

Sun Datacenter InfiniBand Switch 648

Installation Guide



Part No. 820-7738-12
May 2010, Revision A

Copyright © 2009, 2010 Oracle and/or its affiliates. All rights reserved.

This software and related documentation are provided under a license agreement containing restrictions on use and disclosure and are protected by intellectual property laws. Except as expressly permitted in your license agreement or allowed by law, you may not use, copy, reproduce, translate, broadcast, modify, license, transmit, distribute, exhibit, perform, publish, or display any part, in any form, or by any means. Reverse engineering, disassembly, or decompilation of this software, unless required by law for interoperability, is prohibited.

The information contained herein is subject to change without notice and is not warranted to be error-free. If you find any errors, please report them to us in writing.

If this is software or related software documentation that is delivered to the U.S. Government or anyone licensing it on behalf of the U.S. Government, the following notice is applicable:

U.S. GOVERNMENT RIGHTS Programs, software, databases, and related documentation and technical data delivered to U.S. Government customers are "commercial computer software" or "commercial technical data" pursuant to the applicable Federal Acquisition Regulation and agency-specific supplemental regulations. As such, the use, duplication, disclosure, modification, and adaptation shall be subject to the restrictions and license terms set forth in the applicable Government contract, and, to the extent applicable by the terms of the Government contract, the additional rights set forth in FAR 52.227-19, Commercial Computer Software License (December 2007). Oracle America, Inc., 500 Oracle Parkway, Redwood City, CA 94065.

This software or hardware is developed for general use in a variety of information management applications. It is not developed or intended for use in any inherently dangerous applications, including applications which may create a risk of personal injury. If you use this software or hardware in dangerous applications, then you shall be responsible to take all appropriate fail-safe, backup, redundancy, and other measures to ensure its safe use. Oracle Corporation and its affiliates disclaim any liability for any damages caused by use of this software or hardware in dangerous applications.

Oracle and Java are registered trademarks of Oracle and/or its affiliates. Other names may be trademarks of their respective owners.

AMD, Opteron, the AMD logo, and the AMD Opteron logo are trademarks or registered trademarks of Advanced Micro Devices. Intel and Intel Xeon are trademarks or registered trademarks of Intel Corporation. All SPARC trademarks are used under license and are trademarks or registered trademarks of SPARC International, Inc. UNIX is a registered trademark licensed through X/Open Company, Ltd.

This software or hardware and documentation may provide access to or information on content, products, and services from third parties. Oracle Corporation and its affiliates are not responsible for and expressly disclaim all warranties of any kind with respect to third-party content, products, and services. Oracle Corporation and its affiliates will not be responsible for any loss, costs, or damages incurred due to your access to or use of third-party content, products, or services.

Copyright © 2009, 2010, Oracle et/ou ses affiliés. Tous droits réservés.

Ce logiciel et la documentation qui l'accompagne sont protégés par les lois sur la propriété intellectuelle. Ils sont concédés sous licence et soumis à des restrictions d'utilisation et de divulgation. Sauf disposition de votre contrat de licence ou de la loi, vous ne pouvez pas copier, reproduire, traduire, diffuser, modifier, breveter, transmettre, distribuer, exposer, exécuter, publier ou afficher le logiciel, même partiellement, sous quelque forme et par quelque procédé que ce soit. Par ailleurs, il est interdit de procéder à toute ingénierie inverse du logiciel, de le désassembler ou de le décompiler, excepté à des fins d'interopérabilité avec des logiciels tiers ou tel que prescrit par la loi.

Les informations fournies dans ce document sont susceptibles de modification sans préavis. Par ailleurs, Oracle Corporation ne garantit pas qu'elles soient exemptes d'erreurs et vous invite, le cas échéant, à lui en faire part par écrit.

Si ce logiciel, ou la documentation qui l'accompagne, est concédé sous licence au Gouvernement des Etats-Unis, ou à toute entité qui délivre la licence de ce logiciel ou l'utilise pour le compte du Gouvernement des Etats-Unis, la notice suivante s'applique :

U.S. GOVERNMENT RIGHTS. Programs, software, databases, and related documentation and technical data delivered to U.S. Government customers are "commercial computer software" or "commercial technical data" pursuant to the applicable Federal Acquisition Regulation and agency-specific supplemental regulations. As such, the use, duplication, disclosure, modification, and adaptation shall be subject to the restrictions and license terms set forth in the applicable Government contract, and, to the extent applicable by the terms of the Government contract, the additional rights set forth in FAR 52.227-19, Commercial Computer Software License (December 2007). Oracle America, Inc., 500 Oracle Parkway, Redwood City, CA 94065.

Ce logiciel ou matériel a été développé pour un usage général dans le cadre d'applications de gestion des informations. Ce logiciel ou matériel n'est pas conçu ni n'est destiné à être utilisé dans des applications à risque, notamment dans des applications pouvant causer des dommages corporels. Si vous utilisez ce logiciel ou matériel dans le cadre d'applications dangereuses, il est de votre responsabilité de prendre toutes les mesures de secours, de sauvegarde, de redondance et autres mesures nécessaires à son utilisation dans des conditions optimales de sécurité. Oracle Corporation et ses affiliés déclinent toute responsabilité quant aux dommages causés par l'utilisation de ce logiciel ou matériel pour ce type d'applications.

Oracle et Java sont des marques déposées d'Oracle Corporation et/ou de ses affiliés. Tout autre nom mentionné peut correspondre à des marques appartenant à d'autres propriétaires qu'Oracle.

AMD, Opteron, le logo AMD et le logo AMD Opteron sont des marques ou des marques déposées d'Advanced Micro Devices. Intel et Intel Xeon sont des marques ou des marques déposées d'Intel Corporation. Toutes les marques SPARC sont utilisées sous licence et sont des marques ou des marques déposées de SPARC International, Inc. UNIX est une marque déposée concédée sous licence par X/Open Company, Ltd.

Ce logiciel ou matériel et la documentation qui l'accompagne peuvent fournir des informations ou des liens donnant accès à des contenus, des produits et des services émanant de tiers. Oracle Corporation et ses affiliés déclinent toute responsabilité ou garantie expresse quant aux contenus, produits ou services émanant de tiers. En aucun cas, Oracle Corporation et ses affiliés ne sauraient être tenus pour responsables des pertes subies, des coûts occasionnés ou des dommages causés par l'accès à des contenus, produits ou services tiers, ou à leur utilisation.



Adobe PostScript

Contents

Using This Documentation ix

Preparing the Site 1

Understanding Switch Specifications 1

Physical Specifications 2

Environmental Requirements 3

Acoustic Noise Emissions 3

Electrical Specifications 3

Network Management Connector and Pins 4

Serial Management Connector and Pins 5

CXP Connector and Pins 5

Routing Service Cables 7

Power Cord Requirements 8

Management Cable Requirements 9

Understanding InfiniBand Cabling 9

InfiniBand Cable Cautions 10

InfiniBand Cable Guidelines 11

InfiniBand Cable Types 12

InfiniBand Cable Path Lengths 12

InfiniBand Cable Bundling 13

Floor and Underfloor Delivery of InfiniBand Cables 14

Overhead Delivery of InfiniBand Cables 14

Installing the Switch 15

Understanding the Installation 15

Supported Configurations 16

Fabric Card Distribution 17

Fabric Card Handling Guidelines 17

Line Card Distribution 17

Line Card Handling Guidelines 18

Fabric Card and Line Card Fillers 18

Installation Preparation 19

Suggested Tools for Installation 19

Antistatic Precautions for Installation 20

Installation Responsibilities 20

Installation Sequence 20

Installing the InfiniBand Software Stack 23

▼ Install the HPC Software Suite 23

Unpacking the Chassis 25

▼ Remove the Shipping Carton Contents 25

▼ Unsecure the Chassis From the Pallet 28

Preparing the Chassis 29

▼ Install the Rail Assemblies in the Rack 29

▼ Install the Cable Trees 32

▼ Install the Cable Curves 38

▼ Install the Chassis in the Rack 39

Inspecting the Components 45

Inspecting the Midplane for Installation 45

▼ Identify the Midplane Fabric Card Connectors 46

▼ Inspect the Pins on the Rear Side of the Midplane 47

▼ Identify the Midplane Line Card Connectors 48

▼ Inspect the Pins on the Front Side of the Midplane	50
Inspecting the Fabric Cards for Installation	51
▼ Identify the Fabric Cards for Installation	52
▼ Inspect the Fabric Card Chassis for Installation	53
▼ Inspect the Fabric Card Retainer Bolts for Installation	53
▼ Inspect the Fans for Installation	54
▼ Inspect the Fabric Card XBOW Connectors for Installation	54
Inspecting the Line Cards for Installation	55
▼ Identify the Line Cards for Installation	56
▼ Inspect the Line Card Chassis for Installation	58
▼ Inspect the Line Card Retainer Bolts for Installation	58
▼ Inspect the Line Card XBOW Connectors for Installation	59
▼ Inspect the Line Card CXP Connectors for Installation	60
Inspecting the InfiniBand Cables for Installation	61
▼ Identify the InfiniBand Cable for Installation	61
▼ Inspect the InfiniBand Cable Hardware for Installation	62
▼ Inspect the InfiniBand Cable Connectors for Installation	63
Installing the Components	63
▼ Install the Midplane Stiffener	64
▼ Install the Fabric Cards or Fabric Card Fillers	67
▼ Remove the Midplane Stiffener	70
▼ Install the Line Cards or Line Card Fillers	72
Powering On the CMCs	75
▼ Attach the Management Cables	76
▼ Attach the Power Cords	78
▼ Check the Power Supply Status LEDs	80
▼ Check the CMC Status LEDs	80
Accessing the CMC	81

▼ Access the CMC From the Serial Management Port	82
▼ Set the Initial UBoot Parameters	83
▼ Access the CMC From the Network Management Port	84
▼ Verify the CMC Status	86
▼ Identify the CMC Addresses	87
▼ Display the CMC FRU ID Information	88
▼ Verify the Power Supply Status	89
▼ Identify the Power Supply Addresses	90
▼ Display the Power Supply FRU ID Information	91
Powering On the Fabric Cards	92
▼ Enable the Fabric Cards for Installation	93
▼ Create the <code>guid.txt</code> File for Installation	93
▼ Power On the Fabric Cards for Installation	96
▼ Check the Fabric Card Status LEDs	96
▼ Verify the Fabric Card Status	97
▼ Identify the Fabric Card Addresses	99
▼ Display the Fabric Card FRU ID Information	100
Powering On the Line Cards	101
▼ Enable the Line Cards for Installation	102
▼ Power On the Line Cards for Installation	103
▼ Check the Line Card Status LEDs	103
▼ Verify the Line Card Status	104
▼ Identify the Line Card Addresses	106
▼ Display the Line Card FRU ID Information	107
Connecting InfiniBand Cables	108
▼ Attach Cables to the CXP Connectors	109
▼ Check the CXP Connector Status LEDs	115
▼ Check Link Status	116

▼ Identify the CXP Connector Addresses	117
▼ Display the InfiniBand Cable FRU ID Information	118
Verifying the InfiniBand Fabric	119
▼ Discover the InfiniBand Fabric Topology	120
▼ Perform Diagnostics on the InfiniBand Fabric	121
▼ Validate the InfiniBand Fabric and Report Errors	123
Index	125

Using This Documentation

This installation guide provides detailed procedures that describe the preparation and installation of the Sun Datacenter InfiniBand Switch 648 from Oracle®. This document is written for technicians, system administrators, authorized service providers, and users who have advanced experience installing computing hardware.

- “Related Documentation” on page ix
- “Documentation, Support, and Training” on page x
- “Documentation Feedback” on page x

Related Documentation

The documents listed as online are available at:

(<http://docs.sun.com/app/docs/prod/ib.switch.648>)

Application	Title	Part Number	Format	Location
Getting started	<i>Sun Datacenter InfiniBand Switch 648 Getting Started Guide</i>	820-7745	Printed PDF	Shipping kit Online
Last-minute information	<i>Sun Datacenter InfiniBand Switch 648 Product Notes</i>	820-7743	PDF	Online
Preparation and installation	<i>Sun Datacenter InfiniBand Switch 648 Installation Guide</i>	820-7738	PDF HTML	Online
Administration	<i>Sun Datacenter InfiniBand Switch 648 Administration Guide</i>	820-7739	PDF HTML	Online
Service	<i>Sun Datacenter InfiniBand Switch 648 Service Manual</i>	820-7740	PDF HTML	Online

Application	Title	Part Number	Format	Location
Command reference	<i>Sun Datacenter InfiniBand Switch 648 Command Reference</i>	820-7741	PDF HTML	Online
Compliance	<i>Sun Datacenter InfiniBand Switch 648 Safety and Compliance Guide</i>	820-7744	PDF	Online
ILOM information	<i>Oracle Integrated Lights Out Manager (ILOM) 3.0 Supplement for the Sun Datacenter InfiniBand Switch 648</i>	821-0896	PDF HTML	Online

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 648 Installation Guide, part number 820-7738-12.

Preparing the Site

Preparing your site for the switch is essential for a proper installation and operation. These topics describe information you should know before you install the switch.

- [“Understanding Switch Specifications” on page 1](#)
- [“Routing Service Cables” on page 7](#)
- [“Understanding InfiniBand Cabling” on page 9](#)

Related Information

- [“Installing the Switch” on page 15](#)
- *Switch Administration*
- *Switch Remote Management*
- *Switch Service*
- *Switch Reference*

Understanding Switch Specifications

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

- [“Physical Specifications” on page 2](#)
- [“Environmental Requirements” on page 3](#)
- [“Acoustic Noise Emissions” on page 3](#)
- [“Electrical Specifications” on page 3](#)
- [“Network Management Connector and Pins” on page 4](#)
- [“Serial Management Connector and Pins” on page 5](#)
- [“CXP Connector and Pins” on page 5](#)

Related Information

- [“Routing Service Cables” on page 7](#)
- [“Understanding InfiniBand Cabling” on page 9](#)

Physical Specifications

Dimension	Measurements
Width	17.56 in. (446.0 mm)
Depth	27 in. (685.8 mm)
Height	19.25 in. (489 mm)
Weight	410.0 lbs (186 kg)

Related Information

- [“Remove the Shipping Carton Contents” on page 25](#)
- [“Install the Chassis in the Rack” on page 39](#)

Environmental Requirements

Parameter	Operating
Ambient temperature	41°F to 95°F (5°C to 35°C)
Relative humidity	5% to 90% 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

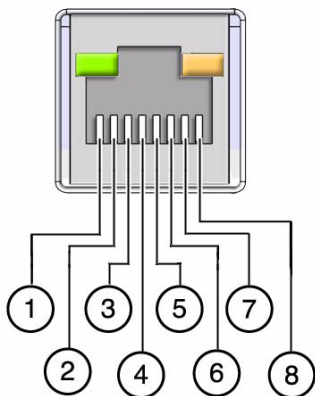
Electrical Specifications

Parameter	AC Version Requirement
Voltage	200 VAC to 240 VAC single phase, 47-63 Hz
Current (per input)	20 A maximum per input at 200 VAC
Current (total)	32 A maximum total for all inputs at 200 VAC
Power	6400 Watt (Total input power is approximately equally divided among the operating power supplies) 2900 Watt maximum per power supply

Related Information

- [“Power Cord Requirements” on page 8](#)
- [“Attach the Power Cords” on page 78](#)

Network Management Connector and Pins



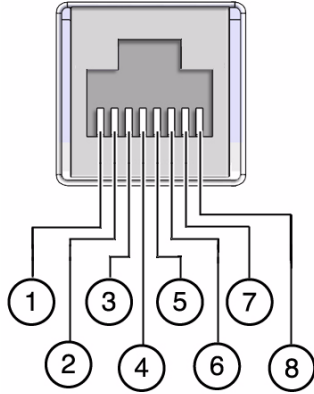
The following table lists the pinout of the network management connector.

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 9](#)
- [“Attach the Management Cables” on page 76](#)
- [“Access the CMC From the Network Management Port” on page 84](#)

Serial Management Connector and Pins



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

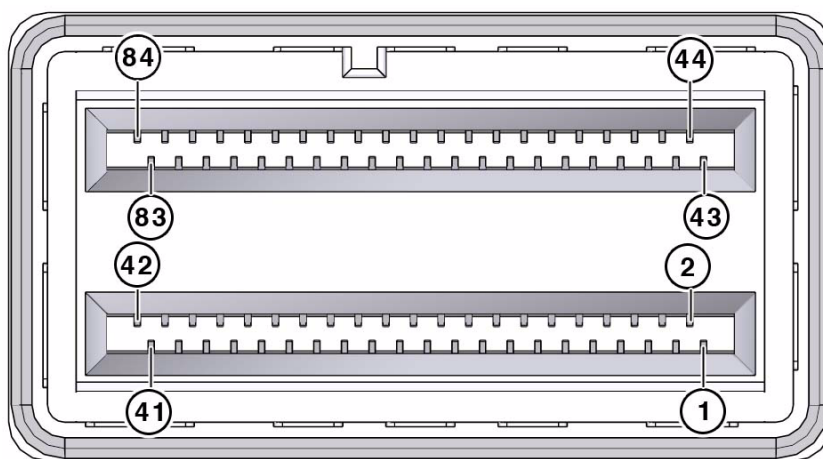
Pin	Signal
1	RTS
2	DTR
3	TXD
4	GND
5	GND
6	RXD
7	DSR
8	CTS

Related Information

- [“Management Cable Requirements” on page 9](#)
- [“Attach the Management Cables” on page 76](#)
- [“Access the CMC From the Serial Management Port” on page 82](#)

CXP Connector and Pins

The CXP connector supports three InfiniBand 4X ports through 84 pins.



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

Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
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
TX _{portdiff}	Differential InfiniBand transmit signal, where: <ul style="list-style-type: none"> • <i>port</i> – 0 to 11 • <i>diff</i> – n or p for negative or positive
RX _{portdiff}	Differential InfiniBand receive signal, where: <ul style="list-style-type: none"> • <i>port</i> – 0 to 11 • <i>diff</i> – n or p for negative or positive
SCL	I ² C clock
SDA	I ² C data I/O
PRSNT	Connection present
Int_L/Reset_L	Reset line

Related Information

- [“InfiniBand Cable Types” on page 12](#)
- [“Connecting InfiniBand Cables” on page 108](#)

Routing Service Cables

These topics describe cable routing.

- [“Power Cord Requirements” on page 8](#)

- [“Management Cable Requirements” on page 9](#)

Related Information

- [“Understanding InfiniBand Cabling” on page 9](#)
- [“Understanding Switch Specifications” on page 1](#)

Power Cord Requirements

The design of the switch is such that the power supplies are in a 2+2 redundancy. Because there are four power supplies, this means that two power supplies must be fully functional for the switch to be operational. Typically, line power is provided from two sources, A and B. Configure the switch with A source feeding power supplies 0 and 1, and B source feeding power supplies 2 and 3.

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

Cable Part Number	Description
180-2004-02	Blue 16A IEC 60309, IEC 60320 C19, 4.0M
180-2005-02	NEMA L6-20P, IEC 60320 C19, 4.0M
180-2060-02	Blue 20A Watertight IEC 60309, IEC 60320 C19, 4.0M
180-2061-02	Blue 16A Watertight IEC 60309, IEC 60320 C19, 4.0M
180-2381-01	IEC 60320 C20, IEC 60320 C19, 2.0M
180-2382-01	IEC 60320 C20, IEC 60320 C19, 1.0M



Caution – Only install and route power cabling 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 78](#)

Management Cable Requirements

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

Typically, the SER MGT connection to the serial device is only used for the initial startup and configuration of the switch. 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 signal, a serial management cable cannot be reliably used if it is more than 10 m long.

You can use the NET MGT connection after the switch has been configured to do so with serial management connection. The advantage of the NET MGT 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 more than 100 m long.

Serial device adapters enable you to use an Ethernet cable for serial management purposes.

Note – Do not use a cable longer than 10m for serial management.

Related Information

- [“Network Management Connector and Pins” on page 4](#)
- [“Serial Management Connector and Pins” on page 5](#)
- [“Attach the Management Cables” on page 76](#)

Understanding InfiniBand Cabling

These topics describe InfiniBand cabling:

- [“InfiniBand Cable Cautions” on page 10](#)
- [“InfiniBand Cable Guidelines” on page 11](#)
- [“InfiniBand Cable Types” on page 12](#)
- [“InfiniBand Cable Path Lengths” on page 12](#)
- [“InfiniBand Cable Bundling” on page 13](#)

- “Floor and Underfloor Delivery of InfiniBand Cables” on page 14
- “Overhead Delivery of InfiniBand Cables” on page 14

Related Information

- “Routing Service Cables” on page 7
- “Understanding Switch Specifications” on page 1
- “Connecting InfiniBand Cables” on page 108

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 step on the cable or connectors. Plan cable paths away from foot traffic or rolling loads.



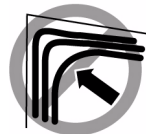
Do not pull the cable out of the shipping box, through any opening, or around any corners. Unroll the cable as you lay it down and move it through turns.



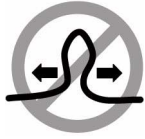
Do not bend the cables to a radius tighter than 85 mm (3.4 inches). Ensure that cable turns are as wide as possible.



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



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



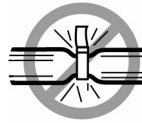
Do not straighten the cable to correct a bend that is too tight. Leave the cable bend as is.



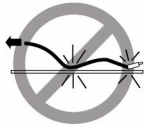
Do not hang the cable for a length more than 2 meters (7 feet). Minimize the hanging weight with intermediate retention points.



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 cinch the cable with hard fasteners or cable ties. Use soft hook-and-loop fastener for bundling and securing cables.



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



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

- [“InfiniBand Cable Guidelines” on page 11](#)
- [“Connecting InfiniBand Cables” on page 108](#)

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 13](#).
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 14 and [“Overhead Delivery of InfiniBand Cables”](#) on page 14.

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 8
- [“Management Cable Requirements”](#) on page 9

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
Pass-through, copper core, CXP - CXP	0.4 m, 1 m, 2 m, 3 m, 5 m	QDR

Related Information

- [“InfiniBand Cable Path Lengths”](#) on page 12
- [“Connecting InfiniBand Cables”](#) on page 108
- [“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 floor, consider the height of the raised floor when calculating cable path length.

Related Information

- [“InfiniBand Cable Types” on page 12](#)
- [“InfiniBand Cable Bundling” on page 13](#)
- [“Connecting InfiniBand Cables” on page 108](#)
- [“Management Cable Requirements” on page 9](#)
- [“Power Cord Requirements” on page 8](#)

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 216 InfiniBand cables, so that is 18 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 will not fall far before it is retained by another strap.

Related Information

- [“InfiniBand Cable Guidelines” on page 11](#)
- [“InfiniBand Cable Path Lengths” on page 12](#)
- [“Overhead Delivery of InfiniBand Cables” on page 14](#)
- [“Connecting InfiniBand Cables” on page 108](#)

Floor and Underfloor Delivery of InfiniBand Cables

The switch accepts InfiniBand cables from floor or underfloor delivery. The cable management hardware at the front 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

- [“InfiniBand Cable Guidelines” on page 11](#)
- [“Overhead Delivery of InfiniBand Cables” on page 14](#)
- [“Connecting InfiniBand Cables” on page 108](#)

Overhead Delivery of InfiniBand Cables

For overhead delivery, it is suggested that cable shelves and lattices be used 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

- [“InfiniBand Cable Guidelines” on page 11](#)
- [“Floor and Underfloor Delivery of InfiniBand Cables” on page 14](#)
- [“Connecting InfiniBand Cables” on page 108](#)

Installing the Switch

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

- [“Understanding the Installation” on page 15](#)
- [“Installing the InfiniBand Software Stack” on page 23](#)
- [“Unpacking the Chassis” on page 25](#)
- [“Preparing the Chassis” on page 29](#)
- [“Inspecting the Components” on page 45](#)
- [“Installing the Components” on page 63](#)
- [“Powering On the CMCs” on page 75](#)
- [“Powering On the Fabric Cards” on page 92](#)
- [“Powering On the Line Cards” on page 101](#)
- [“Connecting InfiniBand Cables” on page 108](#)
- [“Verifying the InfiniBand Fabric” on page 119](#)

Related Information

- [“Preparing the Site” on page 1](#)
- *Switch Administration*
- *Switch Remote Management*
- *Switch Service*
- *Switch Reference*

Understanding the Installation

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

- [“Supported Configurations” on page 16](#)

- [“Fabric Card Distribution” on page 17](#)
- [“Fabric Card Handling Guidelines” on page 17](#)
- [“Line Card Distribution” on page 17](#)
- [“Line Card Handling Guidelines” on page 18](#)
- [“Fabric Card and Line Card Fillers” on page 18](#)
- [“Installation Preparation” on page 19](#)
- [“Suggested Tools for Installation” on page 19](#)
- [“Antistatic Precautions for Installation” on page 20](#)
- [“Installation Responsibilities” on page 20](#)
- [“Installation Sequence” on page 20](#)

Related Information

- *Switch Administration*, understanding administrative commands
- *Switch Service*, understanding service procedures

Supported Configurations

The switch is sold with two configurations, ATO and fully populated.

With an ATO configuration, you must configure the quantity of fabric cards and line cards at the time of ordering. With a less than a fully populated switch, fabric card fillers and line card fillers are automatically included in the order, to fill the vacant slots.

In the fully populated configuration, the switch ships with the following:

- 9 line cards
- 9 fabric cards
- 1 midplane stiffener
- 4 power supplies
- 2 CMCs

The fabric card and line card distribution determine how you configure a switch that is not fully populated.

Related Information

- [“Installing the Components” on page 63](#)

Fabric Card Distribution

In a less than fully populated configuration, you must install fabric cards in a particular order, to maintain thermal management. The following sequence is the placement order for fabric cards:

0, 1, 8, 7, 6, 2, 3, 5, 4

For example, if you are installing 5 fabric cards, install them in slots 0, 1, 8, 7, and 6.

