![Sun Microsystems logo]

Sun Fire™ Link Switch Installation and Service Manual

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Preface

This document describes the procedures for installation and service of the Sun Fire Link Switch. These instructions are intended for an experienced hardware installer and system administrator.

Before You Read This Book

To follow the procedures described in this document, you should be familiar with the related topics discussed in the following documents:

- The *Sun Fire Link Release Notes*
- Documentation that accompanied your Sun Enterprise™ or other Sun UltraSPARC™ based server
- Documentation for the Solaris™ operating environment

Using UNIX Commands

This document may not contain information on basic UNIX® commands and procedures such as shutting down the system, booting the system, and configuring devices.

See one or more of the following for this information:

- *Solaris Handbook for Sun Peripherals*
- AnswerBook2™ online documentation for the Solaris operating environment
- Other software documentation that you received with your system

Typographic Conventions

TABLE P-1 Typographic Conventions

Typeface	Meaning	Examples
AaBbCc123	The names of commands, files, and directories; on-screen computer output	Edit your `.login` file. Use `ls -a` to list all files. `% You have mail.`
AaBbCc123	What you type, when contrasted with on-screen computer output	`% `**`su`** `Password:`
AaBbCc123	Book titles, new words or terms, words to be emphasized	Read Chapter 6 in the *User's Guide*. These are called *class* options. You *must* be superuser to do this.
	Command-line variable; replace with a real name or value	To delete a file, type `rm` *filename*.

Shell Prompts

TABLE P-2 Shell Prompts

Shell	Prompt
C shell	*machine_name*%
C shell superuser	*machine_name*#
Bourne shell and Korn shell	$
Bourne shell and Korn shell superuser	#

Related Documentation

TABLE P-3 Related Documentation

Application	Title	Part Number
Overview	*Sun Fire™ Link System Overview*	816-0697
Task Map	*Task Map for Getting Started With Sun Fire™ Link Networks*	816-0041
Site Planning	*Sun Fire™ Link Systems Site Planning Guide*	816-6592
Service	*Sun Fire™ Link Service Manual*	806-1394
Hardware Installation	*Sun Fire™ Link Hardware Installation Guide*	806-1396
Software Installation	*Sun Fire™ Link Software Installation Guide*	806-1401
System Administration	*Sun Fire™ Link Fabric Administrator's Guide*	806-1405
Late Breaking Information	*Sun Fire™ Link Interconnect Release Notes*	806-1404

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Please include the title and part number of your document with your feedback:

Sun Fire Link Switch Installation and Service Manual, part number 806-1397-11

Preparing for Switch Installation

This chapter contains the following sections:

- Section 1.1, "What is the Sun Fire Link Switch?" on page 1-1
- Section 1.2, "Where is the Sun Fire Link Switch Installed?" on page 1-8
- Section 1.3, "Configuring the Sun Fire Link Switch" on page 1-9
- Section 1.4, "Clustering Three or More Nodes" on page 1-10
- Section 1.5, "Planning the Installation" on page 1-10
- Section 1.6, "Tools Required" on page 1-10
- Section 1.7, "Safety Precautions" on page 1-11

1.1   What is the Sun Fire Link Switch?

The Sun Fire Link switch (FIGURE 1-2) is part of a clustering technology that can be used to scale the capabilities of upper end Sun Fire systems, specifically Sun Fire 6800 and 15K/12K systems. The switch manages the Sun Fire Link network in a hub and spoke fashion using eight optical ports (FIGURE 1-1).

Switch enclosure 0

Switch ASIC

Backplane

Optical modules 0-7

SC

AC input unit

Switch enclosure 1

Switch ASIC

Backplane

Optical modules 0-7

SC

AC input unit

Link 0

Link 2

Link 0

Link 2

Optical cables

6800

Node 0

Fire Link Assy

Fire Link Assy

6800

Node 1

Fire Link Assy

Fire Link Assy
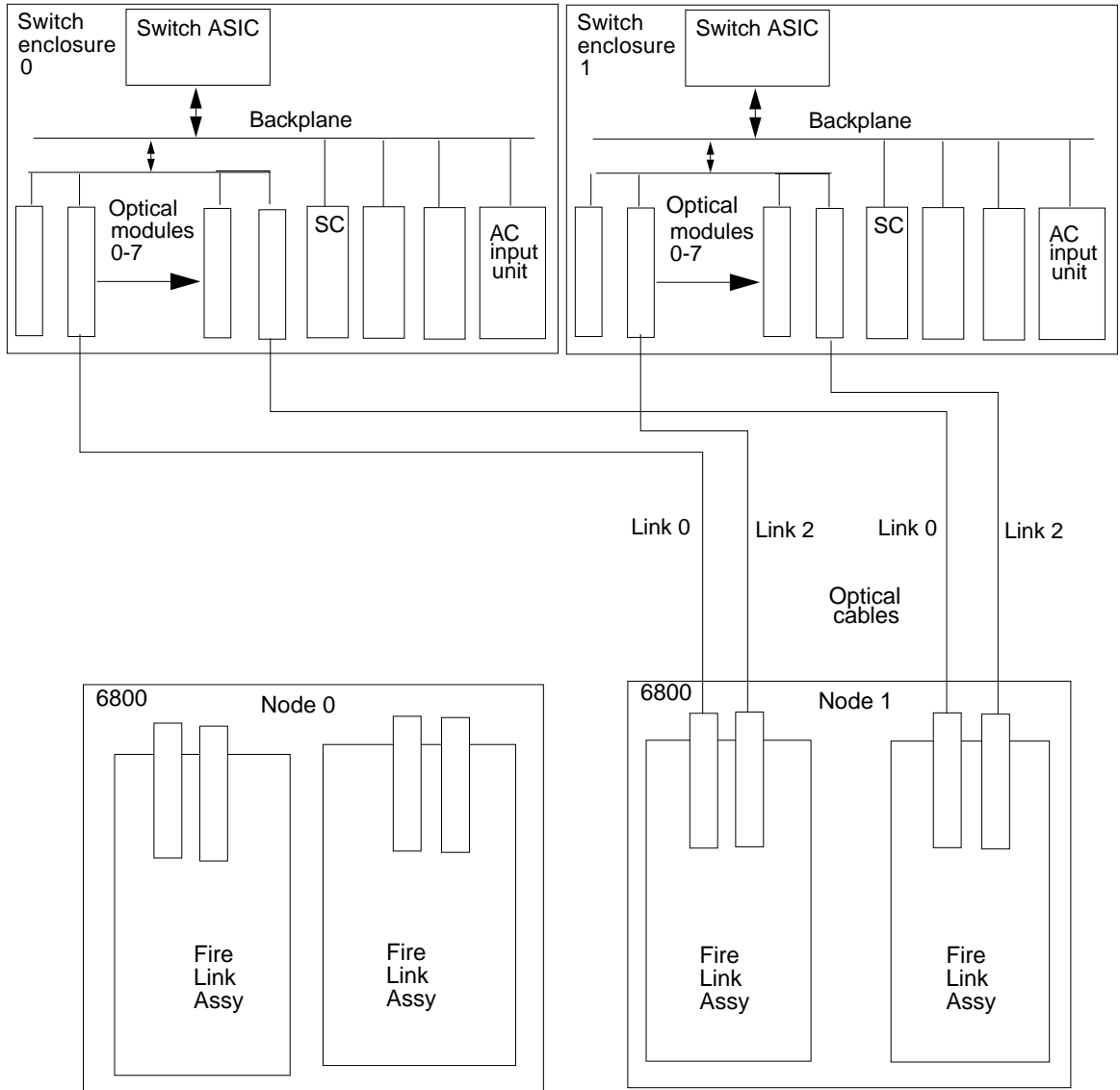
FIGURE 1-1   Typical Switch and Node Interconnections

Note – Sun Fire Link optical modules and Paroli modules are two terms used in this document for the same module.

The switch consists of an enclosure that includes a backplane and two fan trays. The switch enclosure is vented front to rear. The backplane has slots that accommodate several modular components (TABLE 1-1), which are of the cPCI form factor.

The modular components are:

- Sun Fire Link optical modules (up to eight)
- Sun Fire Link Switch System Controller module
- Fan tray (two)
- Power supply modules (two)
- Sun Fire Link switch ASIC module

The switch System Controller module has an Ethernet port and two serial ports. Each optical module has a transmit and receive connector pair.

Note – Although these modules are of the compactPCI form factor they are not compactPCI modules. Modules of this form factor may be a tighter fit in the slot than other cards that you are accustomed to installing.

TABLE 1-1   Switch Components

Description	Part Number	Module Width
Two Fan tray	370-4393	Not applicable
Two power supply modules	300-1518	Two units each
Switch system controller module	501-5637	Two units
Eight optical modules	375-0093	One unit each
Switch ASIC module	501-5939	Three units
Backplane, interconnecting harness and AC Input Unit	540-5205	Not applicable
Fuse (AC Input Unit)	S505-3A	Not applicable
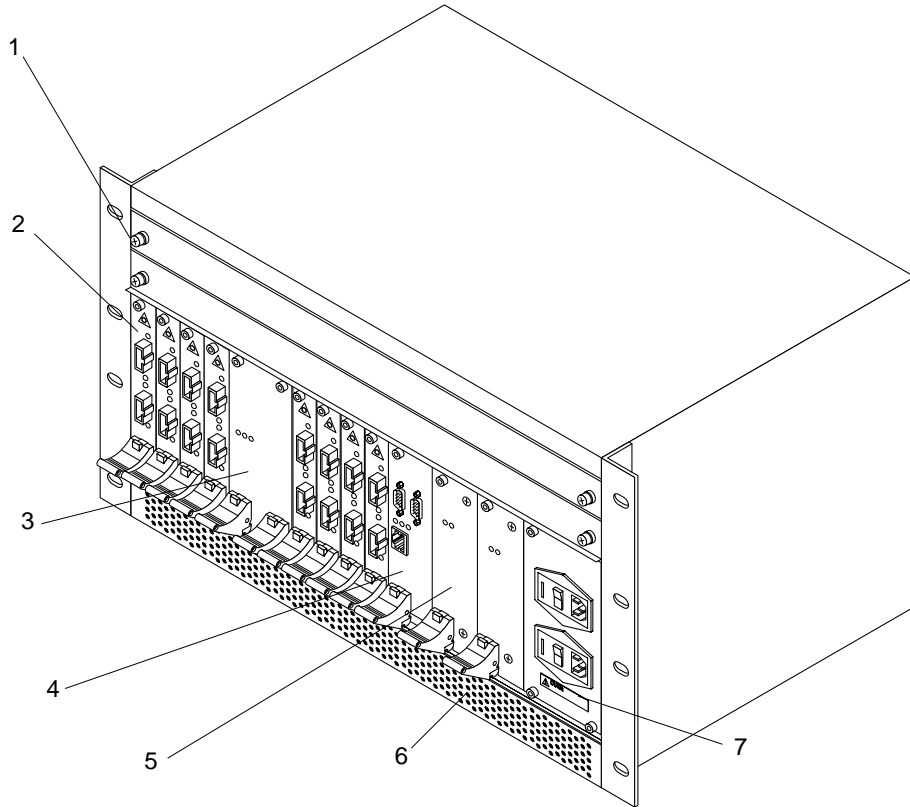
1. Fan trays (2)   5. Power supply modules (2)
2. Optical modules (8)   6. Air intake vent (rear exhaust vent
3. Switch ASIC module   7. AC input unit
4. Switch system controller module

FIGURE 1-2 Switch Enclosure

1.1.1   Sun Fire Link System Controller Module

The system controller module controls the Sun Fire Link switch with a local microprocessor. The module has two serial ports and one Ethernet port (FIGURE 1-3).
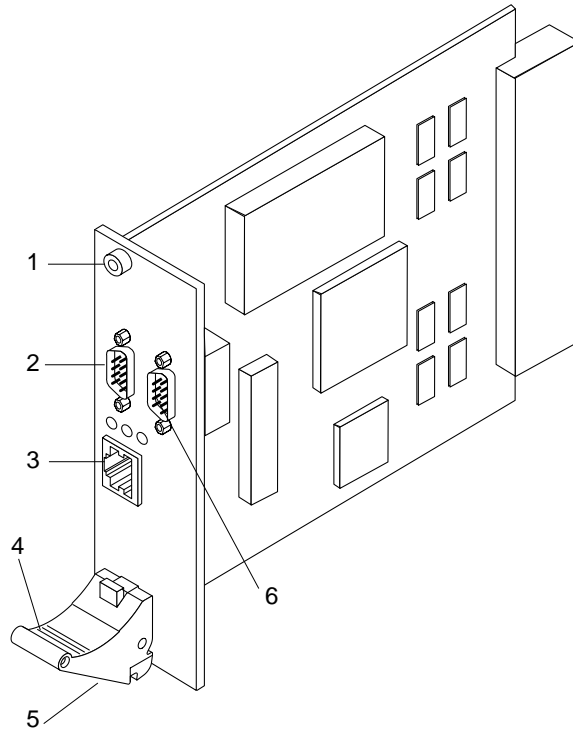
1. Captive screw   4. Ejector lever
2. Serial port B   5. Captive screw (below ejector lever)
3. Ethernet port   6. Serial port A

FIGURE 1-3   Sun Fire Link System Controller Module

1.1.1.1   Flash-Write Enable Jumper

There is a jumper on the switch system controller module that either prevents or permits flash updating of the module's firmware. The jumper is at the position labeled J0601 (FIGURE 1-4). Pin 1 is labeled on the board with an asterisk (*). If the jumper is in the disabled position, you must set the jumper to the enabled position before you can flash update the module.

Note – After you flash update the module, leave the jumper in the enabled position.

.

Enabled position   Disabled position

J0601   J0601

Pin 1   Pin 1
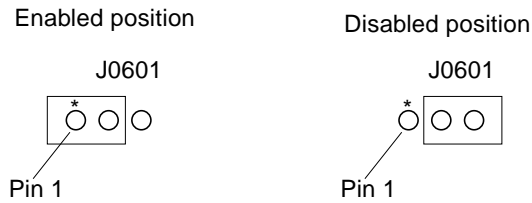
FIGURE 1-4   Flash-write Enabled Jumper on Switch System Controller Module

1.1.2   Sun Fire Link Switch ASIC Module

The switch ASIC module (FIGURE 1-5) is a crossbar packet switch connecting as many as eight Sun Fire Link bidirectional fiber-optic links. The switch module checks incoming data for proper framing, CRC, and routability, then directs them through an internal crossbar to an outgoing link. Each bidirectional link is managed by an associated ejector (receiver) and injector (transmitter) circuit in the ASIC.

Captive screws (2)

Ejectors (2)

Captive screws
(below ejector levers)
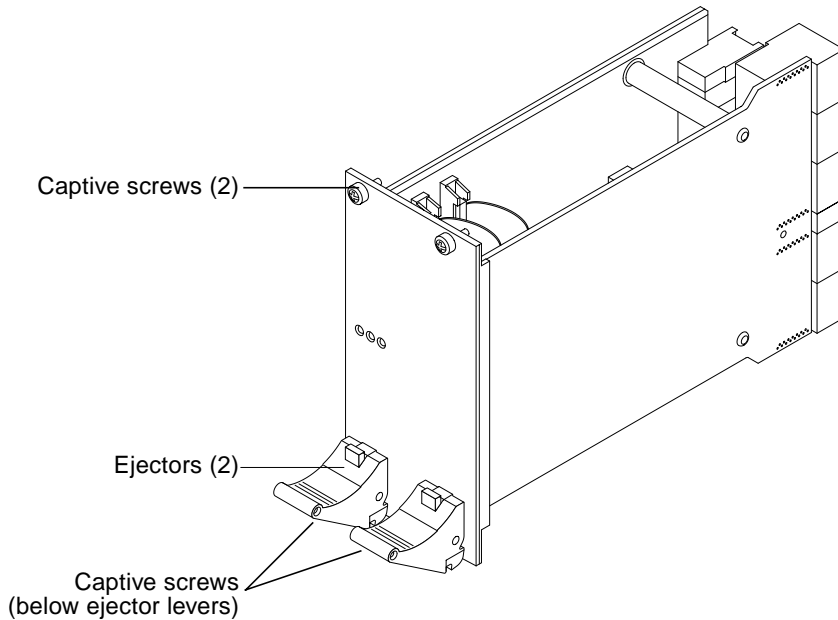
FIGURE 1-5   Sun Fire Link ASIC Module

1.1.3 Sun Fire Link Optical Modules

Optical module components are built around transceiver interface assemblies. They have:

- cPCI form factor
- 0.8-inch wide, 3U cPCI form factor
- Hot-plug capability
- Tx and Rx link ports, with labels
- Eye safety
- FDA Class 1, IEC Class 3A
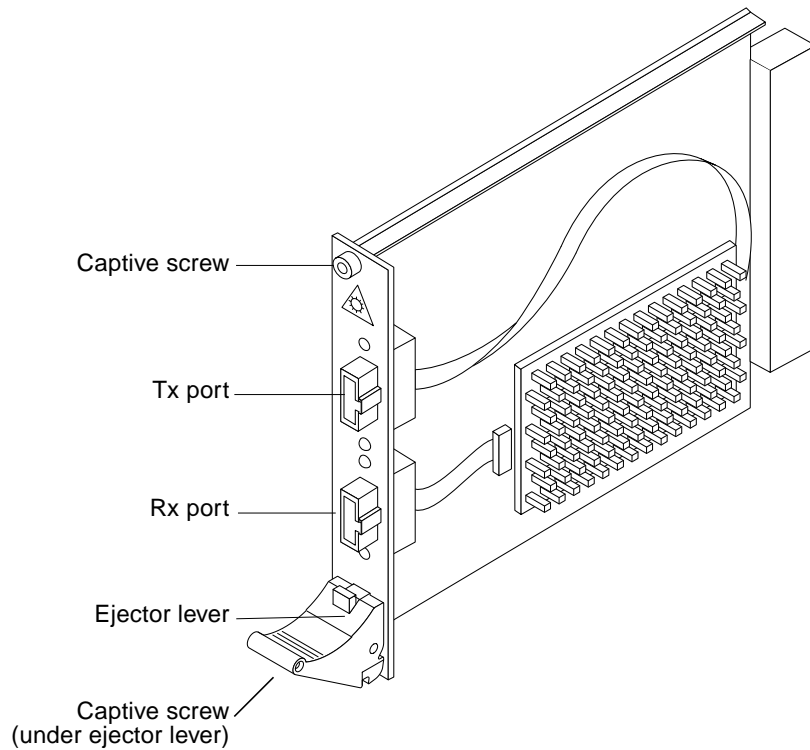
FIGURE 1-6   Sun Fire Link Optical Module

