Netra™ 1290 Server Service Manual

Sun Microsystems, Inc.
www.sun.com

Part No. 819-4373-10
May 2006, Revision A

Submit comments about this document at: `http://www.sun.com/hwdocs/feedback`

Please
Recycle

Adobe PostScript

Contents

Figures

Tables

Preface

The *Netra 1290 Server Service Manual* provides detailed procedures that describe the removal and installment of replaceable parts in the Netra™ 1290 server. This manual also includes information about the use and maintenance of the server. This document is written for technicians, system administrators, authorized service providers (ASPs), and users who have advanced experience servicing computer hardware.

How This Document Is Organized

Chapter 1 provides an overview of the Netra 1290 server service procedures.

Chapter 2 describes tasks to perform before replacing components.

Chapter 3 describes mechanical component replacement.

Chapter 4 provides storage component replacement procedures.

Chapter 5 provides replacement procedures for various system boards.

Chapter 6 describes chassis component replacement.

Chapter 7 describes task to perform after replacing components.

Appendix A lists the specifications of the Netra 1290 server.

Appendix B provides server connector information.

Appendix C describes maintenance and transporting procedures.

Using UNIX Commands

This document might not contain information about basic UNIX® commands and procedures such as shutting down the system, booting the system, and configuring devices. Refer to the following for this information:

- Software documentation that you received with your server
- Solaris™ Operating System documentation, which is at:

  `http://docs.sun.com`

Shell Prompts

Shell	Prompt
C shell	*machine-name*%
C shell superuser	*machine-name*#
Bourne shell and Korn shell	$
Bourne shell and Korn shell superuser	#

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. Replace command-line variables with real names or values.	Read Chapter 6 in the *User's Guide*. These are called *class* options. You *must* be superuser to do this. To delete a file, type `rm` *filename*.

* The settings on your browser might differ from these settings.

Related Documentation

The documents listed as online are available at:

`http://www.sun.com/products-n-solutions/hardware/docs/`

Application	Title	Part Number	Format	Location
Pointer doc	*Netra 1290 Server Getting Started Guide*	819-4378-10	Printed PDF	Shipping kit Online
Installation	*Netra 1290 Server Installation Guide*	819-4372-10	PDF	Online
Administration	*Netra 1290 Server System Administration Guide*	819-4374-10	PDF	Online
Updates	*Netra 1290 Server Product Notes*	819-4375-10	PDF	Online
Compliance	*Netra 1290 Server Safety and Compliance Guide*	819-4376-10	PDF	Online

Documentation, Support, and Training

Sun Function	URL	Description
Documentation	`http://www.sun.com/documentation/`	Download PDF and HTML documents, and order printed documents
Support	`http://www.sun.com/support`	Obtain technical support
Training	`http://www.sun.com/training/`	Learn about Sun courses

Third-Party Web Sites

Sun is not responsible for the availability of third-party web sites mentioned in this document. Sun does not endorse and is not responsible or liable for any content, advertising, products, or other materials that are available on or through such sites or resources. Sun will not be responsible or liable for any actual or alleged damage or loss caused by or in connection with the use of or reliance on any such content, goods, or services that are available on or through such sites or resources.

Sun Welcomes Your Comments

Sun is interested in improving its documentation and welcomes your comments and suggestions. You can submit your comments by going to:

`http://www.sun.com/hwdocs/feedback`

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

Netra 1290 Server Service Manual, part number 819-4373-10

CHAPTER 1

Netra 1290 Server Component Replacability

This chapter describes the replacability of FRUs and options for the Netra 1290 server.

Some of the FRUs and options can be installed by a competent system administrator, but many *must* be installed by an appropriately qualified service engineer, as shown in TABLE 1-1. For the latest FRU list and part numbers of each FRU, refer to the *Sun System Handbook*.

TABLE 1-1 FRUs and Options

		Can be installed by:	
Description	**Configuration**	**System Administrator**	**Qualified Service Engineer**
CPU/memory module			✓
Memory expansion (DIMMs)			✓
Power cord kit		✓	✓
Cable management arm	CMA-Lite		✓
	CMA-800		✓
SCSI Hard drive		✓	✓
DDS-4 tape drive			✓
DVD-ROM drive			✓
Environmental filter kit		✓	✓
Bezel kit		✓	✓
CPU/memory filler panel			✓
Tape drive filler panel			✓

TABLE 1-1 FRUs and Options *(Continued)*

Description	Configuration	Can be installed by: System Administrator	Can be installed by: Qualified Service Engineer
Power supply		✓	✓
Power distribution board			✓
Backplane			✓
System configuration card reader			✓
Media bay (includes SCSI backplane)			✓
L2 repeater board			✓
IB_SSC assembly			✓
Main system fans			✓
System fan tray (includes 8 fans)			✓
IB_SSC fan			✓
Top bezel and system indicator board			✓
Power inlet assembly			✓
DVD-ROM adapter board			✓
System configuration card		✓	✓
Internal cable kit			✓
Antigravity clutch kit	CPU/memory board		✓
	IB_SSC assembly		✓
	L2 repeater board		✓
Rackmount slide kit			✓
Left front door/handle assembly			✓
Right front door/handle assembly			✓
IB_SSC internal foam baffle			✓

CHAPTER 2

Preparing to Replace Components

This chapter provides information and procedures to perform before replacing components. Topics include:

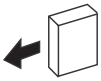
2.1 Safety Information

2.1.1 Safety and Status Symbols

TABLE 2-1 Safety 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 or equipment damage. To reduce the risk, follow the instructions.
	**HOT SURFACE**	Hot surfaces. Avoid contact. Surfaces are hot and might cause personal injury if touched.

