | Displays all cards. The CLI defaults to “add” if you only enter the show card command.                      |

### Command Modes:

User-execute and privileged-execute modes.

### Privilege Level:

General read-only user.

### Usage Guidelines:

Each system interface card is a system in itself. System resources comprise:

- available and used memory
- available and used flash memory space
- system-image on the interface card
- CPU name and version

The system-image should match the image that is on the controller card. Occasions may occur when you update the system-image on the controller but it is not propagated to an interface card, such as when swapping interface cards between chassis or updating the system-image on the controller when an interface card is down.

Disk space may be an issue if you try to update the system-image on the controller but cannot propagate this data to the interface card because the interface card is full.

The CPU description may be requested by support-personnel in the event you are experience difficulties with a controller or interface card.

The fields in the show card-inventory output are described in the table below.

**Table B-7 show card-inventory Command Field Descriptions**

| Field                | Description                                                                                                                                                                                                                               |
|----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| slot-id              | Slot number of the controller card.                                                                                                                                                                                                       |
| used-memory          | Total amount of local RAM being used by the card.                                                                                                                                                                                         |
| free-memory          | Total amount of available local RAM.                                                                                                                                                                                                      |
| used-disk-space      | Total amount of local flash memory space being used by the card.                                                                                                                                                                          |
| free-disk-space      | Total amount of available local flash memory space.                                                                                                                                                                                       |
| primary-image-source | Indicates the system-image to use the next time the system is rebooted or power-cycled. This value should be the same for all cards in the system.                                                                                        |
| image                | If there is only instance of the image field, it indicates the system-image used to initialize the card firmware. If there are two instances of the image field, the second instance indicates a second system-image present on the card. |
| cpu-descr            | CPU type, model, and firmware version.                                                                                                                                                                                                    |

**Examples:**

To display the configuration and status information for controller:

```
HP-IB# show card-inventory
```

```
=====
                        Card Resource/Inventory Information
=====

slot-id : 1
  used-memory : 52652 (kbytes)
  free-memory : 75172 (kbytes)
  used-disk-space : 66930 (kbytes)
  free-disk-space : 35449 (kbytes)
  last-image-source : Release-1.1.3hp/build020
  primary-image-source : Release-1.1.3hp/build020
    image : Release-1.1.3hp/build020
  cpu-descr : PPC 440GP Rev. C - Rev 4.129 (pvr 4012 0481)
  fpga-firmware-rev : 6
  ib-firmware-rev : 5.1.0
```

HP-IB#

**Defaults:**

“show card inventory” defaults to “show card inventory all”

**Related Commands:**

“boot-config” on page 248

“card” on page 250

“copy” on page 252

## **show clock**

### **Synopsis:**

The show clock command displays the current system time.

### **Syntax:**

```
show clock
```

### **Command Modes:**

User-execute and privileged-execute modes.

### **Privilege Level:**

Unrestricted read-write user.

### **Usage Guidelines:**

If the clock is not set, system time begins at 00:00:00, January 1, 1970.

### **Examples:**

```
HP-IB# show clock
Mon Mar 17 02:26:32 2003 (UTC)
HP-IB#
```

### **Defaults:**

This command has no defaults.

### **Related Commands:**

“clock” on page 250

## show config

### Synopsis:

The show config command displays the current configuration as a series of commands executed during the current CLI session. When executed, this command queries all active service components to collect their current configuration data and translates the data into a CLI command format for display.

### Syntax:

```
show config
```

### Command Modes:

User-execute and privileged-execute modes.

### Privilege Level:

Unrestricted read-write user.

### Usage Guidelines:

This is a record of the configuration steps performed and may be saved, edited, and reused to replicate a configuration.

```
HP-IB# show config
! Release-1.1.3hp/build020
! Thu Jan  8 13:10:50 2004
enable
config terminal
!
boot-config primary-image-source Release-1.1.3hp/build020
!
ib sm subnet-prefix fe:80:00:00:00:00:00 sweep-interval 600
!
interface mgmt-ethernet
 ip address 15.13.118.181 255.255.248.0
 gateway 15.13.112.1
 no shutdown
!
HP-IB#
```

### Defaults:

This command has no defaults.

**Show Commands**

**Related Commands:**

“copy” on page 252

“history” on page 264

## show fan

### Synopsis:

The show fan command displays the status of the two fans that cool the system chassis.

### Syntax:

```
show fan
```

### Command Modes:

User-execute and privileged-execute modes.

### Privilege Level:

General read-only user.

### Usage Guidelines:

Both fans should be operational while the system is powered-up. If the operational status of a fan is “down”, contact Customer Support for a fan module replacement.

The fields in the show fan output are described in the table below.

**Table B-8 show fan Command Field Descriptions**

| Field                 | Description                                                                                                                                                                                     |
|-----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| fan                   | Fan module number. Fan 1 is the fan on the left-side as you are facing the front of the chassis. Fan 2 is on the right-side of the chassis. There is only one fan module in the system chassis. |
| oper status           | Operational status of the fan. The value is unknown, up, down, or failure. up indicates the fan is operating correctly.                                                                         |
| fan                   | Fan module number.                                                                                                                                                                              |
| product serial number | Factory-assigned product serial-number.                                                                                                                                                         |
| pca serial-number     | Printed Circuit-Assembly (PCA) serial-number.                                                                                                                                                   |
| pca number            | Printed Circuit-Assembly (PCA) assembly-number.                                                                                                                                                 |
| fru number            | Field-replaceable unit-number.                                                                                                                                                                  |

### Examples:

```
HP-IB> show fan
```

```
=====
                          Fan Information
=====
fan  oper-status  speed
-----
1    up           68
2    up           68
3    up           68
```

**Show Commands**

**Defaults:**

This command has no defaults.

**Related Commands:**

“show power-supply” on page 212

“show sensor” on page 215

## show host

### Synopsis:

The show host command displays the Domain Name System configuration of the chassis.

### Syntax:

```
show host
```

### Command Modes:

User-execute and privileged-execute modes.

### Privilege Level:

Fibre Channel read-only user.

### Usage Guidelines:

The information displayed is the network domain of the chassis, and the DNS servers that are used to resolve network names to IP addresses.

### Examples:

```
HP-IB# show host
```

```
=====
                        Host Information
=====
name-server-one : 10.3.106.20
name-server-two : 0.0.0.0
domain-name     : shasta
```

```
HP-IB#
```

### Defaults:

This command has no defaults.

### Related Commands:

“hostname” on page 265

**Show Commands****show ib**

The `show ib` command displays information about the subnet manager running on the fabric. The information displayed is used to configure the subnet manager, including the nodes and ports within that subnet.

**Synopsis:**

The `show ib sm configuration` command displays information about the subnet managers running on the fabric.

**Syntax:**

```
show ib sm configuration
```

This command requires several keywords, which are shown in the table below.

**Table B-9 show ib Keyword Descriptions**

| Keyword       | Description                                                                                                                                                                                                                                                    |
|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| configuration | Displays the configuration of the subnet manager that is running on the fabric. It includes information like the subnet manager GUID, SM Key, and status. See “show ib sm configuration” on page 170.                                                          |
| neighbor      | Displays the inter-connectivity of nodes on the subnet and their GUIDs. It identifies the GUID of each node, the node ports, and the ports to which they are linked. It includes information like node type and status. See “show ib sm neighbor” on page 172. |
| node          | Displays the configuration and attributes of nodes on the subnet. In addition to node and port GUIDs, this command keyword identifies the node device and vendor. See “show ib sm node” on page 174.                                                           |
| port          | Displays the configuration and attributes of ports on the subnet. It includes information like link and virtual lane attributes, as well as packet violations. See “show ib sm port” on page 177.                                                              |
| switch        | Displays the configuration and capabilities of switches on the subnet. This includes information like the type of forwarding supported and switch capabilities. See “show ib sm switch” on page 184.                                                           |

## show ib sm configuration

### Synopsis:

The show ib sm configuration command displays information about the subnet managers running on the fabric.

### Syntax:

```
show ib sm configuration {subnet-prefix
subnet prefix
| all [summary]}
```

The arguments associated with this command are described below:

**Table B-10 show ib Command Syntax Descriptions**

| Syntax        | Description                                                                                                                                                                                                           |
|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| subnet prefix | Refers to the subnet prefix of the subnet manager that you want to display.                                                                                                                                           |
| all           | Shows all the subnet managers that are currently configured and running on the fabric.                                                                                                                                |
| summary       | An abridged form of the data may be returned by including the summary keyword at the end of the command line. The abridged information includes the subnet prefix, GUID, priority, and SM Key of the subnet managers. |

### Command Modes:

User-execute and privileged-execute modes.

### Privilege Level:

HP Fabric read-only user.

### Usage Guidelines:

The fields in the show ib sm configuration output are described in the table below.

**Table B-11 show ib Command Field Descriptions**

| Field         | Description                                                                                                                                                                                                                                     |
|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| subnet-prefix | 64-bit value used that identifies the HP Fabric Clustering System subnet. This is a unique subnet identifier and is joined with the GUID to form the global identifier (GID) of the port. All GIDs within a subnet have the same subnet prefix. |
| guid          | GUID of this subnet manager.                                                                                                                                                                                                                    |
| priority      | User-assigned priority for this subnet manager. The value is an integer between 0 and 15. The default is 0.                                                                                                                                     |
| sm-key        | 64-bit subnet management key assigned to the subnet manager. The default is 00:00:00:00:00:00:00:00.                                                                                                                                            |
| admin-status  | Administrative status of the subnet manager. The value is enable or disable. Disabling a subnet manager places it in an inactive state but leaves it intact in the configuration. The default is enable.                                        |

**Table B-11 show ib Command Field Descriptions (Continued)**

| Field       | Description                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| oper-status | Operational status of the subnet manager. This is the status as determined by self-detection. The value is notActive, discovering, standby, or master. notActive indicates the subnet manager has not been enabled or has been disabled. discovering indicates the subnet manager is sweeping the fabric. standby indicates a slave subnet manager. As there is only one subnet manager running on the fabric, it is always designated the master. |
| act-count   | Activity counter that increments each time the subnet manager issues an subnet management packet (SMP) or performs other management activities.                                                                                                                                                                                                                                                                                                    |
| status      | Status of the subnet manager. It may be active or inactive. active indicates that it is actively managing subnets. inactive indicates that it is not managing subnets.                                                                                                                                                                                                                                                                             |

**Examples:**

The following example shows the detailed configuration of a Subnet Manager.

```
HP-IB# show ib sm configuration subnet-prefix fe:80:00:00:00:00:00 detail
=====
                        Subnet Manager Information
=====
    subnet-prefix : fe:80:00:00:00:00:00
              guid : 00:05:ad:00:00:00:13:f5
              priority : 10
              sm-key : 00:00:00:00:00:00:00:00
    admin-status : enable
    oper-status  : master
    act-count    : 6362
    status       : active
```

The following example shows the summary configuration of a subnet manager.

```
HP-IB# show ib sm configuration subnet-prefix fe:80:00:00:00:00:00 summary
=====
                        Subnet Manager Configuration Summary
=====
subnet-prefix      guid                priority sm-key
-----
fe:80:00:00:00:00:00 00:05:ad:00:00:00:13:f5 10          00:00:00:00:00:00:00:00
HP-IB#
```

**Defaults:**

This command has no defaults.

**Related Commands:**

“show ib-agent switch” on page 179

“interface ib” on page 241

## show ib sm multicast

### Synopsis:

The show ib sm multicast command shows the multicast groups configured on the device.

### Syntax:

```
show ib sm multicast [subnet-prefix subnet-prefix | summary]
```

**Table B-12 show ib sm multicast Command Syntax Descriptions**

| Syntax                           | Description                                                                                                                                                                                                           |
|----------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| subnet-prefix<br>x subnet-prefix | Shows the multicast groups managed by the Subnet Manager on the specified device.                                                                                                                                     |
| summary                          | An abridged form of the data may be returned by including the summary keyword at the end of the command line. The abridged information includes the subnet prefix, GUID, priority, and SM Key of the subnet managers. |

### Command Modes:

User-execute and privileged-execute modes.

### Privilege Level:

HP Fabric read-only user.

### Usage Guidelines:

<CONFIRM SOMETHING IS NEEDED >Add description of output.

### Examples:

```
HP-IB# show ib sm multicast summary
```

```
=====
                          Summary of Multicast-Groups on Device
=====
 subnet-prefix : fe:80:00:00:00:00:00:00
                MGID : ff:12:40:1b:ff:f1:00:00:00:00:00:00:00:ff:ff:ff:ff

 multicast-group-members :
   port-GID : fe:80:00:00:00:00:00:00:00:05:ad:00:00:00:12:bf
 member-join-state : full-member
 proxy-join-status : false

 subnet-prefix : fe:80:00:00:00:00:00:00
                MGID : ff:12:40:1b:ff:f9:00:00:00:00:00:00:00:ff:ff:ff:ff
```

**Defaults:**

This command has no defaults.

**Related Commands:**

“ib sm subnet-prefix” on page 235

Show Commands

**show ib sm neighbor**

**Synopsis:**

The show ib sm neighbor command shows the interconnection of all the ports of all the nodes on the HP Fabric Clustering System subnet. In addition, this command shows the node status, type, and respective GUIDs.

**Syntax:**

show ib sm neighbor

**Command Modes:**

User-execute and privileged-execute modes.

**Privilege Level:**

HP Fabric read-only user.

**Usage Guidelines:**

The fields in the show ib sm neighbor window are described in the table below.

**Table B-13 show ib sm neighbor Command Field Descriptions**

| Field             | Description                                                                                                                                                            |
|-------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| subnet-prefix     | 64-bit value that identifies the HP Fabric Clustering System subnet to which this node belongs.                                                                        |
| local-node-guid   | 64-bit GUID of the HP Fabric Clustering System node.                                                                                                                   |
| local-port-id     | Port ID of the HP Fabric Clustering System node. The value is an integer between 0 and 255.                                                                            |
| local-node-type   | Type of the HP Fabric Clustering System node. The value is channel-adapter, switch, or router.                                                                         |
| remote-node-guid  | 64-bit Guid of the neighboring HP Fabric Clustering System node to which the local node is linked.                                                                     |
| remote-port-id    | Port ID of the neighboring HP Fabric Clustering System node to which the local node is linked. The value is an integer between 0 and 255.                              |
| remote-node-type  | Type of the neighboring HP Fabric Clustering System node. The value is channel-adapter, switch, or router.                                                             |
| link-stat         | State of the link between the local and neighboring nodes. The value is noStateChange, down, initialize, armed, or active.                                             |
| link-width-active | Active link width. This parameter is used with LinkSpeedActive to determine the link rate between the two connected nodes. The value is width1x, width4x, or width12x. |

**Examples:**

HP-IB# show ib sm neighbor

```

=====
                               Subnet Management Neighbors
=====

 subnet-prefix : fe:80:00:00:00:00:00:00
 local-node-guid : 00:05:ad:00:00:00:11:97
    
```

```
    local-port-id : 2
    local-node-type : channel-adapter
remote-node-guid : 00:05:ad:00:00:00:13:da
    remote-port-id : 1
remote-node-type : switch
    link-state : active
link-width-active : width4x

    subnet-prefix : fe:80:00:00:00:00:00:00
    local-node-guid : 00:05:ad:00:00:00:13:da
    local-port-id : 1
    local-node-type : switch
remote-node-guid : 00:05:ad:00:00:00:11:97
    remote-port-id : 2
remote-node-type : channel-adapter
    link-state : active
link-width-active : width4x
```

...<output truncated>

**Defaults:**

This command has no defaults.

**Related Commands:**

“ib sm subnet-prefix” on page 235

## show ib sm node subnet-prefix

### Synopsis:

The show ib sm node subnet-prefix command displays the configuration and attributes of subnet management nodes in a specified subnet or the whole fabric.

### Syntax:

```
show ib sm node subnet-prefix  
subnet prefix [ all | node guid | summary]
```

The arguments associated with this command are described below:

**Table B-14** show ib sm node subnet-prefix Command Syntax Descriptions

| Syntax                              | Description                                                             |
|-------------------------------------|-------------------------------------------------------------------------|
| subnet-prefix<br>x<br>subnet prefix | Enter the subnet prefix of the subnet manager that you want to display. |
| all                                 | Displays all subnet information in the fabric.                          |
| node guid                           | Use with the all keyword.                                               |
| summary                             | Displays a Subnet Manager node summary.                                 |

### Command Modes:

User-execute and privileged-execute modes.

### Privilege Level:

HP Fabric read-only user.

### Usage Guidelines:

Use this command to display the configuration of all the nodes on a subnet, or to display the configuration of an individual node. The output may also be displayed in summary form. The summary comprises the subnet-manager prefix, the node GUID and type, and vendor identification.

The fields in the show ib sm node output are described in the table below.

**Table B-15** show ib sm node subnet-prefix Command Field Descriptions

| Field         | Description                                                                                                                                                                                                                                                                   |
|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| subnet-prefix | 64-bit value that identifies the HP Fabric Clustering System subnet to which this node belongs.                                                                                                                                                                               |
| node-guid     | GUID of this node.                                                                                                                                                                                                                                                            |
| description   | Description of device, is one has been configured.                                                                                                                                                                                                                            |
| base-version  | Supported base management datagram (MAD) version. Indicates that this channel adapter, switch, or router supports up to and including this version. See section 13.4.2, Management Datagram Format, in “InfiniBand™ Architecture, Vol. 1, Release 1.0”, for more information. |

**Table B-15 show ib sm node subnet-prefix Command Field Descriptions (Continued)**

| Field         | Description                                                                                                                                                                                                                                                              |
|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| class-version | Supported MAD class format version. Indicates that this channel adapter, switch, or router supports up to, and including, this version. This column is displayed in the “Advanced” view only.                                                                            |
| type          | Type of node being managed. The value is channel adapter, switch, router, or error. error indicates an unknown type.                                                                                                                                                     |
| num-ports     | Number of physical ports on this node.                                                                                                                                                                                                                                   |
| port-guid     | GUID of this port. A port within a node can return the node GUID as its PortGUID if the port is an integral part of the node and is not field-replaceable (i.e., not swappable). This column is displayed in the “Advanced” view only.                                   |
| partition-cap | Number of entries in the partition table for channel adapter, router, and the switch management port. The value is the same for all ports on the node. This is set to at least 1 for all nodes including switches. This column is displayed in the “Advanced” view only. |
| device-id     | Manufacturer-assigned device identification. This column is displayed in the “Advanced” view only.                                                                                                                                                                       |
| revision      | Manufacturer-assigned device revision. This column is displayed in the “Advanced” view only.                                                                                                                                                                             |
| local-portnum | The link port number this subnet management packet (SMP) came in on. The value is the same for all ports on the node. This column is displayed in the “Advanced” view only.                                                                                              |
| vendor-id     | Device vendor ID. The value is the same for all ports on the node.                                                                                                                                                                                                       |

**Examples:**

The following example displays the configuration of all the nodes on all the subnets on the fabric.

```
HP-IB# show ib sm node subnet-prefix all
=====
                Subnet Management Nodes
=====
subnet-prefix : fe:80:00:00:00:00:00
node-guid    : 00:05:ad:00:00:00:11:97
base-version : 1
class-version : 1
              type : channel adapter
num-ports    : 2
port-guid    : 00:05:ad:00:00:00:11:99
partition-cap : 64
device-id    : 0
revision     : 0
local-portnum : 2
vendor-id    : 00:05:ad

subnet-prefix : fe:80:00:00:00:00:00
```

Show Commands

```

node-guid : 00:05:ad:00:00:00:13:da
base-version : 1
class-version : 1
    type : switch
num-ports : 9
port-guid : 00:05:ad:00:00:00:13:da
partition-cap : 1
device-id : 0
revision : 0
local-portnum : 1
vendor-id : 00:05:ad

```

...

The following example displays a node configuration in summary form.

```

HP-IB# show ib sm node subnet-prefix fe:80:00:00:00:00:00:00 node-guid
00:05:ad:00:00:00:13:80 summary

```

```

=====
Subnet Manager Node Summary
=====
subnet-prefix          node-guid              node-type              vendor-id
-----
fe:80:00:00:00:00:00  00:05:ad:00:00:00:13:80  channel adapter      00:05:ad

```

HP-IB#

The following example displays a node configuration in summary form.

```

HP-IB# show ib sm node subnet-prefix fe:80:00:00:00:00:00:00 node-guid
00:05:ad:00:00:00:13:80 summary

```

```

=====
Subnet Manager Node Summary
=====
subnet-prefix          node-guid              node-type              vendor-id
-----
fe:80:00:00:00:00:00  00:05:ad:00:00:00:13:80  channel adapter      00:05:ad

```

HP-IB#

**Defaults:**

This command has no defaults.

**Related Commands:**

“ib sm subnet-prefix” on page 235

## show ib sm partition

### Synopsis:

The show ib sm partition command displays partitions managed by Subnet Managers on the device.

### Syntax:

```
show ib sm partition
```

### Command Modes:

User-execute and privileged-execute modes.

### Privilege Level:

HP Fabric read-only user.

### Usage Guidelines:

In the output, 7f:ff refers to the default Partition, which cannot be altered. Members of Partitions are identified by their Node GUID and port-number, as displayed below.

A single Partition can have members that are both full-membership, as well as members that have limited membership.

### Examples:

The following example displays the configuration of all the nodes on all the subnets on the fabric.

```
HP-IB# show ib sm partition
```

```
=====
                          Partitions Managed By The Subnet Managers
=====

subnet-prefix : fe:80:00:00:00:00:00:00
      p_key   : 7f:ff

      partition-members :
        node-guid : 00:05:ad:00:00:00:02:40
        port-number : 0
        member-type : full-member

        node-guid : 00:05:ad:00:00:00:02:42
        port-number : 0
        member-type : full-member

        node-guid : 00:05:ad:00:00:00:02:42
        port-number : 0
```

member-type : full-member

**Defaults:**

This command has no defaults.

**Related Commands:**

“ib sm subnet-prefix” on page 235

## show ib sm port

### Synopsis:

The show ib sm port command identifies subnet management ports, the nodes they belong to, their capabilities, and their link statistics.

### Syntax:

```
show ib sm port subnet-prefix  
subnet prefix  
| all [node-guid guid] [summary]
```

The arguments associated with this command are described below:

**Table B-16 show ib sm port Command Syntax Descriptions**

| Syntax            | Description                                                                                                                                                                                           |
|-------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| subnet prefix     | Enter the subnet prefix of the subnet managers that you want to display.                                                                                                                              |
| all               | Shows all the subnet managers that are currently configured and running on the fabric.                                                                                                                |
| node-guid<br>guid | Include the guid of a node to display only the configuration of that node.                                                                                                                            |
| summary           | An abridged form of the data may be returned by including the summary keyword at the end of the command line. The abridged information includes the subnet-manager prefix, node-GUID, LID, and state. |

### Command Modes:

User-execute and privileged-execute modes.

### Privilege Level:

HP Fabric read-only user.

### Usage Guidelines:

Port information may be reported for all the ports on a specific subnet or all the ports comprising a specific node. The output may also be displayed in summary form.

The fields in the show ib sm port output are described in the table below.