1.1.4 Sun Fire Link Power Supply Modules

Captive screw

Captive screw
(below ejector lever)
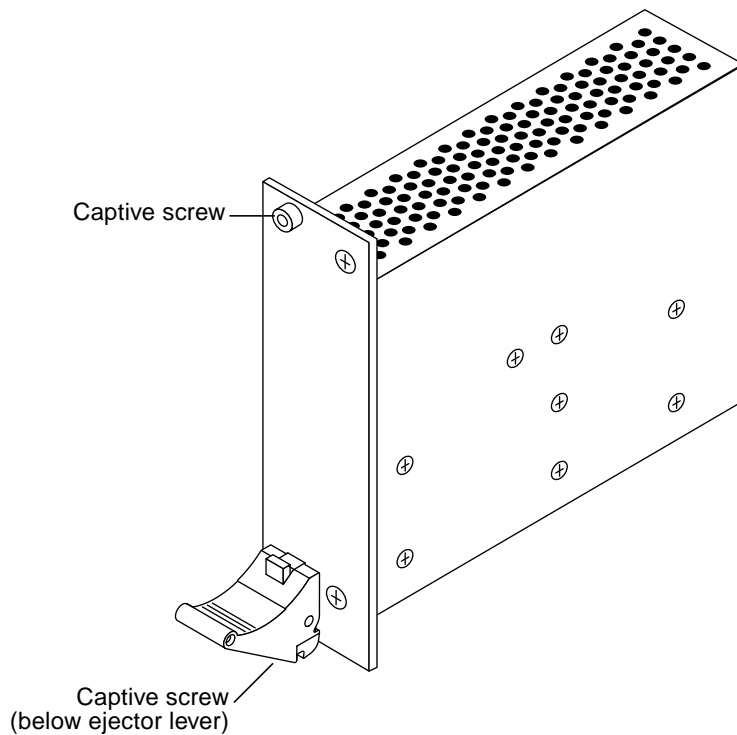
FIGURE 1-7   Sun Fire Link Power Supply Module

1.2 Where is the Sun Fire Link Switch Installed?

The Sun Fire Link switch enclosure uses seven units of vertical rack space (12.25 inches). The depth of the switch enclosure is 16 inches including the rackmounting ears that recess the enclosure approximately 4 inches (3.625 inches) behind the rack's rails.

The Sun Fire Link switch enclosure can be mounted in a Sun Fire expansion or StorEdge cabinet, or a customer's cabinet.

1.3 Configuring the Sun Fire Link Switch

You must select from a number of configuration options before attempting to use the switch, see Section 3.3.3, "Updating Switch Configuration Variables" on page 3-8. Some of these options, such as the IP address, are required for other components to communicate with the switch. Other options make it easier to administer the switch, such as the loghost designation, which provides a log location.

1.3.1 Internet Protocol (IP) Address

IP addresses on Ethernet are associated with a media access control (MAC) address. When the switch power on process begins, a dynamic host configuration protocol (DHCP) request keyed with the Switch MAC address is broadcast on Ethernet and the response determines the IP address.

Whenever an IP address is fetched from Ethernet, it is stored in non-volatile configuration information (NVCI). If an IP address is not supplied via DHCP, the previously stored IP address is used.

1.3.2 `syslog` Message Target

The UNIX `syslog` infrastructure provides elaborate and configurable message logging capabilities. Switches send properly formatted `syslog` messages via ethernet to user datagram protocol (UDP) port 514 (by default) to a specific host.

A `syslog` target is an IP address, UDP port pair identifying where to send messages. The UDP port is optional, but the IP address is mandatory. The IP address of the `syslog` server will be collected from the DHCP server, along with the IP address of the switch. The user is responsible for configuring the DHCP server to return this information.

1.4 Clustering Three or More Nodes

The Sun Fire Link switch is required when clustering larger clusters. Three nodes can be configured directly (each node being connected to each of the other two nodes) with two-way striping. Three nodes with four-way striping must use a switch. Cabling and further details are provided in the *Sun Fire™ Link Hardware Installation Guide.*

1.5 Planning the Installation

Refer to the *Sun Fire™ Link Hardware Installation Guide*.

You will also require the following:

- Serial line or terminal concentrator to access the system controller
- Ftp or http server for firmware upgrades

1.6 Tools Required

For the procedures in this book, you will need these tools:

- Screwdriver, Phillips 0.1 and 0.2
- Allen wrench
- Torque wrench
- Needlenose pliers
- ESD mat
- Grounding wrist strap

1.7   Safety Precautions

For your protection, observe the following principles when setting up your equipment:

- Follow all cautions, warnings, and instructions marked on the equipment.
- Never push objects of any kind through openings in the equipment as they may touch dangerous voltage points or short out components that could result in fire or electric shock.
- Refer servicing of equipment to qualified personnel.

1.8   Electrical Hazards

To protect both yourself and the equipment, observe the following safety precautions:

- Wear a conductive wrist strap or foot strap when handling magnetic storage devices, or modules.
- Use an approved ESD mat. It provides protection from static damage when used with a wrist strap or foot strap. The mat also cushions and protects small parts that are attached to modules.
- Ensure that the voltage and frequency of the power outlet to be used matches the electrical rating labels on the equipment
- Use only properly grounded power outlets as described in the *Sun Fire 6800 System Installation Guide*. For example, keep the chassis AC power cord(s) connected to ensure a proper ground.
- DO NOT make mechanical or electrical modifications to the cabinet. Sun Microsystems™ is not responsible for regulatory compliance of modified cabinets.

1.9 Safety Symbols

The following symbols mean:

TABLE 1-2   Symbols
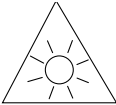
Symbol	Description	Meaning
	CAUTION	Hazardous voltages are present. To reduce the risk of electrical shock and danger, follow the instructions.
	CAUTION	Risk of personal injury. To reduce the risk, follow the instructions.
	CAUTION	Risk of equipment damage. To reduce the risk, follow the instructions.
	SURFACE	CAUTION: Hot surfaces. Avoid contact. Surfaces are hot and may cause personal injury if touched.
	AC	A terminal to which alternating current or voltage may be applied.
	SYSTEM POWER	System is receiving DC power. When the power LED is lit the system is operating normally.
	BOARD OR COMPONENT POWER	Module or component is receiving DC power. When the power LED for the module or component (top green LED) is lit, the component is operating normally.

TABLE 1-2 Symbols *(Continued)*

Symbol	Description	Meaning
	FAULT	System has detected a hardware failure. When the fault LED (middle, amber) is lit, the system has detected a hardware failure.
	OK TO REMOVE	You can safely remove module or component from the system when the Removal OK LED (bottom, amber) is lit.
	PROTECTIVE EARTH	Earth ground.
	CHASSIS	Frame or chassis ground.
	FUSE REPLACEMENT MARKING	For continued protection against risk of fire and electric shock, replace ONLY with fuse of the same type and rating.
	OPTICAL LASER WARNING	CAUTION: It is unsafe to look directly into uncovered connector receptacles on active optical modules as it can be injurious to your eyesight.

1.10   Handling Modules

Sun Fire Link switch modules have surface-mount components that can be broken by flexing the assemblies. To minimize the amount of module flexing, observe the following precautions.

- Hold the module only by the front edges.
- When removing the module from an antistatic bag, keep the module vertical until you lay it on the Sun ESD mat.
- Do not place the module on a hard surface. Use a cushioned antistatic mat. The module connectors and components have very thin pins that bend easily.
- Be careful of small parts located on the component sides of the module.
- Do not use an oscilloscope probe on the components. The soldered pins are easily damaged or shorted by the probe point.
- Transport the module in an antistatic bag.

1.10.1   Heat Sinks

The heat sinks on the optical modules can be damaged by incorrect handling or packaging. Do not touch the heat sinks while installing or removing the modules. Hold the modules only by the edges. If a heat sink is loose or broken, obtain a replacement module.

1.11   Filler Boards

Filler boards, which are physically inserted into the module slot, are used for EMI protection and for air flow. If you are going to remove an optical module from a powered-on switch for more than one minute you must install a filler board in the module slot in order to prevent the switch from overheating.

1.12 LEDs

LEDs on the Sun Fire Link switch modules provide visual indications of a module's status and have different functions depending upon the module type. LED status must be monitored on the switch system controller, ASIC, and optical modules as a function of their removal or replacement (TABLE 1-3). The following sections detail LED operation for each of the module types.

1.12.1 Switch System Controller LEDs and Switch ASIC Module LEDs

Three LEDs on the switch system controller (FIGURE 1-8) and switch ASIC modules (FIGURE 1-8) function as indicated in TABLE 1-3.

1. Fault status LED
2. Removal OK LED
3. Power LED

4. Ejector lock button
5. Ejectors
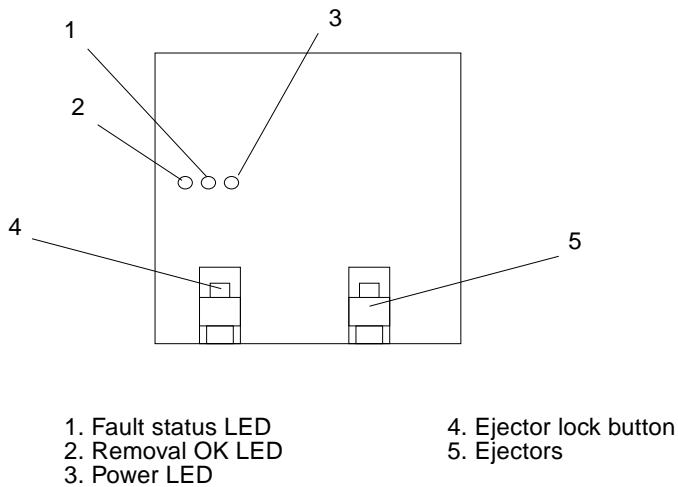
FIGURE 1-8   Switch System Controller
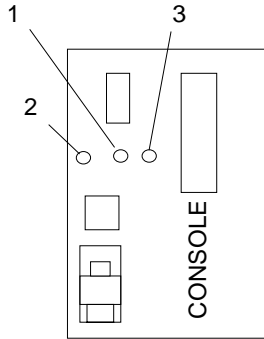
1. Fault status LED
2. Removal OK LED
3. Power LED

FIGURE 1-9 Switch ASIC LEDs

TABLE 1-3 Switch System Controller and Switch ASIC Module LED Functions

LED	On	Off
Power (green)	Power is applied to the module	Power to the module is off
Fault (amber)	Internal module fault	No internal module fault
Removal OK (amber)	You can remove the module under hot-swap conditions	You cannot remove the module under hot-swap conditions

1.12.2 Optical Module LEDs

The optical modules have three LEDs (FIGURE 1-10). A single green LED indicates power is applied; green and amber LEDs indicate link status (TABLE 1-3).

Power LED

Link status LED (green)
Fault status LED (amber)
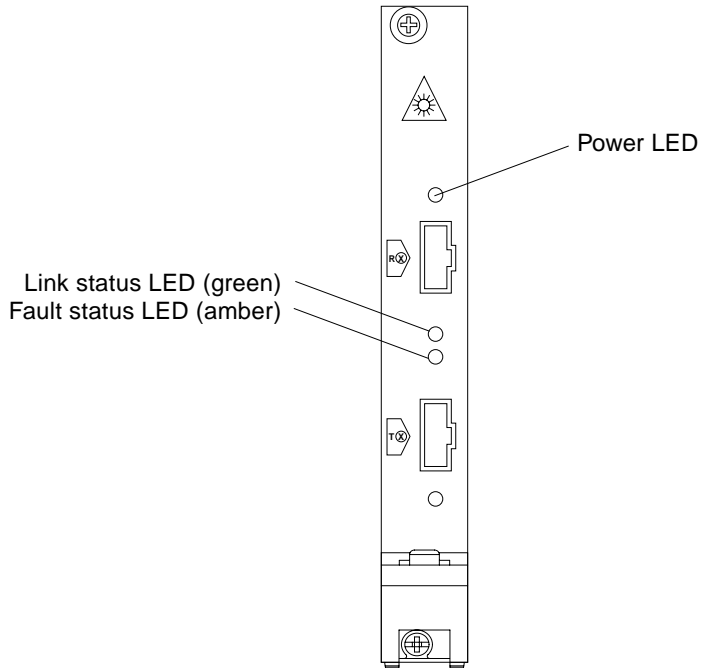
FIGURE 1-10 Card LEDs on Optical Module

TABLE 1-4 Card LEDs on Optical Module

Link Status LED (Green)	Fault Status LED (Amber)	Meaning
OFF	OFF	No External Link detected. No valid Rx Clock detected
ON	OFF	Link operational: Valid Rx clock received. Remote ID validated.
ON	ON	Degraded link detected: This combination indicates that an error threshold has been exceeded. The link is still operational but performance may be degraded.
BLINKING	OFF	Link is in the process of moving to the operational state.

1.12.3   Power Supply Modules

There are two LEDs for each power supply. A green Power LED is lit when power is applied and there is no fault. An amber Fault LED is lit if power is applied and there is a fault.

Power LED   Fault status LED
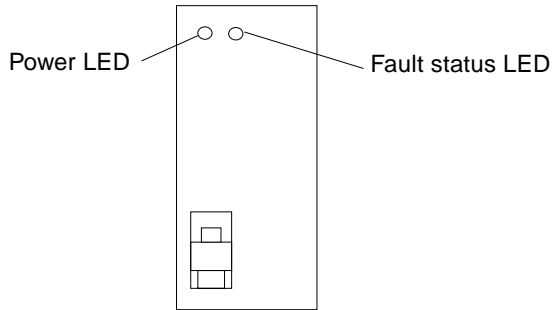
FIGURE 1-11 Power Supply Module LEDs

Installing the Sun Fire Link Switch

Note – Sun Fire Link optical modules and Paroli modules are two terms used in this document for the same module.

This chapter provides installation procedures for a new system. It contains the following sections:

- Section 2.1, "Mounting Sun Fire Link Switches" on page 2-1.
- Section 2.2, "Installing an Ethernet Cable" on page 2-2
- Section 2.4, "Adding Optical Modules to the System" on page 2-3.
- Section 2.5, "Attaching Cables to the Optical Modules" on page 2-5.
- Section 2.7, "Powering on the Sun Fire Link Switch" on page 2-7.
- Section 2.8, "Configuring the Sun Fire Link Switch" on page 2-7.

2.1 Mounting Sun Fire Link Switches

Use the guidelines shown in FIGURE 2-1.

Switch #1 (7 U)		Switch #1 (7 U)

————— Cable Slot (1 U) —————

| Switch #2 (7 U) | | Switch #2 (7 U) |

————— Cable Slot (1 U) —————

| | | Switch #3 (7 U) |

| 20 U available for storage | Cable Slot (1 U) ————— | |

| | | Switch #4 (7 U) |

Cable Slot (1 U) —————

| | | 4 U available for storage |

Two switches in a rack   U=rack unit   Four switches in a rack
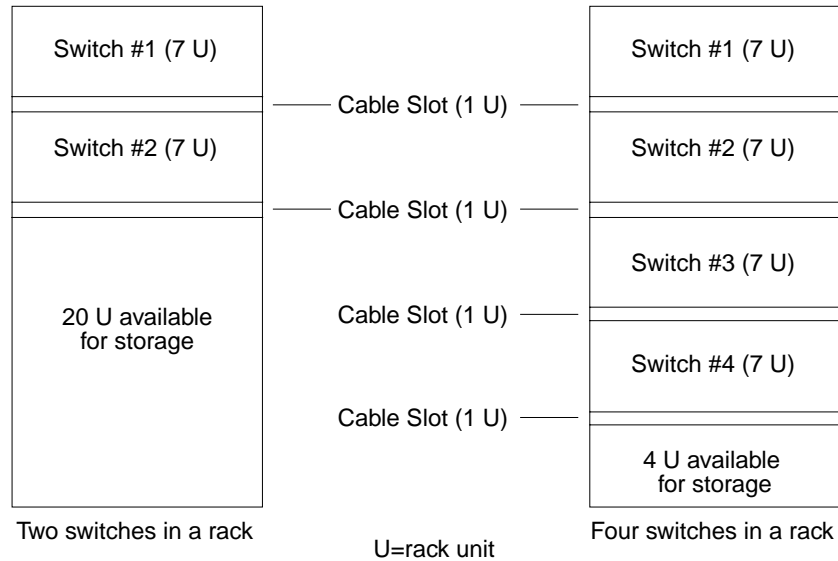
FIGURE 2-1   Switch Placement in Racks

2.2 Installing an Ethernet Cable

There is an Ethernet port on the system controller module that has a standard RJ-45 LAN connector supporting 10 base-T communications.

● **Connect the Ethernet cable to the Ethernet port on the system controller module.**

2.3 Installing a Serial Cable

A serial cable is used for configuring the switch through the command line interface. See Chapter 3 for details on the command line interface.

● **Install a serial cable (DB-9M connector) from port A on the switch system controller (FIGURE 1-3) to the network terminal server (NTS) or terminal. See the *Sun Fire Link Systems Site Planning Guide* for a connection diagram.**

2.4 Adding Optical Modules to the System

Optical modules must be added to the switch chassis in numerical order beginning with slot 0.

1. **Attach an ESD wrist or foot strap. Connect the ESD strap to the system.**

Caution – You must install the optical module in a powered-on switch within one minute of removing a filler board from the slot in order to prevent the system from overheating.

