Sun Datacenter InfiniBand Switch 72

User's Guide

Part No. 820-7751-12
May 2010, Revision A

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Contents

Using This Documentation

This user guide provides detailed procedures that describe preparation, installation, administration, and service for the Sun Datacenter InfiniBand Switch 72 from Oracle®. This document is written for technicians, system administrators, authorized service providers, and users who have advanced experience installing, administering, and servicing InfiniBand fabric hardware.

Related Documentation

The documents listed as online are available at:

(http://docs.sun.com/app/docs/prod/ib.switch.72)

Application	Title	Part Number	Format	Location
Getting started	*Sun Datacenter InfiniBand Switch 72 Getting Started Guide*	820-7755	Printed PDF	Shipping kit Online
Last-minute information	*Sun Datacenter InfiniBand Switch 72 Product Notes*	820-7753	PDF	Online
Installation, administration, and service	*Sun Datacenter InfiniBand Switch 72 User's Guide*	820-7751	PDF HTML	Online
Command reference	*Sun Datacenter InfiniBand Switch 72 Command Reference*	820-7752	PDF HTML	Online
Compliance	*Sun Datacenter InfiniBand Switch 72 Safety and Compliance Guide*	820-7754	PDF	Online

Some commands reference the PICMG 3.0 specification, available at:

(http://www.picmg.org)

Some commands reference the IPMI specification, available at:

(http://www.intel.com/design/servers/ipmi)

Documentation, Support, and Training

These web sites provide additional resources:

- Documentation (http://docs.sun.com)
- Support (http://www.sun.com/support)
- Training (http://www.sun.com/training)

Documentation Feedback

Submit comments about this document by clicking the Feedback[+] link at (http://docs.sun.com). Include the title and part number of your document with your feedback:

Sun Datacenter InfiniBand Switch 72 User's Guide, part number 820-7751-12.

Installing the Switch

The following topics describe the installation of the switch. The topics are listed in the order of completion.

Related Information

Understanding Switch Specifications

These topics describe the specifications of the switch and the connectors found on the switch chassis and the pinouts of those connectors.

- "Network Management Connector and Pins" on page 4
- "USB Management Connector and Pins" on page 5
- "CXP Connector and Pins" on page 5

Related Information

- "Install the Switch in the Rack" on page 18
- "Powering On the Switch" on page 23

Physical Specifications

Dimension	Measurements
Width	17.52 in. (445.0 mm)
Depth	24 in. (609.6 mm)
Height	1.75 in. (44.5 mm)
Weight	23.0 lbs (11.4 kg)

Related Information

- "Shipping Carton Contents" on page 16
- "Install the Switch in the Rack" on page 18

Environmental Requirements

Parameter	Operating
Ambient temperature	41˚F to 89.6˚F (5˚C to 32˚C)
Relative humidity	5% to 85% noncondensing, 80˚F (27˚C) maximum wet bulb
Elevation (Sun requirement)	Maximum 9840 feet (3000 meters) at 104˚F (40˚C)

Acoustic Noise Emissions

Parameter	Operating	Idling
Acoustic power LWAd (1B=10dB)	7.1 B	7.2 B
Acoustic pressure LpAm	58.9 dBA	59.0 dBA

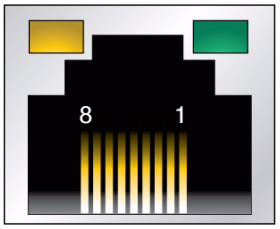
Electrical Specifications

Parameter	AC Version Requirement
Voltage	100 VAC to 240 VAC single phase, 47 to 63 Hz
Current (per input)	5.4 A maximum per input at 100 VAC
Current (total)	5.6 A maximum total for all inputs at 100 VAC
Power	550 Watts (Total input power is approximately equally divided among the operating power supplies)

Related Information

- "Power Cord Requirements" on page 7
- "Attach the Power Cords" on page 27

Network Management Connector and Pins



The following table lists the pinout of the network management connector.

Pin.	Signal
1	TXD+
2	TXD-
3	RXD+
4	Not used
5	Not used
6	RXD-
7	Not used
8	Not used

Related Information

- "Management Cable Requirements" on page 8
- "Attach the Management Cables" on page 24
- "Access the Management Controller From the Network Management Port" on page 29

USB Management Connector and Pins

The following table lists the pinout of the USB management connector.

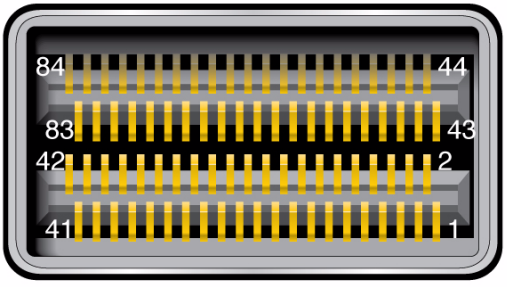
Pin	Signal
1	+5 VDC
2	- Data
3	+ Data
4	GND

Related Information

- "Management Cable Requirements" on page 8
- "Attach the Management Cables" on page 24
- "Access the Management Controller From the USB Management Port" on page 30

CXP Connector and Pins

The CXP connector has three InfiniBand port connections.



The following table lists the pinout for each connection.

Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
1	GND	22	GND	43	GND	64	GND
2	TX0p	23	TX1p	44	RX3p	65	RX2p
3	TX0n	24	TX1n	45	RX3n	66	RX2n
4	GND	25	GND	46	GND	67	GND
5	TX2p	26	TX3p	47	RX1p	68	RX0p
6	TX2n	27	TX3n	48	RX1n	69	RX0n
7	GND	28	GND	49	GND	70	GND
8	TX4p	29	TX5p	50	RX7p	71	RX6p
9	TX4n	30	TX5n	51	RX7n	72	RX6n
10	GND	31	GND	52	GND	73	GND
11	TX6p	32	TX7p	53	RX5p	74	RX4p
12	TX6n	33	TX7n	54	RX5n	75	RX4n
13	GND	34	GND	55	GND	76	GND
14	TX8p	35	TX9p	56	RX11p	77	RX10p
15	TX8n	36	TX9n	57	RX11n	78	RX10n
16	GND	37	GND	58	GND	79	GND
17	TX10p	38	TX11p	59	RX9p	80	RX8p
18	TX10n	39	TX11n	60	RX9n	81	RX8n
19	GND	40	GND	61	GND	82	GND
20	SCL	41	VCC3.3-Tx	62	PRSNT	83	VCC3.3-Rx
21	SDA	42	VCC12-Tx	63	Int_L/Reset_L	84	VCC12-Rx

The following table provides descriptions of the CXP signals.

Signal	Description
GND	Ground for both signal and power return
VCC3.3-Tx	3.3V standby power from the power supplies
VCC3.3-Rx	3.3V standby power return
VCC12-Tx	12V power for cable export and future enhancements
VCC12-Rx	12V power return

Signal	Description
TX*portdiff*	Differential InfiniBand transmit signal, where: • *port* – `0` to `11` • *diff* – `n` or `p` for negative or positive
RX*portdiff*	Differential InfiniBand receive signal, where: • *port* – `0` to `11` • *diff* – `n` or `p` for negative or positive
SCL	I^2C clock
SDA	I^2C data I/O
PRSNT	Connection present
Int_L/Reset_L	Reset line

Related Information

- "InfiniBand Cable Types" on page 11
- "Connecting InfiniBand Cables" on page 35

Routing Service Cables

These topics describe cable routing requirements:

- "Power Cord Requirements" on page 7
- "Management Cable Requirements" on page 8

Related Information

- "Understanding InfiniBand Cabling" on page 9

Power Cord Requirements

The power supplies are in a N+N redundancy. Line power is provided from two sources, A and B.

Your switch country kit should contain two power cords that are specific to your country or application. The following table describes the power cords available.

Cable Part Number	Description
X311L (180-1097)	North America/Asia, IEC 320 C13 to NEMA 5-15P - 15A/125V 2.5M Black, RoHS:Y
X312E (180-1982)	China, IEC 320 C13 to GB 2099/GB 1002 - 10A/250V 2.0M, RoHS:Y
X312F (180-1999)	Argentina, IEC 320 C13 to IRAM 2073 - 10A/250V 2.0M Black, RoHS:Y
X312G (180-1662)	Korea, IEC 320 C13 to KSC 8305 - 15A/250V 2.0M Black, RoHS:Y
X312L (180-1993)	Continental Europe, IEC 320 C13 to CEE 7/7 10A/250V 2.0M Black, RoHS:Y
X314L (180-1994)	Swiss, IEC 320 C13 to SEV 1011 - 10A/250V 2.0M Black, RoHS:Y
X317L (180-1997)	U.K., IEC 320 C13 to BS 1363 - 10A/250V 2.0M Black, RoHS:Y
X332A (180-2121)	Taiwan, IEC 320 C13 to NEMA 5-15P - 10A/125V 2.5M Black, RoHS:Y
X383L (180-1995)	Danish, IEC 320 C13 to Asfnit 107 - 10A/250V 2.0M Black, RoHS:Y
X384L (180-1996)	Italian, IEC 320 C13 to CEI 23-16/VII - 10A/250V 2.0M Black, RoHS:Y
X386L (180-1998)	Australian, IEC 320 C13 to AS 3112 - 10A/250V 2.0M Black, RoHS:Y

Caution – Install and route power cabling only in a manner that complies to federal, state, and local electrical codes.

Related Information

- "Electrical Specifications" on page 3
- "Attach the Power Cords" on page 27

Management Cable Requirements

Management of the switch is done at the management console, which is either a 10/100 Ethernet connection at the NET ports or a USB-to-serial device attached to the USB port.

Typically, the NET connection (network management) is the default means of communicating with the management controller. The controller has a DHCP client in operation and requires the Ethernet network to have a DHCP server. The DHCP server must be configured with the MAC address of the management controller, so the server can provide an IP address to the management controller upon boot. If a DHCP server is not available, then the USB connection is used.

The advantage of the NET connection over the USB connection is that administration of the switch can happen from anywhere on the network. There is no cable length constraint for the network management route because of the re-amplification, filtering, and processing that happens at each hub or switch within the Ethernet network. No network management cable should be any longer than 100 meters.

The USB connection requires a USB-to-serial adapter. The adapter must be configured to communicate with your serial device management console. The serial device can be a serial terminal, a terminal server, or a serial connection running on a system or laptop. Because of the nature of the serial signal, a serial management cable cannot be used reliably if it is more than 10 meters long.

The USB-to-serial adapter is not included with your switch. You can purchase such an adapter from computer and electronics stores.

Related Information

- "Network Management Connector and Pins" on page 4
- "USB Management Connector and Pins" on page 5
- "Attach the Management Cables" on page 24

Understanding InfiniBand Cabling

These topics describe InfiniBand cabling:

- "InfiniBand Cable Cautions" on page 10
- "InfiniBand Cable Guidelines" on page 11
- "InfiniBand Cable Path Lengths" on page 12
- "InfiniBand Cable Types" on page 11
- "InfiniBand Cable Bundling" on page 12
- "Floor and Underfloor Delivery of InfiniBand Cables" on page 13
- "Overhead Delivery of InfiniBand Cables" on page 13

Related Information

- "Routing Service Cables" on page 7
- "Connecting InfiniBand Cables" on page 35

InfiniBand Cable Cautions

To prevent InfiniBand cable damage, you *must* follow these cautions:

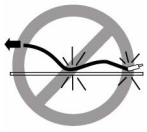
Do not uncoil the cable, as a kink might occur. Hold the coil closed as you unroll the cable, pausing to allow the cable to relax as it is unrolled.

Do not pull the cable out of the shipping box, through any opening, or around any corners. Unroll the cable as you lay it down and move it through turns.

Do not twist the cable to open a kink. If it is not severe, open the kink by unlooping the cable.

Do not straighten the cable to correct a bend that is too tight. Leave the cable bend as is.

Do not drop the cable or connectors from any height. Gently set the cable down, resting the cable connectors on a stable surface.



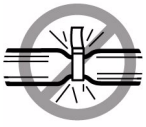
Do not drag the cable or its connectors over any surface. Carry the entire cable to and from the points of connection.

Do not step on the cable or connectors. Plan cable paths away from foot traffic or rolling loads.

Do not bend the cables to a radius tighter than 85 mm (3.4 inches). Ensure that cable turns are as wide as possible.

Do not pack the cable to fit a tight space. Use an alternative cable route.

Do not hang the cable for a length more than 2 meters (7 feet). Minimize the hanging weight with intermediate retention points.



Do not cinch the cable with hard fasteners or cable ties. Use soft hook-and-loop fastener for bundling and securing cables.

Do not force the cable connector into the receptacle by pushing on the cable. Apply connection or disconnection forces at the connector only.

Related Information

- "Connecting InfiniBand Cables" on page 35

InfiniBand Cable Guidelines

Proper InfiniBand cable installation requires the following:

1. Plan the cable routes and cable length needs, identifying problematic cable route bends, minimizing the length of continuous vertical runs to no more than 2 meters (7 feet), and specifying hardware to support cable routing.

   See "InfiniBand Cable Path Lengths" on page 12.

2. Carry the entire cable to the points of connection and unroll the cable from the first connection point to the second. Keep the coil closed and pause to enable the cable to relax as it is unrolled and moved through turns.

3. Ensure that cable route turns are larger than 85 mm (3.4 inches) radius for optical cables and 127 mm (5 inches) radius for copper cables. Find alternative routes for turns that are tighter.

4. Secure the cable to hard points and bundle it with soft, hook-and-loop fasteners.

   See "InfiniBand Cable Bundling" on page 12.

5. Mediate the slack between securing points to maintain minimal cable tension and proper support.

   See "Floor and Underfloor Delivery of InfiniBand Cables" on page 13 and "Overhead Delivery of InfiniBand Cables" on page 13.

6. Label the ends of cables to identify their routes. Rest the cable connectors on a stable surface when they are not connected.

Related Information

- "Power Cord Requirements" on page 7
- "Management Cable Requirements" on page 8

InfiniBand Cable Types

The following table lists the cables available for the switch, their length, and data rate.

Cable Type	Lengths	Data Rate
Splitter, optical core, CXP - QSFP x3	10 m, 20 m	QDR
Splitter, copper core, CXP - QSFP x3	1 m, 2 m, 3 m, 5 m	QDR
Pass-through, optical core, CXP - CXP	10 m, 20 m	QDR

Cable Type	Lengths	Data Rate
Pass-through, copper core, CXP - CXP	0.4 m, 1 m, 2 m, 3 m, 5 m	QDR

Related Information

- "CXP Connector and Pins" on page 5

InfiniBand Cable Path Lengths

Cable paths should be as short as possible. When the length of a cable path has been calculated, select the shortest cable to satisfy the length requirement. When specifying a cable, consider the following:

- Bends in the cable path increases the required length of the cable. Rarely does a cable travel in a straight line from connector to connector. Bends in the cable path are necessary, and each bend increases the total length.
- Bundling increases the required length of the cables. Bundling causes one or more cables to follow a common path. However, the bend radius is different in different parts of the bundle. If the bundle is large and unorganized, and there are many bends, one cable might experience only the inner radius of bends, while another cable might experience the outer radius of bends. In this situation, the differences of the required lengths of the cables is quite substantial.
- If you are routing the InfiniBand cable under the floor, consider the height of the raised floor when calculating cable path length.

Related Information

- "InfiniBand Cable Types" on page 11

InfiniBand Cable Bundling

When bundling InfiniBand cables in groups, use hook and loop straps to keep cables organized. If possible, use color-coordinated straps to help identify cables and their routing. The InfiniBand splitter and 4X copper conductor cables are fairly thick and heavy for their length. Consider the retention strength of the hook and loop straps when supporting cables. Bundle as few cables as reasonably possible. If the InfiniBand cables break free of their straps and fall free, the cables might break internally when they strike the floor or are jerked from tension.

You can bundle the cables using many hook and loop straps. Do not bundle more than 12 cables together. A fully configured switch has 24 InfiniBand cables, so that is at least two bundles.

Place the hook and loop straps as close together as reasonably possible. For example, every 1 ft (0.3 m). If a cable breaks free from a strap, the cable can not fall far before it is retained by another strap.

Related Information

- "Connecting InfiniBand Cables" on page 35

Floor and Underfloor Delivery of InfiniBand Cables

The switch accepts InfiniBand cables from floor or underfloor delivery. The cable management hardware at the rear of the switch supports the weight of the InfiniBand cables.

Floor and underfloor delivery limits the tension in the InfiniBand cable to the weight of the cable for the rack height of the switch.

Related Information

- "Connecting InfiniBand Cables" on page 35

Overhead Delivery of InfiniBand Cables

For overhead delivery, use cable shelves and lattices to support the InfiniBand cables.

If the overhead delivery has a large drop height, consider using an intermediate support for the InfiniBand cables. Use of the support can limit the tension in the InfiniBand cable to the weight of the cable for the distance between the supports and the switch.

Related Information

- "Connecting InfiniBand Cables" on page 35

Understanding the Installation

This section provides you with a quick introduction to the installation process. Topics include:

Related Information

- "Shipping Carton Contents" on page 16
- "Install the Switch in the Rack" on page 18
- "Powering On the Switch" on page 23
- "Connecting InfiniBand Cables" on page 35
- "Verifying the InfiniBand Fabric" on page 41

Installation Preparation

Before installing or servicing the switch, you must prepare the following:

- The environment where the switch is to be installed must conform to the requirements found in "Environmental Requirements" on page 3.
- The rack to receive the switch must have proper power, management, and InfiniBand fabric cabling brought to it.
- The rack must have an available location for the switch.
- There must be a clean, dry, stable work surface.

Related Information

- "Suggested Tools" on page 15
- "Antistatic Precautions" on page 15
- "Installation Responsibilities" on page 15
- "Installation Sequence" on page 16

Suggested Tools

The following tools are necessary or beneficial for installing the switch:

- Antistatic mat
- Antistatic wrist strap
- No. 2 Phillips screwdriver
- No. 1 Phillips screwdriver
- Flashlight
- Gloves
- Magnifying glass

Related Information

- "Antistatic Precautions" on page 15

Antistatic Precautions

When installing the switch chassis, take care to follow antistatic precautions:

- Use an antistatic mat as a work surface.
- Wear an antistatic wrist strap that is attached to either the mat or a metal portion of the switch chassis.

Related Information

- "Suggested Tools" on page 15

Installation Responsibilities

The personnel who install the switch must be fully capable of the following tasks:

- Rackmount a heavy object
- Perform line voltage verification
- Connect delicate cables in tight spaces
- Configure network hosts and serial terminals
- Perform software tasks of an administrative nature
- Interpret screen output as it pertains to InfiniBand fabrics

Related Information

- "Installation Sequence" on page 16

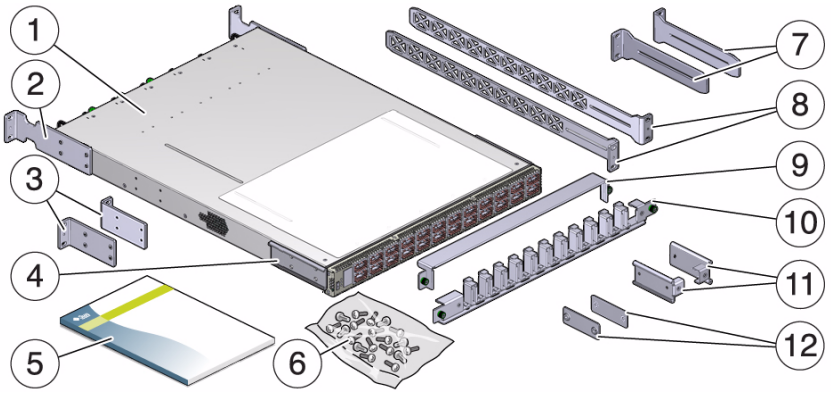
Installation Sequence

The process of installing the switch has a specific sequence of tasks that must be performed in order. The following table describes the switch installation task sequence and provides links to those procedures.

Step	Links
1	"Shipping Carton Contents" on page 16
2	"Install the Switch in the Rack" on page 18
3	"Attach the Management Cables" on page 24
4	"Attach the Power Cords" on page 27
5	"Accessing the Management Controller" on page 28
6	"Verify the Switch Status" on page 31
7	"Start the Subnet Manager" on page 34
8	"Attach the InfiniBand Cables" on page 36
9	"Check Link Status" on page 41
10	"Discover the InfiniBand Fabric Topology" on page 42
11	"Perform Diagnostics on the InfiniBand Fabric" on page 43
12	"Validate the InfiniBand Fabric and Report Errors" on page 44

Shipping Carton Contents

- Sun Datacenter InfiniBand Switch 72
- Cable bracket and rackmount kit
  - Cable management bracket and cover
  - Two rack-mounting rail assemblies
  - Assortment of screws and captive nuts
- *Sun Datacenter InfiniBand Switch 72 Getting Started Guide*



Item	Descripton
1	Switch
2	Front mounting brackets, long
3	Front mounting brackets, short
4	C-shaped brackets
5	Documentation
6	Hardware
7	Cable management extenders
8	Long rails
9	Cable management cover
10	Cable management assembly
11	Attachment brackets
12	Attachment plates
	Power cords (not pictured)

After verifying the package contents, install the switch into the rack. See "Install the Switch in the Rack" on page 18.

Related Information

- "Install the Switch in the Rack" on page 18

▼ Install the Switch in the Rack

Caution – The airflow through the switch is in from the fans, through the chassis, and out at the connector panel. The front of the switch chassis (fan end) intakes from the cold aisle and the rear of the switch chassis (connector end) exhausts to the hot aisle. This flow direction requires you to install the switch in an orientation that is the opposite of what you might assume.

1. **Identify the prerequisite and subsequent installation tasks that you must perform in conjunction with this procedure.**

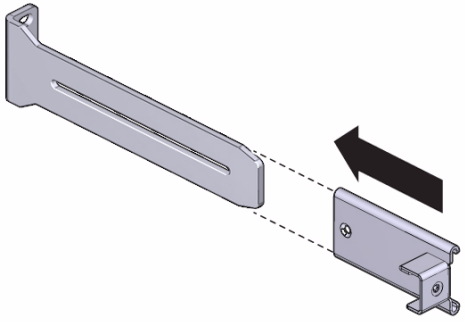
   See "Installation Sequence" on page 16.

2. **If installed, open the rack doors.**

3. **Assemble the cable management extenders.**

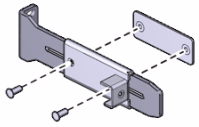
   a. **Slide the attachment bracket over the extender, so that the tab on the bracket is opposite the flange on the extender.**

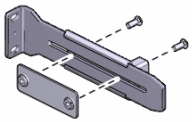
      The open end of the tab is toward the flange. The flat end of the tab is toward the rear of the extender.



   b. **Place the attachment plate on the flange side of the extender, opposite the attachment bracket.**

   c. **Use two screws to sandwich the attachment bracket and plate to the extender, in the position farthest from the flange.**





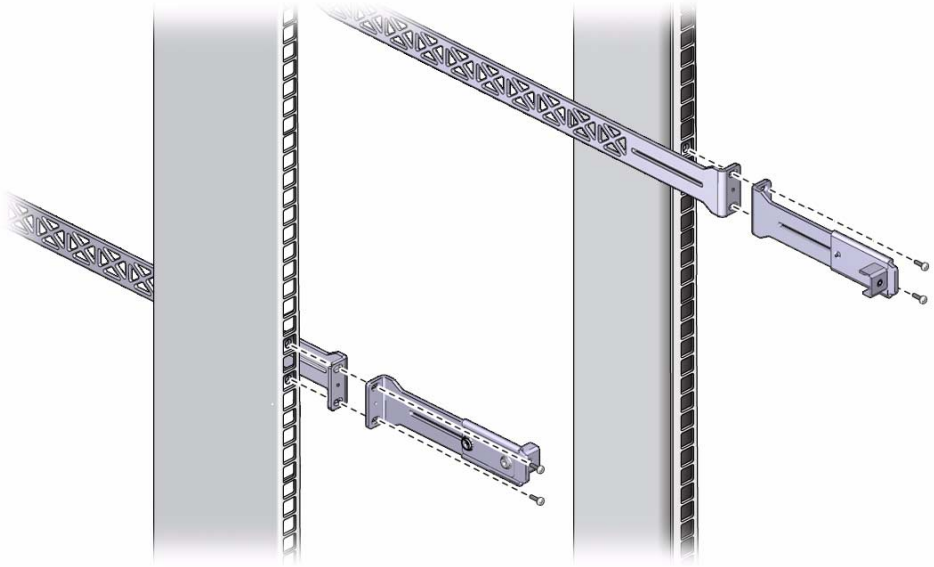
d. **Using a No. 2 Phillips screwdriver, tighten the two screws.**

e. **Repeat from Step a for the other cable management extender.**

4. **Attach the cable management extenders and long rails to the rear of the rack.**

a. **Place the long rail to the mounting location on the rear rack post.**

b. **Butt the flange of the extender to the flange of the long rail.**

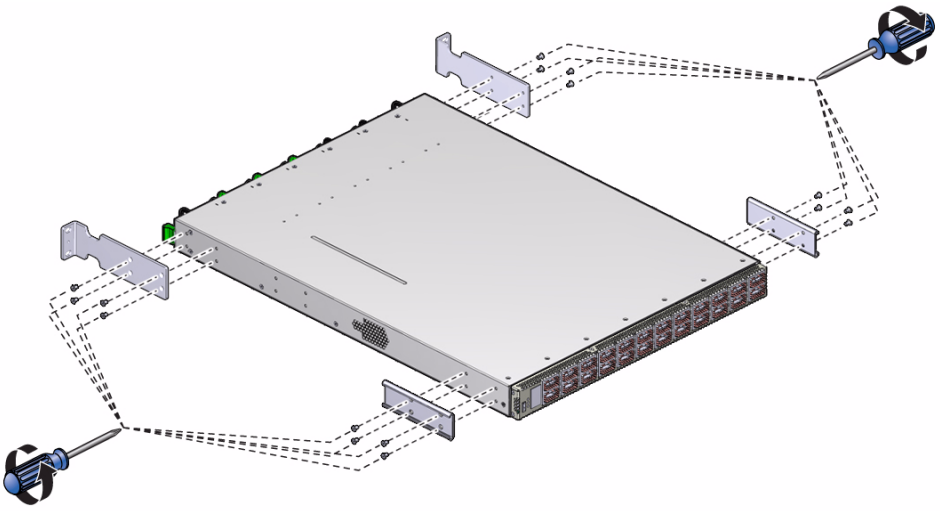


c. **Secure the assembly to the post with two captive nuts and two screws.**

d. **Repeat from Step a for the other cable management extender and long rail.**

5. **Attach the long front brackets (with cutouts) to the switch with 4 screws on each side.**

   The flange of the long front brackets point away from the switch.



