

Cisco SFS 7008 InfiniBand Server Switch
Quick Start Guide (Topspin 270 Quick Start Guide)
Release 2.2.0 Update 1

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Regulatory Notices

FCC Statement

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Safety Information

- [“Electrical Cautions” on page v](#)
- [“General Cautions” on page vii](#)

Electrical Cautions



CAUTION: Use only the power cable provided with your Topspin 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.



CAUTION: Grounding is supplied by the ground-prong on the 3-prong power cable. 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 Topspin system.



CAUTION: Always ground yourself before touching any internal Topspin system component to avoid damage from electrostatic discharge (ESD).



CAUTION: The Topspin system has two power cables. The operator must disconnect all power cables before attempting to remove the system from the rack.



CAUTION: Remove power cables by grasping the cable connector and pulling straight out. If the chassis comes equipped with a power-plug retainer, move the bail wire used to retain the plug to the side before attempting to remove the power plug. Replace power-supply cables by grasping the cable connector, align the connector with the power jack, and insert the connector straight into the jack. If the chassis comes equipped with a power-plug retainer, move the bail wire back into place to keep the power plug firmly in place.



CAUTION: The Topspin system contains lithium batteries. Do not attempt to replace or discard these batteries. The batteries may only be serviced by Topspin service personnel.



CAUTION: Observe and follow service markings. Do not service the Topspin system, except as explained in the Topspin documentation supplied with your system. Opening the chassis or removing the enclosure cover exposes you to electrical shock and may damage system components.

If one or more of the following situations occurs, remove power to the Topspin system chassis, and contact your Topspin support representative:

- The power cable or power plug is damaged.
- The system has been exposed to water.
- The system has been dropped or damaged in any way.
- The system does not operate correctly after following the installation instructions.



CAUTION: You must ensure the operating environment has adequate air circulation. Keep the Topspin system in a cool, well-ventilated room. Do not block cooling vents. Install filler panels into all unused slots.



CAUTION: Never place your hand inside an empty card or module bay. You should never have cause to place a hand anywhere inside the Topspin chassis. Unused card and module bays should always have a Topspin cover over the bay to ensure proper safety, ventilation, and cooling.

General Cautions



CAUTION: No user is authorized to remove the Topspin system enclosure cover. The internal chassis contains no user-serviceable components. Removing the enclosure cover voids your warranty. See the warranty card for further details regarding the servicing of your chassis.

In general

- Do not spill food or liquids on your system components.
- Protect your Topspin system from sudden power-surges and interruptions by using a surge suppressor, line conditioner, or uninterruptable power supply (UPS).
- Place cables appropriately so that they do not obstruct any egress within the data center and they do not block any ventilation inlets or outlets.
- Rack mount the Topspin chassis according to the rack manufacturer recommendations.

Contact Information

Table III-1: Customer Contact Information

Address	Topspin Communications, Inc. 515 Ellis St. Mountain View, CA 94043
Telephone, Corporate Headquarters	(866) TOPSPIN or (650) 316-3300
Fax	(650) 316-3269
Telephone, Technical Support	(800) 499-1473
Email, Technical Support	support@topspin.com
Web site, Support	http://support.topspin.com

Topspin 270 Contents List

The following contents are included with your Topspin 270 product:

___Accessory Kit

___TopspinOS CD-ROM (1)

___Documentation

- *Topspin 270 Quick Start Guide*
- Release Notes

___Hardware Kit

- 2 short rack ears (installed on chassis)
- 2 long rack ears (installed on chassis). See package insert for instructions.

___Bezel

___Power Cable

- 1 standard

___Serial Cable Kit

___Serial Cable

- DB-9 female to RJ-45 adapter
- DB-9 male to RJ-45 adapter
- MX-9-1 roll-over cable

___Documents

- Located inside serial cable kit package

___Chassis

___Power Supply

- 1 installed standard

___Fan Trays

- 1 installed standard

___Fabric Controller Cards

- 4 cards (2 installed in core slots and others installed in node slots) for 48-port configuration
- 5 cards (2 installed in core slots and others installed in node slots) for 72-port configuration
- 6 cards (2 installed in core slots and others installed in node slots) for 96-port configuration

___LIM InfiniBand Card(s)

- 4 cards installed for 48-port configuration
- 6 cards installed for 72-port configuration
- 8 cards installed for 96-port configuration

___Management Interface Module

- 1 installed on chassis

___Chassis ID Module

- 1 installed in chassis

___Blanking Panel

- Blanking panels on all empty bays in the chassis.
-

Product Registration

Thank You For Purchasing Your Topspin® Product!