2. **Remove the filler board occupying the slot.**

The optical module slots are identified LINK 0 through LINK 7, from left to right (FIGURE 2-2).
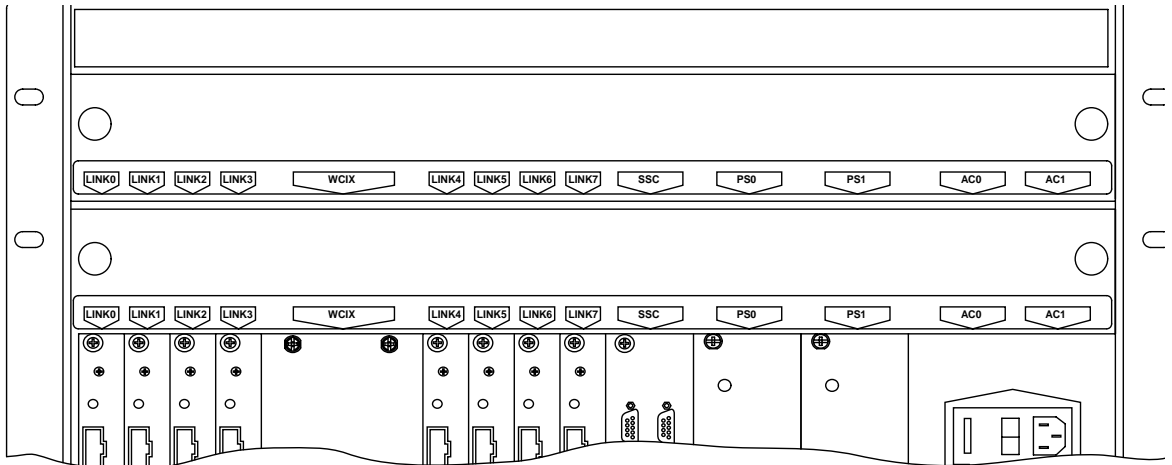
FIGURE 2-2   Module Labeling

3. **Ensure that the module ejector is unlocked by depressing the ejector red lock button (**FIGURE 2-3**).**

Captive
screws (2)

Ejector
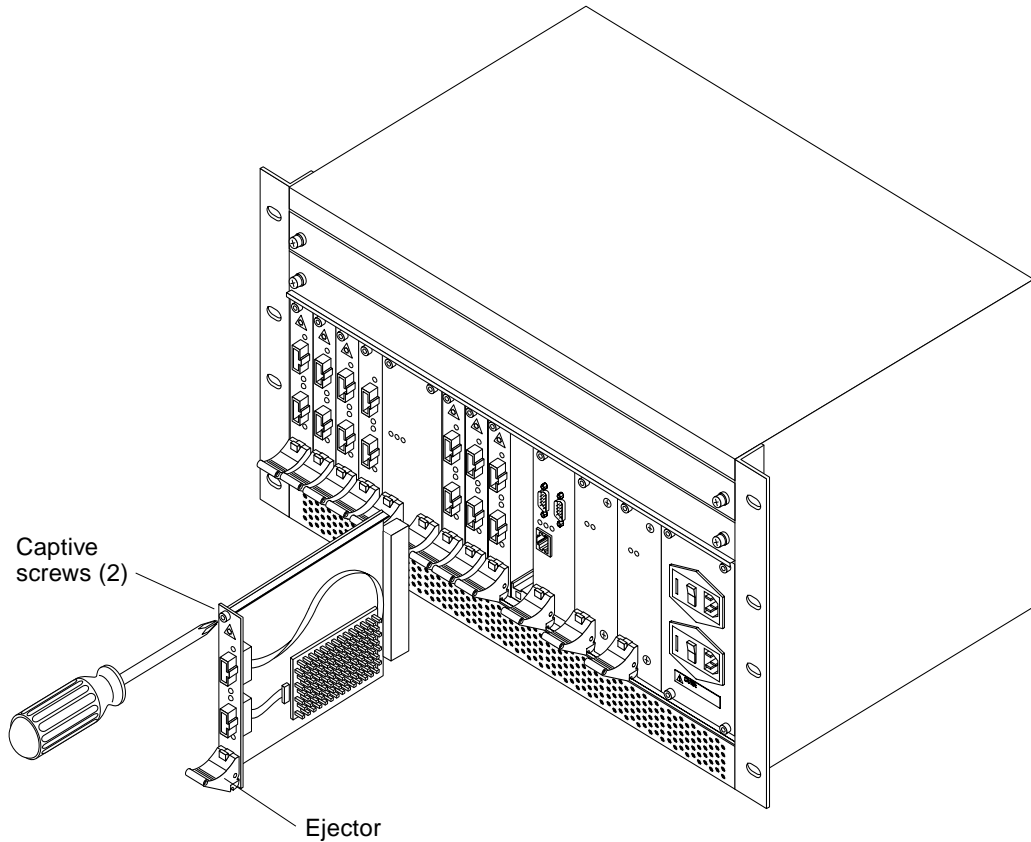
FIGURE 2-3   Adding Optical Module

⚠️ **Caution –** Damage to the module can occur if an attempt is made to install the module without the module being correctly engaged into both the top and bottom slots of the card guides. Also, ensure that the module is correctly aligned within the slots prior to sliding it towards the backplane.

4. **Align the top and bottom of the module into the upper and lower slots that are on the left side of each card guide.**

5. **Once the module is correctly aligned in the card guide slots, slide the module towards the backplane until the ejector handle perceptively rises.**

6. **Once the module is fully inserted, push the module ejector handle up until the lock button engages with a snap.**

Note – It is important to tighten the screws as indicated in the following step in order to seat the module into the backplane connector.

7. **Tighten the captive screws.**

   It is important to tighten the screws to seat the module into the backplane connector.

8. **Attach optical cables as described in Section 2.5, "Attaching Cables to the Optical Modules" on page 2-5.**

2.4.1 Optical Link Module LEDs

Besides the LEDs that are located on the switch chassis (*slot LEDs*), each optical link module has three LEDs (FIGURE 1-10 and TABLE 2-1). A single green LED indicates whether or not power is applied; paired green and amber LEDs convey link status and configuration, TABLE 2-1.

TABLE 2-1   Card LEDs on Optical Module

Link Status LED (Green)	Fault Status LED (Amber)	Meaning
OFF	OFF	No External Link detected. No valid Rx Clock detected
ON	OFF	Link operational: Valid Rx clock received. Remote ID validated.
ON	ON	Degraded link detected: This combination indicates that an error threshold has been exceeded. The link is still operational but performance may be degraded.
BLINKING	OFF	Link is in the process of moving to the operational state.

2.5 Attaching Cables to the Optical Modules

Sun Fire Link fiber-optic cables attach switch interface optical modules to one another. Details about Sun Fire Link optical cables are listed below:

- Cables are available in 5-, 12-, and 20-meter lengths.
- Each cable has two plugs at each end (FIGURE 2-4). The white plug is the transmit cable, and the black plug is the receive cable.

- Each cable is labeled with a serial number that aids in cable route tracing (FIGURE 2-4).
- Cable changes can be made while the switch is operational. Changes should be made consistent with the software intended to manage and validate these changes.
- The cable connectors have a ridge on one side of the plug (FIGURE 2-4) that indicates proper alignment of the cable with the connector.
- The connectors make a distinct clicking sound when fully inserted.

To protect the cables, be sure to:

- Keep dust caps in place whenever cables are not connected
- Maintain a minimum bend radius of at least 30 millimeter (1.2 inches)

1. Cable length
2. Bar code
3. Unique serial number
   (at both ends of cable)
4. Insertion marks (disappear
   when inserted)

5. Transmit connector
6. Receive connector

FIGURE 2-4   Sun Fire Link Cable

2.6 Cabling Sun Fire Link Systems

Cables can be added to and removed from the system while the system is an operation.

● **Install cables (The black connector is receive and the white connector is transmit.) Be sure to follow the cabling patterns you planned for your system in Appendix A of the** *Sun Fire Link Hardware Installation Guide.*

Make sure to insert the cable connector all the way in until you hear a clicking sound.

2.7 Powering on the Sun Fire Link Switch

1. **Connect the two switch AC input cables into outlets that are on separate circuit breakers.**

Caution – Although the switch can operate on just one power source, the second power source (on a separate circuit breaker) provides for redundancy. Connect each AC input cable to independent sources to make the system redundant.

---

2. **Position the switches on the switch AC Power Input unit to on.**

Note – The Sun Fire Link switch operating system real time operating system (RTOS) and the switch application software are preloaded at the factory.

When the system controller module is powered on, it will boot RTOS. To reboot, use the `reboot` command.

2.8 Configuring the Sun Fire Link Switch

Once a switch is installed and powered on, use the `setupplatform` command to set the following configuration variables:

- `ip_mode [dhcp]`
- `ip_address [] >`

- netmask [] >
- routers [] >
- hostname [08:00:12:ab:56:78] >
- tpe_link_test [true] >
- dns_domain [] >
- dns_resolvers [] >
- loghost [] >
- console_timeout [] >
- snmp_enabled [false] >
- snmp_enabled [false] >
- switch_description [] >
- switch_contact [] >
- switch_location [] >
- snmp_private_community [P-private] >
- snmp_public_community [P-public] >
- snmp_trap_hosts [] >

Note – Variables under snmp_enabled are skipped if snmp_enabled is set to false. Some network variables are displayed by setupplatform only when ip_mode has been set to static. Many network variables may already have been assigned values if DHCP was enabled when the switch was booted and a DHCP server was configured to respond to this switch.

Command Line Interface

This chapter discusses commands available through the SwitchApp command line interface (CLI).

Note – *Sun Fire Link optical module* and *Paroli* are two terms used in this document for the optical modules used within a Sun Fire Link Interconnect system.

The CLI commands can configure the switch system (such as setting network configuration parameters, passwords, and time and date), query board test status, and manually initiate tests.

This chapter contains the following sections:

- Section 3.1, "Accessing the Command Line Interface" on page 3-1
- Section 3.2, "Help Commands" on page 3-2
- Section 3.3, "Setup Commands" on page 3-4
- Section 3.5, "Diagnostic Commands" on page 3-18
- Section 3.6, "Maintenance Commands" on page 3-26

3.1 Accessing the Command Line Interface

The SwitchApp CLI is accessible through serial port A on the switch, or through a networked system that is connected to serial port A.

The CLI prompt (`SSC>`) is displayed after the real time operating system (RTOS) loads. The RTOS is loaded automatically when the switch is powered on. Some examples in this chapter include a fictitious hostname in the CLI prompt (`switch-one:SSC>`). Until a hostname is assigned, the factory setting displays the switch's MAC address instead of the hostname in the switch prompt.

3.2　Help Commands

You can display help information in two ways:

- `help` command
- `-h` option for a specific SwitchApp command

3.2.1　Using the `help` Command

You can use the help command for a specific command or to display a list of commands for which help is available.

- For detailed help for a specific command, type:

```
SSC> help command_name
```

■ To see a list of commands for which help is available, type:

CODE EXAMPLE 3-1   Viewing Help Topics Available

```
switch-one:SSC>help

flashupdate-- Updates the flash memory of the switch
help-- Shows help for a command, or lists commands.
logout-- Will logout the user from the console
password-- Interactively sets the password used to access the command line
interface
reboot-- Reboots the Switch system controller
reinitnetwork-- Reinitializes the network adapter with updated settings.
rmi_password-- Interactively sets the password used to authenticate RMI
requests.
set -- Sets a specified configuration variable.
setdate-- Sets the date and time on the SSC
setdefaults-- Sets all configuration settings to default values
setupplatform-- Prompts for values of system configuration variables
show-- Displays the specified system configuration variables
showboards-- Shows a list of installed boards and their statuses
showdate-- Shows the SSC date and time
showdiags-- Shows a list of diagnostic tests and their statuses
showenvironment-- Shows values of the switch's environmental sensors
showlinks-- Displays the status of the links of the switch
showplatform-- Displays the values of system configuration variables
showsc -- Shows firmware revisions, memory information, and the date and time
testboard-- Manually executes one or all POST tests on a particular board
```

3.2.2   Using the –h Option

The –h option provides an alternate method of displaying help information.

● **Type:**

```
SSC> command_name –h
```

Detailed help for the specified command is displayed. This is equivalent to typing
help *command_name*.

3.3 Setup Commands

All commands support a -h option, which displays detailed help on that command and is equivalent to typing the help command.

Tip – Unless specifically indicated in this chapter, any command or variable name can be abbreviated if the abbreviation is unambiguous. For example, the showdate command can be abbreviated to showda, but not to showd, which can be interpreted as either showdate or showdiags.

3.3.1 Setting the RMI Password

The RMI password ensures that only authorized instances of Sun™ Management Center software can update the switch.

3.3.1.1 Setting the RMI Password

This procedure is for the first time you set the RMI password.

● **Type:**

CODE EXAMPLE 3-2 Setting an RMI Password

```
switch-one:SSC> rmi_password

No RMI password is assigned. Do you want to set one? (y/[n]) >y

Enter new RMI Password   >      (not echoed)
Confirm new RMI Password >      (not echoed)

RMI Password set.
```

3.3.1.2 Changing the RMI Password

This procedure is for the changing an RMI password that has been previously set.

- **Type:**

CODE EXAMPLE 3-3   Changing an RMI Password

```
switch-one:SSC> rmi_password
Enter current password  > <enter old password>
Enter new Password   >   <enter new password>
Confirm new Password >   <enter new passsword>
Password set.
```

3.3.1.3   Disabling the RMI Password

Setting a blank (null) password disables RMI password security.

- **Type:**

CODE EXAMPLE 3-4   Disabling an RMI Password

```
switch-one:SSC> rmi_password

An RMI password is assigned. Do you want to modify it? (y/[n]) >y

Enter new RMI Password   >    (press Return)
Confirm new RMI Password >    (press Return)

RMI Password cleared.
```

3.3.2   Setting the Switch Console Password

The Switch Console password controls unauthorized access to the switch console.

Note – This is an optional feature; it will only be enabled if you set up a password.

3.3.2.1   Setting or Changing the Switch Console Password

It is not necessary to provide the old password in order to change or set a new
password.

- **Type:**

CODE EXAMPLE 3-5   Assigning an Switch Console Password

```
switch-one:SSC> password

No password is assigned. Do you want to set one? (y/[n]) >y

Enter new Password   >     (not echoed)
Confirm new Password >     (not echoed)

Password set.
```

3.3.2.2   Disabling the Switch Console Password

Setting a blank (null) password disables Switch Console password security.

- **Type:**

CODE EXAMPLE 3-6   Disabling a Switch Console Password

```
switch-one:SSC> password

Enter current Password > (enter current console password)
Enter new Password   >     (press Return)
Confirm new Password >     (press Return)

Password cleared.
```

3.3.2.3   Resetting a Forgotten or Lost Switch Console Password

If you have forgotten the switch console password, complete the following procedure to reset the password.

Note – You have 10 minutes to complete this procedure (including the hardware portion of moving the jumper) or the process must be started over again.

Note – Replacing the System Controller module will require that the Sun Fire Link Interconnect network configuration be restored using the Sun MC/Fabric Manager. Refer to the *Sun Fire™ Link Fabric Administrator's Guide* for procedures on restoring the configuration.

1. **Type:**

   CODE EXAMPLE 3-7   Resetting Switch Console Password

   ```
   switch-one:SSC>
   Enter Password> resetpassword
   Password reset request acknowledged.
   You must complete the password reset
   procedure within ten minutes, or the
   request will become invalid.

   It is OK to power off the system now.
   ```

2. **Power off the switch being sure to turn off power on both AC Power Input units.**

3. **Remove the switch system controller module (Section 4.2.1, "Removing a Switch System Controller Module" on page 4-5).**

4. **Move the flash-write enable jumper from its current position to the other position (Section 1.1.1.1, "Flash-Write Enable Jumper" on page 1-5).**

   For example, if the jumper is in the enabled position, move it to the disabled position.

5. **Reinstall the switch system controller module (Section 4.2.2, "Installing a Switch System Controller Module" on page 4-6).**

6. **Power on the switch.**

   The system returns to the password prompt.

7. **Type:**

   CODE EXAMPLE 3-8   Resetting Switch Console Password

   ```
   switch-one:SSC>
   Enter Password> resetpassword
   The password has been reset.
   ```

   Note – After completing this procedure, it is advisable to leave the jumper in the enabled position.

3.3.3 Updating Switch Configuration Variables

With one of the set commands, you can set an individual variable.

3.3.3.1 Setting a Specific Variable

The `set` command modifies the switch configuration variable that you specify. The range of possible values depends on the variable selected.

- Specifying no value, the current value is displayed, and you can choose to keep it or specify a new value.
- Setting a variable to – (dash) clears the current value or resets the value to a default, if there is one.
- If a value requires an IP address, specify the address in decimal format (*xxx.xxx.xxx.xxx*).

Note – Modifications to `loghost` or `snmp_trap_host` take effect immediately. Changes to `hostname` only take effect upon reboot. Changes to the remainder of these settings take place upon reboot or execution of the `reinitnetwork` command.

Tip – See the `setupplatform` command below, which is a quicker way to modify all of these settings at once.

To set a specific variable:

- **Type:**

```
SSC> set variable value
```

For example, you can specify the loghost value simultaneously with the `loghost` variable as shown below:

```
switch-one:SSC> set loghost workstation2
switch-one:SSC> show loghost
loghost = workstation2
```

Or, you can set the loghost name interactively by specifying the variable alone on the command line:

```
switch-one:SSC> set loghost
hostname [workstation2] > workstation3:local2
switch-one:SSC> show loghost
loghost = workstation3:local2
```

TABLE 3-1 lists all variables and values for the `set` command.

TABLE 3-1   Setting Variables and Values for the `set` Command

Variables	Values
dns_domain	Any string, such as "east.sun.com"
dns_resolvers	As many as two IP addresses, separated by spaces or commas or both
hostname	Any hostname that complies with DNS restrictions on hostnames. The hostname is displayed in the switch prompt. If a hostname has not been set, the switch prompt displays the MAC address instead.
ip_address	The IP address of this host
ip_mode	static or dhcp The Switch defaults to using DHCP unless this setting is modified. If DHCP has been selected when the network adapter is initialized, the system controller attempts to retrieve the hostname, IP address, netmask, routers, loghost, and DNS settings from the DHCP server. If new values are retrieved for those settings, they will overwrite the user-set values stored in the Switch configuration. Otherwise, the current values are kept.