6. **Attach the C-shaped brackets to the switch with 4 screws on each side.**

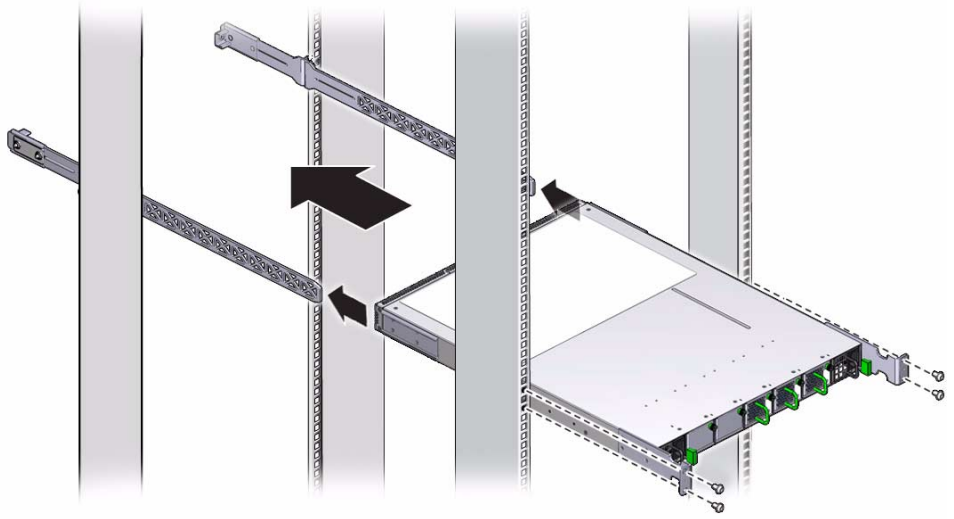
   The edge of the C-shaped bracket is flush to the rear of the chassis.

7. **Route the power cords through the rack with the female end at the front of the rack where the switch will install.**

   Ensure that there is 24 inches (610 mm) of power cord slack at the front of the rack to provide an adequate service loop for when removing the switch from the rack.

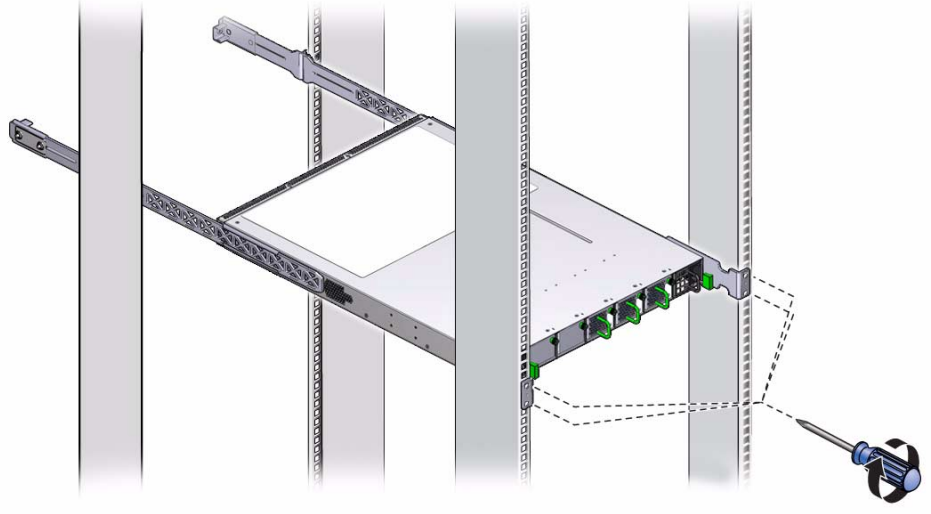
8. **Carefully lift the switch and slide it into the rack, from the front rearward.**

   Ensure that the ends of the long rails slide into the C-shaped brackets at the rear of the switch chassis and that the power cords lay into the cut-outs of the long front mounting brackets.

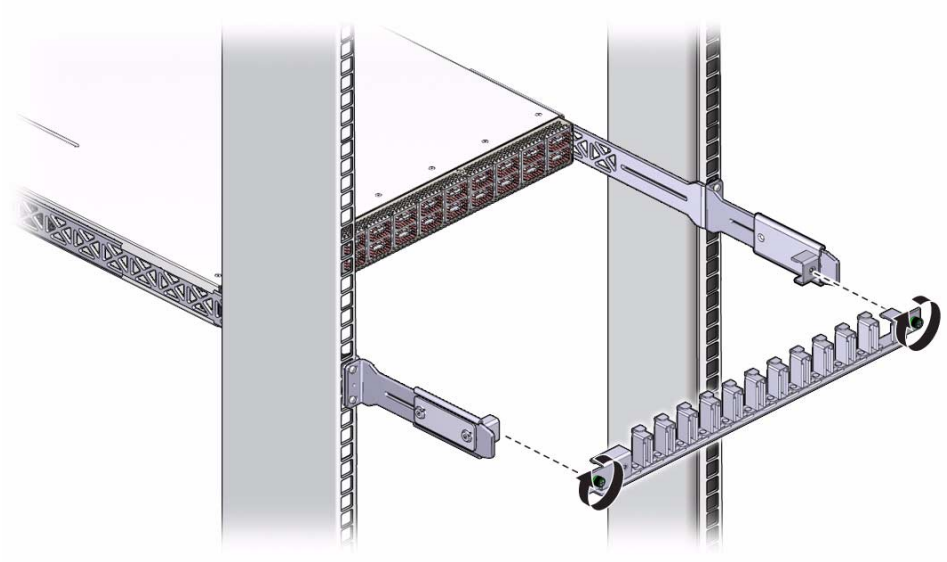


9. **Mount the front of the switch chassis to the front rack posts with two captive nuts and two screws at each side.**

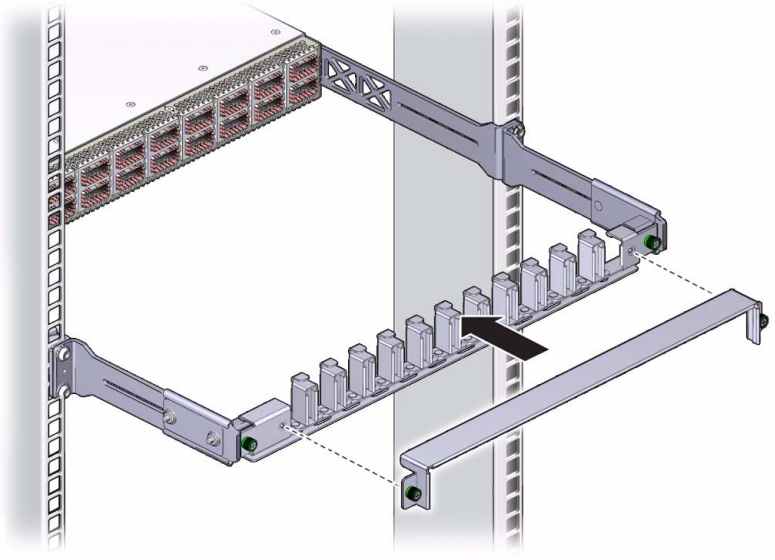
   Tighten the screws securely.



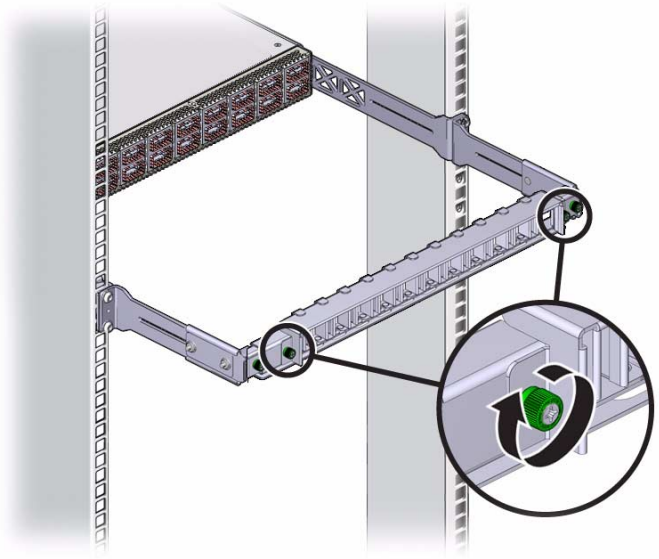
10. **Install the cable management bracket to the tabs of the attachment brackets at the rear of the switch, tightening the thumbscrews on each side of the cable management bracket.**



11. **Install the cable management bracket cover.**



12. **Tighten the thumbscrews on each side of the cover.**



13. **Attach the management cables.**

    See "Attach the Management Cables" on page 24.

Related Information

- "Shipping Carton Contents" on page 16
- "Powering On the Switch" on page 23

Powering On the Switch

After installing the components, enable powering up of the switch by performing these tasks.

- "Attach the Management Cables" on page 24
- "Attach the Power Cords" on page 27
- "Accessing the Management Controller" on page 28
- "Verify the Switch Status" on page 31
- "Start the Subnet Manager" on page 34

Related Information

- "Understanding Switch Specifications" on page 1
- "Routing Service Cables" on page 7
- "Connecting InfiniBand Cables" on page 35

▼ Attach the Management Cables

The switch has two connectors for network communication or serial communication with the management controller.

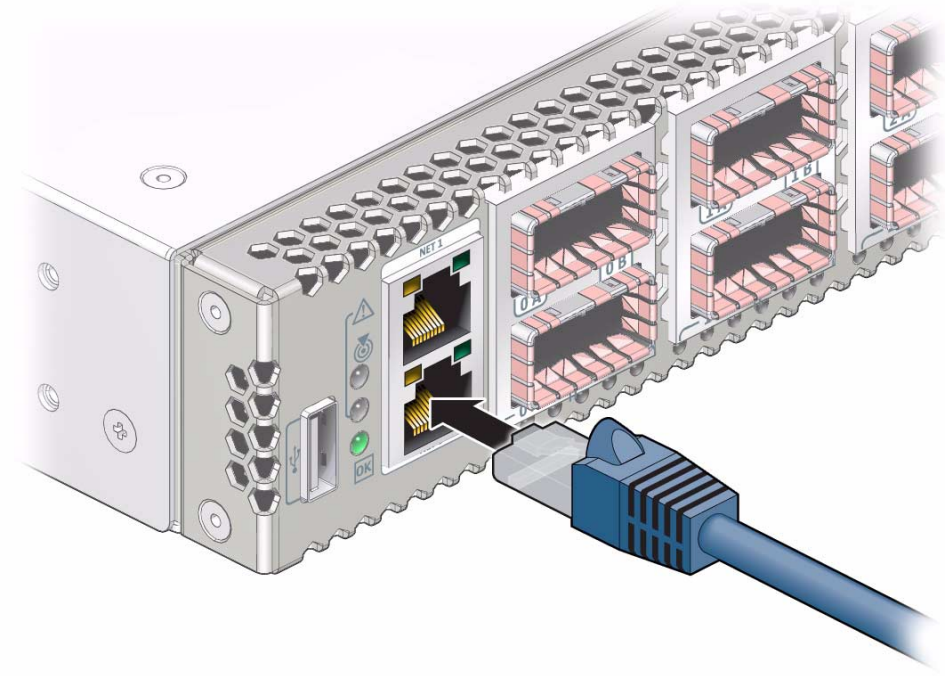
The network management connector, labeled NET, is a 100 BASE-T Ethernet interface. This connector is preferred because it permits remote management of the switch over the Ethernet network.

The USB management connector, labeled USB, is the second choice for communication with the management controller in the switch. The management console can be a serial terminal, a system running a TIP connection, or other serial device which communicates with the management controller through a USB-to-serial adapter. The serial parameters for communication with the USB-to-serial adapter is typically 115600, 8, N, 1.

1. **Identify the prerequisite and subsequent installation tasks that you must perform in conjunction with this procedure.**

   See "Installation Sequence" on page 16.

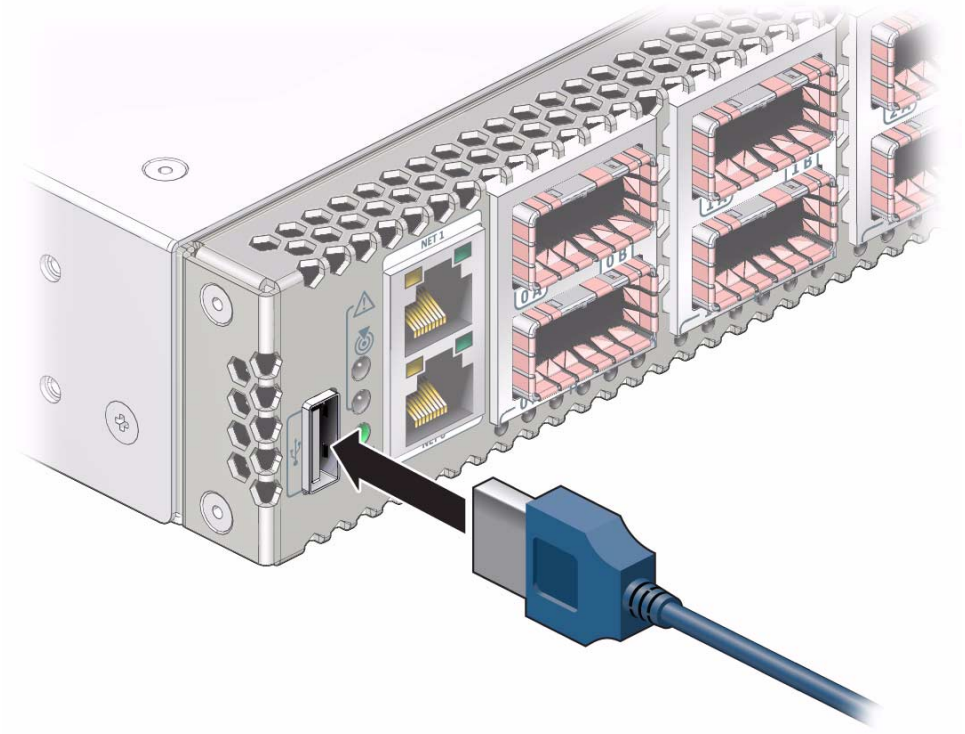
2. **Connect the network management cables from the management console to the connectors labeled NET.**



3. **Configure the DHCP server with the MAC address of the management controller.**

   The MAC address is printed on the customer information (yellow) sheet on the outside of the switch shipping carton and on the pull-out tab on the left side front of the switch chassis, adjacent to power supply 0.

4. **(Optional) Connect the serial management cables from the management console to the USB-to-serial adapter, and from the adapter to the connector labeled with the USB symbol.**



5. **Route the management cables so that they do not interfere with other cables, with servicing the switch, or with other systems.**
6. **Prepare the management console for communication with the management controller.**
7. **Power on the switch.**

   See "Attach the Power Cords" on page 27.

Related Information

- "Network Management Connector and Pins" on page 4
- "USB Management Connector and Pins" on page 5
- "Management Cable Requirements" on page 8
- "Attach the InfiniBand Cables" on page 36

▼ Attach the Power Cords

The power cords for the switch ship separately and are specific to the country of installation. The facility power receptacles for the power cords should be located such that the power cords are routed out of the way, either to the sides of the rack or under the floor.

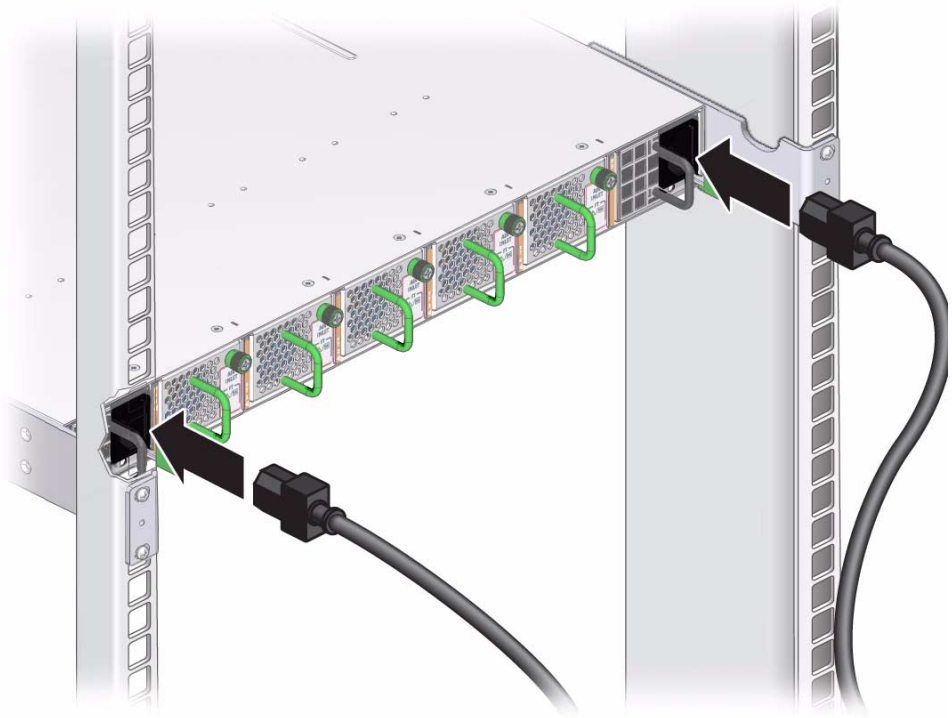
When live power is delivered to the receptacles at the front of the chassis, standby and main power is made available by the power supplies. When standby power is distributed to the chassis, the management controller is powered on. The main power is supplied for the switch chips and fans.

1. **Identify the prerequisite and subsequent installation tasks that you must perform in conjunction with this procedure.**

   See "Installation Sequence" on page 16.

2. **Ensure that the circuit breakers for the power supplies are switched off.**

3. **Plug a power cord into each power receptacle at the front of the chassis.**



4. **Route each power cord to its respective facility power receptacle.**

   Use cable ties or hook and loop fastener straps to bundle and secure the cord.

5. **Plug each power cord into the receptacle.**
6. **Energize the circuit breakers so that the power receptacles are live.**
7. **Verify that the status LEDs for each power supply indicates normal operation.**

   The AC LED lights and in a moment, the OK LED should light. The Attention LED should be unlit. See "Check Power Supply Status LEDs" on page 58.

Note – At this time, power is being supplied to the management controller. The controller is effectively on and booting up. You might see the boot sequence on the management console.

---

8. **Verify that the fans spin up.**

   You should feel air going into the fans and the fan Attention LEDs should be unlit. See "Check Fan Status LEDs" on page 59.
9. **Verify that the chassis status OK LED lights.**

   See "Check Chassis Status LEDs" on page 56.
10. **Access the management controller.**

    See "Accessing the Management Controller" on page 28.

Related Information

- "Power Cord Requirements" on page 7
- "Electrical Specifications" on page 3
- "Attach the InfiniBand Cables" on page 36

Accessing the Management Controller

With power applied, you can now access the management controller.

- "Access the Management Controller From the Network Management Port" on page 29
- "Access the Management Controller From the USB Management Port" on page 30

Related Information

- "Network Management Connector and Pins" on page 4
- "USB Management Connector and Pins" on page 5
- "Management Cable Requirements" on page 8

▼ Access the Management Controller From the Network Management Port

Note – The administrator of the switch has the username of `root`.

1. **Identify the prerequisite and subsequent installation tasks that you must perform in conjunction with this procedure.**

   See "Installation Sequence" on page 16.

2. **If you have not already done so, configure the DHCP server with the MAC address and new host name of the management controller inside of your switch.**

   The MAC address is printed on the customer information (yellow) sheet on the outside of the switch shipping carton and on the pull-out tab on the left side front of the switch chassis, adjacent to power supply 0.

3. **Open a SSH session and connect to the management controller by specifying the controller's host name as configured with the DHCP server.**

   For example:

```
% ssh -l root nm2name
root@nm2name's password: password
#
```

   where *nm2name* is the host name of the management controller. The name might be the word `hostname`. Initially, the password is `changeme`.

Note – You can change the *password* at a later time. See "Change the Administrator Password" on page 93 for instructions on how to change the administrator password.

4. **Verify the switch status.**

   See "Verify the Switch Status" on page 31.

Related Information

- "Network Management Connector and Pins" on page 4
- "Management Cable Requirements" on page 8

▼ Access the Management Controller From the USB Management Port

Note – The administrator of the switch has the username of `root`.

1. **Identify the prerequisite and subsequent installation tasks that you must perform in conjunction with this procedure.**

   See "Installation Sequence" on page 16.

2. **If you have not already done so, connect a USB-to-serial adapter to the USB port of the switch.**

3. **Connect a serial terminal, terminal server, or workstation with a TIP connection to the USB-to-serial adapter.**

   Configure the terminal or terminal emulator with these settings:

   - 115200 baud
   - 8 bits
   - No parity
   - 1 Stop bit
   - No handshaking

4. **Press the Return or Enter key on the serial device several times to synchronize the connection.**

   You might see text similar to the following:

```
...
CentOS release 5.2 (Final)
Kernel 2.6.27.13-nm2 on an i686

nm2name login:
```

   where *nm2name* is the host name of the management controller. The name might be the word `hostname`. Even if you do not see the text, go to Step 5.

5. **Type `root` for the login name followed by the `root` password of `changeme`.**

```
nm2name login: root
Password: password
#
```

   The # prompt is displayed.

Note – You can change the *password* at a later time. See "Change the Administrator Password" on page 93 for instructions on how to change the administrator password.

6. **Verify the switch status.**

   See "Verify the Switch Status" on page 31.

Related Information

- "USB Management Connector and Pins" on page 5
- "Management Cable Requirements" on page 8

▼ Verify the Switch Status

You can use the following commands on the management controller to check the status of the switch.

1. **Identify the prerequisite and subsequent installation tasks that you must perform in conjunction with this procedure.**

   See "Installation Sequence" on page 16.

2. **Check the overall health of the switch:**

```
# showunhealthy
OK - No unhealthy sensors
#
```

   An unfavorable output from the `showunhealthy` command means a hardware fault with that particular component.

3. **Check the status of the power supplies:**

```
# checkpower
PSU 0 present status: OK
PSU 1 present status: OK
#
```

   A power supply output that is not `OK` from the `checkpower` command means that there is a problem with that power supply. See "Check Power Supply Status LEDs" on page 58 for assistance.

4. **Check the status of the fans:**

```
# getfanspeed
Fan 0 rpm 12311
Fan 1 rpm 12311
Fan 2 rpm 12311
Fan 3 rpm 12433
Fan 4 rpm 12433
#
```

- A `stopped` or low speed in the output of the `getfanspeed` command means there is a problem with that particular fan.
- If `not present` is in the output of the `getfanspeed` command, yet a fan is installed at the particular slot, there is a problem with that particular fan.

For either condition, check the fan. See "Servicing the Fans" on page 124.

5. **Check the status of the switch chips:**

```
# checkboot
I4-A OK
I4-B OK
I4-C OK
I4-D OK
I4-E OK
I4-F OK
#
```

If the output of the `checkboot` command is *not* `OK`, there is a problem with the particular switch chip. Try resetting the switch chip. See "Reset the Switch Chip" on page 89.

6. **Alternatively, you can use the `env_test` command to perform the preceding checks and more:**

```
# env_test
NM2 Environment test started:
Starting Voltage test:
Voltage ECB OK
Measured 3.3V Main = 3.28 V
Measured 3.3V Standby = 3.40 V
Measured 12V = 12.06 V
Measured 5V = 5.10 V
Measured VBAT = 3.17 V
Measured 1.8V = 1.78 V
Measured 1.2V Standby = 1.21 V
Measured 1.8V Standby = 1.80 V
```

```
Measured 2.5VA = 2.51 V
Measured 2.5VB = 2.51 V
Measured 1.2VA = 1.22 V
Measured 1.2VB = 1.22 V
Measured 1.2VC = 1.21 V
Measured 1.2VD = 1.21 V
Measured 1.2VB = 1.21 V
Measured 1.2VE = 1.21 V
Measured 1.2VF = 1.21 V
Voltage test returned OK
Starting PSU test:
PSU 0 present
PSU 1 present
PSU test returned OK
Starting Temperature test:
Back temperature 23.00
Front temperature 32.62
ComEx temperature 26.12
I4-A temperature 55, maxtemperature 56
I4-B temperature 48, maxtemperature 49
I4-C temperature 53, maxtemperature 53
I4-D temperature 48, maxtemperature 49
I4-E temperature 53, maxtemperature 54
I4-F temperature 53, maxtemperature 54
Temperature test returned OK
Starting FAN test:
Fan 0 running at rpm 12433
Fan 1 running at rpm 12311
Fan 2 running at rpm 12311
Fan 3 running at rpm 12433
Fan 4 running at rpm 12433
FAN test returned OK
Starting Connector test:
Connector test returned OK
Starting I4 test:
I4-A OK
I4-B OK
I4-C OK
I4-D OK
I4-E OK
I4-F OK
All I4s OK
I4 test returned OK
NM2 Environment test PASSED
#
```

7. **Once the switch has an operational status, start the Subnet Manager.**

   See "Start the Subnet Manager" on page 34.

Related Information

- *Switch Reference*, `showunhealthy` command
- *Switch Reference*, `checkpower` command
- *Switch Reference*, `getfanspeed` command
- *Switch Reference*, `checkboot` command
- *Switch Reference*, `env_test` command

▼ Start the Subnet Manager

If you have no Subnet Managers other than the one within the management controller, you can set the Subnet Manager priority to the lowest value. If you have other Subnet Managers in your InfiniBand fabric, you must decide which is to be the master Subnet Manager. The master Subnet Manager has the highest priority. All other Subnet Managers are slave Subnet Managers, and *must* have a lower priority.

1. **Identify the prerequisite and subsequent installation tasks that you must perform in conjunction with this procedure.**

   See "Installation Sequence" on page 16.

2. **Create the root node GUID file.**

   See "Create the `guid.txt` File" on page 105.

3. **Create the Subnet Manager configuration file.**

   See "Create the `opensm.conf` File" on page 106.

4. **Determine the priority of the Subnet Manager within the management controller.**

5. **Set the priority of the Subnet Manager:**

```
# setsmpriority priority
```

   where *priority* is `0` (lowest) to `13` (highest). For example, to set the Subnet Manager to priority 13:

```
# setsmpriority 13
-------------------------------------------------
OpenSM 3.2.6_20090717
 Reading Cached Option File: /etc/opensm/opensm.conf
 Loading Cached Option:routing_engine = ftree
 Loading Cached Option:sminfo_polling_timeout = 1000
 Loading Cached Option:polling_retry_number = 3
Command Line Arguments:
```

```
 Priority = 13
 Creating config file template '/tmp/osm.conf'.
 Log File: /var/log/opensm.log
-----------------------------------------------
#
```

6. **Enable the Subnet Manager:**

```
# enablesm
Starting IB Subnet Manager.                                [  OK  ]
#
```

7. **Attach the InfiniBand cables.**

   See "Attach the InfiniBand Cables" on page 36.

Related Information

- *Switch Reference*, `setsmpriority` command
- *Switch Reference*, `enablesm` command
- *Switch Reference*, `opensm` command

Connecting InfiniBand Cables

After verifying the switch operational status, you can begin attaching the InfiniBand cables.