Topspin Communications is pleased that you have selected Topspin for your computing infrastructure. Topspin provides comprehensive customer support resources via telephone and Web access.

Topspin's Customer Support Web site has the latest TopspinOS (IB Switch and I/O Chassis Operating System), Linux and Windows Host Side Drivers, Boot over Infiniband Firmware and technical documentation. Topspin recommends that you download the latest Topspin software and documentation from the Topspin support web site so that you can take full advantage of the latest capabilities.

Registration Benefits

Customers must register on-line to receive the following benefits:

- Software updates and downloads
- Product warranty support
- Customer service and support
- Product documentation

Registration Instructions

Please immediately follow the instructions below to register yourself as a Topspin user:

1. Go to <http://support.topspin.com>
2. Click the “**Register Now**” link below the customer login prompt
3. Enter at least one of your product serial numbers in the spaces provided. Each serial number must be entered exactly as it appears on the product label, including dashes.
4. Enter your contact information in the spaces provided.

User Name and Password

Once you register, Topspin will provide you with a user name and password to access the secure customer support Web site. You may also contact Topspin customer support at:

- Email: support@topspin.com
- Phone: (800) 499-1473

- Online Help Desk: <http://support.topspin.com>

Terms and Conditions of Sale for Topspin Communications, Inc.

PLEASE READ THESE TERMS AND CONDITIONS CAREFULLY BEFORE USING THE PRODUCTS THAT ARE PROVIDED WITH THIS AGREEMENT. BY USING ANY PRODUCTS, YOU ACKNOWLEDGE THAT YOU HAVE READ AND UNDERSTOOD ALL THESE TERMS AND CONDITIONS AND YOU WILL BE CONSENTING TO BE BOUND BY THEM. IF YOU DO NOT ACCEPT THESE TERMS AND CONDITIONS, DO NOT USE THE PRODUCTS AND RETURN PRODUCTS WITHIN 30 DAYS UNUSED IN THE ORIGINAL SHIPPING CONTAINER TO THE PLACE OF PURCHASE FOR A FULL REFUND.

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Declaration of Conformity

Topspin Communications, Inc.
515 Ellis St.
Mountain View, CA 94043
Phone: (650) 316-3300
Fax: (650) 316-3269
<http://www.topspin.com>

We

Topspin Communications
515 Ellis Street
Mountain View, CA 94043
USA

Declare under our sole responsibility that the product

- Product Name: Topspin 270
- Model Number: Topspin 270

To which this declaration relates is in conformity with the following standard(s) or other normative document(s) ([Table VII-1](#))

Table VII-1: Standards

Safety:	EN60950:	2000
EMC:	EN55022:	1998, Class A
	EN61000-3-2	1995
	EN6100-3-3:	1995
	EN55024	1998

Following the provisions of the Radio & telecommunications Terminal equipment Directive 99/5/EEC, the EMC Directive 89/336/EEC and of the Low Voltage Directive 73/23/EEC.

Place of Issue: Mountain View, CA, USA

Date of Issue: 18 May, 2004



William P. Cerreta
Systems Director

Topspin Limited End User Warranty

Topspin provides the following limited warranty (“Limited Warranty”) for Topspin products:

- For a period of (1) year from the date of shipment, the hardware components will be free from defects in materials and workmanship; and
- For a period of ninety (90) days from the date of shipment, the software components will substantially conform to Topspin’s then-current specifications.

Products may be registered at www.topspin.com/support to be eligible for warranty support.

If the product fails to meet the Limited Warranty above, Topspin, at its option, will:

- Repair the product by means of hardware and/or software, or
- Replace the product with an equivalent product.

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Extent of Limited Warranty

This limited warranty does not cover damages due to external causes, including accident, problems with electrical power, usage not in accordance with the product instructions, misuse, neglect, alteration, repair, improper installation, or improper testing.

topspin does not warrant that the functions of the hardware or software will meet your specific requirements or that the operation of the product will be uninterrupted or error free. You assume responsibility for proper selection of the product to achieve your intended results.