Note – Where fabric cards slots are vacant, install fabric card fillers.

Related Information

- [“Install the Fabric Cards or Fabric Card Fillers” on page 67](#)
- [“Power On the Fabric Cards for Installation” on page 96](#)
- [“Line Card Distribution” on page 17](#)

Fabric Card Handling Guidelines

Fabric cards use high-density XBOW connectors that interface with the midplane pins. If these connectors are damaged, the pins of the midplane connector can also be damaged upon fabric card insertion.

You must inspect the fabric card chassis, retainer bolts, fans, and connectors before installing the fabric card into the switch chassis.



Caution – Lift fabric cards by their sides. Do not lift fabric cards by their XBOW connectors or allow the XBOW connectors to strike any object.

Related Information

- [“Line Card Handling Guidelines” on page 18](#)
- [“InfiniBand Cable Cautions” on page 10](#)

Line Card Distribution

Similar to fabric card placement order, line cards have a placement order also:

0, 1, 2, 3, 4, 5, 6, 7, 8

For example, if you are installing 5 line cards, install them in slots 0, 1, 2, 3, and 4.

Note – Where line cards slots are vacant, install line card fillers.

Related Information

- [“Install the Line Cards or Line Card Fillers” on page 72](#)
- [“Power On the Line Cards for Installation” on page 103](#)
- [“Fabric Card Distribution” on page 17](#)

Line Card Handling Guidelines

Line cards use high-density XBOW connectors that interface with the midplane pins. If these connectors are damaged, the pins of the midplane connector can also be damaged upon line card insertion.

You must inspect the line card chassis, retainer bolts, and connectors before installing the line card into the switch chassis.



Caution – Lift line cards by their handles or by their sides. Do not lift line cards by their XBOW connectors or allow the XBOW connectors to strike any object.

Related Information

- [“Fabric Card Handling Guidelines” on page 17](#)
- [“InfiniBand Cable Cautions” on page 10](#)

Fabric Card and Line Card Fillers

Where fabric cards and line cards are not installed, a filler must be present. The fillers help maintain air flow characteristics so as to maintain proper chassis thermal management.

Line card fillers are empty shells without active components. Holes in the face of a filler permit restrictive air flow.

Fabric card fillers have IPMB controllers and fans, but no switch chips. This design enables the filler to assist with removing heat from the chassis. The fabric card filler is enabled and activated like a fabric card.

Related Information

- [“Install the Fabric Cards or Fabric Card Fillers” on page 67](#)
- [“Install the Line Cards or Line Card Fillers” on page 72](#)

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

- [“Preparing the Chassis” on page 29](#)

Suggested Tools for Installation

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

- Socket extension
- 10 mm Socket
- 20 mm Socket
- Ratchet
- Pen
- Notepad
- No. 2 Phillips screwdriver
- Flashlight
- Gloves
- Magnifying glass
- Other tools

Related Information

- [“Unpacking the Chassis” on page 25](#)
- [“Preparing the Chassis” on page 29](#)
- [“Inspecting the Components” on page 45](#)
- [“Installing the Components” on page 63](#)

Antistatic Precautions for Installation

When installing the switch components, 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

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

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	Link
1.	“Install the HPC Software Suite” on page 23
2.	“Remove the Shipping Carton Contents” on page 25
3.	“Unsecure the Chassis From the Pallet” on page 28
4.	“Install the Rail Assemblies in the Rack” on page 29

Step	Link
5.	“Install the Cable Trees” on page 32
6.	“Install the Cable Curves” on page 38
7.	“Install the Chassis in the Rack” on page 39
8.	“Identify the Midplane Fabric Card Connectors” on page 46
9.	“Inspect the Pins on the Rear Side of the Midplane” on page 47
10.	“Identify the Midplane Line Card Connectors” on page 48
11.	“Inspect the Pins on the Front Side of the Midplane” on page 50
12.	“Identify the Fabric Cards for Installation” on page 52
13.	“Inspect the Fabric Card Chassis for Installation” on page 53
14.	“Inspect the Fabric Card Retainer Bolts for Installation” on page 53
15.	“Inspect the Fans for Installation” on page 54
16.	“Inspect the Fabric Card XBOW Connectors for Installation” on page 54
17.	“Identify the Line Cards for Installation” on page 56
18.	“Inspect the Line Card Chassis for Installation” on page 58
19.	“Inspect the Line Card Retainer Bolts for Installation” on page 58
20.	“Inspect the Line Card XBOW Connectors for Installation” on page 59
21.	“Inspect the Line Card CXP Connectors for Installation” on page 60
22.	“Identify the InfiniBand Cable for Installation” on page 61
23.	“Inspect the InfiniBand Cable Hardware for Installation” on page 62
24.	“Inspect the InfiniBand Cable Connectors for Installation” on page 63
25.	“Install the Midplane Stiffener” on page 64
26.	“Install the Fabric Cards or Fabric Card Fillers” on page 67
27.	“Remove the Midplane Stiffener” on page 70
28.	“Install the Line Cards or Line Card Fillers” on page 72
29.	“Attach the Management Cables” on page 76
30.	“Attach the Power Cords” on page 78
31.	“Check the Power Supply Status LEDs” on page 80
32.	“Check the CMC Status LEDs” on page 80
33.	“Access the CMC From the Serial Management Port” on page 82
34.	“Set the Initial UBoot Parameters” on page 83
35.	“Access the CMC From the Network Management Port” on page 84

Step	Link
36.	“Verify the CMC Status” on page 86
37.	“Identify the CMC Addresses” on page 87
38.	“Display the CMC FRU ID Information” on page 88
39.	“Verify the Power Supply Status” on page 89
40.	“Identify the Power Supply Addresses” on page 90
41.	“Display the Power Supply FRU ID Information” on page 91
42.	“Enable the Fabric Cards for Installation” on page 93
43.	“Create the guid.txt File for Installation” on page 93
44.	“Power On the Fabric Cards for Installation” on page 96
45.	“Check the Fabric Card Status LEDs” on page 96
46.	“Verify the Fabric Card Status” on page 97
47.	“Identify the Fabric Card Addresses” on page 99
48.	“Display the Fabric Card FRU ID Information” on page 100
49.	“Enable the Line Cards for Installation” on page 102
50.	“Power On the Line Cards for Installation” on page 103
51.	“Check the Line Card Status LEDs” on page 103
52.	“Verify the Line Card Status” on page 104
53.	“Identify the Line Card Addresses” on page 106
54.	“Display the Line Card FRU ID Information” on page 107
55.	“Attach Cables to the CXP Connectors” on page 109
56.	“Check the CXP Connector Status LEDs” on page 115
57.	“Check Link Status” on page 116
58.	“Identify the CXP Connector Addresses” on page 117
59.	“Display the InfiniBand Cable FRU ID Information” on page 118
60.	“Discover the InfiniBand Fabric Topology” on page 120
61.	“Perform Diagnostics on the InfiniBand Fabric” on page 121
62.	“Validate the InfiniBand Fabric and Report Errors” on page 123

Installing the InfiniBand Software Stack

The OFED InfiniBand software stack is available in the HPC software suite, created for Red Hat Enterprise Linux 5.2 systems. The HPC software is delivered as an `.iso` image. You can burn this image to a CD or DVD, or extract the files from within the image. In addition to many software applications, the HPC software image contains linux `.rpm` packages which are required to setting up and manage the InfiniBand fabric. These `.rpm` files are found in the `/SunHPC` directory of the `.iso` image.

- [“Install the HPC Software Suite” on page 23](#)

Related Information

- [“Understanding the Installation” on page 15](#)
- [“Verifying the InfiniBand Fabric” on page 119](#)

▼ Install the HPC Software Suite

This procedure installs the entire HPC software suite by default.

1. **Identify the prerequisite and subsequent tasks you must perform in conjunction with this procedure, to install the switch.**
See the table in [“Installation Sequence” on page 20](#).
2. **Become superuser of the Linux InfiniBand host that is to receive the software.**
3. **Open this URL in a web browser:**
(<http://www.sun.com/software/products/hpcsoftware/getit.jsp>)
4. **In the section “Free Sun HPC Software, Linux Edition 1.2 Download”, click on the Download button.**
The intermediate page loads.
If you are already logged into the Sun Download Center, go to [Step 8](#).
5. **Provide your username and password.**
6. **If you are not registered with the Sun Download Center, click Register Now.**
Once you are registered, return to this step.
7. **Click Log In and Continue.**
The download page is displayed.

8. Click on “Download or read the latest Installation Guide”.

Read or save the document for later reading.

Note – The installation guide is also available at this URL:

(<http://docs.sun.com/app/docs/prod/hpc.linux12~hpc-sw-linux-1.2#hic>)

9. Click on the links to download the software and release notes.

Alternatively, use the Download Manager.

Note – The software is approximately 390 Mbyte.

10. Save the files to your download directory.

11. Burn a CD or DVD from the .iso image.

Alternatively, mount the .iso image as a loopback device.

a. Create the directory mount point:

```
# mkdir -p /mnt/disk
```

b. Mount the .iso image:

```
# mount -o loop sun-hpc-linux-1.2a.iso /mnt/disk
```

c. Change directory to list files inside the .iso image:

```
# cd /mnt/disk/SunHPC
# ls -l
```

12. Follow the instructions in the installation guide to install the software.

13. After installation, reboot the Linux InfiniBand host.

During startup, the InfiniBand fabric becomes active.

14. Begin the installation of the switch.

See “Remove the Shipping Carton Contents” on page 25.

Related Information

- “Create the `guid.txt` File for Installation” on page 93

Unpacking the Chassis

The first part of installing the switch chassis is to unpack it from its shipping container. Perform the tasks in the following order:

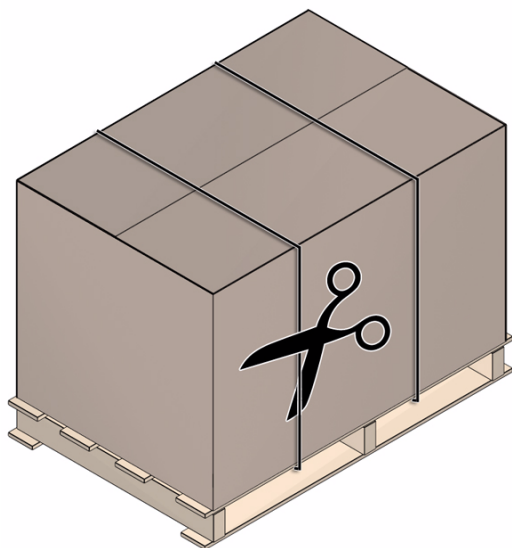
- [“Remove the Shipping Carton Contents” on page 25](#)
- [“Unsecure the Chassis From the Pallet” on page 28](#)

Related Information

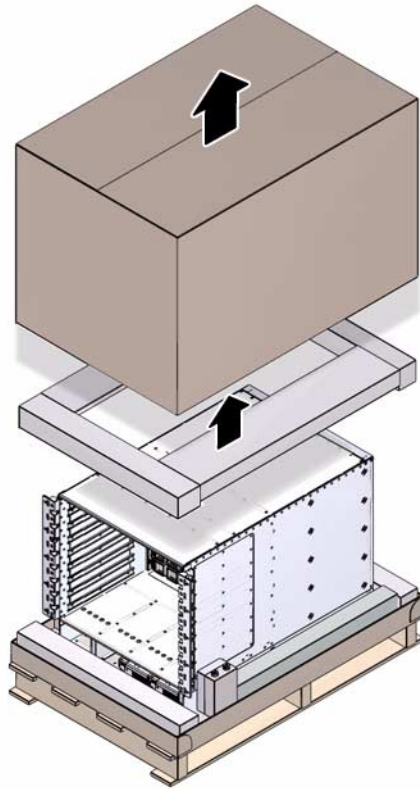
- [“Understanding the Installation” on page 15](#)
- [“Preparing the Chassis” on page 29](#)

▼ Remove the Shipping Carton Contents

1. **Identify the prerequisite and subsequent tasks you must perform in conjunction with this procedure, to install the switch.**
See the table in [“Installation Sequence” on page 20](#).
2. **Ensure that there is adequate space around the switch to maneuver a computer lifting device.**
3. **Remove the yellow Customer Information Sheet from the plastic pocket on the side of the packaging and keep it for future reference.**
4. **Remove the carton protection pads.**
5. **Cut the bands from the outer packaging and open the carton.**



6. Remove the outer carton.
7. Remove and unpack the shipping kit.



8. Remove the internal saddle.
9. Lift off the switch bag.
10. Make a visual check to ensure that the switch chassis is undamaged.
11. Move the switch to the operating location using a computer lifting device.
12. Unsecure the switch chassis from the shipping pallet.
See [“Unsecure the Chassis From the Pallet”](#) on page 28.

Related Information

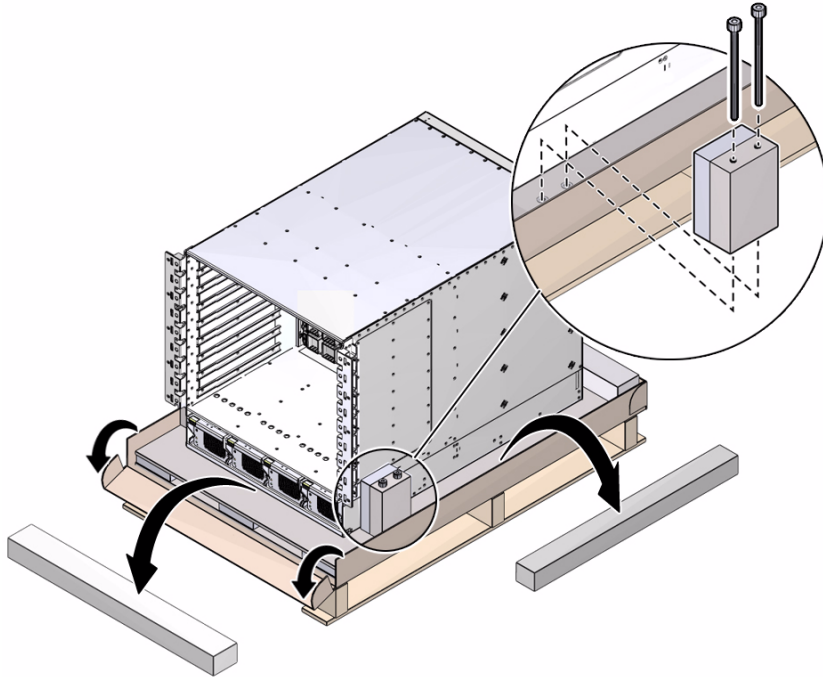
- [“Suggested Tools for Installation”](#) on page 19

▼ Unsecure the Chassis From the Pallet

1. Identify the prerequisite and subsequent tasks you must perform in conjunction with this procedure, to install the switch.

See the table in [“Installation Sequence”](#) on page 20.

2. Remove the shipping cradle bolts.



3. Open the cardboard lip and remove the packing.

4. Prepare the switch chassis for component installation.

See [“Install the Rail Assemblies in the Rack”](#) on page 29.

Related Information

- [“Suggested Tools for Installation”](#) on page 19
- [“Remove the Shipping Carton Contents”](#) on page 25

Preparing the Chassis

After unpacking the switch chassis and components, mount the switch chassis and cable management hardware into the rack. Perform the tasks in the following order:

Note – The illustrations in this topic describe the switch being installed at the middle position for better clarity. Install the first switch in the rack at the bottom position for rack stability.

- [“Install the Rail Assemblies in the Rack” on page 29](#)
- [“Install the Cable Trees” on page 32](#)
- [“Install the Cable Curves” on page 38](#)
- [“Install the Chassis in the Rack” on page 39](#)

Related Information

- [“Understanding the Installation” on page 15](#)
- [“Installing the Components” on page 63](#)

▼ Install the Rail Assemblies in the Rack

There are three positions to install the switch into the rack, bottom, middle, and top. The rack does not accommodate more than three switches.

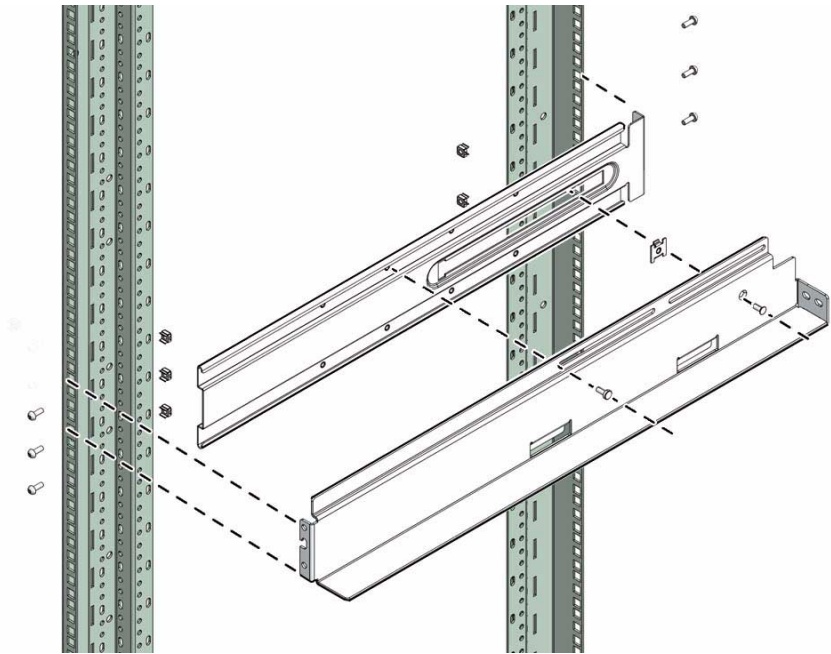
Note – For this procedure, the term *cabinet holes* refers to the holes in the posts of the cabinet. For the Sun Rack II cabinet, these holes are square. The holes are numbered from 1 starting at the very bottom. Hole 2, 3, 4, and so on, are the second, third, fourth, and so on, hole from the bottom. The numbering scheme printed on the posts is not used.

Note – If you are installing fewer than three switches, favor the bottom and middle positions.

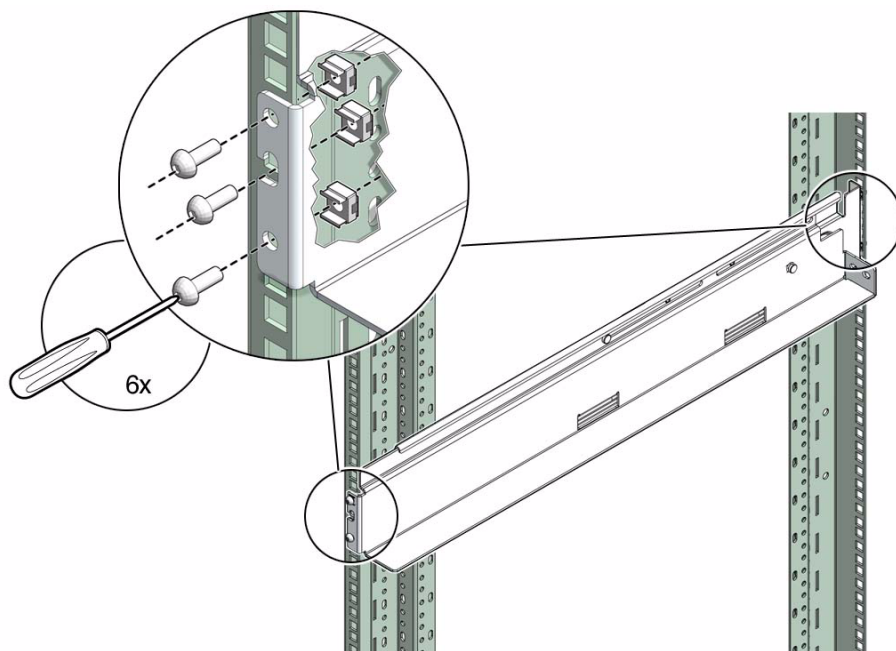


Caution – Do not install any rail-mounted equipment in the Sun Datacenter InfiniBand Switch 648 rack. The Sun Datacenter InfiniBand Switch 648 switches must be loaded into the rack from the bottom up.

1. **Identify the prerequisite and subsequent tasks you must perform in conjunction with this procedure, to install the switch.**
See the table in [“Installation Sequence” on page 20](#).
2. **Remove the front door of the rack or cabinet (if applicable).**
3. **If installing the switch into a Sun Rack II cabinet, remove both stabilizer legs from the front of the rack.**
4. **Adjust the length of each slide rail assembly.**
 - a. **Loosen the four nuts that secure the rear bracket.**
 - b. **Reposition the rear bracket to the location marked “NGR Cabinet” on the slide rail assembly and secure the rear bracket.**
5. **Insert the captive nuts for the front bracket into cabinet holes x , y , and z .**
where x , y , and z are the respective cabinet holes:
 - 2, 4, and 5 for bottom mounting
 - 36, 38, and 39 for middle mounting
 - 70, 72, and 73 for top mounting



6. **Insert the captive nuts for the rear bracket into cabinet holes t , u , and v .**
where t , u , and v are the respective cabinet holes:
 - 2, 5, and 6 for bottom mounting
 - 36, 39, and 40 for middle mounting
 - 70, 73, and 74 for top mounting
7. **Secure the slide rail into the rack with three M6 screws at the front and three M6 screws at the rear.**



8. Repeat [Step 4](#) through [Step 7](#) for the second slide rail assembly.

9. Install the cable trees.

See [“Install the Cable Trees”](#) on page 32.

Related Information

- [“Suggested Tools for Installation”](#) on page 19
- [“Unsecure the Chassis From the Pallet”](#) on page 28

▼ Install the Cable Trees

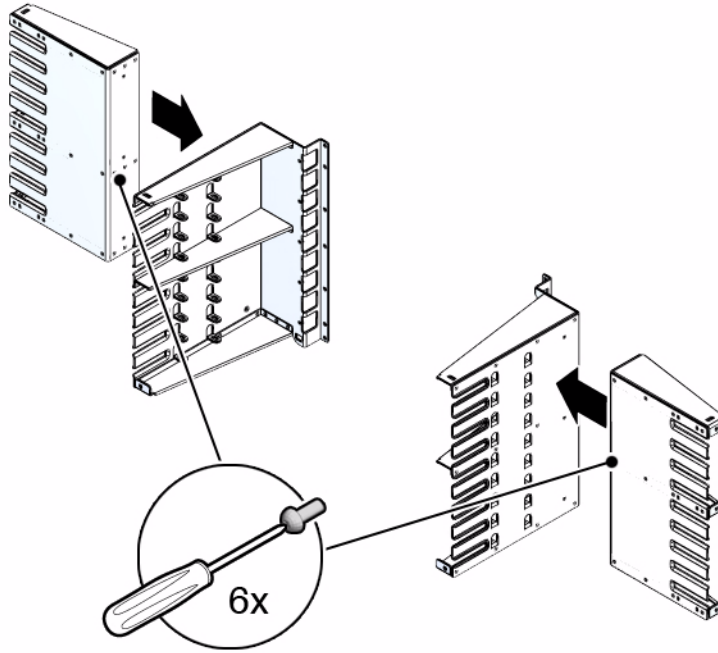
The cable trees have two parts, a main trunk and an outer branch. These pieces are left-right symmetrical and their orientation for installation can be determined as follows:

- The main trunk installs at the front of the rack with the reinforcing ribs and cable shelf tabs toward the centerline of the rack. The square EMI screen mounting hole is at the bottom of the main trunk.
- The outer branch installs onto the main trunk with the reinforcing ribs facing to the rear of the rack. The center reinforcing rib has 4 openings above and 5 openings below.

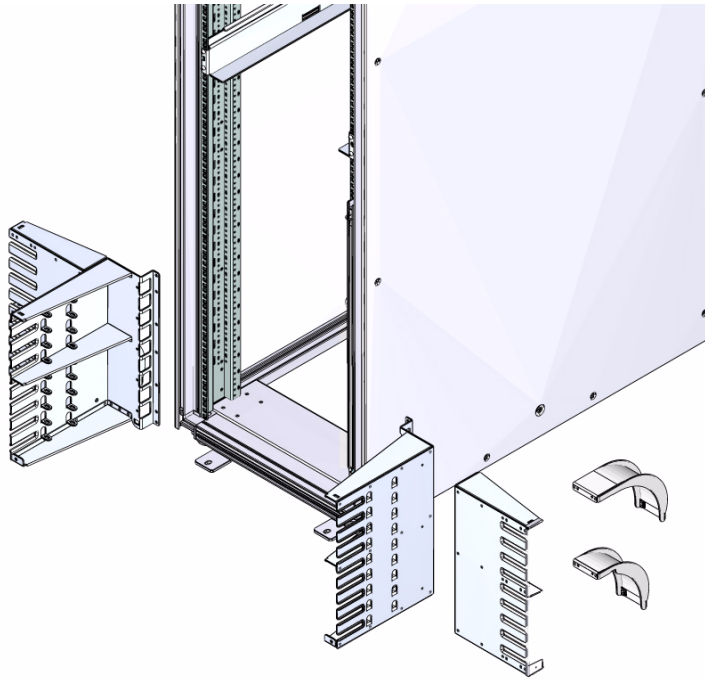
Note – For this procedure, the term *cabinet holes* refers to the holes in the posts of the cabinet. For the Sun Rack II cabinet, these holes are square. The holes are numbered from 1 starting at the very bottom. Hole 2, 3, 4, and so on, are the second, third, fourth, and so on, hole from the bottom. The numbering scheme printed on the posts is not used.

Note – This task requires two people.

1. **Identify the prerequisite and subsequent tasks you must perform in conjunction with this procedure, to install the switch.**
See the table in [“Installation Sequence”](#) on page 20.
2. **Bring the cable management hardware to the rack.**
3. **Identify the left main trunk and left outer branch.**
4. **While holding the left main trunk and left outer branch together, have a helper install the three M4 mounting screws.**
 - a. **Install the first screw for the top hole on the main trunk.**
Finger tighten the screw only.