**Table B-17 show ib sm port Command Field Descriptions**

| Field         | Description                                                                                                                                                                                                                                                  |
|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| subnet-prefix | 64-bit value that identifies the HP Fabric Clustering System subnet to which this port belongs.                                                                                                                                                              |
| node-guid     | 64-bit GUID of the node to which this port belongs.                                                                                                                                                                                                          |
| if-index      | Local port number on this node.                                                                                                                                                                                                                              |
| mkey          | 64-bit management key for this port. See section 14.2.4, Management Key and 3.5.3, Keys, “InfiniBand™ Architecture, Vol. 1, Release 1.0”, for more information.                                                                                              |
| gid-prefix    | 64-bit GID prefix for this port. This prefix is assigned by the subnet manager, based upon the port router and the rules for local identifiers. See section 4.1.3, Local Identifiers, “InfiniBand™ Architecture, Vol. 1, Release 1.0”, for more information. |

**Table B-17 show ib sm port Command Field Descriptions (Continued)**

| Field                | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| lid                  | 16-bit base-LID of this port.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| master-sm-lid        | 16-bit base LID of the master subnet manager managing this port.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| cap-mask             | 32-bit bitmask that specifies the supported capabilities of the port. A bit value of 1 (one) indicates a supported capability. The bits are: 0, 11-15, 18, 21-31 (Reserved and always 0.), 1 IsSM, 2 IsNoticeSupported, 3 IsTrapSupported, 4 IsResetSupported, 5 IsAutomaticMigrationSupported, 6 IsSLMappingSupported, 7 IsMKeyNVRAM (supports M_Key in NVRAM), 8 IsPKeyNVRAM (supports P_Key in NVRAM), 9 Is LED Info Supported, 10 IsSMdisabled, 16 IsConnectionManagementSupported, 17 IsSNMPTunnelingSupported, 19 IsDeviceManagementSupported, 20 IsVendorClassSupported. Values are expressed in hexadecimal. |
| diag-code            | 16-bit diagnostic code. See section 14.2.5.6.1 Interpretation of Diagcode, “InfiniBand™ Architecture, Vol. 1, Release 1.0”, for more information.                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| mkey-lease-period    | Initial value of the lease-period timer in seconds. The lease period is the length of time that the M_Key protection bits are to remain non-zero after a SubnSet (PortInfo) fails an M_Key check. After the lease period expires, clearing the M_Key protection bits allows any subnet manager to read (and then set) the M_Key. Set this field to 0 to indicate that the lease period is never to expire. See section 14.2.4, Management Key, “InfiniBand™ Architecture, Vol. 1, Release 1.0”, for more information.                                                                                                |
| link-width-enabled   | Enabled link width. The value is an integer that indicates the enabled link-width sets for this port. The value may be,<br>0 (no state change),<br>1 (1x),<br>2 (4x),<br>3 (1x or 4x),<br>8 (12x),<br>9 (1x or 12x),<br>10 (4x or 12x),<br>11 (1x, 4x or 12x),<br>255 (set this parameter to the LinkWidthSupported value).                                                                                                                                                                                                                                                                                          |
| link-width-supported | Supported link width. The value is 1 (1x), 3 (1x or 4x), or 11 (1x, 4x, or 12x).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| link-width-active    | Active link width. Used in conjunction with LinkSpeedActive to determine the link rate between two nodes. The value is 1 (1x), 2 (4x), or 8 (12x).                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| link-speed-supported | Supported link speed. The value is 1 (2.5 Gbps).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| state                | A higher form of addressing than PhyState, State determines that the nodes can actually communicate and indicates the state transition that has occurred. A transition is a port change from down to initialize, initialize to down, armed to down, or active to down as a result of link state machine logic. Changes to the port state resulting from SubnSet have no affect on this parameter value. The value is noStateChange, down, initialize, armed, or active.                                                                                                                                              |
| phy-state            | Indicates the actual state of the port. This is used to determine that electricity is flowing between nodes and they can hand-shake. The value is noStateChange, sleeping, polling, disabled, portConfigurationTraining, linkup, or linkErrorRecovery. The default state upon power-up is polling.                                                                                                                                                                                                                                                                                                                   |
| link-down-def-state  | Default LinkDown state to return to. The value is noStateChange, sleeping, or polling,. See section 5.5.2, Status Outputs (MAD GET), “InfiniBand™ Architecture, Vol. 2, Release 1.0”, for more information.                                                                                                                                                                                                                                                                                                                                                                                                          |

**Table B-17 show ib sm port Command Field Descriptions (Continued)**

| Field                     | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|---------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| mkey-prot-bits            | Management key protection bits for the port. The bits are 0, 1, 2, and 3. See section 14.2.4.1, Levels of Protection, “InfiniBand™ Architecture, Vol. 1, Release 1.0”, for more information.                                                                                                                                                                                                                                                                                   |
| lmc                       | Local identifier mask control (LMC) for multipath support. An LMC is assigned to each channel adapter and router port on the subnet. It provides multiple virtual ports within a single physical port. The value of the LMC specifies the number of path bits in the LID. A value of 0 (zero) indicates one LID is allowed on this port. See sections 3.5.10, Addressing, and 4.1.3, Local Identifiers, “InfiniBand™ Architecture, Vol. 1, Release 1.0”, for more information. |
| link-speed-active         | Speed of an active link. The value is 1 (2.5 Gbps).                                                                                                                                                                                                                                                                                                                                                                                                                            |
| link-speed-enabled        | Maximum speed the link is capable of handling. The value is 0 (No state change), 1 (2.5 Gbps), or 3 (value derived from link-speed-supported).                                                                                                                                                                                                                                                                                                                                 |
| neighbor-mtu              | Active maximum transmission unit enabled on this port for transmit. Check the mtu-cap value at both ends of every link and use the lesser speed. The value is mtu256, mtu512, mtu1024, mtu2048, or mtu4096.                                                                                                                                                                                                                                                                    |
| master-sm-SL              | Administrative service level required for this port to send a non-SMP message to the subnet manager.                                                                                                                                                                                                                                                                                                                                                                           |
| VL-cap                    | Maximum range of data virtual lanes supported by this port. The value is vl0, vl0ToV11, vl0ToV13, vl0ToV17, or vl0ToV114. See also oper-VL.                                                                                                                                                                                                                                                                                                                                    |
| VL-high-limit             | Maximum high-priority limit on the number of bytes allowed for transmitting high-priority packets when both ends of a link operate with multiple data virtual-lanes. Used with the virtual-lane arbitration table. The maximum high-limit is determined by checking the vl-arb-high-cap on the other side of the link and then negotiating downward.                                                                                                                           |
| VL-arb-high-cap           | Highest arbitration value allowed by the arbiter in determining the next packet in a set of packets to send across the link. Used with the virtual-lane arbitration table and specified as a VL/Weight pair. See section 14.2.5.9, VL Arbitration Table, “InfiniBand™ Architecture, Vol. 1, Release 1.0”, for more information.                                                                                                                                                |
| VL-arb-low-cap            | Lowest arbitration value allowed by the arbiter in determining the next packet in a set of packets to send across the link. Used with the virtual-lane arbitration table and specified as a VL/Weight pair. See section 14.2.5.9, VL Arbitration Table, “InfiniBand™ Architecture, Vol. 1, Release 1.0”, for more information.                                                                                                                                                 |
| mtu-cap                   | Used in conjunction with neighbor-mtu to determine the maximum transmission size supported on this port. The lesser of mtu-cap and neighbor-mtu determines the actual MTU used. The value is 256, 512, 1024, 2048, or 4096                                                                                                                                                                                                                                                     |
| VL-stall-count            | Number of sequentially dropped packets at which the port enters a VLStalled state. The virtual lane exits the VLStalled state (8 * HLL) units after entering it. See section 18.2.5.4, Transmitter Queuing, “InfiniBand™ Architecture, Vol. 1, Release 1.0”, for a description of HLL.                                                                                                                                                                                         |
| HOQ-life                  | Maximum duration allowed to packets at the head of a virtual-lane queue. Used with VL-stall-count to determine the outgoing packets to discard.                                                                                                                                                                                                                                                                                                                                |
| oper-VL                   | Administrative limit for the number of virtual lanes allowed to the link. Do not set this above the VL-cap value. The value is vl0, vl0-V11, vl0-V13, vl0-V17, or vl0-V114.                                                                                                                                                                                                                                                                                                    |
| in-part-enforce           | Boolean value that indicates whether or not to support optional partition enforcement for the packets received by this port. There is no default value.                                                                                                                                                                                                                                                                                                                        |
| out-part-enforce          | Boolean value that indicates whether or not to support optional partition enforcement for the packets transmitted by this port. There is no default value.                                                                                                                                                                                                                                                                                                                     |
| in-filter-raw-pkt-enforce | Boolean value that indicates whether or not to support optional raw packet enforcement for the raw packets received by this port. There is no default value.                                                                                                                                                                                                                                                                                                                   |

**Table B-17 show ib sm port Command Field Descriptions (Continued)**

| Field                          | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|--------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| out-filter-raw-pk<br>t-enforce | Boolean value that indicates whether or not to support optional raw packet enforcement for the raw packets transmitted by this port. There is no default value.                                                                                                                                                                                                                                                                                             |
| mkey-violation                 | Number of subnet management packets (SMPs) that have been received on this port with invalid M_Keys since initial power up or the last reset. See section 14.2.4, Management Key, “InfiniBand™ Architecture, Vol. 1, Release 1.0”, for more information.                                                                                                                                                                                                    |
| pkey-violation                 | Number of subnet management packets that have been received on this port with invalid P_Keys since initial power up or the last reset. See section 9.2.7, Partition Key (P_KEY), “InfiniBand™ Architecture, Vol. 1, Release 1.0”, for more information.                                                                                                                                                                                                     |
| qkey-violation                 | Number of subnet management packets that have been received on this port with invalid Q_Keys since initial power up or the last reset. See section 10.2.4, Q Keys, “InfiniBand™ Architecture, Vol. 1, Release 1.0”, for more information.                                                                                                                                                                                                                   |
| guid-cap                       | Number of GUID entries allowed for this port in the port table. Any entries that exceed this value are ignored on write and read back as zero. See section 14.2.5.5, GUIDCap, “InfiniBand™ Architecture, Vol. 1, Release 1.0”, for more information.                                                                                                                                                                                                        |
| subnet-timeout                 | Maximum propagation delay allowed for this port to reach any other port in the subnet. This value also affects the maximum rate at which traps can be sent from this port. Delay is affected by switch configuration. This parameter, along with resp-time, may be used by requestors to determine the interval to wait for a response to a request before taking other action. Duration is calculated as $(4.096 \text{ ms} * 2^{\text{SubnetTimeout}})$ . |
| resp-time                      | Maximum time allowed between the port reception of a subnet management packet and the transmission of the associated response. See section 13.4.6.2, Timers and Timeouts, “InfiniBand™ Architecture, Vol. 1, Release 1.0”, for more information.                                                                                                                                                                                                            |
| local-phy-error                | Threshold at which ICRC, VCRC, FCCRC, and all physical errors result in an entry into the BAD PACKET or BAD PACKET DISCARD states of the local packet receiver. See section 7.12.2, Error Recovery Procedures, “InfiniBand™ Architecture, Vol. 1, Release 1.0”, for more information.                                                                                                                                                                       |
| local-overflow-er<br>ror       | Threshold at which the count of buffer overruns, across consecutive flow-control update periods, result in an overrun error. A possible cause of such errors is when an earlier packet has physical errors and the buffers are not immediately reclaimed.                                                                                                                                                                                                   |

**Examples:**

```
HP-IB# show ib sm port subnet-prefix
fe:80:00:00:00:00:00:00
=====
                Subnet Management Ports
=====
subnet-prefix : fe:80:00:00:00:00:00:00
node-guid    : 00:05:ad:00:00:00:13:17
if-index     : 1
             mkey   : 00:00:00:00:00:00:00:00
gid-prefix   : fe:80:00:00:00:00:00:00
             lid    : 14
```

Show Commands

```

    master-sm-lid : 1
        cap-mask : 00:10:02:48
        diag-code : 00:00
    mkey-lease-period : 0
    link-width-enabled : 3
    link-width-supported : 3
        link-width-active : 2
    link-speed-supported : 1
        state : active
        phy-state : linkup
    link-down-def-state : polling
        mkey-prot-bits : 0
            lmc : 0
    link-speed-active : 1
    link-speed-enabled : 1
        neighbor-mtu : 2048
        master-sm-SL : 0
            VL-cap : vl0-vl7
            VL-high-limit : 0
            VL-arb-high-cap : 8
            VL-arb-low-cap : 8
            mtu-cap : 2048
    local-overflow-error : 0
    ...

```

The following example displays the ports of a node in summary form.

```

HP-IB# show ib sm port subnet-prefix fe:80:00:00:00:00:00 node-guid
00:05:ad:00:00:00:13:7f summary
=====
                Subnet Manager Port Summary
=====
subnet-prefix node-guid                if-index    lid    state
-----
fe:80:00:00:00:00:00 00:05:ad:00:00:00:13:7f 1            0    active

```

```
fe:80:00:00:00:00:00:00 00:05:ad:00:00:00:13:7f 4      0      active
fe:80:00:00:00:00:00:00 00:05:ad:00:00:00:13:7f 5      0      active
fe:80:00:00:00:00:00:00 00:05:ad:00:00:00:13:7f 6      0      active
fe:80:00:00:00:00:00:00 00:05:ad:00:00:00:13:7f 9      0      active
```

HP-IB#

**Defaults:**

This command has no defaults.

**Related Commands:**

“ib sm subnet-prefix” on page 235

“show ib sm configuration” on page 149

“show ib sm multicast” on page 152

“show ib sm neighbor” on page 154

“show ib sm partition” on page 160

“show ib sm port” on page 162

Show Commands

**show ib sm service**

**Synopsis:**

The show ib sm service command identifies subnet management switches, the nodes they belong to, their capabilities, and their link statistics.

**Syntax:**

```
show ib sm service subnet-prefix
subnet prefix
all | [node-guid guid] [summary]
```

The arguments associated with this command are described below:

**Table B-18 show ib sm service Command Syntax Descriptions**

| Syntax         | Description                                                                                                                                                                              |
|----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| subnet prefix  | Enter the subnet prefix of the subnet managers that you want to display.                                                                                                                 |
| all            | Shows all the subnet managers that are currently configured and running on the fabric.                                                                                                   |
| node-guid guid | Include the guid of a node to display only the configuration of that node.                                                                                                               |
| summary        | An abridged form of the data may be returned by including the summary keyword at the end of the command line. The abridged information includes the subnet-manager prefix and node-GUID. |

**Command Modes:**

User-execute and privileged-execute modes.

**Privilege Level:**

HP Fabric read-only user.

**Usage Guidelines:**

Switch information may be reported for all the switches on a specific subnet or all the switches comprising a specific node. The output may also be displayed in summary form.

**Examples:**

```
HP-IB# show ib sm service summary
=====
                          Summary of Services on Device
=====
subnet-prefix : fe:80:00:00:00:00:00:00
  service-id  : 00:00:00:00:00:00:00:67
              GUID : fe:80:00:00:00:00:00:00:05:ad:00:00:01:20:21
  service-data :
```

```
data-8 : 00:00:00:00:00:00:00:00:00:00:00:00:00:00:00:00
data-16 : 0000:0000:0000:0000:0000:0000:0000:0000
data-32 : 00000000:00000000:00000000:00000000
data-64 : 0000000000000000:0000000000000000

subnet-prefix : fe:80:00:00:00:00:00:00
service-id : 00:00:00:00:00:00:00:67
GID : fe:80:00:00:00:00:00:00:05:ad:00:00:01:20:22
service-data :
data-8 : 00:00:00:00:00:00:00:00:00:00:00:00:00:00:00:00
data-16 : 0000:0000:0000:0000:0000:0000:0000:0000
data-32 : 00000000:00000000:00000000:00000000
data-64 : 0000000000000000:0000000000000000
```

**Defaults:**

This command has no defaults.

**Related Commands:**

“ib sm subnet-prefix” on page 235

“show ib sm configuration” on page 149

“show ib sm multicast” on page 152

“show ib sm neighbor” on page 154

“show ib sm partition” on page 160

“show ib sm port” on page 162

Show Commands

**show ib sm switch**

**Synopsis:**

The show ib sm switch command identifies subnet management switches, the nodes they belong to, their capabilities, and their link statistics.

**Syntax:**

```
show ib sm switch subnet-prefix
subnet prefix
| all [node-guid guid] [summary]
```

The arguments associated with this command are described below:

show ib sm switch configuration Syntax Description

**Table B-19 show ib sm switch Command Syntax Descriptions**

| Syntax                              | Description                                                                                                                                                                              |
|-------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| subnet-prefix<br>x<br>subnet prefix | Enter the subnet prefix of the subnet managers that you want to display.                                                                                                                 |
| all                                 | Shows all the subnet managers that are currently configured and running on the fabric.                                                                                                   |
| node-guid<br>guid                   | Include the guid of a node to display only the configuration of that node.                                                                                                               |
| summary                             | An abridged form of the data may be returned by including the summary keyword at the end of the command line. The abridged information includes the subnet-manager prefix and node-GUID. |

**Command Modes:**

User-execute and privileged-execute modes.

**Privilege Level:**

HP Fabric read-only user.

**Usage Guidelines:**

Switch information may be reported for all the switches on a specific subnet or all the switches comprising a specific node. The output may also be displayed in summary form.

The fields in the show ib sm switch output are described in the table below.

**Table B-20 show ib sm switch Command Field Descriptions**

| Field          | Description                                                                                                                               |
|----------------|-------------------------------------------------------------------------------------------------------------------------------------------|
| subnet-prefix  | 64-bit value that identifies the HP Fabric Clustering System subnet to which this node belongs.                                           |
| node-guid      | 64-bit GUID of the node to which this switch belongs.                                                                                     |
| linear-fdb-cap | Maximum number of entries allowed in the linear unicast forwarding table. 0 (zero) indicates that there is no linear forwarding database. |

**Table B-20 show ib sm switch Command Field Descriptions (Continued)**

| Field                  | Description                                                                                                                                                                                                                                                                                   |
|------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| random-fdb-cap         | Maximum number of entries allowed in the random unicast forwarding table. 0 (zero) indicates that there is no random forwarding database.                                                                                                                                                     |
| mcast-fdb-cap          | Maximum number of entries allowed in the multicast forwarding table.                                                                                                                                                                                                                          |
| linear-fdb-top         | Specifies the top of the linear forwarding table. Packets received with unicast LIDs greater than this value are discarded by the switch. This parameter applies only to switches that implement linear forwarding tables and is ignored by switches that implement random forwarding tables. |
| default-port           | Specifies the default port to which to forward all the unicast packets from other ports whose DLID does not exist in the random forwarding table.                                                                                                                                             |
| default-pri-mcast-port | Specifies the default port to which to forward all the multicast packets from other ports whose DLID does not exist in the multicast forwarding table.                                                                                                                                        |
| def-non-pri-mcast-port | Specifies the port to which to forward all the multicast packets from default-pri-mcast-port whose DLID does not exist in the multicast forwarding table.                                                                                                                                     |
| life-time-value        | Specifies the duration a packet can live in the switch. Time units are in milliseconds. See section 18.2.5.4, Transmitter Queueing, “InfiniBand™ Architecture, Vol. 1, Release 1.0”, for more information.                                                                                    |
| port-state-change      | Indicates a change in port state. The value changes from NotInTransition to PortInTransition anytime the State parameter of a port changes from down to initialize, initialize to down, armed to down, or active to down, as a result of link state machine logic.                            |
| lid-per-port           | Number of LID/LMC combinations that may be assigned to a given external port for switches that support the random forwarding table. This value is always 0. 0 indicates that there is one LID per port.                                                                                       |
| partition-enf-cap      | Number of entries in this partition enforcement table per physical port. 0 (zero) indicates that partition enforcement is not supported by the switch.                                                                                                                                        |
| in-enf-cap             | Indicates if the switch is capable of partition enforcement on received packets. The value is true or false.                                                                                                                                                                                  |
| out-enf-cap            | Indicates if the switch is capable of partition enforcement on transmitted packets. The value is true or false.                                                                                                                                                                               |
| in-filter-raw-pkt-cap  | Indicates if the switch is capable of raw packet enforcement on received packets. The value is true or false.                                                                                                                                                                                 |
| out-filter-raw-pkt-cap | Indicates if the switch is capable of raw packet enforcement on transmitted packets. The value is true or false.                                                                                                                                                                              |

**Examples:**

```
HP-IB# show ib sm switch subnet-prefix
fe:80:00:00:00:00:00
  node-guid
00:05:ad:00:00:00:13:81
=====
                Subnet Management Switches
=====
```

Show Commands

```

        subnet-prefix : fe:80:00:00:00:00:00:00
            node-guid  : 00:05:ad:00:00:00:13:81
    linear-fdb-cap    : 49152
    random-fdb-cap    : 0
        mcast-fdb-cap : 1024
    linear-fdb-top    : 1024
        default-port  : 255
    def-pri-mcast-port : 255
    def-non-pri-mcast-port : 255
        life-time-value : 11
    port-state-change : port in transition
        lid-per-port   : 0
    partition-enf-cap : 64
        in-enf-cap     : false
        out-enf-cap    : false
    in-filter-raw-pkt-cap : true
    out-filter-raw-pkt-cap : true
    
```

HP-IB#

The following example displays the switches of a subnet in summary form.

```
HP-IB# show ib sm switch subnet-prefix fe:80:00:00:00:00:00:00 summary
```

```

=====
                        Subnet Manager Switch Summary
=====
subnet-prefix          node-guid
-----
fe:80:00:00:00:00:00:00 00:05:ad:00:00:00:13:7f
fe:80:00:00:00:00:00:00 00:05:ad:00:00:00:13:81
fe:80:00:00:00:00:00:00 00:05:ad:00:00:00:13:83
fe:80:00:00:00:00:00:00 00:05:ad:00:00:00:13:85
fe:80:00:00:00:00:00:00 00:05:ad:00:00:00:13:87
fe:80:00:00:00:00:00:00 00:05:ad:00:00:00:13:89
HP-IB#
    
```

**Defaults:**

This command has no defaults.

**Related Commands:**

“ib sm subnet-prefix” on page 235

“show ib sm configuration” on page 149

“show ib sm multicast” on page 152

“show ib sm neighbor” on page 154

“show ib sm partition” on page 160

“show ib sm port” on page 162

## show ib-agent channel-adapter

### Synopsis:

The show ib-agent channel-adapter command displays the channel adapters used by subnet management agents, or just the channel adapter used by one subnet management agent.

### Syntax:

```
show ib-agent channel-adapter all |  
node_guid
```

node-info

Specify the node-GUID of specific channel-adapter to display the SMA nodes of that channel adapter, otherwise specify the all argument to display all the nodes of all the channel-adapters on the fabric.

The node-info keyword is required.

### Command Modes:

User-execute and privileged-execute modes.

### Privilege Level:

HP Fabric read-only user.

### Usage Guidelines:

Each system channel adapter runs its own subnet-management agent.

The fields in the show ib-agent channel-adapter output are described in the table below.

**Table B-21** show ib-agent channel-adapter Command Field Descriptions

| Field          | Description                                                                                                                                                         |
|----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| guid           | Globally unique identifier of the node. The value is an 8-byte string.                                                                                              |
| type           | Type of device this SMA supports. The value is always adapter.                                                                                                      |
| lid            | LID of the channel-adapter.                                                                                                                                         |
| base-version   | Supported base-management datagram version supported.                                                                                                               |
| class-version  | Supported subnet-management class.                                                                                                                                  |
| port-guid      | Globally unique identifier of the node port.                                                                                                                        |
| partition-cap  | Number of entries in the partition table for channelAdapter, router, and switch management ports. This is, at a minimum, set to 1 for all nodes including switches. |
| device-id      | Device ID information, as assigned by the device manufacturer.                                                                                                      |
| revision       | Device revision, as assigned by the device manufacturer.                                                                                                            |
| local-port-num | Number of the link port which received this request, otherwise the value is 0.                                                                                      |
| vendor-id      | Device vendor, per the IEEE standard.                                                                                                                               |
| trap-buffer    | Special purpose string buffer for HP Fabric trap data.                                                                                                              |

**Table B-21 show ib-agent channel-adapter Command Field Descriptions (Continued)**

| Field     | Description                                              |
|-----------|----------------------------------------------------------|
| num-ports | Number of physical ports on this node.                   |
| string    | Node description string. Unicode characters are 16 bits. |

**Examples:**

```
HP-IB# show ib-agent channel-adapter 00:05:ad:00:00:00:13:17 node-info
```

```
=====
                        SMA Node Information
=====

        guid : 00:05:ad:00:00:00:13:17
        type  : adapter
          lid : 14
    base-version : 1
    class-version : 1
      port-guid : 00:05:ad:00:00:00:13:18
    partition-cap : 64
      device-id : 5a:44
        revision : 00:00:00:a0
local-port-num : 1
  vendor-id    : 00:05:ad
    trap-buffer :
      num-ports : 2
        string  : slot 7: /dev/ts_ua0
          guid   : 00:05:ad:00:00:00:13:17
            type : adapter
              lid : 0
        base-version : 1
      class-version : 1
        port-guid : 00:05:ad:00:00:00:13:18
      partition-cap : 64
        device-id : 5a:44
          revision : 00:00:00:a0
local-port-num : 1
  vendor-id    : 00:05:ad
    trap-buffer :
```

**Show Commands**

```
num-ports : 2
string : slot 7: /dev/ts_ua0
```

**Defaults:**

This command has no defaults.

**Related Commands:**

“ib-agent channel-adapter” on page 238

“ib-agent switch” on page 240

## show ib-agent summary

### Synopsis:

The show ib-agent summary command displays subnet-management agent information in a summary form.

### Syntax:

```
show ib-agent summary
```

### Command Modes:

User-execute and privileged-execute modes.

### Privilege Level:

HP Fabric read-only user.

### Usage Guidelines:

Subnet-management agent information may be displayed in a summary form.

The fields in the show ib-agent summary output are described in the table below.

**Table B-22 show ib-agent summary Command Field Descriptions**

| Field  | Description                                                                                                  |
|--------|--------------------------------------------------------------------------------------------------------------|
| slot   | System chassis slot in which the device resides.                                                             |
| type   | Type of node being managed. The value is adapter, switch, router, or error. error indicates an unknown type. |
| state  | Logical state of the port. The value is down or active.                                                      |
| port   | SMA-node port-number.                                                                                        |
| guid   | Globally unique identifier of the SMA node.                                                                  |
| string | Node description string. The string identifies the system chassis slot and OS device used by the agent.      |
| lid    | Decimal-base LID of this port.                                                                               |

### Examples:

The following example displays a summary of all the SMA nodes.

```
HP-IB> show ib-agent summary
=====
                        SMA Node Information Summary
=====
slot  type      state  port  guid                                string                                lid
-----
1     switch    active  0     00:0d:9d:ff:ff:fe:0a:1c  slot 1: /dev/hp_ua0  1
1     switch    active  0     00:0d:9d:ff:ff:fe:0a:1e  slot 1: /dev/hp_ua1  2
1     switch    active  0     00:0d:9d:ff:ff:fe:0a:20  slot 1: /dev/hp_ua2  3
```

### Defaults:

This command has no defaults.

**Related Commands:**

“ib sm subnet-prefix” on page 235

“show ib sm configuration” on page 149

“show ib sm multicast” on page 152

“show ib sm neighbor” on page 154

“show ib sm partition” on page 160

“show ib sm port” on page 162

## show ib-agent switch

### Synopsis:

The show ib-agent switch command displays subnet-management agent information.

### Syntax:

```
show ib-agent switch [switch guid] all | linear-frd-info lid | mcast-info lid |
node-info
| pkey-info | port-info | sl-vl-map | switch-info]
```

### Command Modes:

User-execute and privileged-execute modes.

### Privilege Level:

HP Fabric read-only user.