Variables	Values
loghost	*IP address* [:*facility*] or *hostname* [:*facility*] *facility* may be a standard `syslog` facility: one of `kern`, `user`, `mail`, `daemon`, `auth`, `syslog`, `lpr`, `news`, `uucp`, `cron`, and `local0…local7`. If no facility is specified, the default of `local0` will be used.
console_timeout	Amount of time (in minutes) between command line entries. If time is exceeded, it will reset back to the main console. If a password has been specified, a password will be required.
netmask	Netmask
routers	As many as two IP addresses, separated by spaces or commas or both
snmp_enabled	`true` or `false` If `snmp_enabled` is true, an SNMP agent starts whenever SwitchApp starts. Use these parameters to configure the switch agent: `switch_description`: A string describing the switch. `switch_location`: A string describing the location of the switch. `snmp_public_community`: Authentication string for SNMP readers. The default value is P-public. `snmp_private_community`: Authentication string for SNMP readers and writers. The default value is P-private. `snmp_trap_hosts`: As many as two IP addresses or hostnames, separated by spaces or commas or both. If you change the value of `snmp_enabled`, you must reboot the switch for the change to take effect. By default, the value for `snmp_enabled` is false.
tpe_link_test	`true` or `false` This can be set to `false` to work with hubs that do not provide link pulses. The default value is `true`.

3.3.3.2   Setting the Time and Date

These commands set the time, date, and time zone (*tz*) to values that you specify, then display the new time and date.

● **Type one of the following** `setdate` **commands:**

CODE EXAMPLE 3-9   Setting the Date, Time and Time Zone

```
SSC> setdate -r datehost
SSC> setdate -t        (displays time zone choices)
SSC> setdate [-t tz] [mmdd]HHMM[.SS]
SSC> setdate [-t tz] mmddHHMM[[cc]yy][.SS]
SSC> setdate -t tz
```

`where:`

-t *tz* sets the time zone. To display available time zones, type `setdate -t`, as shown above.

-r *datehost* uses `rdate` to synchronize the time and date on the local host with the time and date on a remote host (*datehost*). *datehost* must be a valid hostname or IP address.

Note – The -r option does not set the time zone on the local host. Set the time zone manually.

3.3.3.3   Resetting Variables to Default Settings

The `setdefaults` command sets default values for all stored configuration settings, including the RMI password and network settings. The `setdefaults` command prompts for a password if one was previously set up.

Note – Running this commands resets the current password to its default value.

Caution – Use the `setdefaults` command should with care. It replaces user-defined values and requires a reboot so that the full effects of the command can take effect.

● **Type:**

```
SSC> setdefaults [-y]
```

Note – Enter the entire command. Do not abbreviate.

If you specify −y, the defaults are set without prompting the user. Otherwise, you are prompted for confirmation.

Note – The setdefaults command clears the value of the timezone (but not the time).

3.3.3.4   Setting Variables Interactively

The setupplatform command interactively prompts you for values for all network settings. If the current settings are correct, press Enter. Notes for the set command apply to the setupplatform command as well.

● **Type:**

CODE EXAMPLE 3-10 Setting Variables With setupplatform command

```
wildcat-ssc:SSC [expert]> setupplatform
ip_mode [dhcp] >static
ip_address [] >12.34.56.78
netmask [] >255.255.255.0
routers [] >23.45.67.89 34.45.56.67
hostname [08:00:12:ab:56:78] >switch-one
tpe_link_test [true] > (press Enter to accept)
dns_domain [] >demo.sun.com
dns_resolvers [] >56.67.78.89 98.76.54.32
loghost [] >sys1logger:local3
console_timeout [0]>10
snmp_enabled [false] >true
switch_description [] >WCIX_switch
switch_contact [] >administrator_name@sun.com
switch_location [] >Boston
snmp_private_community [P-private] >new_private_auth_string
snmp_public_community [P-public] >new_public_auth_string
snmp_trap_hosts [] >123.123.234.151, traphost2
```

Note – Variables under snmp_enabled are skipped if snmp_enabled is set to false. Some network variables are displayed by setupplatform only when ip_mode has been set to static. Many network variables may already have been assigned values if DHCP was enabled when the switch was booted and a DHCP server was configured to respond to this switch.

3.4 Updating the Flash Memory of the Switch

The `flashupdate` command updates the flash memory of the switch.

Note – There is a jumper on the switch system controller module that must be set to the enabled position in order to flash update the memory. See Section 1.1.1.1, "Flash-Write Enable Jumper" on page 1-5.

You must fully specify the URL describing the location of the update image file (for either ftp or http protocols).

- **Type:**

  ```
  SSC> flashupdate [-y | -n] [-f] ftp://support_site/pub/boot/switchApp.jflash
  ```

You can specify the URL for the update image file with or without the optional `-f` argument. The `-f` argument exists only for compatibility. If the host specified in the URL is not in the domain specified by the `dns_domain` variable, the URL must contain a fully qualified domain name.

When you execute the `flashupdate` command without either `-n` or `-y` arguments, the switch verifies the integrity of the flash image file. If this verification fails, the switch aborts the flash memory update. If the verification succeeds, the switch instructs you to reboot the switch. After rebooting, the switch updates its flash memory then automatically reboots to load the new firmware.

If you specify the `-n` argument, the switch tests only the integrity of the image file and network reliability, and does not update the switch's flash memory.

If you specify the `-y` argument, and if the update file passes the initial integrity test, the switch automatically reboots and updates the flash memory.

3.4.1 Displaying Switch Configuration Variables

With one of the `show` commands, you can display an individual variable.

3.4.1.1 Displaying a Specified Variable

The show command displays the current value of the variable that you specify. See TABLE 3-1 for a list of variables.

● **Type:**

```
SSC> show variable1 [ variable2 [ variable3 ] ... ]
```

For example, to display the hostname variable, type:

```
switch-one:SSC> show hostname
hostname = switch-one
```

3.4.1.2 Displaying the Current Time and Date

● **Type:**

```
switch-one:SSC> showdate

System date is 10-Mar-01 2:52:52 AM
```

3.4.1.3 Displaying All Variables Set by the `setupplatform` Command

● **Type:**

CODE EXAMPLE 3-11 Displaying All Variables for `setupplatform`

```
switch-one:SSC> showplatform
hostid = 80d8a87f
mac_address = 8:0:20:d8:a8:7f
ip_mode = dhcp
ip_address = 129.148.221.121
netmask = 255.255.255.0
routers = 129.148.221.1
hostname = wildcat-ssc
tpe_link_test = true
dns_domain = demo.sun.com
dns_resolvers = 129.148.161.50, 129.148.172.14
loghost =
console_timeout = 0
snmp_enabled = true
switch_description = switchtest
switch_contact = switchadmin
switch_location = Boston
snmp_private_community = P-private
snmp_public_community = P-public
snmp_trap_hosts = 129.148.221.64
```

Although they may not be set by the `setupplatform` command, the switch's host ID and MAC address are displayed by this command.

3.4.1.4 Displaying the Revisions of SwitchApp and the RTOS Firmware

This command also displays the current time and date.

● **Type:**

CODE EXAMPLE 3-12 Displaying Version of SwitchAPP and Firmware

```
switch-one:SSC> showsc

SwitchApp version     : x.x.x
RTOS firmware version : x.x.x

Free JVM memory       : 2764896 bytes
```

CODE EXAMPLE 3-12 Displaying Version of SwitchAPP and Firmware

```
Free RTOS memory       :   690672 bytes


System date            : 09-Mar-01 9:53:18 PM
```

3.4.1.5   Displaying the Status and Errors of Switch Links

The showlinks command displays information on the status and the errors of the links of the switch. Type one of the following showlinks commands:

CODE EXAMPLE 3-13   Displaying Status and Errors of Links

```
SSC> showlinks              (displays both links and errors)
SSC> showlinks -l        (displays only links)
SSC> showlinks -e        (displays only errors)
SSC> showlinks [-e|-l] loop [time]
```

where:

   -l   displays only the status of the links.

   -e   displays only the error statistics of the links.

   loop [*time*] re-evaluates the requested information every *time* seconds (default 1 second). When in loop mode, the monitoring terminates when you press Enter.

TABLE 3-2   Link States

State	Meaning
disabled	The link has been disabled by the Sun Fire Link Network Manager.
undertest	The link is undergoing diagnostics testing.
up	The link is participating in a configuration and the link is currently routing traffic through it.
waitup	The link is in the process of being used in a configuration but is not yet currently routing traffic through it.
off	The link is off.

TABLE 3-3   Error States

Error	Meaning
Current	The number of errors that has occurred during this sampling interval.
Average	The average number of errors that have occurred thus far.
Total	The total number of errors since the link has come up.
Num of Intervals	The number of intervals that have occurred since the link has been up.
Min/Interval	The number of minutes that make up an interval.

When no arguments are provided, all information is displayed.

- **Type:**

CODE EXAMPLE 3-14   Displaying Link Status

```
switch-one:SSC> showlinks

======================= LINKS ===============================
Link State
---- -----
5    waitup

======================= ERRORS ==============================
Link Current Average Total Num of intervals Min/interval
---- ------- ------- ----- ---------------- ------------
5    0       0       0     0                60

switch-one:SSC>
```

3.5   Diagnostic Commands

All commands support a -h option, which displays detailed help on that command and is equivalent to typing the help command.

3.5.1   Displaying Information

With the show commands you can monitor the status of the switch components.

3.5.1.1   Listing the Installed Boards With Test Status

- **Type:**

CODE EXAMPLE 3-15   Displaying Board Status

```
switch-one:SSC> showboards

Slot      Component Type          State          Status
-----     --------------          -----          ------
PS0       Power Supply            In use         OK
PS1       Power Supply            In use         OK
FTTOP     Fan Tray                In use         OK
```

CODE EXAMPLE 3-15 Displaying Board Status *(Continued)*

```
switch-one:SSC> showboards
FTBOT   Fan Tray                    In use          OK
SSC     Switch System Controller    In use          Passed
WCIX    WCIX Module                 In use          Passed
LINK0   Link Module                 Available       Passed
Link2   Link Module                 Available       Passed
Link4   Link Module                 Available       Passed
```

TABLE 3-4 Operational State of the Component (State Column)

State Value	Description
Unknown	Unable to determine state of component.
Removable	Component has been prepared for removal and will not be used.
Unavailable	Component is not usable because it has not been tested or because it has failed testing.
Testing	Component is under test.
Available	Component has passed testing but is not actively in use.
In use	Component is actively in use by the switch.

TABLE 3-5 Test Status of Power Supplies (Status Column)

Status Value	Description
OK	Supply is functioning correctly.
Degraded	Failure is imminent.
Failed/Absent	Power supply is not installed or has failed.

TABLE 3-6 Test Status of Fan Trays (Status Column)

Status Value	Description
OK	Functioning correctly.
Failed	At least one fan in the tray is not running at an acceptable speed.
Absent/Unpowered	Fan tray is missing or is not running.

TABLE 3-7 Test Status of All Other Boards (Status Column)

Status Value	Description
Not tested	Testing has not begun for component.
Partially tested	Not all POST tests have been executed because a necessary component has not been installed.
Under test	Component is currently being tested.
Passed	Passed all POST tests.
Failed	Failed one or more POST tests.

3.5.1.2 Listing the Installed Boards With Extended Test Status

The `showdiags` command displays a list of installed boards, lists of tests that have been run or scheduled, and status of those tests.

- **Type:**

CODE EXAMPLE 3-16   Displaying Installed Boards, Tests, and Status

```
switch-one:SSC> showdiags

Board      Test name     Test description                 Status
--------   ---------     ----------------                ------
BACKPLN    frubasic      FRUID data integrity test        Passed

SSC        rtc           Test realtime clock              Passed
SSC        rtcbatt       Test realtime clock battery      Passed
SSC        ethint        Ethernet internal loopback test  Passed
SSC        ttybloop      TTYB external loopback test      Not executed
SSC        i2cprobe      Probe all i2c devices            Passed
SSC        ps            Power supply status test         Passed
SSC        volt          Voltage range test               Passed
SSC        temp          Temperature range test           Passed
SSC        fans          Fan speed test                   Passed
SSC        frubasic      FRUID data integrity test        Passed
SSC        linker         Scan path linker FPGA test      Passed

WCIX       i2cprobe      Probe all i2c devices            Passed
WCIX       ps            WCIX 2.5V supply status test     Passed
WCIX       pll_lock      WCIX PLL lock test               Passed
WCIX       volt          Voltage range test               Passed
WCIX       temp          WCIX module temperature range test Passed
WCIX       frubasic      FRUID data integrity test        Passed
WCIX       jtagid        WCIX JTAG IDCODE test            Passed
WCIX       shadowid      WCIX IDCODE via Shadow Scan test  Passed
WCIX       csr_wrv       WCIX CSR W/R/V test              Passed
WCIX       lbist         WCIX LogicBIST test              Passed
WCIX       csr_reset     WCIX CSR Reset test             Passed

LINK0       i2cprobe      Probe all i2c devices            Passed
LINK0       volt          Voltage range test               Passed
LINK0       temp          Temperature range test           Passed
LINK0       frubasic      FRUID data integrity test        Passed
LINK0       jtagid        Link JTAG IDCODE test            Passed
LINK0       interconnect  Link / WCIX Interconnect test    Passed
LINK0       link          Link loopback test              Not executed
```

3.5.1.3 Displaying Fan Speeds and Board Information

The `showenvironment` command displays information on fan speeds, and the temperatures and voltage levels detected on each board.

● **Type:**

CODE EXAMPLE 3-17 Displaying Fan Speeds, Temperatures and Voltage

```
switch-one:SSC> showenvironment

Slot    Sensor            Value       Units       Status
-----   --------------    --------    ---------   ------
PS0     Status            nominal     -           ok
PS1     Status            nominal     -           ok
FTTOP   Fan 0 speed          2789     RPM         ok
FTTOP   Fan 1 speed          2812     RPM         ok
FTTOP   Fan 2 speed          2934     RPM         ok
FTBOT   Fan 0 speed          3096     RPM         ok
FTBOT   Fan 1 speed          2812     RPM         ok
FTBOT   Fan 2 speed          2766     RPM         ok
SSC     3.3 VDC              3.35     Volts DC    ok
SSC     5.0 VDC              5.10     Volts DC    ok
SSC     12.0 VDC            11.81     Volts DC    ok
SSC     Board temp.         20.00     Degrees C   ok
SSC     Backup battery        ok      -           ok
WCIX    1.5 VDC              1.50     Volts DC    ok
WCIX    2.5 VDC              2.51     Volts DC    ok
WCIX    3.3 VDC              3.35     Volts DC    ok
WCIX    5.0 VDC              5.05     Volts DC    ok
WCIX    Board temp.         23.00     Degrees C   ok
WCIX    Power Supply      nominal     -           ok
LINK0   Board temp.         22.00     Degrees C   ok
LINK0   1.5 VDC              1.51     Volts DC    ok
LINK0   3.3 VDC              3.30     Volts DC    ok
LINK2   Board temp.         21.00     Degrees C   ok
LINK2   1.5 VDC              1.52     Volts DC    ok
LINK2   3.3 VDC              3.30     Volts DC    ok
```

3.5.2 Testing Boards and Devices

With the `test` commands you can test the status of switch components.

3.5.2.1 Running a Test

Use the `testboard` command to request that a particular POST test (or all available tests) be run on a particular board. If `loop` is specified, the test will run repeatedly until you press Enter.

● **Type:**

```
SSC> testboard board [test_name] [loop]
```

where *board* is one of the following:

  `ssc` (switch system controller)

  `backplane`

  `wcix` (switch)

  `link0`... `link7` (to indicate a particular optical module)

  `all_links` (to indicate all optical modules)

The allowed range for *test_name* depends on the specified board.

Tests involve several aspects of the boards. See TABLE 3-8 for definitions of some board test terminology.

TABLE 3-8 Board Test Terminology

Term	Definition
SSC	Switch system controller.
FRUID	Field Replaceable Unit ID: a serial EEPROM that is located on every FRU (Field Replaceable Unit). The FRUID PROM stores data about the FRU on which it is mounted.
JTAG	An IEEE standard serial bus used by the SSC to access test features of ASICs in the switch.
i2c	A low-speed serial bus used for communication between the SSC processor and various sensors and control devices in the switch.

See TABLE 3-9 for descriptions of the tests.

Note – The `testboard` command does not allow a destructive test to be run on a component that is in use.

If no test name is specified, all available tests for that component will be executed unless that particular component is currently in use (in which case only non-destructive tests will be run). Test names must be spelled out; they must not be abbreviated.

TABLE 3-9 JPOST Tests

Component	Test Name	Description
Backplane		
	frubasic	Verifies the integrity of data stored on the backplane's FRUID PROM.
SSC		
	rtc	Verifies that the realtime clock is operating properly.
	rtcbatt	Checks the realtime clock's internal battery.
	ethint	Verifies CPU's internal Ethernet logic.
	ttybloop	Verifies operation of TTYB serial port (loopback connector must be installed).
	i2cprobe	Ensures that all i2c devices on the SSC card are accessible.
	ps	Verifies that the switch has at least one properly functioning power supply.
	volt	Ensures that voltage levels on the SSC card are within acceptable ranges.
	temp	Ensures that temperature levels on the SSC card are within acceptable ranges.
	fans	Verifies that the Switch has at least one properly-functioning fan tray.
	frubasic	Verifies the integrity of data stored on the SSC's FRUID PROM.
	linker	Verifies the operation of the JTAG scan path linker on the SSC card.
WCIX		
	i2cprobe	Ensures that all i2c devices on the WCIX module are accessible.
	ps	Verifies the status of the WCIX ASIC's 2.5 volt power supply.
	pll_lock	Verifies that the WCIX ASIC has synchronized to its external clock source.