- "InfiniBand Cable Cautions" on page 10
- "InfiniBand Cable Guidelines" on page 11
- "Attach the InfiniBand Cables" on page 36
- "Check Link Status" on page 41

Related Information

- "Understanding InfiniBand Cabling" on page 9
- "Powering On the Switch" on page 23
- "Verifying the InfiniBand Fabric" on page 41

▼ Attach the InfiniBand Cables

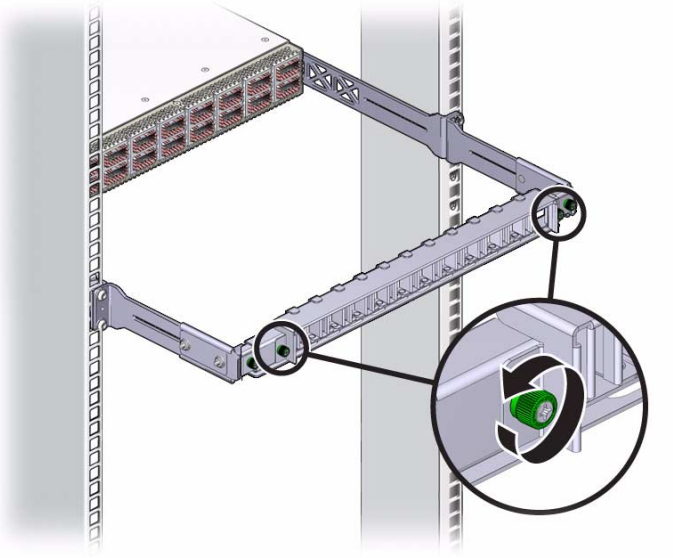
Caution – InfiniBand cables must never turn tighter than a 5-inch (127 mm) radius. A tighter radius damages the wires and fibers inside the cable.

Note – When you install the InfiniBand cables, connect cables to the lower connectors first, then connect cables to the upper connectors.

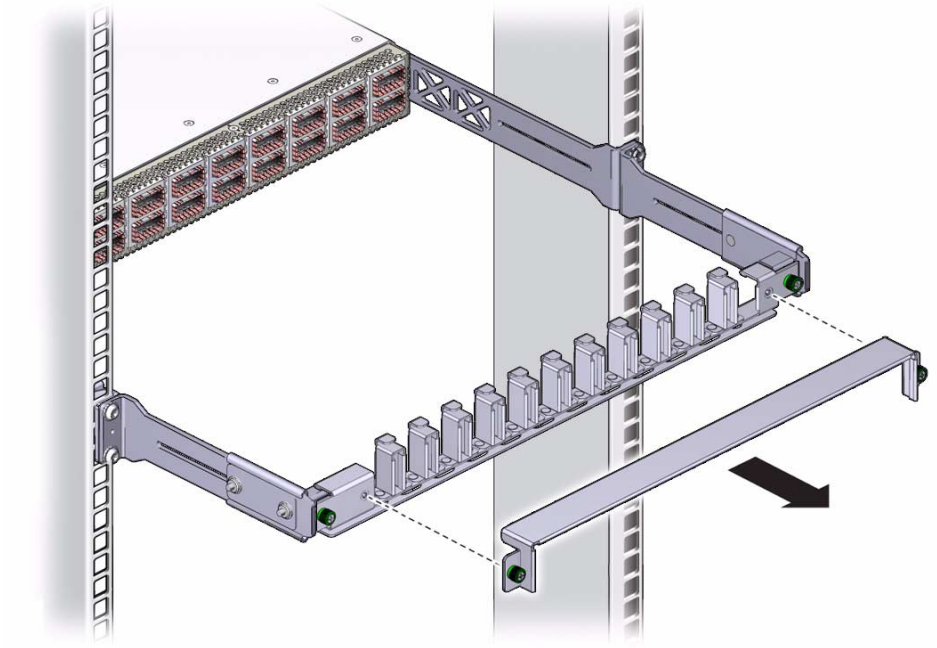
1. **Identify the prerequisite and subsequent installation tasks that you must perform in conjunction with this procedure.**

   See "Installation Sequence" on page 16.

2. **Loosen the two captive thumbscrews that secure the cover to the cable management bracket.**



3. **Lift the cover off.**



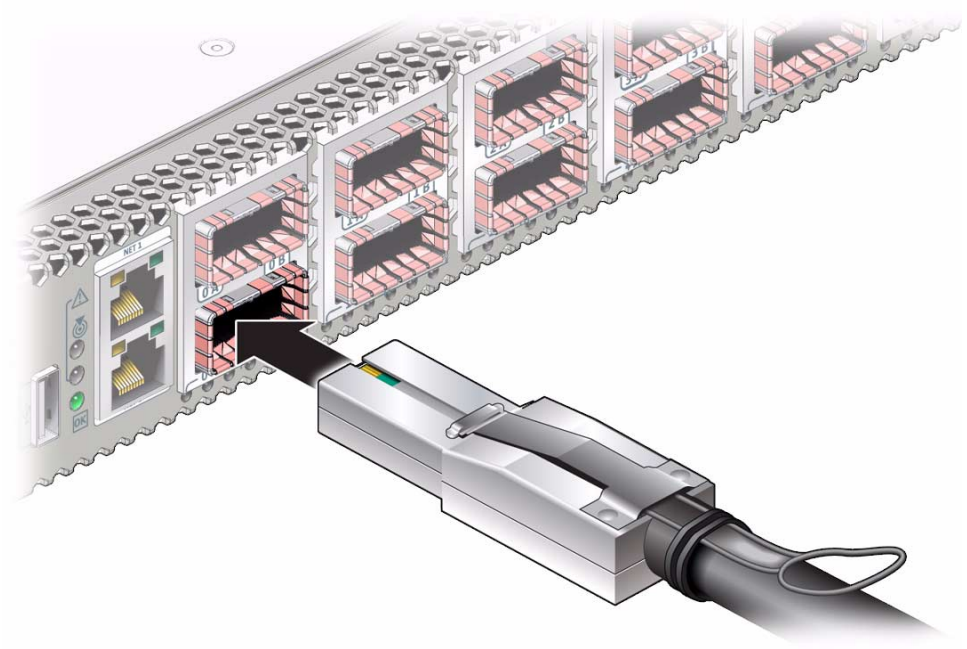
4. **Remove the protective cap from the connector and visually inspect the cable connector.**

   The shell should not be bent and should be parallel to the inner boards. If the connector is bent or damaged, use a different cable.

5. **Ensure that the retraction strap is forward.**

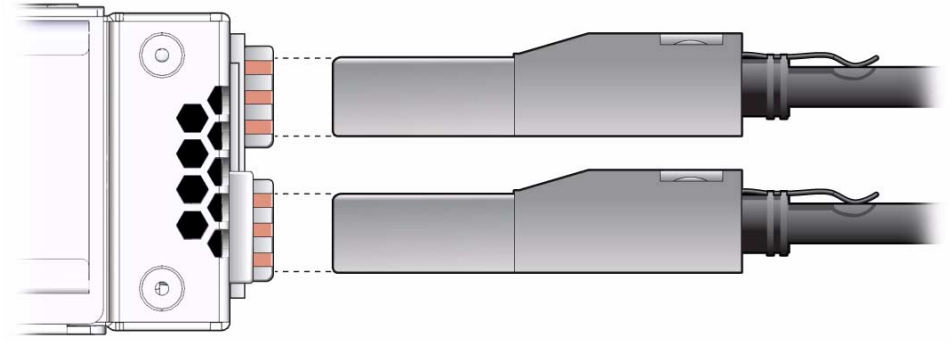
6. **Orient the cable connector to the CXP receptacle squarely and horizontally.**

   Ensure that the upper shell just touches the underside of the top of the receptacle on the rear panel.



7. **Slowly move the connector in.**

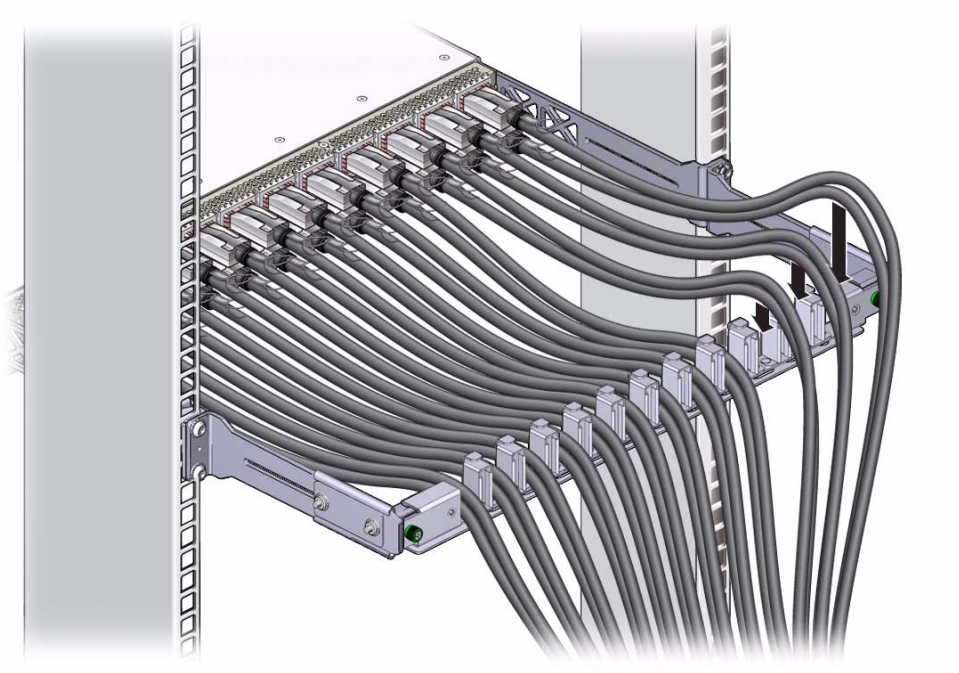
   As you slide the connector in, the top of the shell should scrape against the underside of the top of the CXP receptacle.



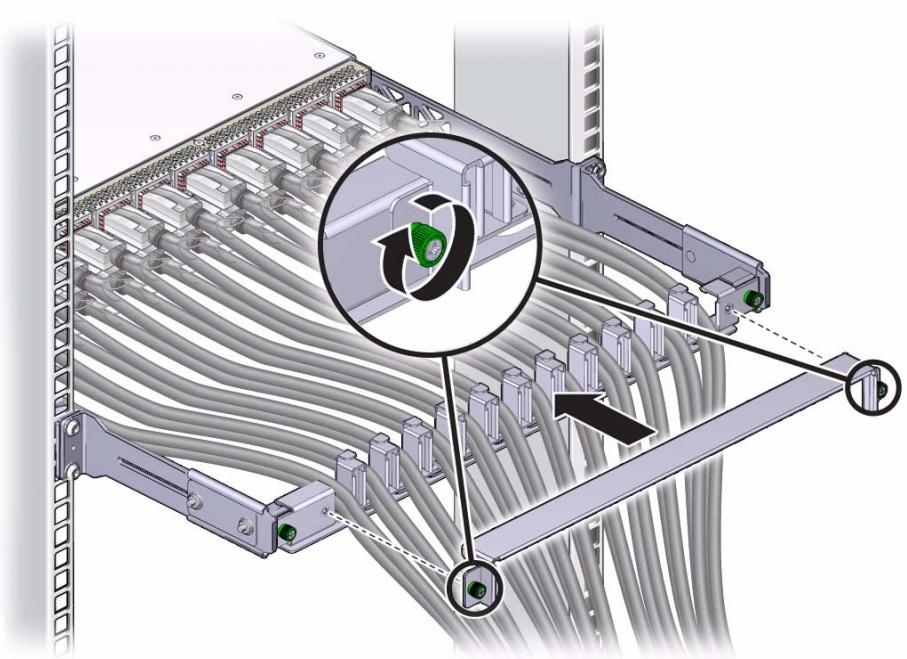
   - If the connector stops or binds after about 1/4 in. (5 mm) travel, back out and repeat from Step 6.
   - If the connector stops or binds with about 1/8 in. (2 mm) still to go, back out and repeat Step 7.

8. **Continue to push the connector in until the hooks catch onto the top of the receptacle.**

9. **Place the cable into the open slot on the cable management bracket.**



10. **Repeat Step 4 through Step 9 for all cables to be installed.**
11. **Replace the cover for the cable management bracket and tighten the thumbscrews.**



12. **Route the InfiniBand cables so that they do not interfere with other cables, or with servicing the Sun Datacenter InfiniBand Switch 72 or other systems.**

    Use hook and loop fastener straps to bundle and secure the cables.

Note – Do not use cable zip ties to bundle or secure the cable, because the ties damage the wires inside the cable.

---

13. **Check that the Link LEDs for cabled links are lit green.**

    If the Link LED is unlit, the link is down. If the Link LED flashes, there are symbol errors. See "Check Link Status LEDs" on page 57.

14. **If installed, close the rack doors to maintain EMI compliance.**

15. **Check the link status.**

    See "Check Link Status" on page 41.

Related Information

- "Understanding InfiniBand Cabling" on page 9
- "Attach the Management Cables" on page 24
- "Attach the Power Cords" on page 27

▼ Check Link Status

1. **Identify the prerequisite and subsequent installation tasks that you must perform in conjunction with this procedure.**

   See "Installation Sequence" on page 16.

2. **On the management controller, determine the state of the links:**

```
# listlinkup
```

   - If the link for a connector is reported as `Not present`, there is no cable attached or the link at either end of the cable is down.
   - If a port `is down`, use the `enableswitchport` command to bring the port up. Alternatively, use the `i4reset` command to reset the entire switch chip. See "Enable a Switch Chip Port" on page 92 and "Reset the Switch Chip" on page 89.

3. **Verify the InfiniBand fabric.**

   See "Verifying the InfiniBand Fabric" on page 41.

Related Information

- *Switch Reference*, `listlinkup` command
- *Switch Reference*, `enableswitchport` command
- *Switch Reference*, `i4reset` command
- "Verify the Switch Status" on page 31

Verifying the InfiniBand Fabric

Use the `ibnetdiscover`, `ibdiagnet`, and `ibcheckerrors` commands to initially determine the operational status of your switch in the InfiniBand fabric.

- "Discover the InfiniBand Fabric Topology" on page 42
- "Perform Diagnostics on the InfiniBand Fabric" on page 43
- "Validate the InfiniBand Fabric and Report Errors" on page 44

Related Information

- "Powering On the Switch" on page 23
- "Connecting InfiniBand Cables" on page 35

▼ Discover the InfiniBand Fabric Topology

The `ibnetdiscover` command enables you to see the InfiniBand fabric topology and build a topology file which is used by the OpenSM Subnet Manager.

1. **Identify the prerequisite and subsequent installation tasks that you must perform in conjunction with this procedure.**

   See "Installation Sequence" on page 16.

2. **On the management controller, type:**

```
# ibnetdiscover
#
# Topology file: generated on Thu Aug 13 18:16:02 2009
#
# Max of 2 hops discovered
# Initiated from node 0021283a8620b0f0 port 0021283a8620b0f0
vendid=0x2c9
devid=0xbd36
sysimgguid=0x21283a8620b0f3
switchguid=0x21283a8620b0f0(21283a8620b0f0)
Switch  36 "S-0021283a8620b0f0"         # "Sun DCS 72 QDR FC switch o4nm2-72p-2"
enhanced port 0 lid 25 lmc 0
[36]    "S-0021283a8620b0d0"[4]         # "Sun DCS 72 QDR switch 1.2(LC)" lid 23
4xQDR
[35]    "S-0021283a8620b0b0"[5]         # "Sun DCS 72 QDR switch 1.2(LC)" lid 21
4xQDR
[34]    "S-0021283a8620b0d0"[6]         # "Sun DCS 72 QDR switch 1.2(LC)" lid 23
4xQDR
.
.
.
vendid=0x2c9
devid=0xbd36
sysimgguid=0x21283a8620b0e3
switchguid=0x21283a8620b0e0(21283a8620b0e0)
Switch  36 "S-0021283a8620b0e0"          # "Sun DCS 72 QDR switch 1.1(FC)" base
port 0 lid 24 lmc 0
[22]    "S-0021283a8620b0c0"[18]                # "Sun DCS 72 QDR switch 1.2(LC)"
lid 22 4xQDR
.
.
.
#
```

Note – The output for your InfiniBand fabric will differ from that in the example.

3. **Perform InfiniBand fabric diagnostics.**

   See "Perform Diagnostics on the InfiniBand Fabric" on page 43.

Related Information

- *Switch Reference*, `ibnetdiscover` command
- "Validate the InfiniBand Fabric and Report Errors" on page 44

▼ Perform Diagnostics on the InfiniBand Fabric

The `ibdiagnet` command performs a collection of tests on the InfiniBand fabric and generates several files that contain parameters and aspects of the InfiniBand fabric.

1. **Identify the prerequisite and subsequent installation tasks that you must perform in conjunction with this procedure.**

   See "Installation Sequence" on page 16.

2. **On the management controller, type:**

```
# ibdiagnet
```

   In the following example, the `ibdiagnet` command is minimized to determine which links are underperforming:

```
# ibdiagnet -lw 4x -ls 10 -skip all
Loading IBDIAGNET from: /usr/lib/ibdiagnet1.2
-W- Topology file is not specified.
  Reports regarding cluster links will use direct routes.
Loading IBDM from: /usr/lib/ibdm1.2
-I- Using port 0 as the local port.
-I- Discovering ... 6 nodes (6 Switches & 0 CA-s) discovered.
.
.
.
-I- Links With links width != 4x (as set by -lw option)
-I---------------------------------------------------
-I- No unmatched Links (with width != 4x) were found
-I---------------------------------------------------
-I- Links With links speed != 10 (as set by -ls option)
-I---------------------------------------------------
-I- No unmatched Links (with speed != 10) were found
.
.
.
-I- Stages Status Report:
```

```
  STAGE                                    Errors Warnings
  Bad GUIDs/LIDs Check                     0      0
  Link State Active Check                  0      0
  Performance Counters Report              0      0
  Specific Link Width Check                0      0
  Specific Link Speed Check                0      2
  Partitions Check                         0      0
  IPoIB Subnets Check                      0      0
Please see /tmp/ibdiagnet.log for complete log
----------------------------------------------------------------
-I- Done. Run time was 16 seconds.
#
```

Note – The output for your InfiniBand fabric will differ from that in the example.

3. **Validate and check errors for the InfiniBand fabric.**

   See "Validate the InfiniBand Fabric and Report Errors" on page 44.

Related Information

- *Switch Reference*, `ibdiagnet` command
- "Discover the InfiniBand Fabric Topology" on page 42

▼ Validate the InfiniBand Fabric and Report Errors

The `ibcheckerrors` command uses the topology file to scan the InfiniBand fabric and validate the connectivity as described in the topology file, and to report errors as indicated by the port counters.

1. **Identify the prerequisite and subsequent installation tasks that you must perform in conjunction with this procedure.**

   See "Installation Sequence" on page 16.

2. **On the management controller, type:**

```
# ibcheckerrors
#warn: counter RcvSwRelayErrors = 48342         (threshold 100) lid 25 port 255
Error check on lid 25 (Sun DCS 72 QDR FC switch o4nm2-72p-2) port all:  FAILED
#warn: counter RcvSwRelayErrors = 56839         (threshold 100) lid 25 port 28
Error check on lid 25 (Sun DCS 72 QDR FC switch o4nm2-72p-2) port 28:  FAILED
#warn: counter RcvSwRelayErrors = 56839         (threshold 100) lid 25 port 9
Error check on lid 25 (Sun DCS 72 QDR FC switch o4nm2-72p-2) port 9:  FAILED
#warn: counter SymbolErrors = 65535     (threshold 10) lid 20 port 255
Error check on lid 20 (Sun DCS 72 QDR switch 1.2(LC)) port all:  FAILED
```

```
.
.
.
## Summary: 6 nodes checked, 0 bad nodes found
##          144 ports checked, 2 ports have errors beyond threshold
#
```

Note – The output for your InfiniBand fabric will differ from that in the example.

Related Information

- *Switch Reference*, `ibcheckerrors` command
- "Discover the InfiniBand Fabric Topology" on page 42
- "Perform Diagnostics on the InfiniBand Fabric" on page 43

Administering the Switch

The following topics describe the administration of the switch.

Related Information

- "Installing the Switch" on page 1
- "Servicing the Switch" on page 111
- *Switch Remote Administration*
- *Switch Reference*

Troubleshooting the Switch

The following topics help you resolve some basic problems that might occur with your switch.

Related Information

- "Administrative Command Overview" on page 66

- "Monitoring the Hardware" on page 67
- "Monitoring the InfiniBand Fabric" on page 76
- "Controlling the Hardware" on page 87
- "Controlling the InfiniBand Fabric" on page 93

Switch Hardware Problems

The following table lists situations that might occur with switch hardware and corrective steps that can be taken to resolve the problem.

Situation	Corrective Steps
The Attention LED on a power supply is lit or the power supply seems dysfunctional.	1. Check the power supply status. See "Display Power Supply Status" on page 68. 2. Unplug the respective power cord, wait 15 minutes, then reattach the power cord. 3. If the previous steps do not rectify the situation, replace the power supply. See "Servicing the Power Supplies" on page 113.
There is no network communication with the management controller.	1. Verify that the management controller is powered without faults. See "Check Chassis Status LEDs" on page 56 . 2. Verify that there is a LinkUp condition at the network management port. See "Check Network Management Port Status LEDs" on page 57. 3. Verfiy the DHCP server is providing the IP address you are using to access the management controller. See DHCP server documentation. 4. If you are able to access the management controller through the USB connector, restart the management controller. See "Access the Management Controller From the USB Management Port" on page 30 and "Restart the Management Controller" on page 88. 5. If you are unable to access the management controller through the USB connector, power cycle the switch. See "Power Off a Power Supply" on page 117 and "Power On a Power Supply" on page 122. 6. If the previous steps do not rectify the situation, replace the switch. See "Remove the Switch From the Rack" on page 139 and "Installing the Switch" on page 1.

Situation	Corrective Steps
The Attention LED on the switch chassis is lit or the management controller seems dysfunctional.	1. If you are unable to access the management controller, power cycle the switch. See "Power Off a Power Supply" on page 117 and "Power On a Power Supply" on page 122. 2. If you are able to access the management controller, restart the management controller. See "Restart the Management Controller" on page 88. 3. Check overall switch health. See "Display Switch General Health" on page 68 4. Verify that the switch is within operating temperatures and voltages. See "Display Switch Environmental and Operational Data" on page 71. 5. If the previous steps do not rectify the situation, replace the switch. See "Remove the Switch From the Rack" on page 139 and "Installing the Switch" on page 1.
The Attention LED on a fan is lit or the fan seems dysfunctional.	1. Check the fan speed. See "Display Fan Status" on page 71. 2. If the previous step does not rectify the situation, replace the fan. See "Servicing the Fans" on page 124. 3. If the previous step does not rectify the situation, install the fan into another available slot. See "Servicing the Fans" on page 124 4. If no other slots are available, replace the switch. See "Remove the Switch From the Rack" on page 139 and "Installing the Switch" on page 1.
After installation, no links are operational.	1. Verify that there is at least one Subnet Manager active on the InfiniBand Fabric. See "Display Subnet Manager Status" on page 87. 2. If no Subnet Manager is active, start the Subnet Manager within the switch. See "Start the Subnet Manager" on page 34. 3. If the previous steps do not rectify the situation, restart the Subnet Manager. See "Disable the Subnet Manager" on page 107 and "Enable the Subnet Manager" on page 107.
After installation, not all links are operational.	1. Determine which links are non-operational. See "Display Link Status" on page 75. 2. For links that are "`Down`", disable and re-enable the respective ports. See "Disable a Switch Chip Port" on page 92 and "Enable a Switch Chip Port" on page 92. 3. If the previous steps do not rectify the situation, disable the respective port. See "Disable a Switch Chip Port" on page 92.

Situation	Corrective Steps
There was a power outage during a firmware update.	1. If you are able to access the management controller, restart the management controller. See "Restart the Management Controller" on page 88. 2. If you are unable to access the management controller, power cycle the switch. See "Power Off a Power Supply" on page 117 and "Power On a Power Supply" on page 122. 3. Reperform the firmware upgrade. See "Upgrading the Firmware" on page 145.

Related Information

- "InfiniBand Fabric Problems" on page 51
- "Understanding the LEDs" on page 54
- "Understanding Routing Through the Switch" on page 59
- "Switch GUIDs Overview" on page 65

InfiniBand Fabric Problems

The following table lists situations that might occur with the InfiniBand fabric and corrective steps that can be taken to resolve the problem.

Situation	Corrective Steps
Performance of the InfiniBand fabric seems diminished.	1. Determine if there are errors or problems with the InfiniBand fabric. See: "Perform Comprehensive Diagnostics for the Entire Fabric" on page 94 "Find 1x or SDR or DDR Links in the Fabric" on page 97 "Determine Which Links Are Experiencing Significant Errors" on page 97 2. Locate the affected nodes by the GUID provided in the output of the `ibdiagnet` command. See "Locate a Switch Chip or Connector From the GUID" on page 74. 3. If the problem is at a cable connection, swap the suspect cable with a known good cable or reconnect the cable to a known good remote port and repeat Step 1. See "Servicing the InfiniBand Cables" on page 132. 4. If the problem still remains at the cable connection, disable and re-enable the respective port and repeat Step 1. See "Disable a Port" on page 102 and "Enable a Port" on page 103. Temporary solution: • If the problem still remains, disable the affected port. See "Disable a Port" on page 102. Permanent solution: • If the problem still remains, replace the affected component or the switch. See "Servicing the InfiniBand Cables" on page 132. See remote port's documentation for replacement procedures. See "Remove the Switch From the Rack" on page 139 and "Installing the Switch" on page 1.

Situation	Corrective Steps
An InfiniBand Link LED is blinking.	1. Disconnect and properly reconnect both ends of the respective InfiniBand cable. See *Switch Service*, servicing an InfiniBand cable. 2. If the LED is still blinking, determine the significance of the errors through use of the `ibdiagnet` command. See "Determine Which Links Are Experiencing Significant Errors" on page 97. 3. Determine which connectors map to the affected link by deconstructing the node's GUID and port. See "Locate a Switch Chip or Connector From the GUID" on page 74. 4. If some of the links are running at 1x or SDR, use that situation elsewhere in this table to rectify the problem. 5. Disable and re-enable the respective ports. See "Disable a Port" on page 102 and "Enable a Port" on page 103. 6. If the errors are still significant, swap the cable with a known good one or reconnect the cable to a known good remote port, and repeat from 2. 7. Depending upon what does or does not rectify the problem, replace that component. See "Servicing the InfiniBand Cables" on page 132. See remote port's documentation for replacement procedures.

Situation	Corrective Steps

Some InfiniBand links are running at 1x or SDR.	For a temporary solution:
	1. Identify the suspect links using the `ibdiagnet` command.
	See "Find 1x or SDR or DDR Links in the Fabric" on page 97. Look for text like the following:
	`-W- link with SPD=2.5 found at direct path "1,19"`
	`From: a Switch PortGUID=0x00066a00d80001dd Port=19`
	`To: a Switch PortGUID=0x00066a00d80001dd Port=24`
	2. Determine which connectors map to the affected link by deconstructing the node's GUID and port.
	See "Locate a Switch Chip or Connector From the GUID" on page 74.
	3. Verify the cable connection at both ends.
	See "Servicing the InfiniBand Cables" on page 132.
	4. Disable and re-enable the respective ports.
	See "Disable a Port" on page 102 and "Enable a Port" on page 103.
	5. If the previous steps do not rectify the problem, disable the port.
	See "Disable a Port" on page 102.
	For a permanent solution:
	1. Perform the steps for a temporary solution, steps 1 to step 4.
	2. Swap the cable with a known good one or reconnect the cable to a known good remote port, and repeat from 1.
	3. Depending upon what does or does not rectify the problem, replace that component or the switch.
	See "Servicing the InfiniBand Cables" on page 132.
	See remote port's documentation for replacement procedures.
	See "Remove the Switch From the Rack" on page 139 and "Installing the Switch" on page 1.