### Usage Guidelines:

Subnet-management agent information may be displayed in a summary form.

The fields in the show ib-agent summary output are described in the table below.

**Table B-23 show ib-agent switch Command Field Descriptions**

| Field | Description                                 |
|-------|---------------------------------------------|
| guid  | Globally unique identifier of the SMA node. |
| lid   | Decimal-base LID of this port.              |

### Examples:

The following example displays a summary of all the SMA nodes.

```
HP-IB# show ib-agent switch all linear-frd-info lid 0
```

```
=====
                        Linear Forwarding Information
=====
switch-guid : 00:05:ad:00:00:00:02:40
lid      0      1      2      3      4      5      6      7
---      -
0        0

switch-guid : 00:05:ad:00:00:00:02:42
lid      0      1      2      3      4      5      6      7
---      -
```

Show Commands

```
0      0
```

```
switch-guid : 00:05:ad:00:00:00:02:44
```

```
lid      0      1      2      3      4      5      6      7
```

```
-----
```

```
0      0
```

```
switch-guid : 00:05:ad:00:00:00:02:46
```

```
lid      0      1      2      3      4      5      6      7
```

```
-----
```

```
0      0
```

**Defaults:**

This command has no defaults.

**Related Commands:**

“ib sm subnet-prefix” on page 235

“show ib sm configuration” on page 149

“show ib-agent switch linear-frd-info” on page 181

“show ib sm neighbor” on page 154

“show ib sm partition” on page 160

“show ib sm port” on page 162

## show ib-agent switch linear-frd-info

### Synopsis:

The show ib-agent switch linear-frd-info command displays the linear forwarding tables of specific switches.

### Syntax:

```
show ib-agent switch {all | sw_guid} linear-frd-info lid {lid | all }
```

**Table B-24 show ib-agent switch linear-frd-info Command Syntax Descriptions**

| Syntax  | Description                                                                                                                                                                                           |
|---------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| sw_guid | 64-bit GUID of the switch. Specify the GUID of a specific HP Fabric Clustering System switch, sw_guid, to display the attributes of a single switch.                                                  |
| all     | Enter the all keyword to display the attributes of all the switches on the fabric.                                                                                                                    |
| lid     | Logical ID of the target device. Enter a LID, a range of LIDs, or the keyword "all".<br><br>Note: A range is a hyphen-separated pair of LIDs. Valid LIDs are integers between 0 and 48384, inclusive. |

### Command Modes:

User-execute and privileged-execute modes.

### Privilege Level:

HP Fabric read-only user.

### Usage Guidelines:

The information returned is the switch GUID, LID, and forwarding routes. You can use this information to set the linear-forwarding attributes of a switch for Unicast LIDs.

The fields in the show ib-agent switch output are described in the table below.

**Table B-25 show ib-agent switch linear-frd-info Command Field Descriptions**

| field       | description                               |
|-------------|-------------------------------------------|
| switch-guid | 64-bit GUID of the switch.                |
| lid         | Logical ID of the target device           |
| 0-7         | Number of storage devices using this LID. |

### Examples:

```
HP-IB# show ib-agent switch 00:05:ad:00:00:00:13:7f linear-frd-info lid 2
```

```
=====
```

```
Linear Forwarding Information
```

**Show Commands**

```
=====
switch-guid : 00:05:ad:00:00:00:13:7f
lid         0         1         2         3         4         5         6         7
-----
0           0
HP-IB#
```

**Defaults:**

This command has no defaults.

**Related Commands:**

“ib sm subnet-prefix” on page 235

“show ib sm configuration” on page 149

“show ib-agent switch” on page 179

## show ib-agent switch all mcast-info lid

### Synopsis:

The show ib-agent switch all mcast-info lid command displays the multicast forwarding tables of the specified switches.

### Syntax:

```
show ib-agent switch [all][sw_guid] mcast-info lid lid
```

**Table B-26 show ib-agent switch all mcast-info lid Command Syntax Descriptions**

| Syntax  | Description                                                                                                                                                           |
|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| sw_guid | The GUID of a specific HP Fabric Clustering System switch.                                                                                                            |
| all     | Enter either a range of LIDs, or the keyword “all”.                                                                                                                   |
| lid     | Enter either a range of LIDs, or the keyword “all”. A range is a hyphen-separated pair of LIDs. Valid LIDs are decimal-base integers between 12 and 65535, inclusive. |

### Command Modes:

User-execute and privileged-execute modes.

### Privilege Level:

HP Fabric read-only user.

### Usage Guidelines:

The information displayed is the switch GUID, LID, and forwarding routes.

### Examples:

```
HP-IB# show ib-agent switch 00:05:ad:00:00:00:13:7f mcast-info lid all
```

```
=====
```

```
Multicast Information
```

```
=====
```

```
node-guid : 00:05:ad:00:00:00:13:7f
```

```
block-index : 0
```

```
lid      port-mask
```

```
49152   00:00
```

```
49153   00:00
```

```
49154   00:00
```

```
49155   00:00
```

```
49156   00:00
```

```
49157   00:00
```

```
49158   00:00
```

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```
49159 00:00
49160 00:00
49161 00:00
49162 00:00
49163 00:00
49164 00:00
```

...

**Defaults:**

This command has no defaults.

**Related Commands:**

“ib sm subnet-prefix” on page 235

“show ib sm configuration” on page 149

“show ib-agent switch” on page 179

## show ib-agent switch all node-info

### Synopsis:

The show ib-agent switch node-info command lists the switch nodes, their type, GUIDs, and capabilities.

### Syntax:

```
sw_guid switch node-info
```

### Command Modes:

User-execute and privileged-execute modes.

### Privilege Level:

HP Fabric read-only user.

### Usage Guidelines:

Internally, each node connection is implemented by 6 switch chips. Each switch chip runs its own subnet management agent. Externally, they are viewed by a subnet manager as interconnected switches and, therefore, each is listed by the node-info command.

The fields in the show ib-agent switch node-info output are described in the table below.

**Table B-27 show ib-agent switch all node-info Command Field Descriptions**

| Field          | Description                                                                                                                                                         |
|----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| guid           | Globally unique identifier of the node. The value is an 8-byte string.                                                                                              |
| type           | Type of device this SMA supports. The value is always adapter.                                                                                                      |
| lid            | LID of the channel-adapter.                                                                                                                                         |
| base-version   | Supported base-management datagram version supported.                                                                                                               |
| class-version  | Supported subnet-management class.                                                                                                                                  |
| port-guid      | Globally unique identifier of the node port.                                                                                                                        |
| partition-cap  | Number of entries in the partition table for channelAdapter, router, and switch management ports. This is, at a minimum, set to 1 for all nodes including switches. |
| device-id      | Device ID information, as assigned by the device manufacturer.                                                                                                      |
| revision       | Device revision, as assigned by the device manufacturer.                                                                                                            |
| local-port-num | Number of the link port which received this request, otherwise the value is 0.                                                                                      |
| vendor-id      | Device vendor, per the IEEE standard.                                                                                                                               |
| trap-buffer    | Special purpose string buffer for HP Fabric Clustering System trap data.                                                                                            |
| num-ports      | Number of physical ports on this node.                                                                                                                              |
| string         | Node description string. Unicode characters are 16 bits.                                                                                                            |

### Examples:

```
HP-IB# show ib-agent switch all node-info
```

```
=====
```

Show Commands

SMA Node Information

```
=====
      guid : 00:05:ad:00:00:00:13:7f
      type : switch
      lid : 2
      base-version : 1
      class-version : 1
      port-guid : 00:05:ad:00:00:00:13:7f
      partition-cap : 1
      device-id : a8:7c
      revision : 00:00:00:a0
      local-port-num : 255
      vendor-id : 00:05:ad
      trap-buffer :
      num-ports : 9
      string : slot 16: /dev/ts_ua0
```

...

**Defaults:**

This command has no defaults.

**Related Commands:**

“ib sm subnet-prefix” on page 235

“show ib sm configuration” on page 149

“show ib-agent switch” on page 179

## show ib-agent switch all pkey-info

### Synopsis:

The show ib-agent switch all pkey-info command displays the index of the partition key table.

### Syntax:

```
show ib-agent all pkey-info|
```

### Command Modes:

User-execute and privileged-execute modes.

### Privilege Level:

HP Fabric read-only user.

### Usage Guidelines:

A 16-bit partition key value is carried in packets and stored in the Channel Adapters. The value is used to determine membership in a partition. This keyword also identifies the node GUID and HP Fabric Clustering System port of that node.

### Examples

```
HP-IB# show ib-agent switch all pkey-info
```

```
=====
                                PKey Information
=====
```

```
HP-IB#
```

### Defaults:

This command has no defaults.

### Related Commands:

“ib sm subnet-prefix” on page 235

“show ib sm configuration” on page 149

“show ib-agent switch” on page 179

Show Commands

**show ib-agent switch port-info**

**Synopsis:**

The show ib-agent switch port-info command lists all the port attributes of HP Fabric Clustering System Switches, such as their capabilities, MTUs, states, speeds, link widths, and limits.

**Syntax:**

show ib-agent switch [card/port | all] port-info

**Command Modes:**

User-execute and privileged-execute modes.

**Privilege Level:**

HP Fabric read-only user.

**Usage Guidelines**

None.

**Examples:**

HP-IB# show ib-agent switch 00:05:ad:00:00:00:13:7f port-info

```

=====
                                Port Information
=====
node-guid : 00:05:ad:00:00:00:13:7f
  port : 0
  mkey : 00:00:00:00:00:00:00:00
gid-prefix : 00:00:00:00:00:00:00:00
  lid : 2
master-SML-id : 1
capability-mask : 00:00:02:08
  diag-code : 00:00
mkey-lease-period : 00:00
  local-port-num : 255
link-width-enabled : 1x, 4x
link-width-supported : 1x, 4x
  link-width-active : 1x
link-speed-supported : 2.5 Gbps
  state : active
  port-phys : nop
  link-down-def : polling
    
```

```
mkey-protect-bits : 0
    LMC : 0
    ls-active : 2.5 Gbps
ls-active-enabled : 2.5 Gbps
    neighbor-MTU : 256
    master-SMSL : 0
    VL-cap : VL0 - VL7
    VL-high-limit : 0
VL-arbitration-high-cap : 8
    VL-arbitration-low-cap : 8
    MTU-cap : 1024
    VL-stall-count : 0
    HOQ-life : 7
    op-VLs : VL0 - VL7
    pkey-enf-in : 0
    pkey-enf-out : 0
    filter-raw-pkt-in : 0
filter-raw-pkt-out : 0
    mkey-violations : 0
    pkey-violations : 0
    qkey-violations : 0
    guid-cap : 1
    subnet-timeout : 31
    resp-time-value : 8
    local-phys-err : 4
    overrun-err : 0
```

**Defaults:**

This command has no defaults.

**Related Commands:**

“ib sm subnet-prefix” on page 235

“show ib sm configuration” on page 149

“show ib-agent switch” on page 179

## show ib-agent switch sl-vl-map

### Synopsis:

The show ib-agent switch sl-vl-map keyword shows the service level (SL) to virtual lane (VL) mapping table for the nodes on switch devices.

### Syntax:

```
show ib-agent switch [card/port | all] sl-vl-map
```

### Command Modes:

User-execute and privileged-execute modes.

### Privilege Level:

HP Fabric read-only user.

### Usage Guidelines:

**Table B-28** show sm ib-agent switch Output Descriptions

| Output             | Description                                                     |
|--------------------|-----------------------------------------------------------------|
| node-guid          | 64-bit GUID of this node.                                       |
| in-ib-port         | Ingress port number. The value is an integer between 0 and 255. |
| out-ib-port        | Egress port number. The value is an integer between 0 and 255.  |
| SL0 to VL mapping. |                                                                 |

### Examples:

```
HP-IB# show ib-agent switch 00:05:ad:00:00:00:13:7f sl-vl-map
```

```
=====
```

```
SLVL-Map Table
```

```
=====
```

```
node-guid : 00:05:ad:00:00:00:13:7f
in-ib-port : 0
out-ib-port : 0
s10toV1 : 0
s11toV1 : 0
s12toV1 : 0
s13toV1 : 0
s14toV1 : 0
s15toV1 : 0
```

```
s16toV1 : 0  
s17toV1 : 0  
s18toV1 : 0  
s19toV1 : 0  
s110toV1 : 0  
s111toV1 : 0  
s112toV1 : 0  
s113toV1 : 0  
s114toV1 : 0  
s115toV1 : 0
```

...

**Defaults:**

This command has no defaults.

**Related Commands:**

“ib sm subnet-prefix” on page 235

“show ib sm configuration” on page 149

“show ib-agent switch” on page 179

## show ib-agent switch switch-info

### Synopsis:

The show ib-agent switch switch-info keyword shows the service level (SL) to virtual lane (VL) mapping table for the nodes on switch devices.

### Syntax:

```
show ib-agent switch [card/port | all] switch-info
```

### Command Modes:

User-execute and privileged-execute modes.

### Privilege Level:

HP Fabric read-only user.

### Usage Guidelines:

**Table B-29** show ib-agent switch all Output Descriptions

| Output             | Description                                                     |
|--------------------|-----------------------------------------------------------------|
| node-guid          | 64-bit GUID of this node.                                       |
| in-ib-port         | Ingress port number. The value is an integer between 0 and 255. |
| out-ib-port        | Egress port number. The value is an integer between 0 and 255.  |
| SL0 to VL mapping. |                                                                 |

### Examples:

```
HP-IB# show ib-agent switch all switch-info
```

```
=====
                               SMA Switch Information
=====

      guid : 00:05:ad:00:00:00:02:40
      lft-cap : 49152
      rft-cap : 0
      mft-cap : 1024
      lft-top : 1024
      default-port : 255
      def-mcast-pri-port : 255
      def-mcast-NP-port : 255
```

```
    life-time-value : 11
port-state-change : 0
    lids-per-port : 0
partition-enf-cap : 64
    inbound-enf-cap : 1
    outbound-enf-cap : 1
filter-raw-pkt-in-cap : 1
filter-raw-pkt-out-cap : 1

        guid : 00:05:ad:00:00:00:02:42
    lft-cap : 49152
    rft-cap : 0
    mft-cap : 1024
    lft-top : 1024
    default-port : 255
def-mcast-pri-port : 255
    def-mcast-NP-port : 255
    life-time-value : 11
port-state-change : 0
    lids-per-port : 0
partition-enf-cap : 64
```

**Defaults:**

This command has no defaults.

**Related Commands:**

“ib sm subnet-prefix” on page 235

“show ib sm configuration” on page 149

“show ib-agent switch” on page 179

**Show Commands****show interface ib****Synopsis:**

The show interface ib command displays the IP parameters and statistics for ports on Fabric interface cards.

**Syntax:**

```
show interface ib card
/
port
| all [
sma args
] [statistics]
```

The syntax is described in the table below:

**Table B-30 show interface ib Command Syntax Descriptions**

| Syntax     | Description                                                                                                                                                                                                |
|------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| card/port  | Refers to an individual card#/port# pair, a range of cards/ports, a list of cards/ports, or the keyword all.                                                                                               |
| all        | Use instead of entering individual card#/port# pair, or a range of cards/ports                                                                                                                             |
| sma args   | The sma sub-command displays the attributes and table data for subnet management agents that access Fabric ports. For an explanation of the sma sub-command, see “show interface ib sma” on page 102.      |
| statistics | The statistics keyword displays network statistics for the Fabric port on the interface card. The information displayed is octets, unicast and multicast packets, discarded packets, protocol errors, etc. |

**Command Modes:**

User-execute and privileged-execute modes.

**Privilege Level:**

HP Fabric read-only user.

**Usage Guidelines:**

Without the optional sma sub-command or statistics keyword, the show interface ib command displays general information about the Fabric interface port, such as its administrative status, its operational speed and status, and duplex mode.

The output fields of the show interface ib command are described in the table below.

**Table B-31 show interface ib Output Descriptions**

| Field | Description                                                                                                                                |
|-------|--------------------------------------------------------------------------------------------------------------------------------------------|
| port  | Identifies the Fabric interface card and port. The format is card#/port#.                                                                  |
| name  | User assigned name. If no name is assigned, the port name is displayed instead. This field is set by the config interface ib name command. |

**Table B-31 show interface ib Output Descriptions (Continued)**

| Field        | Description                                                                                                                                                                                                                                                                                                |
|--------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| type         | Identifies the type of the Fabric card. Supported cards are ib1xTX, ib1xFX, ib4xTX, and ib4xFX. This field is set by the config card type command.                                                                                                                                                         |
| desc         | Text description of the Fabric port. The default is the port identifier in the form slot#/card#.                                                                                                                                                                                                           |
| last-change  | Time at which the Fabric port configuration was last changed.                                                                                                                                                                                                                                              |
| mtu          | Maximum Transmission Unit for the Fabric port. Used to configure the MTU size of IP network traffic.                                                                                                                                                                                                       |
| admin-status | Indicates if you have enabled the port for configuration and use. The value of this field may be up or down. The default is down. The field is set by the config interface ib shutdown command.                                                                                                            |
| oper-status  | Indicates if the port is physically ready for configuration and use. The value of this field may be up or down. If this field is down but the admin-status is up, check that the Fabric interface card is securely seated in the slot and a cable is attached between the port and the target Fabric host. |
| link-trap    | Indicates if connection link errors are to be captured and sent to trap recipients. The value may be either enabled or disabled. This field is set by the config interface ib link-trap command.                                                                                                           |

The administrative (admin) status, speed, and connection-type reflect the values you had assigned. The operational (oper) status, speed, and connection-type reflect the values derived from the physical hardware and its connections. This allows you to verify your configuration settings against the actual hardware. The admin/oper pairs do not have to match for you to use the card. However, if there is a mismatch, the oper value is used.

**Examples:**

The following example shows the output of the show interface ib command without the sma sub-command or statistics keyword.

```
HP-IB# show interface ib 15/1
=====
                        InfiniBand Interface Info
=====
      port : 15/1
      name : 15/1
      type : ib4xTX
      desc : 15/1 (961)
last-change : none
      mtu : 4096
admin-status : up
oper-status  : down
oper-speed   : unknown
oper-duplex  : unknown
link-trap    : enabled

HP-IB#
```

The following example shows the output of the show interface ib command with the statistics keyword.

Show Commands

```
HP-IB# show interface gate 4 statistics
```

```
=====
                        InfiniBand Interface Statistics
=====

        gateway : 4
            name : 4/0 (256)
        in-octets : 0
        in-ucast-pkts : 0
    in-multicast-pkts : 0
in-broadcast-pkts : 0
        in-NUcast-pkts : 0
            in-discards : 0
                in-errors : 0
in-unknown-protos : 0
            out-octets : 0
                out-ucast-pkts : 0
                    out-NUcast-pkts : 0
out-multicast-pkts : 0
out-broadcast-pkts : 0
            out-discards : 0
                out-errors : 0
                    out-QLen : 0
```

```
HP-IB#
```

**Defaults:**

This command has no defaults.

**Related Commands:**

“interface ib” on page 241

“ib-agent switch” on page 240

## show interface ib sm

### Synopsis:

The show interface ib sm command displays the attributes and table data for subnet management agents that access Fabric ports.

### Syntax:

```
show interface ib sm sma node-info
show interface ib sm sma node-info
```

The syntax is described in the table below:

**Table B-32 show interface sma ib Command Syntax Descriptions**

| Syntax    | Description                                                                                                                                                                                                                                                                                                                               |
|-----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| node-info | Lists each node used by the subnet management agents, its type, GUID, and capabilities. Internally, each node connection is implemented by 6 switch chips. Each switch chip runs its own subnet management agent. Externally, they are viewed by a subnet manager as interconnected switches and, therefore, each is listed by node-info. |
| port-info | Lists all the port attributes of the HP Fabric Clustering System Switches, such as their capabilities, MTUs, states, and MKeys. This keyword may take an optional argument, which is detail. Add detail to the end of the command string to display all available port information.                                                       |

### Command Modes:

User-execute and privileged-execute modes.

### Privilege Level:

HP Fabric read-only user.

### Usage Guidelines:

None.

### Examples:

The following example displays the SMA node information for Fabric port 1.

```
HP-IB# show interface ib 1/1 sma node-info
=====
                        SMA Node Information
=====
                        guid : 00:05:ad:00:00:00:10:a2
                        type  : switch
                        lid   : 1
                        base-version : 1
                        class-version : 1
```

Show Commands

```

    port-guid : 00:05:ad:00:00:00:10:a2
partition-cap : 1
    device-id : a8:7c
    revision  : 00:00:00:a0
local-port-num : 255
    vendor-id : 00:05:ad
trap-buffer :
    num-ports : 9
    string    : slot 1: /dev/ts_ua0

```

HP-IB#

The following example displays general SMA port information for Fabric port 1.

HP-IB# show interface ib 16/1 sma port-info

```

=====
                        SMA Port Information
=====
node-guid          port state mkey          gidprefix      1
id  capability  neighbor-MTU
-----
00:05:ad:00:00:00:13:7f 8      active 00:00:00:00:00:00:00:00 fe:80:00:00:00:00:0
0:00 14      00:00:00:00  2048

```

HP-IB#

The following example displays general SMA port information for Fabric port 1

HP-IB# show interface ib 16/1 sma port-info detail

```

=====
                        SMA Port Information
=====
node-guid : 00:05:ad:00:00:00:13:7f
port      : 8
mkey     : 00:00:00:00:00:00:00:00
gid-prefix : fe:80:00:00:00:00:00:00
lid      : 14
master-sm-lid : 0
capability-mask : 00:00:00:00
diag-code  : 00:00
mkey-lease-period : 00:00
local-port-num : 255

```

```
link-width-enabled : 1x, 4x
link-width-supported : 1x, 4x
  link-width-active : 4x
link-speed-supported : 2.5 Gbps
  state : active
  port-phys : linkup
  link-down-def : polling
mkey-protect-bits : 0
  lmc : 0
  ls-active : 2.5 Gbps
ls-active-enabled : 2.5 Gbps
  neighbor-mtu : 2048
  master-sm-sl : 0
  vl-cap : VL0 - VL7
  vl-high-limit : 0
vl-arbitration-high-cap : 8
  vl-arbitration-low-cap : 8
  mtu-cap : 2048
  vl-stall-count : 0
  hoq-life : 7
  op-vls : VL0 - VL7
  pkey-enf-in : 0
  pkey-enf-out : 0
  filter-raw-pkt-in : 0
  filter-raw-pkt-out : 0
  mkey-violations : 0
  pkey-violations : 0
...output truncated
```

HP-IB#

**Defaults:**

This command has no defaults.

**Related Commands:**

“show interface ib” on page 194

“show interface ib sm” on page 197

## show interface ib sm statistics

### Synopsis:

The show interface ib sm statistics command displays the HP Fabric Clustering System interface statistics.

### Syntax:

```
show interface ib sm
statistics
```

### Command Modes:

User-execute and privileged-execute modes.

### Privilege Level:

HP Fabric read-only user.

### Usage Guidelines:

None.

### Examples:

The following example displays the SMA node information for Fabric port 1.