TABLE 3-9 JPOST Tests *(Continued)*

	volt	Ensures that voltage levels on the WCIX module are within acceptable ranges.
	temp	Ensures that temperature levels on the WCIX module are within acceptable ranges.
	frubasic	Verifies the integrity of data stored on the WCIX module's FRUID PROM.
	jtagid	Verifies the WCIX ASIC's JTAG ID code.
	shadowid	Verifies that the WCIX's ID code may be read from an internal control register.
	csr_wrv	Verifies that WCIX internal registers may be written and read successfully.
	lbist	Executes built-in self test of the logic on the WCIX ASIC. This test may only be performed when the WCIX module is not in use.
	csr_reset	Verifies the reset functionality of the WCIX ASIC. This test may only be performed when the WCIX module is not in use.
Links		
	i2cprobe	Ensures that all i2c devices on the optical module are accessible.
	volt	Ensures that voltage levels on the optical module are within acceptable ranges.
	temp	Ensures that temperature levels on the optical module are within acceptable ranges.
	frubasic	Verifies the integrity of data stored on the optical module's FRUID prom
	jtagid	Verifies the JTAG IDs of the ASICs on the optical module. This test may only be performed when the optical module is not in use.
	interconnect	Verifies the interconnect between the selected optical module and the WCIX module. This test may only be performed when the optical module is not in use.
	link	Performs a link loopback test on the selected optical module. This verifies that the optical module's transmitter and receiver are operating properly. A loopback cable must be installed on that optical module. This test may only be performed when the optical module is not in use.

3.6 Maintenance Commands

With the `maintenance` commands you can perform routine switch maintenance such as rebooting, reinitializing the network adapter, and logging out of the CLI.

3.6.1 Rebooting the Switch System Controller

● **Type:**

```
SSC> reboot [-y]
```

The entire command must be entered, rather than just an abbreviation.

If you include the **-y** option, the system controller reboots without prompting you. Otherwise, you are prompted for confirmation.

3.6.2 Reinitializing the Network Adapter

If you change network-related switch configuration settings, the changes are not put into effect until you reinitialize the network adapter.

Note – If the hostname has been changed, reboot the system controller instead.

● **Type:**

```
SSC> reinitnetwork [-y]
```

If you include the -y option, the adapter is reinitialized without prompting you. Otherwise, you are prompted for confirmation.

3.6.3 Logging out of the CLI

Type:

```
SSC> logout
```

If a password has been set, the CLI returns to the password prompt. If a password has not been set, the CLI restarts.

Replacing Sun Fire Link Switch Components

Note – *Sun Fire Link optical module* and *Paroli* are two terms used within this document for the optical modules used within a Sun Fire Link Interconnect system.

This chapter contains removal and replacement procedures in the following sections:

- Section 4.1, "Removing and Replacing Sun Fire Link Optical Modules" on page 4-2
- Section 4.2, "Removing and Replacing Switch System Controller Modules" on page 4-5
- Section 4.3, "Removing and Replacing Power Supply Modules" on page 4-8
- Section 4.4, "Removing and Replacing Switch ASIC Modules" on page 4-10
- Section 4.4.1, "Removing a Switch ASIC Module" on page 4-10
- Section 4.5, "Removing and Replacing Fan Trays" on page 4-12
- Section 4.6, "Removing and Replacing a Backplane, AC Input Unit and Connecting Harness" on page 4-14
- Section 4.7, "Removing and Replacing Fuses in the AC Input Unit" on page 4-17

The optical modules and System Controller modules are hot-swappable after preparatory software procedures are run; the dual power supply modules and fan trays are also hot-swappable, but only one at a time. The switch ASIC module is not hot-swappable and should only be replaced after the switch enclosure has been powered off.

4.1 Removing and Replacing Sun Fire Link Optical Modules

⚠

Caution – You must install the appropriate filler board in a powered-on switch within one minute of removing an optical module from the slot in order to prevent the system from overheating. If you are removing and replacing a complete chassis, or a backplane, AC Input unit and connection harness, this caution does not apply as the complete chassis is powered off before you are directed to perform this procedure.

4.1.1 Removing a Sun Fire Link Optical Module

1. **Ensure that either a replacement module or filler board is immediately available.**

2. **Attach an ESD wrist or foot strap and then connect the ESD strap to the system.**

   Ensure that an ESD mat or suitable container is available for the removed module.

3. **Loosen the captive screws at the top and bottom of the module (**FIGURE 4-1**).**

Captive
screws (2)
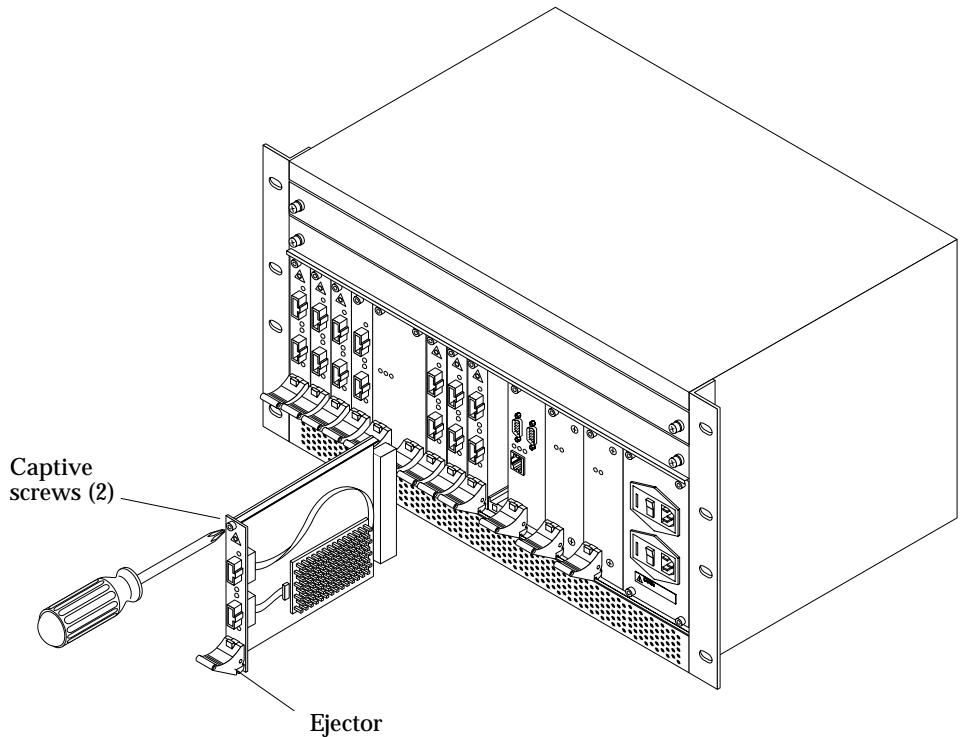
Ejector

FIGURE 4-1 Replacing an Optical Module

4. **Unlock the module ejector by depressing its red button.**

5. **Unseat the module by pressing the ejector lever down.**

⚠

Caution – You must install the appropriate filler board in a powered-on switch within one minute of removing an optical module from the slot in order to prevent the system from overheating.

6. **Slide the module out of the slot and place on an ESD mat or within a suitable container.**

4.1.2 Installing a Sun Fire Link Optical Module

1. **Attach an ESD wrist or foot strap and then connect the ESD strap to the system.**

2. **Remove the filler board or filler panel (if any) occupying the slot.**

3. Ensure that the replacement module ejector is unlocked by depressing the ejector red lock button (FIGURE 4-1**).**

⚠ **Caution –** Damage to the module can occur if you attempt to insert the module without the module being correctly engaged into both the top and bottom slots of the card guides. Ensure that the module is correctly aligned within the slots prior to sliding it towards the backplane.

4. Align the top and bottom of the module into the upper and lower slots that are on the left side of each card guide, and then slide the module towards the backplane until the module ejector lever rises.

5. Push the module ejector lever up until the lock button engages with a snap.

This will seat the module to the enclosure connector.

6. Tighten the captive screws at the bottom and top of the module.

Tighten the screws to seat the module into the backplane connector.

7. Replace or reinstall any cabling.

4.1.3   Optical Link Module LEDs

Besides the LEDs that are located on the switch chassis, each Optical link module has three LEDs (see TABLE 4-1). A single green LED indicates whether or not power is applied; paired green and amber LEDs convey link status and configuration, TABLE 4-1.

TABLE 4-1   Link Operational LED States

Link Status LED (Green)	Fault Status LED (Amber)	Meaning
OFF	OFF	No External Link detected. No valid Rx Clock detected.
ON	OFF	Link operational. Valid Rx clock received. Remote ID validated.
ON	ON	Degraded link detected. This combination indicates that an error threshold has been exceeded. The link is still operational but performance may be degraded.
BLINKING	OFF	Link is in the process of moving to the operational state.

4.2 Removing and Replacing Switch System Controller Modules

Note – Replacing the System Controller module requires that the Sun Fire Link Interconnect network configuration be restored by using the Sun MC/Fabric Manager. Refer to the *Sun Fire™ Link Fabric Administrator's Guide* for procedures on restoring the configuration.

4.2.1 Removing a Switch System Controller Module

1. **Use the** `showplatform` **command to display the switch configuration variables.**

   Note the settings as they will be used to restore the switch to its original configuration.

2. **Shut down the System Controller module using the** `shutdown [-y] ssc` **command.**

   Ensure that the module's amber Removal OK LED is lit after you deactivate the module.

3. **Attach an ESD wrist or foot strap and then connect the ESD strap to the system.**

   Ensure that an ESD mat or suitable container is available for the removed module.

4. **Disconnect and tag any cabling to the module.**

5. **Loosen the captive screws at the bottom and top of the module (**FIGURE 4-2**).**
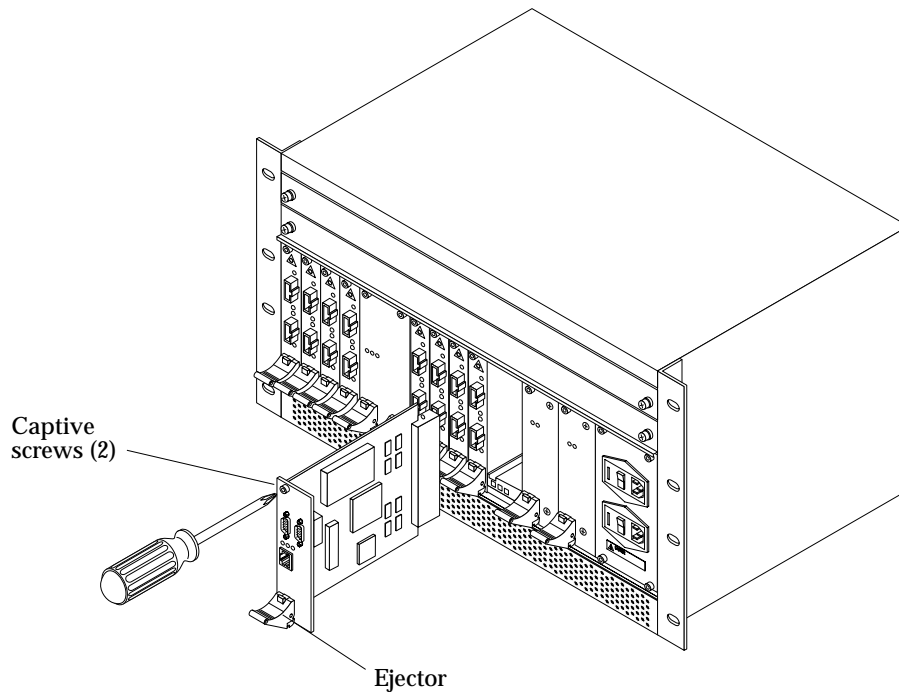
FIGURE 4-2   Replacing a Switch System Controller

6. **Unlock the module ejector by depressing the red button on the module ejector.**

7. **Press the ejector lever down to unseat the module from the enclosure connector.**

8. **Slide the module out of the slot and place on an ESD mat or within a suitable container.**

4.2.2   Installing a Switch System Controller Module

1. **Attach an ESD wrist or foot strap and then connect the ESD strap to the system.**

2. **Unlock the replacement module ejector by depressing the red button on the ejector (**FIGURE 4-2**).**

⚠ **Caution –** Damage to the module can occur if an attempt is made to install the module without the module being correctly engaged into both the top and bottom slots of the card guides. Also, ensure that the module is correctly aligned within the slots prior to sliding it towards the backplane.

3. **Align the top and bottom of the module into the upper and lower slots that are on the left-hand side of each card guide.**

   Once the module is correctly aligned in the card guide slots, slide the module towards the backplane until the ejector lever rises.

4. **Push the module ejector lever up until the lock button engages with a distinctive snap.**

   This will seat the module connector to the switch enclosure connector.

   Note – Tighten the screws to seat the module into the backplane connector. Once the module is re-seated in a powered-on switch the system controller will automatically boot.

   ---

5. **Tighten the captive screws at the bottom and top of the module.**

6. **Replace any cabling.**

7. **Once the switch CLI comes up, use the** `setupplatfform` **command to restore the original switch configuration variables (as noted in Step 1 of the System Controller removal procedure).**

   If DHCP is being used, the following variables may have already been set by the DHCP server:

   - *ip_address*
   - *netmask*
   - *routers*
   - *hostname*
   - *dns_domain*
   - *dns_resolvers*

8. **Reboot using the** `reboot [-y]` **command**.

9. **Restore the original Sun Fire Link Interconnect network configuration by using the Sun MC/Fabric Manager.**

   Refer to the *Sun Fire™ Link Fabric Administrator's Guide* for procedures on restoring the configuration.

4.3 Removing and Replacing Power Supply Modules

⚠ **Caution –** The switch will shut down if a power supply module is not functioning within the chassis at all times once the switch is powered on.

4.3.1 Removing a Power Supply Module

1. **Use the** `showenvironment` **command and ensure that the remaining power supply module is functioning properly.**

   This step is not necessary if you came to this procedure as a result of replacing the backplane, harness and AC input unit (complete chassis is powered off already).

2. **On the AC input module, turn the corresponding power switch off.**

   The AC input module input switches are labeled PS1 and PS2.

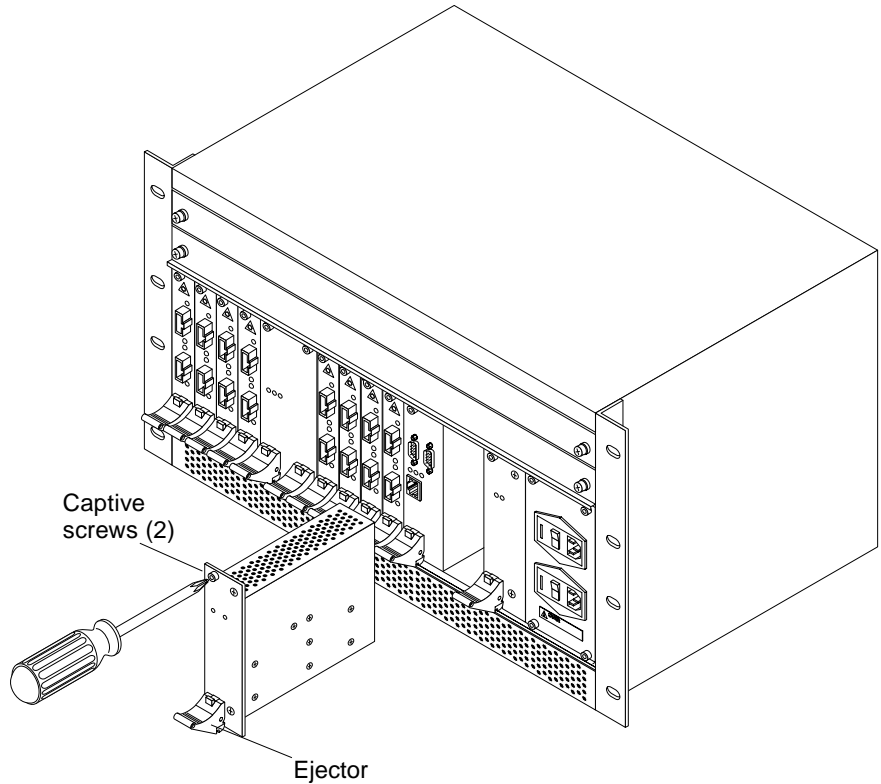3. **Loosen the captive screws at the top and bottom of the module (**FIGURE 4-3**).**

Captive screws (2)

Ejector

FIGURE 4-3 Replacing a Sun Fire Link Power Supply Module

4. **Attach an ESD wrist or foot strap and then connect the ESD strap to the system.**
   Ensure that an ESD mat or suitable container is available for the removed module.

5. **Unlock the module ejector by depressing the ejectors red button.**

6. **Press the ejector lever down to unseat the module from the enclosure connector.**

7. **Slide the module out of the slot.**

4.3.2 Installing a Power Supply Module

1. **Attach an ESD wrist or foot strap. Connect the ESD strap to the system.**

2. **Unlock the module ejector by depressing the ejector red button (**FIGURE 4-3**).**

⚠

Caution – Damage to the module can occur if an attempt is made to install the module without the module being correctly engaged into both the top and bottom slots of the card guides. Also, ensure that the module is correctly aligned within the slots prior to sliding it towards the backplane.

3. **Align the top and bottom of the module into the upper and lower slots that are on the left side of each card guide.**

   Once the module is correctly aligned in the card guide slots, slide the module towards the backplane until the ejector lever rises.

4. **Push the module ejector lever up until the lock button engages with a distinctive snap.**

   This will seat the module connector to the enclosure connector.

Note – Tighten the screws.

5. **Tighten the screws on the top and bottom of the module to seat the module into the backplane connector.**

6. **On the AC input module, turn the corresponding power switch on.**

   The AC input module input switches are labeled PS1 and PS2.

4.4 Removing and Replacing Switch ASIC Modules

4.4.1 Removing a Switch ASIC Module

1. **Shut down all active modules using the** shutdown [-y] all **command**.

2. **Remove power from the switch enclosure by setting both AC input power unit switches to Off.**

3. **Attach an ESD wrist or foot strap and then connect the ESD strap to the system.**

   Ensure that an ESD mat or suitable container is available for the removed module.