How to Obtain Warranty Service

To obtain warranty service, the product must first be registered with Topspin as outlined above. Topspin must be notified during the applicable warranty period in order to have any obligation under the Limited Warranty.

To request warranty service, you must contact Topspin's service department. Contact information can be obtained from Topspin's Web site at www.topspin.com/support.

If warranty service is required, Topspin will issue a Return Material Authorization Number ("RMA"). you must ship the product back to Topspin in its original or equivalent packaging, prepay shipping charges, and insure the shipment or accept the risk of loss or damage during shipment. Topspin will ship the repaired or replacement product to you, freight prepaid, if you use an address in the continental U.S., where applicable. Shipments to other locations will be made freight collect.

Note that advance replacement and other premium service products may be available at an additional cost from Topspin.

All replaced product will become the property of Topspin. Replaced or repaired product may be new, reconditions or contain refurbished materials. In connection with warranty service, Topspin may, in its sole discretion, modify the product at no cost to you to improve its functionality or reliability.

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TOPSPIN[®]

Choosing the Appropriate Mounting Brackets

Customer Note

Your hardware package includes two different sets of mounting brackets to secure your Topspin 270 Server Switch to a rack. They are included to support the different rack mounting options for the Topspin 270.

Refer to the information below to determine which set of mounting brackets are appropriate for your use:

Included in Your Hardware Kit:

1 Set of Long Brackets

Two brackets are included in the set.

Use the set of 2 long brackets to stabilize the 270 Server Switch if you are mounting the switch on a shelf or other weight-bearing device.

Refer to the *Topspin 270 Hardware Guide* for shelf requirements.

1 Set of Short Brackets

Two brackets are included in the set.

You must use the set of short brackets to stabilize the 270 Server Switch if you are mounting the switch in the optional Topspin Rack Kit.

The Topspin shelf is an optionally purchased item. Refer to the installation instructions, which are included with the shelf hardware.

Topspin 270 Quick Start

This chapter gives an overview of the following:

- “Prepare the Site” on page 1
- “Verify the Hardware Configuration” on page 2
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Prepare the Site

- Read the cautionary statements in “[Safety Information](#)” on page v.
- Register the InfiniBand switch online. Go to <http://topspin.com/support/>.
- Ground yourself using an approved ground wrist-strap.
- Make sure you have the right cables and sufficient ventilation.
- Unpack the Topspin 270 package, using the packing list provided.
- Prepare a management workstation, such as a PC or laptop running a terminal program, and a straight-through M/F DB-9 serial cable (included).

Verify the Hardware Configuration

If you have not purchased a fully loaded chassis with high-availability components installed, verify that you have the minimum hardware components necessary to run the chassis. Specific components in the Topspin 270 have interdependencies on other components.

1. Verify that you have at least one Management Interface module installed in slot 15 (the left slot). Slot 15 is paired with the Fabric Controller in slot 11.
2. Verify that you have a Fabric Controllers installed in the Core slots (slots 11). A second Fabric Controller card (installed in slot 12) is not required for the chassis to function, but is required to have a non-blocking fabric.
3. Verify that you have at least one power supply installed.
4. Verify that you have at least one fan module installed.
5. Verify that you have a Line Interface module (LIM) installed in the slot that corresponds with the Fabric Controller slot. A LIM in slot 9 must have a Fabric Controller card in slot 11.
6. Verify that you have a Chassis ID module installed.

Mount the Chassis in a Rack

For more detailed information about the Topspin 270 server switch, refer to the *Topspin 270 Hardware Guide*.

This section describes how to install the Topspin 270 server switch in an equipment rack.

Requirements

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

- A #2 phillips screwdriver
- A shelf installed in the rack (not provided). The shelf should be capable of supporting up to 106 pounds for a fully loaded chassis. If you have purchased the optional Topspin 270 shelf, refer to the *Topspin 270 Hardware Guide* for installation instructions.
- Screws for your particular rack (not provided). These are required to attach the mounting brackets to your rack.
- Four mounting brackets with screws (pre-installed on the chassis).
- Three people are recommended to lift the switch into the rack; however, the procedure can be performed by two people.

Note: The Topspin 270 chassis weighs up to 106 pounds (fully loaded).