There are errors on some InfiniBand links.	1. Clear the error counters.
	See "Clear Error Counters" on page 98.
	2. Start a fabric stress test.
	3. Identify the suspect links using the `ibdiagnet` command.
	See "Determine Which Links Are Experiencing Significant Errors" on page 97. Look for text like the following:
	`-W- lid=0x0006 guid=0x0021283a8816c0a0 dev=48438 Port=34`
	`Performance Monitor counter : Value`
	`link_recovery_error_counter : 0x1`
	`symbol_error_counter : 0x25 (Increase by 3 during ibdiagnet)`
	4. For links that are experiencing recovery errors or substantial symbol errors, refer to other parts of this table to help identify the cause and rectify the problem.

Situation	Corrective Steps
Output of InfiniBand commands provides only GUID and port, not switch chip or CXP connectors.	You can find the location of a node in the switch, by deconstructing the node's GUID and port, then you can crossreference the node and port to a connector. See "Locate a Switch Chip or Connector From the GUID" on page 74 and "Understanding Routing Through the Switch" on page 59.

Related Information

- "Switch Hardware Problems" on page 48
- "Understanding the LEDs" on page 54
- "Understanding Routing Through the Switch" on page 59
- "Switch GUIDs Overview" on page 65

Understanding the LEDs

Status LEDs are used on many components of the switch chassis as a means of indicating the component's state. You can check the state of the LEDs, using the following procedures:

- "Front Status LEDs" on page 55
- "Rear Status LEDs" on page 55
- "Check Chassis Status LEDs" on page 56
- "Check Network Management Port Status LEDs" on page 57
- "Check Link Status LEDs" on page 57
- "Check Power Supply Status LEDs" on page 58
- "Check Fan Status LEDs" on page 59

Related Information

- "Switch Hardware Problems" on page 48
- "InfiniBand Fabric Problems" on page 51
- "Understanding Routing Through the Switch" on page 59
- "Switch GUIDs Overview" on page 65

Front Status LEDs

The power supply status LEDs and fan status LEDs are located on the front of the switch chassis.

FIGURE: Front Status LEDs

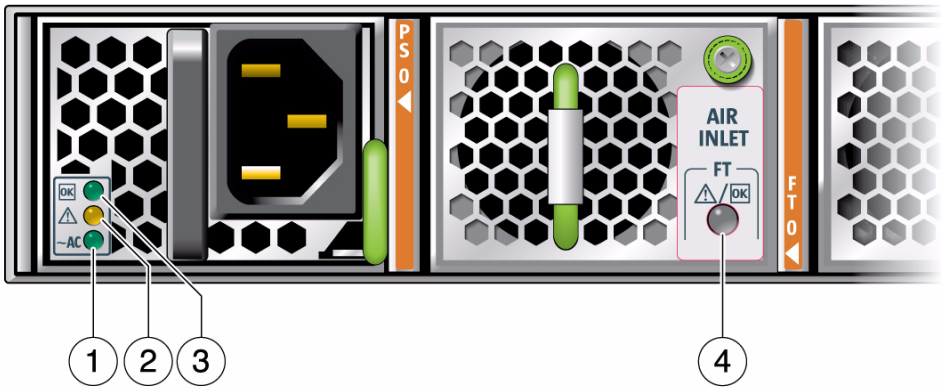


Figure Legend

1	Power supply AC LED
2	Power supply Attention LED
3	Power supply OK LED
4	Fan status LEDs

Related Information

- "Check Power Supply Status LEDs" on page 58
- "Check Fan Status LEDs" on page 59

Rear Status LEDs

The chassis status LEDs, network management status LEDs, and link status LEDs are located on the rear of the switch chassis.

FIGURE: Rear Status LEDs

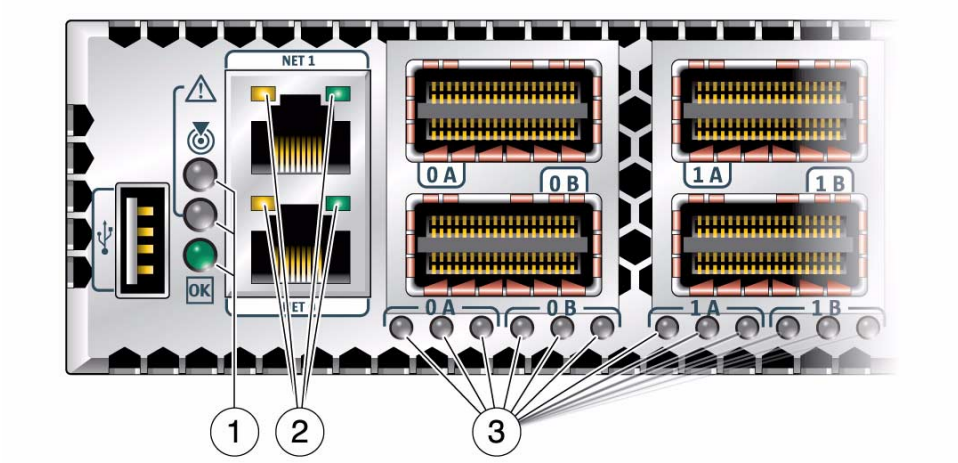


Figure Legend

1	Chassis status LEDs
2	NET status LEDs
3	Link status LEDs

Related Information

- "Check Chassis Status LEDs" on page 56
- "Check Network Management Port Status LEDs" on page 57
- "Check Link Status LEDs" on page 57

▼ Check Chassis Status LEDs

The chassis status LEDs are located on the left side of the rear panel. See "Rear Status LEDs" on page 55.

1. **Visually inspect the chassis status LEDs.**

2. **Compare what you see to the following table.**

Glyph	Location	Name	Color	State and Meaning
	Top	Locator	White	On – No function. Off – Disabled. Flashing – The switch is identifying itself.
	Middle	Attention	Amber	On – Normal fault detected. Off – No faults detected. Flashing – No function.
	Bottom	OK	Green	On – Switch is functional without fault. Off – Switch is off or initializing. Flashing – No function.

Related Information

- "Display Switch Environmental and Operational Data" on page 71

▼ Check Network Management Port Status LEDs

The network management port status LEDs are located on the network management connector of the rear panel. See "Rear Status LEDs" on page 55.

1. **Visually inspect the NET status LEDs.**
2. **Compare what you see to the following table.**

Name	Position	Color	State
Activity	Left	Green	On – No function. Off – No activity. Flashing – Packet activity.
Link speed	Right	Amber or green	Amber on – 100BASE-T Green on – 1000BASE-T Off – No link or link down. Flashing – No function.

▼ Check Link Status LEDs

The link status LEDs are located at the InfiniBand connectors of the rear panel. See "Rear Status LEDs" on page 55.

1. **Visually inspect the link status LEDs.**

2. **Compare what you see for a particular link to the following table.**

Name	Color	State and Meaning
Link	Green	On – Link established. Off – No link or link down. Flashing – Symbol errors.

Related Information

- "Display Link Status" on page 75
- "Display the Link Status of a Node" on page 80
- "Display Counters for a Node" on page 81

▼ Check Power Supply Status LEDs

The power supply status LEDs are located on the power supply at the front of the chassis. See "Front Status LEDs" on page 55.

1. **Visually inspect the power supply's status LEDs.**
2. **Compare what you see on the power supply to the following table.**

Glyph	Location	Name	Color	State and Meaning
OK	Top	OK	Green	On – 12 VDC is supplied. Off – No DC voltage is present. Flashing – No function.
⚠	Middle	Attention	Amber	On – Fault detected, 12 VDC shut down. Off – No faults detected. Flashing – No function.
~ AC	Bottom	AC	Green	On – AC power present and good. Off – AC power not present. Flashing – No function.

Caution – If a power supply has shut down because of a thermal or overcurrent condition, signified by the amber Attention LED lighting, remove the respective power cord from the chassis. Allow the power supply to completely cool for at least 15 minutes. A shorter cooling time might cause damage to the power supply when the power cord is reattached. If the Attention LED lights amber upon reattaching the power cord, replace the power supply.

Related Information

- "Display Power Supply Status" on page 68
- "Check Board-Level Voltages" on page 69

▼ Check Fan Status LEDs

The fan status LEDs are located in the lower right corner of the fans at the front of the switch chassis. See "Front Status LEDs" on page 55.

1. **Visually inspect the fan status LEDs.**
2. **If the LED is lit, there is a problem with that fan.**

Related Information

- "Display Fan Status" on page 71

Understanding Routing Through the Switch

The tables in the following topics describe the routing through the switch. The first table maps the CXP connector and link LED to a switch chip port. The second table provides a switch chip to switch chip map. The third table maps the switch chip port to a CXP connector and link LED. When a command's output provides a switch chip port or CXP connector, you can use these tables to determine the route that link is following.

- "CXP Connectors and Link LEDs to Switch Chip Port Routes" on page 60
- "Switch Chip Port to Switch Chip Port Routes" on page 61
- "Switch Chip Port to CXP Connectors and Link LED Routes" on page 62
- "Signal Route Through the Switch" on page 64

Note – The tables have shaded cells which are used for the example described in "Signal Route Through the Switch" on page 64.

Related Information

- "Switch Hardware Problems" on page 48
- "InfiniBand Fabric Problems" on page 51
- "Understanding the LEDs" on page 54
- "Switch GUIDs Overview" on page 65

CXP Connectors and Link LEDs to Switch Chip Port Routes

The following table provides a mapping of the CXP connector and its link LEDs to the respective switch chip and port. The switch chip and port are given as *chip-port*, where:

- *chip* – The identifying letter of the switch chip (A–D).
- *port* – The identifying number of the port (19–36).

Note – The shaded cell seen in the PDF file is used for the example described in "Signal Route Through the Switch" on page 64. The shaded cell is not seen in the HTML file.

Connector Group	CXP Connector A			CXP Connector B		
	Left LED P3	Center LED P2	Right LED P1	Left LED P3	Center LED P2	Right LED P1
0	A-20	A-21	A-22	A-19	A-23	A-24
1	A-26	A-27	A-28	A-25	A-29	A-30
2	A-35	A-34	A-33	A-36	A-32	A-31
3	B-20	B-21	B-22	B-19	B-23	B-24
4	B-26	B-27	B-28	B-25	B-29	B-30
5	B-35	B-34	B-33	B-36	B-32	B-31
6	C-20	C-21	C-22	C-19	C-23	C-24
7	C-26	C-27	C-28	C-25	C-29	C-30
8	C-35	C-34	C-33	C-36	C-32	C-31
9	D-20	D-21	D-22	D-19	D-23	D-24
10	D-26	D-27	D-28	D-25	D-29	D-30
11	D-35	D-34	D-33	D-36	D-32	D-31

Note – When using CXP to QSFP splitter cables, the P1, P2, and P3 QSFP connectors are related to the right, center, and left link LEDs respectively.

Related Information

- "Switch Chip Port to Switch Chip Port Routes" on page 61

Switch Chip Port to Switch Chip Port Routes

The following table provides a mapping of switch chip (I4) and port to another switch chip (I4) and port.

Note – The shaded cell seen in the PDF file is used for the example described in "Signal Route Through the Switch" on page 64. The shaded cell is not seen in the HTML file.

I4	Port	→	I4	Port	I4	Port	→	I4	Port	I4	Port	→	I4	Port	I4	Port	→	I4	Port
A	1	→	E	9	C	1	→	F	9	E	1	→	A	9	F	1	→	C	9
A	2	→	F	8	C	2	→	E	8	E	2	→	C	8	F	2	→	A	8
A	3	→	F	7	C	3	→	E	7	E	3	→	C	7	F	3	→	A	7
A	4	→	E	6	C	4	→	F	6	E	4	→	A	6	F	4	→	C	6
A	5	→	F	5	C	5	→	E	5	E	5	→	C	5	F	5	→	A	5
A	6	→	E	4	C	6	→	F	4	E	6	→	A	4	F	6	→	C	4
A	7	→	F	3	C	7	→	E	3	E	7	→	C	3	F	7	→	A	3
A	8	→	F	2	C	8	→	E	2	E	8	→	C	2	F	8	→	A	2
A	9	→	E	1	C	9	→	F	1	E	9	→	A	1	F	9	→	C	1
A	10	→	F	19	C	10	→	E	19	E	10	→	D	13	F	10	→	B	13
A	11	→	E	20	C	11	→	F	20	E	11	→	B	14	F	11	→	D	14
A	12	→	E	21	C	12	→	F	21	E	12	→	B	15	F	12	→	D	15
A	13	→	F	27	C	13	→	E	27	E	13	→	D	10	F	13	→	B	10
A	14	→	E	26	C	14	→	F	26	E	14	→	B	11	F	14	→	D	11
A	15	→	E	25	C	15	→	F	25	E	15	→	B	12	F	15	→	D	12
A	16	→	F	24	C	16	→	E	24	E	16	→	D	18	F	16	→	B	18
A	17	→	E	23	C	17	→	F	23	E	17	→	B	17	F	17	→	D	17
A	18	→	F	22	C	18	→	E	22	E	18	→	D	16	F	18	→	B	16
B	1	→	E	28	D	1	→	F	28	E	19	→	C	10	F	19	→	A	10

I4	Port	→	I4	Port	I4	Port	→	I4	Port	I4	Port	→	I4	Port	I4	Port	→	I4	Port
B	2	→	F	29	D	2	→	E	29	E	20	→	A	11	F	20	→	C	11
B	3	→	F	30	D	3	→	E	30	E	21	→	A	12	F	21	→	C	12
B	4	→	E	36	D	4	→	F	36	E	22	→	C	18	F	22	→	A	18
B	5	→	F	35	D	5	→	E	35	E	23	→	A	17	F	23	→	C	17
B	6	→	E	34	D	6	→	F	34	E	24	→	C	16	F	24	→	A	16
B	7	→	F	33	D	7	→	E	33	E	25	→	A	15	F	25	→	C	15
B	8	→	F	32	D	8	→	E	32	E	26	→	A	14	F	26	→	C	14
B	9	→	E	31	D	9	→	F	31	E	27	→	C	13	F	27	→	A	13
B	10	→	F	13	D	10	→	E	13	E	28	→	B	1	F	28	→	D	1
B	11	→	E	14	D	11	→	F	14	E	29	→	D	2	F	29	→	B	2
B	12	→	E	15	D	12	→	F	15	E	30	→	D	3	F	30	→	B	3
B	13	→	F	10	D	13	→	E	10	E	31	→	B	9	F	31	→	D	9
B	14	→	E	11	D	14	→	F	11	E	32	→	D	8	F	32	→	B	8
B	15	→	E	12	D	15	→	F	12	E	33	→	D	7	F	33	→	B	7
B	16	→	F	18	D	16	→	E	18	E	34	→	B	6	F	34	→	D	6
B	17	→	E	17	D	17	→	F	17	E	35	→	D	5	F	35	→	B	5
B	18	→	F	16	D	18	→	E	16	E	36	→	B	4	F	36	→	D	4

Related Information

- "CXP Connectors and Link LEDs to Switch Chip Port Routes" on page 60
- "Switch Chip Port to CXP Connectors and Link LED Routes" on page 62
- "Signal Route Through the Switch" on page 64
- "Display Link Status" on page 75
- "Display Switch Chip Port Status" on page 76

Switch Chip Port to CXP Connectors and Link LED Routes

A reverse-lookup mapping of the switch chip and port to CXP connector and its link LEDs is provided in the following table. The connectors and LEDs are given as *connectorletter-location*, where:

- *connector* – The identifying number of the connector group (0–11).
- *letter* – The letter identifying the upper (A) or lower (B) connector.

- *location* – The location of the LED, left, center, or right.

Note – The shaded cell seen in the PDF file is used for the example described in "Signal Route Through the Switch" on page 64. The shaded cell is not seen in the HTML file.

Port	Switch Chip A	Switch Chip B	Switch Chip C	Switch Chip D
19	0B-left-P3	3B-left-P3	6B-left-P3	9B-left-P3
20	0A-left-P3	3A-left-P3	6A-left-P3	9A-left-P3
21	0A-center-P2	3A-center-P2	6A-center-P2	9A-center-P2
22	0A-right-P1	3A-right-P1	6A-right-P1	9A-right-P1
23	0B-center-P2	3B-center-P2	6B-center-P2	9B-center-P2
24	0B-right-P1	3B-right-P1	6B-right-P1	9B-right-P1
25	1B-left-P3	4B-left-P3	7B-left-P3	10B-left-P3
26	1A-left-P3	4A-left-P3	7A-left-P3	10A-left-P3
27	1A-center-P2	4A-center-P2	7A-center-P2	10A-center-P2
28	1A-right-P1	4A-right-P1	7A-right-P1	10A-right-P1
29	1B-center-P2	4B-center-P2	7B-center-P2	10B-center-P2
30	1B-right-P1	4B-right-P1	7B-right-P1	10B-right-P1
31	2B-right-P1	5B-right-P1	8B-right-P1	11B-right-P1
32	2B-center-P2	5B-center-P2	8B-center-P2	11B-center-P2
33	2A-right-P1	5A-right-P1	8A-right-P1	11A-right-P1
34	2A-center-P2	5A-center-P2	8A-center-P2	11A-center-P2
35	2A-left-P3	5A-left-P3	8A-left-P3	11A-left-P3
36	2B-left-P3	5B-left-P3	8B-left-P3	11B-left-P3

Note – When using CXP to QSFP splitter cables, the P1, P2, and P3 QSFP connectors are related to the right, center, and left link LEDs respectively.

Related Information

- "CXP Connectors and Link LEDs to Switch Chip Port Routes" on page 60
- "Switch Chip Port to Switch Chip Port Routes" on page 61
- "Signal Route Through the Switch" on page 64

- "Display Link Status" on page 75
- "Display Switch Chip Port Status" on page 76

Signal Route Through the Switch

By combining the information from the tables in "Understanding Routing Through the Switch" on page 59, it is possible to determine a route through the switch. This topic describes a sample situation that might occur.

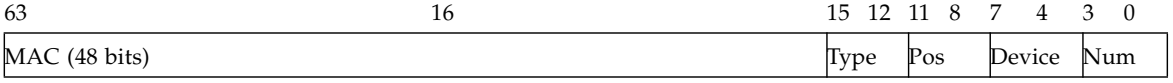
1. A route is initiated at connector 2B. The left LED (P3) blinks.
2. Using "CXP Connectors and Link LEDs to Switch Chip Port Routes" on page 60, it is determined that the link routes to switch chip A, through port 36.
3. The Subnet Manager instructs switch chip A to use port 4 to forward the link.
4. Using "Switch Chip Port to Switch Chip Port Routes" on page 61, it is determined that the link routes to I4 switch chip E, port 6.
5. The Subnet Manager instructs switch chip E to use port 12 to forward the link.
6. Using "Switch Chip Port to Switch Chip Port Routes" on page 61, it is determined that the link routes to switch chip B, port 15.
7. The Subnet Manager instructs switch chip B to use port 24 to forward the link.
8. Using "Switch Chip Port to CXP Connectors and Link LED Routes" on page 62, it is determined that the link exits the switch at connector 3B. The right LED (P1) blinks.

Related Information

- "CXP Connectors and Link LEDs to Switch Chip Port Routes" on page 60
- "Switch Chip Port to Switch Chip Port Routes" on page 61
- "Switch Chip Port to CXP Connectors and Link LED Routes" on page 62
- "Display a Route Through the Fabric" on page 79
- "Perform Comprehensive Diagnostics for a Route" on page 95

Switch GUIDs Overview

Global unit identifiers (GUIDs) are unique 64-bit strings that identify nodes such as switches and channel adapters. For the Sun Datacenter InfiniBand switches, GUIDs are modified to identify the node's role and location. The following table describes the GUID's structure.



The five fields of the GUID are described as follows:

- MAC – Bits 63 through 16 are the Machine Allocation Code (MAC) address. A standard for network components, the MAC address is typically provided by manufacturers in a 6-byte, colon delimited string. For example, 00:11:22:33:44:55.
- Type – Bits 15 through 12 is the type of board on which the node resides.
- Pos – Bits 11 through 8 identify the position of the board within the switch.
- Device – Bits 7 through 4 identify which device on the board has that node.
- Num – Bits 3 through 0 are numbers reserved for the programs which modify the GUID. In most occurrences, the value is 0x2.

The following table provides values for Type, Pos, Device.

Board	Type	Position	Device
Fabric card	0xF	0x0 (Fabric card 0)–0x8 (Fabric card 8)	0xA (I4 chip 0)–0xB (I4 chip 1)
Line card	0x1	0x0 (Line card 0)–0x8 (Line card 8)	0xA (I4 chip 0)–0xD (I4 chip 3)
Gateway	0x3	0x0	0xA,0xB (I4 chips 0, 1) 0x0, 0x4 (Gbe chips)
36-Port	0xA	0x0	0xA (I4 chip 0)
72-Port	0xB	0x0	0xA (I4 chip 0)–0xF (I4 chip 5)

For example, given the following output from the `ibswitches` command:

```
Switch  : 0x0021283a8620b0e0 ports 36 "Sun DCS 72 QDR switch 1.1(FC)" base port
1 lid 24 lmc 0
```

The GUID is 0x0021283a8620b0e0 or 0021283a8620 B 0 E 0. Using the information provided in this topic:

- The MAC address is 0x0021283a8620 or 00:21:28:3A:86:20.
- The type is 0xB, or a 72-port board.

- The position is 0x0.
- The device is 0xE, or I4 switch chip E.
- The number is 0.

Related Information

- *Switch Reference*, `ibnetdiscover` command
- *Switch Reference*, `ibnodes` command
- *Switch Reference*, `ibswitches` command
- *Switch Reference*, `ibhosts` command
- "Identify All Switches in the Fabric" on page 77
- "Switch Hardware Problems" on page 48
- "InfiniBand Fabric Problems" on page 51
- "Understanding the LEDs" on page 54
- "Understanding Routing Through the Switch" on page 59

Administrative Command Overview

The following topics provide an overview of administrative tasks and the command sets to perform those tasks. Administering the switch requires accessing the management controller.

- "Access the Management Controller From the Network Management Port" on page 29
- "Access the Management Controller From the USB Management Port" on page 30
- "Hardware Command Overview" on page 67
- "InfiniBand Command Overview" on page 67

Related Information

- "Troubleshooting the Switch" on page 47
- "Monitoring the Hardware" on page 67
- "Monitoring the InfiniBand Fabric" on page 76
- "Controlling the Hardware" on page 87
- "Controlling the InfiniBand Fabric" on page 93

Hardware Command Overview

The management controller uses a simplified Linux OS and file system. From the # prompt on the management controller, you can type hardware commands to perform some administrative and management tasks. Hardware commands are user-friendly and can perform some testing upon the switch chips, enabling greater control of the switch and its operation.

After you log in to the `root` account, the shell prompt (#) appears, and you can enter shell commands. Enter the hardware commands in the following format:

```
# command [arguments][arguments]...
```

Related Information

- *Switch Reference*, understanding hardware commands
- "InfiniBand Command Overview" on page 67

InfiniBand Command Overview

The InfiniBand commands are a means of monitoring and controlling aspects of the InfiniBand fabric. These commands are also installed on and run from the management controller, which is also the host of the Subnet Manager. Use of these commands requires thorough knowledge of InfiniBand architecture and technology.

After you log in to the `root` account, the shell prompt (#) appears, and you can enter shell commands. Enter the InfiniBand commands in the following format:

```
# command [option][option] ...
```

Related Information

- *Switch Reference*, understanding InfiniBand commands
- "Hardware Command Overview" on page 67

Monitoring the Hardware

The following topics enable you to display and check the operation and status of the switch.

Note – To use the commands described in these topics, you must be the `root` user of the management controller.

Related Information

▼ Display Switch General Health

An easy way to perform a quick check of the switch's operation is with the `showunhealthy` command.

- **On the management controller, type:**

```
# showunhealthy
OK - No unhealthy sensors
#
```

Related Information

- *Switch Reference*, `showunhealthy` command
- "Display Switch Environmental and Operational Data" on page 71

▼ Display Power Supply Status

The `checkpower` command performs a simple pass-fail test on the power supplies.

1. **On the management controller, type:**

```
# checkpower
PSU 0 present status: OK
PSU 1 present status: Alert
#
```

2. **If you see the words `Alert` or `Not Present` in the command output, perform the following steps for the affected power supply.**

   a. **Remove the power cord from the affected power supply.**

      See "Power Off a Power Supply" on page 117.

   b. **Remove the affected power supply from the switch chassis.**

      See "Remove a Power Supply" on page 118.

   c. **Wait one minute.**

   d. **Reinstall the power supply.**

      See "Install a Power Supply" on page 120.

   e. **Re-attach the power cord.**

      See "Power On a Power Supply" on page 122.

   f. **If the power supply's Attention LED lights or the `checkpower` command still reports `Alert` or `Not Present` for the power supply, replace the power supply.**

      See "Servicing the Power Supplies" on page 113.

Related Information

- *Switch Reference*, `checkpower` command
- "Check Board-Level Voltages" on page 69
- "Display Switch Environmental and Operational Data" on page 71

▼ Check Board-Level Voltages

When you want to know if the voltages used by the various components within the switch are within nominal values, use the `checkvoltages` command. If a voltage deviates more than 10% of its nominal value, there is a problem. This check also reports if a battery has failed.

- **On the management controller, type:**

```
# checkvoltages
Voltage ECB OK
Measured 3.3V Main = 3.28 V
Measured 3.3V Standby = 3.37 V
Measured 12V = 12.00 V
Measured 5V = 5.10 V
Measured VBAT = 3.08 V
Measured 1.8V = 1.77 V
Measured 1.2V Standby = 1.21 V
Measured 1.8V Standby = 1.80 V
Measured 2.5VA = 2.51 V
Measured 2.5VB = 2.51 V
Measured 1.2VA = 1.22 V
Measured 1.2VB = 1.21 V
Measured 1.2VC = 1.21 V
Measured 1.2VD = 1.22 V
Measured 1.2VE = 1.21 V
Measured 1.2VF = 1.21 V
All voltages OK
#
```

Related Information

- *Switch Reference*, `checkvoltages` command
- "Display Power Supply Status" on page 68
- "Display Switch Environmental and Operational Data" on page 71

▼ Display Internal Temperatures

If you are concerned with the internal temperature of the switch, you can use the `showtemps` command to display nominal and measured temperatures. If there is a great deviation, there might not be enough cooling.

- **On the management controller, type:**

```
# showtemps
Back temperature 22.88
Front temperature 31.75
Com-Express temperature 26.12
I4-A temperature 55 maxtemperature 55
I4-B temperature 47 maxtemperature 49
I4-C temperature 52 maxtemperature 52
I4-D temperature 48 maxtemperature 49
```

```
I4-E temperature 52 maxtemperature 52
I4-F temperature 52 maxtemperature 54
#
```

Related Information

- *Switch Reference*, `showtemps` command
- "Display Fan Status" on page 71
- "Display Switch Environmental and Operational Data" on page 71

▼ Display Fan Status

The output of the `getfanspeed` command can help you determine fan speed inconsistencies, which might indicate a future failure.