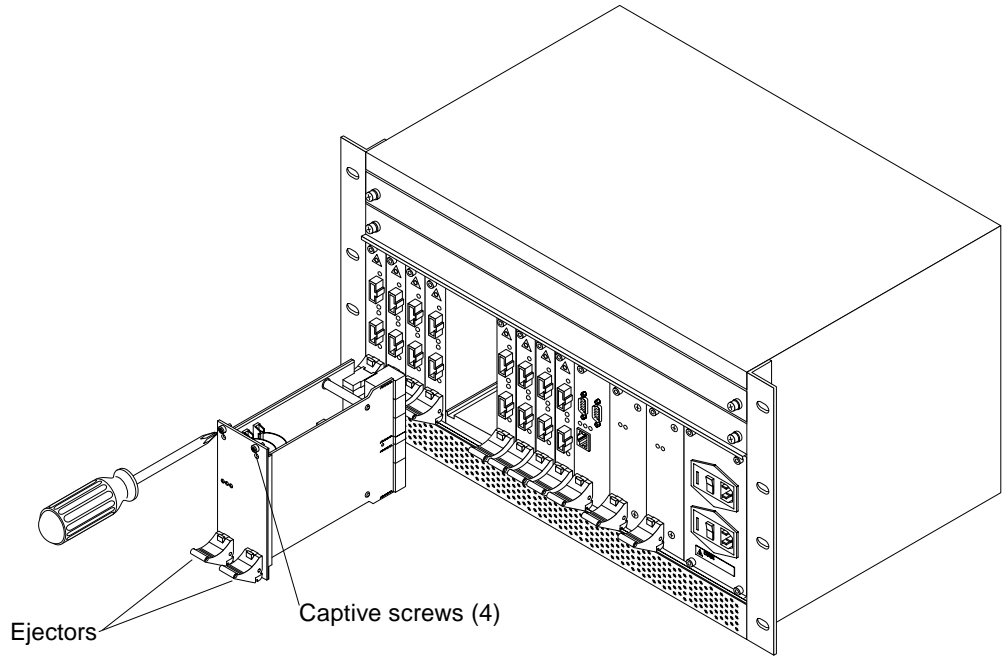4. **Loosen the four captive screws, two each on the top and bottom of the module (**FIGURE 4-4**).**

Ejectors

Captive screws (4)

FIGURE 4-4 Replacing a Switch ASIC Module

5. **Unlock both module ejectors by depressing the ejectors red buttons.**

6. **Simultaneously press both ejector levers down.**

   This will unseat the module from the enclosure connector.

7. **Slide the module out of the slot.**

4.4.2   Installing a Switch ASIC Module

1. **Remove power from the switch enclosure by setting both AC input power unit switches to Off.**

2. **Attach an ESD wrist or foot strap and then connect the ESD strap to the system.**

3. **Unlock both replacement module ejectors by depressing the ejector red buttons.**

Caution – Damage to the module can occur if an attempt is made to install the module without the module being correctly engaged into both the top and bottom slots of the card guides. Also, ensure that the module is correctly aligned within the slots prior to sliding it towards the backplane.

4. **Align the top and bottom of the module into the upper and lower slots that are on the left side of each card guide.**

   Once the module is correctly aligned in the card guide slots, slide the module towards the backplane until the ejector lever rises.

5. **Simultaneously push both module ejector levers up until the lock buttons engage with a distinctive snap.**

   This will seat the module connector to the enclosure connector.

6. **Tighten the four captive screws, two each on the top and bottom of the module (**FIGURE 4-4**) to seat the module into the backplane connector.**

7. **On the AC Input module, place both power switches to On.**

4.5 Removing and Replacing Fan Trays

Caution – The switch will shut down if a fan tray is not functioning within the chassis at all times once the switch is powered on.

4.5.1 Removing a Fan Tray

1. **Use the** `showenvironment` **command and ensure that the remaining fan tray is functioning properly.**

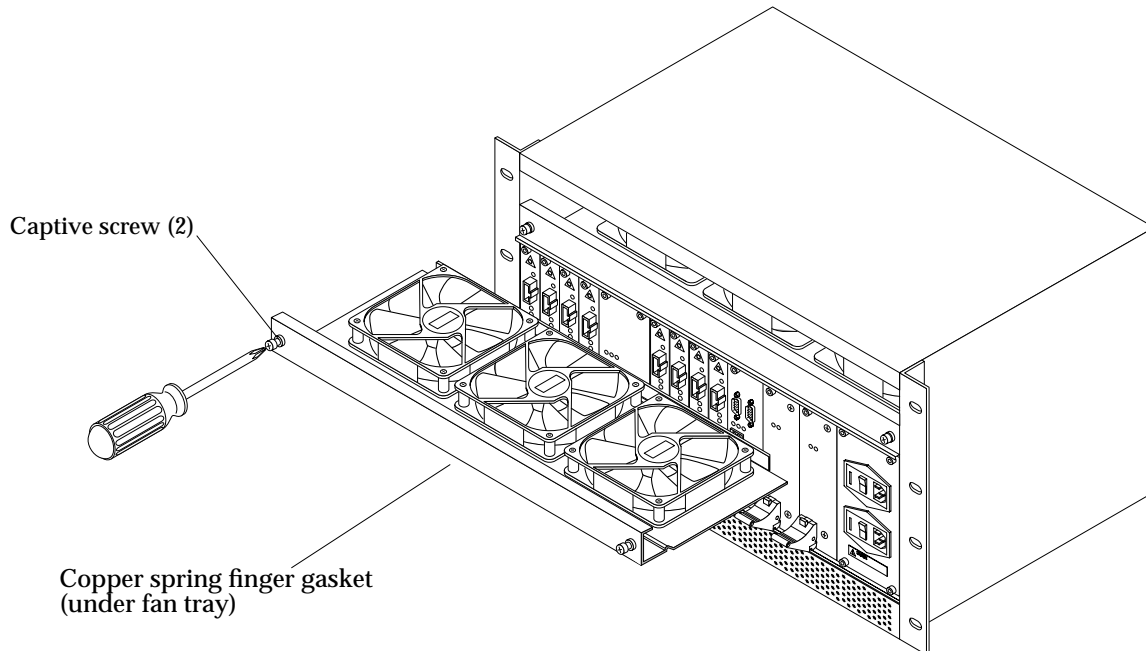**2. Loosen the captive screws at either side of the fan tray (**FIGURE 4-5**).**

Captive screw (2)

Copper spring finger gasket
(under fan tray)

FIGURE 4-5   Replacing a Fan Tray

3. Pull the tray out of the slot.

⚠

Caution – When removing and installing the fan trays be careful not to bend the copper spring finger gasket. The gasket is located on the underside of the fan tray and provides EMI protection.

4.5.2   Installing a Fan Tray

1. Place edges of the fan tray in the slot guides.

Caution – When removing and installing the fan trays be careful not to bend the copper spring finger gasket. The gasket is located on the underside of the fan tray and provides EMI protection.

2. **Ensure that both sides of the tray are engaged in the guide slots and then push the fan tray into the slot (**FIGURE 4-5**).**

⚠ **Caution –** Use care to avoid injury from or damage to the EMI springfingers at the bottom of the assembly.

3. **Tighten the captive screws (**FIGURE 4-5**).**

4. **Position the switches on the switch AC power input unit to On.**

4.6 Removing and Replacing a Backplane, AC Input Unit and Connecting Harness

4.6.1 Removing a Backplane, AC Input Unit and Connecting Harness

1. **Shut down all active modules using the** `shutdown [-y] all` **command**.

2. **Remove power from the switch enclosure by positioning both AC input unit switches to Off.**

3. **Remove the chassis input power cables from their respective outlets.**

4. **Tag and then remove all cabling from the optical and system controller modules.**

5. **Remove both fan trays and all modules as indicated in the previous individual module removal procedures.**

6. **Loosen and remove all screws (12) securing back panel to chassis, then remove the back panel (**FIGURE 4-6**).**
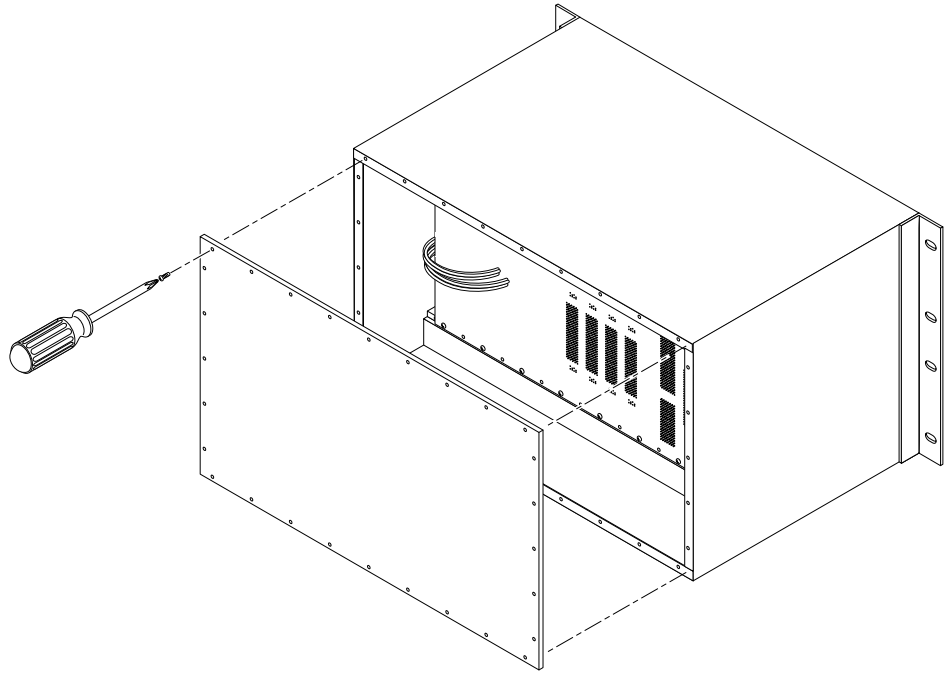
FIGURE 4-6 Replacing the Back Panel

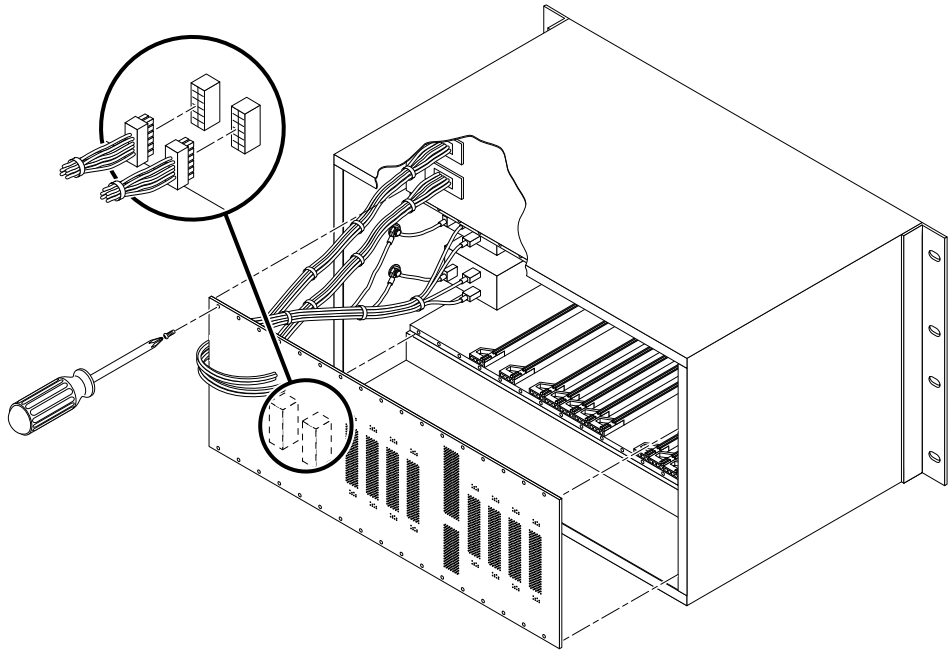**7. Loosen and remove all screws (20) securing backplane to chassis.**

FIGURE 4-7   Replacing the Backplane

8. Move to front of chassis and loosen the four captive screws that secure the AC input unit to the chassis.

9. Remove backplane, connecting harness and AC input unit from chassis enclosure.

4.6.2   Installing a Backplane, AC Input Unit and Connecting Harness

1. Place replacement backplane, together with interconnecting harness and AC input unit into enclosure.

2. Position backplane, harness and AC input unit so they are properly aligned within chassis to receive mounting screws.

3. Secure backplane to chassis using 20 screws.

4. Secure AC input unit to chassis using the four captive screws

5. Secure chassis back panel using 12 screws.

6. **Refer to previous individual module replacement procedures and replace all modules previously removed.**

7. **Reattach all cabling to the optical and system controller modules.**

8. **Connect the two switch AC input cables into outlets that are on separate circuit breakers.**

Note – If DHCP is being used, notify the DHCP system administrator that the switch MAC address has changed.

---

9. **Position the switches on the switch AC input unit to On.**

4.7 Removing and Replacing Fuses in the AC Input Unit

! **Caution –** The AC input unit fuse may be replaced only by qualified Sun Service personnel.

4.7.1 Removing a Fuse From the AC Input Unit

1. **To maintain redundancy, make sure that the AC input unit with the good fuse is powered on.**

2. **Position the switch on the AC input unit that contains the burnt-out fuse to OFF.**

3. **Using a 1/8-inch flat-head screwdriver, insert the screwdriver into the notch at the left of the AC input unit and pry the cover off.**

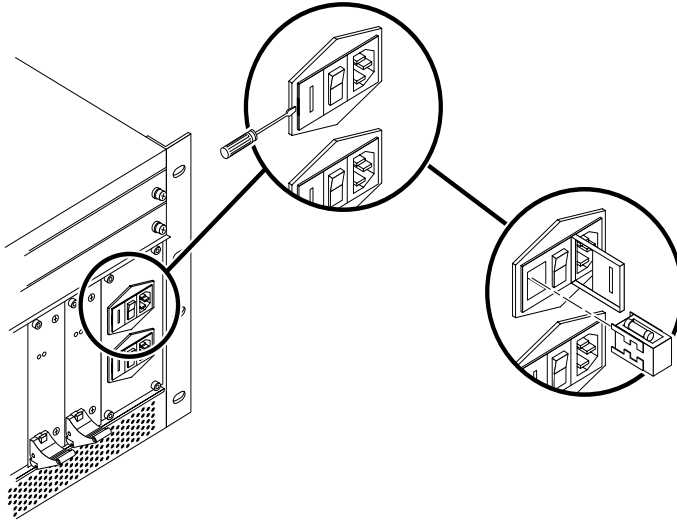   The cover is hinged and will swing open to reveal the red fuse holder.

FIGURE 4-8   Replacing the Fuse in the AC Input Unit

4. Using a 1/8-inch flat-head screwdriver, pull the red fuse holder out of the unit.

5. Remove the burnt-out fuse from the side of the fuse holder.

4.7.2   Installing a Fuse in the AC Input Unit

1. Replace the fuse in the fuse holder.

2. Replace the fuse holder and snap the cover into place.

Verifying Sun Fire Link Switch Operation

This chapter provides procedures for confirming correct installation of the Sun Fire Link switch.

Use the showboards command to check the status of each component. The following example shows a sample output for the showboards command.

```
switch-one:SSC> showboards

Slot     Component Type            State          Status

PS0      Power Supply              In use         OK

PS1      Power Supply              In use         OK

FTTOP    Fan Tray                  In use         OK

FTBOT    Fan Tray                  In use         OK

SSC      Switch System Controller  In use         Passed

WCIX     WCIX Module               In use         Passed

LINK0    Link Module               Available      Passed

LINK1    Link Module               Available      Passed

LINK2    Link Module               Available      Passed
```

```
LINK3    Link Module                     Available            Passed

LINK4    Link Module                     Removable            Passed

LINK5    Link Module                     Available            Passed

LINK7    Link Module                     Available            Passed
```

If any one of the components failed, use the procedures described in the following sections(Section 5.1, "POST" on page 5-2, Section 5.1.1, "Loopback" on page 5-2 and Section 5.2, "Module Tests" on page 5-5) to troubleshoot the component.

5.1   POST

Post (JPOST) on the switch is set in verbose mode by default. It is run whenever the switch is reset.

At the CLI prompt, run `showdiags` to view the results of JPOST.

5.1.1   Loopback

The Sun Fire Link Optical Module (Paroli) loopback test is a quick way to verify that the Sun Fire Link cables are working.

The loopback test is not run during the bring up or reset of the switch. You must run this test manually. It can be run for a particular link or all of the links.

1. **Using customer cables, install the cables in loopback mode.**

   Connect the receive connector from one end of the cable to the receive connector on the optical module. From the opposite end of the cable, connect the transmit connector to the transmit connector on the same optical module.