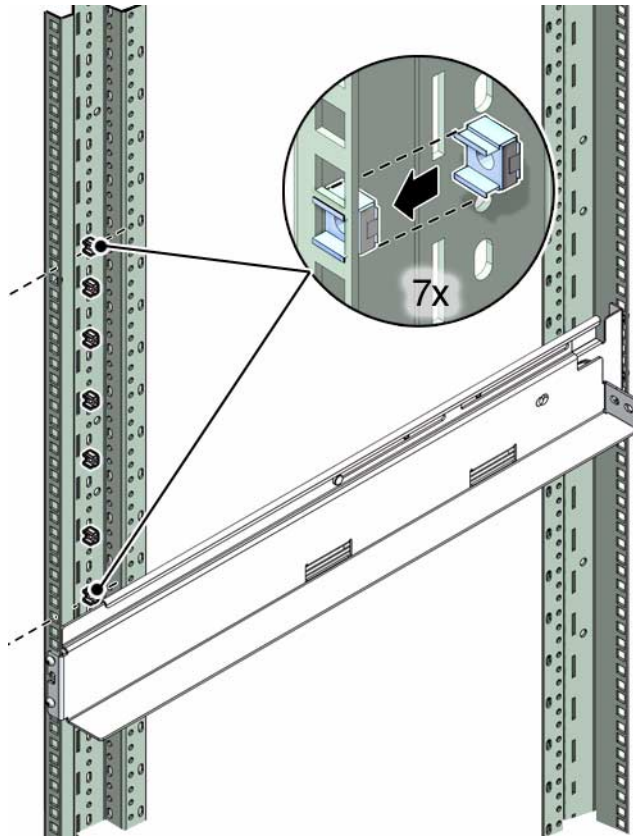
- b. Repeat [Step a](#) so that the middle and bottom screws are installed.
 - c. Using a No. 2 Phillips screwdriver, securely tighten all three screws.
5. Set the assembled cable tree at the left front corner of the rack.



6. Insert the seven captive nuts for the left main trunk into cabinet holes *a*, *b*, *c*, *d*, *e*, *f*, and *g*.

where *a*, *b*, *c*, *d*, *e*, *f*, and *g* are the respective cabinet holes:

- 6, 8, 13, 19, 24, 30, and 33 for bottom mounting
- 40, 42, 47, 53, 58, 64, and 67 for middle mounting
- 74, 76, 81, 87, 92, 98, and 101 for top mounting



7. Lift the left cable tree into position.

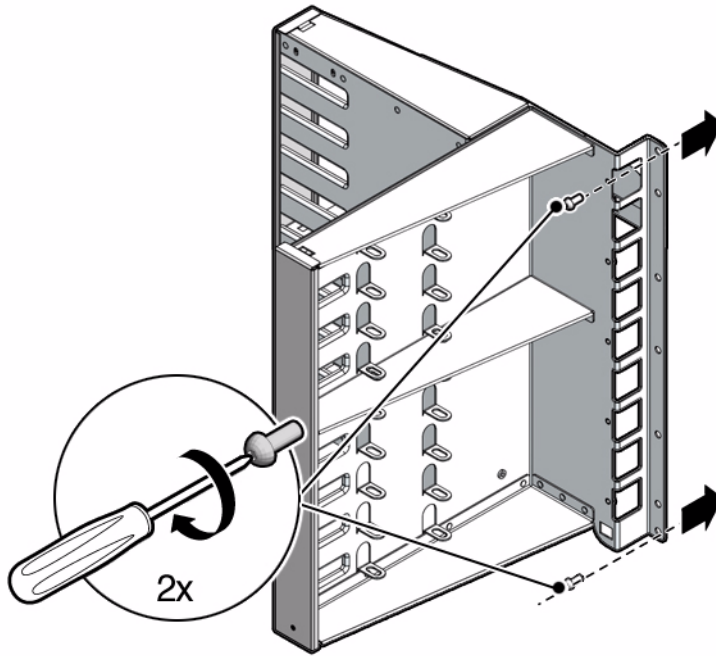
Note – When in the correct position, the cable tree can rest upon the front flange of the slide rail.

Have a helper assist in aligning the cable tree mounting screw holes with the captive nuts in the rack.

8. While holding the cable tree in position, have a helper install the two M6 mounting screws.

a. Install the first screw for the top hole of the main trunk.

Finger tighten the screw only.



b. Install the second screw into the bottom hole of the main trunk.

Finger tighten the screw only.

9. Press the cable tree outward from the rack centerline and using a No. 2 Phillips screwdriver, firmly tighten the top and bottom screws.
10. Repeat [Step 2](#) through [Step 9](#) for the right main trunk and right outer branch at the front right corner of the chassis.
11. Consider your next steps:
 - If you are delivering InfiniBand cables from the floor or from under floor, attach the cable curves.
See [“Install the Cable Curves”](#) on page 38.
 - If you are delivering InfiniBand cables from overhead, secure the switch chassis into the rack.
See [“Install the Chassis in the Rack”](#) on page 39.

Related Information

- [“Suggested Tools for Installation”](#) on page 19
- [“Install the Rail Assemblies in the Rack”](#) on page 29

▼ Install the Cable Curves

Cable curves are identified by their increasing size. Type A are the smallest, type F are the largest. Where you install the switch chassis in the rack determines which cable curves are attached to the outer branch of the cable tree. Consider the following:

Note – If you are delivering fabric cabling from overhead, there is no need to install the cable curves. The curves offer no advantage in this situation.

1. **Identify the prerequisite and subsequent tasks you must perform in conjunction with this procedure, to install the switch.**

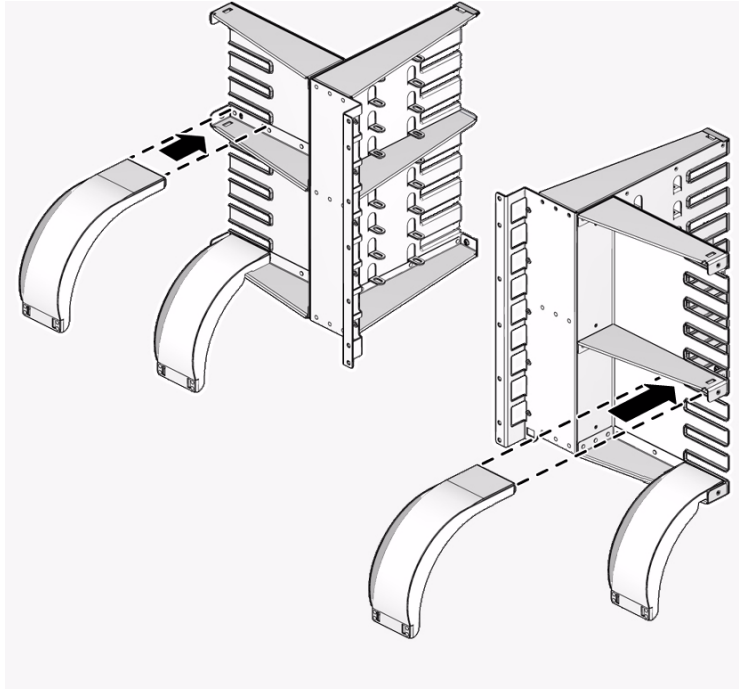
See the table in [“Installation Sequence”](#) on page 20.

2. **Determine which cable curves are appropriate for installation.**

Note – You will need two of each type.

3. **Using a No. 2 Phillips screwdriver, attach the smaller of the cable curves to the bottom position of the right outer branch with two M4 screws.**

The cable curve points down and to the rear of the rack.



4. Repeat [Step 3](#) with the larger cable curve, attaching it to the middle position of the outer branch with two M4 screws.
5. Attach the hook-and-loop fastener straps to the ends of the cable curves.
6. Repeat [Step 3](#) through [Step 5](#) for the left outer branch.
7. Secure the switch chassis into the rack.
See [“Install the Chassis in the Rack”](#) on page 39.

Related Information

- [“Suggested Tools for Installation”](#) on page 19
- [“Install the Cable Trees”](#) on page 32

▼ Install the Chassis in the Rack



Caution – The switch with shipping cradle weighs approximately 286.0 lb (130.0 kg). To prevent personal injury, two people are needed to move the switch safely into the cabinet using a computer equipment lift.

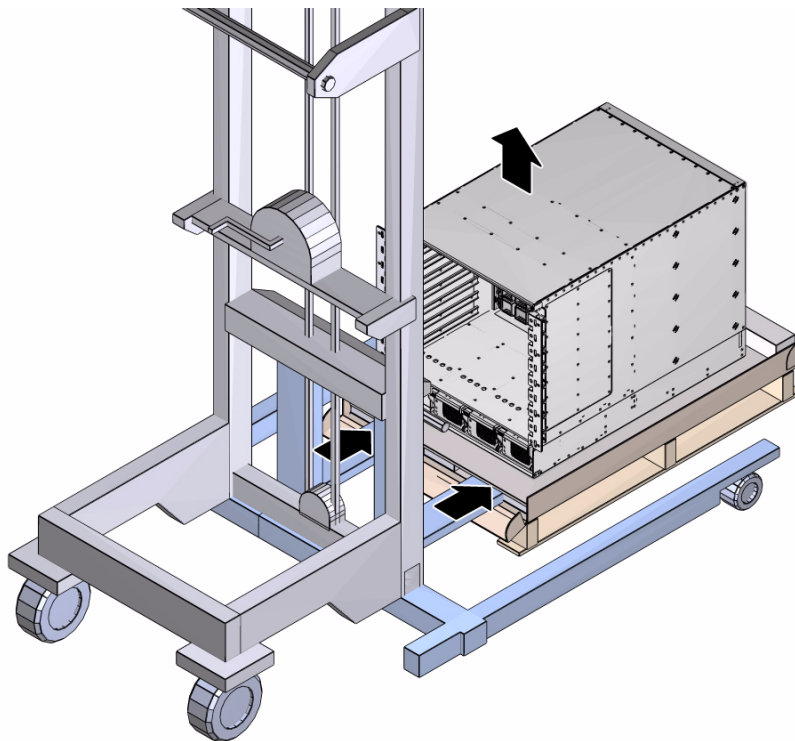


Caution – The shipping cradle must be attached when the switch is lifted. Failure to do so will result in major damage to the switch.

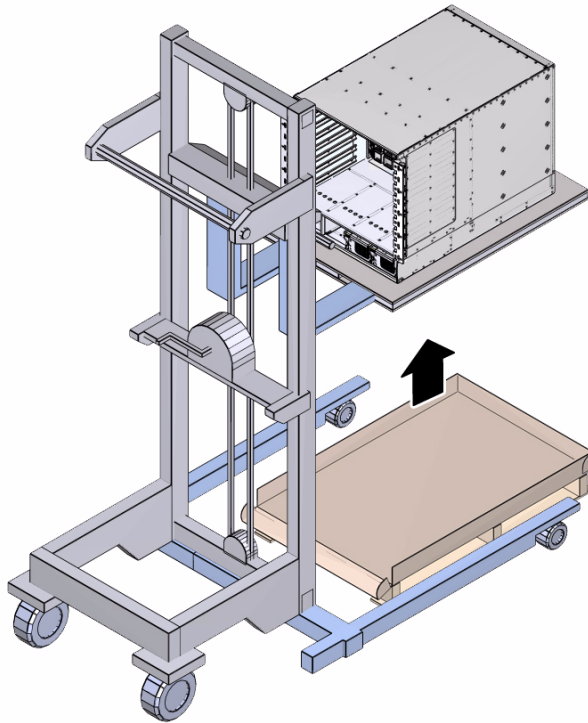


Caution – Do not install any rail-mounted equipment in the Sun Datacenter InfiniBand Switch 648 rack. Oracle's Sun Datacenter InfiniBand Switch 648 switches must be loaded into the rack from the bottom up.

1. Identify the prerequisite and subsequent tasks you must perform in conjunction with this procedure, to install the switch.
See the table in “[Installation Sequence](#)” on page 20.
2. Extend the rack stabilizer and lock it in position (as applicable).
3. Insert the forks of the lifting device fully through the shipping cradle opening.
Make the forks only as narrow as to permit clearance.

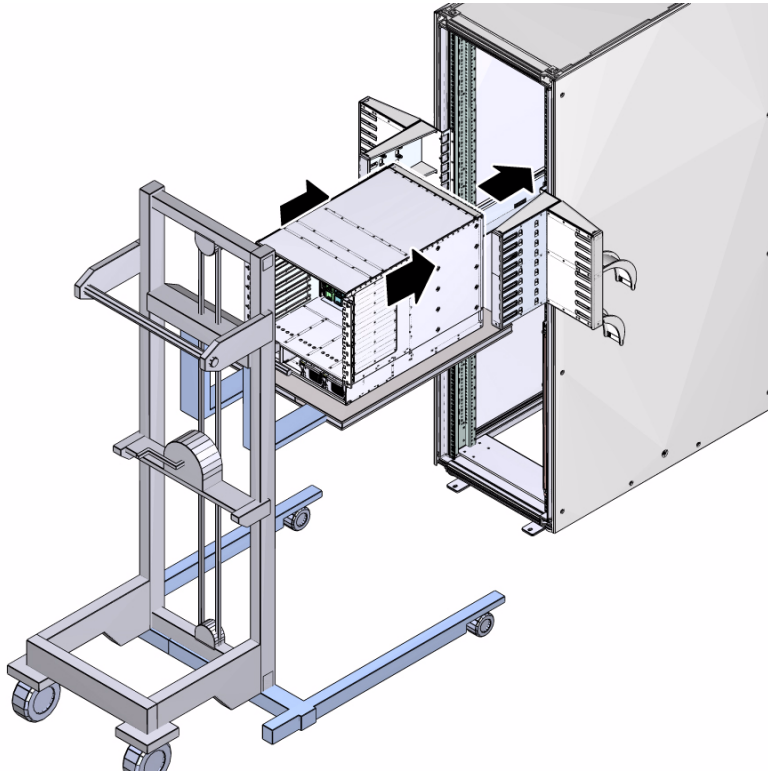


4. Lift the switch off the wooden shipping pallet and remove the pallet.

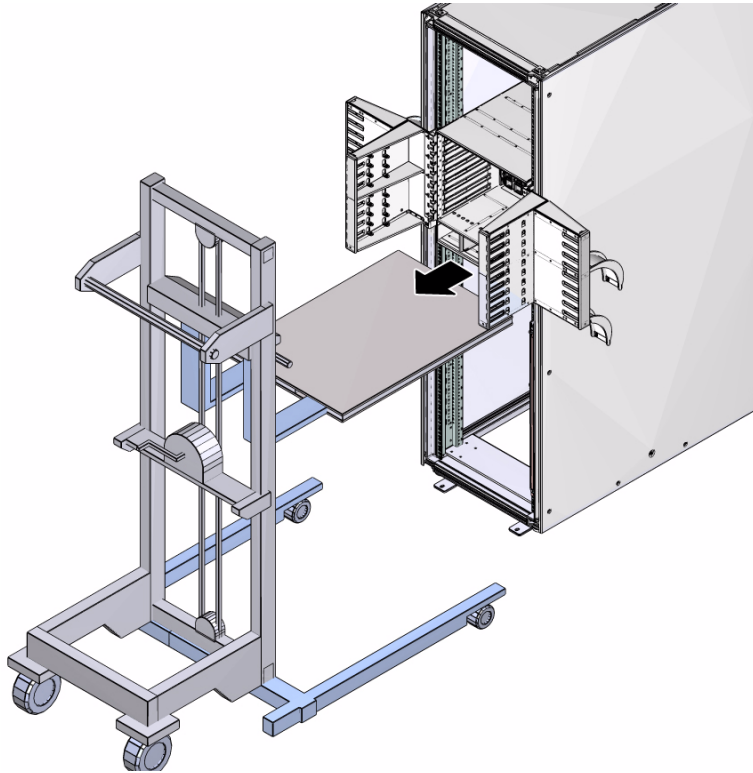


Note – Lift the switch only high enough to remove the pallet.

5. Slowly move the switch to the rack.
6. Set the lift height so that the chassis is equal with the rails on the rack.
7. Carefully move the lifting device forward as possible, until the switch chassis is able to slide safely on the rails.

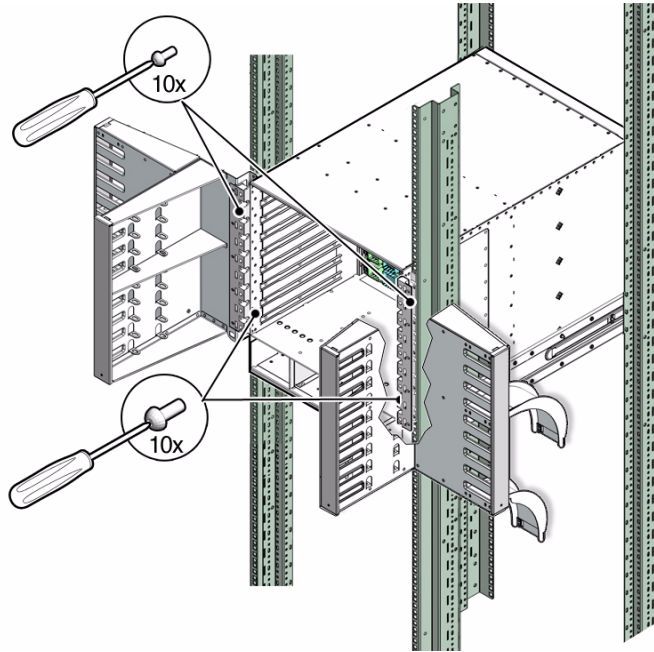


8. Slide the switch into the rack and against the cable trees.
9. Pull the lift back from the rack so that it clears the cable trees.



10. Lower the shipping cradle and move the lift out of the way.
11. Using a No. 2 Phillips screwdriver, install the 10 larger M6 screws on the front of the switch chassis to secure the switch to the rack posts.

Note – The screws enter recessed holes in the switch chassis flange for fastening.



12. Install the 10 smaller M4 screws on the front of the switch chassis to secure the switch to the cable trees.

Note – The screws secure to the outer surface of the switch chassis flange.

13. Install the four M6 screws at the rear of the switch chassis to secure the switch to the rails.
14. Retract the cabinet stabilization mechanism (as required).
15. Inspect the switch components before installing them.

See [“Inspecting the Components”](#) on page 45.

Related Information

- [“Physical Specifications”](#) on page 2
- [“Suggested Tools for Installation”](#) on page 19
- [“Install the Cable Curves”](#) on page 38

Inspecting the Components

After mounting the switch chassis into the rack, check the condition and suitability of the components for installation. Perform the tasks in the following order:

Step	Description	Links
1.	Inspect the midplane.	“Inspecting the Midplane for Installation” on page 45
2.	Inspect the fabric cards.	“Inspecting the Fabric Cards for Installation” on page 51
3.	Inspect the line cards.	“Inspecting the Line Cards for Installation” on page 55
4.	Inspect the InfiniBand cables.	“Inspecting the InfiniBand Cables for Installation” on page 61

Related Information

- [“Understanding the Installation” on page 15](#)
- [“Verifying the InfiniBand Fabric” on page 119](#)

Inspecting the Midplane for Installation

Verify that the midplane is suitable for fabric card and line card installation. Perform the tasks in the following order:

Step	Description	Links
1.	Identify the midplane fabric card connectors.	“Identify the Midplane Fabric Card Connectors” on page 46
2.	Inspect the pins on the rear side of the midplane.	“Inspect the Pins on the Rear Side of the Midplane” on page 47
3.	Identify the midplane line card connectors.	“Identify the Midplane Line Card Connectors” on page 48
4.	Inspect the pins on the front side of the midplane.	“Inspect the Pins on the Front Side of the Midplane” on page 50

Related Information

- “Inspecting the Fabric Cards for Installation” on page 51
- “Inspecting the Line Cards for Installation” on page 55
- “Inspecting the InfiniBand Cables for Installation” on page 61

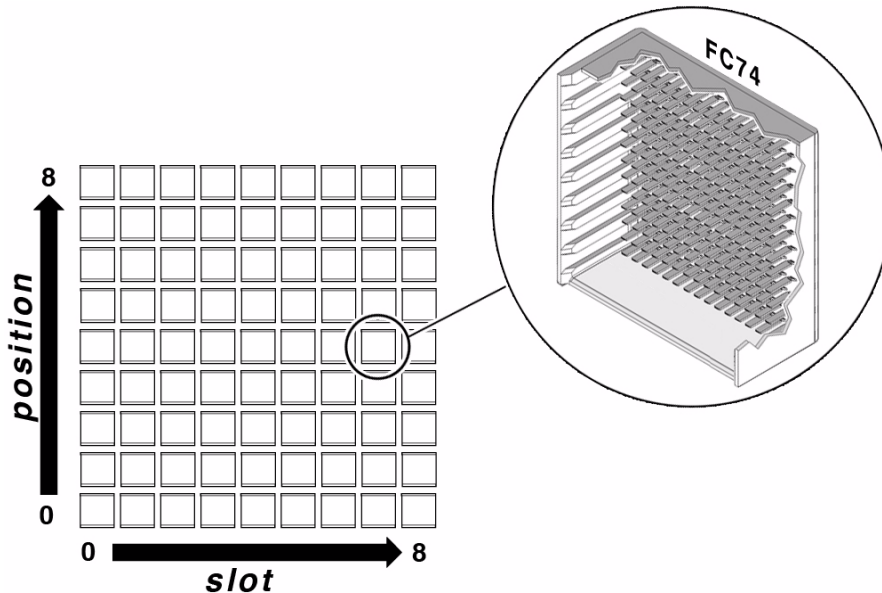
▼ Identify the Midplane Fabric Card Connectors

1. Identify the prerequisite and subsequent tasks you must perform in conjunction with this procedure, to install the switch.

See the table in “Installation Sequence” on page 20.

2. Observe the rear side of the midplane.

The rear side of the midplane has an 9x9 matrix of XBOW connectors that interface with the fabric cards and fabric card fillers.



3. Identify the connector numbers.

A unique connector number is located above each connector. For example, the upper-left connector number is FC08. The lower-right connector number is FC80. The connector number is decoded as $FCslotposition$. Where:

- FC – Fabric card
- *slot* is the fabric card slot, 0 through 8 (left to right)
- *position* is the connector position, 0 through 8 (bottom to top)

4. Find the origin of the coordinate system.

The origin of this coordinate system is the lower-left corner, at FC00. In the illustration, the connector identified is FC74.

5. Inspect the pins on the rear side of the midplane.

See [“Inspect the Pins on the Rear Side of the Midplane” on page 47.](#)

Related Information

- [“Identify the Midplane Line Card Connectors” on page 48](#)

▼ Inspect the Pins on the Rear Side of the Midplane

For this procedure, you need:

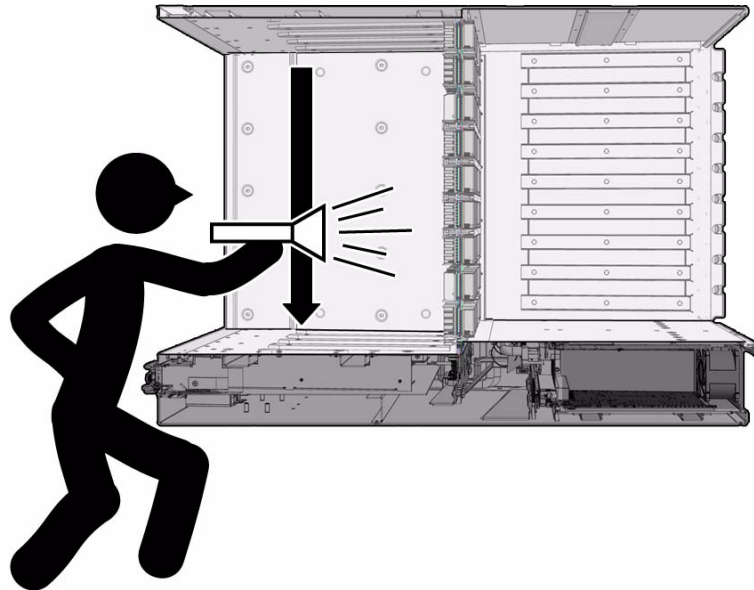
- Flashlight
- Magnifying glass

1. Identify the prerequisite and subsequent tasks you must perform in conjunction with this procedure, to install the switch.

See the table in [“Installation Sequence” on page 20.](#)

2. Position the flashlight above you and use the magnifying glass to look at the individual pins of the top connector.

Look at the pins straight on.



3. Look for any light reflection inconsistencies.

A bent pin reflects light differently, either brighter or darker than the surrounding pins.

Note – Do not look at the individual pins, rather look at all of the connector's pins as a whole. A bent pin will be apparent.

4. Identify the connector with a pin that needs repair and note this.

5. Look for any contaminants that might be present.

These contaminants might appear as light dots near the pins.

6. Move your head down to the next connector and inspect its pins, repeating [Step 2](#) through [Step 5](#).

7. Continue in this manner for all connectors in that column.

8. Repeat [Step 2](#) to [Step 7](#) for fabric card slot 1 to fabric card slot 8.

9. Identify the midplane line card connectors.

See "[Identify the Midplane Line Card Connectors](#)" on page 48.