- **On the management controller, type:**

```
# getfanspeed
Fan 0 rpm 17940
Fan 1 rpm 17940
Fan 2 rpm 17687
Fan 3 rpm 17940
Fan 4 rpm 17687
#
```

Related Information

- *Switch Reference*, `getfanspeed` command
- "Display Switch Environmental and Operational Data" on page 71

▼ Display Switch Environmental and Operational Data

The `env_test` command enables you to perform several investigative tasks, helping you determine the internal environment and operational status of the switch.

- **On the management controller, type:**

```
# env_test
NM2 Environment test started:
Starting Voltage test:
Voltage ECB OK
Measured 3.3V Main = 3.28 V
```

```
Measured 3.3V Standby = 3.40 V
Measured 12V = 12.06 V
Measured 5V = 5.10 V
Measured VBAT = 3.17 V
Measured 1.8V = 1.78 V
Measured 1.2V Standby = 1.21 V
Measured 1.8V Standby = 1.80 V
Measured 2.5VA = 2.51 V
Measured 2.5VB = 2.51 V
Measured 1.2VA = 1.22 V
Measured 1.2VB = 1.22 V
Measured 1.2VC = 1.21 V
Measured 1.2VD = 1.21 V
Measured 1.2VB = 1.21 V
Measured 1.2VE = 1.21 V
Measured 1.2VF = 1.21 V
Voltage test returned OK
Starting PSU test:
PSU 0 present
PSU 1 present
PSU test returned OK
Starting Temperature test:
Back temperature 23.00
Front temperature 32.62
ComEx temperature 26.12
I4-A temperature 55, maxtemperature 56
I4-B temperature 48, maxtemperature 49
I4-C temperature 53, maxtemperature 53
I4-D temperature 48, maxtemperature 49
I4-E temperature 53, maxtemperature 54
I4-F temperature 53, maxtemperature 54
Temperature test returned OK
Starting FAN test:
Fan 0 running at rpm 12433
Fan 1 running at rpm 12311
Fan 2 running at rpm 12311
Fan 3 running at rpm 12433
Fan 4 running at rpm 12433
FAN test returned OK
Starting Connector test:
Connector test returned OK
Starting I4 test:
I4-A OK
I4-B OK
I4-C OK
I4-D OK
I4-E OK
I4-F OK
All I4s OK
```

```
I4 test returned OK
NM2 Environment test PASSED
#
```

Related Information

- *Switch Reference*, `env_test` command

▼ Display Switch Firmware Versions

In time, newer or updated switch firmware might become available. The `nm2version` command displays the versions of the firmware within the switch chassis.

- **On the management controller, type:**

```
# nm2version
NM2-72p version: 0.1.0-1
Build time: Aug 24 2009 16:41:03
FPGA version: 0x94
ComExpress info:
Board Name: "NOW1"
Manufacturer Name: "JUMP"
Manufacturing Date: 2009.02.19
Last Repair Date: 1980.01.01
Serial Number: "NCD2S0240"
Hardware Revision: 0x0100
Firmware Revision: 0x0102
Jida Revision: 0x0103
Feature Number: 0x0001
#
```

Note – The output of the `nm2version` command contains extraneous information. In this example, only the output that is **`bold`** is relevant to the administration of the switch.

Related Information

- *Switch Reference*, `nm2version` command

▼ Locate a Switch Chip or Connector From the GUID

The output of some InfiniBand commands identify a node by its GUID. You can determine the switch chip or InfiniBand cable connection associated with that GUID using this procedure.

1. **In the output of the InfiniBand command, identify the GUID and port in question.**

   For example, given the following output from the `ibdiagnet` command:

```
-W- lid=0x0055 guid=0x0021283a8638b0c0 dev=48438 Port=21
```

   In this example, the GUID is `0x0021283a8638b0c0` and the port is 21.

2. **Truncate all digits of the GUID except the four digits on the right.**

   For example, GUID `0x0021283a8638b0c0` is truncated to `b0c0`.

   The `b0` means that the node is inside of a Sun Datacenter InfiniBand Switch 72. The `c` means that the node is located in I4 switch chip C. The port is 21.

3. **Use the tables in "Understanding Routing Through the Switch" on page 59 to cross-reference the routing to other switch chips and ports and to connections.**

   For example, using "Switch Chip Port to CXP Connectors and Link LED Routes" on page 62, I4 switch chip C, port 21 routes to connector 6A, the center LED, and the link is carried by P2.

Related Information

- "Switch GUIDs Overview" on page 65

▼ Display Switch Chip Boot Status

If you believe there is a problem with a switch chip, the `checkboot` command provides a quick pass-fail check of the switch chips. Should a switch chip fail the test, you can use the `i4reset` command in attempt to reboot the switch chip.

- **On the management controller, type:**

```
# checkboot
I4-A OK
I4-B OK
I4-C OK
I4-D OK
```

```
I4-E OK
I4-F OK
#
```

Related Information

- *Switch Reference*, `checkboot` command
- "Reset the Switch Chip" on page 89
- "Display Switch Environmental and Operational Data" on page 71

▼ Display Link Status

In some situations, you might need to know the status of each route through the switch. Additionally, the `listlinkup` command displays where InfiniBand cables are connected to the switch.

- **On the management controller, type:**

```
# listlinkup
Connector  0A Present <-> I4-A Ports 22 up 21 up 20 up
Connector  1A Not present
Connector  2A Not present
Connector  3A Not present
Connector  4A Not present
.
.
Connector 10B Not present
Connector 11B Not present
Link I4-A 01 <-> I4-E 09 up
Link I4-A 02 <-> I4-F 08 up
Link I4-A 03 <-> I4-F 07 up
.
.
.
Link I4-D 18 <-> I4-E 16 up
#
```

Related Information

- *Switch Reference*, `listlinkup` command
- "Display the Link Status of a Node" on page 80
- "Set Link Speed" on page 91

▼ Display Switch Chip Port Status

If by using other procedures, it seems that a particular port of a switch chip is problematic, you can use the `getportstatus` command to provide the port state, width, and speed.

- **On the management controller, type:**

```
# getportstatus switch_chip  port
```

where:

- *switch_chip* is the letter of the switch chip (`A–F`).
- *port* is the number of the port on the switch chip (`1–36`).

For example:

```
# getportstatus A 7
Portstate 4
Portphystate 5
LinkWidthActive 2
LinkSpeedActive 4
#
```

Related Information

- *Switch Reference*, `getportstatus` command
- "Display the Link Status of a Node" on page 80

Monitoring the InfiniBand Fabric

The following tasks enable you to display and check the operation and status of the InfiniBand fabric and components.

Note – To use the commands described in these topics, you must be the `root` user of the management controller.

- "Identify All Switches in the Fabric" on page 77
- "Identify All HCAs in the Fabric" on page 78
- "Display the InfiniBand Fabric Topology" on page 78
- "Display a Route Through the Fabric" on page 79

- "Display the Link Status of a Node" on page 80
- "Display Counters for a Node" on page 81
- "Display Data Counters for a Node" on page 82
- "Display Low-Level Detailed Information About a Node" on page 83
- "Display Low-Level Detailed Information About a Port" on page 84
- "Map LIDs to GUIDs" on page 86
- "Display Subnet Manager Status" on page 87

Related Information

- "Monitoring the Hardware" on page 67
- "Controlling the InfiniBand Fabric" on page 93

▼ Identify All Switches in the Fabric

If you need to know identity information about the switches in the InfiniBand fabric, you can use the `ibswitches` command. This command displays the GUID, name, LID, and LMC for each switch. The output of the command is a mapping of GUID to LID for switches in the fabric.

- **On the management controller, type:**

```
# ibswitches
Switch  : 0x0021283a8620b0f0 ports 36 "Sun DCS 72 QDR FC switch o4nm2-72p-2"
enhanced port 0 lid 25 lmc 0
Switch  : 0x0021283a8620b0d0 ports 36 "Sun DCS 72 QDR switch 1.2(LC)" base port
0 lid 23 lmc 0
Switch  : 0x0021283a8620b0b0 ports 36 "Sun DCS 72 QDR switch 1.2(LC)" base port
0 lid 21 lmc 0
Switch  : 0x0021283a8620b0a0 ports 36 "Sun DCS 72 QDR switch 1.2(LC)" base port
0 lid 20 lmc 0
Switch  : 0x0021283a8620b0c0 ports 36 "Sun DCS 72 QDR switch 1.2(LC)" base port
0 lid 22 lmc 0
Switch  : 0x0021283a8620b0e0 ports 36 "Sun DCS 72 QDR switch 1.1(FC)" base port
0 lid 24 lmc 0
.
.
.
#
```

Note – The output in the example is just a portion of the full output.

Related Information

- *Switch Reference*, `ibhosts` command
- *Switch Reference*, `ibswitches` command

▼ Identify All HCAs in the Fabric

Similar to the `ibswitches` command, the `ibhosts` command displays identity information about the HCAs in the InfiniBand fabric. The output contains the GUID and name for each HCA.

Note – Unlike the `ibswitches` command, the `ibhosts` command does not display the LIDs.

- **On the management controller, type:**

```
# ibhosts
Ca      : 0x5080020000911314 ports 1 "nsn32-50 HCA-1"
Ca      : 0x5080020000911310 ports 1 "nsn32-20 HCA-1"
Ca      : 0x50800200008e532c ports 1 "ib-71 HCA-1"
Ca      : 0x50800200008e5328 ports 1 "ib-70 HCA-1"
Ca      : 0x50800200008296a4 ports 2 "ib-90 HCA-1"
.
.
.
#
```

Note – The output in the example is just a portion of the full output.

Related Information

- *Switch Reference*, `ibhosts` command
- *Switch Reference*, `ibswitches` command

▼ Display the InfiniBand Fabric Topology

To understand the routing that happens within your InfiniBand fabric, the `ibnetdiscover` command displays the node-to-node connectivity. The output of the command is dependent upon the size of your fabric.

- **On the management controller, type:**

```
# ibnetdiscover
```

Related Information

- *Switch Reference*, `ibnetdiscover` command
- "Determine Changes to the InfiniBand Fabric Topology" on page 95
- "Perform Comprehensive Diagnostics for the Entire Fabric" on page 94

▼ Display a Route Through the Fabric

Often you need to know the route between two nodes. The `ibtracert` command can provide that information by displaying the GUIDs, ports, and LIDs of the nodes along the route.

- **On the management controller, type:**

```
# ibtracert slid dlid
```

where:

- *slid* is the LID of the source node.
- *dlid* is the LID of the destination node.

For example:

```
# ibtracert 25 24
From switch {0x0021283a8620b0f0} portnum 0 lid 25-25 "Sun DCS 72 QDR FC switch
o4nm2-72p-2"
[1] -> switch port {0x0021283a8620b0c0}[9] lid 22-22 "Sun DCS 72 QDR switch
1.2(LC)"
[2] -> switch port {0x0021283a8620b0e0}[8] lid 24-24 "Sun DCS 72 QDR switch
1.1(FC)"
To switch {0x0021283a8620b0e0} portnum 0 lid 24-24 "Sun DCS 72 QDR switch
1.1(FC)"
#
```

For this example:

- The route starts at switch with GUID `0x0021283a8620b0f0` and is using port `0`. The switch is LID `25` and in the description, the switch host's name is `o4nm2-72p-2`.
- The route enters at port `1` of the switch with GUID `0x0021283a8620b0c0` and exits at port `9`. The switch is LID `22`.

- The route enters at port `2` of the switch with GUID `0x0021283a8620b0e02` and exits at port `8`. The switch is LID `24`.

Note – The output for your InfiniBand fabric will differ from that in the example.

Related Information

- *Switch Reference*, `ibtracert` command
- "Perform Comprehensive Diagnostics for a Route" on page 95

▼ Display the Link Status of a Node

If you want to know the link status of a node in the InfiniBand fabric, the `ibportstate` command can tell you the state, width, and speed of that node.

- **On the management controller, type:**

```
# ibportstate lid port
```

where:

- *lid* is the LID of the node.

- *port* is the port of the node.

For example:

```
# ibportstate 24 8
PortInfo:
# Port info: Lid 24 port 8
LinkState:.....................Active
PhysLinkState:.................LinkUp
LinkWidthSupported:............1X or 4X
LinkWidthEnabled:..............1X or 4X
LinkWidthActive:...............4X
LinkSpeedSupported:............2.5 Gbps or 5.0 Gbps or 10.0 Gbps
LinkSpeedEnabled:..............2.5 Gbps or 5.0 Gbps or 10.0 Gbps
LinkSpeedActive:...............10.0 Gbps
Peer PortInfo:
# Port info: Lid 24 DR path slid 25; dlid 65535; 0,8 port 2
LinkState:.....................Active
PhysLinkState:.................LinkUp
LinkWidthSupported:............1X or 4X
LinkWidthEnabled:..............1X or 4X
LinkWidthActive:...............4X
LinkSpeedSupported:............2.5 Gbps or 5.0 Gbps or 10.0 Gbps
LinkSpeedEnabled:..............2.5 Gbps or 5.0 Gbps or 10.0 Gbps
LinkSpeedActive:...............10.0 Gbps
#
```

In the output, the `Active` parameters are the current state of the port.

Related Information

- *Switch Reference*, `ibportstate` command
- "Display Switch Chip Port Status" on page 76
- "Display Link Status" on page 75
- "Find 1x or SDR or DDR Links in the Fabric" on page 97
- "Set Port Speed" on page 101

▼ Display Counters for a Node

To help ascertain the health of a node, the `perfquery` command displays the performance, error, and data counters for that node.

- **On the management controller, type:**

```
# perfquery lid port
```

where:

- *lid* is the LID of the node.
- *port* is the port of the node.

Note – If a *port* value of 255 is specified for a switch node, the counters are the total for all switch ports.

For example:

```
# perfquery 24 8
# Port counters: Lid 24 port 8
PortSelect:......................8
CounterSelect:...................0x1b01
SymbolErrors:....................0
.
.
.
VL15Dropped:.....................0
XmtData:.........................2925432
RcvData:.........................2966688
XmtPkts:.........................40631
RcvPkts:.........................41204
#
```

Note – The output in the example is just a portion of the full output.

Related Information

- *Switch Reference*, `perfquery` command
- "Clear Error Counters" on page 98

▼ Display Data Counters for a Node

If you want to know the data counters for a node, the `ibdatacounts` command provides that subset of the `perfquery` command output.

- **On the management controller, type:**

```
# ibdatacounts lid port
```

where:

- *lid* is the LID of the node.
- *port* is the port of the node.

Note – If no *port* is specified for a switch node, the counters are the total for all switch ports. This is also defined by port 255.

For example:

```
# ibdatacounts 24
# Port counters: Lid 24 port 255
XmtData:.......................22834224
RcvData:.......................22835016
XmtPkts:.......................317142
RcvPkts:.......................317153
#
```

Related Information

- *Switch Reference*, `ibdatacounts` command
- "Clear Data Counters" on page 99

▼ Display Low-Level Detailed Information About a Node

If intensive troubleshooting is necessary to resolve a problem, the `smpquery` command can provide very detailed information about a node.

- **On the management controller, type:**

```
# smpquery switchinfo lid
```

where *lid* is the LID of the node.

For example, to see detailed information about a switch with LID 24, type:

```
# smpquery switchinfo 24
# Switch info: Lid 24
LinearFdbCap:.....................49152
RandomFdbCap:.....................0
McastFdbCap:......................4096
LinearFdbTop:.....................25
DefPort:..........................0
DefMcastPrimPort:.................255
DefMcastNotPrimPort:..............255
LifeTime:.........................18
StateChange:......................0
LidsPerPort:......................0
PartEnforceCap:...................32
InboundPartEnf:...................1
OutboundPartEnf:..................1
FilterRawInbound:.................1
FilterRawOutbound:................1
EnhancedPort0:....................0
#
```

Related Information

- *Switch Reference*, `smpquery` command

▼ Display Low-Level Detailed Information About a Port

The `smpquery` command can provide very detailed information about a port.

- **On the management controller, type:**

```
# smpquery portinfo lid port
```

where:

- *lid* is the LID of the node.

- *port* is the port of the node.

For example, to see detailed information about port 8 on the switch with LID 24, type:

```
# smpquery portinfo 24 8
# Port info: Lid 24 port 8
Mkey:.............................0x0000000000000000
GidPrefix:........................0x0000000000000000
Lid:..............................0x0000
SMLid:............................0x0000
CapMask:..........................0x0
DiagCode:.........................0x0000
MkeyLeasePeriod:..................0
LocalPort:........................8
LinkWidthEnabled:.................1X or 4X
LinkWidthSupported:...............1X or 4X
LinkWidthActive:..................4X
LinkSpeedSupported:...............2.5 Gbps or 5.0 Gbps or 10.0 Gbps
LinkState:........................Active
PhysLinkState:....................LinkUp
LinkDownDefState:.................Polling
ProtectBits:......................0
LMC:..............................0
.
.
.
SubnetTimeout:....................0
RespTimeVal:......................0
LocalPhysErr:.....................8
OverrunErr:.......................8
MaxCreditHint:....................85
RoundTrip:........................16777215
#
```

Note – The output in the example is just a portion of the full output.

Related Information

- *Switch Reference*, `smpquery` command

▼ Map LIDs to GUIDs

In an InfiniBand fabric, the Subnet Manager and Subnet Administrator assign subnet-specific LIDs to nodes. Often in the use of the InfiniBand commands, you must provide a LID to issue a command to a particular InfiniBand device. Alternatively, the output of a command might identify InfiniBand devices by their LID.

You can create a file that is a mapping of node LIDs to node GUIDs, which can help with administrating your InfiniBand fabric. The following procedure creates a file that lists the LID in hexadecimal, the GUID in hexadecimal, and the node description.

Note – Creation of the mapping file is not a requirement for InfiniBand administration.

---

1. **Create an inventory file:**

```
# osmtest -f c -i inventory.txt
```

Note – The `inventory.txt` file can be used for other purposes too, besides this procedure.

---

2. **Create a mapping file:**

```
# cat inventory.txt |grep -e '^lid' -e 'port_guid' -e 'desc' |sed 's/^lid/\nlid/'
> mapping.txt
```

3. **Edit the latter half of the `mapping.txt` file to remove the nonessential information.**

   The content of the `mapping.txt` file looks similar to the following:

```
lid                     0x14
port_guid               0x0021283a8620b0a0
# node_desc             Sun DCS 72 QDR switch 1.2(LC)

lid                     0x15
port_guid               0x0021283a8620b0b0
# node_desc             Sun DCS 72 QDR switch 1.2(LC)

lid                     0x16
port_guid               0x0021283a8620b0c0
# node_desc             Sun DCS 72 QDR switch 1.2(LC)
```

```
.
.
.
```

Note – The output in the example is just a portion of the entire file.

Related Information

- *Switch Reference*, `osmtest` command

▼ Display Subnet Manager Status

If you want to quickly determine your Subnet Manager's priority and state, the `sminfo` command can also provide the LID and GUID of the hosting HCA.

- **On the management controller, type:**

```
# sminfo
```

For example:

```
# sminfo
sminfo: sm lid 25 sm guid 0x21283a8620b0f0, activity count 44911 priority 13
state 3 SMINFO_MASTER
#
```

In the output, the Subnet Manager's hosting HCA has LID `25` and GUID `0x21283a8620b0f0`. The Subnet Manager has a priority of `13` (high) and its state is `3` (master).

Related Information

- *Switch Reference*, `sminfo` command
- "Controlling the Subnet Manager" on page 104

Controlling the Hardware

The following topics describe how you can manage the switch and its components.

Note – To use the commands described in these topics, you must be the `root` user of the management controller.

Related Information

▼ Restart the Management Controller

Should the management controller enter an indeterminate state, you can reboot it. The Subnet Manager and other services are also restarted, however, the InfiniBand fabric's integrity is not impacted.

- **On the management controller, type:**

```
# reboot
Broadcast message from root (pts/0) (Mon Nov 23 12:19:17 2009):
The system is going down for reboot NOW!
# Connection to 123.45.67.89 closed by remote host.
Connection to 123.45.67.89 closed.
#
```

The management controller power cycles and reinitializes.

Note – The `reboot` command severs any management console link to the management controller. You must re-access the management controller to regain administrative control.

Related Information

- "Restart the Entire Switch" on page 89
- "Reset the Switch Chip" on page 89

▼ Restart the Entire Switch

Should you need to restart the entire switch, you can use the `managementreset` command. Resetting the entire switch disrupts the InfiniBand fabric. All services are re-initialized and all links will retrain. Perform this task only when absolutely necessary.

- **On the management controller, type:**

```
# managementreset
Stopping Environment daemon, please wait
Resetting CPLD, please wait
Restarting Environment daemon
Reboot needed to reconnect to I4 and enable IB ports
Do you want do reboot now [yes/no]:yes
Broadcast message from root (pts/0) (Fri Nov 20 17:10:27 2009):
The system is going down for reboot NOW!
# Connection to 123.45.67.89 closed by remote host.
Connection to 123.45.67.89 closed.
#
```

Note – By rebooting the management controller, the link to the management console is severed. You must re-access the management controller to regain administrative control.

Related Information

- "Restart the Management Controller" on page 88
- "Reset the Switch Chip" on page 89

▼ Reset the Switch Chip

If a switch chip does not boot properly, or a large quantity of its ports are problematic, the `i4reset` command might correct the situation.

- **On the management controller, type:**

```
# i4reset switch_chip
```

where *switch_chip* is the letter of the switch chip (A–F).

For example:

```
# i4reset a
Reset I4-A
#
```

Related Information

- *Switch Reference*, `i4reset` command
- "Display Switch Chip Boot Status" on page 74
- "Display Link Status" on page 75
- "Reset a Port" on page 100

▼ Recover Ports After Switch Chip Reset

If after resetting an I4 switch chip using the `i4reset` command ports are still identified as `down`, restart the environment daemon.

1. **On the management console, identify the ports that are `down`:**

```
# listlinkup
Connector  0A Present <-> I4-A Ports 22 down 21 down 20 down
Connector  1A Not present
.
.
.
```

In this example, ports 20, 21, and 22 of switch chip I4-A are `down`.

2. **If the ports are still `down`, restart the environment daemon:**

```
# /etc/init.d/envd stop; /etc/init.d/envd start
#
```

Wait one minute for the links to retrain.

3. **Verify that the ports are** `up`**:**

```
# listlinkup
Connector  0A Present <-> I4-A Ports 22 up 21 up 20 up
Connector  1A Not present
.
.
.
```

Note – If the ports do not come up, repeat this procedure a second time. Additionally, investigate if the respective cable or the InfiniBand device at the other end of the cable is at fault.

Related Information

- *Switch Reference*, `listlinkup` command
- *Switch Reference*, `i4reset` command
- "Reset the Switch Chip" on page 89
- "Display Link Status" on page 75

▼ Set Link Speed

For some configurations, vendor interoperability, or to achieve compatibility, it might be necessary to set link speeds to values different than default. The `setlinkspeed` command enables you to do so for specific ports.

1. **On the management controller, type:**

```
# setlinkspeed switch_chip port speed
```

where:

- *switch_chip* is the letter of the switch chip (`A`–`F`).
- *port* is the number of the port (`1`–`36`).
- *speed* is the speed of the port `1`(x), `2`(x), or `4`(x).

2. **Reset the port:**

```
# enableswitchport switch_chip port
```

where:

- *switch_chip* is the letter of the switch chip (`A–F`).
- *port* is the number of the port (`1–36`).

Related Information

- *Switch Reference*, `setlinkspeed` command
- *Switch Reference*, `enableswitchport` command
- "Understanding Routing Through the Switch" on page 59

▼ Disable a Switch Chip Port

On occasion, you might need to turn off a port. For example, a cable has become damaged and is causing symbol errors that are affecting the switch chip's performance. Use the `disableswitchport` command to disable a switch chip port.

- **On the management controller, type:**

```
# disableswitchport switch_chip port
```

where:

- *switch_chip* is the letter of the switch chip (`A–F`).
- *port* is the number of the port (`1–36`).

Related Information

- *Switch Reference*, `disableswitchport` command
- "Disable a Port" on page 102
- "Enable a Switch Chip Port" on page 92

▼ Enable a Switch Chip Port

You can enable a disabled switch chip port with the `enableswitchport` command.

- **On the management controller, type:**

```
# enableswitchport switch_chip port
```

where:

- *switch_chip* is the letter of the switch chip (`A–F`).
- *port* is the number of the port (`1–36`).

Related Information

- *Switch Reference*, `enableswitchport` command
- "Enable a Port" on page 103
- "Disable a Switch Chip Port" on page 92

▼ Change the Administrator Password

The default password for the `root` user is `changeme`. You can use the `passwd` command to make the password unique and more secure.

- **On the management controller, type:**

```
# passwd user
```

where *user* is the user name who's password is to be changed. For example:

```
# passwd root
Changing password for user root.
New UNIX password: new_password
Retype new UNIX password: new_password
passwd: all authentication tokens updated successfully.
#
```

Related Information

- "Access the Management Controller From the Network Management Port" on page 29
- "Access the Management Controller From the USB Management Port" on page 30

Controlling the InfiniBand Fabric

You can perform the following tasks to manage the InfiniBand fabric and its components.

Note – To use the commands described in these topics, you must be the `root` user of the management controller.

- "Perform Comprehensive Diagnostics for the Entire Fabric" on page 94

Related Information

▼ Perform Comprehensive Diagnostics for the Entire Fabric

If you require a full testing of your InfiniBand fabric, the `ibdiagnet` command can perform many tests with verbose results. The command is a useful tool to determine the general overall health of the InfiniBand fabric.

- **On the management controller, type:**

```
# ibdiagnet -v -r
```

The `ibdiagnet.log` file contains the log of the testing.

Related Information

- *Switch Reference*, `ibdiagnet` command
- *Switch Reference*, `ibdiagpath` command
- "Display the InfiniBand Fabric Topology" on page 78

▼ Perform Comprehensive Diagnostics for a Route

Similar to the `ibdiagnet` command, the `ibdiagpath` command can perform some of the same tests for a particular route.

- **On the management controller, type:**

```
# ibdiagpath -v -l slid,dlid
```

where:

- *slid* is the LID of the source node.
- *dlid* is the LID of the destination node.

The `ibdiagpath.log` file contains the log of the testing.

Related Information

- *Switch Reference*, `ibdiagnet` command
- *Switch Reference*, `ibdiagpath` command
- "Display a Route Through the Fabric" on page 79

▼ Determine Changes to the InfiniBand Fabric Topology

If your fabric has a number of nodes that are suspect, the `osmtest` command enables you to take a "snapshot" (inventory file) of your fabric and at a later time compare that file to the present conditions.

Note – Though this procedure is most useful after initializing the Subnet Manager, it can be performed at any time.