Rack Mount Installation

If you have purchased the optional Topspin 270 shelf, refer to the *Topspin 270 Hardware Guide* for installation instructions.

The following instructions assume you have an industry-standard shelf that meets the requirements listed above.

To mount the Topspin 270 chassis in a rack:

1. Remove the CD-ROM, parts bag, and documentation from the box.
2. Remove the packaging from around the chassis. After you have removed the straps, lift the box up and away from the switch and pallet. Do not cut the packaging, as you could damage the switch. Please save the box and packaging.

3. Install a shelf for the chassis, if you have not already done so. The shelf must support the weight of the chassis, which can be up to 106 pounds if all possible components are installed.



Figure 1-1: Install Appropriate Shelf

4. Determine the direction that the switch will be installed and justified in the rack. The direction that the switch will be justified will determine which set of mounting brackets that need to be removed.
5. Use a #2 phillips screwdriver to remove one set of mounting brackets:
 - If you have determined that the switch will be justified toward the bezel-side in the rack, then use a #2 phillips screwdriver to unscrew the mounting brackets from the port-side of the switch.

- If you have determined that the switch will be justified toward the port-side in the rack, then use a #2 phillips screwdriver to unscrew the mounting brackets from the bezel-side of the switch.



Figure 1-2: Unscrew Extra Mounting Brackets from the Chassis

6. Separate the mounting brackets from the chassis when all screws have been loosened.
7. Use 2 - 3 people to lift the switch into the rack.



Figure 1-3: Chassis Set onto Shelf

8. Push the chassis into the rack until the mounting brackets are flush with rails.

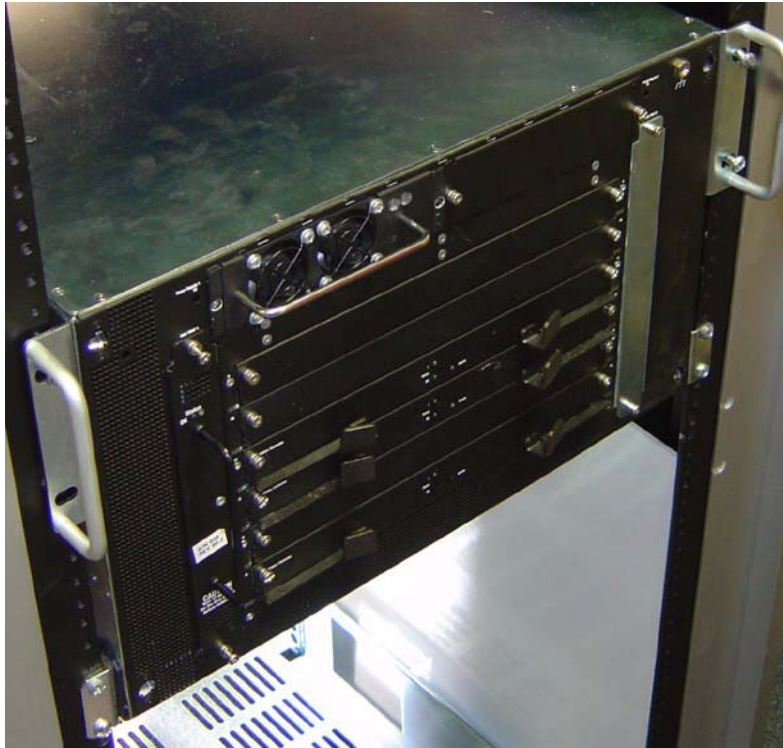


Figure 1-4: Push Switch into Rack

9. Use screws that fit your rack to attach both mounting brackets to the rack posts.



Figure 1-5: Use Appropriate Screws to Attach Mounting Brackets to Rails

Install Optional HA Components

If you have purchased a High-Availability (HA) package, install the following components:

- Redundant Power Supply. Refer to the *Power Supply Module Installation Guide* in the package.
- Redundant Fan Tray. Refer to the *Fan Module Installation Guide* in the package.
- Redundant Management Interface Module. Refer to the *Management Interface Module Installation Guide* in the package.
- Replace the bezel cover on the switch after the redundant components are installed.