Related Information

- "[Inspecting the Fabric Cards for Installation](#)" on page 51
- "[Suggested Tools for Installation](#)" on page 19

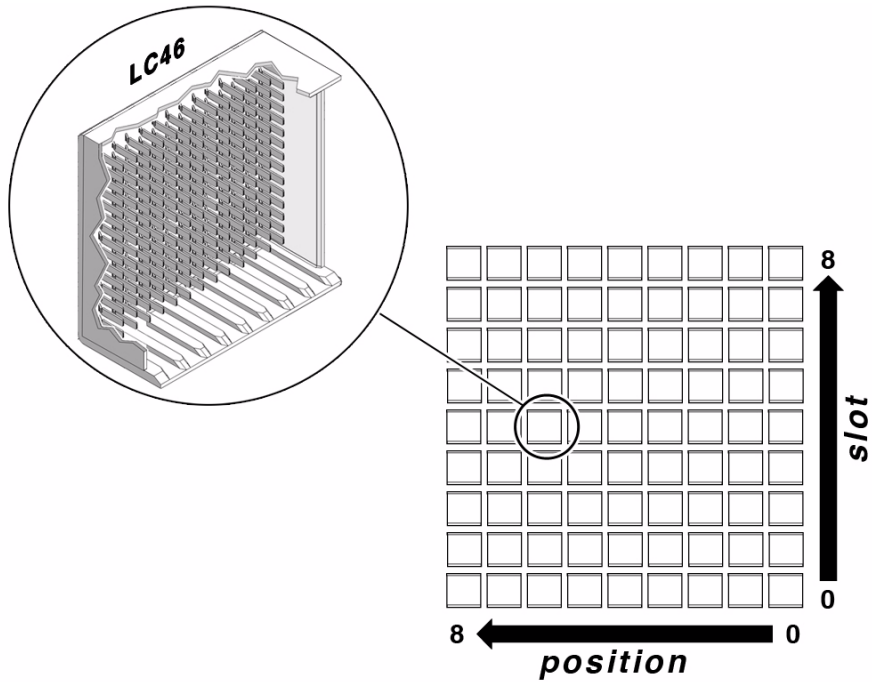
▼ Identify the Midplane Line Card Connectors

1. Identify the prerequisite and subsequent tasks you must perform in conjunction with this procedure, to install the switch.

See the table in "[Installation Sequence](#)" on page 20.

2. Observe the front of the midplane.

The front side of the midplane has an 9x9 matrix of XBOW connectors that interface with the line cards.



3. Identify the connector numbers.

The unique connector number is located above each connector. For example, the lower-left connector number is LC08. The upper-right connector number is LC80. The connector number is decoded as *LCslotposition*. Where:

- LC – Line card
- slot is the line card slot, 0 through 8 (bottom to top)
- position is the connector position, 0 through 8 (right to left)

4. Find the origin of the coordinate system.

The origin of this coordinate system is the lower right corner, at LC00. In the illustration, the connector identified is LC46.

5. Inspect the pins on the front side of the midplane.

See [“Inspect the Pins on the Front Side of the Midplane”](#) on page 50.

Related Information

- [“Identify the Midplane Fabric Card Connectors”](#) on page 46

▼ Inspect the Pins on the Front Side of the Midplane

For this procedure, you need:

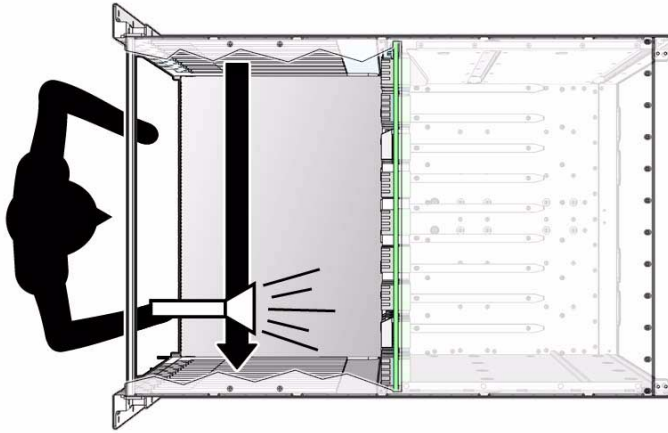
- Flashlight
- Magnifying glass

1. **Identify the prerequisite and subsequent tasks you must perform in conjunction with this procedure, to install the switch.**

See the table in [“Installation Sequence”](#) on page 20.

2. **Position the flashlight to the side of you and use the magnifying glass to look at the individual pins of the left connector.**

Look at the pins as straight on.



3. **Look for any light reflection inconsistencies.**

A bent pin reflects light differently, either brighter or darker than the surrounding pins.

Note – Do not look at the individual pins, rather look at all of the connector’s pins as a whole. A bent pin will be apparent.

4. **Identify the connector with a pin that needs repair and note this.**

5. **Look for any contaminants that might be present.**

These contaminants might appear as light dots near the pins.

6. **Move your head right to the next connector and inspect its pins, repeating [Step 2](#) through [Step 5](#).**

7. Continue in this manner for all connectors in the row.
8. Repeat [Step 2 to Step 7](#) for line card slot 7 to line card slot 0.
9. Inspect the fabric cards.
See [“Identify the Fabric Cards for Installation”](#) on page 52.

Related Information

- [“Inspecting the Line Cards for Installation”](#) on page 55
- [“Suggested Tools for Installation”](#) on page 19

Inspecting the Fabric Cards for Installation

Before you install the fabric cards, verify that they are suitable for installation. Perform the tasks in the following order:

Note – You must perform these inspection tasks on all fabric cards to be installed.

Step	Description	Links
1.	Identify the fabric card.	“Identify the Fabric Cards for Installation” on page 52
2.	Inspect the fabric card chassis.	“Inspect the Fabric Card Chassis for Installation” on page 53
3.	Inspect the fabric card retainer bolts.	“Inspect the Fabric Card Retainer Bolts for Installation” on page 53
4.	Inspect the fans.	“Inspect the Fans for Installation” on page 54
5.	Inspect the fabric card XBOW connectors.	“Inspect the Fabric Card XBOW Connectors for Installation” on page 54

Related Information

- *Switch Service*, inspecting fabric cards
- [“Inspecting the Midplane for Installation”](#) on page 45
- [“Inspecting the Line Cards for Installation”](#) on page 55
- [“Inspecting the InfiniBand Cables for Installation”](#) on page 61

▼ Identify the Fabric Cards for Installation

1. Identify the prerequisite and subsequent tasks you must perform in conjunction with this procedure, to install the switch.

See the table in [“Installation Sequence”](#) on page 20.

2. Use the following illustration to identify the various features of a fabric card.

FIGURE: Fabric Card Features

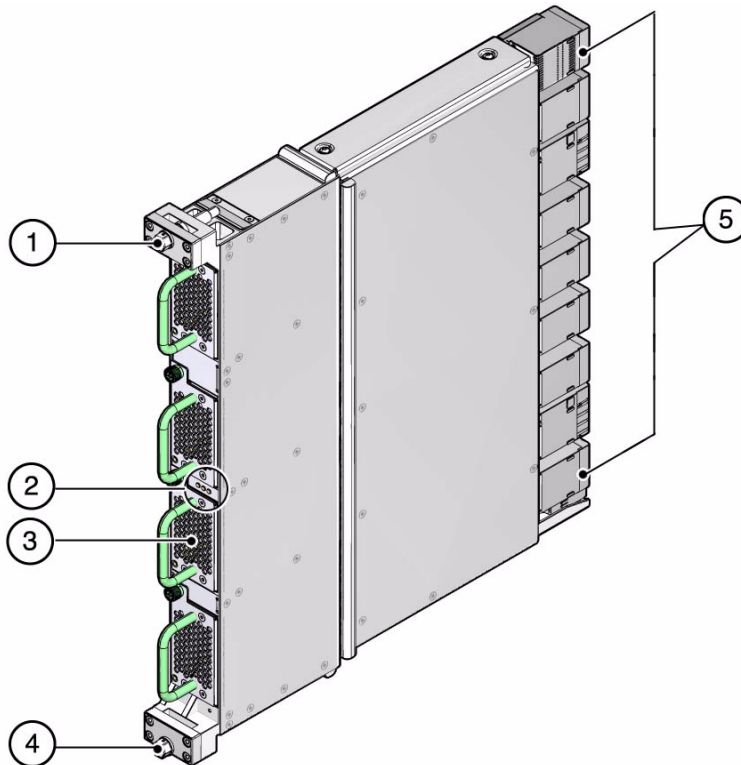


Figure Legend

1	Upper retainer bolt
2	Status LEDs
3	Fans
4	Lower retainer bolt
5	XBOX connectors

3. Inspect the fabric cards.

See [“Inspect the Fabric Card Chassis for Installation”](#) on page 53.

Related Information

- [“Identify the Line Cards for Installation” on page 56](#)
- [“Identify the InfiniBand Cable for Installation” on page 61](#)

▼ **Inspect the Fabric Card Chassis for Installation**

1. **Identify the prerequisite and subsequent tasks you must perform in conjunction with this procedure, to install the switch.**

See the table in [“Installation Sequence” on page 20](#).

2. **Unwrap the replacement fabric card from its antistatic packaging.**
3. **Verify that there is no visible damage to the fabric card chassis.**
4. **Inspect the fabric card retainer bolts.**

See [“Inspect the Fabric Card Retainer Bolts for Installation” on page 53](#).

Related Information

- [“Inspect the Line Card Chassis for Installation” on page 58](#)
- [“Inspect the InfiniBand Cable Hardware for Installation” on page 62](#)

▼ **Inspect the Fabric Card Retainer Bolts for Installation**

The two retainer bolts on the fabric card serve three purposes:

- Align the fabric card for proper insertion into the chassis.
- Allow final insertion of the fabric card into the chassis and simplify the physical connection of the fabric card connectors to the midplane connectors.
- Allow extraction of the fabric card from the chassis and simplify the physical disconnection of the fabric card connectors from the midplane connectors.

1. **Identify the prerequisite and subsequent tasks you must perform in conjunction with this procedure, to install the switch.**

See the table in [“Installation Sequence” on page 20](#).

2. **Ensure that the retainer bolts look finished, are clean, rotate smoothly, do not bind, or do not feel loose or sloppy in any way.**
3. **Inspect the fans.**

See [“Inspect the Fans for Installation” on page 54](#).

Related Information

- [“Inspect the Line Card Retainer Bolts for Installation” on page 58](#)

▼ Inspect the Fans for Installation

The fans of the fabric card are FRU components. The fans secure in position with a thumbscrew.

- 1. Identify the prerequisite and subsequent tasks you must perform in conjunction with this procedure, to install the switch.**

See the table in [“Installation Sequence” on page 20.](#)

- 2. Ensure that each fan is seated properly in the fabric card.**
- 3. Ensure that the thumbscrew is tight on each fan.**
- 4. Inspect the fabric card XBOW connectors.**

See [“Inspect the Fabric Card XBOW Connectors for Installation” on page 54.](#)

▼ Inspect the Fabric Card XBOW Connectors for Installation

The XBOW connectors on fabric cards are the receptacles for the midplane connector pins. These connectors are checked as meticulously as the midplane connector pins. You must verify that no connectors are damaged and no holes are blocked.

You need the following tools:

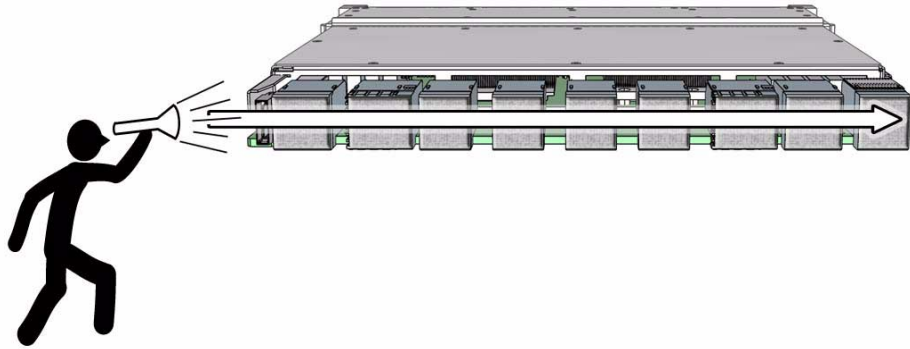
- Flashlight
- Magnifying glass

- 1. Identify the prerequisite and subsequent tasks you must perform in conjunction with this procedure, to install the switch.**

See the table in [“Installation Sequence” on page 20.](#)

- 2. Place the fabric card on a work surface with the XBOW connectors facing you.**
- 3. Using the flashlight positioned to the side and above you, look at the holes of the left-end connector.**

Look at the holes straight on.



Note – Do not look at the individual holes, rather look at all of the connector’s holes as a group. A damaged or contaminated hole will be apparent.

4. Look for any closed-over or contaminated holes.

A closed-over or contaminated hole appears brighter than the surrounding holes.

5. Look for any enlarged or cracked holes.

An enlarged or cracked hole appears darker than the surrounding holes.

6. Move your head slightly right to the next connector, and inspect its holes, repeating [Step 4](#) and [Step 5](#).

7. Continue in this manner for each connector until you reach the right side of the fabric card.

8. Repeat [Step 2](#) through [Step 7](#) for all fabric cards and fabric card fillers.

9. Inspect the line cards.

See “[Identify the Line Cards for Installation](#)” on page 56.

Related Information

- “[Inspect the Line Card XBOW Connectors for Installation](#)” on page 59
- “[Inspect the Pins on the Rear Side of the Midplane](#)” on page 47
- “[Suggested Tools for Installation](#)” on page 19

Inspecting the Line Cards for Installation

Before installing the line cards, verify that they are suitable for installation. Perform the tasks in the following order:

Note – You must perform these inspection tasks on all line cards to be installed.

Step	Description	Links
1.	Identify the line card.	“Identify the Line Cards for Installation” on page 56
2.	Inspect the line card chassis.	“Inspect the Line Card Chassis for Installation” on page 58
3.	Inspect the line card retainer bolts.	“Inspect the Line Card Retainer Bolts for Installation” on page 58
4.	Inspect the line card XBOW connectors.	“Inspect the Line Card XBOW Connectors for Installation” on page 59
5.	Inspect the line card CXP connectors.	“Inspect the Line Card CXP Connectors for Installation” on page 60

Related Information

- *Switch Service*, inspecting line cards
- [“Inspecting the Midplane for Installation” on page 45](#)
- [“Inspecting the Fabric Cards for Installation” on page 51](#)
- [“Inspecting the InfiniBand Cables for Installation” on page 61](#)

▼ Identify the Line Cards for Installation

1. **Identify the prerequisite and subsequent tasks you must perform in conjunction with this procedure, to install the switch.**

See the table in [“Installation Sequence” on page 20](#).

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

FIGURE: Line Card Features

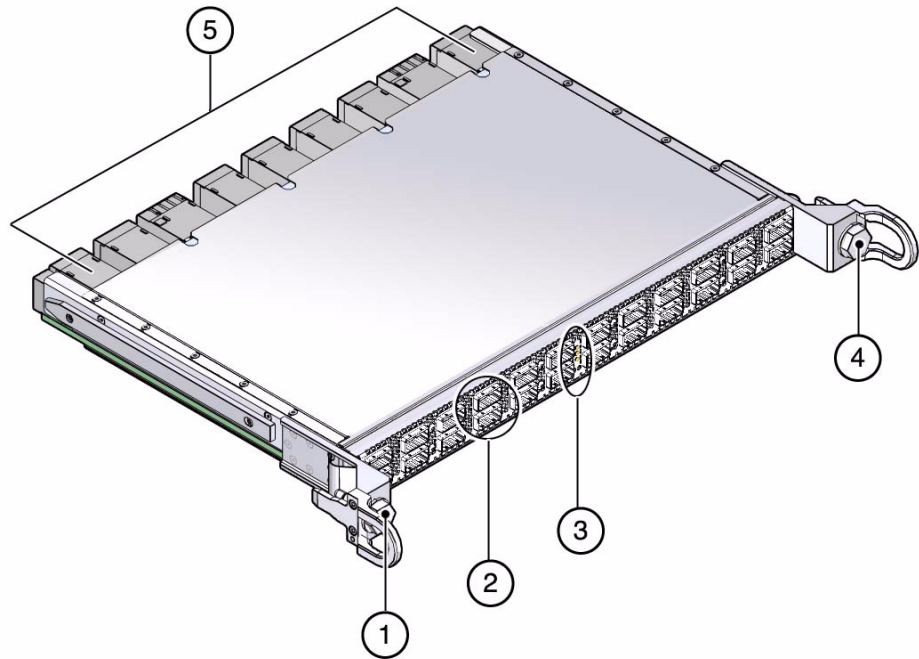


Figure Legend

1	Left retainer bolt
2	CXP connectors
3	Status LEDs
4	Right retainer bolt
5	XBOW connectors

3. Inspect the line cards.

See [“Inspect the Line Card Chassis for Installation”](#) on page 58.

Related Information

- [“Identify the Fabric Cards for Installation”](#) on page 52
- [“Identify the InfiniBand Cable for Installation”](#) on page 61

▼ Inspect the Line Card Chassis for Installation

1. **Identify the prerequisite and subsequent tasks you must perform in conjunction with this procedure, to install the switch.**

See the table in [“Installation Sequence” on page 20](#).

2. **Unwrap the replacement line card from its antistatic packaging.**
3. **Verify that there is no visible damage to the line card chassis.**
4. **Inspect the line card retainer bolts.**

See [“Inspect the Line Card Retainer Bolts for Installation” on page 58](#).

Related Information

- [“Inspect the Fabric Card Chassis for Installation” on page 53](#)
- [“Inspect the InfiniBand Cable Hardware for Installation” on page 62](#)

▼ Inspect the Line Card Retainer Bolts for Installation

The two retainer bolts on the line card serve three purposes:

- Align the line card for proper insertion into the chassis.
- Allow final insertion of the line card into the chassis and simplify the physical connection of the line card connectors to the midplane connectors.
- Allow extraction of the line card from the chassis and simplify the physical disconnection of the line card connectors from the midplane connectors.

1. **Identify the prerequisite and subsequent tasks you must perform in conjunction with this procedure, to install the switch.**

See the table in [“Installation Sequence” on page 20](#).

2. **Ensure that the retainer bolts look finished, are clean, rotate smoothly, do not bind, or do not feel loose or sloppy in any way.**
3. **Inspect the line card XBOW connectors.**

See [“Inspect the Line Card XBOW Connectors for Installation” on page 59](#).

Related Information

- [“Inspect the Fabric Card Retainer Bolts for Installation” on page 53](#)

▼ Inspect the Line Card XBOW Connectors for Installation

The XBOW connectors on line cards are the receptacles for the midplane connector pins. These connectors are checked as meticulously as the midplane connector pins. You must verify that no connectors are damaged and no holes are blocked.

You need the following tools:

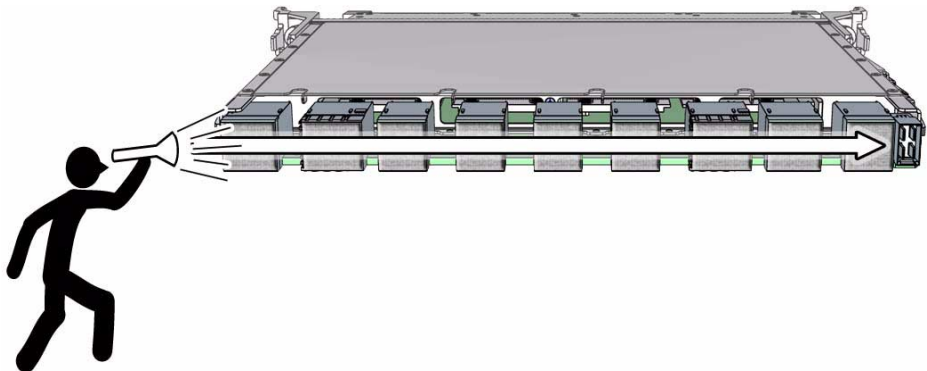
- Flashlight
- Magnifying glass

1. **Identify the prerequisite and subsequent tasks you must perform in conjunction with this procedure, to install the switch.**

See the table in [“Installation Sequence”](#) on page 20.

2. **Place the line card on a work surface with the XBOW connectors facing you.**
3. **Using the flashlight positioned to the side and above you, look at the holes of the left-end connector.**

Look at the holes straight on.



Note – Do not look at the individual holes, rather look at all of the connector’s holes as a group. A damaged or contaminated hole will be apparent.

4. **Look for any closed-over or contaminated holes.**

A closed-over or contaminated hole appears brighter than the surrounding holes.

5. **Look for any enlarged or cracked holes.**

An enlarged or cracked hole appears darker than the surrounding holes.

6. **Move your head slightly right to the next connector, and inspect its pins, repeating [Step 4](#) and [Step 5](#).**

7. Continue in this manner for each connector until you reach the right side of the fabric card.

8. Repeat [Step 2](#) through [Step 7](#) for all line cards to be installed.

9. Inspect the CXP connectors.

See [“Inspect the Line Card CXP Connectors for Installation”](#) on page 60.

Related Information

- [“Inspect the Fabric Card XBOW Connectors for Installation”](#) on page 54
- [“Inspect the Pins on the Front Side of the Midplane”](#) on page 50
- [“Suggested Tools for Installation”](#) on page 19

▼ Inspect the Line Card CXP Connectors for Installation

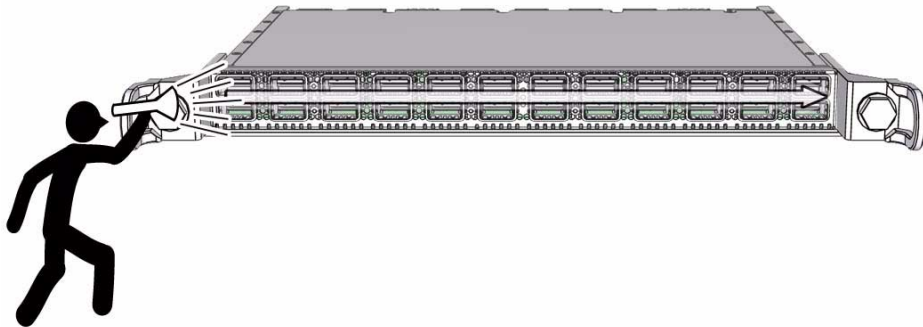
The small CXP connectors on the line card are for the InfiniBand cables. These connectors are much simpler and more robust than XBOW connectors, so inspection is much easier.

1. Identify the prerequisite and subsequent tasks you must perform in conjunction with this procedure, to install the switch.

See the table in [“Installation Sequence”](#) on page 20.

2. Check the small connectors for any debris, or cracked or bent fittings.

Most debris can be blown out. If you find a cracked or bent connector, contact your Sun Service representative.



3. Inspect the InfiniBand cables.

See [“Inspecting the InfiniBand Cables for Installation”](#) on page 61.

Related Information

- [“Inspect the InfiniBand Cable Connectors for Installation”](#) on page 63

Inspecting the InfiniBand Cables for Installation

Before installing the InfiniBand cables, verify that they are suitable for installation. Perform the tasks in the following order:

Step	Description	Links
1.	Identify the InfiniBand cables.	“Identify the InfiniBand Cable for Installation” on page 61
2.	Inspect the InfiniBand cable hardware.	“Inspect the InfiniBand Cable Hardware for Installation” on page 62
3.	Inspect the InfiniBand cable connectors.	“Inspect the InfiniBand Cable Connectors for Installation” on page 63

Related Information

- [“Inspecting the Midplane for Installation” on page 45](#)
- [“Inspecting the Fabric Cards for Installation” on page 51](#)
- [“Inspecting the Line Cards for Installation” on page 55](#)

▼ Identify the InfiniBand Cable for Installation

1. **Identify the prerequisite and subsequent tasks you must perform in conjunction with this procedure, to install the switch.**
See the table in [“Installation Sequence” on page 20](#).
2. **Use the following illustration to identify the various features of an InfiniBand cable.**

FIGURE: InfiniBand Cable Features

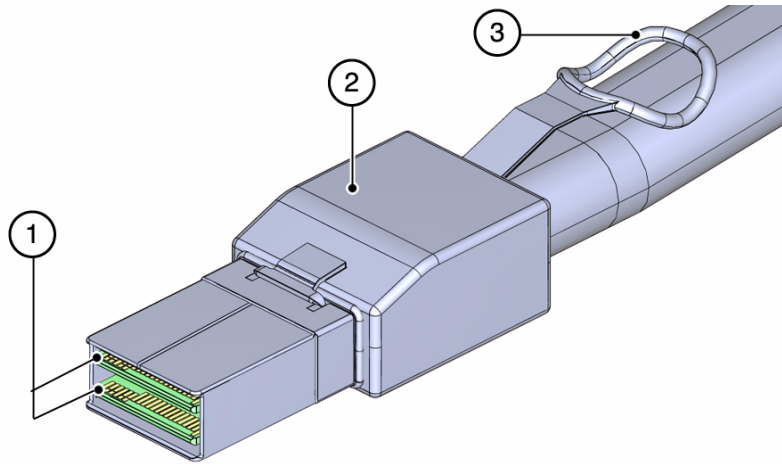


Figure Legend

1	Paddle boards
2	Shield
3	Retraction strap

3. Inspect the InfiniBand cables.

See [“Inspect the InfiniBand Cable Hardware for Installation”](#) on page 62.

Related Information

- [“Identify the Fabric Cards for Installation”](#) on page 52
- [“Identify the Line Cards for Installation”](#) on page 56

▼ Inspect the InfiniBand Cable Hardware for Installation

1. Identify the prerequisite and subsequent tasks you must perform in conjunction with this procedure, to install the switch.

See the table in [“Installation Sequence”](#) on page 20.

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 for Installation”](#) on page 63.

Related Information

- [“Inspect the Fabric Card Chassis for Installation” on page 53](#)
- [“Inspect the Line Card Chassis for Installation” on page 58](#)

▼ Inspect the InfiniBand Cable Connectors for Installation

1. **Identify the prerequisite and subsequent tasks you must perform in conjunction with this procedure, to install the switch.**

See the table in [“Installation Sequence” on page 20](#).

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. **Install the components.**

See [“Install the Midplane Stiffener” on page 64](#).