TABLE 2-1 Safety Symbols *(Continued)*

Symbol	Description	Meaning
	**COMPONENT ACTIVATED**	Component or system is active when the green Active LED is lit.
	**OK TO REMOVE**	You can safely remove board or component from the server when the OK to remove LED (blue or amber) is lit.
	**FAULT**	The component or system has a fault when the Fault LED (amber) is lit.
	**PREDICTIVE FAULT**	The component has a pending fault when the Predictive Fault LED (amber) is lit.
	**LOCATOR**	The Locator LED (white) is lit, when it is activated by service personnel in order to locate the appropriate server or FRU.
	**PROTECTIVE EARTH**	Protective ground.
	**CHASSIS**	Frame or chassis ground.

2.1.2 System Cabinet Precautions

All system cabinets should be anchored to the floor, ceiling, or to adjacent frames, using the manufacturer's instructions.

Free-standing cabinets should be supplied with an antitilt bar, which must be extended to a minimum of 10.6 inches (27 cm) from the front edge of the rack, or at least sufficiently to support the weight of the server when extended on its slides. This prevents instability during installation or service actions.

Caution – If more than one server is installed in a system cabinet, service only one server at a time.

Where an antitilt feature is not supplied and the system cabinet is not bolted to the floor, a safety evaluation *must* be conducted to determine the cabinet stability when the server is extended on its slides, prior to any installation or service activity.

Prior to installing the system cabinet on a *raised* floor, a safety evaluation must be conducted to determine that the raised floor has sufficient strength to support the system cabinet. A solution might be to fix the system cabinet through the raised floor to the concrete floor below.

2.1.3 Electrical Precautions

For your protection, observe the following safety precautions 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 the objects might touch dangerous voltage points or short out components that could result in fire or electric shock.
- Ensure that the voltage and frequency of the power supplied match the electrical rating labels on the equipment.
- Use only properly grounded power outlets as described in the installation guide.
- Service of equipment is performed *only* by qualified personnel.

Caution – *Do not* make mechanical or electrical modifications to the Netra 1290 server. Sun Microsystems is not responsible for regulatory compliance of modified systems.

Caution – The chassis power cords must remain connected to ensure a proper ground.

2.1.4 Antistatic Precautions

Wear an antistatic wrist strap and attach the cord of the wrist strap directly to the server before removing any covers or components. Do not attach the antistatic wrist strap to the ESD mat connection as you and any components you remove must be at the same potential.

Observe the following antistatic precautions:

TABLE 2-2 Antistatic Precautions

Item	Problem	Precaution
ESD jack/wrist or foot strap	Electrostatic discharge (ESD)	Connect the ESD connector to your server and wear the wrist strap or foot strap when handling printed circuit boards. The server has four ESD connections: • Right side towards the front (FIGURE 2-1) • Left side towards the front • Center at the rear • Center of the fan tray assembly, at the front
ESD mat	Electrostatic discharge (ESD)	An approved ESD mat 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 printed circuit boards.
ESD packaging box	Electrostatic discharge (ESD)	Place the board or component in the ESD safe packaging box after you remove it. The CPU/memory board packaging box provides two ESD safe work surfaces.

Attach the antistatic wrist strap to the chassis, connecting the strap as shown in FIGURE 2-1.

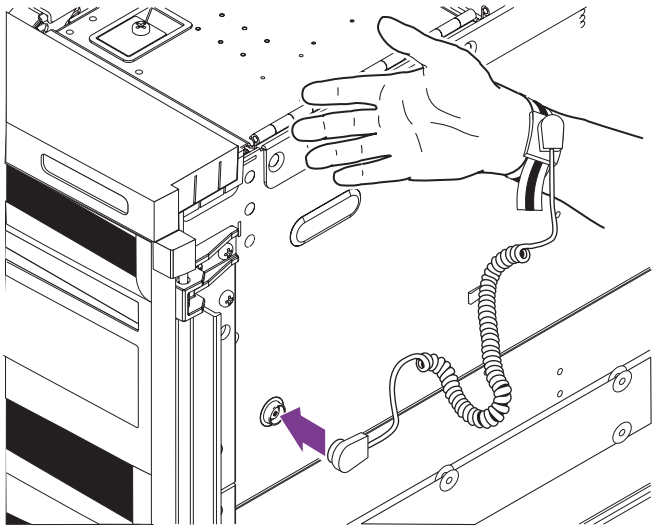


FIGURE 2-1 Attaching the Antistatic Wrist Strap – Right Side

2.2 Bringing the Server to Standby Mode

When replacing non-hot-swappable components, the server must be brought to Standby mode. Before doing this:

- Notify users that the system is going down.
- Back up the system files and data to tape, if necessary.

When the system powers off to Standby mode, the following conditions are observed:

- Source A and Source B indicator LEDs are illuminated on the system indicator board
- IB_SSC assembly Active LED is illuminated
- System controller remains operational
- One fan is running

Bringing the system to Standby mode can be achieved by three methods:

- From the Solaris command line
- From the LOM port
- By means of the On/Standby switch

2.2.1 Bringing the System to Standby Mode From the Solaris Command Line

- **At the system prompt as superuser, type:**

```
# shutdown -i5
```

2.2.2 Bringing the System to Standby Mode From the LOM Port

- **At the** `lom>` **prompt, type:**

```
lom>shutdown
```

- **For an abrupt power off, type:**

```
lom>poweroff

This will abruptly terminate Solaris.
Do you want to continue? [no]
```

Caution – This abruptly brings the system to Standby mode, regardless of the system state.

2.2.3 Bringing the System to Standby Mode by the On/Standby Switch

Caution – The On/Standby switch does not isolate the equipment. Turning off the power switch on the customer-supplied circuit breakers is required to isolate the equipment.