```
HP-IB> show interface ib 1/1 statistics
```

```
=====
                          InfiniBand Interface Statistics
=====

      port : 1/1
      name : 1/1 (65)
      in-octets : 11388
      in-ucast-pkts : 39
      in-multicast-pkts : 0
      in-broadcast-pkts : 0
      in-discards : 0
      in-errors : 0
      in-unknown-protos : 0
      out-octets : 11388
      out-ucast-pkts : 39
      out-multicast-pkts : 0
```

```
out-broadcast-pkts : 0
  out-discards : 0
    out-errors : 0
```

HP-IB>

**Defaults:**

This command has no defaults.

**Related Commands:**

“show interface ib” on page 194

“show interface ib sm” on page 197

**Show Commands****show interface mgmt-ethernet****Synopsis:**

The show interface mgmt-ethernet command shows the configuration of the Ethernet Management port on the system controller.

**Syntax:**

```
show interface mgmt-ethernet
```

This command takes no card or port designation.

**Command Modes:**

User-execute and privileged-execute modes.

**Privilege Level:**

General read-only user.

**Usage Guidelines:**

The Ethernet Management port is an Out-of-Band Management (OBM) port that provides network access to the system chassis in order to run remote CLI and Element Manager sessions. The port must be configured before it can be used (Element Manager GUI is not supported in initial release of HP Fabric Clustering System).

This command displays the administrative status of the interface port, its assigned IP address and subnet mask, plus the IP address of the gateway port used to connect to the Ethernet Management port. If the Ethernet host is directly connected to the Ethernet Management port, without having to go through Ethernet switches, the default gateway-addr value is 0.0.0.0 (some gateway functions are not supported by HP Fabric Clustering System).

**Examples:**

```
HP-IB# show interface mgmt-ethernet
```

```
=====
                        Mgmt-Ethernet Information
=====
      mac-address : 00:05:ad:00:11:75
auto-negotiate  : enabled
      admin-status : up
      ip-addr     : 10.3.102.24
                mask : 255.255.0.0
      gateway-addr : 10.3.0.1
```

```
HP-IB#
```

**Defaults:**

This command has no defaults.

**Related Commands:**

“interface mgmt-ethernet” on page 268

## show interface mgmt-ib

### Synopsis:

The show interface mgmt-ib command displays the status and address information for the virtual Management-Fabric port.

### Syntax:

```
show interface mgmt-ib
```

This command takes no card or port designation.

### Command Modes:

User-execute and privileged-execute modes.

### Privilege Level:

General read-only user.

### Usage Guidelines:

Refer to the “Switch Setup” on page 35 for information regarding Inteface Management IB port.

### Examples:

```
HP-IB# show interface mgmt-ib
```

```
=====
                               Mgmt-InfiniBand Information
=====
      descr : Inband Management Port
  admin-status : up
      ip-addr : 192.168.2.200
      mask : 255.255.255.0
  gateway-addr : 0.0.0.0
```

```
HP-IB#
```

### Defaults:

This command has no defaults.

### Related Commands:

“interface mgmt-ib” on page 269

## show interface mgmt-serial

### Synopsis:

The show interface mgmt-serial command displays the configuration of the Serial-Console port on the system controller card.

### Syntax:

```
show interface mgmt-serial
```

This command takes no card or port designation.

### Command Modes:

User-execute and privileged-execute modes.

### Privilege Level:

General read-only user.

### Usage Guidelines:

The Serial-Console port is the initial connection point with the system chassis and is used to configure the Ethernet Management and Management-InfiniBand ports. This port must be configured and a management station attached before any interaction with the system chassis is possible.

The CLI always defaults to port 1 on the active controller card.

### Examples:

```
HP-IB# show interface mgmt-serial
```

```
=====
                        Mgmt-Serial Information
=====
      baud-rate : 9600
      data-bits  : 8
      stop-bits  : 1
      parity     : off
```

```
HP-IB#
```

### Defaults:

This command has no defaults.

### Related Commands:

“show interface mgmt-ethernet” on page 202

“show interface mgmt-ib” on page 204

## show ip

### Synopsis:

The show ip command is used to display global IP configuration data.

### Syntax:

```
show ip address-table  
show ip ip-over-ib-mtu  
show ip route
```

The syntax is described in the table below:

**Table B-33** show ip Command Syntax Descriptions

| Syntax         | Description                                                                                                                                                                                                                                                           |
|----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| address-table  | This keyword displays the address information of Ethernet interface ports, Ethernet interface cards, and Fabric interface cards. It lists the IP addresses, netmasks, broadcast formats, reassembly sizes, and whether or not the IP address is a primary or backup.  |
| ip-over-ib-mtu | This keyword displays the maximum size of the packet payload of IP-over-IB traffic along a path from the source to its destination on the subnet. The maximum transmission unit is described in terms of payload size.                                                |
| route          | This keyword displays the Classless Inter-Domain Routing (CIDR) forwarding records or routes (both static and dynamic) of all IP routes to system ports. Included in this information are the route destination, route type, route protocol, next hop, and port used. |

### Command Modes:

User-execute and privileged-execute modes.

### Privilege Level:

Ethernet read-only user (address-table).

HP Fabric and Ethernet read-only user (ip-over-ib-mtu).

Ethernet read-only user (route).

### Usage Guidelines:

Refer to the Ethernet chapter for all ip-related commands.

### Examples:

The example below shows the output of the show ip ip-over-ib-mtu command.

```
HP-IB# show ip ip-over-ib-mtu
```

```
=====
                               IP-OVER-IB-MTU Information
=====
ip-over-ib-mtu : 2048
```

HP-IB#

**Defaults:**

This command has no defaults.

**Related Commands:**

“ip ip-over-ib-mtu” on page 230

“ip route” on page 233

**Show Commands**

**show location**

**Synopsis:**

The show location command displays the location field that is returned by the show version command.

**Syntax:**

```
show location
```

**Command Modes:**

User-execute and privileged-execute modes.

**Privilege Level:**

General read-only user.

**Usage Guidelines:**

The show location command displays some contact information to the user, however, it may be configured to display any desired text string.

**Examples:**

```
HP-IB> show location  
3000 Hanover Street, Palo Alto, CA 94304  
HP-IB>
```

**Defaults:**

This command has no defaults.

**Related Commands:**

“location” on page 271

“snmp-server” on page 281

“show version” on page 224

## show logging

### Synopsis:

The `show logging` command displays the active system log file in which are recorded the warnings, errors, notifications, alerts, etc. that occur once the system is successfully booted.

### Syntax:

```
show logging [end]
```

The syntax is described in the table below:

**Table B-34 show logging Command Syntax Description**

| Syntax | Description                                                                                                           |
|--------|-----------------------------------------------------------------------------------------------------------------------|
|        | show logging without the end argument displays the entire active log-file.                                            |
| end    | Displays approximately the last 10 entries in the system log and then continues to display log entries as they occur. |

### Command Modes:

User-execute and privileged-execute modes.

### Privilege Level:

General read-only user.

### Usage Guidelines:

You may want to set the number of lines displayed per screen using the terminal length command. You can also use the `more` command on `ts_log` instead of the `show logging` command.

The `show logging end` command is the equivalent of using the UNIX `tail -f` command. The CLI continues to display log entries as they occur until you enter `<Ctrl>-c`. No other CLI commands may be entered until `<Ctrl>-c` is used to stop the log display.

It is recommended you set the terminal page length to 0 when using the end argument. Otherwise, you will have to keep pressing the `<space>` bar to continue each time the maximum display length is reached. Once you set the page length, do not change the terminal window size. Changing window size restores the terminal length to that of the window and restarts paging.

### Examples:

```
HP-IB# show logging end
```

```
Jan  3 11:09:58 igr-cc ib_sm.x[597]: [INFO]: Successfully add pgid
fe800000000000000000000000000005ad0000001199 to mgid ff18a01b000000000000000005ad00000002
Jan  3 17:02:56 igr-cc port_mgr.x[535]: [INFO]: port down - port=16/7, type=ib4xFX
Jan  3 17:02:58 igr-cc port_mgr.x[535]: [INFO]: port up - port=16/7, type=ib4xFX
Jan  3 18:21:46 igr-cc port_mgr.x[535]: [INFO]: port down - port=16/2, type=ib4xFX
Jan  3 18:21:48 igr-cc port_mgr.x[535]: [INFO]: port up - port=16/2, type=ib4xFX
```

**Show Commands**

```
Jan 3 19:35:55 iqr-cc chassis_mgr.x[523]: [CONF]: [super]: config snmp trap-receiver  
10.10.253.47
```

```
Jan 3 19:35:55 iqr-cc chassis_mgr.x[523]: [CONF]: [super]: config snmp trap-receiver  
10.10.253.47 version v2c
```

```
Jan 3 19:35:55 iqr-cc chassis_mgr.x[523]: [CONF]: [super]: config snmp trap-receiver  
10.10.253.47 community public
```

```
Jan 3 19:35:55 iqr-cc chassis_mgr.x[523]: [CONF]: [super]: config snmp trap-receiver  
10.10.253.47 community public
```

**Defaults:**

This command has no defaults.

**Related Commands:**

“copy” on page 252

“telnet” on page 282

“terminal time-out” on page 283

“show config” on page 143

“logging” on page 273

## show ntp

### Synopsis:

The show ntp command displays the current system date and time, as well as the Network Time Protocol (NTP) servers used to set the system clock.

### Syntax:

```
show ntp
```

### Command Modes:

User-execute and privileged-execute modes.

### Privilege Level:

General read-only user.

### Usage Guidelines:

Use the clock command to set the time and date. Use the ntp configuration command to set the NTP servers that are to maintain the system clock.

### Examples:

```
HP-IB> show ntp
```

```
=====
                        NTP Information
=====
                        Date : 04/16/03
                        Time : 16:02:43
                        Server One : 10.3.120.55
                        Server Two : 10.3.120.56
                        Server Three : 10.3.120.57
```

```
HP-IB>
```

### Defaults:

This command has no defaults.

### Related Commands:

“ntp” on page 275

“clock” on page 250

## show power-supply

### Synopsis:

The show power-supply command displays the status of the system power supplies.

### Syntax:

```
show power-supply
```

### Command Modes:

User-execute and privileged-execute modes.

### Privilege Level:

General read-only user.

### Usage Guidelines:

### Examples:

```
HP-IB> show power-supply
```

```
=====
                                     Power-supply Information
=====
ps      type      oper-status  utilization  voltage
-----
1       AC        up           na           12
2       AC        up           na           12
```

### Defaults:

This command has no defaults.

### Related Commands:

“show backplane” on page 132

“show fan” on page 145

“show sensor” on page 215

## show running-status

### Synopsis:

The show running-status command executes most of the other show commands at one time for a specified interface or all the interfaces.

### Syntax:

```
show running-status ib | all [to-file]
```

The syntax is described in the table below:

```
show running-status Syntax Description
```

**Table B-35 show running-status Keyword Descriptions**

| Keyword | Description                                                                           |
|---------|---------------------------------------------------------------------------------------|
| ib      | Indicates the specific interface for which to execute the show command.               |
| all     | Executes the show command for all interfaces.                                         |
| to-file | Directs the output to a default file. What is the default? Can it be set by the user? |

### Command Modes:

User-execute and privileged-execute modes.

### Privilege Level:

General read-only user.

### Usage Guidelines:

This command can generate a large amount of data. Data is displayed per terminal length command settings. When executed, this command first prompts you to verify your desire to generate the data. Enter y to continue or n to cancel.

The default output file is syslog:igr\_interface\_runningstatus, where interface may be ib or all. If the file already exists, it will be overwritten. This text file may be uploaded to another system using the copy command or viewed using the more command.

### Examples:

```
HP-IB> show running-status ib
Are you sure you want to continue? [yes(default) | no]
Gathering system-wide information, please wait.....
HP-IB> show arp ethernet
```

```
=====
                        ARP Information
=====
```

Show Commands

```
port    physical-address    net-address    type
```

```
-----  
HP-IB> show arp ib
```

```
=====  
                        ARP Information  
=====
```

```
port physical-address                net-address    type
```

```
-----  
HP-IB> show backplane
```

```
=====  
                        Backplane Seeprom  
=====
```

```
base-mac-addr    chassis-id
```

```
-----  
0:0:5:ad:0:0      0x2002
```

```
Press any key to continue (Q to quit)
```

**Defaults:**

This command has no defaults.

**Related Commands:**

See most of the other “show” commands.

## show sensor

### Synopsis:

The show sensor command displays the temperature at several key locations within the system chassis.

### Syntax:

```
show sensor
```

### Command Modes:

User-execute and privileged-execute modes.

### Privilege Level:

General read-only user.

### Usage Guidelines:

The show sensor command identifies the temperature sensors in the system chassis. It also reports their location in the chassis and the current temperature at that location. Chassis temperature should be monitored to verify the cooling efficiency of the blowers and your data center air-conditioning.

Temperatures are in Celsius and vary depending upon their location.

### Examples:

```
HP-IB> show sensor
```

```
=====
                          Sensor Information
=====
sensor   oper-status  temperature (c)
-----
1/1      up           30
```

### Defaults:

This command has no defaults.

### Related Commands:

“show fan” on page 145

“show power-supply” on page 212

Show Commands

**show snmp**

**Synopsis:**

The show snmp command lists the SNMP receivers for switch link-traps, as well as contact and location information.

**Syntax:**

show snmp

**Command Modes:**

User-execute and privileged-execute modes.

**Privilege Level:**

Unrestricted read-write user.

**Usage Guidelines:**

None.

**Examples:**

HP-IB# show snmp

```
=====
                               SNMP Information
=====
                contact : support@hp.com
                location : 3000 Hanover Street, Palo Alto, CA 94304
=====
                               Trap Receivers
=====
ipaddr           version   community
-----
10.3.0.111      v2c         public
HP-IB#
```

**Defaults:**

This command has no defaults.

**Related Commands:**

“location” on page 271

“snmp-server” on page 281

## show system-services

### Synopsis:

The show system-services command shows all system services, such as FTP, and Syslog.

### Syntax:

```
show system-services
```

### Command Modes:

User-execute and privileged-execute modes.

### Privilege Level:

Unrestricted read-write user.

### Usage Guidelines:

None.

### Examples:

```
HP-IB# show system-services
```

```
=====
                        System Services
=====
      ftp service : disabled
telnet service : enabled
      syslog server : 0.0.0.0
=====
                        NTP Information
=====
      date : 09/30/03
      time : 09:57:19
      server-one : 0.0.0.0
      server-two : 0.0.0.0
      server-three : 0.0.0.0
=====
                        Host Information
=====
      name-server-one : 0.0.0.0
      name-server-two : 0.0.0.0
      domain-name :
```

**Show Commands**

**Defaults:**

This command has no defaults.

**Related Commands:**

“radius-server” on page 277

“snmp-server” on page 281

“ntp” on page 275

“hostname” on page 265

“ip name-server-one” on page 231

“ip name-server-two” on page 232

## show terminal

### Synopsis:

The show terminal command shows the terminal parameters and configurations, such as time-outs and maximum allowable command length.

### Syntax:

```
show terminal
```

### Command Modes:

User-execute and privileged-execute modes.

### Privilege Level:

General read-only user.

### Usage Guidelines:

This command is intended primarily for program debug under the direction of Support personnel.

The number of applications and modules may change between releases. The numbers assigned to applications and modules may also change. Check application and module number assignments using CLI help (i.e.,?) for entering command arguments.

### Examples:

```
HP-IB# show terminal
Console is enabled
Connection host address is 10.10.253.128
Length: 25 lines, Width: 80 columns
Timeouts: enabled, Value: 15 minutes
Session limit is set to 3
History is enabled, history size is 30
Maximum command length is 512 characters
Maximum login attempts is 5
```

### Defaults:

This command has no defaults.

### Related Commands:

“telnet” on page 282

“terminal time-out” on page 283

**Show Commands****show trace****Synopsis:**

The show trace command tracks the system program modules called by a system application for a specific interface card.

**Syntax:**

```
show trace {app
appInt
[module
modInt
] [card
cardInt
]}
```

The syntax is described in the table below:

**Table B-36 show trace Command Syntax Descriptions**

| Syntax           | Description                                                                                                                                                                                                                  |
|------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| app appInt       | Specify a system program application.<br>appInt is an integer between 1 and n, where n is an undetermined number that changes between releases. appInt is the number of the internal application to trace.                   |
| module<br>modInt | Indicates a module of the specified application. modInt is an integer between 0 and n, where n is an undetermined number that changes between releases. modInt the number of the program module in the application to trace. |
| card<br>cardInt  | Corresponds to a slot in the chassis. cardInt is an integer between 1 and 2 (for the HP Fabric Clustering System Switch).                                                                                                    |

**Command Modes:**

User-execute and privileged-execute modes.

**Privilege Level:**

General read-only user.

**Usage Guidelines:**

This command is intended primarily for program debug under the direction of Support personnel.

The number of applications and modules may change between releases. The numbers assigned to applications and modules may also change. Check application and module number assignments using CLI help (i.e.,?) for entering command arguments.

**Examples:**

```
HP-IB# show trace app 14 module 20 card 1
IB_CM          20  0x0          0x0
HP-IB#
```

**Defaults:**

This command has no defaults.

**Related Commands:**

“show logging” on page 209

**Show Commands****show user****Synopsis:**

The show user command displays the login information for the current user, a specific user, or all the users in the user database.

**Syntax:**

```
show user [user_name | all]
```

The syntax is described in the table below:

**Table B-37 show user Command Syntax Descriptions**

| Syntax    | Description                                                                                      |
|-----------|--------------------------------------------------------------------------------------------------|
|           | Without any arguments, the show user command displays the user information for the current user. |
| user_name | Specify the name of a specific user.                                                             |
| all       | Shows all users in the user database.                                                            |

**Command Modes:**

User-execute and privileged-execute modes.

**Privilege Level:**

General read-only and unrestricted read-write user.

**Usage Guidelines:**

show user lists the user name, access level, status, and login statistics.

All users may view their own user information, however, only an unrestricted read-write user may view the user information of others.

The output fields for this command are described below.

username: May be any name. The default names are guest, admin, and super.

password: The encrypted user password. The unrestricted read-write user cannot view this password. If the user forgets the password, a new password will have to be assigned.

snmp-community: The SNMP community string necessary for running SNMP commands and the Element Manager (Element Manager GUI is not supported in initial release of HP Fabric Clustering System).

permission-level: Specific controls for accessing interfaces. The permission-levels are one or more of the following: ib-rw, ib-ro, and unrestricted-rw.

admin-status: User account status. May be enabled or disabled.

num-logins: Number of instances of this user currently in use.

num-unsuccessful-logins: Number of times someone has tried unsuccessfully to begin a CLI session with this user name. The count is reset to 0 when the CLI is rebooted.

last-login: Date of the last successful login.

last-unsuccessful-login: Date of last unsuccessful login attempt.

**Examples:**

```
HP-IB> show user admin
```

```
=====
                        User Information
=====
      username : admin
      password  : $1$IJ5..U6.$1Sxb8uqVuUG7kOmiRsxHt1
      snmp-community : private
      permission-level : ib-rw
      admin-status  : enabled
      num-logins    : 1
      num-unsuccessful-logins : 0
      last-login    : Thu Apr 10 22:06:48 2003
      last-unsuccessful-login :
```

```
HP-IB>
```

The following example shows the login information of the current user.

```
HP-IB> show user
```

```
=====
                        User Information
=====
      username : super
      password  : $1$IJ5..U6.$ES3pIhx/ccUaCKgM65vp6.
      snmp-community : secret
      permission-level : unrestricted-rw
      admin-status  : enabled
      num-logins    : 4
      num-unsuccessful-logins : 0
      last-login    : Thu Apr 10 22:06:59 2003
      last-unsuccessful-login :
```

```
HP-IB>
```

**Defaults:**

show user without arguments displays the account information for the user executing the command.

**Related Commands:**

“username” on page 286

## show version

### Synopsis:

The show version command provides a general, high-level description of the current system.

### Syntax:

```
show version
```

### Command Modes:

User-execute and privileged-execute modes.

### Privilege Level:

HP Fabric read-only user.

### Usage Guidelines:

It provides the software version, contact information, system up-time, time of last configuration change, and the last action performed.

### Examples:

```
HP-IB> show version
```

```
=====
                        System Version Information
=====

system-version : HP InfiniBand 12 port 4X switch (AB291A) Release 1.1.3hp
releng #20 11/24/2003 20:14:03

      contact : Local HP support representative
      name    : HP-IB
      location : 3000 Hanover Street, Palo Alto, CA 94304
      up-time  : 43 (d) :2 (h) :55 (m) :9 (s)
      last-change : none
      last-config-save : none
      action    : none
      result    : none
```

```
HP-IB>
```

### Defaults:

This command has no defaults.

**Related Commands:**

“location” on page 271

“snmp-server” on page 281

“show boot-config” on page 134

## IP Commands

### IP Commands (Table)

The commands described in this chapter are listed in the table below.

This chapter describes the commands used to configure Ethernet and InfiniBand Internet Protocol connections. The first part of this chapter contains tables that list each IP command and cross-references command descriptions. The second part is comprised of descriptions of the commands in alphabetical order.

- “arp ib”
- “clear ib arp-cache”
- “default ip ip-over-ib-mtu”
- “ip domain-name”
- “ip ip-over-ib-mtu”
- “ip name-server-one”
- “ip name-server-two”
- “ip route”

**Table B-38** IP Commands

| Command                   | Keyword | Description                                                                                                                                    |
|---------------------------|---------|------------------------------------------------------------------------------------------------------------------------------------------------|
| arp ib                    |         | Assigns static ARP addresses to Fabric interface ports.                                                                                        |
| clear ib arp-cache        |         | Removes accumulated IPoIB addresses from the ARP routing table.                                                                                |
| default ip ip-over-ib mtu |         | Resets the maximum size of the payload of IP-over-IB traffic back to the default size.                                                         |
| exit                      |         | Exits the current mode for the previous mode, or the user-execute mode. See “exit” on page 259                                                 |
| help                      |         | Describes the types of online help information available. See “help” on page 263                                                               |
| history                   |         | Lists all the commands executed during the current CLI session. See “history” on page 264                                                      |
| ip domain-name            |         | Configures the network DNS domain for the system chassis.                                                                                      |
| ip ip-over-ib-mtu         |         | Sets the Maximum Transmission Unit (MTU) of the packet or frame payload of IP-over-IB traffic along a path from the source to its destination. |
| ip name-server-one        |         | Specifies the IP address of the primary DNS server.                                                                                            |
| ip name-server-two        |         | Specifies the IP address of the backup DNS server.                                                                                             |
| ip route                  |         | Defines static routes to remote hosts or networks for IP packet forwarding.                                                                    |
| name                      |         | Assigns names to interface gateways for easier tracking (some gateway functions are not supported by HP Fabric Clustering System).             |

## arp ib

### Synopsis:

The arp ib command is used to statically map an IP address to the Global ID (GID) of a Fabric host running IPoIB on the local network.

### Syntax:

```
arp ib ip gid [:ext] qpn qpn slot#/port#
no arp ib ip port#/slot#
```

The syntax is described in the table below:

**Table B-39 auto-negotiate Syntax Description**

| Syntax      | Description                                                    |
|-------------|----------------------------------------------------------------|
| ip          | Enter the IP address of the target host.                       |
| gid         | Refers to the Global ID of the host HCA.                       |
| ext         | Refers to the GID extension                                    |
| qpn         | Refers to the Queue-Pair number of the host.                   |
| port#/slot# | identifies the chassis port being accessed by the target host. |

### Command Modes:

Global-configuration mode.

### Privilege Level:

HP Fabric read-write user.

### Usage Guidelines:

The system supports dynamic ARP, so any IP host connected to an IB interface port may see or detect all the other connected IPoIB and IP hosts. Connected IPoIB hosts are automatically detected by the subnet manager, queried for their network information, and their information is added to the system routing table. The routing table associates an IP address with a host GID (Global ID).

Static ARP addresses are assigned to Fabric interface ports to ensure these ports connect to the correct network hosts.

An ARP table contains the currently available ARP records in the gateway. An ARP record may be dynamically learned or statically created. For the most part, you may rely upon dynamic ARP addressing. Dynamic ARP records may be deleted from the table after a period of time or updated if a host address-change is detected (some gateway functions are not supported by HP Fabric Clustering System).

### Examples:

```
HP-IB(config)# arp ib 10.2.0.50 gid fe:80:00:00:00:00:00:00:05:ad:00:00:00:16:97
qpn 2 115/0
```

### Defaults:

This command has no defaults.

## clear ib arp-cache

### Synopsis:

The clear ib arp-cache command removes accumulated IPoIB addresses from the ARP routing table.

### Syntax:

```
clear ib arp-cache
```

### Command Modes:

Privileged-execute mode.

### Privilege Level:

HP Fabric read-write user.

### Usage Guidelines:

<CONFIRM THAT THIS IS NEEDED>[insert description] Under what circumstances might you want to do this?

### Examples:

```
HP-IB# clear ib arp-cache  
HP-IB#
```

### Defaults:

This command has no defaults.

### Related Commands:

“arp ib” on page 227

## default ip ip-over-ib-mtu

### Synopsis:

The default ip ip-over-ib-mtu command resets the maximum size of the payload of IP-over-IB traffic back to the default size.

### Syntax:

```
default ip ip-over-ib-mtu
```

### Command Modes:

Global-configuration mode.

### Privilege Level:

Ethernet and HP Fabric read-write users.

**Usage Guidelines:**

The maximum transmission unit is described in terms of payload size. TCP uses the MTU to determine the maximum payload allowed for every transmission. Too great a value can overwhelm routers and result in data retransmission. Too small a value results in degraded performance because there are more headers and acknowledgements required to transmit the same amount of data.

**Examples:**

```
HP-IB(config)# default ip ip-over-ib-mtu
```

**Defaults:**

The default ip-over-ib-mtu is 2048.

---

**NOTE** This command should not be used as change in MTU is not supported.

---

**Related Commands:**

“ip ip-over-ib-mtu” on page 230

“show ip” on page 206

**ip domain-name**

**Synopsis:**

The ip domain-name command configures the network DNS domain for the system chassis.

**Syntax:**

```
ip domain-name string
no ip domain-name
```

The syntax is described in the table below:

**Table B-40 Syntax Description**

| Syntax         | Description                                                    |
|----------------|----------------------------------------------------------------|
| ip domain-name | Configures the network DNS domain for the system chassis.      |
| string         | Enter the network name of domain in which the chassis resides. |
| no             | This keyword removes the assigned domain name.                 |

**Command Modes:**

Global-configuration (config) mode.

**Privilege Level:**

HP Fabric read-write user.

**Usage Guidelines:**

Set the domain name and DNS servers to support network name resolution.

Examples:

```
HP-IB# configure  
HP-IB(config)# ip domain-name shasta
```

**Defaults:**

The default domain name is an empty string.

**Related Commands:**

“show host” on page 147

“ip name-server-one” on page 231

“ip name-server-two” on page 232

## ip ip-over-ib-mtu

**Synopsis:**

The ip ip-over-ib-mtu command sets the Maximum Transmission Unit (MTU) of the packet or frame payload of IP-over-IB traffic along a path from the source to its destination.

**Syntax:**

```
ip ip-over-ib-mtu mtu  
no ip ip-over-ib-mtu
```

The syntax is described in the table below:

**Table B-41 Command Syntax Description**

| Command        | Description                                                                                                                                                                                       |
|----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ip             | Enter the main ip command.                                                                                                                                                                        |
| ip-over-ib-mtu | Sets the maximum size of the packet or frame payload of IP-over-IB traffic along a path from the source to its destination.                                                                       |
| mtu            | Enter the Maximum Transmission Unit (MTU) to apply. The MTU value may be 256, 512, 1024, 2048, or 4096. MTU is specified in octets (8-bit bytes). Refer to Usage Guidelines for more information. |
| no             | Sets the MTU to the default.                                                                                                                                                                      |

**Command Modes:**

Global configuration (config) mode.

**Privilege Level:**

Ethernet and HP Fabric read-write user.

**Usage Guidelines:**

The maximum transmission unit is described in terms of payload size. TCP uses the MTU to determine the maximum payload allowed for every transmission. Too great a value can overwhelm routers and result in data retransmission. Too small a value results in degraded performance because there are more headers and acknowledgements required to transmit the same amount of data.

**Examples:**