Related Information

- [“Inspect the Line Card CXP Connectors for Installation” on page 60](#)

Installing the Components

After inspecting the components, perform these task in the following order to install the components into the switch chassis:

Step	Description	Links
1.	Install the midplane stiffener.	“Install the Midplane Stiffener” on page 64
2.	Install the fabric cards or fabric card fillers.	“Install the Fabric Cards or Fabric Card Fillers” on page 67
3.	Remove the midplane stiffener.	“Remove the Midplane Stiffener” on page 70
4.	Install the line cards or line card fillers.	“Install the Line Cards or Line Card Fillers” on page 72

Related Information

- [“Understanding the Installation” on page 15](#)
- [“Powering On the Fabric Cards” on page 92](#)
- [“Powering On the Line Cards” on page 101](#)

▼ Install the Midplane Stiffener



Caution – The midplane stiffener must be installed before the fabric cards are installed.

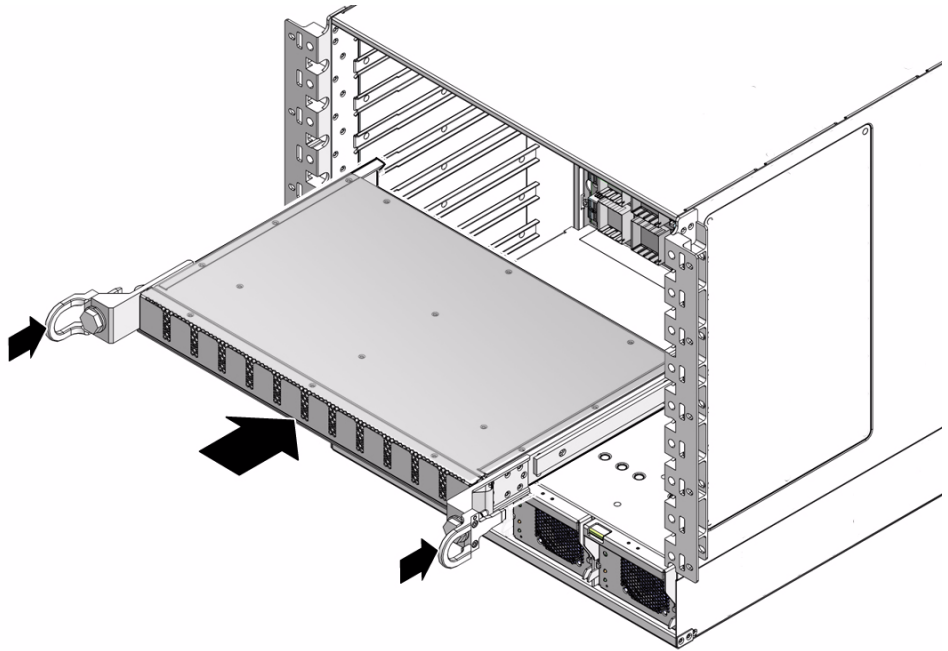
Note – To prevent damage to the pins of the midplane connectors, carefully align the stiffener with the midplane crossbar.

1. **Identify the prerequisite and subsequent tasks you must perform in conjunction with this procedure, to install the switch.**

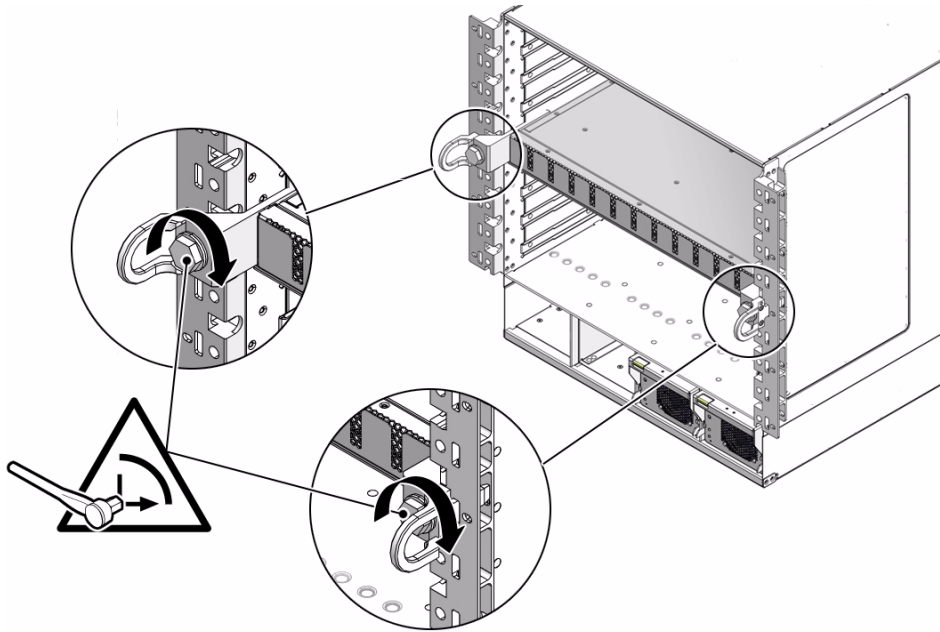
See the table in [“Installation Sequence” on page 20](#).

2. **Lift the midplane stiffener from the work surface and insert the stiffener into the chassis center at slot 4.**

Ensure that the stiffener is perpendicular to the surface of the midplane.



3. Continue to slide the midplane stiffener in until it stops.
4. While pressing the midplane stiffener in with one hand, rotate the retainer bolts clockwise by hand so that they engage.
When you feel resistance in the retainer bolts, stop.
5. Using a 20 mm socket and ratchet, turn the left retainer bolt 1/4 turn clockwise.



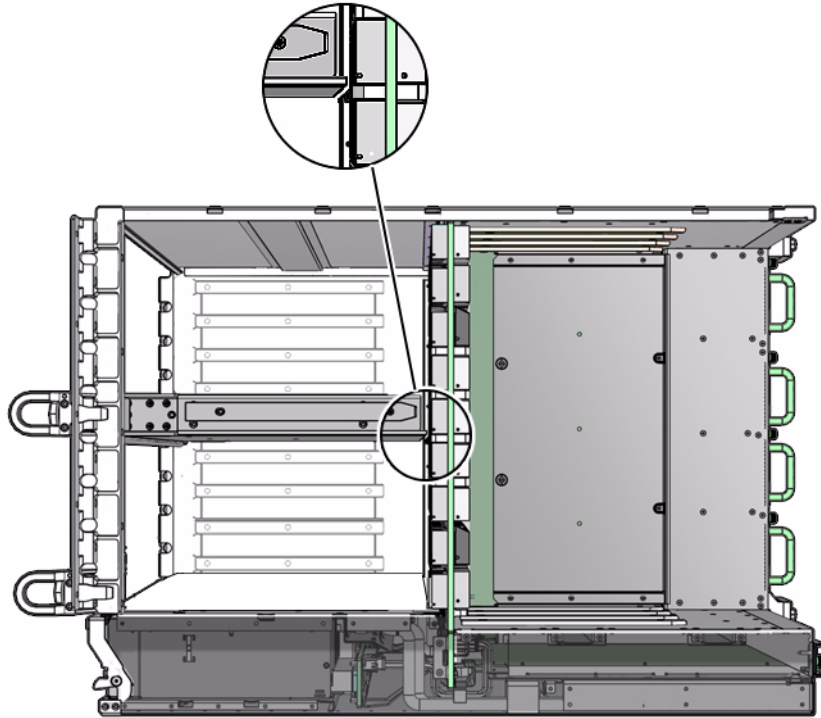
6. Turn the right retainer bolt 1/4 turn clockwise.



Caution – Do not turn the retainer bolts more than 1/4 revolution each time. Turning more than 1/4 turn damages the midplane stiffener and midplane XBOW connectors.

7. Repeat [Step 5](#) and [Step 6](#) until you feel resistance to turning.

8. Verify that the end of the midplane stiffener properly contacts the midplane crossbar.



9. Give each retainer bolt a final torque of 2.0 ft-lb (0.27 kg-m) so that it is snug.
10. Install the fabric cards.
See [“Install the Fabric Cards or Fabric Card Fillers”](#) on page 67.

Related Information

- [“Remove the Midplane Stiffener”](#) on page 70
- [“Inspect the Pins on the Front Side of the Midplane”](#) on page 50
- [“Suggested Tools for Installation”](#) on page 19

▼ Install the Fabric Cards or Fabric Card Fillers

Note – Installing a fabric card or a fabric card filler is the same task.



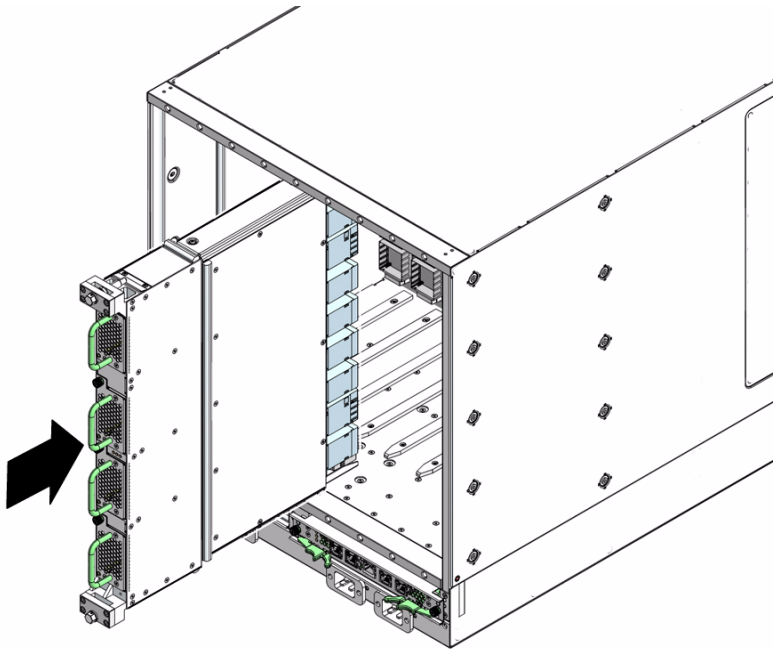
Caution – Installing the fabric card is a methodical task and cannot be rushed. To prevent damage to the fabric card or the midplane XBOW connectors, pay close attention to the procedure and work slowly.

1. Identify the prerequisite and subsequent tasks you must perform in conjunction with this procedure, to install the switch.

See the table in [“Installation Sequence”](#) on page 20.

2. Lift the fabric card from the work surface and orient it vertically, with the wide rail at the top and the narrow rail at the bottom.
3. Insert the fabric card into the chassis at the vacant slot.

Ensure that the fabric card is vertical.



Note – Once the fabric card is about halfway into the slot, it is no longer necessary to bear the weight of the fabric card.

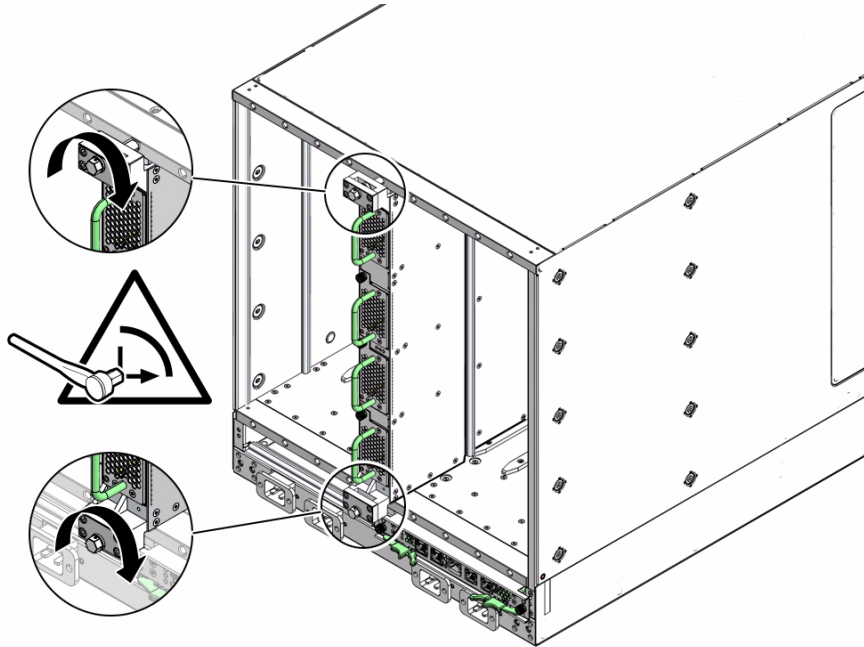
4. Continue to slide the fabric card in, maintaining a vertical orientation.

When you feel resistance, stop.

5. While pressing the fabric card in with one hand, rotate the retainer bolts clockwise by hand so that they engage.

When you feel resistance in the retainer bolts, stop.

6. Using a 10 mm socket and ratchet, turn the lower retainer bolt 1/4 turn clockwise.



7. Turn the upper retainer bolt 1/4 turn clockwise.



Caution – Do not turn the retainer bolts more than 1/4 revolution each time. Turning more than 1/4 turn damages the fabric card and midplane XBOW connectors.

8. Repeat [Step 6](#) and [Step 7](#) about 12 times until you feel resistance to turning and the fabric card is flush to the rear of the chassis.
9. Give each retainer bolt a torque of 2.0 ft-lb (0.27 kg-m).
10. Turn the lower retainer bolt 1/4 turn *counter*-clockwise.
11. Turn the upper retainer bolt 1/4 turn *counter*-clockwise.
12. Repeat [Step 10](#) and [Step 11](#) twice to relieve board deflection.
13. Verify that the fabric card is properly seated in the slot.

- 14. Repeat [Step 2](#) through [Step 13](#) for each fabric card to be installed.**

Install the cards into the following slots in the given sequence:

0, 1, 8, 7, 6, 2, 3, 5, 4

- 15. Repeat [Step 2](#) through [Step 13](#) for each fabric card filler, installing the fillers into the vacant slots.**

- 16. Remove the midplane stiffener.**

See [“Remove the Midplane Stiffener”](#) on page 70.

Related Information

- *Switch Service*, servicing fabric cards
- [“Fabric Card Distribution”](#) on page 17
- [“Install the Midplane Stiffener”](#) on page 64
- [“Suggested Tools for Installation”](#) on page 19

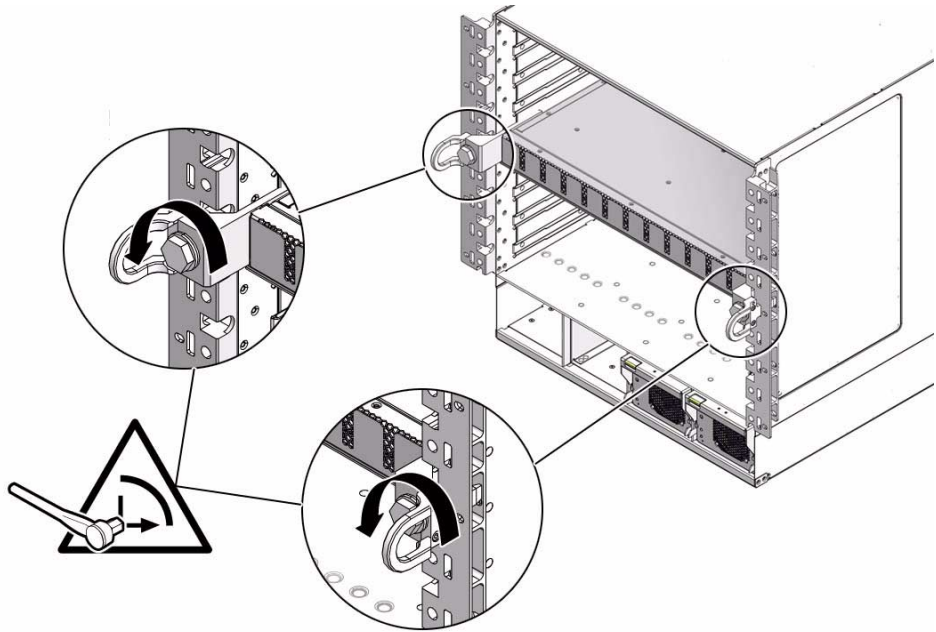
▼ Remove the Midplane Stiffener

You must remove the midplane stiffener before installing the line cards.

- 1. Identify the prerequisite and subsequent tasks you must perform in conjunction with this procedure, to install the switch.**

See the table in [“Installation Sequence”](#) on page 20.

- 2. Using a 20 mm socket and ratchet, turn the left retainer bolt 1/4 turn counter-clockwise.**

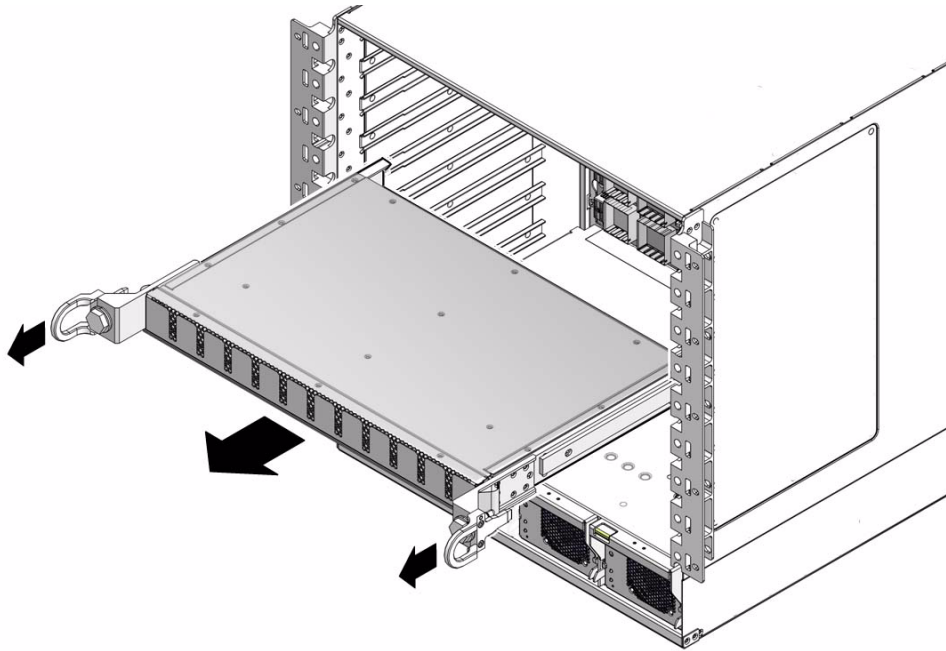


3. Turn the right retainer bolt 1/4 turn counter-clockwise.



Caution – Do not turn the retainer bolts more than 1/4 revolution each time. Turning more than 1/4 turn damages the midplane stiffener and midplane XBOW connectors.

4. Repeat [Step 2](#) and [Step 3](#) until you feel very little resistance to turning and the midplane stiffener is extended approximately 10 mm (1/2 in.) from the front of the chassis.
5. Grasp the handles at both ends of the midplane stiffener and slowly pull it from the chassis.



6. Set the midplane stiffener aside.

7. Install the line cards.

See [“Install the Line Cards or Line Card Fillers”](#) on page 72.

Related Information

- [“Install the Fabric Cards or Fabric Card Fillers”](#) on page 67
- [“Install the Midplane Stiffener”](#) on page 64
- [“Suggested Tools for Installation”](#) on page 19

▼ Install the Line Cards or Line Card Fillers



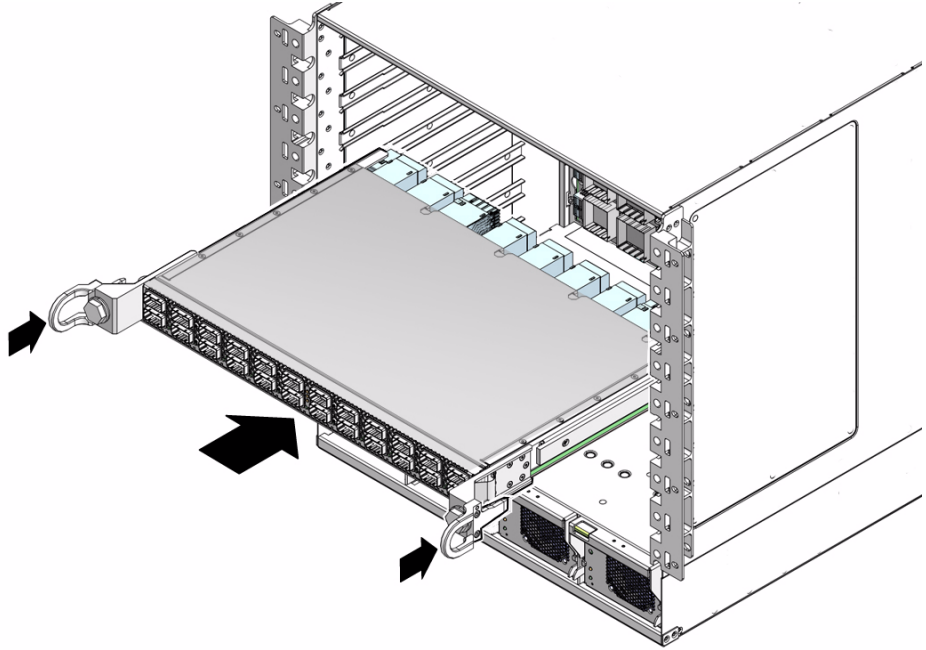
Caution – Installing the line card is a methodical task and cannot be rushed. To prevent damage to the line card or the midplane XBOW connectors, pay close attention to the procedure and work slowly.

1. Identify the prerequisite and subsequent tasks you must perform in conjunction with this procedure, to install the switch.

See the table in [“Installation Sequence”](#) on page 20.

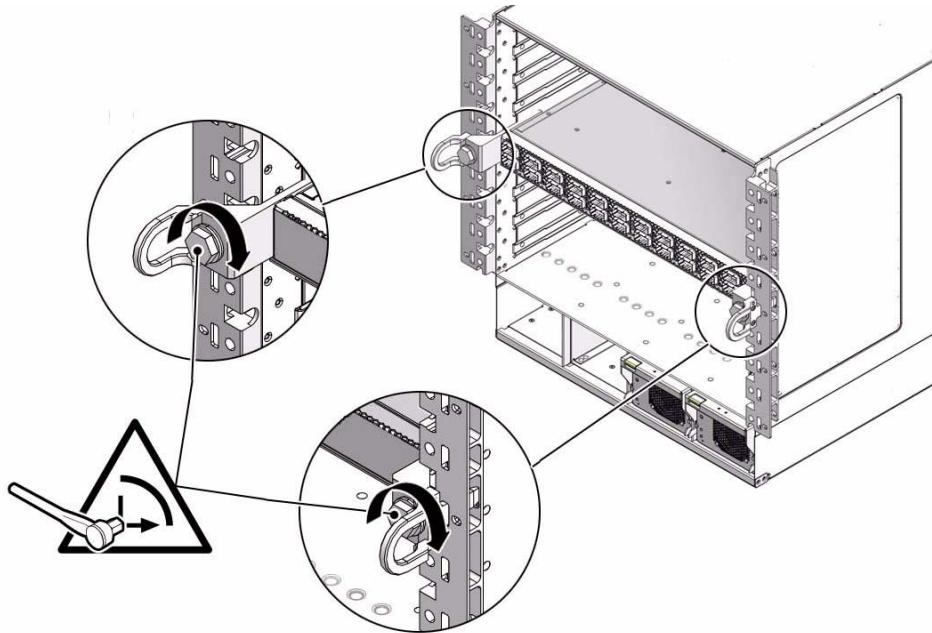
2. Lift the line card from the work surface and orient it horizontally, with the link LEDs across the bottom.
3. Insert the line card into the chassis at slot 0.

Ensure that the line card is square to the chassis and not skewed.



Note – Once the line card is about halfway into the slot, it is no longer necessary to bear the weight of the line card.

4. Continue to slide the line card in, maintaining a squared orientation.
When you feel resistance, stop.
5. While pressing the line card in with one hand, rotate the retainer bolts clockwise by hand so that they engage.
When you feel resistance in the retainer bolts, stop.
6. Using a 20 mm socket and ratchet, turn the left retainer bolt 1/4 turn clockwise.



7. Turn the right retainer bolt 1/4 turn clockwise.



Caution – Do not turn the retainer bolts more than 1/4 revolution each time. Turning more than 1/4 turn damages the line card and midplane XBOW connectors.

8. Repeat [Step 6](#) and [Step 7](#) about 12 times until you feel resistance to turning and the line card is flush to the front of the chassis.
9. Give each retainer bolt a torque of 2.0 ft-lb (0.27 kg-m).
10. Turn the left retainer bolt 1/4 turn *counter-clockwise*.
11. Turn the right retainer bolt 1/4 turn *counter-clockwise*.
12. Repeat [Step 10](#) and [Step 11](#) twice to relieve board deflection.
13. Verify that the line card is properly seated in the slot.
14. Repeat [Step 2](#) through [Step 13](#) for each line card to be installed.
Install the cards into the following slots in the following sequence:
0, 1, 2, 3, 4, 5, 6, 7, 8
15. Install the line card fillers into the vacant slots.

- a. Grasp the handles at each end of the line card filler and lift the filler to the vacant slot.
 - b. Slide the filler into the chassis until it stops.
 - c. While pressing the filler in with one hand, rotate the retainer bolts clockwise by hand so that they engage.
When you feel resistance in the retainer bolts, stop.
 - d. Repeat [Step a](#) through [Step c](#) for all remaining vacant slots.
16. Power on the CMCs.
- See [“Powering On the CMCs”](#) on page 75.