Take one of the following actions:

- **Press the left side of the system On/Standby switch.**
- **For an abrupt power off, press the left side of the On/Standby switch and hold it for at least four seconds.**

Caution – This abruptly brings the system to Standby mode, regardless of the system state.

2.3 Required Tools

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

- Screwdriver, No. 2 Phillips
- Screwdriver, No. 2 Phillips, 6-inch shank (15 cm) (for backplane removal)
- Needlenose pliers (for connector removal)
- Torque wrench and extension (supplied)
- ESD mat and grounding wrist strap or foot strap
- Safety platform

2.4 Sliding the Server Out of the System Cabinet

You need to slide the server out of the system cabinet in order to service the following FRUs:

- Removable media module
- System configuration card (SCC) reader
- IB_SSC (interface board – I/O assembly) fans
- Power distribution boards
- CPU/memory boards
- DIMMs
- IB_SSC assembly (I/O assembly and system controller)
- I/O cards
- L2 repeater boards
- System indicator board
- Backplane
- Clutch for the CPU/memory board, L2 repeater board, IB_SSC assembly
- Side handles

1. **Ensure that the leveling feet are extended to the floor.**
2. **Extend and lock the system cabinet stabilizer bar (**FIGURE 2-2**).**

Caution – Failure to extend and lock the stabilizer bar before you slide a server out of the system cabinet can cause the system cabinet to tip over.

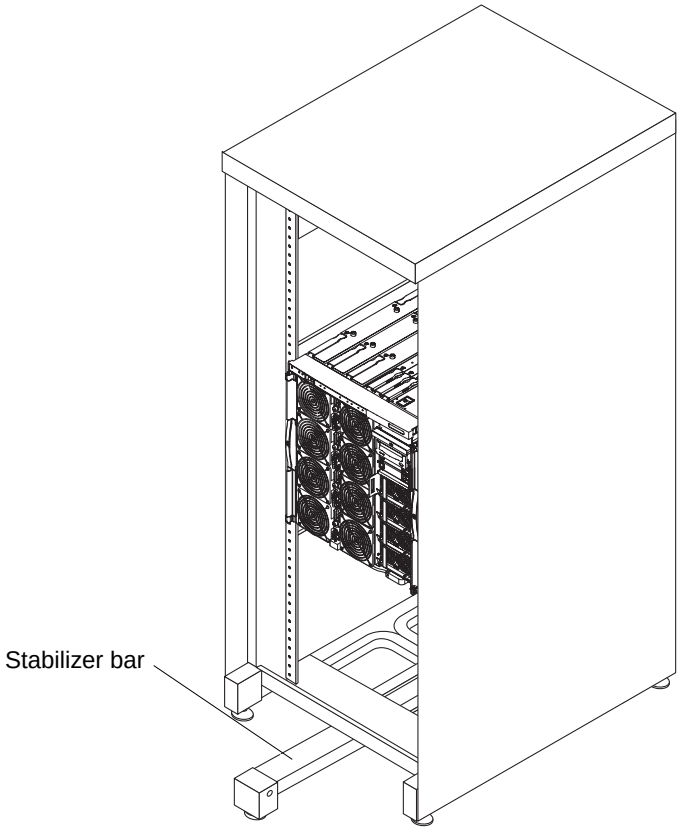


FIGURE 2-2 Sun Rack 900 System Cabinet With Stabilizer Bar Extended

---

Note – If your server has slide rail lock nuts installed, then the following Step 3, applies.

---

3. **Loosen, but do not remove, the slide rail lock nuts at the rear of the server (FIGURE 2-3).**

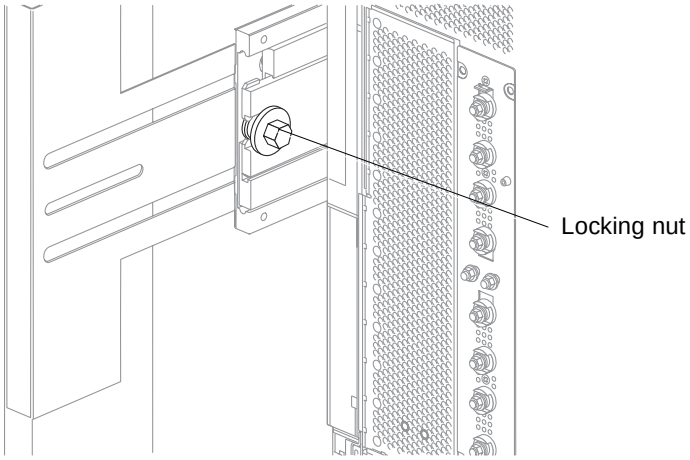


FIGURE 2-3 Slide Rail Lock Nut

4. **Loosen the captive screws on the side handles (FIGURE 2-4).**

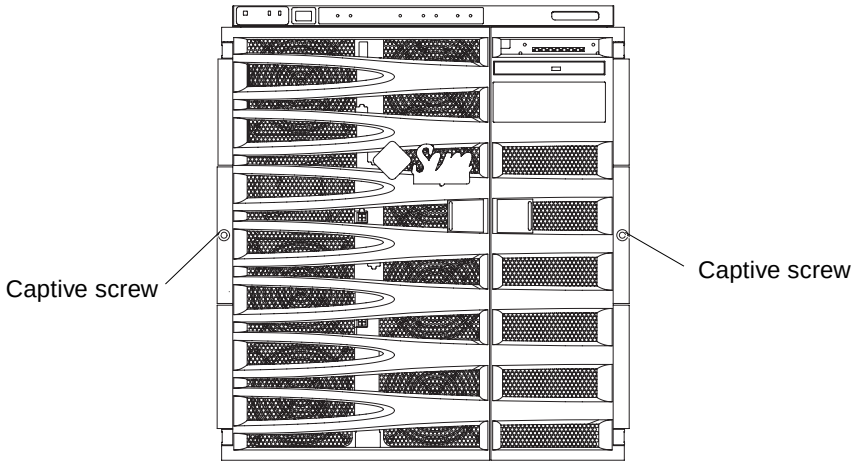


FIGURE 2-4 Side Handles Captive Screws

5. **From the front, carefully pull the server forward out of the system cabinet until the locking latches click (**FIGURE 2-5**).**