```
HP-IB# configure
HP-IB(config)# ip ip-over-ib-mtu 4096
HP-IB(config)#
```

**Defaults:**

The default ip-over-ib-mtu unit is 2048.

**NOTE** HP Fabric Clustering System hosts cannot handle change in MTU.

**Related Commands:**

“show ip” on page 206

**ip name-server-one**

**Synopsis:**

The ip name-server-one command specifies the IP address of the primary DNS server.

**Syntax:**

```
ip name-server-one ip
no ip name-server-one
```

The syntax is described in the table below:

**Table B-42 Command Syntax Description**

| Command         | Description                                                               |
|-----------------|---------------------------------------------------------------------------|
| ip              | Enter the main ip command.                                                |
| name-server-one | Specifies the IP address of the primary DNS server.                       |
| ip              | Enter the IP address of the primary DNS server.                           |
| no              | Use this keyword to return the primary DNS server to the default address. |

**Command Modes:**

Global configuration (config) mode.

**Privilege Level:**

Ethernet and HP Fabric read-write user.

**Usage Guidelines:**

Configure this parameter in order to support name resolution when specifying other devices and hosts by name.

**Examples:**

```
HP-IB# configure
HP-IB(config)# ip name-server-one 10.3.103.22
```

**Defaults:**

The default is an empty string.

**Related Commands:**

“ip name-server-two” on page 232

“show host” on page 147

### ip name-server-two

**Synopsis:**

The name-server-two command specifies the IP address of the backup DNS server.

**Syntax:**

```
ip name-server-two ip
no ip name-server-two
```

The syntax is described in the table below:

**Table B-43 Command Syntax Description**

| Command         | Description                                                           |
|-----------------|-----------------------------------------------------------------------|
| ip              | Enter the main ip command.                                            |
| name-server-two | Specify the IP address of the backup DNS server.                      |
| ip              | Enter the IP address of the backup DNS server.                        |
| no              | Use this keyword to return the backup DNS server to the default name. |

**Command Modes:**

Global configuration (config) mode.

**Privilege Level:**

Ethernet and HP Fabric read-write user.

**Usage Guidelines:**

Configure this optional parameter as a backup to the DNS server specified by name-server-one. In the event that name-server-one is not available, this server is used instead.

**Examples:**

```
HP-IB# configure
HP-IB(config)# ip name-server-two 10.3.103.23
```

**Defaults:**

The default is an empty string.

**Related Commands:**

“ip name-server-one” on page 231

“show host” on page 147

**ip route**

**Synopsis:**

The ip route configuration command defines static routes to remote hosts or networks for IP packet forwarding.

**Syntax:**

ip route dest mask nexthop

no ip route dest mask nexthop

The syntax is described in the table below:

**Table B-44 Command Syntax Description**

| Command  | Description                                                                                                                                                                                                                 |
|----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ip route | Defines static routes to remote hosts or networks for IP packet forwarding.                                                                                                                                                 |
| dest     | Enter the IP address of the host or network that you want to reach. The IP address may be a network address (i.e., host bits set to zero), a host address (i.e., non-zero host bits), or a default route (i.e., all zeros). |
| mask     | Enter the netmask used to resolve host and network addressing. The netmask may be an IP network address, a host route (i.e., 255.255.255.255), or the default route (i.e., 0.0.0.0).                                        |
| no       | Use this keyword to remove the static route setting.                                                                                                                                                                        |

**Command Modes:**

Global configuration (config) mode.

**Privilege Level:**

Ethernet and HP Fabric read-write user.

**Usage Guidelines:**

This command is generally used for remote hosts without direct network access to the system fabric.

Remote routes are available across one or more routers. Routes are verified, so the specified gateway address must be accessible. You should have no occasion to specify a local route because local routes are automatically created when you assign an IP address to a system card or port. Some gateway functions are not supported by HP Fabric Clustering System.

**IP Commands**

**Examples:**

```
HP-IB# configure
```

```
HP-IB(config)# ip route 192.168.3.0 255.255.255.0 10.10.1.0
```

**Defaults:**

The default is an empty string.

**Related Commands:**

“show ip” on page 206

## HP Fabric Clustering System Commands

This chapter describes HP Fabric Clustering System CLI configuration commands, which are used to administer the system chassis.

The commands described here cover are all the HP Fabric Clustering System-related commands, with the exception of IPoIB commands. The IPoIB commands are covered in “IP Commands” on page 226.

The commands described in this chapter are listed in the table below, and described in alphabetic order. Not all commands are available to users with limited privileges. Users with limited access privileges can only display and use a subset of the commands displayed in this section.

The commands are broken-up into two different types:

- HP Fabric Clustering System Subnet Management Configuration Commands
- HP Fabric Clustering System Interface Configuration Commands

**Table B-45 HP Fabric Clustering System Commands**

| Command             |                                                                 | Description                                                                                                                       |
|---------------------|-----------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|
| arp ib              |                                                                 | Assigns static ARP addresses to Fabric interface ports. See “arp ib” on page 227                                                  |
| clear ib            |                                                                 | Assigns static ARP addresses to Fabric interface ports. See “clear ib arp-cache” on page 228                                      |
| ib sm subnet prefix |                                                                 | Used to administer the Subnet Managers for the switch fabric. See “ib sm subnet-prefix” on page 235                               |
| ib-agent            | channel adapter                                                 | Used to configure the Subnet-Management Agent (SMA) node strings for channel adapters. See “ib-agent channel-adapter” on page 238 |
|                     | switch                                                          | used to configure the Subnet-Management Agent (SMA) node strings for internal switches. See “ib-agent switch” on page 240         |
| interface ib        | exit                                                            | Use to exit the current mode. See “exit” on page 259                                                                              |
|                     | gateway                                                         | Configure the IB virtual gateway. See “gateway” on page 261                                                                       |
|                     | help                                                            | Shows command help. See “help” on page 263                                                                                        |
|                     | history                                                         | Shows command history. See “history” on page 264                                                                                  |
|                     | link-trap                                                       | Enables/Disables link-traps. See “link-trap” on page 242                                                                          |
|                     | name                                                            | Assigns names to FC interface cards. See “name” on page 243                                                                       |
|                     | no                                                              | Negate a command, or set its default.                                                                                             |
| shutdown            | Enables or disables interface cards. See “shutdown” on page 244 |                                                                                                                                   |

### ib sm subnet-prefix

#### Synopsis:

The `ib sm subnet-prefix` command is used to administer the subnet managers for the switch fabric. This includes creating Partitions and adding members to those Partitions.

**Syntax:**

```
ib sm subnet-prefix guid [priority priority] [sm-key sm-key] [response-timeout timeout]
sweep-interval interval]
```

```
no ib sm subnet-prefix guid [no priority] [no sm-key] [no response-timeout] [no sweep-interval]
```

```
ib sm subnet-prefix subnet-prefix p_key partiton key partition-member node guid | port-number |
membership type
```

```
no ib sm subnet-prefix subnet-prefix p_key partiton key partition-member node guid | port-number |
membership type
```

The syntax and arguments are described in the table below:

**Table B-46 ib sm subnet-prefix Syntax Description**

| Syntax                 | Description                                                                                                                                                                                                                                                                                                                                                                                                                         |
|------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| guid                   | Globally Unique Identifier (GUID) of this subnet manager. The GUID is a 64-bit value used to identify the Fabric subnet. This is a unique subnet identifier and is joined with the GUID to form the global identifier (GID) of the port. All GIDs within a subnet have the same subnet prefix. You may enter any prefix; however the recommended prefix is: fe:80:00:00:00:00:00:00, which indicates a locally administered subnet. |
| priority               | Assigns a priority to the Subnet Manager.                                                                                                                                                                                                                                                                                                                                                                                           |
| sm-key                 | Refers to a 64-bit subnet management key that is automatically assigned to the subnet manager.                                                                                                                                                                                                                                                                                                                                      |
| response-timeout value | Sets the maximum delay allowed between the port reception of a subnet management packet and the transmission of the associated response. The default is 2,000 microseconds.                                                                                                                                                                                                                                                         |
| sweep-interval value   | Interval at which the subnet manager sweeps the fabric for any network changes. The value is an integer that the number of seconds to wait.                                                                                                                                                                                                                                                                                         |
| no                     | Use this keyword to remove a subnet manager, reset the priority, sweep-interval, or response-timeout parameters back to their default values. Only one of these parameters may be specified on the command line when using the no keyword.<br><br>Also use the no keyword to remove a Partition.                                                                                                                                    |
| subnet-prefix          | Enter a valid IB subnet-prefix.                                                                                                                                                                                                                                                                                                                                                                                                     |
| partition key          | Enter a 16-bit identification for the Partition. See the table below for valid p_key entries.                                                                                                                                                                                                                                                                                                                                       |
| node guid              | Enter the GUID of the node that is to be added to a Partition. Nodes are not added to Partitions, but the specific port is identified by it's Node GUID and it's port number.                                                                                                                                                                                                                                                       |
| port number            | Enter the port number that you want to add to a Partition.                                                                                                                                                                                                                                                                                                                                                                          |
| membership type        | Enter the type of membership that you want a specific Partition member (port) to have. Partitions can contain port members that are both full and limited members.<br><br>Valid entries are: full-member or limited-member                                                                                                                                                                                                          |

**Command Modes:**

Global-configuration mode.

**Privilege Level:**

General read-write user.

**Usage Guidelines:**

This is an HP Fabric Clustering System Subnet Management Configuration Command.

The subnet manager:

- discovers the subnet topology and dynamically updates it at a specified sweep interval
- configures the LIDs, GID subnet prefixes, and P\_Keys for each channel adapter port
- configures the LIDs, subnet prefixes, and forwarding databases for each switch on the subnet
- maintains the endnode and service databases of the subnet, providing a GUID to LID/GID resolution service as well as a services directory.

One subnet manager is used to administer the fabric. All fabric hosts are on this one subnet. Upon bootup, the subnet manager image is loaded and ready.

Each node in the fabric has a subnet management agent (SMA) to shuttle communication requests between the node and the subnet manager. Communication between the subnet manager and the subnet management agent is done using the common management datagram (MAD) message structure. This structure entails the passing of subnet management packets (SMP).

There is a limit to the number of MAD packets that may be queued for a single file descriptor. Once the queue reaches its maximum length (currently set to 8), new packets are dropped. This prevents “livelock” in the situation where new MADs arrive faster than they can be processed.

The subnet management agent receives and transmits subnet management packets to and from the subnet manager. The subnet management packets never extend beyond their respective local HP Fabric Clustering System subnet. Also, SMPs always use Virtual Lane 15 (VL15) and are exclusively addressed to Queue Pair 0 (QP0).

**Regarding Partitions:**

Partitions are created, and then ports are added to those Partitions to enforce isolation. For more information regarding creating Partitions, refer to .

---

**NOTE** HP recommends that the default partition be used for the cluster.

---

You can choose your own p\_key values, or you can simply choose your values from the list in the following table.”

**Table B-47** Acceptable P\_Key Values

|       |       |
|-------|-------|
| 00:01 | 00:11 |
| 00:02 | 00:12 |
| 00:03 | 00:13 |
| 00:04 | 00:14 |

**Table B-47**            **Acceptable P\_Key Values (Continued)**

| 00:05 | 00:15 |
|-------|-------|
| 00:06 | 00:16 |
| 00:07 | 00:17 |
| 00:08 | 00:18 |
| 00:09 | 00:19 |
| 00:10 | 00:20 |

**Examples:**

The following example defines a subnet manager, or redefines the existing subnet manager, with the specified priority, sm-key, response-timeout, and sweep-interval.

```
HP-IB(config)# ib sm subnet-prefix fe:80:00:00:00:00:00:00 priority 10  
sm-key 00:00:00:00:00:00:00:00 response-timeout 2000 sweep-interval 10
```

The following example removes a specified subnet manager.

```
HP-IB(config)# no ib sm subnet-prefix fe:80:00:00:00:00:00:00
```

The following example resets the response-timeout value for the specified subnet manager back to its default value.

```
HP-IB(config)# no ib sm subnet-prefix fe:80:00:00:00:00:00:00 no response-timeout
```

The following example creates a Partition, and adds .

```
HP-IB(config)# ib sm subnet-prefix fe:80:00:00:00:00:00:00 p_key 00:02  
partition-member 00:00:2c:90:01:1a:c8:00 full-member
```

**Defaults:**

You may enter this command without arguments to add a subnet manager with default values.

The default are:

sm-key is 00:00:00:00:00:00:00:00

priority is 0

sweep-interval is 10 seconds

response-timeout is 2,000 microseconds.

**Related Commands:**

“ib-agent channel-adapter” on page 238

“show ib sm configuration” on page 149

**ib-agent channel-adapter**

**Synopsis:**

The ib-agent channel-adapter command and its arguments are used to configure the Subnet-Management Agent (SMA) node strings for channel adapters. A node string is a descriptive string used to identify an object.

**Syntax:**

`ib-agent channel-adapter guid`

The syntax is described in the following table:

**Table B-48**      **ib-agent Command Syntax**

| Syntax                  | Description                                                      |
|-------------------------|------------------------------------------------------------------|
| channel-adapter<br>guid | Enter after the ib-agent command to configure a channel adapter. |

**Command Modes:**

Global-configuration mode.

**Privilege Level:**

Unrestricted and HP Fabric read-write users.

**Usage Guidelines:**

A subnet-management agent (SMA) is the intermediary between a network manager and the network entities it manages, such as the internal fabric switches and host channel adapters. The subnet management agent maps the operations between managed conceptual objects and the physical resources inside the system chassis, and routes event notifications from locally managed objects to remote entities.

Each node in the fabric has a subnet management agent (SMA) to shuttle communication requests between the node and the subnet manager. Communication between the subnet manager and the subnet management agent is done using the common management datagram (MAD) message structure. This structure entails the passing of subnet management packets (SMP).

The subnet management agent receives and transmits subnet management packets to and from the subnet manager. The subnet management packets never extend beyond their respective local HP Fabric Clustering System subnet.

Internally, the fabric switch is comprised of 36 switch chips. Each switch chip runs its own subnet management agent and can be viewed by the subnet manager as a unique entity. Change the node-string for a channel-adapter or switch to make it easier to identify.

**Examples:**

The following example changes the node string of a channel adapter.

```
HP-IB(config)# ib-agent channel-adapter 00:05:ad:00:00:00:13:f7 node-string "primary
HCA"
HP-IB(config)#
```

**Defaults:**

This command has no defaults.

**Related Commands:**

“ib-agent channel-adapter” on page 238

“show ib sm configuration” on page 149

“interface ib” on page 241

## ib-agent switch

### Synopsis:

The `ib-agent switch` command and its arguments are used to configure the Subnet-Management Agent (SMA) node strings for internal switches. A node string is a descriptive string used to identify an object.

### Syntax:

```
ib-agent switch guid
```

The syntax is described in the following table:

**Table B-49**            **ib-agent Command Syntax**

| Syntax | Description                     |
|--------|---------------------------------|
| switch | Refers to the GUID of a switch. |
| guid   |                                 |

### Command Modes:

Global-configuration mode.

### Privilege Level:

Unrestricted and HP Fabric read-write users.

### Usage Guidelines:

A subnet-management agent (SMA) is the intermediary between a network manager and the network entities it manages, such as the internal fabric switches and host channel adapters. The subnet management agent maps the operations between managed conceptual objects and the physical resources inside the system chassis, and routes event notifications from locally managed objects to remote entities.

Each node in the fabric has a subnet management agent (SMA) to shuttle communication requests between the node and the subnet manager. Communication between the subnet manager and the subnet management agent is done using the common management datagram (MAD) message structure. This structure entails the passing of subnet management packets (SMP).

The subnet management agent receives and transmits subnet management packets to and from the subnet manager. The subnet management packets never extend beyond their respective local HP Fabric Clustering System subnet.

Internally, the fabric switch is comprised of 36 switch chips. Each switch chip runs its own subnet management agent and can be viewed by the subnet manager as a unique entity. Change the node-string for a channel-adaptor or switch to make it easier to identify.

### Examples:

The following example changes the node string of a switch.

```
HP-IB(config)# ib-agent switch 00:05:ad:00:00:00:13:da node-string "Switch 0, LID 2"  
HP-IB(config)# exit
```

**Defaults:**

This command has no defaults.

**Related Commands:**

“show ib-agent summary” on page 177

“show ib sm configuration” on page 149

“interface ib” on page 241

## interface ib

**Synopsis:**

Use the `interface ib` command to enter Configuration Interface Infiniband (`config-if-ib`) submode.

**Syntax:**

```
interface ib interface(s) [all]
```

**Table B-50 interface ib Command Syntax Description**

| Syntax       | Description                                                                                                                                                  |
|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|
| interface(s) | The interface or interfaces that you want to configure. You can enter one interface, multiple interfaces, or a range of interfaces. For example: 15/1 - 15/3 |
| all          | Use the all keyword to select all HP Fabric Clustering System interfaces on the system.                                                                      |

**Command Modes:**

Configuration Interface (`config-if`) mode.

**Privilege Level:**

HP Fabric read-write user.

**Usage Guidelines:**

none.

**Examples:**

```
HP-IB(config-if)# interface ib 15/1-15/5
```

```
HP-IB(config-if-ib-15/1-15/5)#
```

**Defaults:**

This command has no defaults.

**Related Commands:**

“link-trap” on page 242

“name” on page 243

“shutdown” on page 244

## link-trap

### Synopsis:

The link-trap interface command generates link-up and link-down traps on HP Fabric Clustering System interfaces.

### Syntax:

```
link-trap
```

```
no link trap
```

The commands syntax is described in the table below:

**Table B-51 link-trap Command Syntax Descriptions**

| Syntax | Description                                   |
|--------|-----------------------------------------------|
| no     | The no keyword disables link-trap generation. |

### Command Modes:

Configuration Interface (config-if) mode.

### Privilege Level:

HP Fabric read-write user.

### Usage Guidelines:

A link-up trap is generated when the operation status (oper-status) changes to up. A link-down trap is generated when the operation status changes to down.

### Examples:

This example enables link-trap generation for interface ports 1 and 5, on card 15. The resulting traps are sent to trap receivers, as defined by the config snmp trap-receiver command.

```
HP-IB(config-if-ib-15/1-15/5)# link-trap
```

### Defaults:

The default is no link-trap.

### Related Commands:

“shutdown” on page 244

“show interface ib” on page 194

**name**

**Synopsis:**

The name command assigns a name to one or more interface ports. The name can be used to simplify port identification and indicate its use.

**Syntax:**

name name

no name

The commands syntax is described in the table below:

**Table B-52 name Command Syntax Descriptions**

| Syntax | Description                                                                                                                                                                                                                                                                            |
|--------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| name   | A text string used to assign the port(s) on the Fabric card. The string is alphanumeric text up to 20 characters in length. If there are spaces in the string, enclose the entire string in double-quotes (“”). Include the no keyword to reset this parameter to a null/empty string. |
| no     | The no keyword returns the port to its default name.                                                                                                                                                                                                                                   |

**Command Modes:**

Configuration Interface (config-if) mode.

**Privilege Level:**

HP Fabric read-write user.

**Usage Guidelines:**

This command sets the name field of the interface. Refer to the rules for name strings in “Using the Documentation” on page 67

**Examples:**

This example assigns the name “InfiniBand Group1-6” to the first 6 ports of InfiniBand card 15.

```
HP-IB(config-if-ib-15/1-15/6)# name "InfiniBand Group1-6"
```

**Defaults:**

The default interface name is card#/port#.

**Related Commands:**

“show ib sm configuration” on page 149

“show interface ib” on page 194

## shutdown

### Synopsis:

The shutdown command sequence enables or disables HP Fabric Clustering System interfaces.

### Syntax:

shutdown

no shutdown

The commands syntax is described in the table below:

**Table B-53 shutdown Command Syntax Description**

| Syntax   | Description                                                   |
|----------|---------------------------------------------------------------|
| shutdown | Disables the specified Fabric cards and ports.                |
| no       | The no keyword disables the specified Fabric cards and ports. |

### Command Modes:

Configuration interface (config-if) mode.

### Privilege Level:

HP Fabric read-write user.

### Usage Guidelines:

Fabric ports must be enabled before they can be configured. Attempts to configure a disabled Fabric port will result in an error message. If you get an error message, display the information for the ports in question.

### Examples:

```
HP-IB(config-if-ib-15/1-15/6)# no shutdown
```

The result of this command is reflected in the admin-status field when displaying interface information. This example sets the admin-status field for ports 1 through 6 on HP Fabric Clustering System card 15 to up.

### Defaults:

The default interface name is card#/port#.

### Related Commands:

“show card” on page 136

“interface ib” on page 241

## Administrative Commands

This chapter lists and describes Administrative commands in alphabetical order.

**Table B-54 Administrative Commands**

| Command           | Description                                                                                                                     |
|-------------------|---------------------------------------------------------------------------------------------------------------------------------|
| action            | Configure Card settings. See “action” on page 247                                                                               |
| boot-config       | Configure system boot information. See “boot-config” on page 248                                                                |
| broadcast         | Send a message to all users that are logged-in. See “broadcast” on page 249                                                     |
| card              | Configure card settings. See “card” on page 250                                                                                 |
| clock             | Configure clocks. See “clock” on page 250                                                                                       |
| configure         | Configure card settings. See “configure” on page 251                                                                            |
| copy              | Copy a file or execute the contents of a config file. See “copy” on page 252                                                    |
| delete            | Remove image, configuration, and log files from the system chassis. See “delete” on page 254                                    |
| dir               | Lists the system-image, configuration, and log files on system chassis. See “dir” on page 255                                   |
| disable           | Used to exit the privileged-execute mode and return to the user-execute mode. See “disable” on page 257                         |
| enable            | Used to enter the privileged-execute mode from the user-execute mode. See “enable” on page 258                                  |
| exec              | Used to execute a file. See “exec” on page 259                                                                                  |
| exit              | Used to leave the current mode for the previous mode or the user-execute mode. See “exit” on page 259                           |
| ftp-server enable | Use to enable or disable ftp-services. See “ftp-server enable” on page 260                                                      |
| gateway           | Gateway functions are not supported by HP Fabric Clustering System                                                              |
| help              | Describes the types of help information available and ways to display specific command-line information. See “help” on page 263 |
| history           | Shows command history. See “history” on page 264                                                                                |
| hostname          | Assigns a name to the system. See “hostname” on page 265                                                                        |
| install           | Installs a downloaded system-image to the appropriate locations. See “install” on page 266                                      |

**Table B-54 Administrative Commands (Continued)**

| Command                 | Description                                                                                                                                                                                                                                                      |
|-------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| interface               | Used to enter a sub-command mode in which to configure Fabric interface cards, as well as chassis management connections. See “interface” on page 267                                                                                                            |
| interface mgmt-ethernet | Enables and configures the IP addresses for the port and gateway of the out-of-band Ethernet port, which is used to administer the chassis (some gateway functions are not supported by HP Fabric Clustering System) . See “interface mgmt-ethernet” on page 268 |
| interface mgmt-ib       | Used to enable and configure the IP addresses for the virtual port and gateway on the fabric (some gateway functions are not supported by HP Fabric Clustering System). See “interface mgmt-ib” on page 269                                                      |
| ip                      | Configures the IP address and subnet mask for a virtual in-band Fabric port. See “ip” on page 270                                                                                                                                                                |
| location                | Used to assign a human-readable identifier to the system chassis. See “location” on page 271                                                                                                                                                                     |
| login                   | Used to change user identity during a CLI session. See “login” on page 272                                                                                                                                                                                       |
| logging                 | Configures active log.<br>See “logging” on page 273                                                                                                                                                                                                              |
| logout                  | Ends the current CLI session. See “logout” on page 273                                                                                                                                                                                                           |
| more                    | Displays text data on the terminal screen for a stored log or configuration file. See “more” on page 274                                                                                                                                                         |
| no                      | Negate a command, or set its default.                                                                                                                                                                                                                            |
| ntp                     | Specifies the NTP servers to use to set and synchronize the system clock. See “ntp” on page 275                                                                                                                                                                  |
| ping                    | Verifies if a host can be reached from the system. See “ping” on page 276                                                                                                                                                                                        |
| radius server           | Configures a radius-server. See “radius-server” on page 277                                                                                                                                                                                                      |
| reload                  | Reboots the chassis. See “reload” on page 278                                                                                                                                                                                                                    |
| shutdown                | Enables or disables a specific interface card in the system chassis or the HP Fabric Clustering System Management Interface. See “shutdown” on page 279                                                                                                          |
| snmp-server             | Allows you set contact, location, and SNMP trap receiver information. See “snmp-server” on page 281                                                                                                                                                              |
| telnet                  | Use to enable or disable access to telnet services. See “telnet” on page 282                                                                                                                                                                                     |
| terminal length         | Sets the number of lines displayed at one time by commands like more so that data does not scroll quickly out of view. See “telnet” on page 282                                                                                                                  |
| terminal time-out       | Sets a limit for inactivity allowed during a CLI session. See “terminal time-out” on page 283                                                                                                                                                                    |

**Table B-54 Administrative Commands (Continued)**

| Command  | Description                                                                                                                                                                                      |
|----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| trace    | Tracks internal system program modules that are called for a specific interface card. See “trace” on page 284                                                                                    |
| type     | Defines the type of gateway or switch cluster connection being configured (some gateway functions are not supported by HP Fabric Clustering System). See “type” on page 285                      |
| username | Used to create and manage administrative access to both CLI, GUI , and SNMP (Element Manager GUI is not supported in initial release of HP Fabric Clustering System). See “username” on page 286 |
| who      | Lists all the users who are currently logged into the CLI and the host system from which they logged in. See “who” on page 289                                                                   |
| write    | Writes a text message to the terminal of a specified user. See “write” on page 290                                                                                                               |

**action**

**Synopsis:**

The action command executes administrative functions on specified card(s). Currently, one function is provided. The administrative function provided removes inactive system-image switch cluster connections.

**Syntax:**

`action delete-inactive-image`

**Table B-55 action Keywords**

| Keyword               | Description                                                                                           |
|-----------------------|-------------------------------------------------------------------------------------------------------|
| delete-inactive-image | Removes the inactive image from the system. The current system image is both installed and activated. |

**Command Modes:**

Configuration Card (config-card) mode.

**Privilege Level:**

Unrestricted or card-specific read-write user.

**Usage Guidelines:**

Use this command to remove older system-images files from local gateway and switch cluster connection memory. Once removed, the card system-image can be synchronized to that of the controller system-image (some gateway functions are not supported by HP Fabric Clustering System).

You must have read-write administrative permissions for the type of card being configured.

**Examples:**

`HP-IB(config-card-2)# action delete-inactive-images`

**Defaults:**

This command has no defaults.

**Related Commands:**

“copy” on page 252

“install” on page 266

“show card” on page 136

**boot-config**

**Synopsis:**

The boot-config configuration command is used to specify the system-image that should be used to initialize the system firmware when the system powers-up, or is rebooted.

**Syntax:**