Related Information

- *Switch Service*, servicing line cards
- [“Line Card Distribution”](#) on page 17
- [“Remove the Midplane Stiffener”](#) on page 70
- [“Suggested Tools for Installation”](#) on page 19

Powering On the CMCs

After installing the components, enable powering up of the switch by performing these tasks in the following order:

Step	Description	Links
1.	Attach the management cables.	“Attach the Management Cables” on page 76
2.	Attach the power cords.	“Attach the Power Cords” on page 78
3.	Check the power supply status LEDs.	“Check the Power Supply Status LEDs” on page 80
4.	Check the CMC status LEDs.	“Check the CMC Status LEDs” on page 80
5.	Access the CMC.	“Accessing the CMC” on page 81
6.	Verify the CMC status.	“Verify the CMC Status” on page 86
7.	Identify the CMC addresses.	“Identify the CMC Addresses” on page 87
8.	Display the CMC FRU ID information.	“Display the CMC FRU ID Information” on page 88

Step	Description	Links
9.	Verify the power supply status.	“Verify the Power Supply Status” on page 89
10.	Identify the power supply addresses.	“Identify the Power Supply Addresses” on page 90
11.	Display the power supply FRU ID information.	“Display the Power Supply FRU ID Information” on page 91

Related Information

- [“Understanding the Installation” on page 15](#)
- [“Powering On the Fabric Cards” on page 92](#)
- [“Powering On the Line Cards” on page 101](#)

▼ Attach the Management Cables

Each CMC has 3 RJ-45 connectors for serial management, debug, and network management.

The serial management connector, labeled SER MGT, is the initial interface from the management console to the CMC. The management console can be a serial terminal, a system running a TIP connection, or other serial device. Once communication with the CMC is established, the CMC can be configured to use the network management connector, labeled NET MGT.

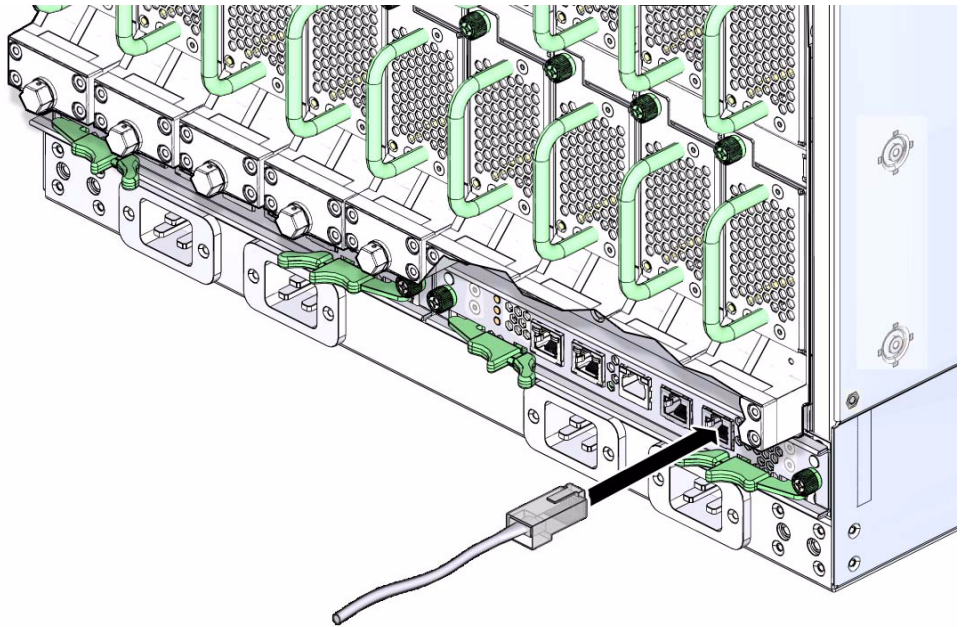
The NET MGT connector is a 100 BASE-T Ethernet interface and is preferred because it permits remote management of the CMC over the network. To have the same functionality with the SER MGT connector, a terminal server would need to be configured.

The debug connector permits low speed serial direct access to the IPMB controllers of each fabric card and line card.

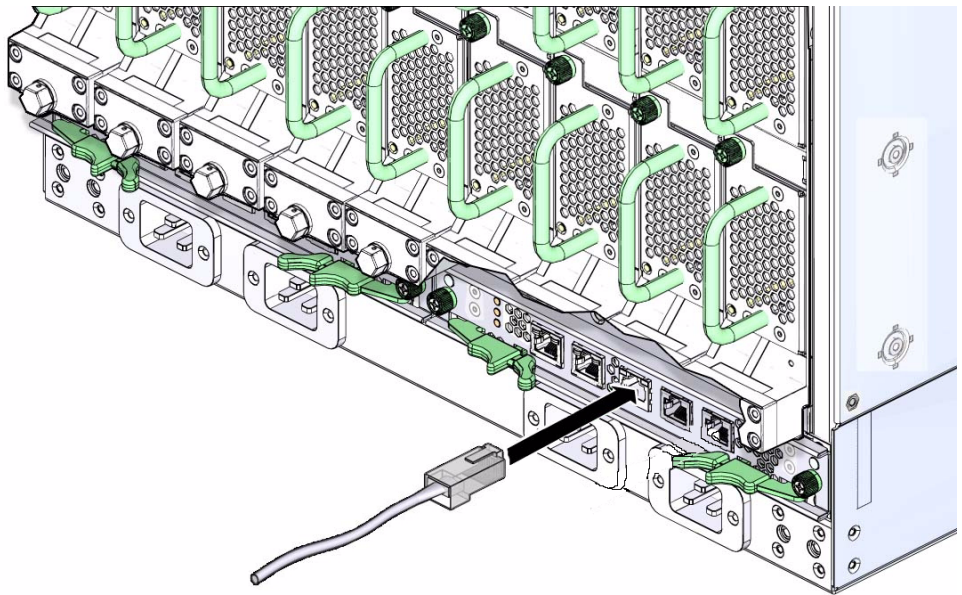
1. Identify the prerequisite and subsequent tasks you must perform in conjunction with this procedure, to install the switch.

See the table in [“Installation Sequence” on page 20](#).

2. Connect the serial management cables from the management console to the connectors labeled SER MGT.



3. (Optional) Connect the network management cables from the management console to the connectors labeled NET MGT.



4. Ready the management console for communication with the CMCs.

5. Power on the CMCs.

See [“Attach the Power Cords”](#) on page 78.

Related Information

- [“Management Cable Requirements”](#) on page 9
- [“Serial Management Connector and Pins”](#) on page 5
- [“Network Management Connector and Pins”](#) on page 4
- [“Attach Cables to the CXP Connectors”](#) on page 109

▼ 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.

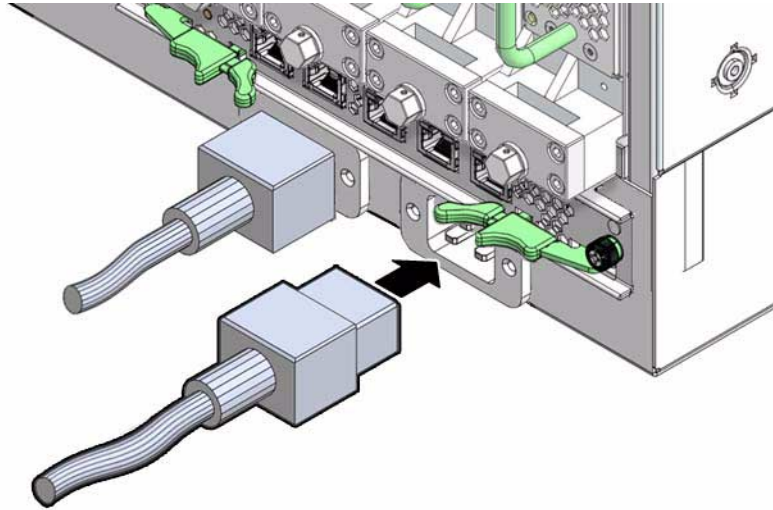
When live power is delivered to the receptacles at the rear of the chassis, standby and 12 volt power is made available by the power supplies. When standby power is distributed to the chassis, the CMCs are powered on. The 12 volt power is supplied for the fabric cards and line cards.

1. Identify the prerequisite and subsequent tasks you must perform in conjunction with this procedure, to install the switch.

See the table in [“Installation Sequence”](#) on page 20.

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

3. Plug a power cord into each power receptacle at the rear 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 indicate normal operation.**
The OK LED should be lit and the Attention LED should be unlit. See [“Check the Power Supply Status LEDs” on page 80](#).

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

Related Information



- [“Power Cord Requirements” on page 8](#)
- [“Electrical Specifications” on page 3](#)
- [“Attach the Management Cables” on page 76](#)
- [“Attach Cables to the CXP Connectors” on page 109](#)

▼ Check the Power Supply Status LEDs

1. Identify the prerequisite and subsequent tasks you must perform in conjunction with this procedure, to install the switch.

See the table in [“Installation Sequence” on page 20](#).

2. Visually inspect the power supply status LEDs.
3. Compare what you see to the following table.

Glyph	Name	Color	State and Meaning
	OK	Green	On – Power supply enabled, 12 VDC is supplied. Off – No input voltage. Flashing – Power supply disabled, 12 VDC is not supplied.
	Attention	Amber	On – Fault detected, 12 VDC shut down. Off – Normal operation. Flashing – No function.

4. Verify the CMC status LEDs indicate a normal start up.

The OK LED should be lit and the Attention LED should be unlit. See [“Check the CMC Status LEDs” on page 80](#).

Related Information

- *Switch Administration*, checking status LEDs
- [“Check the CMC Status LEDs” on page 80](#)
- [“Check the Fabric Card Status LEDs” on page 96](#)
- [“Check the Line Card Status LEDs” on page 103](#)
- [“Check the CXP Connector Status LEDs” on page 115](#)




▼ Check the CMC Status LEDs

1. Identify the prerequisite and subsequent tasks you must perform in conjunction with this procedure, to install the switch.

See the table in [“Installation Sequence” on page 20](#).

2. Visually inspect the CMC status LEDs.

3. Compare what you see to the following table:

Glyph	Name	Color	State and Meaning
	OK	Green	On – CMC is operating normally. Off – No power is being supplied to the CMC. Flashing – CMC is inactive status as the backup CMC.
	Attention	Amber	On – A fault or critical error has been detected. Off – Normal operation. Flashing – No function.
	Ready-to-Remove	Blue	On – CMC has been deactivated and is ready to be removed. Off – Do not remove. Flashing – No function.

4. Access the CMC and configure the `uboot` parameters.

See [“Access the CMC From the Serial Management Port” on page 82.](#)

Related Information

- *Switch Administration*, checking status LEDs
- [“Check the Power Supply Status LEDs” on page 80](#)
- [“Check the Fabric Card Status LEDs” on page 96](#)
- [“Check the Line Card Status LEDs” on page 103](#)
- [“Check the CXP Connector Status LEDs” on page 115](#)

Accessing the CMC

With power applied, you can now access the CMCs by performing these tasks in the following order.

Step	Description	Links
1.	Access the CMC from the serial management port.	“Access the CMC From the Serial Management Port” on page 82
2.	Set the initial <code>uboot</code> parameters.	“Set the Initial UBoot Parameters” on page 83
3.	Access the CMC from the network management port.	“Access the CMC From the Network Management Port” on page 84

Related Information

- “Management Cable Requirements” on page 9
- “Serial Management Connector and Pins” on page 5
- “Network Management Connector and Pins” on page 4
- “Attach the Management Cables” on page 76
- “Attach the Power Cords” on page 78

▼ Access the CMC From the Serial Management Port

1. **Identify the prerequisite and subsequent tasks you must perform in conjunction with this procedure, to install the switch.**

See the table in “Installation Sequence” on page 20.

2. **If you have not already done so, connect a serial terminal, terminal server, or workstation with a TIP connection to the serial management port of the CMC.**

Configure the terminal or terminal emulator with these settings:

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

3. **Press the Return or Enter key several times to synchronize the connection.**

You might see text similar to the following:

```
shmm1500 login:
```

If you do not see the text, still progress to [Step 4](#)

4. **Type `root` for the login name followed by the `root` password.**

```
shmm1500 login: root
Password: password
#
```

The # prompt is displayed.

Note – As shipped, the `root` password is not set and therefore not required. Press the Enter or Return key when prompted for the password. Refer to the *Sun Datacenter InfiniBand Switch 648 Administration Guide* for instructions on how to set the `root` password.

5. **Set the initial `uboot` parameters.**

See “Set the Initial UBoot Parameters” on page 83.

Related Information

- “Access the CMC From the Network Management Port” on page 84
- “Management Cable Requirements” on page 9
- “Serial Management Connector and Pins” on page 5

▼ Set the Initial UBoot Parameters

During startup, the CMC reads the `uboot` parameters to configure the CMC’s behavior. This procedure configures the more common parameters for a consistent user experience.

1. **Identify the prerequisite and subsequent tasks you must perform in conjunction with this procedure, to install the switch.**

See the table in “Installation Sequence” on page 20.

2. **Invoke a reboot of the CMC:**

```
# reboot
```

The CMC reboots.

3. **When you see the following output, press any key to stop the boot process:**

```
hit any key to stop autoboot
```

4. **Use the `setenv` command to set the respective parameters:**

```
shmm1500 setenv m9_autostart y
shmm1500 setenv rc_ifconfig y
shmm1500 setenv start_rc2_daemons y
shmm1500 setenv rc2 /etc/rc.sun_m9
shmm1500 setenv start_mcm y
```

5. Verify the parameters have been properly set:

```
shmm1500 printenv
```

6. Save the parameters and boot the CMC:

```
shmm1500 saveenv  
shmm1500 boot
```

7. Consider your next step:

- (Optional) Configure the network management port to enable switch management over the Ethernet network.
See [“Access the CMC From the Network Management Port” on page 84.](#)
- Verify the CMC status.
See [“Verify the CMC Status” on page 86.](#)

Related Information

- [“Access the CMC From the Serial Management Port” on page 82](#)

▼ Access the CMC From the Network Management Port

To access the CMC using the Ethernet network, you must first configure the network management port through the serial management port. See [“Access the CMC From the Serial Management Port” on page 82.](#) You must also have set the initial uboot parameters. See [“Set the Initial UBoot Parameters” on page 83.](#)

You can set network parameters according to the specific details of your network configuration using the `clia setlanconfig` command.

Note – The following procedure makes changes that do not require a reset or reboot.

1. Identify the prerequisite and subsequent tasks you must perform in conjunction with this procedure, to install the switch.

See the table in [“Installation Sequence” on page 20.](#)

2. Set the IP address for the CMC:

```
# clia setlanconfig 1 3 IP_address
```

where *IP_address* is in the form of *xxx.xxx.xxx.xxx*.

3. Set the netmask for the CMC:

```
# clia setlanconfig 1 6 netmask
```

where *netmask* is the netmask. Typically, the netmask is 255.255.255.0. However, your network environment subnet might require a different netmask. Use a netmask number most appropriate to your environment.

4. Set the IP address for the CMC gateway:

```
# clia setlanconfig 1 12 gateway_IP_address
```

where *gateway_IP_address* is in the form of *xxx.xxx.xxx.xxx*.

5. Open a Telnet session and connect to the CMC by specifying the CMC's network address.

For example:

```
% telnet 123.45.67.89  
Trying 123.45.67.89...  
Connected to 123.45.67.89.  
Escape character is '^]'.  
  
shmm1500 login:
```

6. Login as root using the root password.

```
shmm1500 login: root  
Password: password  
#
```

The # prompt is displayed.

Note – As shipped, the root password is not set and therefore not required. Press the Enter key when prompted for the password. Refer to the *Sun Datacenter InfiniBand Switch 648 Administration Guide* for instructions on how to set the root password.

7. Verify the CMC status.

See [“Verify the CMC Status”](#) on page 86.

Related Information

- *Switch Command Reference*, setlanconfig command

- “Access the CMC From the Serial Management Port” on page 82
- “Management Cable Requirements” on page 9
- “Network Management Connector and Pins” on page 4

▼ Verify the CMC Status

You can use the `clia shmstatus` command to check the status of the CMCs.

1. **Identify the prerequisite and subsequent tasks you must perform in conjunction with this procedure, to install the switch.**

See the table in “Installation Sequence” on page 20.

2. **On the CMC, type:**

```
# clia shmstatus -v
Pigeon Point Shelf Manager Command Line Interpreter
Host: "Active"
Ready For Operation: Yes
Detailed State Flags: "Shelf FRU Found" "RMCP Up"
#
```

If the output displays `Host: Inactive`, use the `clia switchover` command to activate the CMC.

3. **Check the status of the I²C bus components:**

```
# i2ctest
M9 CMC I2C access test started:
I2C test of ADM1026 at bus 3 addr 2e -PASSED
I2C test of PCA9506 at bus 2 addr 21 -PASSED
I2C test of PCA9506 at bus 2 addr 24 -PASSED
I2C test of PCA9548 at bus 2 addr 71 -PASSED
I2C test of PCA9555 at bus 2 addr 20 -PASSED
I2C test of AT64C24 at bus 2 addr 57 -PASSED
M9 CMC I2C access test PASSED
#
```

If any test failed, use the `switchover` command to activate the other CMC and cable it for the rest of the installation process.

4. Verify that all installed components are recognized as installed:

```
# showpresent
```

If an installed component is not recognized, investigate why.

5. Consider your next step:

- (Optional) Display and record the CMC FRU ID information.
See [“Identify the CMC Addresses” on page 87](#).
- Verify the power supply status.
See [“Verify the Power Supply Status” on page 89](#).

Related Information

- *Switch Command Reference*, `shmstatus` command
- *Switch Command Reference*, `i2ctest` command
- *Switch Command Reference*, `showpresent` command
- [“Verify the Power Supply Status” on page 89](#)
- [“Verify the Fabric Card Status” on page 97](#)
- [“Verify the Line Card Status” on page 104](#)
- [“Check Link Status” on page 116](#)

▼ Identify the CMC Addresses

1. Identify the prerequisite and subsequent tasks you must perform in conjunction with this procedure, to install the switch.

See the table in [“Installation Sequence” on page 20](#).

2. Use this table to provide the IPMB address for a CMC in a particular slot.

Slot Number	IPMB Address (in hexadecimal)
0	10
1	12

3. Display and record the CMC FRU ID information.

See [“Display the CMC FRU ID Information” on page 88](#).

Related Information

- *Switch Administration*, component addressing
- “Identify the Power Supply Addresses” on page 90
- “Identify the Fabric Card Addresses” on page 99
- “Identify the Line Card Addresses” on page 106
- “Identify the CXP Connector Addresses” on page 117

▼ Display the CMC FRU ID Information

1. Identify the prerequisite and subsequent tasks you must perform in conjunction with this procedure, to install the switch.

See the table in “Installation Sequence” on page 20.

2. On the CMC, type:

```
# clia fruinfo IPMB_address 0
```

where *IPMB_address* is from “Identify the CMC Addresses” on page 87.

The following example is the output for CMC 0:

```
# clia fruinfo 10 0
Pigeon Point Shelf Manager Command Line Interpreter
10: FRU # 0, FRU Info
Common Header:      Format Version = 1
Board Info Area:
  Version           = 1
  Language Code      = 25
  Mfg Date/Time      = May 22 09:16:00 2009 (7042156 minutes since 1996)
  Board Manufacturer = Sun Microsystems
  Board Product Name = Sun Datacenter Switch DCS 648 - CMC board
  Board Serial Number = 0110SJC-0911CM0001
  Board Part Number  = 541-3807-02
  FRU Programmer File ID = M9_CMC_FRU_541-3807-02_0110SJC-0911CM0001.txt
Product Info Area:
  Version           = 1
  Language Code      = 25
  Manufacturer Name  = Sun Microsystems
  Product Name       = Sun Datacenter Switch DCS 648 - CMC board
  Product Part / Model# = 541-3807-02
  Product Version    = Rev 50
  Product Serial Number = 0110SJC-0905CM0003
  Asset Tag          = none
  FRU Programmer File ID = M9_CMC_FRU_541-3807-02_0110SJC-0911CM0001.txt
```

```
Multi Record Area:
  PICMG Board Point-to-Point Connectivity Record (ID=0x14)
    Version = 0
  Record Type                = 0xc0 OEM Defined Record
    Version = 2
  PPS IPMB Topology Record (ID=0x05)
    Version = 0
#
```

3. Repeat [Step 2](#) for the other CMC.

4. Verify the power supply status.

See [“Verify the Power Supply Status”](#) on page 89.

Related Information

- *Switch Command Reference*, fruinfo command
- [“Display the Power Supply FRU ID Information”](#) on page 91
- [“Display the Fabric Card FRU ID Information”](#) on page 100
- [“Display the Line Card FRU ID Information”](#) on page 107
- [“Display the InfiniBand Cable FRU ID Information”](#) on page 118

▼ Verify the Power Supply Status

1. Identify the prerequisite and subsequent tasks you must perform in conjunction with this procedure, to install the switch.

See the table in [“Installation Sequence”](#) on page 20.

2. On the CMC, type:

```
# psustatus slot
```

where *slot* is the number of the power supply from 0 to 3.

For example, to check the status of power supply 0:

```
# psustatus 0
PSU 0, 12 V on
#
```

3. If any power supply is not producing 12V, investigate why.

See [“Check the Power Supply Status LEDs”](#) on page 80.

4. Consider your next step:

- (Optional) Display and record the power supply FRU ID information.
See [“Identify the Power Supply Addresses” on page 90.](#)
- Power on the fabric cards.
See [“Enable the Fabric Cards for Installation” on page 93.](#)

Related Information

- *Switch Command Reference*, psustatus command
- [“Verify the CMC Status” on page 86](#)
- [“Verify the Fabric Card Status” on page 97](#)
- [“Verify the Line Card Status” on page 104](#)
- [“Check Link Status” on page 116](#)

▼ Identify the Power Supply Addresses

1. **Identify the prerequisite and subsequent tasks you must perform in conjunction with this procedure, to install the switch.**
See the table in [“Installation Sequence” on page 20.](#)
2. **Use this table to provide the IPMB address or FRU number for a power supply in a particular slot.**

Slot Number	IPMB Address (in hexadecimal)	FRU Number
0	20	3
1	20	4
2	20	5
3	20	6

3. **Display and record the power supply FRU ID information.**
See [“Display the Power Supply FRU ID Information” on page 91.](#)

Related Information

- *Switch Administration*, component addressing
- [“Identify the CMC Addresses” on page 87](#)
- [“Identify the Fabric Card Addresses” on page 99](#)
- [“Identify the Line Card Addresses” on page 106](#)
- [“Identify the CXP Connector Addresses” on page 117](#)

▼ Display the Power Supply FRU ID Information

1. Identify the prerequisite and subsequent tasks you must perform in conjunction with this procedure, to install the switch.

See the table in “Installation Sequence” on page 20.

2. On the CMC, type:

```
# clia fruinfo 20 FRU_number
```

where *FRU_number* is from “Identify the Power Supply Addresses” on page 90.

The following example is the output for power supply 0:

```
# clia fruinfo 20 3
Pigeon Point Shelf Manager Command Line Interpreter
20: FRU # 3, FRU Info
Common Header:      Format Version = 1
Internal Use Area:
  Version           = 1
Chassis Info Area:
  Version           = 1
  Chassis Type       = (0)
  Chassis Part Number =
  Chassis Serial Number =
Product Info Area:
  Version           = 1
  Language Code      = 25
  Manufacturer Name  = EMRSN
  Product Name       = DS2900-3-001
  Product Part / Model# = 300-2133-04
  Product Version    = 04
  Product Serial Number = A234EP000B02P
  Asset Tag          =
  FRU Programmer File ID =
Multi Record Area:
  Record Type        = Power Supply Information
  Version            = 2
  Record Type        = DC Output
  Version            = 2
  Record Type        = DC Output
  Version            = 2
#
```

3. Repeat [Step 2](#) for all installed power supplies.

4. Power on the fabric cards.

See [“Enable the Fabric Cards for Installation”](#) on page 93.

Related Information

- *Switch Command Reference*, `fruinfo` command
- [“Display the CMC FRU ID Information”](#) on page 88
- [“Display the Fabric Card FRU ID Information”](#) on page 100
- [“Display the Line Card FRU ID Information”](#) on page 107
- [“Display the InfiniBand Cable FRU ID Information”](#) on page 118

Powering On the Fabric Cards

Perform these tasks in the following order to power on and verify the fabric cards:

Step	Description	Links
1.	Enable the fabric cards.	“Enable the Fabric Cards for Installation” on page 93
2.	Create the <code>guid.txt</code> file.	“Create the guid.txt File for Installation” on page 93
3.	Power on the fabric cards.	“Power On the Fabric Cards for Installation” on page 96
4.	Check the fabric card status LEDs.	“Check the Fabric Card Status LEDs” on page 96
5.	Verify the fabric card status.	“Verify the Fabric Card Status” on page 97
6.	Identify the fabric card addresses.	“Identify the Fabric Card Addresses” on page 99
7.	Display the fabric card FRU ID information.	“Display the Fabric Card FRU ID Information” on page 100

Related Information

- [“Understanding the Installation”](#) on page 15
- [“Powering On the CMCs”](#) on page 75
- [“Powering On the Line Cards”](#) on page 101

▼ Enable the Fabric Cards for Installation

1. Identify the prerequisite and subsequent tasks you must perform in conjunction with this procedure, to install the switch.

See the table in [“Installation Sequence”](#) on page 20.

2. Enable standby power and the IPMB buses for the fabric cards on the CMC:

```
# enablestby fc slot
```

where *slot* is the slot number of the installed fabric cards (0–8).

3. Repeat [Step 2](#) for each installed fabric card.
4. Verify that the OK LED flashes on the fabric cards that have been enabled.
If the OK LED is not flashing on the enabled fabric cards, investigate why. See [“Check the Fabric Card Status LEDs”](#) on page 96.
5. If your InfiniBand fabric uses the Fat-Tree routing algorithm, you must provide a root node GUID file for the Subnet Manager.
 - See [“Create the guid.txt File for Installation”](#) on page 93.
 - Otherwise, continue to [“Power On the Fabric Cards for Installation”](#) on page 96.

Related Information

- *Switch Command Reference*, enablestby command
- [“Enable the Line Cards for Installation”](#) on page 102

▼ Create the guid.txt File for Installation

If your InfiniBand fabric uses the Fat-Tree routing algorithm, you must provide a modified listing of fabric card GUIDs, called the 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.