Configure Basic Connectivity

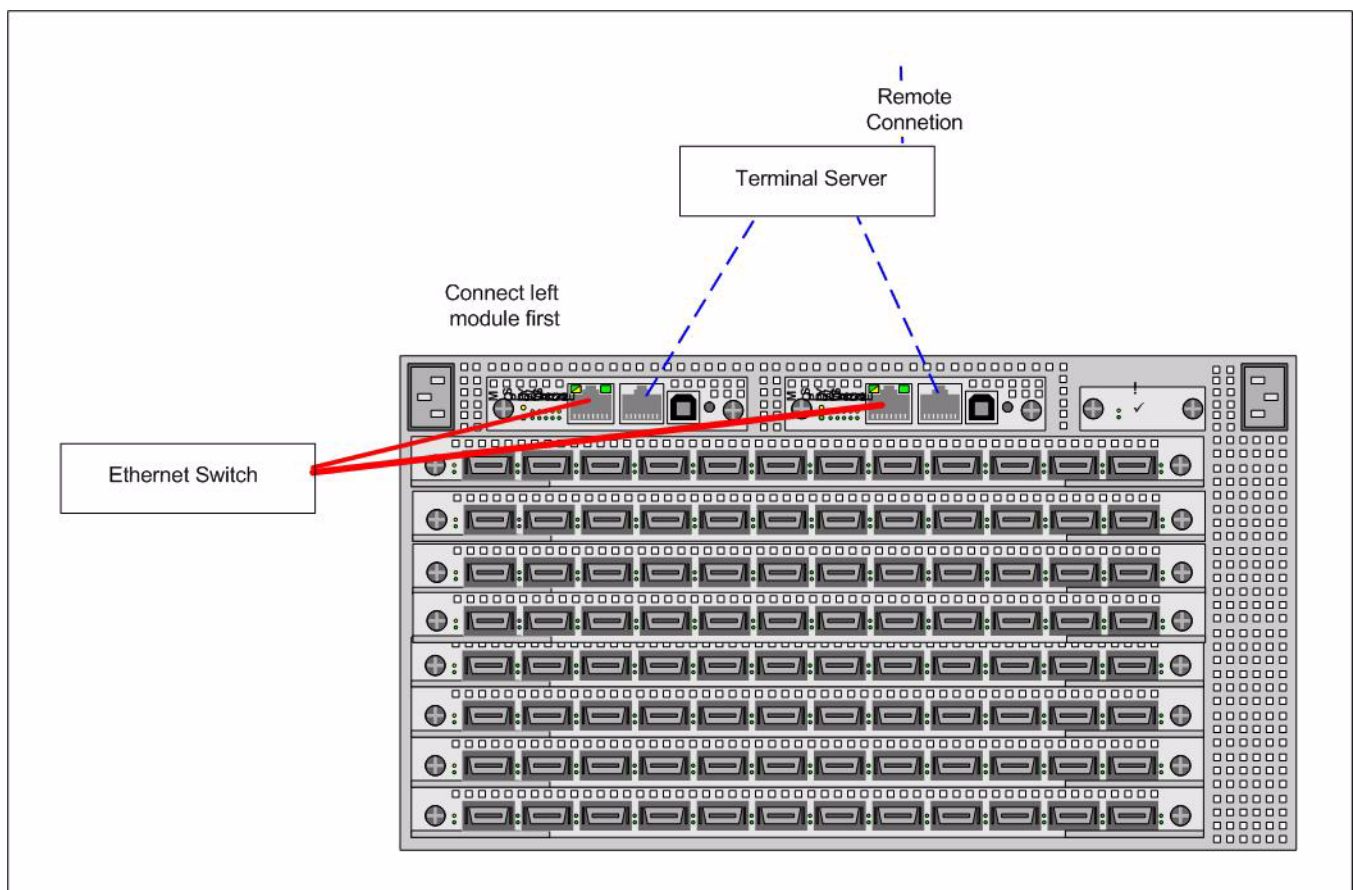


Figure 1-6: Recommended Management Configuration

1. Attach the RJ-45 console cables from the cable kit that is provided.
 - a. Connect the cable to the InfiniBand chassis serial console port on the Management Interface card.
If you have two Management Interface cards, make sure that you connect to the left Management Interface module (slot 15), which will be the primary Management card upon initial boot-up. The serial console port is labeled “10101.”
 - b. Connect the other end of the serial cable to your terminal or management workstation.
For detailed information on how to connect the serial console cable, please see the documentation provided with the serial cable kit.