2. **Enter the following command:**

```
testboard which_module link loop
```

where *which_module* is the optical module you want to test (ie, link0...link7, all_links) Results of the `testboard` command are shown on the console and in the logger. Sample output of the `testboard` command with the cables in loopback is shown

below:

```
wildcat-ssc:SSC[expert]> testboard link2

May 22 02:16:27 wildcat-ssc Switch.POST: {/LINK2/}  Testing Link 2...
May 22 02:16:27 wildcat-ssc Switch.POST: {/LINK2/}  Running test "i2cprobe"
May 22 02:16:27 wildcat-ssc Switch.POST: {/LINK2/}   Probing device Link status
register (U0602)
May 22 02:16:27 wildcat-ssc Switch.POST: {/LINK2/}   Probing device Temperature
sensor (U0605)
May 22 02:16:27 wildcat-ssc Switch.POST: {/LINK2/}   Probing device Voltage A/D
(U0606)
May 22 02:16:27 wildcat-ssc Switch.POST: {/LINK2/}    Probing device FRUID
Seeprom (U0601)
May 22 02:16:27 wildcat-ssc Switch.POST: {/LINK2/}    Test "i2cprobe" PASSED.
May 22 02:16:27 wildcat-ssc Switch.POST: {/LINK2/}  Running test "volt"
May 22 02:16:27 wildcat-ssc Switch.POST: {/LINK2/}   Link No. 2, volt1_5 = 1.52
volts: normal
May 22 02:16:27 wildcat-ssc Switch.POST: {/LINK2/}   Link No. 2, volt3_3 = 3.30
volts: normal
May 22 02:16:27 wildcat-ssc Switch.POST: {/LINK2/}    Test "volt" PASSED.
May 22 02:16:27 wildcat-ssc Switch.POST: {/LINK2/}  Running test "temp"
May 22 02:16:28 wildcat-ssc Switch.POST: {/LINK2/}   Link No. 2, temp = 21.00
degrees C: normal
May 22 02:16:28 wildcat-ssc Switch.POST: {/LINK2/}    Test "temp" PASSED.
May 22 02:16:28 wildcat-ssc Switch.POST: {/LINK2/}  Running test "frubasic"
May 22 02:16:28 wildcat-ssc Switch.POST: {/LINK2/}    Section header CRC okay
May 22 02:16:28 wildcat-ssc Switch.POST: {/LINK2/}    Segment SD CRC okay
May 22 02:16:28 wildcat-ssc Switch.POST: {/LINK2/}    Test "frubasic" PASSED.
May 22 02:16:28 wildcat-ssc Switch.POST: {/LINK2/}  Running test "jtagid"
May 22 02:16:29 wildcat-ssc Switch.POST: {/LINK2/}   Link RX JTAG IDCODE =
0x13815083
May 22 02:16:29 wildcat-ssc Switch.POST: {/LINK2/}   Link TX JTAG IDCODE =
0x13814083
May 22 02:16:29 wildcat-ssc Switch.POST: {/LINK2/}    Test "jtagid" PASSED.
May 22 02:16:29 wildcat-ssc Switch.POST: {/LINK2/}  Running test "interconnect"
May 22 02:16:29 wildcat-ssc Switch.POST: {/LINK2/}   WCIX is in use.  Running
hot-plug interconnect test.
May 22 02:16:33 wildcat-ssc Switch.POST: {/LINK2/}  Applying interconnect test
"HOT_WCIX_P2"
May 22 02:16:34 wildcat-ssc Switch.POST: {/LINK2/}   20 compare vectors
executed.
May 22 02:16:34 wildcat-ssc Switch.POST: {/LINK2/}    Test "interconnect"
PASSED.
May 22 02:16:34 wildcat-ssc Switch.POST: {/LINK2/}  JPOST version 1.12.26 pre-
release PASSED on Link 2
```

5.2 Module Tests

You can execute the individual test for each component (ie, the Switch System Controller, the Switch ASIC, etc) whenever the switch is not being actively used in a working cluster.

1. Enter the following command:

```
switch_1:SSC> testboard board [test_name [loop]]
```

where

   board is one of the following:

   ssc

   backplane

   wcix

   link0...link7, all_links

   test_name is one of the tests listed when you run the showdiags command.

   loop is a continuous repetition of the test until you press Enter.

If you do not specify a test name, the system runs all tests on the specified board.

Results of the testboard command are shown on the console and in the logger.

Sample output of the `testboard` command for the switch system controller (ssc) is shown below:

```
Feb 05 19:05:23 arabian Switch.POST: {/SSC/}  Testing System Controller...
Feb 05 19:05:23 arabian Switch.POST: {/SSC/}  Running test "rtc"
Feb 05 19:05:25 arabian Switch.POST: {/SSC/}   Test "rtc" PASSED.
Feb 05 19:05:25 arabian Switch.POST: {/SSC/}  Running test "rtcbatt"
Feb 05 19:05:25 arabian Switch.POST: {/SSC/}   Test "rtcbatt" PASSED.
Feb 05 19:05:25 arabian Switch.POST: {/SSC/}  Running test "ethint"
Feb 05 19:05:25 arabian Switch.POST: {/SSC/}   Test "ethint" PASSED.
Feb 05 19:05:25 arabian Switch.POST: {/SSC/}  Running test "i2cprobe"
Feb 05 19:05:26 arabian Switch.POST: {/SSC/}   Probing device PAROLI detect
register (U0502)
Feb 05 19:05:26 arabian Switch.POST: {/SSC/}   Probing device WCIX detect and
SSC LED control (U1503)
Feb 05 19:05:26 arabian Switch.POST: {/SSC/}   Probing device Top fan 0 and 1
monitor (U0801)
Feb 05 19:05:26 arabian Switch.POST: {/SSC/}   Probing device Top fan 1 and
bottom fan 0 monitor (U0802)
Feb 05 19:05:26 arabian Switch.POST: {/SSC/}   Probing device Bottom fan 1 and
2 monitor (U0803)
Feb 05 19:05:26 arabian Switch.POST: {/SSC/}   Probing device FRUID Seeprom
(U0503)
Feb 05 19:05:26 arabian Switch.POST: {/SSC/}   Test "i2cprobe" PASSED.
Feb 05 19:05:26 arabian Switch.POST: {/SSC/}  Running test "ps"
Feb 05 19:05:26 arabian Switch.POST: {/SSC/}   Test "ps" PASSED.
Feb 05 19:05:26 arabian Switch.POST: {/SSC/}  Running test "volt"

...

Feb 05 19:05:31 arabian Switch.POST: {/SSC/}   Test "nvrambasic" PASSED.
Feb 05 19:05:31 arabian Switch.POST: {/SSC/}  Running test "linker"
Feb 05 19:05:31 arabian Switch.POST: {/SSC/}   Testing SAMPLE instruction
Feb 05 19:05:31 arabian Switch.POST: {/SSC/}   Testing EXTEST instruction
Feb 05 19:05:31 arabian Switch.POST: {/SSC/}   Testing IR parity
Feb 05 19:05:31 arabian Switch.POST: {/SSC/}   Test "linker" PASSED.
Feb 05 19:05:31 arabian Switch.POST: {/SSC/}  JPOST version 1.12.21 PASSED on
System Controller
```

Illustrated Parts Breakdown

The illustrations and tables in this appendix describe the replacement parts for the Sun Fire Link Interconnect.

A.1 Finding Part Numbers

Part numbers in this section may differ from those found in your system. Before ordering replacement parts, find the label on the part to be replaced and place your order using that number. Be sure to use the right part number.

A.2 List of Replacement Parts

TABLE A-1 lists the replaceable components and their part numbers.

TABLE A-1 List of Replaceable Components

Description	Part Number
Switch system controller	F501-5637
Switch backplane, AC input and cable harness	F540-5205
Switch ASIC	F501-5939
Fan Tray	F370-4393
175W AC/DC power supply	F300-1518
Sun Fire Link optical module (Paroli)	F375-0093

TABLE A-1   List of Replaceable Components

Description	Part Number
Sun Fire Link optical cable, 5 meter	F537-1022
Sun Fire Link optical cable 12 meter	F537-1023
Fiber Link optical cable 20 meter	F537-1024
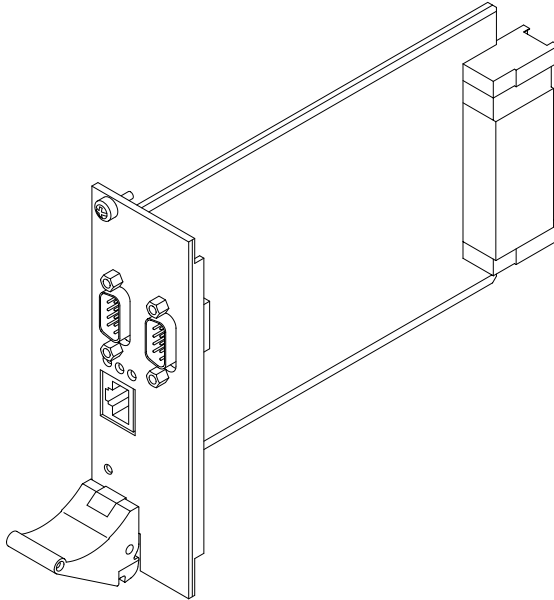
FIGURE A-1   Switch System Controller (F501-5637)
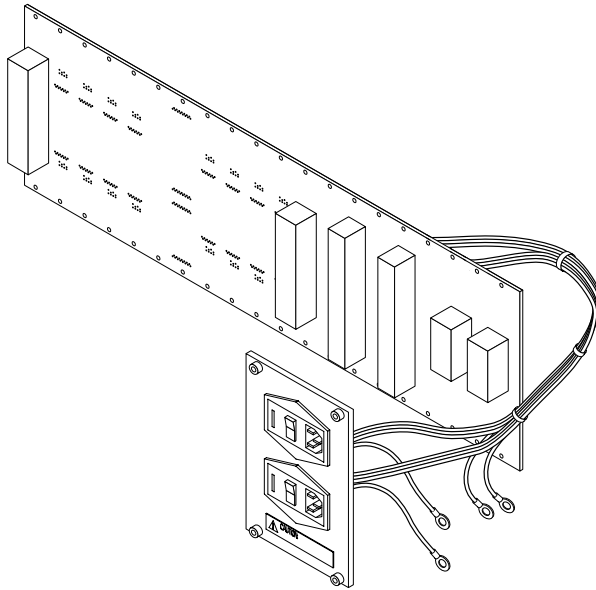
FIGURE A-2 Switch backplane, AC input and cable harness (F540-5205)
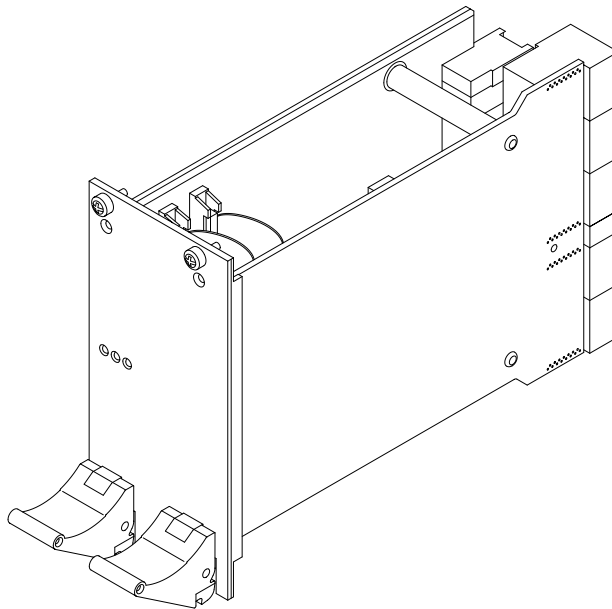
FIGURE A-3 Switch ASIC (F501-5939)
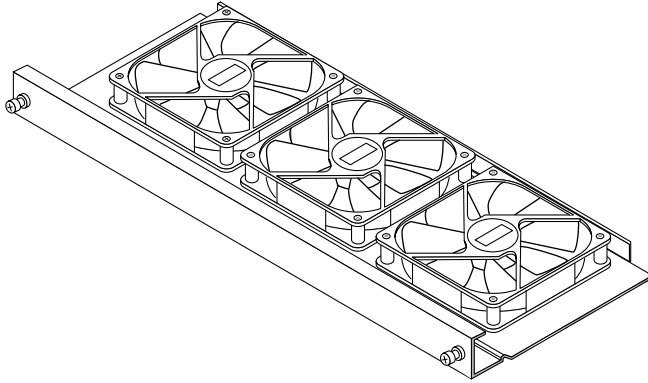
FIGURE A-4 Fan Tray (F370-4393)
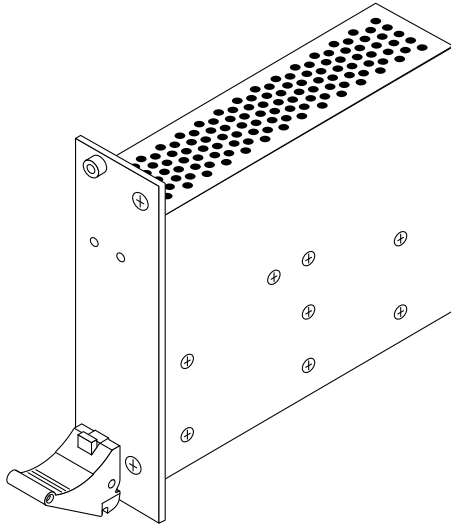
FIGURE A-5 175W AC/DC Power Supply (F300-1518)
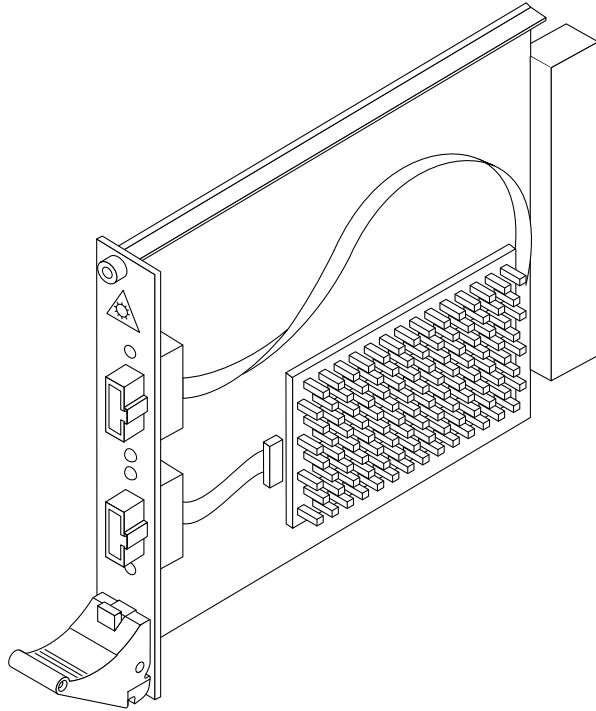
FIGURE A-6 Sun Fire Link Optical Module (Paroli) (F375-0093)
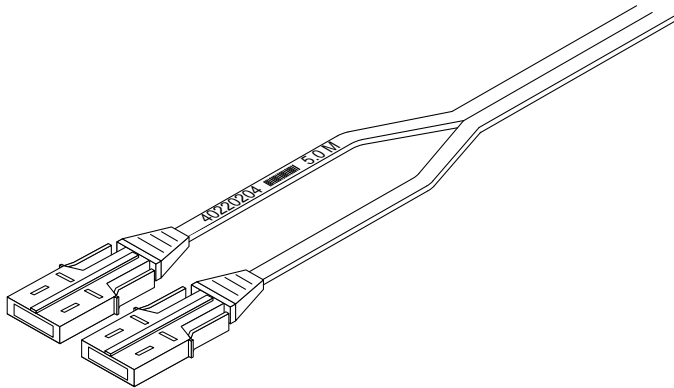
FIGURE A-7 Sun Fire Link Optical Cable (F537-1022, F537-1023, and F537-1024)

Regulatory Compliance Statements

Your Sun product is marked to indicate its compliance class:

- Federal Communications Commission (FCC) — USA
- Industry Canada Equipment Standard for Digital Equipment (ICES-003) - Canada
- Voluntary Control Council for Interference (VCCI) — Japan
- Bureau of Standards Metrology and Inspection (BSMI) — Taiwan

Please read the appropriate section that corresponds to the marking on your Sun product before attempting to install the product.

B.1 FCC Class A Notice

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference.

2. This device must accept any interference received, including interference that may cause undesired operation.

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

Shielded Cables: Connections between the workstation and peripherals must be made using shielded cables to comply with FCC radio frequency emission limits. Networking connections can be made using unshielded twisted-pair (UTP) cables.

Modifications: Any modifications made to this device that are not approved by Sun Microsystems, Inc. may void the authority granted to the user by the FCC to operate this equipment.

B.2   FCC Class B Notice

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference.

2. This device must accept any interference received, including interference that may cause undesired operation.

Note – This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/television technician for help.

Shielded Cables: Connections between the workstation and peripherals must be made using shielded cables in order to maintain compliance with FCC radio frequency emission limits. Networking connections can be made using unshielded twisted pair (UTP) cables.

Modifications: Any modifications made to this device that are not approved by Sun Microsystems, Inc. may void the authority granted to the user by the FCC to operate this equipment.

B.3 ICES-003 Class A Notice - Avis NMB-003, Classe A

This Class A digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

B.4 ICES-003 Class B Notice - Avis NMB-003, Classe B

This Class B digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

VCCI 基準について

クラス A VCCI 基準について

クラス A VCCI の表示があるワークステーションおよびオプション製品は、クラス A 情報技術装置です。これらの製品には、下記の項目が該当します。

> この装置は、情報処理装置等電波障害自主規制協議会 (VCCI) の基準に基づくクラス A 情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。

クラス B VCCI 基準について

クラス B VCCI の表示 [VCI] があるワークステーションおよびオプション製品は、クラス B 情報技術装置です。これらの製品には、下記の項目が該当します。

> この装置は、情報処理装置等電波障害自主規制協議会 (VCCI) の基準に基づくクラス B 情報技術装置です。この装置は、家庭環境で使用することを目的としていますが、この装置がラジオやテレビジョン受信機に近接して使用されると、受信障害を引き起こすことがあります。取扱説明書に従って正しい取り扱いをしてください。

B.5 BSMI Class A Notice

The following statement is applicable to products shipped to Taiwan and marked as Class A on the product compliance label.

警告使用者：
這是甲類的資訊產品，在居住的環境中使用
時，可能會造成射頻 干擾，在這種情況下，
使用者會被要求採取某些適當的對策。

Safety Agency Compliance Statements

Read this section before beginning any procedure. The following text provides safety precautions to follow when installing a Sun Microsystems product.

Safety Precautions

For your protection, observe the following safety precautions when setting up your equipment:

- Follow all cautions and instructions marked on the equipment.
- Ensure that the voltage and frequency of your power source match the voltage and frequency inscribed on the equipment's electrical rating label.
- Never push objects of any kind through openings in the equipment. Dangerous voltages may be present. Conductive foreign objects could produce a short circuit that could cause fire, electric shock, or damage to your equipment.

Symbols

The following symbols may appear in this book:

Caution – There is risk of personal injury and equipment damage. Follow the instructions.

Caution – Hot surface. Avoid contact. Surfaces are hot and may cause personal injury if touched.

Caution – Hazardous voltages are present. To reduce the risk of electric shock and danger to personal health, follow the instructions.

On – Applies AC power to the system.

Depending on the type of power switch your device has, one of the following symbols may be used:

Off - Removes AC power from the system.

Standby – The On/Standby switch is in the standby position.