Note – In this procedure, you issue commands to both the CMC *and* the Linux InfiniBand host.

1. Identify the prerequisite and subsequent tasks you must perform in conjunction with this procedure, to install the switch.

See the table in [“Installation Sequence”](#) on page 20.

2. Type the following command on the CMC to retrieve the fabric card base GUID:

```
# getbaseguid fc slot
```

where *slot* is the number of the fabric card (0–8). For example:

```
# getbaseguid fc 0
Base GUID = 0x00bad0fc0009f000
#
```

3. Record the GUID to a text editor on your Linux InfiniBand host.

4. Repeat [Step 2](#) and [Step 3](#) for each fabric card.

Once you have recorded each fabric card's GUID, you will have a list similar to the following on your Linux InfiniBand host:

```
0x00bad0fc0009f000
0x00bad0fc0033f100
0x00bad00017fcf200
0x00bad00005fcf300
0x00bad00003fcf400
0x00bad00007fcf500
0x00bad0fc0011f600
0x00bad0b00002f700
0x00bad0b00001f800
```

Note – If you have fewer than 9 fabric cards, your list will be smaller.

5. For each GUID, add the following values to make two new sums:

- 0xa2
- 0xb2

Note – For GUIDs that end with two zeros (00), you are effectively replacing the zeros with a2 and b2.

For example, 0x00bad0fc0009f000 becomes:

- 0x00bad0fc0009f0a2
- 0x00bad0fc0009f0b2

6. Repopulate your list with the modified GUIDs.

For example:

```
0x00bad0fc0009f0a2
0x00bad0fc0009f0b2
0x00bad0fc0033f1a2
0x00bad0fc0033f1b2
0x00bad00017fcf2a2
0x00bad00017fcf2b2
0x00bad00005fcf3a2
0x00bad00005fcf3b2
0x00bad00003fcf4a2
0x00bad00003fcf4b2
0x00bad00007fcf5a2
0x00bad00007fcf5b2
0x00bad0fc0011f6a2
0x00bad0fc0011f6b2
0x00bad0b00002f7a2
0x00bad0b00002f7b2
0x00bad0b00001f8a2
0x00bad0b00001f8b2
```

7. Save the list on the Linux InfiniBand host as the `/etc/opensm/guid.txt` file.

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

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

9. Restart the Subnet Manager on the Linux InfiniBand host and instruct it to use the `guid.txt` file.

For example:

```
# /etc/init.d/opensmd stop
Stopping IB Subnet Manager..- . [ OK ]
# /usr/sbin/opensm -R ftree -A -a /etc/opensm/guid.txt -s 120 -B
```

10. Power on the fabric cards.

See [“Power On the Fabric Cards for Installation”](#) on page 96.

Related Information

- *Switch Command Reference*, `getbaseguid` command
- *Switch Command Reference*, `opensm` command
- [“Enable the Fabric Cards for Installation”](#) on page 93

- [“Installing the InfiniBand Software Stack” on page 23](#)

▼ Power On the Fabric Cards for Installation

1. **Identify the prerequisite and subsequent tasks you must perform in conjunction with this procedure, to install the switch.**

See the table in [“Installation Sequence” on page 20](#).

2. **On the CMC, type:**

```
# activate fc slot
```

where *slot* is the slot number of the installed fabric cards (0–8).

When a fabric card is activated, the OK LED is illuminated, the fans spin up, and the fabric card goes to full power.

3. **Repeat [Step 2](#) for each installed fabric card.**
4. **Verify the fabric card status LEDs indicate a normal start up to full power.**
The OK LED should be lit and the Attention LED should be unlit. See [“Check the Fabric Card Status LEDs” on page 96](#).

Related Information

- *Switch Command Reference*, `activate` command
- [“Create the `guid.txt` File for Installation” on page 93](#)
- [“Power On the Line Cards for Installation” on page 103](#)





▼ Check the Fabric Card Status LEDs

1. **Identify the prerequisite and subsequent tasks you must perform in conjunction with this procedure, to install the switch.**

See the table in [“Installation Sequence” on page 20](#).

2. **Visually inspect the fabric card status LEDs.**

3. Compare what you see to the following table.

Glyph	Location	Name	Color	State and Meaning
	Left	Ok	Green	On – Normal operation at full power.
		Ready-to-Remove		Off – No power at all applied. Flashing – Fabric card has been disabled and is ready to be removed, standby voltage available.
	Center	Attention	Amber	On – A fault or critical error has been detected. Off – Normal operation. Flashing – No function.
	Right	Locator	White	On – No function. Off – Normal operation. Flashing – The fabric card is identifying itself.

4. Verify the fabric card status.

See [“Verify the Fabric Card Status” on page 97.](#)

Related Information

- *Switch Administration*, checking status LEDs
- [“Check the Power Supply Status LEDs” on page 80](#)
- [“Check the CMC Status LEDs” on page 80](#)
- [“Check the Line Card Status LEDs” on page 103](#)
- [“Check the CXP Connector Status LEDs” on page 115](#)

▼ Verify the Fabric Card Status

1. Identify the prerequisite and subsequent tasks you must perform in conjunction with this procedure, to install the switch.

See the table in [“Installation Sequence” on page 20.](#)

2. On the CMC, verify that the installed fabric cards are active:

```
# showpresent | grep FC
```

If an installed fabric card is shown to be INACTIVE, investigate why.

3. Check for fabric card power faults:

```
# checkpwrfault | grep FC
```

If an installed fabric card is shown to `FAIL`, investigate why.

4. Check fabric card internal voltages:

```
# checkvoltages
```

If an installed fabric card is shown to `FAIL`, investigate why.

5. Verify that the fans are operating:

```
# checkfans
```

If a fan's speed is too low or the fan has `STOPPED`, investigate why.

6. Verify that the switch chips in the fabric cards are operational:

```
# checkswitches | grep FC
```

If an installed fabric card is shown as `not boot correct`, investigate why.

Note – Fabric card fillers do not have any switch chips. The `checkswitches` command does not display any information about fabric card fillers.

7. Retrieve each fabric card's firmware versions:

```
# getfwversion fc slot
```

where *slot* is the slot number for the installed fabric cards. For example:

```
# getfwversion fc 0
FW versions for FC 0
H8 version          : 0.1.1
FC FPGA version     : 1.0.1
I4 FW image version : 7.2.00
#
```

8. Repeat [Step 7](#) and record the information for each fabric card and compare to identify any discrepancies.

All fabric cards should have the same firmware versions.

9. Consider your next step:

- (Optional) Display and record the fabric cards FRU ID information.
See [“Identify the Fabric Card Addresses” on page 99](#).
- Power on the line cards.
See [“Enable the Line Cards for Installation” on page 102](#).

Related Information

- *Switch Command Reference*, showpresent command
- *Switch Command Reference*, checkpwrfault command
- *Switch Command Reference*, checkvoltages command
- *Switch Command Reference*, checkfans command
- *Switch Command Reference*, checkswitches command
- *Switch Command Reference*, getfwversion command
- [“Power On the Fabric Cards for Installation” on page 96](#)
- [“Verify the CMC Status” on page 86](#)
- [“Verify the Power Supply Status” on page 89](#)
- [“Verify the Line Card Status” on page 104](#)
- [“Check Link Status” on page 116](#)

▼ Identify the Fabric Card Addresses

1. Identify the prerequisite and subsequent tasks you must perform in conjunction with this procedure, to install the switch.

See the table in [“Installation Sequence” on page 20](#).

2. Use this table to provide the IPMB address for a fabric card in a particular slot.

Slot Number	IPMB Address (in hexadecimal)
0	94
1	96
2	98
3	9A
4	9C
5	9E
6	A0

Slot Number	IPMB Address (in hexadecimal)
7	A2
8	A4

3. Display and record the fabric cards FRU ID information.

See “Display the Fabric Card FRU ID Information” on page 100.

Related Information

- *Switch Administration*, component addressing
- “Identify the Power Supply Addresses” on page 90
- “Identify the CMC Addresses” on page 87
- “Identify the Line Card Addresses” on page 106
- “Identify the CXP Connector Addresses” on page 117

▼ Display the Fabric Card FRU ID Information

1. Identify the prerequisite and subsequent tasks you must perform in conjunction with this procedure, to install the switch.

See the table in “Installation Sequence” on page 20.

2. On the CMC, type:

```
# clia fruinfo IPMB_address 0
```

where *IPMB_address* is from “Identify the Fabric Card Addresses” on page 99.

The following example is the output for fabric card 0:

```
# clia fruinfo 94 0
Pigeon Point Shelf Manager Command Line Interpreter
94: FRU # 0, FRU Info
Common Header:      Format Version = 1
Board Info Area:
  Version           = 1
  Language Code      = 25
  Mfg Date/Time      = May  7 09:31:00 2009 (7020571 minutes since 1996)
  Board Manufacturer = Sun Microsystems, Inc.
  Board Product Name  = Sun Datacenter Switch DCS 648 - Fabric Card
  Board Serial Number = 0110SJC-0918FC0231
  Board Part Number   = 541-3811-04
  FRU Programmer File ID = m9_fc_fru-info-0110SJC-0918FC0231.inf
```

```
Product Info Area:
Version          = 1
Language Code    = 25
Manufacturer Name = Sun Microsystems, Inc.
Product Name     = Sun Datacenter Switch DCS 648 - Fabric Card
Product Part / Model# = 541-3811-04
Product Version  = Rev 1
Product Serial Number = 0110SJC-0918FC0231
Asset Tag        = none
FRU Programmer File ID = m9_fc_fru-info-0110SJC-0918FC0231.inf
#
```

3. Repeat [Step 2](#) for all installed fabric cards and fabric card fillers.

4. Power on the line cards.

See [“Enable the Line Cards for Installation”](#) on page 102.

Related Information

- *Switch Command Reference*, fruinfo command
- [“Display the CMC FRU ID Information”](#) on page 88
- [“Display the Power Supply FRU ID Information”](#) on page 91
- [“Display the Line Card FRU ID Information”](#) on page 107
- [“Display the InfiniBand Cable FRU ID Information”](#) on page 118

Powering On the Line Cards

After powering on the fabric cards, perform these tasks in the following order to power on and verify the line cards:

Step	Description	Links
1.	Enable the line cards.	“Enable the Line Cards for Installation” on page 102
2.	Power on the line cards.	“Power On the Line Cards for Installation” on page 103
3.	Check the line card status LEDs.	“Check the Line Card Status LEDs” on page 103
4.	Verify the line card status.	“Verify the Line Card Status” on page 104

Step	Description	Links
5.	Identify line card addresses.	“Identify the Line Card Addresses” on page 106
6.	Display line card FRU ID information.	“Display the Line Card FRU ID Information” on page 107

Related Information

- [“Understanding the Installation” on page 15](#)
- [“Powering On the CMCs” on page 75](#)
- [“Powering On the Fabric Cards” on page 92](#)

▼ Enable the Line Cards for Installation

1. Identify the prerequisite and subsequent tasks you must perform in conjunction with this procedure, to install the switch.

See the table in [“Installation Sequence” on page 20](#).

2. Enable standby power and the IPMB buses for the line cards on the CMC:

```
# enablestby lc slot
```

where *slot* is the slot number of the installed line cards (0–8).

3. Repeat [Step 2](#) for each installed line card.
4. Verify that the OK LED flashes on the line cards that have been enabled.

If the OK LED is not flashing on the enabled line cards, investigate why. See [“Check the Line Card Status LEDs” on page 103](#).

5. Power on the line cards.

See [“Power On the Line Cards for Installation” on page 103](#).

Related Information

- *Switch Command Reference*, enablestby command
- [“Enable the Fabric Cards for Installation” on page 93](#)

▼ Power On the Line Cards for Installation



Caution – You must fully power on all fabric cards and fabric card fillers before powering on the line cards. See [“Power On the Fabric Cards for Installation” on page 96](#).

1. Identify the prerequisite and subsequent tasks you must perform in conjunction with this procedure, to install the switch.

See the table in [“Installation Sequence” on page 20](#).

2. On the CMC, type:

```
# activate lc slot
```

where *slot* is the slot number of the installed line cards (0–8).

When a line card is activated, the OK LED is illuminated and the line card goes to full power.

3. Repeat [Step 2](#) for each installed line card.
4. Verify the line card status LEDs indicate a normal start up to full power.
The OK LED should be lit and the Attention LED should be unlit. See [“Check the Line Card Status LEDs” on page 103](#).

Related Information

- *Switch Command Reference*, activate command
- [“Enable the Line Cards for Installation” on page 102](#)
- [“Power On the Fabric Cards for Installation” on page 96](#)





▼ Check the Line Card Status LEDs

1. Identify the prerequisite and subsequent tasks you must perform in conjunction with this procedure, to install the switch.

See the table in [“Installation Sequence” on page 20](#).

2. Visually inspect the line card status LEDs.

3. Compare what you see to the following table.

Glyph	Location	Name	Color	State and Meaning
	Top	Locator	White	On – No function. Off – Normal operation. Flashing – The line card is identifying itself.
	Middle	Attention	Amber	On – A fault or critical error has been detected. Off – Normal operation. Flashing – No function.
	Bottom	OK	Green	On – Normal operation at full power. Off – No power at all applied.
		Ready-to-Remove		Flashing – Fabric card has been disabled and is ready to be removed, standby voltage available.

4. Verify line card status.

See [“Verify the Line Card Status”](#) on page 104.

Related Information

- *Switch Administration*, checking status LEDs
- [“Check the Power Supply Status LEDs”](#) on page 80
- [“Check the CMC Status LEDs”](#) on page 80
- [“Check the Fabric Card Status LEDs”](#) on page 96
- [“Check the CXP Connector Status LEDs”](#) on page 115

▼ Verify the Line Card Status

1. Identify the prerequisite and subsequent tasks you must perform in conjunction with this procedure, to install the switch.

See the table in [“Installation Sequence”](#) on page 20.

2. On the CMC, verify that the installed line cards are active:

```
# showpresent | grep LC
```

If an installed line card is shown to be INACTIVE, investigate why.

3. Check for line card power faults:

```
# checkpwrfault | grep LC
```

If an installed line card is shown to FAIL, investigate why.

4. Check line card internal voltages:

```
# checkvoltages
```

If an installed line card is shown to FAIL, investigate why.

5. Verify that the switch chips in the line cards are operational:

```
# checkswitches | grep LC
```

If an installed line card is shown as not boot correct, investigate why.

6. Retrieve each line card's firmware versions:

```
# getfwversion lc slot
```

where *slot* is the slot number for the installed line cards. For example:

```
# getfwversion lc 0
FW versions for LC 0
  H8 version           : 0.1.1
  LC FPGA version      : 1.0.1
  I4 FW image version  : 7.2.00
#
```

7. Repeat [Step 6](#) and record the information for each line card and compare to identify any discrepancies.

All line cards should have the same firmware versions.

8. Consider your next step:

- (Optional) Display and record the line cards FRU ID information.
See [“Identify the Line Card Addresses” on page 106](#).
- Connect the Infiniband cables.
See [“Attach Cables to the CXP Connectors” on page 109](#).

Related Information

- *Switch Command Reference*, showpresent command

- *Switch Command Reference*, checkpwrfault command
- *Switch Command Reference*, checkvoltages command
- *Switch Command Reference*, checkswitches command
- *Switch Command Reference*, getfwversion command
- [“Power On the Line Cards for Installation” on page 103](#)
- [“Verify the CMC Status” on page 86](#)
- [“Verify the Power Supply Status” on page 89](#)
- [“Verify the Fabric Card Status” on page 97](#)
- [“Check Link Status” on page 116](#)

▼ Identify the Line Card Addresses

1. **Identify the prerequisite and subsequent tasks you must perform in conjunction with this procedure, to install the switch.**

See the table in [“Installation Sequence” on page 20](#).

2. **Use this table to provide the IPMB address for a line card in a particular slot.**

Slot Number	IPMB Address (in hexadecimal)
0	82
1	84
2	86
3	88
4	8A
5	8C
6	8E
7	90
8	92

3. **Display and record the line cards FRU ID information.**

See [“Display the Line Card FRU ID Information” on page 107](#).

Related Information

- *Switch Administration*, component addressing
- [“Identify the Power Supply Addresses” on page 90](#)

- “Identify the CMC Addresses” on page 87
- “Identify the Fabric Card Addresses” on page 99
- “Identify the CXP Connector Addresses” on page 117

▼ Display the Line Card FRU ID Information

1. Identify the prerequisite and subsequent tasks you must perform in conjunction with this procedure, to install the switch.

See the table in “Installation Sequence” on page 20.

2. On the CMC, type:

```
# clia fruinfo IPMB_address 0
```

where *IPMB_address* is from “Identify the Line Card Addresses” on page 106.

The following example is the output for line card 8:

```
# clia fruinfo 92 0
Pigeon Point Shelf Manager Command Line Interpreter
92: FRU # 0, FRU Info
Common Header:      Format Version = 1
Board Info Area:
  Version           = 1
  Language Code      = 25
  Mfg Date/Time      = Mar 31 16:22:00 2009 (6967702 minutes since 1996)
  Board Manufacturer = Sun Microsystems, Inc.
  Board Product Name = Sun Datacenter Switch DCS 648 - Line Card
  Board Serial Number = 54138100911LC0046
  Board Part Number  = 541-3810-02
  FRU Programmer File ID = m9_lc_fru-info-54138100911LC0046.inf
Product Info Area:
  Version           = 1
  Language Code      = 25
  Manufacturer Name  = Sun Microsystems, Inc.
  Product Name       = Sun Datacenter Switch DCS 648 - Line Card
  Product Part / Model# = 541-3810-02
  Product Version    = Rev 2
  Product Serial Number = 54138100911LC0046
  Asset Tag          = none
  FRU Programmer File ID = m9_lc_fru-info-54138100911LC0046.inf
#
```

3. Repeat [Step 2](#) for all installed line cards.

4. Connect the Infiniband cables.

See [“Attach Cables to the CXP Connectors”](#) on page 109.

Related Information

- [Switch Command Reference, fruinfo command](#)
- [“Display the CMC FRU ID Information”](#) on page 88
- [“Display the Power Supply FRU ID Information”](#) on page 91
- [“Display the Fabric Card FRU ID Information”](#) on page 100
- [“Display the InfiniBand Cable FRU ID Information”](#) on page 118

Connecting InfiniBand Cables

After verifying the line card status, you can begin cabling the line cards with the InfiniBand cables. Perform the tasks in the following order:

Note – Review [“InfiniBand Cable Cautions”](#) on page 10 and [“InfiniBand Cable Guidelines”](#) on page 11 if you have not already done so.

Step	Description	Links
1.	Attach cables to the CXP connectors.	“Attach Cables to the CXP Connectors” on page 109
2.	Check the CXP connector status LEDs.	“Check the CXP Connector Status LEDs” on page 115
3.	Check link status.	“Check Link Status” on page 116
4.	Identify the CXP connector addresses.	“Identify the CXP Connector Addresses” on page 117
5.	Display InfiniBand Cable FRU ID information.	“Display the InfiniBand Cable FRU ID Information” on page 118

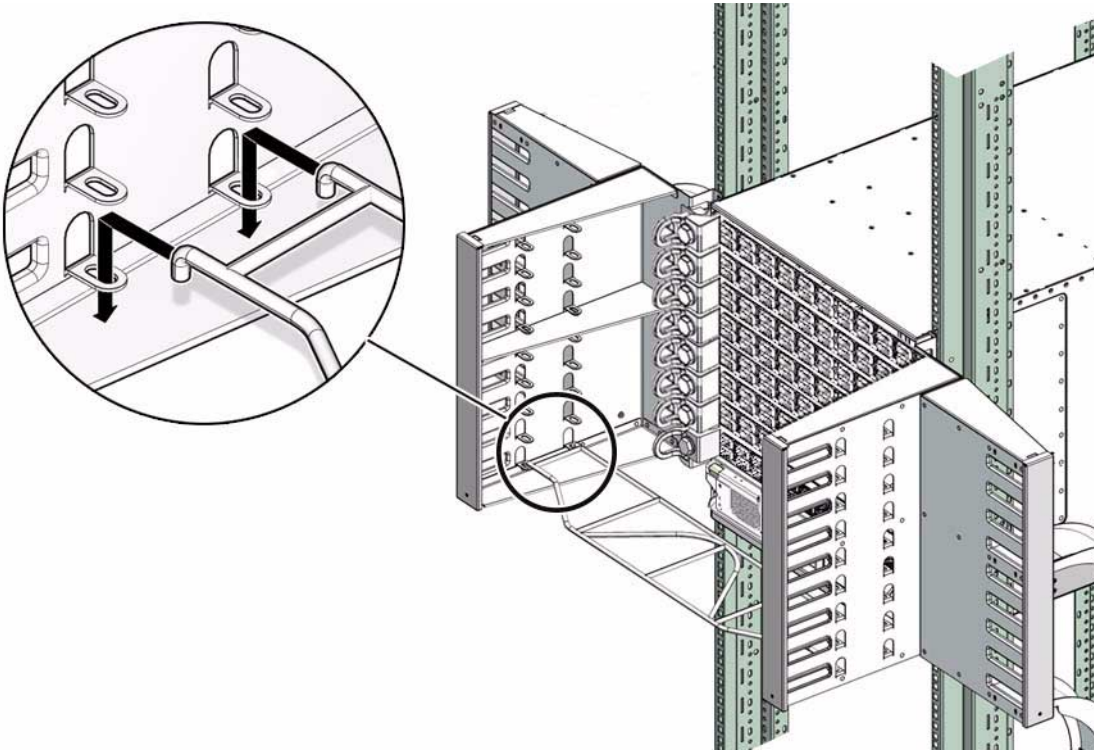
Related Information

- [“Understanding InfiniBand Cabling”](#) on page 9
- [“Understanding the Installation”](#) on page 15
- [“Verifying the InfiniBand Fabric”](#) on page 119

▼ Attach Cables to the CXP Connectors

Note – This procedure describes cabling the switch in a center split, left-right symmetrical configuration.

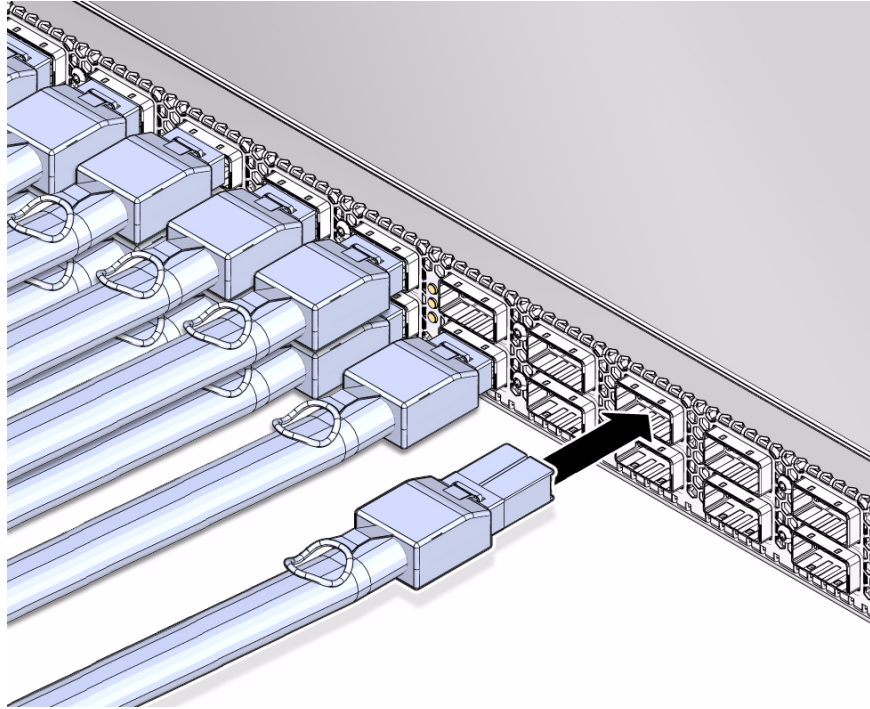
1. Identify the prerequisite and subsequent tasks you must perform in conjunction with this procedure, to install the switch.
See the table in [“Installation Sequence” on page 20](#).
2. Bring the cables to the switch.
3. Install a cable shelf into the slot below the lowest line card.
 - a. Lift the cable shelf into a horizontal orientation, with the long rolled edge towards you.
 - b. Locate where you want to install the cable shelf.
 - c. Move the cable shelf between and just above the branches of the cable tree for the slot where you want to install the shelf.
 - d. Continue to move the shelf in, then lower the shelf into the tabs of the branches.



Note – Install cable shelves only as they are needed. If all cable shelves are installed before the switch is cabled, the shelves' presence makes cabling difficult.

4. Plug the first cable into the CXP connector at 11B.

Note – For each connector group, A is the upper connector, B is the lower connector.



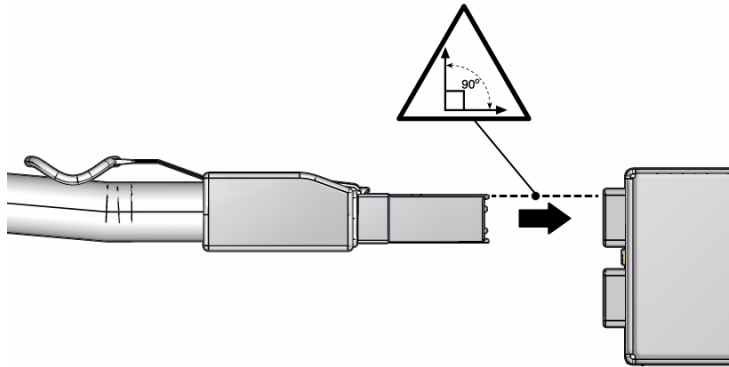
- a. **Remove the protective cap from the connector and visually inspect the cable connector.**

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.

- b. **Ensure that the retraction strap is forward.**

- c. **Orient the cable connector to the line card CXP receptacle squarely and horizontally.**

Ensure that the upper shell just touches the underside of the top of the receptacle on the line card.