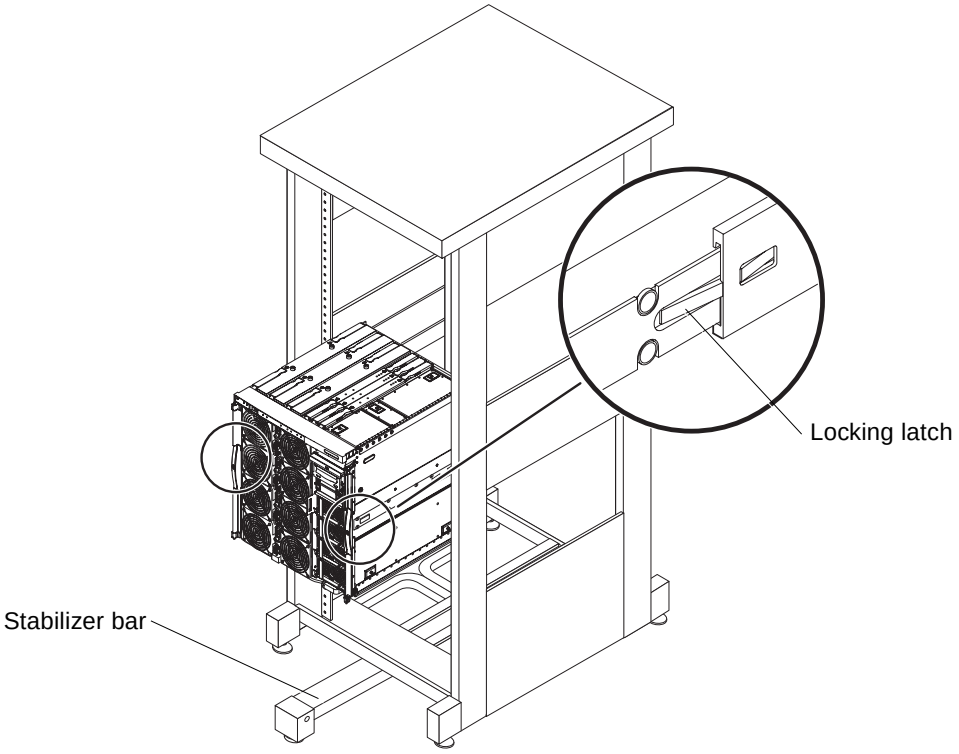


FIGURE 2-5 Sliding the Server Out of the System Cabinet

6. **Attach the antistatic wrist strap to the chassis, connecting the strap as shown in** FIGURE 2-6**.**

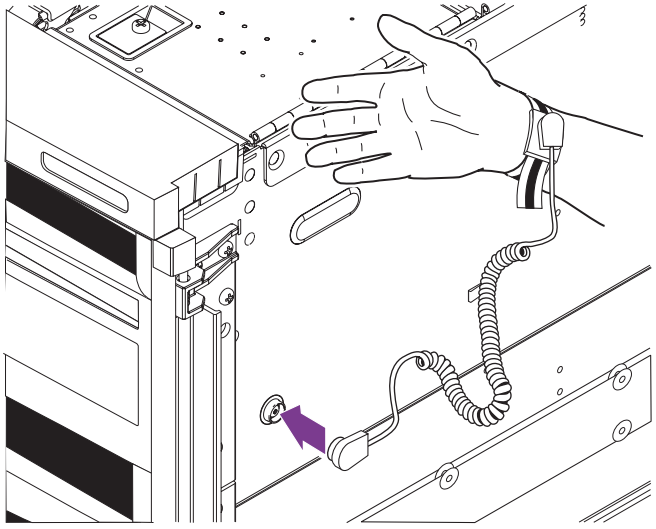


FIGURE 2-6 Attaching the Antistatic Wrist Strap – Right Side

2.5 Removing the Front Doors

There are two doors on the front of the server.

1. **Open both doors by pressing the latches at the center of each door (**FIGURE 2-7**).**