2. Connect an Ethernet cable to the Ethernet port of the left Management Interface module (slot number 15).
 - a. If you have two Management Interface modules, you may also want to connect an Ethernet cable to the standby module (slot 16) to maintain Ethernet connectivity in the event of a fail-over.
3. Open a terminal emulation window using a program such as HyperTerminal for Windows. Set your terminal parameters to the following:

Baud: 9600 bps
Data Bits: 8
Parity: None
Stop Bits: 1
Flow control: None
4. Attach the power cable(s) and power on the chassis.
 - a. If you do not have a High-Availability ready unit, you will only have a single power cord. Make sure that you insert the power cord into the left receptacle. The Topspin 270 system will automatically boot up. You can watch the running status via the serial console. You will know that the system has completed the boot process when you see a **login** prompt.
 - b. For more information about the power cord and power requirements, see the *Topspin 270 Hardware Guide*.
5. Configure an IP address for the Ethernet Management port

It is necessary to configure connectivity to the out-of-box Ethernet management port in order to use Telnet, the Web GUI, or the Java GUI. The system is not pre-configured when it ships from the factory.

IP addresses can be assigned statically (which is the default), or dynamically assigned using DHCP. To select DHCP assignment, refer to the *Topspin 270 Hardware Guide*.

Refer to the static example below:

 - a. When the system has completed booting, press <Enter> several times to display the CLI prompt.

```
Login:
```

- b. Enter the user name and password. The default user name is **super**, and the default password is **super**.

```
Login: super
Password: super
Topspin-270>
```

- c. Enter the **enable** command.

```
Topspin-270> enable
Topspin-270#
```

- d. Enter the **configure** command.

```
Topspin-270# configure
Topspin-270 (config) #
```

- e. Enter the **interface mgmt-ethernet** command.

```
Topspin-270 (config) # interface mgmt-ethernet
```

- f. Enter the IP address of the management port followed by the netmask.

```
Topspin-270 (config-if-mgmt-ethernet) # ip address 10.10.0.22  
255.255.255.0
```

- g. Set the default gateway for the management port. For example:

```
Topspin-270 (config-if-mgmt-ethernet) # gateway 10.10.0.1
```

- h. Enable the management port by entering the **no shutdown** command.

```
Topspin-270 (config-if-mgmt-ethernet) # no shutdown
```

- i. Save the configuration to preserve it between reboots.

```
Topspin-270 (config-if-mgmt-ethernet) # exit  
Topspin-270 (config) # exit  
Topspin-270 # copy running-config startup-config
```

- j. If you have two Fabric Controllers installed in Core slots, you will receive a message asking if you want to save the configuration to the Standby Controller.
Answer **Yes** to save the configuration across both controllers.

Install InfiniBand Cables

1. To plug in an InfiniBand cable, push the connector into the interface until you hear/feel a click.
 - a. Wiggle your connector back and forth to be sure that both sides of the connector have locked firmly into place.
 - b. Connect the other end of the InfiniBand cable to your host once the HCA is installed. If your host does not provide an ample amount of free space around a given IB port, double-check that your IB cable connector engages fully. Wiggle your connector back and forth to be sure that both sides of the connector have locked firmly into place.
 - c. If the IB cable is already connected to an IB host, the physical LED light will turn green on the switch IB port when connected properly.
 - d. To remove a cable with a pinch connector, pinch both sides of the back of the connector and pull the connector away from the port.

(Optional) Launch the Chassis Manager

Chassis Manager is a web-based GUI that can be used to manage a single InfiniBand chassis.

Prepare Your Device

To launch Chassis Manager on your Topspin 270, you must:

- Configure an IP address on the Ethernet management port, if you have not already done so.
- Configure an IP gateway on the Ethernet management port, if you have not already done so.
- Optional. Enable Telnet services (Telnet services should be enabled by default).
- Enable HTTP and/or HTTPS services (HTTP services should be enabled by default).

If you followed the previous steps, you should already have these items configured. If your device meets these requirements, proceed to [“Launch Chassis Manager” on page 9](#). Otherwise, to prepare your device, perform the following steps:



NOTE: Consult your network administrator for an IP address, subnet mask, and gateway address before you begin this process.