---

1. **Initiate the Subnet Manager.**
2. **Take a "snapshot" of the fabric topology.**

```
# osmtest -f c
Command Line Arguments
Done with args
 Flow = Create Inventory
Aug 13 19:44:53 601222 [B7D466C0] 0x7f -> Setting log level to: 0x03
Aug 13 19:44:53 601969 [B7D466C0] 0x02 -> osm_vendor_init: 1000 pending umads
specified
using default guid 0x21283a8620b0f0
```

```
Aug 13 19:44:53 612312 [B7D466C0] 0x02 -> osm_vendor_bind: Binding to port
0x21283a8620b0f0
Aug 13 19:44:53 636876 [B7D466C0] 0x02 -> osmtest_validate_sa_class_port_info:
------------------------------
SA Class Port Info:
 base_ver:1
 class_ver:2
 cap_mask:0x2602
 cap_mask2:0x0
 resp_time_val:0x10
------------------------------
OSMTEST: TEST "Create Inventory" PASS
#
```

3. After an event, compare the present topology to that saved in the inventory file:

```
# osmtest -f v
Command Line Arguments
Done with args
 Flow = Validate Inventory
Aug 13 19:45:02 342143 [B7EF96C0] 0x7f -> Setting log level to: 0x03
Aug 13 19:45:02 342857 [B7EF96C0] 0x02 -> osm_vendor_init: 1000 pending umads
specified
using default guid 0x21283a8620b0f0
Aug 13 19:45:02 351555 [B7EF96C0] 0x02 -> osm_vendor_bind: Binding to port
0x21283a8620b0f0
Aug 13 19:45:02 375997 [B7EF96C0] 0x02 -> osmtest_validate_sa_class_port_info:
------------------------------
SA Class Port Info:
 base_ver:1
 class_ver:2
 cap_mask:0x2602
 cap_mask2:0x0
 resp_time_val:0x10
------------------------------
Aug 13 19:45:02 378991 [B7EF96C0] 0x01 -> osmtest_validate_node_data: Checking
node 0x0021283a8620b0a0, LID 0x14
Aug 13 19:45:02 379172 [B7EF96C0] 0x01 -> osmtest_validate_node_data: Checking
node 0x0021283a8620b0b0, LID 0x15
.
.
.
Aug 13 19:45:02 480201 [B7EF96C0] 0x01 ->
osmtest_validate_single_path_rec_guid_pair:
  Checking src 0x0021283a8620b0f0 to dest 0x0021283a8620b0f0
Aug 13 19:45:02 480588 [B7EF96C0] 0x01 -> osmtest_validate_path_data: Checking
path SLID 0x19 to DLID 0x19
Aug 13 19:45:02 480989 [B7EF96C0] 0x02 -> osmtest_run:
```

```
***************** ALL TESTS PASS *****************
OSMTEST: TEST "Validate Inventory" PASS
#
```

Note – Depending on the size of your InfiniBand fabric, the output from the `osmtest` command could be tens of thousands of lines long.

Related Information

- *Switch Reference*, `osmtest` command
- "Display the InfiniBand Fabric Topology" on page 78

▼ Find 1x or SDR or DDR Links in the Fabric

You can use the `ibdiagnet` command to determine which links are at 1x bandwidth, 2.5 Gbps, or 5 Gbps data rate.

- **On the management controller, type:**

```
# ibdiagnet -lw 4x -ls 10 -pc -pm -skip all
```

In this instance of the `ibdiagnet` command, there is a check for all links to be at 4x QDR (`-lw 4x -ls 10`), and if not, to report those which are not. Additionally, the `ibdiagnet.log` file contains the log of the testing.

Related Information

- *Switch Reference*, `ibdiagnet` command
- "Display the Link Status of a Node" on page 80
- "Determine Which Links Are Experiencing Significant Errors" on page 97

▼ Determine Which Links Are Experiencing Significant Errors

You can use the `ibdiagnet` command to determine which links are experiencing symbol errors and recovery errors by injecting packets.

1. **On the management controller, type.**

```
# ibdiagnet -c 100 -P all=1
```

   In this instance of the `ibdiagnet` command, 100 test packets are injected into each link and the `-P all=1` option returns all counters that increment during the test.

2. **In the output of the `ibdiagnet` command, search for the `symbol_error_counter` string.**

   That line contains the symbol error count in hexadecimal. The preceding lines identify the node and port with the errors. Symbol errors are minor errors, and if there are relatively few during the diagnostic, they can be monitored.

Note – According to the InfiniBand specification 10E-12 BER, the maximum allowable symbol error rate is 120 errors per hour.

---

3. **Also in the output of the `ibdiagnet` command, search for the `link_error_recovery_counter` string.**

   That line contains the recovery error count in hexadecimal. The preceding lines identify the node and port with the errors. Recovery errors are major errors and the respective links must be investigated for the cause of the rapid symbol error propagation.

Note – Additionally, the `ibdiagnet.log` file contains the log of the testing.

Related Information

- *Switch Reference*, `ibdiagnet` command
- "Find 1x or SDR or DDR Links in the Fabric" on page 97
- "Display Counters for a Node" on page 81

▼ Clear Error Counters

If you are troubleshooting a port, the `perfquery` command provides counters of errors occurring at that port. To determine if the problem has been resolved, you can reset all of the error counters to 0 with the `ibclearerrors` command.

- **On the management controller, type:**

```
# ibclearerrors
## Summary: 5 nodes cleared 0 errors
#
```

Related Information

- *Switch Reference*, `ibclearerrors` command
- *Switch Reference*, `perfquery` command
- "Display Counters for a Node" on page 81
- "Clear Data Counters" on page 99

▼ Clear Data Counters

When you are optimizing the InfiniBand fabric for performance, you might want to know how the throughput increases or decreases according to changes you are making to the fabric and Subnet Manager. The `ibclearcounters` command enables you to reset the data counters for all ports to 0.

- **On the management controller, type:**

```
# ibclearcounters
## Summary: 5 nodes cleared 0 errors
#
```

Related Information

- *Switch Reference*, `ibclearcounters` command
- "Display Data Counters for a Node" on page 82
- "Clear Error Counters" on page 98

▼ Check All Ports

To perform a quick check of all ports of all nodes in your InfiniBand fabric, you can use the `ibcheckstate` command.

- **On the management controller, type:**

```
# ibcheckstate -v
# Checking Switch: nodeguid 0x0021283a8620b0f0
Node check lid 25:  OK
```

```
Port check lid 25 port 36:  OK
Port check lid 25 port 35:  OK
Port check lid 25 port 34:  OK
Port check lid 25 port 33:  OK
Port check lid 25 port 32:  OK
.
.
.
Port check lid 22 port 6:  OK
Port check lid 22 port 9:  OK

# Checking Switch: nodeguid 0x0021283a8620b0e0
Node check lid 24:  OK
Port check lid 24 port 22:  OK
.
.
.
Port check lid 24 port 30:  OK
Port check lid 24 port 29:  OK

## Summary: 6 nodes checked, 0 bad nodes found
##          142 ports checked, 0 ports with bad state found
#
```

Note – The `ibcheckstate` command requires time to complete, depending upon the size of your InfiniBand fabric. Without the `-v` option, the output contains only failed ports. The output in the example is only a small portion of the actual output.

Related Information

- *Switch Reference*, `ibcheckstate` command
- "Display Link Status" on page 75

▼ Reset a Port

You might need to reset a port to determine its functionality.

- **On the management controller, type:**

```
# ibportstate lid port reset
```

where:

- *lid* is the LID of the node.

- *port* is the port of the node.

For example:

```
# ibportstate 24 8 reset
Initial PortInfo:
# Port info: Lid 24 port 8
LinkState:.....................Down
PhysLinkState:.................Disabled
LinkWidthSupported:............1X or 4X
LinkWidthEnabled:..............1X or 4X
LinkWidthActive:...............4X
LinkSpeedSupported:............2.5 Gbps or 5.0 Gbps or 10.0 Gbps
LinkSpeedEnabled:..............2.5 Gbps or 5.0 Gbps or 10.0 Gbps
LinkSpeedActive:...............2.5 Gbps

After PortInfo set:
# Port info: Lid 24 port 8
LinkState:.....................Down
PhysLinkState:.................Disabled

After PortInfo set:
# Port info: Lid 24 port 8
LinkState:.....................Down
PhysLinkState:.................PortConfigurationTraining
#
```

Related Information

- *Switch Reference*, `ibportstate` command
- "Reset the Switch Chip" on page 89
- "Disable a Port" on page 102
- "Enable a Port" on page 103

▼ Set Port Speed

You can manually set the speed of a single port to help determine symbol error generation. The `ibportstate` command can set the speed to 2.5, 5.0, or 10.0 Gbyte/sec.

- **On the management controller, type:**

```
# ibportstate lid port speed speed
```

where:

- *lid* is the LID of the node.
- *port* is the port of the node.
- *speed* is the speed of the port: `1` for 2.5 Gbyte/sec, `2` for 5.0 Gbyte/sec, and `4` for 10.0 Gbyte/sec.

Note – Adding speed values enables either speed. For example, speed 7 is 2.5, 5.0, and 10.0 Gbyte/sec.

For example:

```
# ibportstate 24 8 speed 1
Initial PortInfo:
# Port info: Lid 24 port 8
LinkSpeedEnabled:.................2.5 Gbps or 5.0 Gbps or 10.0 Gbps

After PortInfo set:
# Port info: Lid 24 port 8
LinkSpeedEnabled:.................2.5 Gbps
# ibportstate 24 8 speed 7
Initial PortInfo:
# Port info: Lid 24 port 8
LinkSpeedEnabled:.................2.5 Gbps
After PortInfo set:
# Port info: Lid 24 port 8
LinkSpeedEnabled:.................2.5 Gbps or 5.0 Gbps or 10.0 Gbps
#
```

Related Information

- *Switch Reference*, `ibportstate` command
- "Set Link Speed" on page 91
- "Display the Link Status of a Node" on page 80

▼ Disable a Port

If a port is found to be problematic, you can disable it.

- **On the management controller, type:**

```
# ibportstate lid port disable
```

where:

- *lid* is the LID of the node.

- *port* is the port of the node.

For example:

```
# ibportstate 24 8 disable
Initial PortInfo:
# Port info: Lid 24 port 8
LinkState:.....................Active
PhysLinkState:.................LinkUp
LinkWidthSupported:............1X or 4X
LinkWidthEnabled:..............1X or 4X
LinkWidthActive:...............4X
LinkSpeedSupported:............2.5 Gbps or 5.0 Gbps or 10.0 Gbps
LinkSpeedEnabled:..............2.5 Gbps or 5.0 Gbps or 10.0 Gbps
LinkSpeedActive:...............10.0 Gbps

After PortInfo set:
# Port info: Lid 24 port 8
LinkState:.....................Down
PhysLinkState:.................Disabled
#
```

Related Information

- *Switch Reference*, `ibportstate` command
- "Disable a Switch Chip Port" on page 92
- "Enable a Port" on page 103
- "Reset a Port" on page 100

▼ Enable a Port

After disabling a port, you can enable the port with the `ibportstate` command.

- **On the management controller, type:**

```
# ibportstate lid port enable
```

where:

- *lid* is the LID of the node.

- *port* is the port of the node.

For example:

```
# ibportstate 24 8 enable
Initial PortInfo:
# Port info: Lid 24 port 8
LinkState:.....................Down
PhysLinkState:.................Disabled
LinkWidthSupported:............1X or 4X
LinkWidthEnabled:..............1X or 4X
LinkWidthActive:...............4X
LinkSpeedSupported:............2.5 Gbps or 5.0 Gbps or 10.0 Gbps
LinkSpeedEnabled:..............2.5 Gbps or 5.0 Gbps or 10.0 Gbps
LinkSpeedActive:...............2.5 Gbps

After PortInfo set:
# Port info: Lid 24 port 8
LinkState:.....................Down
PhysLinkState:.................PortConfigurationTraining
#
```

Related Information

- *Switch Reference*, `ibportstate` command
- "Enable a Switch Chip Port" on page 92
- "Disable a Port" on page 102
- "Reset a Port" on page 100

Controlling the Subnet Manager

The OpenSM Subnet Manager is enabled with the `enablesm` command, or started with the `opensmd` daemon. When the Subnet Manager starts, it reads the `/etc/opensm/opensm.conf` file for configuration information. The Subnet Manager is disabled with the `disablesm` command or stopped with the `opensmd` daemon.

The following topics describe how to control the Subnet Manager:

- "Create the `guid.txt` File" on page 105
- "Create the `opensm.conf` File" on page 106
- "Enable the Subnet Manager" on page 107
- "Disable the Subnet Manager" on page 107
- "Set the Subnet Manager Priority" on page 108
- "Start the Subnet Manager With the `opensmd` Daemon" on page 109

- "Stop the Subnet Manager With the `opensmd` Daemon" on page 109

Related Information

- "Controlling the Hardware" on page 87
- "Controlling the InfiniBand Fabric" on page 93

▼ Create the `guid.txt` File

If your InfiniBand fabric uses the Fat-Tree routing algorithm, you must provide a root node GUID file for the Subnet Manager. The `/etc/opensm/guid.txt` file is such a file. This procedure describes how to create the `guid.txt` file.

1. **Type the following command on the management controller to retrieve the node GUID:**

```
# ibstat |grep Node
```

For example:

```
# ibstat |grep Node
     Node GUID: 0x0021283a8638b0f0
#
```

2. **Start a text editor on the management controller and record the GUID twice.**

For example, you would see the following in the text editor:

```
0x0021283a8638b0f0
0x0021283a8638b0f0
```

3. **Change the last two digits on the right from `f0` to `e0` for one of the GUIDs.**

For example:

```
0x0021283a8638b0f0
0x0021283a8638b0e0
```

4. **Save the text editor file on the management controller as the `/etc/opensm/guid.txt` file.**

5. **Set the permissions for the** `/etc/opensm/guid.txt` **file:**

```
# chmod 0644 /etc/opensm/guid.txt
#
```

Related Information

- *Switch Reference*, `opensm` command
- *Switch Reference*, `getbaseguid` command
- "Create the `opensm.conf` File" on page 106
- "Enable the Subnet Manager" on page 107
- "Start the Subnet Manager With the `opensmd` Daemon" on page 109

▼ Create the `opensm.conf` File

The `opensmd` daemon uses the `opensm.conf` file to configure the OpenSM Subnet Manager. You must create an `opensm.conf` file that is optimized for the Sun Datacenter InfiniBand Switch 72.

1. **On the management controller, stop the OpenSM Subnet Manager.**

   See "Stop the Subnet Manager With the `opensmd` Daemon" on page 109.

2. **If a** `/etc/opensm/opensm.conf` **file does not exist, create one:**

```
# opensm --create-config /etc/opensm/opensm.conf
-------------------------------------------------
OpenSM 3.3.2_20090831_ce6f8dd
Command Line Arguments:
 Creating config file template '/etc/opensm/opensm.conf'.
 Log File: /var/log/opensm.log
-------------------------------------------------
#
```

   The `/etc/opensm/opensm.conf` file is created.

3. **Open the** `/etc/opensm/opensm.conf` **file in a text editor.**

4. **Find the following parameters and change them to as listed.**

   - `sweep_interval 120`
   - `routing_engine ftree`
   - `use_ucast_cache TRUE`
   - `root_guid_file /etc/opensm/guid.txt`

Note – If the `/etc/opensm/guid.txt` file does not exist, you must create it. See "Create the `guid.txt` File" on page 105.

5. **Save the `/etc/opensm/opensm.conf` file.**

6. **Set the permissions for the `/etc/opensm/opensm.conf` file:**

```
# chmod 0644 /etc/opensm/opensm.conf
#
```

Related Information

- *Switch Reference*, `opensm` command
- *Switch Reference*, `opensmd` daemon
- "Create the `guid.txt` File" on page 105
- "Enable the Subnet Manager" on page 107
- "Start the Subnet Manager With the `opensmd` Daemon" on page 109

▼ Enable the Subnet Manager

The Subnet Manager within the management controller is not enabled by default. Use the `enablesm` command to enable and start the Subnet Manager.

- **On the management controller, type:**

```
# enablesm
Starting IB Subnet Manager.                                [  OK  ]
#
```

Related Information

- *Switch Reference*, `enablesm` command
- "Start the Subnet Manager With the `opensmd` Daemon" on page 109
- "Create the `guid.txt` File" on page 105
- "Create the `opensm.conf` File" on page 106

▼ Disable the Subnet Manager

If your InfiniBand fabric has too many Subnet Managers, you can disable and stop the Subnet Manager within the management controller by using the `disablesm` command.

- **On the management controller, type:**

```
# disablesm
Stopping IB Subnet Manager..-.-.-.-.-.-+                    [  OK  ]
#
```

Related Information

- *Switch Reference*, `disablesm` command
- "Stop the Subnet Manager With the `opensmd` Daemon" on page 109

▼ Set the Subnet Manager Priority

By default, the Subnet Manager within the management controller is set to 0 priority. If there is more than one Subnet Manager in your InfiniBand fabric, you must set the Subnet Managers' priorities appropriately. The Subnet Manager with the highest priority is the *master* Subnet Manager.

Note – Setting Subnet Managers of the same fabric to the same priority can have undesirable results.

---

1. **On the management controller, type:**

```
# setsmpriority priority
```

where *priority* is `0` (lowest) to `13` (highest). For example:

```
# setsmpriority 3
-------------------------------------------------
OpenSM 3.2.6_20090717
  Reading Cached Option File: /etc/opensm/opensm.conf
  Loading Cached Option:routing_engine = ftree
  Loading Cached Option:sm_priority = 13
  Loading Cached Option:sminfo_polling_timeout = 1000
  Loading Cached Option:polling_retry_number = 3
Command Line Arguments:
  Priority = 3
  Creating config file template '/tmp/osm.conf'.
  Log File: /var/log/opensm.log
-------------------------------------------------
#
```

2. **Restart the Subnet Manager:**

```
# disablesm
Stopping IB Subnet Manager..                               [  OK  ]
# enablesm
Starting IB Subnet Manager.                                [  OK  ]
#
```

Related Information

- *Switch Reference*, `setsmpriority` command
- "Create the `opensm.conf` File" on page 106

▼ Start the Subnet Manager With the `opensmd` Daemon

The `opensmd` daemon enables you to start the OpenSM Subnet Manager without providing command line configuration parameters.

- **On the management controller, type:**

```
# /etc/init.d/opensmd start
Starting IB Subnet Manager.                                [  OK  ]
#
```

The Subnet Manager is started.

Related Information

- *Switch Reference*, `opensmd` command
- "Create the `guid.txt` File" on page 105
- "Create the `opensm.conf` File" on page 106
- "Enable the Subnet Manager" on page 107
- "Stop the Subnet Manager With the `opensmd` Daemon" on page 109

▼ Stop the Subnet Manager With the `opensmd` Daemon

You can stop the OpenSM Subnet Manager with the `opensmd` daemon.

- **On the management controller, type:**

```
# /etc/init.d/opensmd stop
Stopping IB Subnet Manager..-.                             [  OK  ]
#
```

The Subnet Manager is stopped.

Related Information

- *Switch Reference*, `opensmd` command
- "Disable the Subnet Manager" on page 107
- "Start the Subnet Manager With the `opensmd` Daemon" on page 109

Servicing the Switch

Once a failed part is identified, it can be replaced. The topics listed here help you service switch chassis components.

Related Information

- "Installing the Switch" on page 1
- "Administering the Switch" on page 47
- *Switch Remote Administration*
- *Switch Reference*

Understanding Service Procedures

Servicing the switch means a component addition, replacement, or subtraction.

A component addition means installing a component to increase the functionality of the switch. Component replacement means removing a failed component and installing a functional one. Component subtraction means removing a component.

These topics provide information to prepare for service procedures.

Related Information

- "Servicing the Power Supplies" on page 113
- "Servicing the Fans" on page 124
- "Servicing the InfiniBand Cables" on page 132
- "Servicing the Battery" on page 139
- "Upgrading the Firmware" on page 145

Replaceable Components

The following illustration identifies the replaceable components of the switch.

FIGURE: Replaceable Components

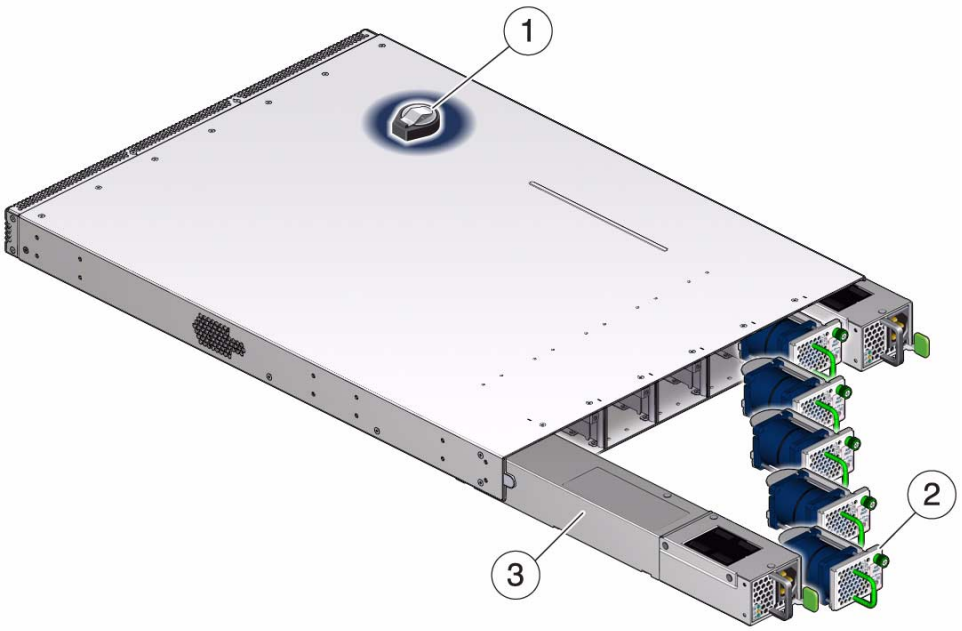


Figure Legend

1	Battery
2	Fan
3	Power supply

Related Information

- “Servicing the Power Supplies” on page 113
- “Servicing the Fans” on page 124
- “Servicing the InfiniBand Cables” on page 132
- “Servicing the Battery” on page 139

Servicing the Power Supplies

The following table provides a description of a goal you want to achieve and links to the sequential tasks required to reach that goal.

Description	Links
Add a power supply.	“Inspecting a Power Supply” on page 114 “Install a Power Supply” on page 120 “Power On a Power Supply” on page 122
Replace a power supply.	“Inspecting a Power Supply” on page 114 “Power Off a Power Supply” on page 117 “Remove a Power Supply” on page 118 “Install a Power Supply” on page 120 “Power On a Power Supply” on page 122
Subtract a power supply.	“Power Off a Power Supply” on page 117 “Remove a Power Supply” on page 118

Related Information

- “Understanding Service Procedures” on page 111
- “Servicing the Fans” on page 124
- “Servicing the InfiniBand Cables” on page 132
- “Servicing the Battery” on page 139

Inspecting a Power Supply

Before installing a power supply, inspect its hardware and connectors to verify its suitability for installation.

Step	Description	Links
1.	Identify the Power Supply.	"Identify the Power Supply" on page 114
2.	Inspect the hardware.	"Inspect the Power Supply Hardware" on page 116
3.	Inspect the connectors.	"Inspect the Power Supply Connectors" on page 116

Related Information

- "Inspecting a Fan" on page 125
- "Inspecting an InfiniBand Cable" on page 132

▼ Identify the Power Supply

1. **Identify the prerequisite and subsequent service tasks you must perform in conjunction with this procedure.**

   See "Inspecting a Power Supply" on page 114.

2. **Use the following illustration to identify the various features of a power supply.**

FIGURE: Power Supply Features

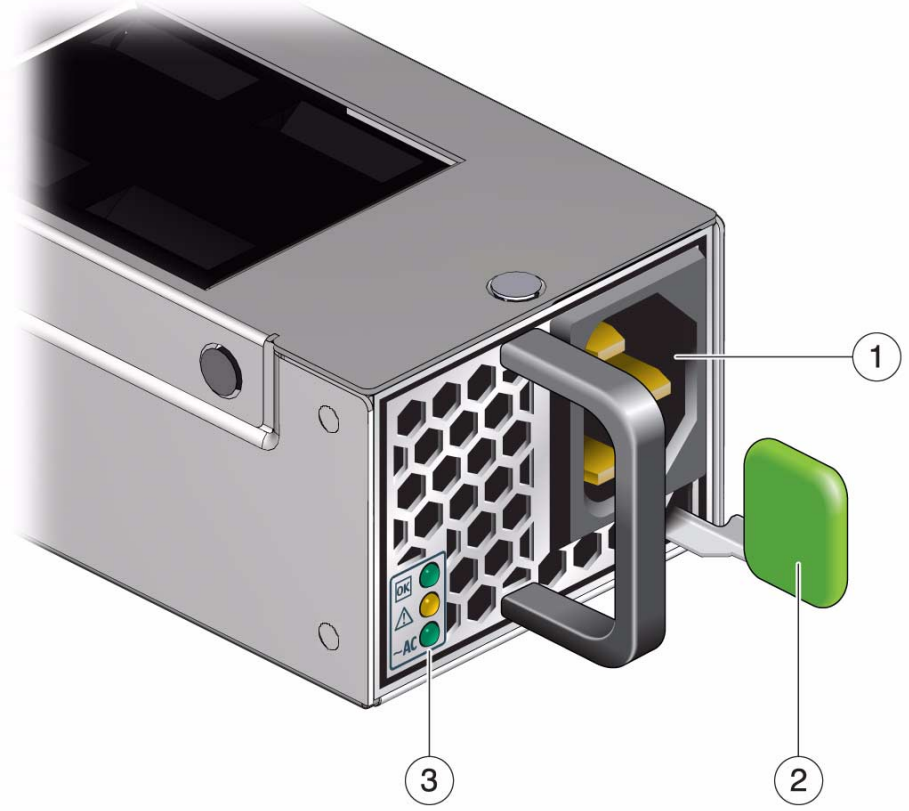


Figure Legend

1	AC Connector
2	Release tab
3	Status LEDs

3. **Inspect the power supply hardware.**

   See "Inspect the Power Supply Hardware" on page 116.

Related Information

- "Identify the Fan" on page 125
- "Identify the InfiniBand Cable" on page 133

▼ Inspect the Power Supply Hardware

1. **Identify the prerequisite and subsequent service tasks you must perform in conjunction with this procedure.**

   See "Inspecting a Power Supply" on page 114.

2. **Unwrap the replacement power supply from its antistatic packaging.**
3. **Verify that there is no visible damage to the power supply chassis.**
4. **Verify that the release tab moves freely and smoothly.**
5. **Inspect the power supply connectors.**

   See "Inspect the Power Supply Connectors" on page 116.

Related Information

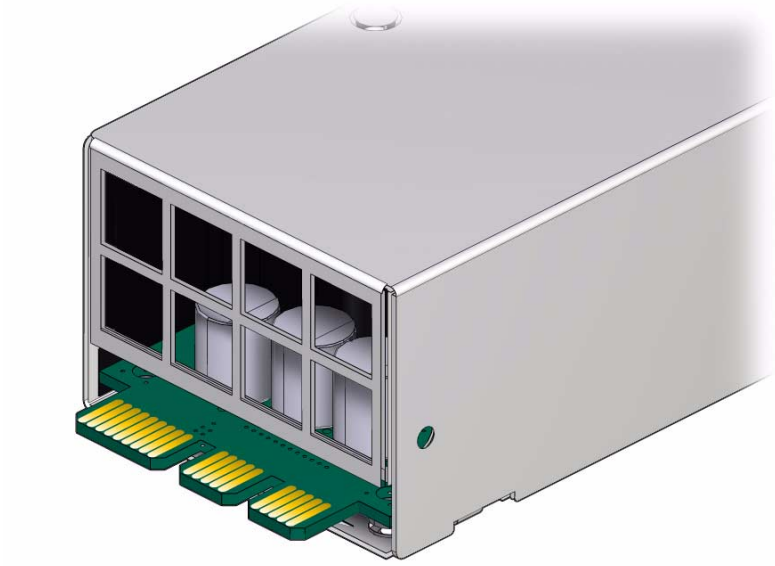
- "Inspect the Fan Hardware" on page 126
- "Inspect the InfiniBand Cable Hardware" on page 133

▼ Inspect the Power Supply Connectors

1. **Identify the prerequisite and subsequent service tasks you must perform in conjunction with this procedure.**

   See "Inspecting a Power Supply" on page 114.