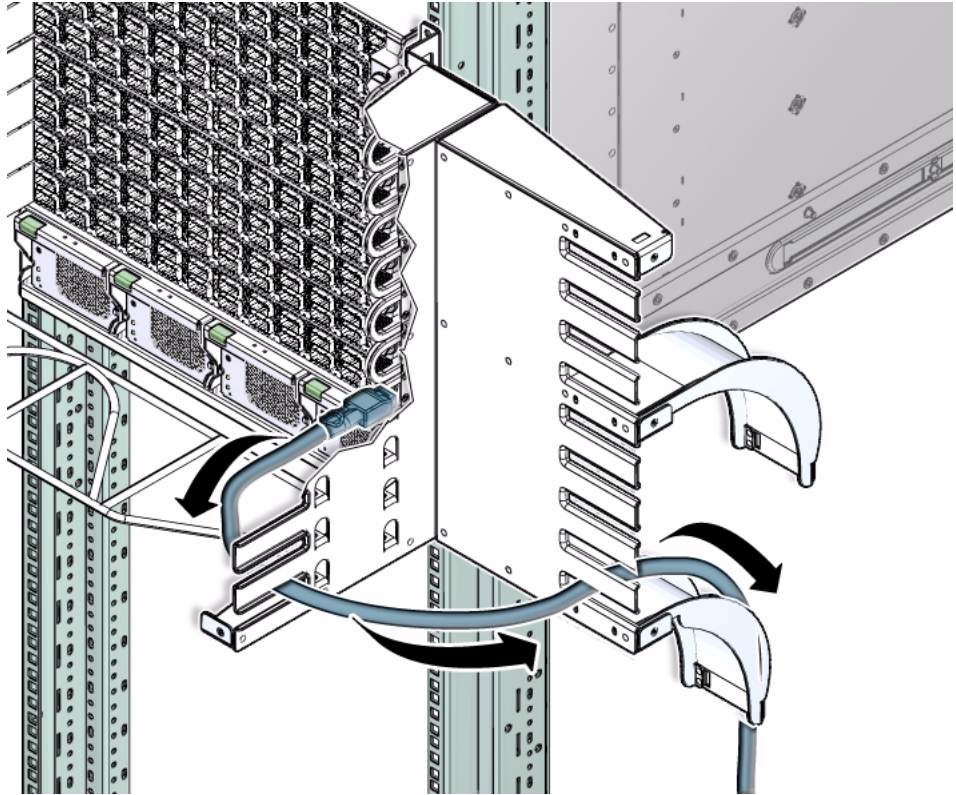
d. Slowly move the connector in.

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

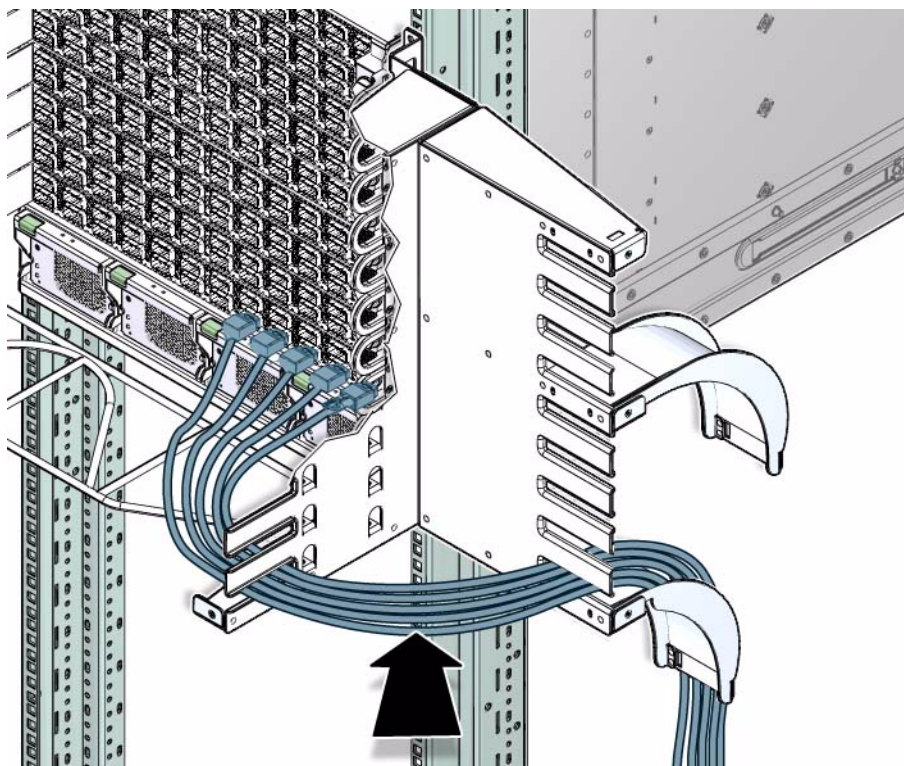
e. Continue to push the connector in until the hooks catch onto the top of the receptacle.

5. Curve the cable to the right through the branches of the cable tree.



Caution – Do not allow any copper core InfiniBand cable to bend tighter than a 5 inch (127 mm) radius. Do not allow any optical InfiniBand cable to bend tighter than a 3.4 inch (85 mm) radius. Tight bends can damage the cable internally.

6. Place the cable over the cable curve and move the cable in toward the rack.



7. Repeat [Step 4](#) for the second cable at CXP connector 0B.
8. Curve the cable to the left through the branches of the cable tree.



Caution – Do not force a bend radius of less than 5 inches (127 mm). Any bend tighter than this damages the inner fibers of the cable, rendering it useless.

9. Place the cable over the cable curve and move the cable in toward the rack.
10. Repeat [Step 4](#) for the third cable at CXP connector 10B.
11. Curve the cable to the right through the branches of the cable tree, next to the cable already there.
12. Place the cable over the cable curve and move the cable against the cable already there.
13. Repeat [Step 4](#) for the fourth cable at CXP connector 1B.
14. Curve the cable to the left through the branches of the cable tree, next to the cable already there.

15. Place the cable over the cable curve and move the cable against the cable already there.
16. Repeat [Step 4](#) for cables connecting to CXP connectors 9B, 2B, and so on, to and including 6B and 5B.
Place the cables next to the cables that are already there.
17. Repeat [Step 4](#) for cables connecting to CXP connectors 11A, 0A, 10A, 1A, and so on, to and including 6A and 5A.
Place the cables on top of the cables that are already there.
18. When you have finished for the lowest line card, repeat from [Step 3](#) through [Step 17](#) for the remaining line cards, working your way up.

Note – There are two cable curves on each side of the switch. The cables from line cards 0 through 4 route over the lowest cable curve. The cables from line cards 5 through 8 route over the next cable curve up.

19. Install the EMI screen.
 - a. Hook the lower half of the screen at the two square holes at the bottom of the cable trees.
 - b. Expand the screen and set the upper half over the top of the switch chassis and cable trees.
 - c. Insure that the screen is seated against the cable trees.
20. Verify the cabled CXP connector status LEDs indicate a link.
The Link LED should be lit and not flash. See [“Check the CXP Connector Status LEDs”](#) on page 115.

Related Information

- [“Understanding InfiniBand Cabling”](#) on page 9
- [“Attach the Management Cables”](#) on page 76
- [“Attach the Power Cords”](#) on page 78

▼ Check the CXP Connector Status LEDs

There are six Link status LEDs for each CXP connector pair. For the upper connector (A), the Link status is provided by the three LEDs on the left. For the lower connector (B), the Link status is provided by the three LEDs on the right. The following table provides a description of the Link status LED's state and meaning.

1. Identify the prerequisite and subsequent tasks you must perform in conjunction with this procedure, to install the switch.

See the table in [“Installation Sequence” on page 20](#).

2. Visually inspect the CXP connector status LEDs.
3. Compare what you see to the following table.

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

4. Check link status.

See [“Check Link Status” on page 116](#).

Related Information

- *Switch Administration*, checking status LEDs
- [“Check the Power Supply Status LEDs” on page 80](#)
- [“Check the CMC Status LEDs” on page 80](#)
- [“Check the Fabric Card Status LEDs” on page 96](#)
- [“Check the Line Card Status LEDs” on page 103](#)
- [“Check the CXP Connector Status LEDs” on page 115](#)

▼ Check Link Status

1. Identify the prerequisite and subsequent tasks you must perform in conjunction with this procedure, to install the switch.

See the table in [“Installation Sequence” on page 20](#).

2. On the CMC, determine the state of links:

```
# checklinks -c
```

If a port for a line card or fabric card is down, investigate why. You can append the `-e` option of the `checklinks` command to attempt to enable a downed link.

Note – The cable connection of the line card where the link is down is identified.

3. Consider your next step:

- (Optional) Display and record the InfiniBand cable FRU ID information.
See [“Identify the CXP Connector Addresses” on page 117](#).
- Interface with the InfiniBand software stack.
See [“Discover the InfiniBand Fabric Topology” on page 120](#).

Related Information

- *Switch Administration*, checking status LEDs
- *Switch Command Reference*, `checklinks` command
- [“Attach Cables to the CXP Connectors” on page 109](#)
- [“Verify the CMC Status” on page 86](#)
- [“Verify the Power Supply Status” on page 89](#)
- [“Verify the Fabric Card Status” on page 97](#)
- [“Verify the Line Card Status” on page 104](#)

▼ Identify the CXP Connector Addresses

1. Identify the prerequisite and subsequent tasks you must perform in conjunction with this procedure, to install the switch.

See the table in [“Installation Sequence” on page 20](#).

2. Use this table to provide the IPMB address FRU number for a particular CXP connector in a line card.

Connector Number	IPMB Address FRU Number	Connector Number	IPMB Address FRU Number	Connector Number	IPMB Address FRU Number
0A	2	4A	10	8A	18
0B	1	4B	9	8B	17
1A	4	5A	12	9A	20
1B	3	5B	11	9B	19
2A	6	6A	14	10A	22
2B	5	6B	13	10B	21
3A	8	7A	16	11A	24
3B	7	7B	15	11B	23

3. Display and record the InfiniBand cable FRU ID information.

See [“Display the InfiniBand Cable FRU ID Information” on page 118](#).

Related Information

- *Switch Administration*, component addressing
- [“Identify the Power Supply Addresses” on page 90](#)
- [“Identify the CMC Addresses” on page 87](#)
- [“Identify the Fabric Card Addresses” on page 99](#)
- [“Identify the Line Card Addresses” on page 106](#)

▼ Display the InfiniBand Cable FRU ID Information

Note – Retrieving FRU ID information from an InfiniBand cable is only possible if the cable supports the IPMI specification for providing FRU ID information.

1. Identify the prerequisite and subsequent tasks you must perform in conjunction with this procedure, to install the switch.

See the table in [“Installation Sequence” on page 20](#).

2. On the CMC, type:

```
# clia fruinfo IPMB_address FRU_number
```

where:

- *IPMB_address* is from [“Identify the Line Card Addresses” on page 106](#).
- *FRU_number* is from [“Identify the CXP Connector Addresses” on page 117](#)

The following example is the output connector 2A on line card 1:

```
# clia fruinfo 84 6
Pigeon Point Shelf Manager Command Line Interpreter
84: FRU # 6, FRU Info
Common Header:      Format Version = 1
Board Info Area:
  Version           = 1
  Language Code      = 25
  Mfg Date/Time      = Mar 13 10:34:00 2009 (6941434 minutes since 1996)
  Board Manufacturer =
  Board Product Name =
```

```
Board Serial Number      =
Board Part Number        =
FRU Programmer File ID   =
Product Info Area:
Version                  = 1
Language Code            = 25
Manufacturer Name        = MergeOptics GmbH
Product Name             = 10m, 84 Circuit iPass Stacked Active Optical Cable
Product Part / Model#    =
Product Version          = Rev. 50
Product Serial Number    = 2612BER-0911XB0054
Asset Tag                =
FRU Programmer File ID   = 2612BER-0911XB0054.inf
#
```

3. Repeat [Step 2](#) for all installed cables on all installed line cards.

4. **Interface with the InfiniBand software stack.**

See [“Discover the InfiniBand Fabric Topology”](#) on page 120.

Related Information

- *Switch Command Reference*, fruinfo command
- [“Display the CMC FRU ID Information”](#) on page 88
- [“Display the Power Supply FRU ID Information”](#) on page 91
- [“Display the Fabric Card FRU ID Information”](#) on page 100
- [“Display the Line Card FRU ID Information”](#) on page 107

Verifying the InfiniBand Fabric

As part of the installation process, you should check the InfiniBand fabric and how the switch interacts with the fabric. You use the `ibnetdiscover`, `ibdiagnet`, and `ibcheckerrors` commands to initially determine the operational status of your switch in the InfiniBand fabric. These commands are issued from the Linux InfiniBand host in the following order:

Step	Description	Links
1.	Discover the InfiniBand fabric topology.	“Discover the InfiniBand Fabric Topology” on page 120
2.	Perform diagnostics on the InfiniBand fabric.	“Perform Diagnostics on the InfiniBand Fabric” on page 121

Step	Description	Links
3.	Validate the InfiniBand fabric and report errors.	“Validate the InfiniBand Fabric and Report Errors” on page 123

Related Information

- [“Understanding the Installation” on page 15](#)
- [“Installing the InfiniBand Software Stack” on page 23](#)
- [“Connecting InfiniBand Cables” on page 108](#)

▼ 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 tasks you must perform in conjunction with this procedure, to install the switch.**

See the table in [“Installation Sequence” on page 20](#).

2. **On the Linux InfiniBand host, type:**

```
# ibnetdiscover
#
# Topology file: generated on Thu Oct 29 16:49:36 2009
#
# Initiated from node 0003ba000100c708 port 0003ba000100c70a
vendid=0x2c9
devid=0xbd36
sysimgguid=0x3ba2550282543
switchguid=0x21283a83ae11d2(21283a83ae11d2)
Switch 36 "S-0021283a83ae11d2" # "Sun DCS 648 shmm1500 LC slot 1 switch 3" base
port 0 lid 35 lmc 0
  [1]      "S-00bad0fc0100f8a2"[19] # "Sun DCS 648 shmm1500 FC slot 8 switch 0"
lid 56 4xQDR
  [2]      "S-00bad0fc0100f8b2"[36] # "Sun DCS 648 shmm1500 FC slot 8 switch 1"
lid 57 4xQDR
  [3]      "S-0021283a77bdf7a2"[19] # "Sun DCS 648 shmm1500 FC slot 7 switch 0"
lid 54 4xQDR
.
.
.
vendid=0x2c9
devid=0x673c
sysimgguid=0x3ba000100c70b
```

```
caguid=0x3ba000100c708
Ca      2 "H-0003ba000100c708" # "nsn34-39 HCA-1"
[2] (3ba000100c70a)      "S-00bad0cc010016a2" [22]      # lid 58 lmc 0
"Sun DCS 648 shmm1500 LC slot 6 switch 0" lid 1 4xQDR
#
```

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

3. Perform InfiniBand fabric diagnostics.

See [“Perform Diagnostics on the InfiniBand Fabric”](#) on page 121.

Related Information

- *Switch Command Reference*, `ibnetdiscover` command
- [“Check Link Status”](#) on page 116
- [“Installing the InfiniBand Software Stack”](#) on page 23

▼ Perform Diagnostics on the InfiniBand Fabric

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

1. Identify the prerequisite and subsequent tasks you must perform in conjunction with this procedure, to install the switch.

See the table in [“Installation Sequence”](#) on page 20.

2. On the Linux InfiniBand host, type:

```
# ibdiagnet
```

In the following example, the `ibdiagnet` command checks for 4x link width and 10 Gbyte/sec speed and dumps the Performance Manager counters and then clears them:

```
# ibdiagnet -lw 4x -ls 10 -pm -pc
Loading IBDIAGNET from: /usr/lib64/ibdiagnet1.2
-W- Topology file is not specified.
  Reports regarding cluster links will use direct routes.
Loading IBDM from: /usr/lib64/ibdm1.2
-I- Using port 2 as the local port.
-I- Discovering ... 55 nodes (54 Switches & 1 CA-s) discovered.
-I- -----
-I- Bad Guids/LIDs Info
```

```

-I-----
-I- No bad Guids were found
-I-----
-I- Links With Logical State = INIT
-I-----
-I- No bad Links (with logical state = INIT) were found
-I-----
-I- PM Counters Info
-I-----
-I- No illegal PM counters values were found
-I-----
-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- No unmatched Links (with speed != 10) were found
-I-----
-I- Fabric Partitions Report (see ibdiagnet.pkey for a full hosts list)
-I-----
-I-   PKey:0x7fff Hosts:1 full:1 partial:0
-I-----
-I- IPoIB Subnets Check
-I-----
-I- Subnet: IPv4 PKey:0x7fff QKey:0x00000b1b MTU:2048Byte rate:10Gbps SL:0x00
-W- Suboptimal rate for group. Lowest member rate:40Gbps > group-rate:10Gbps
-I-----
-I- Bad Links Info
-I- No bad link were found
-I-----
-I-----
-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         0
  Partitions Check                     0         0
  IPoIB Subnets Check                 0         1
Please see /tmp/ibdiagnet.log for complete log
-I-----
-I- Done. Run time was 42 seconds.
#

```

Note – The Performance Manager counters are available in the `ibdiagnet.pm` file.

3. Validate and check errors for the InfiniBand fabric.

See [“Validate the InfiniBand Fabric and Report Errors”](#) on page 123.

Related Information

- *Switch Command Reference*, `ibdiagnet` command
- [“Discover the InfiniBand Fabric Topology”](#) on page 120
- [“Installing the InfiniBand Software Stack”](#) on page 23

▼ 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 tasks you must perform in conjunction with this procedure, to install the switch.

See the table in [“Installation Sequence”](#) on page 20.

2. On the Linux InfiniBand host, type:

```
# ibcheckerrors
#warn: counter SymbolErrors = 65532      (threshold 10) lid 85 port 255
Error check on lid 85 (Sun DCS 648 shmm1500 LC slot 6 switch 1) port all:  FAILED
#warn: counter SymbolErrors = 65535      (threshold 10) lid 1 port 255
Error check on lid 1 (Sun DCS 648 shmm1500 LC slot 6 switch 0) port all:  FAILED
.
.
.
## Summary: 55 nodes checked, 0 bad nodes found
##          1296 ports checked, 0 ports have errors beyond threshold
#
```

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

Related Information

- *Switch Command Reference*, `ibcheckerrors` command
- [“Perform Diagnostics on the InfiniBand Fabric”](#) on page 121
- [“Installing the InfiniBand Software Stack”](#) on page 23

Index

A

- accessing
 - CMC, 81
 - network management, 84
 - serial management, 82
- acoustic noise emissions, 3
- activate command, 96, 103
- addressing
 - CMC, 87
 - fabric card, 99
 - fabric card filler, 99
 - InfiniBand cable, 117
 - line card, 106
 - power supply, 90
- antistatic precautions, 20
- attaching
 - InfiniBand cable, 108, 109
 - management cables, 76
 - power cords, 78

B

- boot command, 83

C

- chassis
 - installing, 39
 - preparing, 29
 - unpacking, 25
 - unsecuring, 28
- checkfans command, 97
- checklinks command, 116
- checkpwrfault command, 97, 104
- checkswitches command, 97, 104
- checkvoltages command, 97, 104
- CMC
 - accessing, 81

- network management, 84
- serial management, 82
- addressing, 87
- FRU ID, 88
- LEDs, 80
- powering on, 75
- status, 86
- command
 - activate, 96, 103
 - boot, 83
 - checkfans, 97
 - checklinks, 116
 - checkpwrfault, 97, 104
 - checkswitches, 97, 104
 - checkvoltages, 97, 104
 - enablestby, 93, 102
 - fruinfo, 88, 91, 100, 107, 118
 - getbaseguid, 93
 - getfwversion, 97, 104
 - i2ctest, 86
 - ibcheckerrors, 123
 - ibdiagnet, 121
 - ibnetdiscover, 120
 - opensm, 93
 - printenv, 83
 - psustatus, 89
 - reboot, 83
 - saveenv, 83
 - setenv, 83
 - setlanconfig, 84
 - shmstatus, 86
 - showpresent, 86, 97, 104
 - telnet, 84
- component
 - inspecting, 45
 - installing, 63
- connecting InfiniBand cables, 108
- connector

- CXP, 5
- InfiniBand cable, 5
- network management, 4
- serial management, 5

creating

- guid.txt file, 93

CXP connector, 5

D

diagnosing

- InfiniBand fabric, 121

discovering the InfiniBand fabric, 120

displaying

- FRU ID
- CMC, 88
- fabric card, 100
- InfiniBand cable, 118
- line card, 107
- power supply, 91

E

electrical specifications, 3

enablestby command, 93, 102

enabling

- fabric card, 93
- fabric card filler, 93
- line card, 102

environmental requirements, 3

F

fabric card

- addressing, 99
- distribution, 17
- enabling, 93
- features, 52
- filler, 18
- FRU ID, 100
- handling guidelines, 17
- inspecting, 51
- chassis, 53
- fans, 54
- retainer bolts, 53
- XBOW connectors, 54

installing, 67

LEDs, 96

midplane

- connectors, 46

- midplane inspection, 47
- powering on, 92, 96
- status, 97

fabric card filler

- addressing, 99
- enabling, 93
- features, 52
- FRU ID, 100
- handling guidelines, 17
- inspecting, 51
- chassis, 53
- fans, 54
- retainer bolts, 53
- XBOW connectors, 54

installing, 67

LEDs, 96

powering on, 92, 96

status, 97

features

- fabric card, 52
- fabric card filler, 52
- InfiniBand cable, 61
- line card, 56

FRU ID

- CMC, 88
- fabric card, 100
- fabric card filler, 100
- InfiniBand cable, 118
- line card, 107
- power supply, 91

fruinfo command, 88, 91, 100, 107, 118

G

getbaseguid command, 93

getfwversion command, 97, 104

H

handling guidelines

- fabric card, 17
- fabric card filler, 17
- InfiniBand cable, 9
- line card, 18

I

i2ctest command, 86

ibcheckerrors command, 123

ibdiagnet command, 121

ibnetdiscover command, 120

InfiniBand cable

- addressing, 117
- attaching, 109
- bundling, 13
- cautions, 10
- connector, 5
- delivery
 - floor and underfloor, 14
 - overhead, 14
- features, 61
- FRU ID, 118
- handling guidelines, 9, 11
- inspecting, 61
 - connectors, 63
 - hardware, 62
- length, 12
- path lengths, 12
- routing, 9
- type, 12
- understanding, 9

InfiniBand fabric

- diagnosing, 121
- discovering, 120
- validating, 123
- verifying, 119

initial

- configuration, 83

inspecting

- components, 45
- fabric card, 51
 - chassis, 53
 - fans, 54
 - retainer bolts, 53
 - XBOW connectors, 54
- fabric card filler, 51
 - chassis, 53
 - fans, 54
 - retainer bolts, 53
 - XBOW connectors, 54

InfiniBand cable, 61

- connectors, 63
- hardware, 62

line card, 55

- chassis, 58
- CXP connectors, 60
- retainer bolts, 58
- XBOW connectors, 59

midplane, 45

installation

- preparation, 19
- responsibilities, 20
- sequence, 20
- understanding, 15

installing

- cable curve, 38
- cable tree, 32
- chassis, 39
- components, 63
- fabric card, 67
- fabric card filler, 67
- HPC software, 23
- InfiniBand software, 23
- line card, 72
- midplane stiffener, 64
- rail, 29
- switch, 15

L

LEDs

- CMC, 80
- fabric card, 96
- fabric card filler, 96
- line card, 103, 115
- power supply, 80

line card

- addressing, 106
- distribution, 17
- enabling, 102
- features, 56
- filler, 18
- FRU ID, 107
- handling guidelines, 18
- inspecting, 55
 - chassis, 58
 - CXP connectors, 60
 - retainer bolts, 58
 - XBOW connectors, 59
- installing, 72
- LEDs, 103, 115
- midplane
 - connectors, 48
 - inspection, 50
- powering on, 101, 103
- status, 104

link status, 116

M

management cables

- attaching, 76
- requirements, 9

midplane

- connectors
 - fabric card, 46
 - line card, 48
- inspecting, 45
 - fabric card, 47
 - line card, 50
- stiffener
 - installing, 64
 - removing, 70

N

network management

- cable requirements, 9
- connector, 4

O

- opensm command, 93

P

physical specifications, 2

power cord

- attaching, 78
- requirements, 8

power supply

- addressing, 90
- FRU ID, 91
- LEDs, 80
- status, 89

powering on

- CMC, 75
- fabric card, 92, 96
- fabric card filler, 92, 96
- line card, 101, 103

preparing

- chassis, 29
- for installation, 19
- site, 1

- printenv command, 83

- psustatus command, 89

R

- rail installation, 29

- reboot command, 83

removing

- midplane stiffener, 70
- shipping carton contents, 25

- root node GUID file, 93

routing

- InfiniBand cable, 9
- service cables, 7

S

- saveenv command, 83

- sequence of installation tasks, 20

serial management

- cable requirements, 9
- connector, 5

- setenv command, 83

- setlanconfig command, 84

setting

- uboot parameters, 83

- shmstatus command, 86

- showpresent command, 86, 97, 104

specifications

- acoustic noise, 3
- electrical, 3
- environmental, 3
- physical, 2
- switch, 1

status

- CMC, 86
- fabric card, 97
- fabric card filler, 97
- line card, 104
- link, 116
- power supply, 89

- suggested tools, 19

- supported configurations, 16

switch

- installation, 15
- specifications, 1

T

- telnet command, 84

U

- uboot parameters, 83

- understanding

- InfiniBand cable, 9
- installation, 15
- switch specifications, 1
- unpacking the chassis, 25
- unsecuring the chassis, 28

V

- validating the InfiniBand fabric, 123
- verifying the InfiniBand fabric, 119