1. If you have not yet configured an IP address for the Management port, refer to [“Configure Basic Connectivity” on page 6](#).
2. Enter the **telnet enable** command in global config mode to start telnet services on your device. You may need to use the **exit** command to return to global config mode.

Example

```
Topspin-270> enable
Topspin-270# configure
Topspin-270 (config) # telnet enable
```

3. Enter the **ip http server** command to enable HTTP services on your device. HTTPs is also supported.

Example

```
Topspin-270 (config) # ip http server
```

Launch Chassis Manager

To launch Chassis Manager, perform the following steps:

Launch your Web browser. Chassis Manager supports the following browsers

- Microsoft Internet Explorer version 6
 - Netscape Navigator version 6
 - Mozilla version 1.4
4. Type the Management IP address of your Server Switch in the address field of your browser and press **Enter**. (You configured the IP address in [Step 5](#).)



Figure 1-7: Web Browser Window

A log-in window opens. [Figure 1-8](#) displays the log-in window.

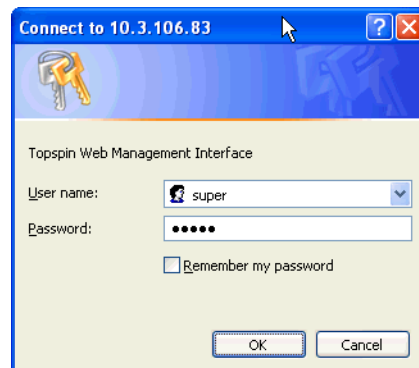


Figure 1-8: Chassis Manager Log-In Window

5. Enter your Server Switch user name and password in the log-in window and click the **OK** button. Chassis Manager loads in your browser window.

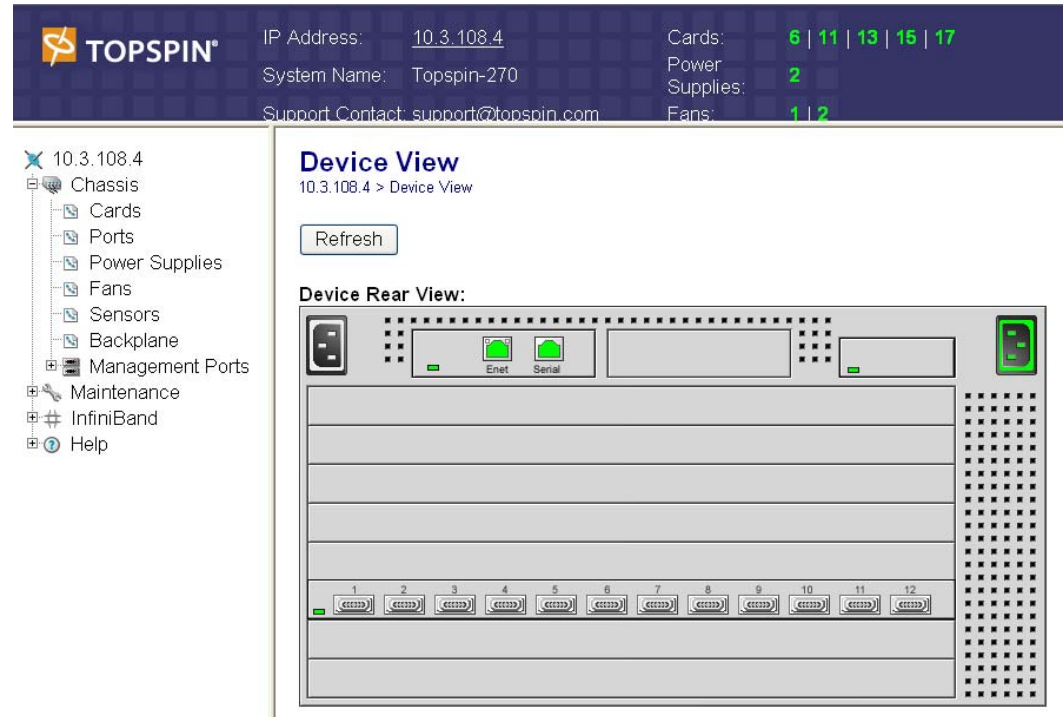


Figure 1-9: Chassis Manager Opening

(Optional) Install the Element Manager GUI

For more information regarding the Element Manager tasks, refer to the *InfiniBand User Guide*.