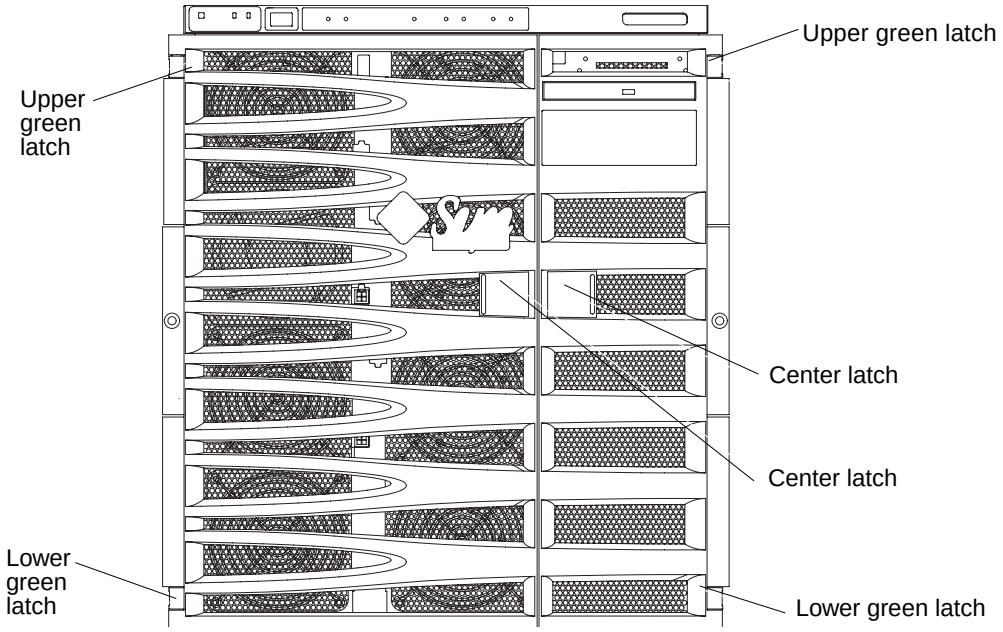


FIGURE 2-7 Front View of Server

2. **Remove one door.**

   a. **While holding the door with one hand, push the green latch on the top of the door (**FIGURE 2-8**).**

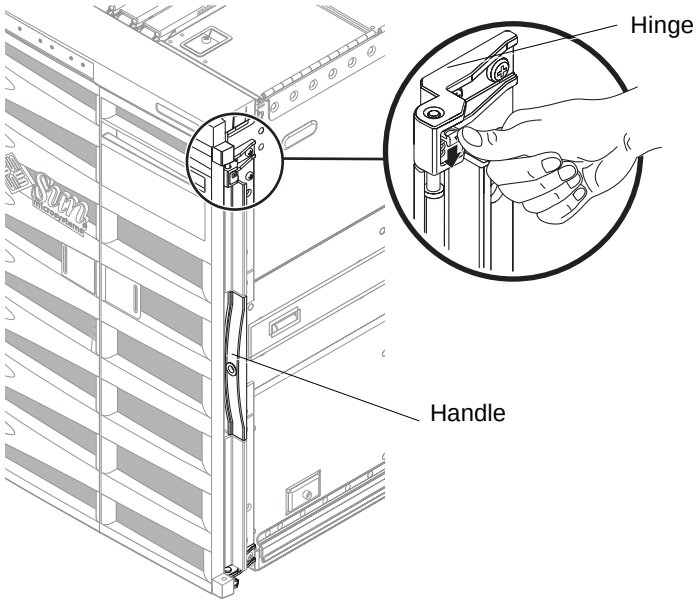


FIGURE 2-8 Bezel Hinge Release Mechanism

b. Move the door downwards.

The door will unlatch from the bottom green latch.

3. **Repeat** Step 2 **to remove the other door.**

CHAPTER 3

Replacing Mechanical Components

This chapter describes the following topics:

3.1 CMA-Lite Cable Management Arm

The cable management arm (CMA) supports and protects cables when a server slides into or out of a cabinet. Servers can be configured with either of two cable management arms – CMA-Lite or CMA-800. Use the CMA-Lite cable management arm if the larger CMA-800 management arm does not fit the cabinet. Threaded holes to attach the CMA are provided on the rear of the server (FIGURE 3-1).

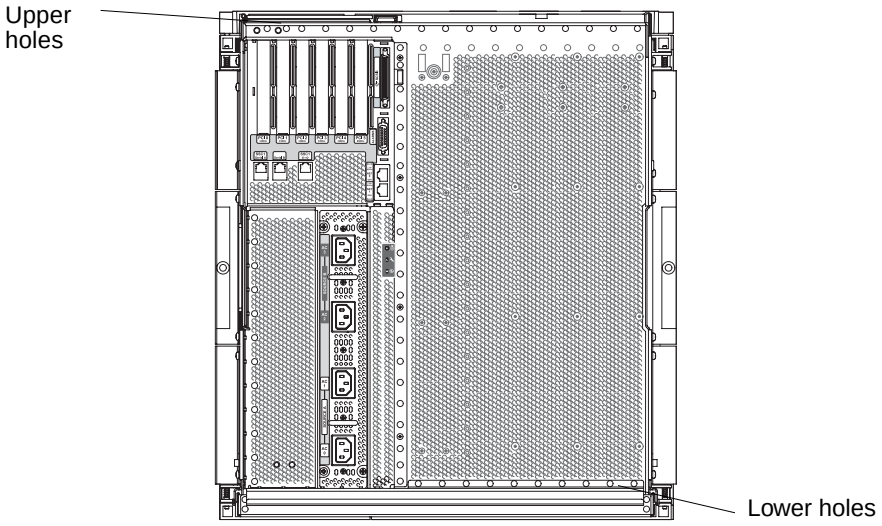


FIGURE 3-1 CMA Mounting Holes

The following procedures describe how to remove and install the CMA-Lite cable management arm.

3.1.1 Removing the CMA–Lite

1. **Remove or detach any cables being supported by the CMA-Lite.**
2. **Loosen the captive screws at the pivot at the end of the lower arm to the bottom rear of the server (**FIGURE 3-2**).**
3. **Loosen the captive screws at the center pivot point of the CMA to the inside rear of the left-hand rail assembly (**FIGURE 3-2**).**
4. **Loosen the captive screws at the end of the upper arm to the top rear of the server (**FIGURE 3-2**).**