2. **Verify that the connectors are clean and without damage.**



3. **The power supply is ready for installation.**

   See "Install a Power Supply" on page 120.

Related Information

- "Inspect the Fan Connector" on page 127
- "Inspect the InfiniBand Cable Connectors" on page 134

▼ Power Off a Power Supply

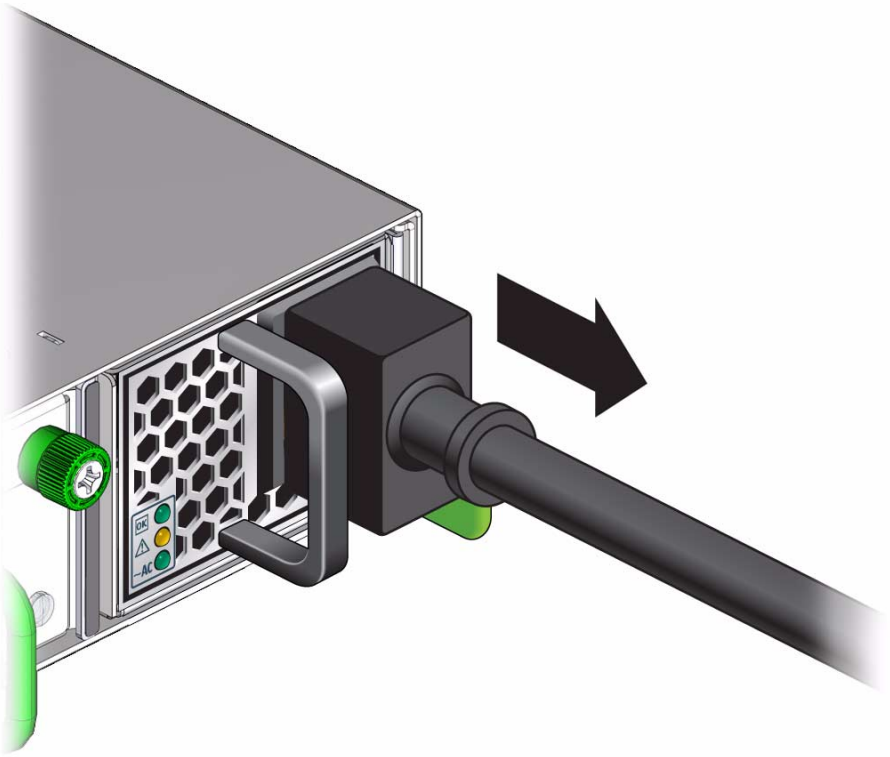
Note – Powering off both power supplies consequently powers off the switch.

1. **Identify the prerequisite and subsequent service tasks you must perform in conjunction with this procedure.**

   See "Servicing the Power Supplies" on page 113.

2. **Determine which power supply is to be removed.**

3. **At the front of the switch chassis, remove the power cord from the respective power supply.**



The power supply is completely powered off.

4. **Remove the power supply.**

   See "Remove a Power Supply" on page 118.

Related Information

- "Power On a Power Supply" on page 122

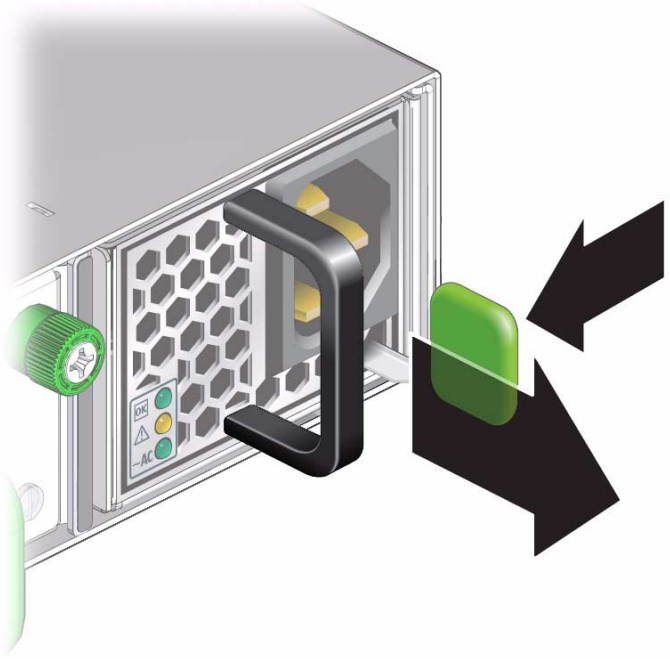
▼ Remove a Power Supply

1. **Identify the prerequisite and subsequent service tasks you must perform in conjunction with this procedure.**

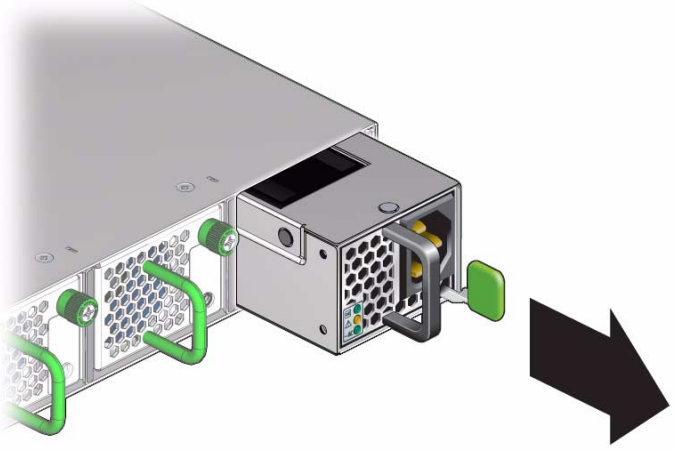
   See "Servicing the Power Supplies" on page 113.

2. **Locate the power supply to be removed.**

3. **Press and hold the release tab to the left and pull on the handle of the power supply.**



4. **Continue to pull the handle of the power supply to remove it from the chassis.**



5. **Set the power supply aside.**

6. **Install a replacement power supply.**

   See "Install a Power Supply" on page 120.

Related Information

- "Remove a Fan" on page 127
- "Remove an InfiniBand Cable" on page 134
- "Remove the Switch From the Rack" on page 139
- "Replace the Battery" on page 140

▼ Install a Power Supply

Note – For residual power discharge, the power supply slot must remain vacant for at least one minute before installing a power supply.

---

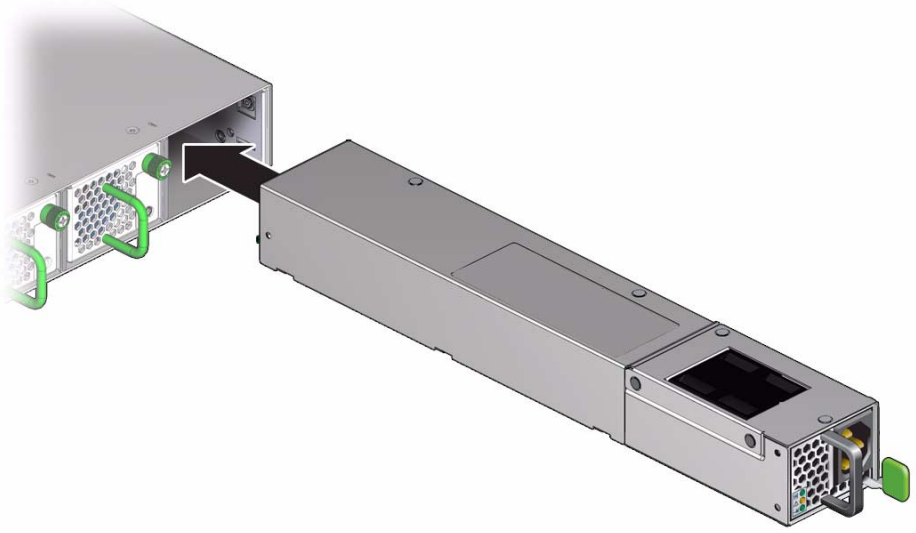
1. **Identify the prerequisite and subsequent service tasks you must perform in conjunction with this procedure.**

   See "Servicing the Power Supplies" on page 113.

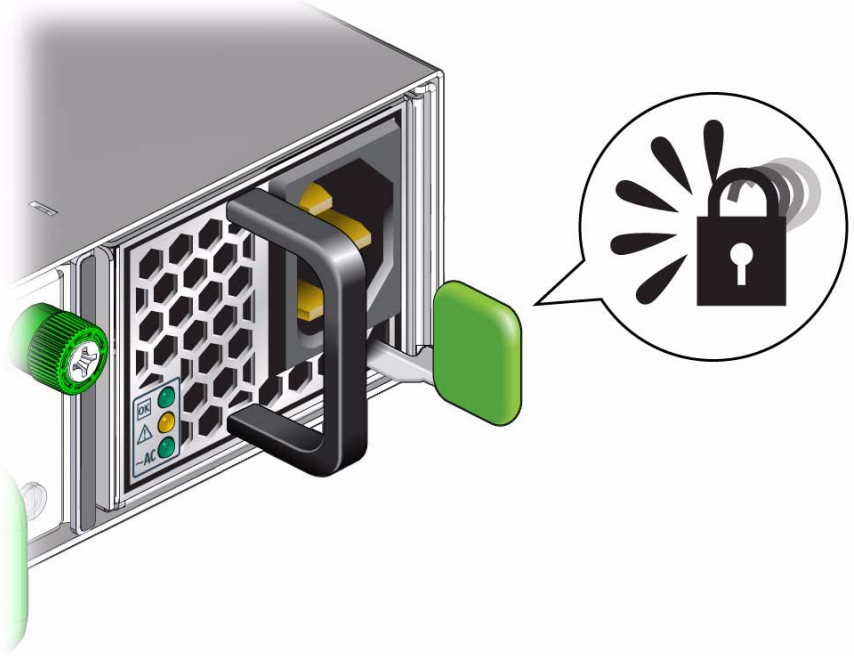
2. **Inspect the replacement power supply.**

   See "Inspecting a Power Supply" on page 114.

3. **Verify that the slot where the power supply installs is clean and free of debris.**
4. **Verify that the slot connector pins are straight and not missing.**
5. **Verify that the slot connector receptacles are free from obstructions.**
6. **Orient the power supply with the status LEDs on the left and the release tab on the right.**
7. **Slide the power supply into the open slot, pushing at the handle.**



8. **When the power supply seats, push firmly so that the release tab clicks to secure the power supply into the chassis.**



9. **Power on the power supply.**

See "Power On a Power Supply" on page 122.

Related Information

- "Install a Fan" on page 130
- "Install an InfiniBand Cable" on page 136
- "Replace the Battery" on page 140

▼ Power On a Power Supply

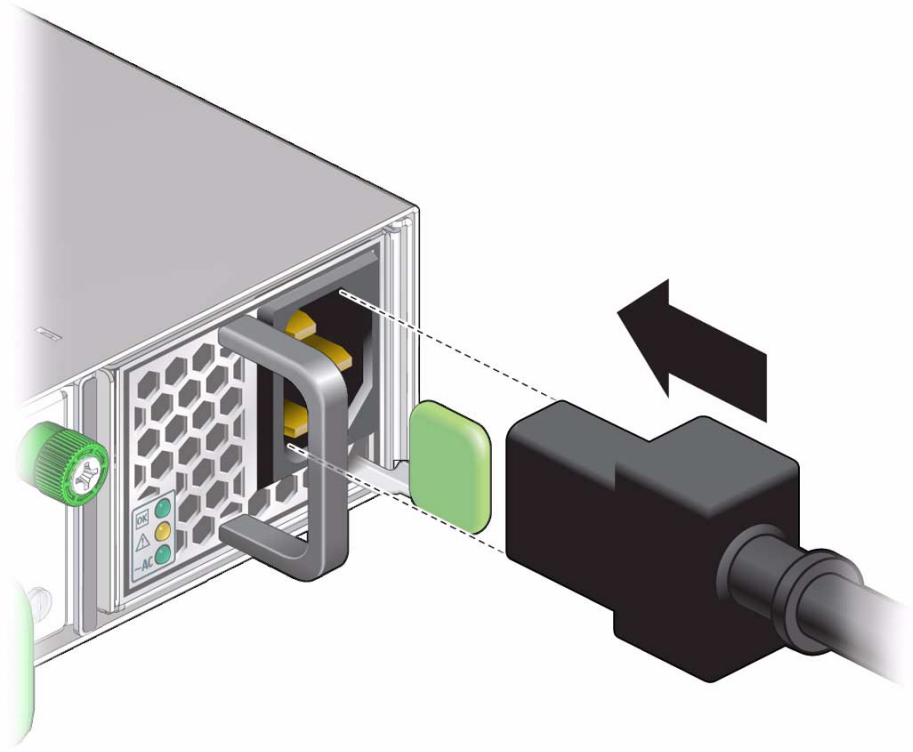
Note – For residual power discharge, the power cord must remain unattached to the power supply for at least one minute before powering on a power supply.

---

1. **Identify the prerequisite and subsequent service tasks you must perform in conjunction with this procedure.**

   See "Servicing the Power Supplies" on page 113.

2. **Reconnect the power cord to the power supply.**



The AC LED lights green to indicate the power supply is connected to facility power. A moment later, the OK LED lights green to indicate the power supply is at full power.

3. **Verify the power supply's operation with the** `checkpower` **and** `checkvoltages` **commands on the management controller.**

   For example, to check the power supplies:

```
# checkpower
PSU 0 present status: OK
PSU 1 present status: OK
#
```

```
# checkvoltages
Voltage ECB OK
Measured 3.3V Main = 3.28 V
Measured 3.3V Standby = 3.40 V
Measured 12V = 12.06 V
```

```
Measured 5V = 5.10 V
Measured VBAT = 3.17 V
Measured 1.8V = 1.78 V
Measured 1.2V Standby = 1.21 V
Measured 1.8V Standby = 1.80 V
Measured 2.5VA = 2.51 V
Measured 2.5VB = 2.51 V
Measured 1.2VA = 1.22 V
Measured 1.2VB = 1.21 V
Measured 1.2VC = 1.21 V
Measured 1.2VD = 1.21 V
Measured 1.2VE = 1.21 V
Measured 1.2VF = 1.21 V
All voltages OK
#
```

Related Information

- *Switch Reference*, `checkpower` command
- *Switch Reference*, `checkvoltages` command
- "Power Off a Power Supply" on page 117

Servicing the Fans

The following table provides a description of a goal you want to achieve and links to the sequential tasks required to reach that goal.

Description	Links
Add a fan.	"Inspecting a Fan" on page 125 "Install a Fan" on page 130
Replace a fan.	"Inspecting a Fan" on page 125 "Remove a Fan" on page 127 "Install a Fan" on page 130
Subtract a fan.	"Remove a Fan" on page 127

Related Information

- "Understanding Service Procedures" on page 111
- "Servicing the Power Supplies" on page 113
- "Servicing the InfiniBand Cables" on page 132

- "Servicing the Battery" on page 139

Inspecting a Fan

Before installing a fan, inspect its hardware and connector to verify its suitability for installation.

Step	Description	Links
1.	Identify the fan.	"Identify the Fan" on page 125
2.	Inspect the hardware.	"Inspect the Fan Hardware" on page 126
3.	Inspect the connector.	"Inspect the Fan Connector" on page 127

Related Information

- "Inspecting a Power Supply" on page 114
- "Inspecting an InfiniBand Cable" on page 132

▼ Identify the Fan

1. **Identify the prerequisite and subsequent service tasks you must perform in conjunction with this procedure.**

   See "Inspecting a Fan" on page 125.

2. **Use the following illustration to identify the various features of a fan.**

FIGURE: Fan Features

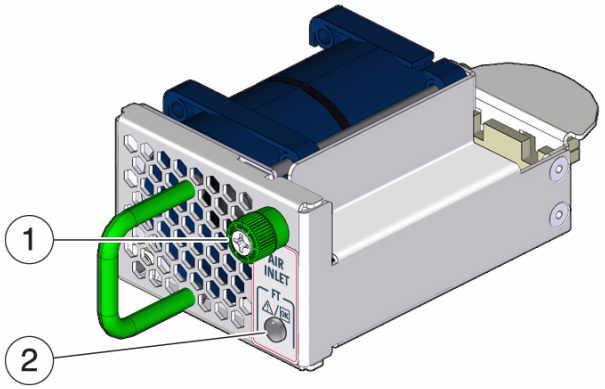


Figure Legend

1	Thumbscrew
2	Status LED

3. **Inspect the fan hardware.**

   See "Inspect the Fan Hardware" on page 126.

Related Information

- "Identify the Power Supply" on page 114
- "Identify the InfiniBand Cable" on page 133

▼ Inspect the Fan Hardware

1. **Identify the prerequisite and subsequent service tasks you must perform in conjunction with this procedure.**

   See "Inspecting a Fan" on page 125.

2. **Unwrap the replacement fan from its antistatic packaging.**
3. **Verify that there is no visible damage to the fan chassis.**
4. **Verify that the thumbscrew spins freely and smoothly.**
5. **Inspect the fan connector.**

   See "Inspect the Fan Connector" on page 127.

Related Information

- "Inspect the Power Supply Hardware" on page 116

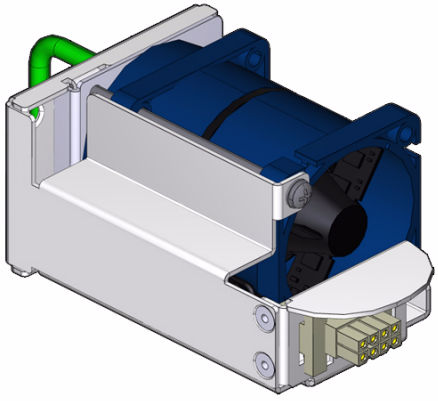
- "Inspect the InfiniBand Cable Hardware" on page 133

▼ Inspect the Fan Connector

1. **Identify the prerequisite and subsequent service tasks you must perform in conjunction with this procedure.**

   See "Inspecting a Fan" on page 125.

2. **Verify that the connector is clean and without damage.**
3. **Verify that the connector receptacles are free from obstructions.**



4. **Verify that the connector freely floats in its mounting.**
5. **The fan is ready for installation.**

   See "Install a Fan" on page 130.

Related Information

- "Inspect the Power Supply Connectors" on page 116
- "Inspect the InfiniBand Cable Connectors" on page 134

▼ Remove a Fan

Note – Fans are hot-swappable and do not require powering off.

---

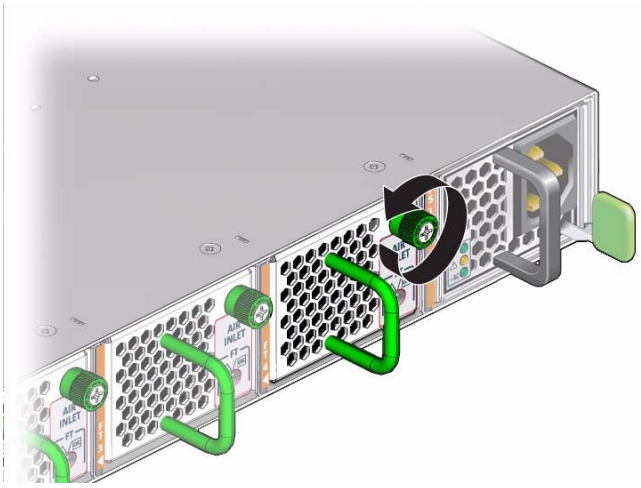
1. **Identify the prerequisite and subsequent service tasks you must perform in conjunction with this procedure.**

   See "Servicing the Fans" on page 124.

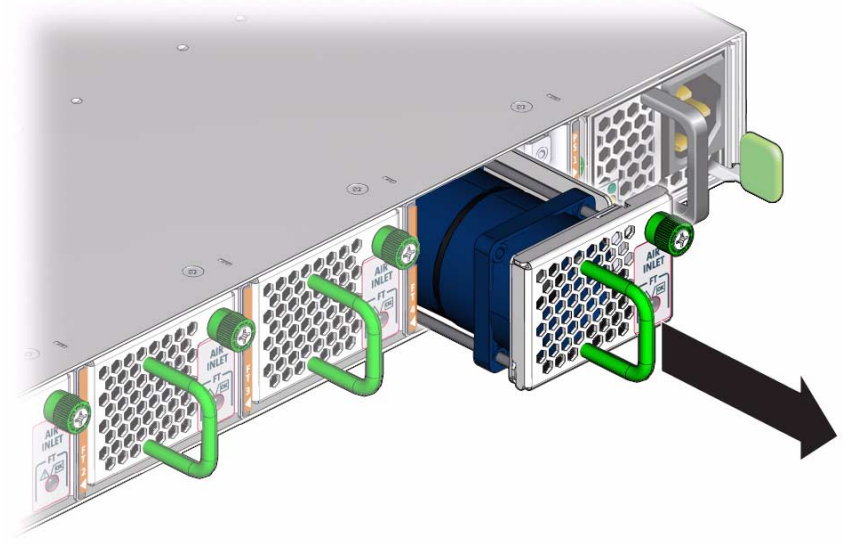
2. **Determine which fan is to be removed.**

   If a fan has failed, its Attention LED lights.

3. **Loosen the captive thumbscrew at the right side of the fan.**



4. **Grasp the handle and pull the fan straight out.**



5. **Set the fan aside.**
6. **Consider your next steps:**
   - If you are removing the fan for replacement, install a new fan.
     See "Install a Fan" on page 130.
   - If you are removing the fan as a subtractive action, you are finished.

Note – If fewer than two fans are operational, the switch shuts down to prevent thermal overload.

Related Information

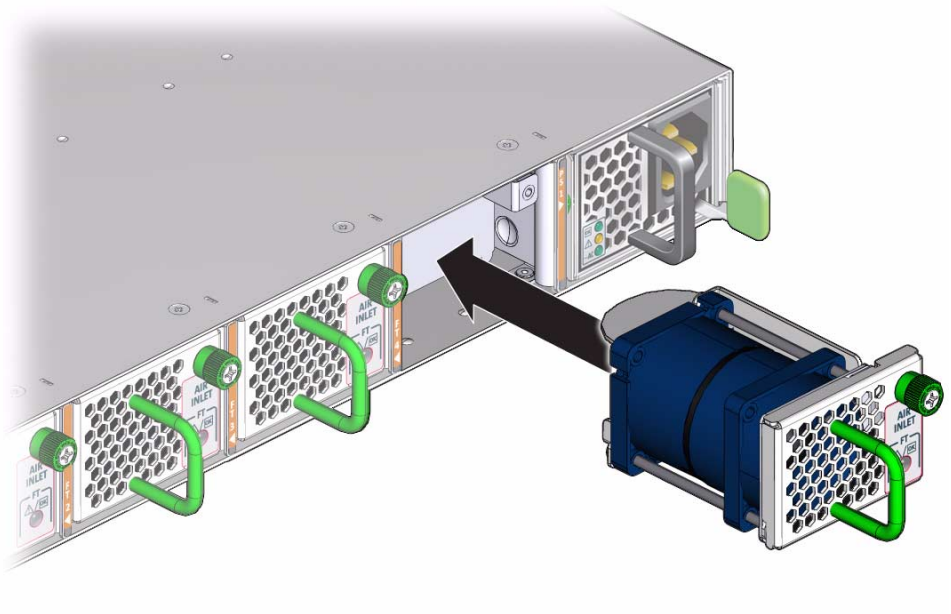
- "Remove a Power Supply" on page 118
- "Remove an InfiniBand Cable" on page 134
- "Remove the Switch From the Rack" on page 139
- "Replace the Battery" on page 140

▼ Install a Fan

1. **Identify the prerequisite and subsequent service tasks you must perform in conjunction with this procedure.**

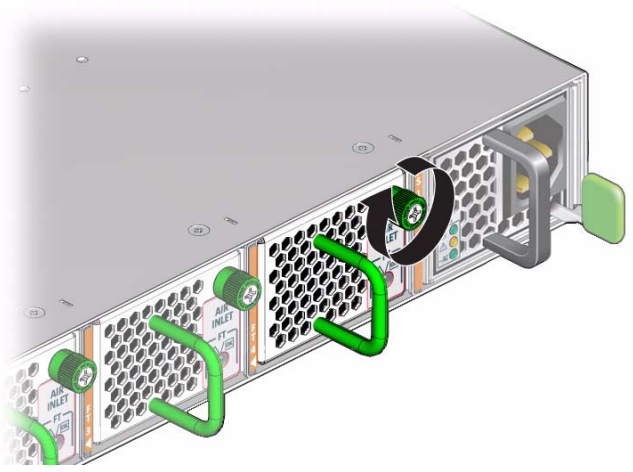
   See "Servicing the Fans" on page 124.
2. **Inspect the replacement fan.**

   See "Inspecting a Fan" on page 125.
3. **Verify that the slot where the fan installs is clean and free of debris.**
4. **Verify that the slot connector pins are straight and not missing.**
5. **Orient the fan over the opening in the switch chassis with the thumbscrew on the right.**
6. **Firmly slide the fan into the chassis until the fan stops.**



The fan might immediately power on.

7. **Tighten the captive thumbscrew to secure the fan in the switch chassis.**



8. **Verify that the fan Attention LED goes out.**

9. **Use the `getfanspeed` command on the management controller to verify the fan's operation.**

   For example, to check the fans:

```
# getfanspeed
Fan 0 rpm 14270
Fan 1 rpm 14270
Fan 2 rpm 14270
Fan 3 rpm 14270
Fan 4 rpm 14434
#
```

Note – You should see a fan speed for the fan you just installed.

Related Information

- *Switch Reference*, `getfanspeed` command
- "Install a Power Supply" on page 120
- "Install an InfiniBand Cable" on page 136
- "Replace the Battery" on page 140

Servicing the InfiniBand Cables

The following table provides a description of a goal you want to achieve and links to the sequential tasks required to reach that goal.

Description	Links
Add an InfiniBand cable.	"Inspecting an InfiniBand Cable" on page 132 "Install an InfiniBand Cable" on page 136
Replace an InfiniBand cable.	"Inspecting an InfiniBand Cable" on page 132 "Remove an InfiniBand Cable" on page 134 "Install an InfiniBand Cable" on page 136
Subtract an InfiniBand cable.	"Remove an InfiniBand Cable" on page 134

Related Information

- "Understanding Service Procedures" on page 111

- "Servicing the Power Supplies" on page 113
- "Servicing the Fans" on page 124
- "Servicing the Battery" on page 139

Inspecting an InfiniBand Cable

Before installing an InfiniBand cable, inspect its hardware and connectors to verify its suitability for installation.