1. Check that you have sufficient system resources. You will need:
 - 32 MB free RAM
 - 50 MB disk space + 50MB additional temporary space during installation
 - 300 Mhz processor
 - 800x600 screen resolution, 16bit color depth
2. Insert the Topspin CD-ROM into the CD-ROM drive of a server that has network access to a Topspin management port.
3. The GUI can be found in the following location on the CD-ROM.
 - Linux/install_linux_ia64.bin
 - Linux/install_linux_x86.bin
 - Windows/install_x86.exe
 - Solaris/install_solaris_sparc.bin

4. Run the installation wizard:
 - a. On Windows, double-click install.exe.
 - b. On Solaris and Linux systems, enter `sh ./install_yourOS.bin`.
 - c. Follow the on-screen instructions.
 - d. Enter location and preference information as requested by the installation program.
6. Start the Element Manager.
 - a. On Linux platforms, change to the installation directory and run the Element Manager with **`./TopspinEM`**.
 - b. On Windows platforms, click **Programs -> Topspin Element Manager -> TopspinEM**.
 - c. When prompted to enter a device name, enter the DNS host name or IP address of the Topspin 270, and community string for the unrestricted user. The default community string for the unrestricted user is secret.

Configure and Connect InfiniBand Hosts

This section describes a brief overview for configuring your InfiniBand hosts.

For more detailed instructions, please see the *HCA Installation Guide*, which is included with your HCA(s).

1. Install the HCA(s).
 - a. Power down the host system following proper grounding procedures.
 - b. Unpack the HCA card and insert it into an open 64-bit PCI or PCI-X slot.
2. Power on the host system.
3. Install the HCA driver(s).

An integrated suite of drivers is provided, including IPoIB, SRP, SDP, uDAPL and MPI.

 - a. Make sure your Linux kernel is supported. Refer to the Topspin Web site for a list of supported versions.
 - b. Insert the supplied CD-ROM into the CD-ROM drive. The CD-ROM is provided in box with the Switched Computing system.
 - c. (Optional) Mount the file-system for the CD-ROM drive if your platform does not auto-mount devices.

```
# mount /mnt/cdrom
```

- d. Open a terminal or graphic window and access the top-level directory on the CD-ROM
- e. Execute the command `./tsinstall` in a terminal window. This program automatically detects the available kernel and installs the appropriate drivers as RPM packages. By default, topspin files are saved in the `/usr/local/topspin` directory.

```
# cdmount ./tsinstall
```

4. Configure the HCA drivers.
 - a. Configure the IPoIB driver by assigning an IP address to interface ib0 and/or ib1, which corresponds to the two HCA ports. IPoIB drivers load when the interfaces are used for the first time.

To assign ib interfaces, enter **ifconfig ib# ip address netmask netmask**:

Example of One HCA

```
# ifconfig ib0 192.168.0.0 netmask 255.255.255.0
#
# ifconfig ib1 192.168.0.1 netmask 255.255.255.0
#
```

Example of Two HCAs

```
# ifconfig ib0 192.168.0.0 netmask 255.255.255.0
#
# ifconfig ib1 192.168.0.1 netmask 255.255.255.0
#
# ifconfig ib2 192.168.0.2 netmask 255.255.255.0
#
# ifconfig ib3 192.168.0.3 netmask 255.255.255.0
#
```

- a. Merge ib0 and ib1 for port-to-port redundancy, if desired. Refer to the *HCA/Host-Side Driver User Guide for Linux* or the *HCA/Host-Side Driver User Guide for Windows* for instructions.
 - b. (Optional) Configure MPI.
 - Make sure that your connections to the HCA uses port 1 of the first HCA. MPI requires the use of HCA 1, port 1.
 - Setup rsh or ssh on two nodes so that you can run commands between a remote and local node without entering a login or password. This is required to use the MPI protocol.
 - Add paths to your environment PATH:


```
/usr/local/topspin/mpi/mpich/bin
```

```
/usr/local/topspin/bin
```

 or
 - Add the paths for all users by adding the following line to your `/etc/profile.d` script:


```
export PATH=$PATH:/usr/local/topspin/mpi/mpich/bin:/usr/local/topspin/bin
```
 - c. Configure all other drivers, including SDP.

Refer to the *HCA/Host-Side Driver User Guide for Linux* for instructions.

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