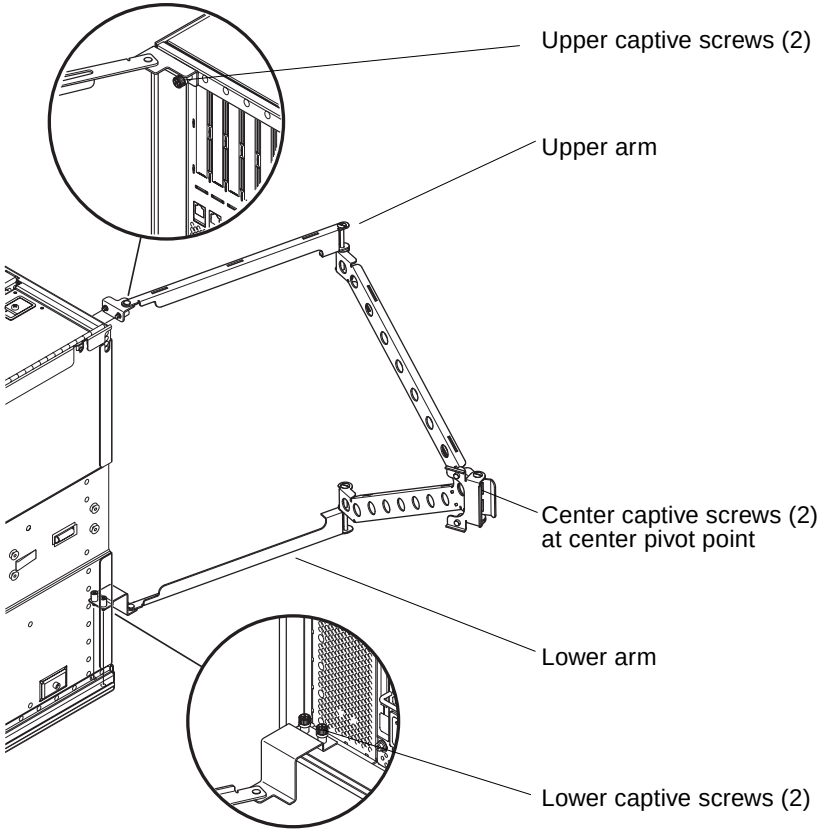


FIGURE 3-2 CMA–Lite Cable Management Arm

5. **Lift the CMA-Lite off the rear of the server and set it aside.**
6. **Continue to** Section 3.1.2, "Installing the CMA–Lite" on page 3-3**.**

3.1.2 Installing the CMA–Lite

1. **Position the replacement CMA-Lite over the screw mounting holes at the rear of the server.**
2. **Secure the pivot at the end of the upper arm to the top rear of the server, using the two captive screws (**FIGURE 3-2**).**
3. **Secure the center pivot point of the CMA to the inside rear of the left-hand rail assembly, using the two captive screws (**FIGURE 3-2**).**

4. **Secure the pivot at the end of the lower arm to the bottom rear of the server, using the two captive screws (FIGURE 3-2).**

5. **Reattach the cables to be supported by the CMA-Lite.**

3.2 CMA-800 Cable Management Arm

The following procedures describe how to remove and install the CMA-800.

3.2.1 Removing the CMA-800

To remove a CMA-800, see FIGURE 3-3 for parts identification and orientation, and proceed as follows:

Note – In the following procedure all left-hand and right-hand orientation is as viewed from the rear of the system chassis.

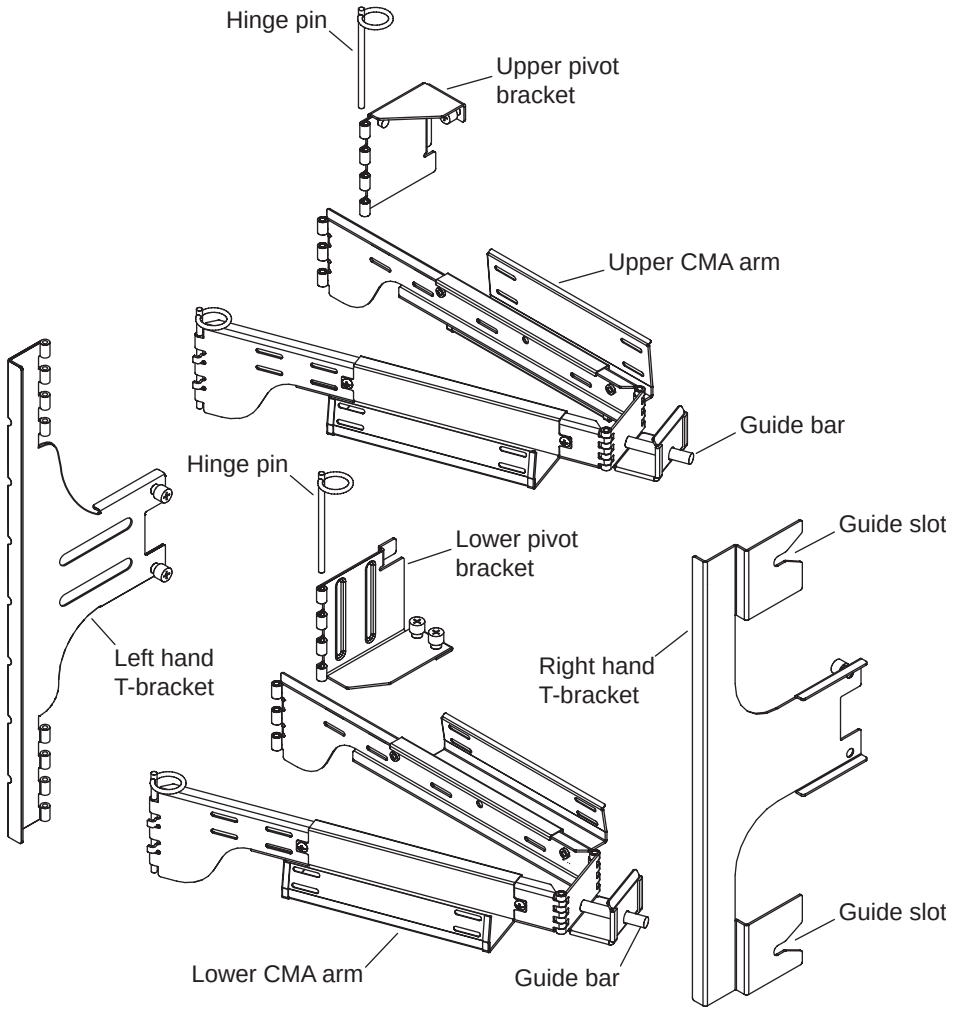


FIGURE 3-3 Upper and Lower CMA Arms, and Left-Hand and Right-Hand T-Brackets

1. **Remove or detach the cabling from the cable channels of the upper and lower CMA arms.**
2. **If necessary, bundle and tie the cabling such that it will not interfere with the CMA-800 removal process.**
3. **Free the upper and lower arms from the left-hand T-bracket by removing the associated hinge pins (**FIGURE 3-4**).**