```
boot-config primary-image-source dir
```

**Table B-56 boot-config Keywords**

| key word             | Description                                                       |
|----------------------|-------------------------------------------------------------------|
| primary-image-source | Specifies that the name of the new boot-config file is to follow. |

**Table B-57 boot-config Arguments**

| Argument | Description                 |
|----------|-----------------------------|
| dir      | Enter the actual file name. |

**Command Modes:**

Global-configuration mode.

**Privilege Level:**

Unrestricted read-write user.

**Usage Guidelines:**

Enter the primary-image-source keyword, followed by the system-image directory. Specify an image directory as an image source.

Do not specify image files that end in .img since these are compressed archives that must be installed first.

**Examples:**

```
HP-IB(config)# boot-config primary-image-source Release-1.1.0/build460
```

The example directs the system controller to use the Release-1.1.0/build460 directory when the system-image to initialize itself. If this directory is not available, the system will not boot successfully.

**Defaults:**

This command has no defaults.

**Related Commands:**

“install” on page 266

“radius-server” on page 277

“show boot-config” on page 134

**broadcast**

**Synopsis:**

The broadcast command sends a text message to all current CLI users.

**Syntax:**

broadcast “message”

**Table B-58 broadcast Command Arguments**

| Argument | Description                                                                                                                             |
|----------|-----------------------------------------------------------------------------------------------------------------------------------------|
| message  | Enter the message to be broadcast. Enclose multi-word messages within double-quotes. Single-word messages do not require double-quotes. |

**Command Modes:**

User-execute and privileged-execute modes.

**Privilege Level:**

Unrestricted read-write user.

**Usage Guidelines:**

Message broadcasting is an important feature to forewarn all CLI users that some major event is about to take place, such as bringing down a network for administration. A broadcast message is sent to every active CLI session on the system chassis, including the user who sends the message.

Enclose multi-word messages within double-quotes. Single-word messages do not require double-quotes.

**Examples:**

```
HP-IB# broadcast "IB card 1 going down in 10 minutes."
```

```
HP-IB#
```

The example displays the following broadcast message from super:

```
Switch going down in 10 minutes.
```

**Defaults:**

This command has no defaults.

**Related Commands:**

“reload” on page 278

“who” on page 289

“write” on page 290

## **card**

**Synopsis:**

The card command enters Configuration Card (config-card) submode. Commands in this submode enable/disable, set type, and reinitialize cards.

**Syntax:**

card card-identifier

**Command Modes:**

Global-configuration mode.

**Privilege Level:**

read-write user

**Usage Guidelines**

**Examples:**

```
HP-IB> enable
```

```
HP-IB# config
```

```
HP-IB(config)# card all
```

```
HP-IB(config-card-1,6,11,15-16)# no shutdown
```

```
HP-IB(config-card-1,6,11,15-16)#
```

**Defaults:**

This command has no defaults.

**Related Commands:**

“shutdown” on page 279

“clock” on page 250

## **clock**

**Synopsis:**

The clock command is used to manually set the time and date of the on-board system clock.

**Syntax:**

clock hh:mm:ss dd mm yy

**Table B-59 clock Command Argument Descriptions**

| Argument | Description |
|----------|-------------|
| hh       | Hour        |
| mm:      | Minute      |
| :ss      | Second      |
| dd       | Day         |
| mm       | Month       |
| yy       | Year        |

**Command Modes:**

Global-configuration mode.

**Privilege Level:**

Unrestricted and general read-write user.

**Usage Guidelines:**

Time is maintained in one of two ways:

- An on-board system clock
- External NTP servers

Time is set at the factory. To ensure accurate synchronization, it is recommended that you use an external NTP server. This causes log dates to be synchronized with other management systems.

**Examples:**

```
HP-IB(config)# clock set 19:22:10 25 05 15
```

**Defaults:**

This command has no defaults.

**Related Commands:**

“clock” on page 250

“ntp” on page 275

“show clock” on page 142

**configure**

**Synopsis:**

The configure command is used to enter the global-configuration mode.

**Syntax:**

configure

**Command Modes:**

User-execute mode.

**Privilege Level:**

Unrestricted and general read-write user.

**Usage Guidelines:**

The configure command is used to enter the global-configuration mode. In this mode, you may configure gateway and switch cluster connections, subnet management, IP addressing, and the system (some gateway functions are not supported by HP Fabric Clustering System).

**Examples:**

```
HP-IB# configure
```

```
HP-IB(config)#
```

**Defaults:**

This command has no defaults.

**Related Commands:**

“interface ib” on page 241

## copy

**Synopsis:**

The copy command is used to copy image, configuration, and log data onto and off of the system chassis. It also copies files locally, including the current configuration. The copy command is also used to execute the contents of a configuration file.

**Syntax:**

**Table B-60 copy Command Syntax Descriptions**

| example                                | description                                                                                   |
|----------------------------------------|-----------------------------------------------------------------------------------------------|
| copy ftp://usr:passwd@host/loc fs:file | Download a file from a remote host.                                                           |
| copy tftp://remote system / file path  | Download a file from a remote system using tftp.                                              |
| copy fs:file ftp://usr:passwd@host/loc | Upload a file to a remote host.                                                               |
| copy running-config<br>startup-config  | Copy the current configuration to the default file used to configure the system upon boot-up. |
| copy config:file running-config        | Execute a configuration file without having to reboot the system.                             |

The arguments to the copy command are described below.

**Table B-61 copy Command Argument Descriptions**

| Argument | Description                                                                                                                                                                                                                                                                       |
|----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| usr      | Network user name for executing the FTP command on the specified host. The user name is always followed by a colon (:).                                                                                                                                                           |
| passwd   | Network password for executing the FTP command on the specified host. The password is always followed by the “at” character (@). A password is sent as-is, without encryption, to the target host, however, the system and connected hosts should be protected behind a firewall. |
| host     | IP address or DNS name of the remote host system. The host is always followed by a colon (:).                                                                                                                                                                                     |

**Command Modes:**

Privileged-execute mode.

**Privilege Level:**

Unrestricted read-write user.

**Usage Guidelines:**

You may download image and configuration files from an FTP server to the system chassis. You may also upload log and configuration files from the system chassis to an FTP server.

Download image files to upgrade system firmware and download configuration files to quickly replicate a desired configuration. Upload configuration and log files to maintain backups and troubleshoot the system.

Image files require additional processing. After they have been copied onto the system chassis, image files must be installed before they can be used to initialize the system.

After configuration files are downloaded to the system chassis, they may be specified in the configure boot-config command and used the next time the system is booted.

The File Transfer Protocol (FTP) is used to copy data to and from a remote host. As such, part of the copy command requires you to include your network user name and password, as well as the host DNS name or IP address.

The copy and show logging commands are the only CLI commands which recognize <Ctrl>-c. You may enter <Ctrl>-c during the uploading/downloading process to terminate file transfer in the event network transfer hangs.

---

**NOTE** You can only download image and configuration files. Log files cannot be downloaded. You can only upload configuration and log files. System-image data cannot be uploaded.

---

**Examples:**

```
HP-IB# copy
ftp://root:infini@15.13.113.96/tmp/HP-AB291A-Release-1.1.3hp-build020.img
image:HP-AB291A-Release-1.1.3hp-build020.img
operation completed successfully
HP-IB#
```

**Administrative Commands**

The example above shows downloading a system-image file from a remote host to the system chassis. Once downloaded it may be installed and propagated to all the gateway and switch cluster connections in the chassis (some gateway functions are not supported by HP Fabric Clustering System).

```
HP-IB# copy running-config startup-config
operation completed successfully
```

HP-IB

The second example shows copying the current configuration to the default configuration file that is read by the chassis as it initializes itself upon reboot.

**Defaults:**

This command has no defaults.

**Related Commands:**

- “boot-config” on page 248
- “delete” on page 254
- “dir” on page 255
- “install” on page 266
- “show boot-config” on page 134

**delete**

**Synopsis:**

The delete command is used to remove image, configuration, and log files from the system chassis.

**Syntax:**

```
delete fs:file
```

The arguments related to the delete command are described below.

**Table B-62 delete Command Argument Descriptions**

| Argument | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| fs       | System file-system. This is an internal directory that is identified by name only. The file-systems are config, images, and syslog. The specified file-system must be appropriate for the type of file being deleted. For example, if an attempt is made to delete a configuration file from the syslog file-system, an error is returned because the name of the file is not appropriate for the file-system. The file-system specification is always followed by a colon (:). Note that startup-config is aliased to config:startup-config. Therefore, the file system for this file is assumed and does not have to be explicitly stated. |
| file     | Name of the configuration, image, or log file to be deleted.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |

**Command Modes:**

Privileged-execute mode.

**Privilege Level:**

Unrestricted read-write user.

**Usage Guidelines:**

Active images cannot be deleted. Refer to “Deleting System Images and Image Files” on page 78 for directions about how to make a system-image inactive in order to delete it.

To delete a system-image from an individual gateway or switch cluster connection, use the card action command (some gateway functions are not supported by HP Fabric Clustering System).

**Examples:**

```
HP-IB# delete config:ip-back.cfg
*****
HP-IB#
```

**Defaults:**

This command has no defaults.

**Related Commands:**

- “card” on page 250
- “copy” on page 252
- “dir” on page 255

**dir**

**Synopsis:**

The dir command lists the system-image, configuration, and log files on the system chassis.

**Syntax:**

```
dir config | image | syslog
```

This command requires one of three arguments: config, image, or syslog. The files are stored on the the system chassis in separate file-systems. The CLI automatically tracks these file-systems so you do not need to include file-path information to administer these files.

**Table B-63 dir Command Argument Descriptions**

| Argument | Description                    |
|----------|--------------------------------|
| config   | Lists the configuration files. |

**Table B-63 dir Command Argument Descriptions (Continued)**

| Argument | Description                                                                                                                                                                                                                                                                                                                       |
|----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| image    | Lists the current system image. The file-name entries ending in .img are image files. The file-name entries that look like relative path-names are installed system-images. No more than two system-images may be installed on the system. Image files must be unpacked and installed before they may be used to boot the system. |
| syslog   | Lists the log files.                                                                                                                                                                                                                                                                                                              |

**Command Modes:**

Privileged-execute mode.

**Privilege Level:**

General read-only user.

**Usage Guidelines:**

The file-name entries ending in .img are image files. The file-name entries that look like relative path-names are installed system-images. No more than two system-images may be installed on the system. Image files must be unpacked and installed before they may be used to boot the system.

**Examples:**

To display configuration files:

```
HP-IB# dir config
```

```
=====
Existing Configurations on System
=====
slot      date-created          size      file-name
-----
1         Thu Oct 24 11:21:06 2002      58        check.cfg
1         Thu Dec  5 14:50:09 2002     39216     check2.cfg
1         Wed Dec 11 09:09:54 2002     1712     config_bc.cfg
1         Thu Dec  5 11:18:21 2002     1712     running_config.cfg
1         Wed Dec  4 07:10:23 2002     4407     running_config.cfg.backup
1         Thu Dec  5 12:04:53 2002     1712     running_config2.cfg
1         Thu Oct 24 11:19:53 2002      58        test.cfg
```

```
HP-IB#
```

To display installed system-images and image files

```
HP-IB# dir image
```

```
=====
Existing Boot-Images on System
```

```
=====
slot date-created          size      file-name
-----
1    Tue Jan 13 10:24:35 2004  18905824  HP-AB291A-Release-1.1.3hp-build023.img
1    Sun Feb 22 10:24:44 2004  18932637  HP-AB291A-Release-1.1.3hp-build025.img
1    Sun Feb 22 10:29:45 2004  13085184  Release-1.1.3hp/build025
HP-IB#
HP-IB# dir syslog
=====
```

Existing Syslog-files on System

```
=====
slot  date-created          size      file-name
-----
1     Thu Jun 12 12:13:06 2002    19636    ts_log
1     Wed Jun 11 13:28:54 2002     4978     ts_log.1.gz
1     Tue Jun 10 04:02:02 2002      30       ts_log.2.gz
1     Mon Jun 9 04:02:02 2002      30       ts_log.3.gz
1     Sun Jul 8 04:02:02 2002      30       ts_log.4.gz
1     Sat Jul 7 04:02:02 2002      30       ts_log.5.gz
1     Fri Jul 6 17:20:35 2002    16264    ts_log.6.gz
1     Thu Jul 5 15:14:57 2002      245     ts_log.7.gz
HP-IB#
```

**Defaults:**

This command has no defaults.

**Related Commands:**

“boot-config” on page 248

“copy” on page 252

“delete” on page 254

“install” on page 266

**disable**

**Synopsis:**

The disable command is used to exit the privileged-execute mode and return to the user-execute mode.

**Syntax:**

disable

**Command Modes:**

Privileged-execute mode.

**Privilege Level:**

General read-only user.

**Usage Guidelines:**

**Examples:**

```
HP-IB# disable
```

```
HP-IB>
```

**Defaults:**

This command has no defaults.

**Related Commands:**

“enable” on page 258

**enable**

**Synopsis:**

The enable command is used to enter the privileged-execute mode from the user-execute mode.

**Syntax:**

```
enable
```

**Command Modes:**

User-execute mode.

**Privilege Level:**

General read-only user.

**Usage Guidelines:**

**Examples:**

```
HP-IB> enable
```

```
HP-IB#
```

**Defaults:**

This command has no defaults.

**Related Commands:**

“disable” on page 257

**exec**

**Synopsis:**

The exec command is used to execute a file.

**Syntax:**

exec file

**Table B-64** exit Command Keyword Description

| Keyword | Description                                |
|---------|--------------------------------------------|
| file    | Name of the file that you want to execute. |

**Command Modes:**

All modes.

**Privilege Level:**

Privileged-execute modes.

**Usage Guidelines:**

None.

**Examples:**

```
HP-IB> enable
HP-IB# config
HP-IB(config)# exec config:test.cfg
```

**Defaults:**

This command has no defaults.

**Related Commands:**

“copy” on page 252

“configure” on page 251

**exit**

**Synopsis:**

The exit command is used to leave the current mode for the previous mode or the user-execute mode.

**Syntax:**

exit [all]

**Table B-65** exit Command Keyword Description

| Keyword | Description                                         |
|---------|-----------------------------------------------------|
| all     | exits all modes to return to the user-execute mode. |

**Command Modes:**

All modes.

**Privilege Level:**

All users.

**Usage Guidelines:**

The exit command by itself returns to previous mode. With the all keyword the CLI returns to the user-execute mode. This command logs you out of the CLI when executed in the user-execute or privileged-execute mode.

**Examples:**

```
HP-IB(config-card-1,2)# exit all  
HP-IB>
```

**Defaults:**

This command has no defaults.

**Related Commands:**

“login” on page 272

“enable” on page 258

## ftp-server enable

**Synopsis:**

The ftp-server enable command is used to enable or disable an ftp-server in the system.

**Syntax:**

```
ftp-server enable  
no ftp-server enable
```

**Table B-66** ftp -server Command Keyword Description

| Keyword | Description                                                |
|---------|------------------------------------------------------------|
| no      | Use the no keyword to disable an ftp server in the system. |

**Command Modes:**

Privileged-execute modes.

**Privilege Level:**

All users.

**Usage Guidelines:**

Files can be uploaded and downloaded over FTP or over TFTP.

**Examples:**

The following example shows ftp services being disabled in the system.

```
HP-IB(config)# no ftp-server enable  
HP-IB(config)#
```

**Defaults:**

This command has no defaults.

**Related Commands:**

“show system-services” on page 217

“copy” on page 252

**gateway**

**Synopsis:**

The gateway command configures:

- the IP address of the gateway for the Ethernet Management port.  
or
- the IP address of the gateway for a virtual in-band Fabric port.

**Syntax:**

```
gateway ip  
no gateway ip
```

**Table B-67 gateway Command Argument Description**

| Argument | Description                                             |
|----------|---------------------------------------------------------|
| ip       | Enter the IP address to add or remove from the gateway. |

**Table B-68 gateway Command Keyword Descriptions**

| Keyword | Description                                                                                    |
|---------|------------------------------------------------------------------------------------------------|
| no      | Disables the gateway indicated by ip and resets the gateway IP address to all zeros (0.0.0.0). |

**Command Modes:**

Configuration Interface Ethernet Management (config-if-mgmt-ethernet) mode.

or

Configuration Interface InfiniBand (config-if-mgmt-ib) mode.

**Privilege Level:**

Unrestricted read-write user.

**Usage Guidelines:**

Ethernet Management:

The Ethernet Management gateway provides a window to the Fabric backplane and expansion modules.

The Ethernet Management gateway port must be enabled and its port IP addresses must be assigned before it may be used to administer the chassis.

The Ethernet Management gateway does not have to be specifically identified, like the gateways of expansion modules. This is because there is only one active Ethernet Management port on the chassis.

InfiniBand Management:

The Management-InfiniBand gateway provides a window to the Fabric backplane and expansion modules that run IP. The Management-InfiniBand gateway and port IP addresses must be assigned before a Fabric port may be used to administer the chassis.

The Management-InfiniBand gateway does not have to be specifically identified, like the gateways of expansion modules. This is because there is only one active Management-InfiniBand port on the chassis.

You must configure the Management-InfiniBand port through the serial-console terminal.

**Examples:**

The following example shows the gateway command for the Ethernet management interface.

```
HP-IB# configure
HP-IB(config)# interface mgmt-ethernet
HP-IB(config-if-mgmt-ethernet)# gateway 10.3.0.94
```

The following example shows the ip address command in the InfiniBand management interface.

```
HP-IB# configure
HP-IB(config)# interface mgmt-ib
HP-IB(config-if-mgmt-ib)# gateway 10.3.0.94
```

**Defaults:**

The default gateway IP address is 0.0.0.0.

**Related Commands:**

“interface mgmt-ib” on page 269

“show interface mgmt-ethernet” on page 202

“show interface mgmt-ib” on page 204

## help

**Synopsis:**

The help command describes the types of help information available and ways to display specific command-line information.

**Syntax:**

```
help
```

**Command Modes:**

All modes.

**Privilege Level:**

All users.

**Usage Guidelines:**

This command may be executed in any mode. It provides the methods for you to display the various types of available help.

**Examples:**

```
HP-IB(config-if-ib-16/1-16/12)# help
```

Help may be requested at any point in a command by entering a question mark '?'. If nothing matches, the help list will be empty and you must backup until entering a '?' shows the available options.

Two styles of help are provided:

1. Full help is available when you are ready to enter a command argument (e.g. 'show ?') and describes each possible argument.
2. Partial help is provided when an abbreviated argument is entered and you want to know what arguments match the input (e.g. 'show pr?'.)

```
HP-IB(config-if-ib-16/1-16/12)#
```

**Defaults**

This command has no defaults.

**Related Commands:**

None

**history**

**Synopsis:**

The history command lists all the commands executed during the current CLI session.

**Syntax:**

history

**Command Modes:**

All modes.

**Privilege Level:**

All users.

**Usage Guidelines:**

The format of the history output and a configuration file are similar. The contents of the history may be cut-and-pasted to a text file and, with minor editing, used as a configuration file.

This is a global command that may be executed in any mode. To display just one screen of history data at a time, set the terminal display length.

**Examples:**

```
HP-IB(config)# history
 1 history
 2 enable
 3 config
 4 arp
 5 boot-conf
 6 boot-config
 7 diagn
 8 interface ib all
 9 exit
10 interface ethernet all
11 ip
12 history
HP-IB(config)#
```

**Defaults:**

This command has no defaults.

**Related Commands:**

“copy” on page 252

“telnet” on page 282

“show system-services” on page 217

**hostname**

**Synopsis:**

The hostname command assigns a name to the system.

**Syntax:**

hostname name

**Table B-69 hostname Command Argument Description**

| Argument | Description                    |
|----------|--------------------------------|
| name     | Name you assign to the system. |

**Command Modes:**

Global-configuration mode.

**Privilege Level:**

Unrestricted read-write user.

**Usage Guidelines:**

The hostname is used as part of the contact information and as the CLI prompt. It is also the system network-name. The assigned hostname may be used to establish DNS connections to the chassis. The name you enter must adhere to standard IP networking rules.

This command changes the CLI prompt. The new hostname is applied immediately, however, the prompt does not change until you change modes. For example, the prompt changes when you exit the global-configuration mode.

**Examples:**

```
HP-IB(config)# hostname samplename
HP-IB(config)# exit
samplename# config
```

**Defaults:**

This command has no defaults.

**Related Commands:**

“ip name-server-one” on page 231

“show version” on page 224

## install

### Synopsis:

The install command installs a downloaded system-image to the appropriate locations. The administrator must then specify which system-image to use to boot the chassis, and reload the chassis.

### Syntax:

```
install image:file
```

**Table B-70** install Command Argument Descriptions

| Argument | Description                                          |
|----------|------------------------------------------------------|
| image    | Specifies the file resides in the image file-system. |
| file     | The name of the image file to install.               |

Image files must reside in the image file-system and the file name must have the .img extension.

### Command Modes:

Privileged-execute mode.

### Privilege Level:

Unrestricted read-write user.

### Usage Guidelines:

After downloading the image file to the chassis controller, it must be installed. The CLI install command performs everything necessary to install a new system-image to flash disk. It automatically installs all necessary firmware and component images. Once installed, the administrator must reinitialize the chassis using the newly installed system-image.

Run the boot-config command to specify the new system-image to use to initialize the chassis when it boots up.

Only cards with an oper-status of up are updated. If a card is down when you run install, or a card is added after running install, bring up the card and run install again. Specify the same image file. If the image is already installed on a card, that card is skipped. Run the boot-config command again so that all cards know to boot from the same system-image.

### Examples:

```
HP-IB# install image:HP-AB291A-Release-1.1.3hp-build020.img Proceed with install?  
[yes(default) | no]  
***** operation completed successfully
```

### Defaults:

This command has no defaults.

### Related Commands:

“boot-config” on page 248

“card” on page 250

“show boot-config” on page 134

“show card” on page 136

## interface

### Synopsis:

The interface command is used to enter a sub-command mode in which to configure Fabric interface cards, as well as chassis management connections.

### Syntax:

interface {type}

The interface sub-commands are listed in the table below.

**Table B-71 interface Command Keywords**

| Keyword       | Description                                                                                                                                                                                                                                                                                                                                             |
|---------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ib            | Enters interface mgmt-ib submode.<br>Configures the Fabric interface. See “HP Fabric Clustering System Commands” on page 235 for a description of HP Fabric Clustering System configuration commands.                                                                                                                                                   |
| mgmt-ethernet | Enters interface mgmt-ethernet submode.<br>The interface mgmt-ethernet command is used to enable and configure the IP addresses for the port and gateway of the out-of-band Ethernet port used to administer the the system chassis.<br>Configures the out-of-band Ethernet management port used to administer the chassis. See “interface” on page 267 |
| mgmt-ib       | Configures in-band Fabric management port used to administer the chassis. See “interface mgmt-ib” on page 269                                                                                                                                                                                                                                           |

### Command Modes:

Privileged-execute mode.

### Privilege Level:

Unrestricted read-write user.

### Usage Guidelines:

The `no gateway ip` command configures the default gateway IP address of the out-of-band Ethernet Management port.

Using the `no` keyword disables the gateway indicated by `ip` and resets the gateway IP address to all zeros (0.0.0.0).

The `help` command displays the command help. See “gateway” on page 261

The `history` command displays all the commands executed during the current CLI session. See “history” on page 264

**Administrative Commands**

`no ip address ip` configures the IP address of the out-of-band Ethernet port. A static address that will be used by hosts on the network to connect to the Ethernet Management port. Once enabled, hosts on the network use this address to run CLI, Element Manager, and SNMP software. `mask` is the subnet mask for the IP address (Element Manager GUI is not supported in initial release of HP Fabric Clustering System).

The Ethernet Management port must be enabled and its IP and gateway addresses must be assigned before it may be used to run the CLI or Element Manager. Some gateway functions are not supported by HP Fabric Clustering System; Element Manager GUI is not supported in initial release of HP Fabric Clustering System.

The Ethernet Management port does not have to be specifically identified, like the ports of expansion modules. This is because there is only one active Ethernet Management port on the chassis.

Use `no shutdown` to disable/enable the Ethernet Management port.

**Related Commands:**

“boot-config” on page 248

“card” on page 250

“interface ib” on page 241

**interface mgmt-ethernet****Synopsis:**

The `interface mgmt-ethernet` command enables and configures the IP addresses for the port and gateway of the out-of-band Ethernet port, which is used to administer the chassis.

**Syntax:**