Modifications to Equipment

Do not make mechanical or electrical modifications to the equipment. Sun Microsystems is not responsible for regulatory compliance of a modified Sun product.

Placement of a Sun Product

Caution – Do not block or cover the openings of your Sun product. Never place a Sun product near a radiator or heat register. Failure to follow these guidelines can cause overheating and affect the reliability of your Sun product.

Caution – Noise level during normal operating condition is below 70Db(A). Noise level during over temperature condition may be above 70Db(A). Limit exposure during this temporary condition.

SELV Compliance

Safety status of I/O connections comply to SELV requirements.

Power Cord Connection

Caution – Sun products are designed to work with a line-to-neutral or line-to-line connection. To reduce the risk of electric shock, do not plug Sun products into any other type of power system. Contact your facilities manager or a qualified electrician if you are not sure what type of power is supplied to your building.

Caution – Not all power cords have the same current ratings. Household extension cords do not have overload protection and are not meant for use with computer systems. Do not use household extension cords with your Sun product.

Caution – Your Sun product is shipped with a grounding type (three-wire) power cord. To reduce the risk of electric shock, always plug the cord into a grounded power outlet.

The following caution applies only to devices with a Standby power switch:

Caution – The power switch of this product functions as a standby type device only. The power cord serves as the primary disconnect device for the system. Be sure to plug the power cord into a grounded power outlet that is nearby the system and is readily accessible. Do not connect the power cord when the power supply has been removed from the system chassis.

Lithium Battery

Caution – On Sun SC CPU boards, there is a lithium battery molded into the real-time clock, SGS No. MK48T59Y, MK48TXXB-XX, MK48T18-XXXPCZ, M48T59W-XXXPCZ, or MK48T08. Batteries are not customer replaceable parts. They may explode if mishandled. Do not dispose of the battery in fire. Do not disassemble it or attempt to recharge it.

Laser Compliance Notice

Sun products that use laser technology comply with Class 1 laser requirements.

Class 1 Laser Product
Luokan 1 Laserlaite
Klasse 1 Laser Apparat
Laser KLasse 1

CD ROM/DVD ROM

Caution – Use of controls, adjustments, or the performance of procedures other than those specified herein may result in hazardous radiation exposure.

Einhaltung sicherheitsbehördlicher Vorschriften

Auf dieser Seite werden Sicherheitsrichtlinien beschrieben, die bei der Installation von Sun-Produkten zu beachten sind.

Sicherheitsvorkehrungen

Treffen Sie zu Ihrem eigenen Schutz die folgenden Sicherheitsvorkehrungen, wenn Sie Ihr Gerät installieren:

- Beachten Sie alle auf den Geräten angebrachten Warnhinweise und Anweisungen.
- Vergewissern Sie sich, daß Spannung und Frequenz Ihrer Stromquelle mit der Spannung und Frequenz übereinstimmen, die auf dem Etikett mit den elektrischen Nennwerten des Geräts angegeben sind.
- Stecken Sie auf keinen Fall irgendwelche Gegenstände in Öffnungen in den Geräten. Leitfähige Gegenstände könnten aufgrund der möglicherweise vorliegenden gefährlichen Spannungen einen Kurzschluß verursachen, der einen Brand, Stromschlag oder Geräteschaden herbeiführen kann.

Symbole

Die Symbole in diesem Handbuch haben folgende Bedeutung:

Achtung – Gefahr von Verletzung und Geräteschaden. Befolgen Sie die Anweisungen.

Achtung – Hohe Temperatur. Nicht berühren, da Verletzungsgefahr durch heiße Oberfläche besteht.

Achtung – Gefährliche Spannungen. Anweisungen befolgen, um Stromschläge und Verletzungen zu vermeiden.

Ein – Setzt das System unter Wechselstrom.

Je nach Netzschaltertyp an Ihrem Gerät kann eines der folgenden Symbole benutzt werden:

Aus – Unterbricht die Wechselstromzufuhr zum Gerät.

Wartezustand (Stand-by-Position) - Der Ein-/ Wartezustand-Schalter steht auf Wartezustand. Änderungen an Sun-Geräten.

Nehmen Sie keine mechanischen oder elektrischen Änderungen an den Geräten vor. Sun Microsystems, übernimmt bei einem Sun-Produkt, das geändert wurde, keine Verantwortung für die Einhaltung behördlicher Vorschriften

Aufstellung von Sun-Geräten

Achtung – Um den zuverlässigen Betrieb Ihres Sun-Geräts zu gewährleisten und es vor Überhitzung zu schützen, dürfen die Öffnungen im Gerät nicht blockiert oder verdeckt werden. Sun-Produkte sollten niemals in der Nähe von Heizkörpern oder Heizluftklappen aufgestellt werden.

Achtung – Unter normalen Betriebsbedingungen liegt der Geräuschpegel unter 70   Db(A). Bei erhöhten Temperaturen kann der Geräuschpegel bei über 70   Db(A) liegen. Minimieren Sie eine Überhitzung des Gerätes.

Einhaltung der SELV-Richtlinien

Die Sicherung der I/O-Verbindungen entspricht den Anforderungen der SELV-Spezifikation.

Anschluß des Netzkabels

⚡ **Achtung** – Sun-Produkte sind für die Verwendung mit einer Leiter-zu-Neutral- oder einer Leiter-zu-Leiter-Verbindung vorgesehen. Um die Stromschlaggefahr zu reduzieren, schließen Sie Sun-Produkte nicht an andere Stromquellen an. Ihr Betriebsleiter oder ein qualifizierter Elektriker kann Ihnen die Daten zur Stromversorgung in Ihrem Gebäude geben.

⚡ **Achtung** – Nicht alle Netzkabel haben die gleichen Nennwerte. Herkömmliche, im Haushalt verwendete Verlängerungskabel besitzen keinen Überlastungsschutz und sind daher für Computersysteme nicht geeignet.

⚡ **Achtung** – Ihr Sun-Gerät wird mit einem dreiadrigen Netzkabel für geerdete Netzsteckdosen geliefert. Um die Gefahr eines Stromschlags zu reduzieren, schließen Sie das Kabel nur an eine fachgerecht verlegte, geerdete Steckdose an.

Die folgende Warnung gilt nur für Geräte mit Wartezustand-Netzschalter:

⚡ **Achtung** – Der Ein/Aus-Schalter dieses Geräts schaltet nur auf Wartezustand (Stand-By-Modus). Um die Stromzufuhr zum Gerät vollständig zu unterbrechen, müssen Sie das Netzkabel von der Steckdose abziehen. Schließen Sie den Stecker des Netzkabels an eine in der Nähe befindliche, frei zugängliche, geerdete Netzsteckdose an. Schließen Sie das Netzkabel nicht an, wenn das Netzteil aus der Systemeinheit entfernt wurde.

Lithiumbatterie

⚠ **Achtung** – SC CPU-Karten von Sun verfügen über eine Echtzeituhr mit integrierter Lithiumbatterie (Teile-Nr. MK48T59Y, MK48TXXB-XX, MK48T18-XXXPCZ, M48T59W-XXXPCZ, oder MK48T08). Diese Batterie darf nur von einem qualifizierten Servicetechniker ausgewechselt werden, da sie bei falscher Handhabung explodieren kann. Werfen Sie die Batterie nicht ins Feuer. Versuchen Sie auf keinen Fall, die Batterie auszubauen oder wiederaufzuladen.

Einhaltung der Richtlinien für Laser

Sun-Produkte, die mit Laser-Technologie arbeiten, entsprechen den Anforderungen der Laser Klasse 1.

Class 1 Laser Product
Luokan 1 Laserlaite
Klasse 1 Laser Apparat
Laser KLasse 1

CD ROM/DVD ROM

⚠ **Warnung** – Die Verwendung von anderen Steuerungen und Einstellungen oder die Durchfhrung von Prozeduren, die von den hier beschriebenen abweichen, knnen gefhrliche Strahlungen zur Folge haben.

Conformité aux normes de sécurité

Ce texte traite des mesures de sécurité qu'il convient de prendre pour l'installation d'un produit Sun Microsystems.

Mesures de sécurité

Pour votre protection, veuillez prendre les précautions suivantes pendant l'installation du matériel :

- Suivre tous les avertissements et toutes les instructions inscrites sur le matériel.
- Vérifier que la tension et la fréquence de la source d'alimentation électrique correspondent à la tension et à la fréquence indiquées sur l'étiquette de classification de l'appareil.
- Ne jamais introduire d'objets quels qu'ils soient dans une des ouvertures de l'appareil. Vous pourriez vous trouver en présence de hautes tensions dangereuses. Tout objet conducteur introduit de la sorte pourrait produire un court-circuit qui entraînerait des flammes, des risques d'électrocution ou des dégâts matériels.

Symboles

Vous trouverez ci-dessous la signification des différents symboles utilisés :

Attention: – risques de blessures corporelles et de dégâts matériels. Veuillez suivre les instructions.

Attention: – surface à température élevée. Evitez le contact. La température des surfaces est élevée et leur contact peut provoquer des blessures corporelles.

Attention: – présence de tensions dangereuses. Pour éviter les risques d'électrocution et de danger pour la santé physique, veuillez suivre les instructions.

MARCHE – Votre système est sous tension (courant alternatif).

Un des symboles suivants sera peut-être utilisé en fonction du type d'interrupteur de votre système:

ARRET - Votre système est hors tension (courant alternatif).

VEILLEUSE – L'interrupteur Marche/Veilleuse est en position « Veilleuse ».

Modification du matériel

Ne pas apporter de modification mécanique ou électrique au matériel. Sun Microsystems n'est pas responsable de la conformité réglementaire d'un produit Sun qui a été modifié.

Positionnement d'un produit Sun

Attention: – pour assurer le bon fonctionnement de votre produit Sun et pour l'empêcher de surchauffer, il convient de ne pas obstruer ni recouvrir les ouvertures prévues dans l'appareil. Un produit Sun ne doit jamais être placé à proximité d'un radiateur ou d'une source de chaleur.

Attention: – Pendant le fonctionnement normal, le niveau de bruit est inférieur à 70 Db (A). Pendant l'utilisation à des températures élevées, il peut être supérieur à 70 Db (A). Limitez l'utilisation pendant ces conditions temporaires.

Conformité SELV

Sécurité : les raccordements E/S sont conformes aux normes SELV.

Connexion du cordon d'alimentation.

Attention: – Les produits Sun sont conçus pour fonctionner avec une connexion ligne à neutre ou ligne à ligne. Pour écarter les risques d'électrocution, ne pas brancher de produit Sun dans un autre type d'alimentation secteur. En cas de doute quant au type d'alimentation électrique du local, veuillez vous adresser au directeur de l'exploitation ou à un électricien qualifié.

Attention: – tous les cordons d'alimentation n'ont pas forcément la même puissance nominale en matière de courant. Les rallonges d'usage domestique n'offrent pas de protection contre les surcharges et ne sont pas prévues pour les systèmes d'ordinateurs. Ne pas utiliser de rallonge d'usage domestique avec votre produit Sun.

Attention: – votre produit Sun a été livré équipé d'un cordon d'alimentation à trois fils (avec prise de terre). Pour écarter tout risque d'électrocution, branchez toujours ce cordon dans une prise mise à la terre.

L'avertissement suivant s'applique uniquement aux systèmes équipés d'un interrupteur VEILLEUSE:

Attention: – le commutateur d'alimentation de ce produit fonctionne comme un dispositif de mise en veille uniquement. C'est la prise d'alimentation qui sert à mettre le produit hors tension. Veillez donc à installer le produit à proximité d'une prise murale facilement accessible. Ne connectez pas la prise d'alimentation lorsque le châssis du système n'est plus alimenté.

Batterie au lithium

Attention: – sur les cartes SC CPU Sun, une batterie au lithium (référence MK48T59Y, MK48TXXB-XX, MK48T18-XXXPCZ, M48T59W-XXXPCZ, ou MK48T08.) a été moulée dans l'horloge temps réel SGS. Les batteries ne sont pas des pièces remplaçables par le client. Elles risquent d'exploser en cas de mauvais traitement. Ne pas jeter la batterie au feu. Ne pas la démonter ni tenter de la recharger.

Conformité aux certifications Laser

Les produits Sun qui font appel aux technologies lasers sont conformes aux normes de la classe 1 en la matière.

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Attention: – L'utilisation de contrôles, de réglages ou de performances de procédures autre que celle spécifiée dans le présent document peut provoquer une exposition à des radiations dangereuses.

Normativas de seguridad

El siguiente texto incluye las medidas de seguridad que se deben seguir cuando se instale algún producto de Sun Microsystems.

Precauciones de seguridad

Para su protección observe las siguientes medidas de seguridad cuando manipule su equipo:

- Siga todas los avisos e instrucciones marcados en el equipo.
- Asegúrese de que el voltaje y la frecuencia de la red eléctrica concuerdan con las descritas en las etiquetas de especificaciones eléctricas del equipo.
- No introduzca nunca objetos de ningún tipo a través de los orificios del equipo. Pueden haber voltajes peligrosos. Los objetos extraños conductores de la electricidad pueden producir cortocircuitos que provoquen un incendio, descargas eléctricas o daños en el equipo.

Símbolos

En este libro aparecen los siguientes símbolos:

Precaución – Existe el riesgo de lesiones personales y daños al equipo. Siga las instrucciones.

Precaución – Superficie caliente. Evite el contacto. Las superficies están calientes y pueden causar daños personales si se tocan.

Precaución – Voltaje peligroso presente. Para reducir el riesgo de descarga y daños para la salud siga las instrucciones.

Encendido – Aplica la alimentación de CA al sistema.

Según el tipo de interruptor de encendido que su equipo tenga, es posible que se utilice uno de los siguientes símbolos:

Apagado - Elimina la alimentación de CA del sistema.

En espera – El interruptor de Encendido/En espera se ha colocado en la posición de En espera.

Modificaciones en el equipo

No realice modificaciones de tipo mecánico o eléctrico en el equipo. Sun Microsystems no se hace responsable del cumplimiento de las normativas de seguridad en los equipos Sun modificados.

Ubicación de un producto Sun

Precaución – Para asegurar la fiabilidad de funcionamiento de su producto Sun y para protegerlo de sobrecalentamien-tos no deben obstruirse o taparse las rejillas del equipo. Los productos Sun nunca deben situarse cerca de radiadores o de fuentes de calor.

Precaución – El nivel de ruido en circunstancias normales de funcionamiento está por debajo de 70 Db (A). El nivel de ruido en circunstancias de temperatura excesiva podría estar por encima de 70 Db (A). En dichas circunstancias temporales limite la exposición.

Cumplimiento de la normativa SELV

El estado de la seguridad de las conexiones de entrada/salida cumple los requisitos de la normativa SELV.

Conexión del cable de alimentación eléctrica

Precaución – Los productos Sun están diseñados para funcionar con una conexión línea a neutra o línea a línea. Para reducir el riesgo de descarga eléctrica, no conecte los productos Sun a otro tipo de sistema de alimentación eléctrica. Póngase en contacto con el responsable de mantenimiento o con un electricista cualificado si no está seguro del sistema de alimentación eléctrica del que se dispone en su edificio.

Precaución – No todos los cables de alimentación eléctrica tienen la misma capacidad. Los cables de tipo doméstico no están provistos de protecciones contra sobrecargas y por tanto no son apropiados para su uso con computadores. No utilice alargadores de tipo doméstico para conectar sus productos Sun.

Precaución – Con el producto Sun se proporciona un cable de alimentación con toma de tierra. Para reducir el riesgo de descargas eléctricas conéctelo siempre a un enchufe con toma de tierra.

La siguiente advertencia se aplica solamente a equipos con un interruptor de encendido que tenga una posición "En espera":

Precaución – El interruptor de encendido de este producto funciona exclusivamente como un dispositivo de puesta en espera. El enchufe de la fuente de alimentación está diseñado para ser el elemento primario de desconexión del equipo. El equipo debe instalarse cerca del enchufe de forma que este último pueda ser fácil y rápidamente accesible. No conecte el cable de alimentación cuando se ha retirado la fuente de alimentación del chasis del sistema.

Batería de litio

Precaución – En las placas de SC CPU Sun hay una batería de litio insertada en el reloj de tiempo real, tipo SGS Núm. MK48T59Y, MK48TXXB-XX, MK48T18-XXXPCZ, M48T59W-XXXPCZ, o MK48T08. Las baterías no son elementos reemplazables por el propio cliente. Pueden explotar si se manipulan de forma errónea. No arroje las baterías al fuego. No las abra o intente recargarlas.

Aviso de cumplimiento con requisitos de láser

Los productos Sun que utilizan la tecnología de láser cumplen con los requisitos de láser de Clase 1.

Class 1 Laser Product
Luokan 1 Laserlaite
Klasse 1 Laser Apparat
Laser KLasse 1

CD ROM/DVD ROM

Precaución – El manejo de los controles, los ajustes o la ejecución de procedimientos distintos a los aquí especificados pueden exponer al usuario a radiaciones peligrosas.

GOST-R Certification Mark
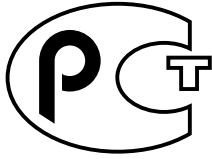
Nordic Lithium Battery Cautions

Norge

ADVARSEL – Litiumbatteri —
Eksplosjonsfare.Ved utskifting benyttes kun
batteri som anbefalt av apparatfabrikanten.
Brukt batteri returneres apparatleverandøren.

Sverige

VARNING – Explosionsfara vid felaktigt
batteribyte. Använd samma batterityp eller
en ekvivalent typ som rekommenderas av
apparattillverkaren. Kassera använt batteri
enligt fabrikantens instruktion.

Danmark

ADVARSEL! – Litiumbatteri —
Eksplosionsfare ved fejlagtig håndtering.
Udskiftning må kun ske med batteri af samme
fabrikat og type. Levér det brugte batteri
tilbage til leverandøren.

Suomi

VAROITUS – Paristo voi räjähtää, jos se on
virheellisesti asennettu. Vaihda paristo
ainoastaan laitevalmistajan suosittelemaan
tyyppiin. Hävitä käytetty paristo valmistajan
ohjeiden mukaisesti.

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