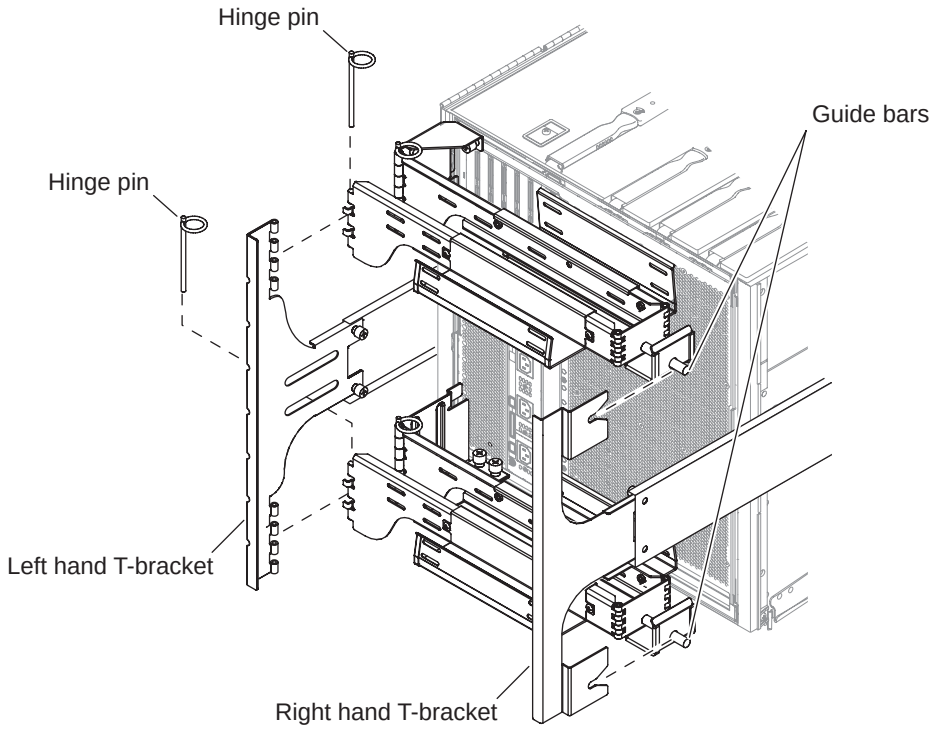


FIGURE 3-4 Detachment of Upper and Lower CMA Arms From T-Bracket

4. **Free the upper and lower CMA arms from the right-hand T-bracket by removing each arm's guide bar from the T-bracket guide slots (**FIGURE 3-4**).**

5. **Remove the right-hand T-bracket from the associated chassis slide rails by loosening the captive screws and then removing the T-bracket (FIGURE 3-5).**

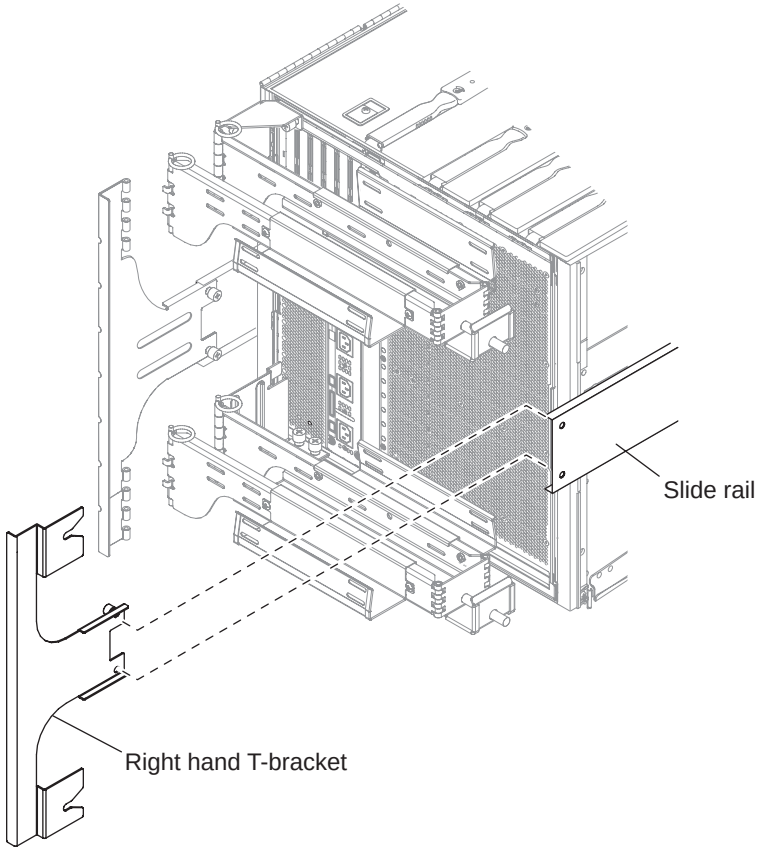


FIGURE 3-5 Detaching Right-Hand T-Bracket

6. **Remove the left-hand T-bracket from the associated chassis slide rails by loosening the captive screws and then removing the T-bracket (FIGURE 3-6).**