```
interface mgmt-ethernet
```

**Command Modes:**

Configuration Interface Ethernet Management mode (`config-if-mgmt-ether`).

**Privilege Level:**

Unrestricted read-write user.

**Usage Guidelines:**

Entering this command puts you in the Interface configuration Ethernet Management mode.

The Ethernet Management port must be enabled and its IP and gateway addresses must be assigned before it may be used to run the CLI or Element Manager; Element Manager GUI is not supported in initial release of HP Fabric Clustering System.

The Ethernet Management port does not have to be specifically identified, like the ports of expansion modules. This is because there is only one active Ethernet Management port on the chassis.

Use the `gateway ip` command after this command to configure the IP address of the gateway for the Ethernet Management port. The `no gateway ip` command configures the default gateway IP address of the out-of-band Ethernet Management port (some gateway functions are not supported by HP Fabric Clustering System).

Use the `shutdown` command on the line following this command to shutdown the ethernet management port. Follow this command with `no shutdown` to enable the ethernet management port.

**Example:**

```
HP-IB# configure
HP-IB(config)# interface mgmt-ethernet
HP-IB(config-if-mgmt-ethernet)# ip address 10.3.106.25
255.255.255.0
```

**Related Commands:**

- “ip” on page 270
- “shutdown” on page 244
- “show interface mgmt-ethernet” on page 202
- “show interface mgmt-ib” on page 204

**interface mgmt-ib**

**Synopsis:**

The interface mgmt-ib command is used to enable and configure the IP addresses for the virtual port and gateway on the fabric. Once configured, hosts connected to any HP Fabric Clustering System Switch port that run IPoIB may use the port and gateway to administer the chassis.

**Syntax:**

```
interface mgmt-ib
```

**Command Modes:**

- Privileged-execute mode.
- Configuration Interface Management IB mode (config-if-mgmt-ib).

**Privilege Level:**

Unrestricted read-write user.

**Usage Guidelines:**

Use this command to enter the Configure IB Management mode, which will enable you to connect you to control the virtual port and gateway of the fabric (some gateway functions are not supported by HP Fabric Clustering System).

The Management-InfiniBand port provides Telnet, SSH, and Element Manager access from HP Fabric Clustering System hosts running IPoIB that are connected to any of the fabric ports on the HP Fabric Clustering System interface (Element Manager GUI is not supported in the HP Fabric Clustering System initial release).

The Management-InfiniBand port assignment is recognized throughout the entire fabric. Any HP Fabric Clustering System host connected to any HP Fabric Clustering System interface port may access the Management-InfiniBand port. Connected hosts may be disconnected and then reconnected to any other HP Fabric Clustering System interface port without having to redefine the Management-InfiniBand port.

One Management-InfiniBand port may be assigned. The Management-InfiniBand interface must be configured before you can use it.

**Administrative Commands**

Use the `gateway` command after this command to configure the IP address of the gateway for the Ethernet Management port. The `no gateway ip` command configures the default gateway IP address of the out-of-band Ethernet Management port (some gateway functions are not supported by HP Fabric Clustering System).

---

**NOTE** You must configure the Management-InfiniBand port through the serial-console terminal.

---

**Example:**

```
HP-IB# configure
HP-IB(config)# interface mgmt-ib
HP-IB(config-if-mgmt-ib)# gateway 10.3.0.94
```

**Related Commands:**

“ip” on page 270

“interface ib” on page 241

“ip” on page 270

“show interface mgmt-ethernet” on page 202

“show interface mgmt-ib” on page 204

**ip****Synopsis:**

The `ip` command configures the IP address and subnet mask for a virtual in-band Fabric port.

**Syntax:**

```
ip ip mask
```

```
no ip ip mask
```

`ip` is a static address that will be used by HP Fabric Clustering System hosts running IPoIB to connect to the virtual Management-InfiniBand port. Once enabled, hosts on the network use this address to run CLI, Element Manager, and SNMP software, as well as other connected hosts running IP or IPoIB. `mask` is the subnet mask for the IP address (Element Manager GUI is not supported in initial release of HP Fabric Clustering System).

`no ip address` disables the management port indicated by `ip` and resets its IP address to all zeros (0.0.0.0).

**Command Modes:**

InterfaceConfiguration (config) mode.

Configuration Interface Management IB mode (config-if-mgmt-ib).

Configuration Interface Ethernet Management mode (config-if-mgmt-ether).

**Privilege Level:**

Unrestricted read-write user.

**Usage Guidelines:**

The Management-InfiniBand IP and gateway addresses must be assigned before the virtual port may be used to administer the the system chassis or be accessed by other hosts running IP or IPoIB. Hosts with connectivity to management ports may manage the chassis using Telnet, SSH, or the Element Manager, if they have access to the same subnet (some gateway functions are not supported by HP Fabric Clustering System; Element Manager GUI is not supported in initial release of HP Fabric Clustering System).

The Management-InfiniBand port does not have to be specifically identified, like the ports of expansion modules. This is because there is only one active Management-InfiniBand port on the chassis.

You must configure the Management-InfiniBand port through the serial-console terminal.

**Examples:**

```
HP-IB# configure
HP-IB(config)# interface mgmt-ib
HP-IB(config-if-mgmt-ib)# ip address 10.3.106.25 255.255.255.0
```

**Defaults:**

This command has no defaults.

**Related Commands:**

- “interface mgmt-ib” on page 269
- “interface mgmt-ethernet” on page 268
- “ip” on page 270
- “show interface mgmt-ethernet” on page 202
- “show interface mgmt-ib” on page 204

**location**

**Synopsis:**

The location command is used to assign a human-readable identifier to the system chassis. This location may be the location of support providers, the company, the system chassis, etc.

**Syntax:**

```
location string
no location
```

The syntax is described in the table below:

**Table B-72 location Syntax Descriptions**

| Argument | Description                                                                           |
|----------|---------------------------------------------------------------------------------------|
| string   | refers to an ASCII text string. Enclose multi-word strings within double-quotes (“”). |
| no       | The no location command resets the current location to an empty string.               |

**Command Modes:**

Global-configuration mode.

**Privilege Level:**

Unrestricted read-write user.

**Usage Guidelines:**

The location command and the snmp-server location configuration command have the same effect. They both configure the same location parameter.

**Examples:**

```
HP-IB# config
HP-IB(config)# location "515 Ellis Street, Mountain View, CA 94043"
```

**Defaults:**

This command has no defaults.

**Related Commands:**

- “snmp-server” on page 281
- “show location” on page 208
- “show version” on page 224

## login

**Synopsis:**

The login command is used to change user identity during a CLI session.

**Syntax:**

```
login user
```

**Command Modes:**

User-execute and privileged-execute modes.

**Privilege Level:**

All users.

**Usage Guidelines:**

The login command allows you to assume the identity of another user without having to exit the CLI.

**Examples:**

```
HP-IB> login super
Password: xxxxxx
HP-IB>
```

**Defaults:**

This command has no defaults.

**Related Commands:**

“username” on page 286

“show user” on page 222

## logging

**Synopsis:**

The logging command configures the active system log file in which the warnings, errors, notifications, alerts, etc. are recorded.

**Syntax:**

```
logging host ip address
```

**Command Modes:**

User-execute and privileged-execute modes.

**Privilege Level:**

All users.

**Usage Guidelines:**

Warnings, errors, notifications, alerts, etc. occur once the system is successfully booted.

**Examples:**

```
HP-IB(config)# logging 10.3.0.600
```

```
HP-IB(config)#
```

**Defaults:**

This command has no defaults.

**Related Commands:**

“show logging” on page 209

“terminal length” on page 282

“snmp-server” on page 281

“show snmp” on page 216

## logout

**Synopsis:**

The logout command ends the current CLI session.

**Syntax:**

logout

**Command Modes:**

User-execute and privileged-execute modes.

**Privilege Level:**

All users.

**Usage Guidelines:**

The logout command ends the current CLI session. If logged in through the serial-console port, the CLI login prompt is displayed. If logged in through a Telnet connection, the Telnet session is also terminated and you are returned to your operating system.

**Examples:**

```
HP-IB# logout
```

```
HP-IB#
```

```
Connection to host lost.
```

**Defaults:**

This command has no defaults.

**Related Commands:**

“exit” on page 259

“login” on page 272

**more**

**Synopsis:**

The more command displays text data on the terminal screen for a stored log or configuration file.

**Syntax:**

```
more fs:file
```

fs is the file-system that contains the file. The file-system may be config or syslog. You cannot display image file data or compressed system log files. Only the currently active log file, ts\_log, may be viewed.

**Command Modes:**

Privileged-execute mode.

**Privilege Level:**

General read-write user.

### Usage Guidelines:

The more command is used to display text data resident on the chassis in increments determined by the terminal length command.

The specified file-system must be appropriate for the file. See also the “dir” command to list the names of files in the respective file-systems.

Press any key (except “q” or “Q”) to display the next screen of text lines.

### Examples:

```
HP-IB# more config:sup-config
! Release-1.1.3hp/build023
! Mon Jan 12 19:49:38 2003
enable
config terminal
```

The lines beginning with an exclamation point (!) are comments ignored when the configuration file is executed.

### Defaults:

This command has no defaults.

### Related Commands:

“dir” on page 255

“telnet” on page 282

## ntp

### Synopsis:

The ntp configuration commands specify the NTP servers to use to set and synchronize the system clock.

### Syntax:

```
ntp [server-one ip-address | server-two ip-address | server-three ip-address]
```

```
no ntp [server-one | server-two | server-three]
```

ip is the IP address of an NTP server. no ntp resets the specified server to all zeros (0.0.0.0).

### Command Modes:

Global-configuration mode.

### Privilege Level:

Unrestricted read-write user.

### Usage Guidelines

The NTP server indicated by the server-one argument is the primary server that is checked first. The NTP server indicated by the server-two argument is the secondary server that is used in the event sever-one is not available. And server-three is the fallback in the event server-two is also unavailable. When using NTP, secondary and tertiary server configurations are not required but are recommended.

If you use NTP servers to set the system clock, there is no need to set it manually with the clock command. The system clock is initialized and reset by the NTP servers. You may specify up to three NTP servers.

**Examples:**

```
HP-IB(config)# ntp server-one 10.0.3.110
HP-IB(config)# ntp server-two 10.0.3.111
HP-IB(config)# ntp server-three 10.0.3.112
```

**Defaults:**

This command has no defaults.

**Related Commands:**

“clock” on page 250  
“show clock” on page 142  
“show ntp” on page 211

## ping

**Synopsis:**

Use the ping command to verify if a host can be reached from the system.

**Syntax:**

```
ping dest
```

dest is the IP address or DNS name of the host, port, or expansion module you wish to ping.

**Command Modes:**

User-execute and privileged-execute modes.

**Privilege Level:**

General read-only user.

**Usage Guidelines:**

You may ping between connected Ethernet and HP Fabric Clustering System hosts, to the system Ethernet Management port, gateway ports, and expansion modules (some gateway functions are not supported by HP Fabric Clustering System).

The reply packet tells you if the host received the ping and the amount of time it took to return the packet.

A DNS server must be configured on the network for you to use DNS names.

**Examples:**

```
HP-IB# ping 10.3.102.24
Sending 5 ICMP Echoes to 10.3.102.24, 56 data bytes
!!!!
Success rate is 100 percent (5/5)
```

```
round-trip min/avg/max = 0.000000/0.000000/0.000000 ms
```

HP-IB#

**Defaults:**

This command has no defaults.

**Related Commands:**

“hostname” on page 265

## radius-server

**Synopsis:**

The radius-server command configures a radius-server.

**Syntax:**

```
radius-server {host ip address}
```

**Table B-73 radius-server Syntax Descriptions**

| Syntax     | Description                                                         |
|------------|---------------------------------------------------------------------|
| host       | Enter this keyword before the ip address of the radius-server.      |
| ip address | Enter the ip address of the radius-server that is to be configured. |

**Command Modes:**

Privileged-execute mode.

**Privilege Level:**

General read-write user.

**Usage Guidelines:**

None.

**Examples:**

```
HP-IB> enable
```

```
HP-IB# config
```

```
HP-IB(config)# radius-server host 10.5.0.100
```

**Defaults:**

This command has no defaults.

**Related Commands:**

“clock” on page 250

“snmp-server” on page 281

## reload

### Synopsis:

The reload command reboots the chassis.

### Syntax:

```
reload
```

### Command Modes:

Privileged-execute mode.

### Privilege Level:

General read-write user.

### Usage Guidelines:

At stages of chassis and interface setup you need to reinitialize chassis firmware or restore interface card configurations. You may power-cycle by unplugging and replugging the electrical cord to the system chassis but this approach is not recommended. The reload command is recommended because it allows the chassis to close files and prepare for shutdown. reload brings down the entire system chassis and restarts all the cards in the chassis.

The system prompts for you to verify the reload. If you had not already saved configuration changes, and the system detects the changes, it prompts you to save. If you enter yes, the new configuration is stored in startup-config. You may optionally save the configuration to an alternate file by entering the file name, followed by a carriage-return.

The system reinitializes itself and then loads the system-image and the startup-config file. Wait a few minutes and attempt to log onto the chassis.

### Examples:

```
HP-IB# reload
System configuration has been modified. Save?
[yes(default)/no/*.cfg] yes
Proceed with reload? [confirm]
HP-IB#
Connection to host lost.
#
```

### Defaults:

This command has no defaults.

### Related Commands:

“boot-config” on page 248

“broadcast” on page 249

“install” on page 266

“who” on page 289

“show boot-config” on page 134

## shutdown

### Synopsis:

The shutdown command enables or disables a specific interface card in the system chassis.

The shutdown command enables or disables the Ethernet Management port.

The shutdown command enables or disables the Management-InfiniBand port.

### Syntax:

```
shutdown
```

```
no shutdown
```

### Command Modes:

Configuration Card (config-card) mode.

### Privilege Level:

Unrestricted or card-specific read-write user.

### Usage Guidelines:

Enabling/Disabling a card:

A card must be enabled, or brought up, before it can be configured. Enter this command after the card type command to bring up each card in the chassis. You may enter this command at any time to disable a card while in the current configuration mode.

When an interface card is placed out-of-service, the power is turned off for that card and it no longer processes packets. The system-image resident on the card cannot be deleted or updated when the card is down. Unless you have cause to do otherwise, make sure all the expansion modules and switch cluster connections are up before attempting to update the system-image.

Enabling/Disabling the Ethernet Management Port:

Note: The Ethernet Management port must be enabled, or brought up, before it can be configured. Enter this command before assigning the port IP and gateway addresses (some gateway functions are not supported by HP Fabric Clustering System).

The Ethernet Management port does not have to be specifically identified, like the ports of expansion modules. This is because there is only one active Ethernet Management port on the chassis.

When the Ethernet Management port is disabled, its current configuration remains intact. If there are problems configuring the Ethernet Management port, first check that the admin-status field in show interface mgmt-ethernet output is set to up.

Enabling/Disabling the Management-InfiniBand port:

The Management-InfiniBand port provides Telnet, SSH, and Element Manager access from HP Fabric Clustering System hosts running IPoIB that are connected to any of the HP Fabric Clustering System ports on the system HP Fabric Clustering System interface (Element Manager GUI is not supported in the HP Fabric Clustering System initial release).

**Administrative Commands**

The interface `mgmt-ib` command is used to enable and configure the IP addresses for the virtual port and gateway on the fabric. Once configured, hosts connected to any HP Fabric Clustering System switch port that run IPoIB may use the port and gateway to administer the system chassis (some gateway functions are not supported by HP Fabric Clustering System).

The Management-InfiniBand port assignment is recognized throughout the entire fabric. Any HP Fabric Clustering System host connected to any HP Fabric Clustering System interface port may access the Management-InfiniBand port. Connected hosts may be disconnected and then reconnected to any other HP Fabric Clustering System interface port without having to redefine the Management-InfiniBand port.

One Management-InfiniBand port may be assigned. The Management-InfiniBand interface must be configured before you can use it.

You must configure the Management-InfiniBand port through the serial-console terminal.

**Examples:**

The following example shows enabling interface card 12.

```
HP-IB# config
HP-IB(config)# card 12
HP-IB(config-card-12)# no shutdown
HP-IB(config-card-12)#
```

**The following example shows enabling the interface Management Ethernet port.**

```
HP-IB# configure
HP-IB(config)# interface mgmt-ethernet
HP-IB(config-if-mgmt-ethernet)# no shutdown
```

The following example shows enabling the interface Management IB port.

```
HP-IB# configure
HP-IB(config)# interface mgmt-ib
HP-IB(config-if-mgmt-ib)# no shutdown
```

**Defaults:**

This command has no defaults.

**Related Commands:**

“show card” on page 136

“card” on page 250

“show interface mgmt-serial” on page 205

“interface mgmt-ib” on page 269

“interface mgmt-ethernet” on page 268

## snmp-server

### Synopsis:

The snmp-server command lets you set contact, location, and SNMP trap receiver information.

### Syntax:

```
snmp-server [contact contact-string | host dest community-string | location location-string]
no snmp-server
```

**Table B-74 snmp-server Command Keyword Descriptions**

| Keyword  | Description                                                                                                                                                                         |
|----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| contact  | The snmp-server contact command sets the contact information for this managed node. Specifies contact information that is included when displaying the chassis version information. |
| host     | Configures the SNMP server to receive linkUp/linkDown SNMP traps.                                                                                                                   |
| location | Specifies the location of the chassis that is included when displaying the chassis version information.                                                                             |

**Table B-75 snmp-server Command Argument Descriptions**

| Argument         | Description                                                                                                                                                                                                                                     |
|------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| contact-string   | String is an ASCII text string. Enclose multi-word strings within double-quotes (“”). The no snmp-server contact command resets the current contact information to an empty string.                                                             |
| dest             | IP address or DNS name of the SNMP server.                                                                                                                                                                                                      |
| community-string | Community string to use to authenticate the system chassis to the SNMP server. Enclose multi-word strings within double-quotes. The no snmp-server host command resets the SNMP trap receiver information to an empty string.                   |
| location-string  | The SNMP community-string that will be used to authenticat ethe chassis to the SNMP server. Enclose multi-word community strings withint double-quotes. the no snmp-server host command resets the current host information to an empty string. |

### Command Modes:

Global-configuration mode.

### Privilege Level:

Unrestricted read-write user.

### Usage Guidelines:

The snmp-server contact string is displayed by viewing system version or SNMP information.

The snmp-server host string is displayed by viewing using the show snmp command.

The snmp trap receiver must be configured to recognize the specified location community string.

### Examples:

```
HP-IB0(config)# snmp-server contact "support@hp.com"
```

## Administrative Commands

```
HP-IB(config)# snmp-server host 10.3.106.99 secret
```

```
HP-IB(config)# snmp-server host 10.3.106.99 secret
```

### Related Commands:

“gateway” on page 261

“radius-server” on page 277

“ntp” on page 275

“location” on page 271

## telnet

### Synopsis:

The telnet command allows you to enable or disable access to telnet services.

### Syntax:

```
telnet enable
```

```
telnet disable
```

### Command Modes:

Privileged-execute modes.

### Privilege Level:

General read-only user.

### Usage Guidelines:

### Examples:

```
HP-IB(config)# telnet enable
```

### Defaults:

Telnet access is enabled by default.

### Related Commands:

“show system-services” on page 217

“ftp-server enable” on page 260

## terminal length

### Synopsis:

The terminal length command sets the number of lines displayed at one time by commands like more so that data does not scroll quickly out of view.

**Syntax:**

```
terminal length int
```

```
terminal no length
```

int is a number between 0 and 512 that indicates the number of lines to display at one time.

0 turns off paging and displays data on the screen without stopping until completed. It is recommended you set the terminal page length to 0 when using the tail command with the end argument. Otherwise, you will have to keep pressing the <space> bar to continue each time the maximum display length is reached. no length resets the terminal length to the default.

**Command Modes:**

User-execute and privileged-execute modes.

**Privilege Level:**

General read-only user.

**Usage Guidelines:**

The number of lines specified only applies to the current CLI session. Other users are unaffected by changes to the display length.

If you set the page length to 0 to disable paging, do not change the terminal window size. Changing window size restores the terminal length to that of the window and re-enables paging.

**Examples:**

```
HP-IB# terminal length 66
```

**Defaults:**

The default is 24 lines per screen.

**Related Commands:**

“more” on page 274

“show logging” on page 209

“show system-services” on page 217

**terminal time-out****Synopsis:**

The terminal time-out command sets a limit for inactivity allowed during a CLI session.

**Syntax:**

```
terminal time-out int
```

```
terminal no time-out
```

int is a number between 1 and 100000 that indicates the number of minutes of inactivity allowed before automatically closing the CLI session. no timeout resets the session limit for inactivity to the default.

**Command Modes:**

User-execute and privileged-execute modes.

**Privilege Level:**

General read-write user.

**Usage Guidelines:**

Changes to this parameter are applied immediately to all users, whether logged in now or who log in later. Note that system time-outs may still apply if you are using Telnet or SSH to connect to the system.

**Examples:**

```
HP-IB# terminal time-out 60
```

**Defaults:**

The default time-out interval is 15 minutes.

**Related Commands:**

“show system-services” on page 217

**trace**

**Synopsis:**

The trace command tracks internal system program modules that are called for a specific interface card. This feature is intended primarily for program debug under the direction of Support personnel.

**Syntax:**

```
trace app app module mod level lev flowmask val card card
```

app is an integer indicating the internal application to trace.

mod is the program module in side the application.

lev is the verbosity of the trace information returned.

val is a decimal or hex value.

card is the slot number of the card being traced.

**Command Modes:**

Global-configuration mode.

**Privilege Level:**

General read-write user.

**Usage Guidelines:**

The number of applications and modules may change between releases. The numbers assigned to applications and modules may also change. Check application and module number assignments using CLI help (i.e.,?) before executing this command, as shown in the example below.

**Examples:**

```
HP-IB(config)# trace app ?
app <1-25>
app numbers:
APP_ID_CLI           = 1
APP_ID_OSPF          = 2
APP_ID_RIP           = 3
...
...
APP_ID_IP_AGENT      = 22
APP_ID_FIB_AGENT     = 23
APP_ID_KERNEL        = 24
APP_ID_CARD_AGENT    = 25
APP_ID_SM             = 26
HP-IB(config)# trace app 4 module 36 level very-verbose flowmask 0x12 card 2
```

**Defaults:**

This command has no defaults.

**Related Commands:**

“show trace” on page 220

**type**

**Synopsis:**

The type command defines the type of gateway or switch cluster connection being configured.

**Syntax:**

type type

**Table B-76**      **type Command Argument**

| Argument | Description                                                                                                                                                               |
|----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| type     | type may be one of the following: <ul style="list-style-type: none"> <li>• controllerIb12port4x (90-only controller)</li> <li>• ib12port4x (12-port 4X Fabric)</li> </ul> |

**Command Modes:**

Configuration Card (config-card) mode.

**Privilege Level:**

Unrestricted or card-specific read-write user.

**Usage Guidelines:**

The card type must be specified before it may be enabled.

**Examples:**

HP-IB Example:

```
HP-IB(config-card-2)# type en4port1G
```

**Defaults:**

Fabric switch cluster connection type does not have to be specified because it is automatically detected and configured when the system boots up.

**Related Commands:**

“shutdown” on page 279

“show card” on page 136

**username**

**Synopsis:**

The username command is used to create and manage administrative access to both CLI, GUI, and SNMP (Element Manager GUI is not supported in initial release of HP Fabric Clustering System).

**Syntax:**

```
username user password passwd <-- must be executed 1st
```

```
username user no
```

```
username user disable
```

```
username user enable
```

```
username user community-string string
```

```
username user no-community-string
```

```
username user privilege priv1 [priv2] [priv3]
```

user and passwd are alphanumeric strings up to 34 characters each.

The privilege argument removes all existing privileges, and replaces them with them with the new ones.

**Command Modes:**

Global-configuration mode.

**Privilege Level:**

Unrestricted read-write user or general read-write user (change own password only).

**Usage Guidelines:**

The username command is used to:

Create and remove user accounts. The default CLI user accounts are guest, admin, and super.

Change user password. A user with read-write access may change their own password.

Assign access levels based upon functional areas, such as Fibre Channel, Ethernet, and HP Fabric Clustering System administrative areas. Access levels may be unrestricted or read-only or read-write for the various administrative areas. Unrestricted is the equivalent to the superuser.

Enable or disable the account.

Associate user accounts with SNMP community strings. This community string is also used as the password for Element Manager access (Element Manager GUI is not supported in initial release of HP Fabric Clustering System).

The user account must be created using the password argument before any other user configuration is allowed.

The default unrestricted username for the CLI is super and the default password is super. SNMP community strings provide the user credentials necessary to access Management Information Base (MIB) objects. The default community-string assigned to the unrestricted user for the Element Manager is secret (Element Manager GUI is not supported in initial release of HP Fabric Clustering System).

One unique community string is associated with each username and password. Community strings can be associated with a variety of privilege levels. The user must have an SNMP community string to begin an Element Manager session. If you do not want users to have SNMP access to the system, do not assign them a community string. By default, a new user account has a null or empty community string. Only the unrestricted user may view community strings (Element Manager GUI is not supported in initial release of HP Fabric Clustering System).

Also, SNMP community strings are sent across the network in UDP packets. There is no encryption.

By default, new user accounts have read-only access. You may grant write privileges to a user for functional areas, such as InfiniBand. The privileges are:

- ib-ro (InfiniBand read-only access)
- ib-rw (InfiniBand read-write)
- unrestricted-rw (Read-write access to all network configuration commands).

Privileges are order-dependent. You must enter multiple access privileges in the order shown in the list above. When changing the privileges of an existing user, specify all the privileges allowed to the user (including re-entering existing privileges), because the privilege argument removes all existing privileges and replaces them with them with the new ones.

For security purposes, since multiple users exist on the system, it is highly recommended that you change the default passwords after initial configuration. The default user accounts are listed in the table below.

**Table B-77 Default User Accounts**

| User Name | Password                                                                       | Privilege                                                                                                                                                                                                                                                                                 |
|-----------|--------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| super     | By default, the password is “super”. The default community string is “secret”. | The super user has unrestricted privileges. Use this account to manage any part of the system. This user may view and modify a configuration, as well as administer user accounts and access privileges. This user configures the console and management ports for initial chassis setup. |

**Table B-77 Default User Accounts (Continued)**

| User Name | Password                                                                        | Privilege                                                                                                                                                                                                |
|-----------|---------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| admin     | By default, the password is “admin”. The default community string is “private”. | The admin user has general read-write privileges. This user may view and modify the current configuration. However, the admin user can change only its own user information, such as the admin password. |
| guest     | The default password is “guest”. The default community string is “public”.      | The guest user has read-only privileges. This user may only view the current configuration. The guest user cannot make any changes during the CLI session.                                               |

**Examples:**

The following example creates a user with HP Fabric Clustering System administrative privileges, as well as an SNMP community-string.