Step	Description	Links
1.	Identify the cable.	"Identify the InfiniBand Cable" on page 133
2.	Inspect the hardware.	"Inspect the InfiniBand Cable Hardware" on page 133
3.	Inspect the connectors	"Inspect the InfiniBand Cable Connectors" on page 134

Related Information

- "Inspecting a Power Supply" on page 114
- "Inspecting a Fan" on page 125

▼ Identify the InfiniBand Cable

1. **Identify the prerequisite and subsequent service tasks you must perform in conjunction with this procedure.**

   See "Inspecting an InfiniBand Cable" on page 132.

2. **Use the following illustration to identify the various features of the InfiniBand cable.**

FIGURE: InfiniBand Cable Features

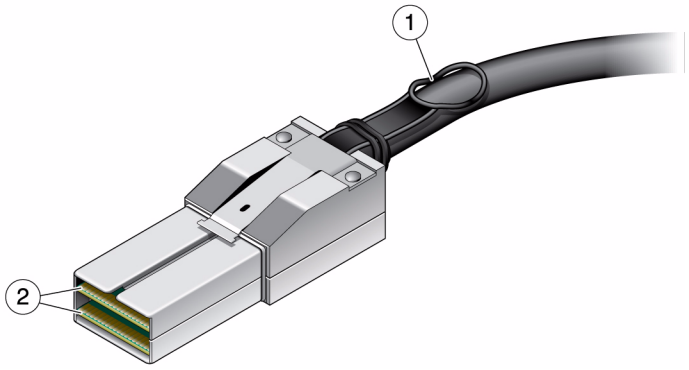


Figure Legend

1	Retraction strap
2	Paddle boards

3. **Inspect the InfiniBand cable hardware.**

   See "Inspect the InfiniBand Cable Hardware" on page 133.

Related Information

- "Identify the Power Supply" on page 114
- "Identify the Fan" on page 125

▼ Inspect the InfiniBand Cable Hardware

1. **Identify the prerequisite and subsequent service tasks you must perform in conjunction with this procedure.**

   See "Inspecting an InfiniBand Cable" on page 132.

2. **Verify that the cable is not cut or damaged.**
3. **Verify that the cable is not kinked or has a fold.**
4. **Verify that the cable is of the correct type from its label.**
5. **Inspect the cable connectors.**

   See "Inspect the InfiniBand Cable Connectors" on page 134.

Related Information

- "Inspect the Power Supply Hardware" on page 116

- "Inspect the Fan Hardware" on page 126

▼ Inspect the InfiniBand Cable Connectors

1. **Identify the prerequisite and subsequent service tasks you must perform in conjunction with this procedure.**

   See "Inspecting an InfiniBand Cable" on page 132.

2. **Verify that the shell is not bent and is parallel to the inner boards.**
3. **Verify that there are no contaminants inside of the connector.**
4. **Verify that the retractor strap adequately operates the hooks.**
5. **The cable is ready for installation.**

   See "Install an InfiniBand Cable" on page 136.

Related Information

- "Inspect the Power Supply Connectors" on page 116
- "Inspect the Fan Connector" on page 127

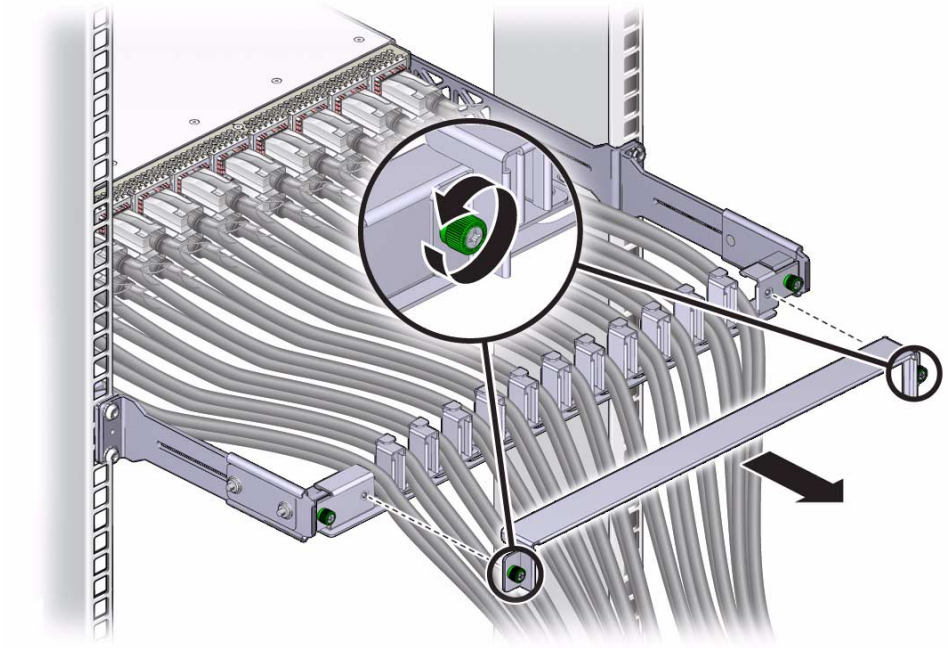
▼ Remove an InfiniBand Cable

This procedure describes how to remove the cables from the switch chassis, so that the cable can be replaced. If you are removing all cables for switch replacement, start removing the cables from the left side of the switch, working your way to the right.

1. **Identify the prerequisite and subsequent service tasks you must perform in conjunction with this procedure.**

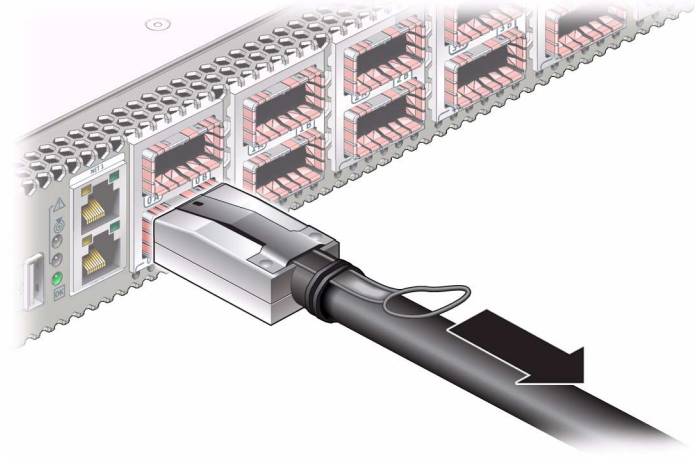
   See "Servicing the InfiniBand Cables" on page 132.

2. **Loosen the thumbscrews and remove the cover for the cable management bracket.**



3. **Locate the cable to be removed.**
4. **Grasp the cable connector to support its weight and apply the removal force.**
5. **Pull on the loop of the retractor strap while simultaneously pulling on the cable connector.**

   The cable connector comes free.



6. **Carefully move the cable out of the cable management hardware.**
7. **Open hook-and-loop fasteners from bundles and securing hard points to gently lower the cable to the floor.**

Caution – Do not allow the cable to drop or strike the floor. Jerking, bending, pulling on, or dropping the cable can damage the cable.

8. **Consider your next steps:**
   - If you are removing a single cable for replacement, install the new cable.

     See "Install an InfiniBand Cable" on page 136.
   - If you are disconnecting all cables for switch replacement, repeat from Step 4 for all cables.

Related Information

- "Remove a Power Supply" on page 118
- "Remove a Fan" on page 127
- "Remove the Switch From the Rack" on page 139
- "Replace the Battery" on page 140

▼ Install an InfiniBand Cable

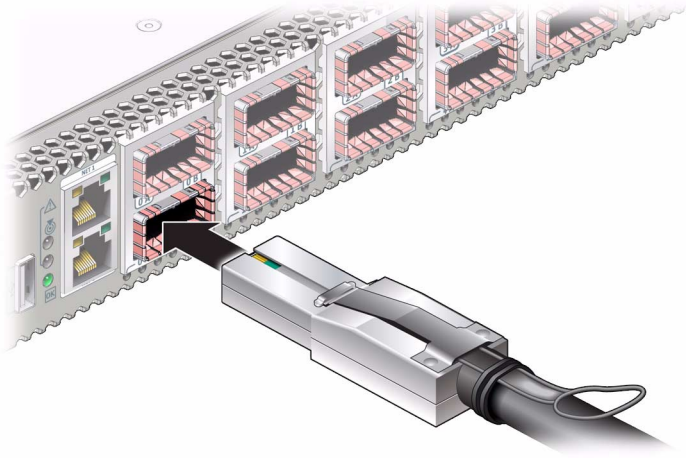
1. **Identify the prerequisite and subsequent service tasks you must perform in conjunction with this procedure.**

   See "Servicing the InfiniBand Cables" on page 132.
2. **Determine your next steps:**
   - If you are cabling an entire switch after a replacement procedure, locate the cable for the connector 11B and go to Step 5.
   - If you are installing a replacement cable to the switch, start the procedure at Step 3.
3. **Inspect the replacement InfiniBand cable.**

   See "Inspecting an InfiniBand Cable" on page 132.
4. **Bring the replacement cable to the switch.**
5. **Feed the cable through the cable management hardware.**

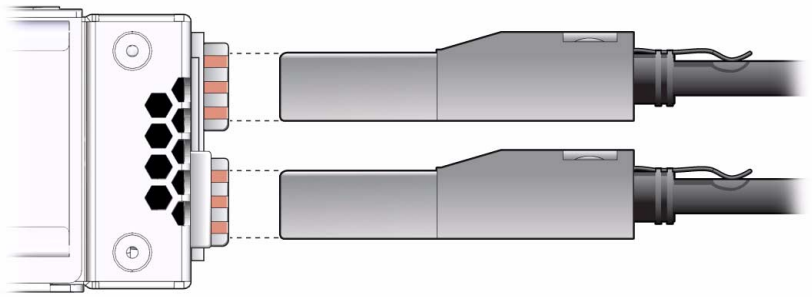
6. **Orient the cable connector to the CXP receptacle squarely and horizontally.**

   Ensure that the upper shell just touches the underside of the top of the receptacle on the rear panel.



7. **Slowly move the connector in.**

   As you slide the connector in, the top of the shell should scrape against the underside of the top of the CXP receptacle.



   - If the connector stops or binds after about 1/4 in. (5 mm) travel, back out and repeat from Step 6.
   - If the connector stops or binds with about 1/8 in. (2 mm) still to go, back out and repeat Step 7.

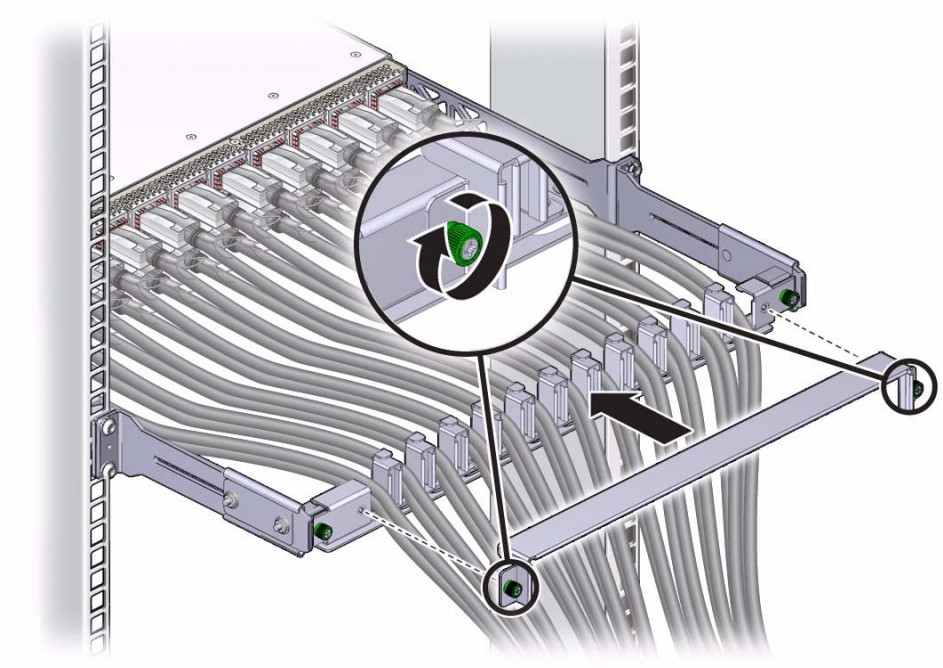
8. **Continue to push the connector in until the hooks catch onto the top of the receptacle.**

9. **Secure the cable into the cable management hardware.**

   Close hook-and-loop fasteners at bundles and securing hard points.

10. **If you are installing all cables as part of a switch replacement procedure, repeat from Step 5 for all cables, working your way from right to left.**

11. **Replace the cover for the cable management bracket and tighten the thumbscrews.**



Related Information

- "Install a Power Supply" on page 120
- "Install a Fan" on page 130
- "Replace the Battery" on page 140

Servicing the Battery

Oracle's Sun Datacenter InfiniBand Switch 72 has a battery on the main board that supports the management controller. You can only replace the battery because the management controller is dependent upon the battery. You cannot add or subtract the battery. Perform these tasks in order to replace the battery:

Step	Description	Links
1.	Remove all IB cables.	"Remove an InfiniBand Cable" on page 134
2.	Power off both power supplies.	"Power Off a Power Supply" on page 117
3.	Remove the switch from the rack.	"Remove the Switch From the Rack" on page 139
4.	Replace the battery.	"Replace the Battery" on page 140
5.	Install the switch in the rack.	"Installing the Switch" on page 1

Related Information

- "Understanding Service Procedures" on page 111
- "Servicing the Power Supplies" on page 113
- "Servicing the Fans" on page 124
- "Servicing the InfiniBand Cables" on page 132

▼ Remove the Switch From the Rack

1. **Identify the prerequisite and subsequent service tasks you must perform in conjunction with this procedure.**

   See "Servicing the Battery" on page 139.

Note – You must remove all InfiniBand cables from the switch and power down both power supplies by removing both power cords. See "Remove an InfiniBand Cable" on page 134 and "Power Off a Power Supply" on page 117.

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2. **Disconnect the management cables.**
3. **Use a No. 2 Phillips screwdriver to remove the four screws that secure the front of the switch into the rack.**

4. **Slide the switch out of the front of the rack.**
5. **Set the switch chassis onto a stable work surface.**

Related Information

- "Install the Switch in the Rack" on page 18
- "Remove a Power Supply" on page 118
- "Remove a Fan" on page 127
- "Remove an InfiniBand Cable" on page 134
- "Replace the Battery" on page 140

▼ Replace the Battery

1. **Identify the prerequisite and subsequent service tasks you must perform in conjunction with this procedure.**

   See "Servicing the Battery" on page 139.

Note – You must remove the switch from the rack. See "Remove the Switch From the Rack" on page 139.

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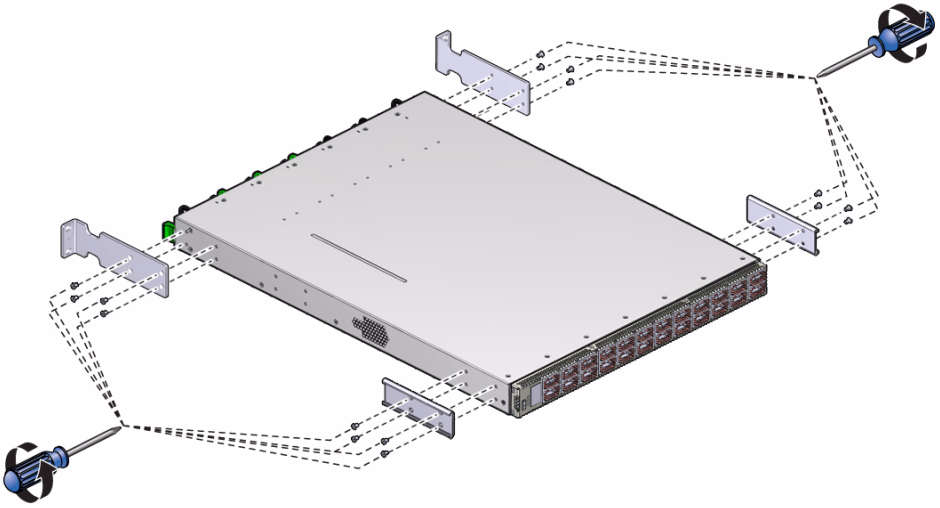
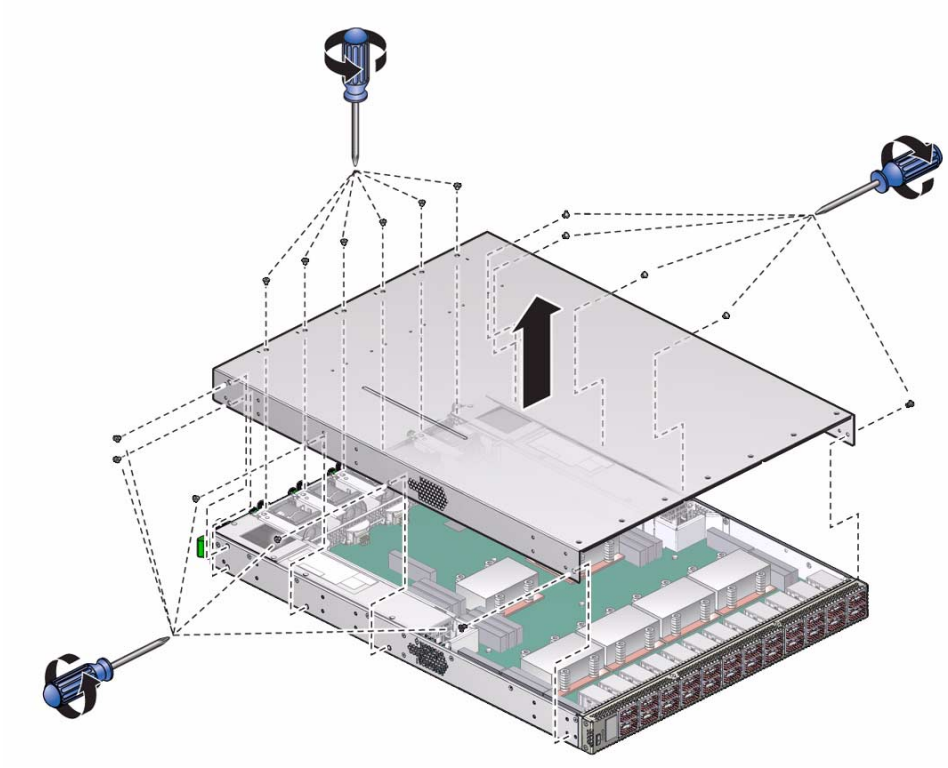
2. **Use a No. 1 Phillips screwdriver to remove the eight screws that secure the C-shaped brackets at the rear sides of the switch chassis.**



3. **Remove the eight screws that secure the long front brackets at the front sides of the switch chassis.**

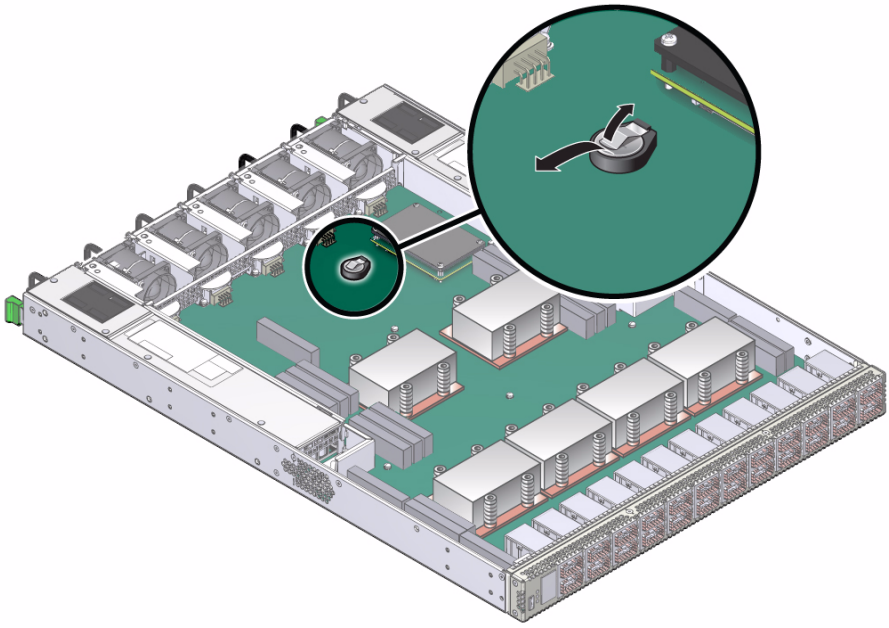
4. **Remove the 16 screws that secure the top cover to the chassis.**

   There are five screws on each side and six screws across the top front of the cover.

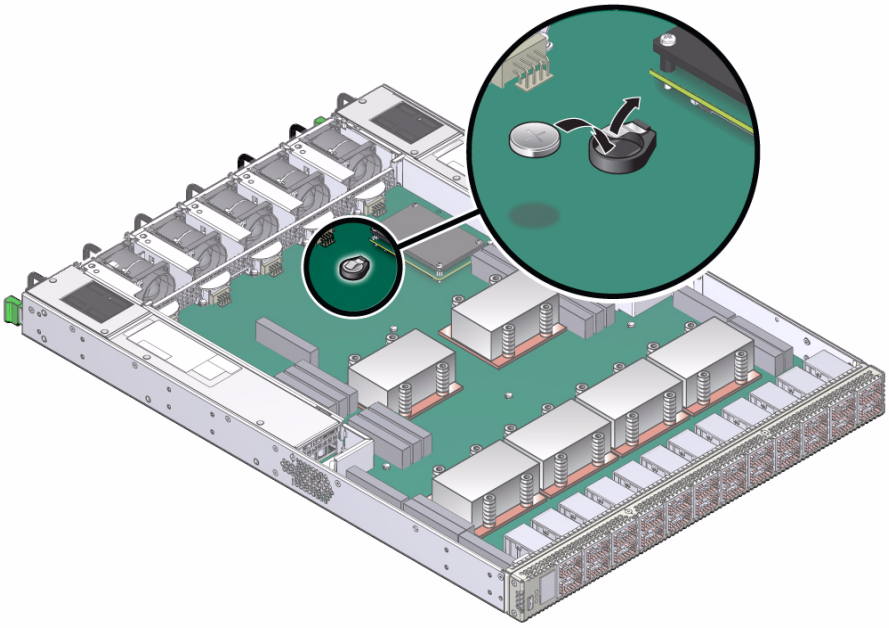


5. **Slide the cover forward and lift it off.**

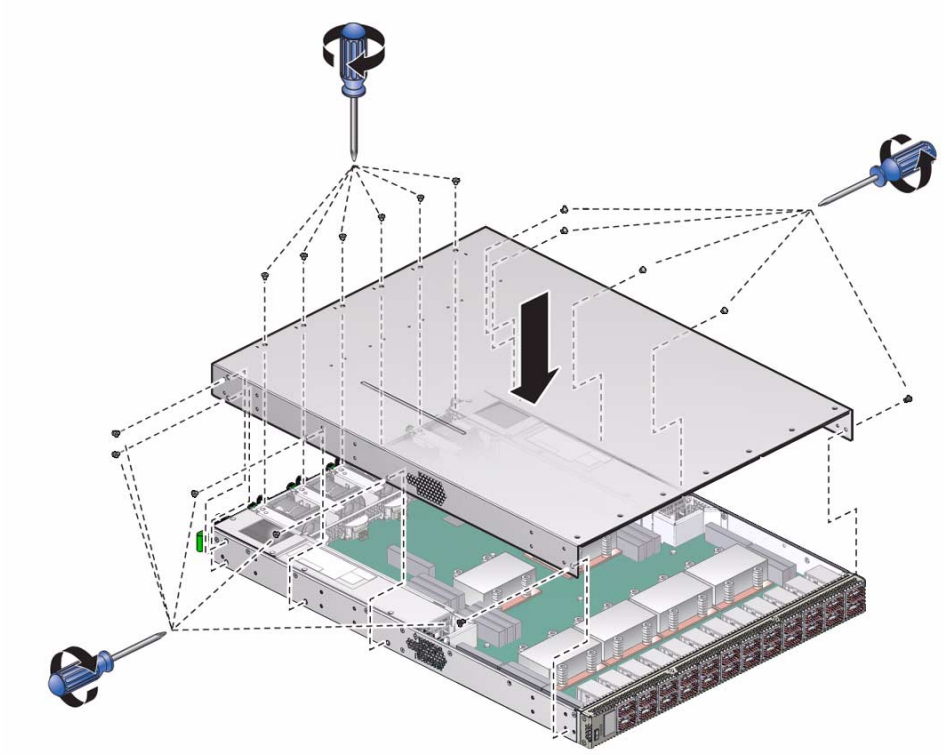
6. **Lift up slightly on the clip that retains the battery and release the battery from the main board.**



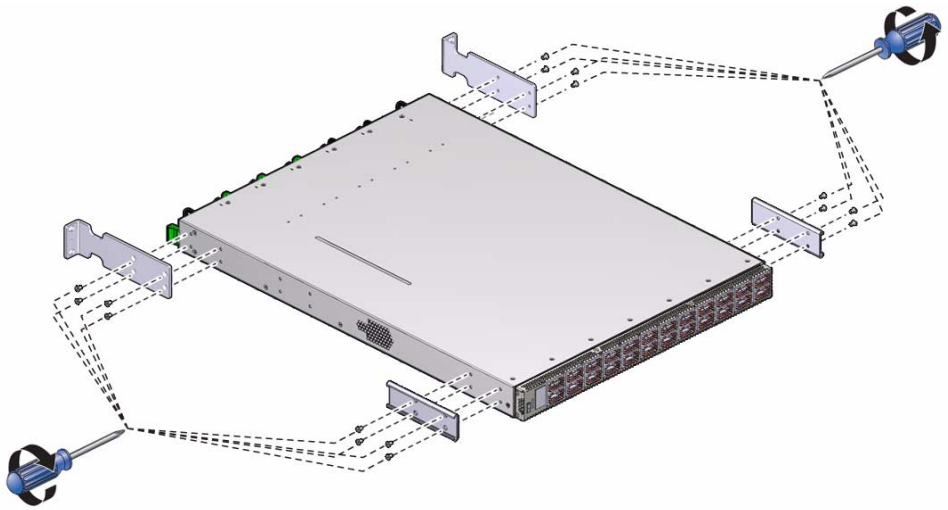
7. **Properly dispose of the old battery.**
8. **Unwrap the replacement battery from its antistatic packaging.**
9. **Install the replacement battery into the main board with the + side up.**



10. **Orient the cover over the chassis and lower it in place.**
11. **Slide the cover rearward so that it engages at the rear panel.**
    Ensure that the screw holes in the cover align with the holes in the chassis.



12. **Use a No. 1 Phillips screwdriver to install the 16 screws that secure the cover to the chassis.**
13. **Use eight screws to attach the two long front brackets to the front sides of the chassis.**



14. **Use eight screws to attach the two C-shaped brackets to the rear sides of the chassis.**

15. **Install the switch into the rack.**

    See "Installing the Switch" on page 1.

Upgrading the Firmware

Periodically, a newer version of the firmware for management controller or the I4 switch chips might become available. Refer to the *Sun Datacenter InfiniBand Switch 72 Product Notes*, part number 820-7753, for more information.

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