```
HP-IB(config)# username ib-admin password ibadmin
HP-IB(config)# username ib-admin community-string ib-commstr
HP-IB(config)# username ib-admin privilege ib-rw
HP-IB(config)# username ib-admin enable
```

```
HP-IB(config)# exit
HP-IB# show user ib-admin
```

```
=====
                        User Information
=====
      username : ib-admin
      password : $1$xMC/.16E$D8ZPG4CqYZNJ7R2AQoTBA1
      snmp-community : ib-commstr
      permission-level : ib-rw
      admin-status : enabled
      num-logins : 0
      num-unsuccessful-logins : 0
      last-login :
      last-unsuccessful-login :
```

The following example disables a user but leaves the user account intact.

```
HP-IB(config)# username ib-admin disable
```

The following example removes a user account.

```
HP-IB(config)# username ib-admin no
```

**Defaults:**

Guest user accounts are disabled by default. All other user accounts are enabled.

**Related Commands:**

“show user” on page 222

## who

**Synopsis:**

The who command lists all the users who are currently logged into the CLI and the host system from which they logged in.

**Syntax:**

```
who
```

**Command Modes:**

User-execute and privileged-execute modes.

**Privilege Level:**

General read-only user.

**Usage Guidelines:**

This command should be used before rebooting the system so you can broadcast a message about impending reboots.

**Examples:**

```
HP-IB# who
super          Console
super          10.10.253.47
admin          10.10.196.8
HP-IB#
```

**Defaults:**

This command has no defaults.

**Related Commands:**

“broadcast” on page 249

“write” on page 290

## write

### Synopsis:

The write command writes a text message to the terminal of a specified user.

### Syntax:

```
write user string
```

user is the name

string is the SNMP community-string that will be used to authenticate the chassis to the SNMP server. Enclose multi-word community strings within double-quotes (“”).

### Command Modes:

User-execute and privileged-execute modes.

### Privilege Level:

General read-only user.

### Usage Guidelines:

This command is used to send messages about administrative functions that are of interest to individual users or an impending reboot if there is only one other user on the chassis.

### Examples:

```
HP-IB# write admin "Please reconnect ib1 to the switch cluster connection."
```

```
HP-IB#
```

### Defaults:

This command has no defaults.

### Related Commands:

“broadcast” on page 249

“who” on page 289

---

## **C How to Use Windows HyperTerminal**

## Attaching through Windows HyperTerminal

You can use Windows HyperTerminal (HyperTerminal) to make an initial connection to the HP Fabric Clustering System Switch to configure TCPIP. This allows you to remotely administer and manage your HP Fabric Clustering System Switch. HP recommends configuring TCPIP on the switch so you can more easily perform firmware updates and to allow for remote HP Support connections to your HP Fabric Clustering System Switch. After TCP/IP is configured on the switch, HyperTerminal should be used only as a backup to access the switch if the LAN is unavailable.

If you are using Windows (95/ 98 /98 SE, Windows 2000, Windows ME, NT4, XP), the HyperTerminal program is included as part of the operating system software bundle.

### HyperTerminal Prerequisite

It may be necessary to install the HyperTerminal component of the operating system software bundle. Follow the instructions below to verify installation. If you need to install the HyperTerminal software, continue on to the HyperTerminal Installation Instructions.

#### Verifying HyperTerminal Installation

Follow these steps to verify that HyperTerminal is installed:

**Step 1.** Click **Start > Run** from the Windows menu bar.

**Step 2.** Type **hypert~~r~~m**.

---

**NOTE** The command ends in “trm”, not “term.”

---

**Step 3.** Click **OK**.

If you receive an error message `Cannot find hypertrm`, you must install HyperTerminal. See instructions below.

#### HyperTerminal Installation Instructions

Follow these steps to install the HyperTerminal software:

**Step 1.** Click **Start > Settings > Control Panel > Add / Remove Programs**.

The **Add / Remove** dialog box should display.

**Step 2.** Select **Properties** and then click the **Windows Setup** tab.

**Step 3.** Double-click **Communications** and check the box for **HyperTerminal**.

**Step 4.** Click **OK**, and then **OK** again to install.

---

**NOTE** You may be asked for your Windows installation disk during this procedure.

---

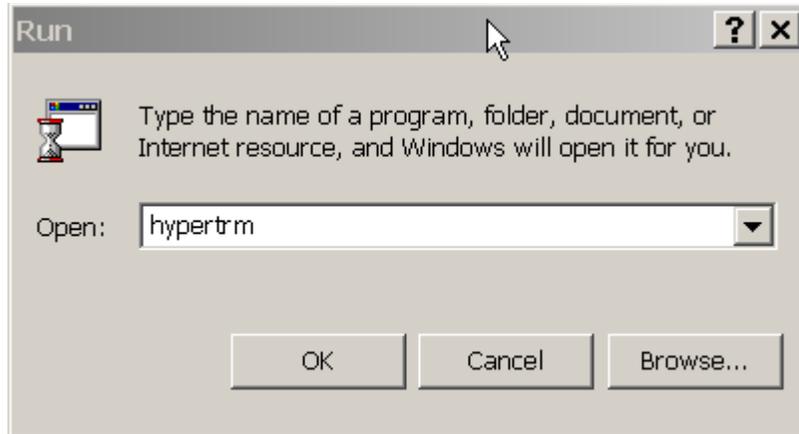
#### Loading HyperTerminal

**Step 1.** Click **Start > Run**.

**Step 2.** Type `hypertrm`.

**Step 3.** Click **OK**.

**Figure C-1** Run Program Dialog Box



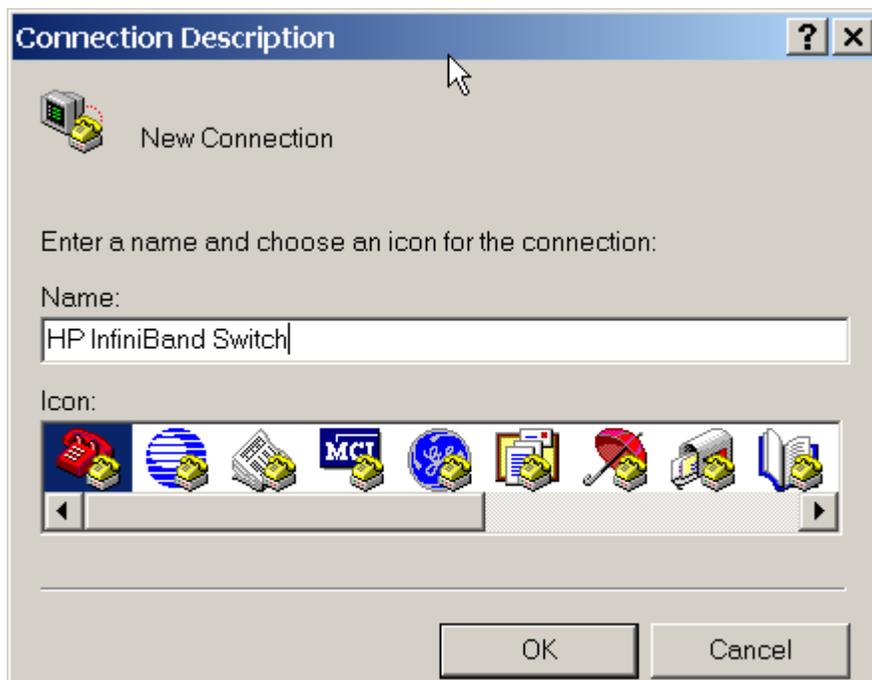
## Configuring the HyperTerminal Connection

When HyperTerminal starts, you are presented with a *Connection Description* dialog box.

**Step 1.** Enter a Connection Description.

1. Type a name for the connection.
2. Choose the appropriate icon for your connection type.
3. Click **OK**.

**Figure C-2** Connection Description Dialog Box



**Step 2.** Enter Connection Details.

You will be presented a *Connect To* dialog box.

1. Specify your **COM Port** in the *Connect Using* section of the dialog box.
2. Click **OK**.

**Figure C-3** Connect To Dialog Box

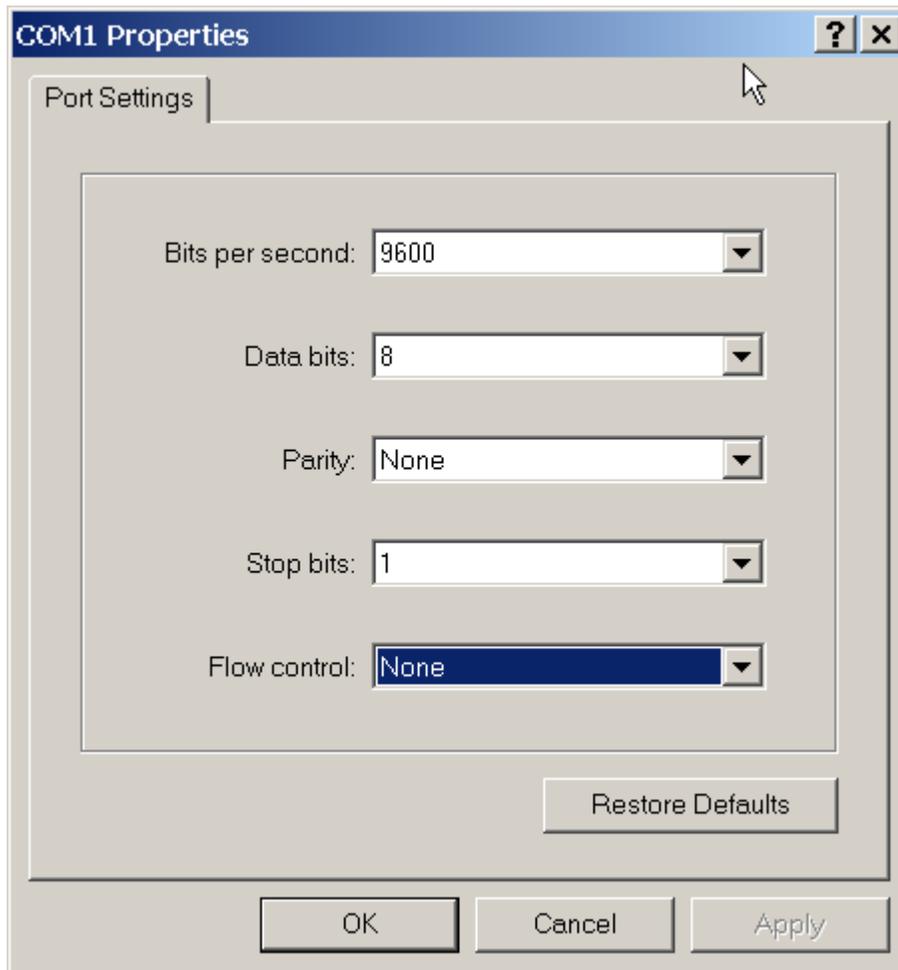


**Step 3.** Enter COM Port Property Information.

The *COM Port Properties* dialog box displays.

1. Enter **Bits per second: 9600**
2. Enter **Data bits: 8**
3. Enter **Parity bits: None**
4. Enter **Stop bits: 1**
5. Enter **Flow control: None**
6. Click **OK**.

**Figure C-4 COM Port Properties Dialog Box**

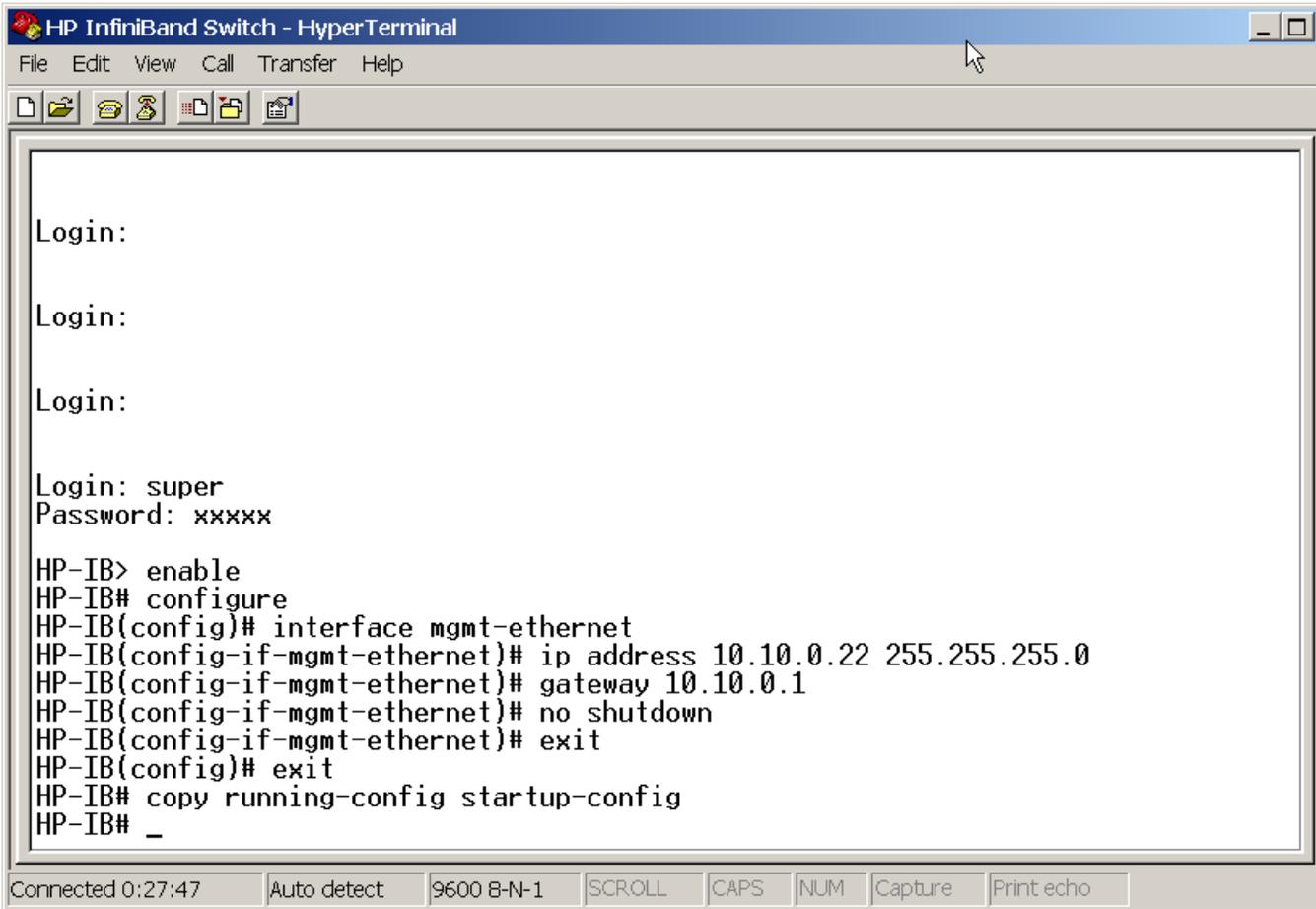


### **Verifying the HyperTerminal Connection**

A blank terminal window will open. You should now be communicating directly between the COMPORT and the switch. To confirm this, press **Return**.

You should see the CLI login prompt.

**Figure C-5** HyperTerminal Login



---

## Glossary

**1X link** – An HP Fabric Clustering System link capable of 2.5 Gb/s in each direction simultaneously. 1X technology is upward compatible with 4X (10Gb/s) and 12X (30 Gb/s) links.

**4X link** - An HP Fabric Clustering System link capable of 10 Gb/s in each direction simultaneously. A 4x link consists of 4 signal pairs, each running at 2.5 Gb/s. 10 Gb/s links are the current level of InfiniBand technology.

**12X link** – An HP Fabric Clustering System link capable of 30 Gb/s in each direction simultaneously. It consists of 12 signal pairs, each running at 2.5 Gb/s. 30 Gb/s technology and is downward compatible with 10 Gb/s (4X). 12x links will become available at the end of 2003

**Agent** A software-driven process running on a communications or networking device that allows that device to participate in a network management system. For example, an SNMP agent running on a router provides the ability for the router to exchange information with an SNMP network management system through the use of the SNMP protocol.

**ARP** Address Resolution Protocol (ARP) maps TCP/IP network addresses to MAC physical addresses. This ensures proper host-IP address routing.

**Base LID** The numerically lowest Local Identifier (LID) for a set of ports on a subnet.

**CA** See Channel Adapter

**Channel Adapter** The Channel Adapter (CA) is the component in an end node that connects to the fabric. A CA is classified as either a Host Channel Adapter (HCA) or a Target Channel Adapter (TCA). See also Host Channel Adapter and Target Channel Adapter.

**CLI** Command Line Interface.

**DMA** Direct Memory Access is an efficient way of transporting data between systems. It allows one system to dump data directly into the memory of another system, thus bypassing the CPU and freeing CPU resources for other uses.

**DTE-DCE** Configures the wiring of the RS-232 port. When DCE (Data Communication Equipment) is selected, data is received on Pin3 and transmitted on Pin2 (DB-9 connector). When DTE (Data Terminal Equipment) is selected, Pin3 is the transmit and Pin2 is the receive.

**FSPF** Fabric Shortest Path First is a popular link-state path-selection protocol. It takes into account the number of switch links, or hops, a connection has to make in selecting a network path. The number of switch links is used to calculate “cost”.

**GID** Group ID (GID) assigned to every Fabric interface port. The 16-byte GID value is unique across the fabric. The GID is the result of a combined GUID and LID. The GID and QPN are used to identify the IPoIB interface at the port. Multiple GIDs may be associated with a single port.

**GUID** Globally Unique Identifier. A number that uniquely identifies a device or component on the network layer. It identifies the target subnet and the port in that subnet. Every channel adapter has a GUID. The GUID and LID result in a Global ID (GID) address in accordance with the IPv6 standard.

**HCA** See Host Channel Adapter

**Host Channel Adapter** Host Channel Adapter modules are a method of supporting HP Fabric Clustering System scalability in the server without redesigning the system motherboard. Fabric HCA modules are similar to Fibre Channel host bus adapters (HBAs) in that they create scalable, extensible connectivity outside the server. In HP Fabric Clustering System configurations, HCAs are used to extend the input/output (I/O) connectivity normally provided by a bus physically located in the server.

**IBML** InfiniBand Management Link. Provides management for multiple InfiniBand modules in a single chassis.

**ICMP** Internet Control-Message Protocol (ICMP) is a message control and error-reporting protocol between a host server and a gateway to the Internet.

**IEC** International Electrotechnical Commission (IEC) assesses international standards and conformity to these standards for all electrotechnology disciplines.

**IETF** Internet Engineering Task Force (IETF) is a large international community of network designers, operators, vendors, and researchers guiding the evolution of Internet architecture. See <http://www.ietf.org/overview.html>.

**IOC** An I/O Controller (IOC) and Target Channel Adapter (TCA) are the parts of an I/O unit. IOCs provide I/O services and TCAs (Target Channel Adapter) provide the transport services. The I/O interface of the TCA is implemented by an I/O Controller.

**IP** Internet Protocol. A layer-3 protocol (transport) that uses a “best effort” approach to delivering datagrams across networks.

**IPoIB** Internet Protocol over InfiniBand.

**IT-API** Interconnect Transport API. A user API for RDMA-capable transports including InfiniBand.

**kernel** The kernel is loaded into RAM when the system boots, and contains many critical procedures that are needed for the system to operate. The essential shape and capabilities of the system are determined by the kernel, which can also be referred to as the Operating System (OS).

**LID** Local Identifier.

**MAC** The Media Access Control (MAC) address is a unique hardware number. On an Ethernet LAN, it is the same number as your Ethernet address. When a host is connected to the Internet, a correspondence table relates the IP address to your computer's physical (MAC) address on the LAN. The MAC address is used by the Media Access Control sublayer of the Data-Link Layer (DLC) layer of telecommunication protocol. There is a different MAC sublayer for each physical device type. The other sublayer level in the DLC layer is the Logical Link Control sublayer.

**MAD** Management Datagram.

**ICAST** Multicast message forwarding method that simultaneously transmits messages to multiple ports on a fabric.

**MIB** The Management Information Base (MIB) defines the logical and physical characteristics of a system. The “objects” in a MIB determine SNMP agent characteristics.

**MPI** Message Passing Interface (MPI) is used in computing clusters to provide high-speed and scalable networks. A widely used set of standards for message passing that emphasize portability and ease-of-use; common in High Performance Computing (HPC) applications.

**NIC** Network Interface Card.

**NTP** Network Time Protocol (NTP) synchronizes the clocks of networked computer systems. It synchronizes system clocks to Universal Time (UTC) for millisecond and sub-millisecond accuracy.

**OSI** Open System Interconnection.

**OSPF** Open Shortest Path First (OSPF) is a router protocol preferred in larger autonomous system networks over the Routing Information Protocol (RIP). (RIP is a legacy protocol generally running on older corporate networks.)

**PPP** Point-to-Point Protocol (PPP) is a layer-2 (data-link layer) service that runs IP across a serial connection between two systems.

**Protocol Stack** A layered set of protocols that work together to provide a set of network functions. Each intermediate protocol layer uses the layer below it to provide a service to the layer above.

**QoS** Quality of Service.

**RARP** Reverse Address Resolution Protocol (RARP) allows a LAN system to query a gateway server for its IP address. The gateway server uses the MAC address of the requestor to locate the IP address in the ARP table and returns the IP address to the requestor. This is typically used to setup new systems.

**RDMA** Remote Direct Memory Access (RDMA) allows a network adapter, with the remote application's permission, to move data into and out of the application's buffers. It is typically used by Fibre Channel devices for block storage transfers, clustering applications, and InfiniBand.

**RED** Random Early Detection (RED) is an algorithm to monitor traffic load at points in the network and stochastically discard packets as network congestion increases.

**RIP** Routing Information Protocol.

**Service Level** Used for Quality of Service (QoS), a Service Level (SL) specifies the desired service level desired within a subnet. Service Levels are mapped to Virtual Lane.

**SM** The Subnet Manager (SM) configures and manages routers, switches, and channel adapters. Multiple subnet managers per subnet are supported.

**SMP** Subnet Management Packet (SMP) on the fabric.

**SNMP** Simple Network Management Protocol (SNMP) lets a user define management information base (MIB) extensions. SNMP agents access MIB objects when requested by an SNMP Manager.

**Target Channel Adapter** The Target Channel Adapter (TCA) is the complement to HCA. It is the end node component of an I/O device that connects it to the fabric.

**TCA** See Target Channel Adapter (TCA).

**TCP** Transmission Control Protocol (TCP).

**TFTP** Trivial File Transfer Protocol (TFTP) is a simplified version of FTP that allows files to be transferred from one computer to another over a network, usually without the use of client authentication (for example, username and password).

**Traps** Unsolicited reports sent by SNMP agents to interested clients. Trap messages are used to report significant TCP/IP events asynchronously.

**UDP** An Internet protocol that provides connectionless datagram delivery service to applications. UDP over IP adds the ability to address multiple endpoints to IP within a single network node.

**Unicast** Analogous to PPP, unicast is a communication link between a one sender and one receiver. Unlike multicast, unicast is the serial transmission of data between a sender and receiver.

**Upper Layer Protocol (ULP)** Any protocol residing in OSI Layers five or above. Standard ULPs supported by InfiniBand include Internet Protocol (IPoIB) and Message Passing Interface (MPI).

**VL** Virtual Lane (VL) is a logical lane on the data-link layer that transports packets across a point-to-point link. Used in conjunction with Service Levels.

**VLAN** Virtual LAN. Unlike conventional LANs, a VLAN uses methods other than geographic location to map workstations. This allows the administrator to more easily manage load-balancing, band-width allocation, and add new users.



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