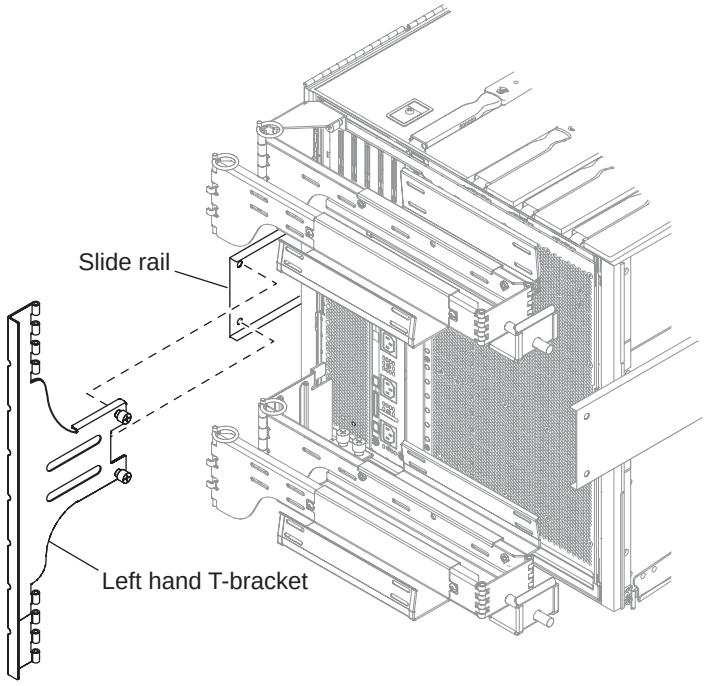


FIGURE 3-6 Detaching Left-Hand T-Bracket

7. **Remove the upper CMA arm from the upper pivot bracket by removing the hinge pin (**FIGURE 3-7**).**

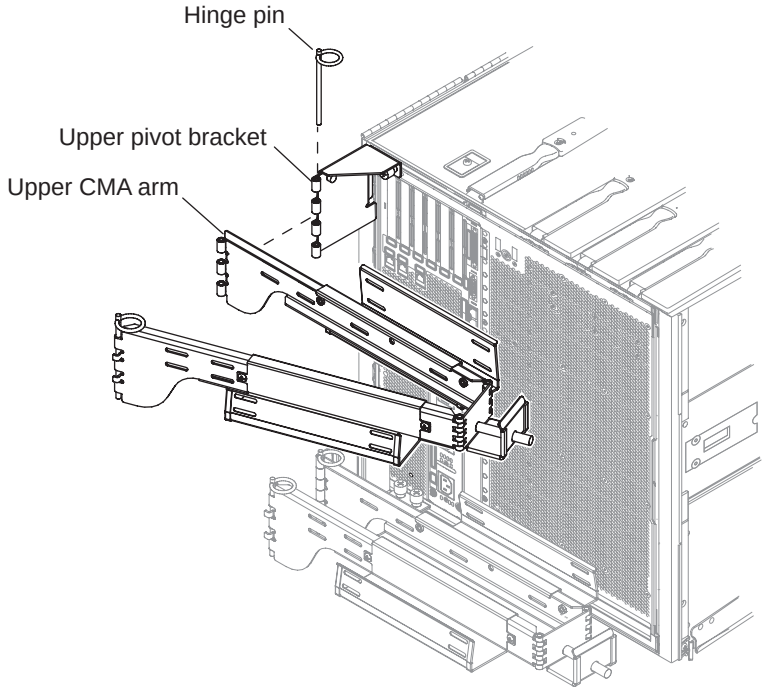


FIGURE 3-7 Detachment of Upper CMA Arm and Pivot Bracket

8. **Remove the lower CMA arm from the lower pivot bracket by removing the hinge pin (**FIGURE 3-8**)**

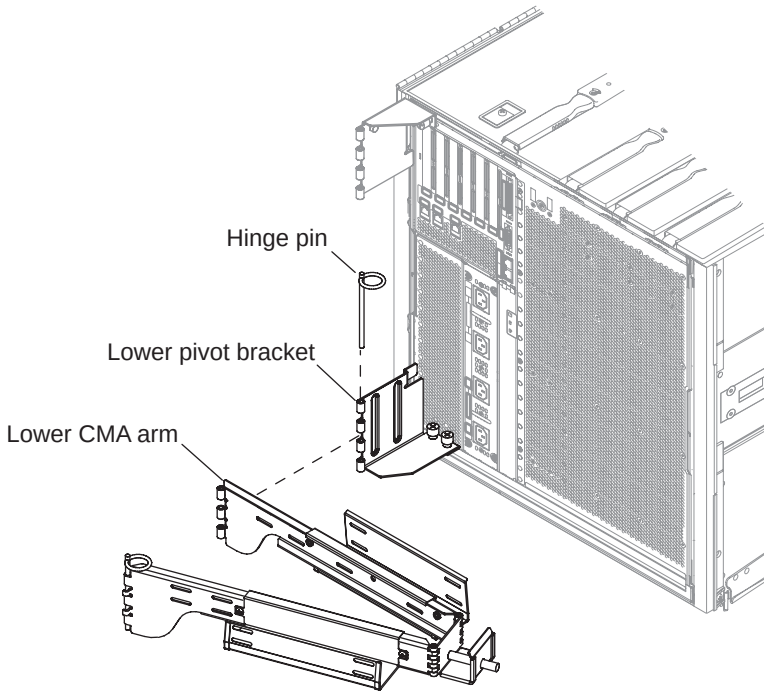


FIGURE 3-8 Detaching Lower CMA Arm and Pivot Bracket

9. **Determine your next step:**
   - If the CMA arms are going to be removed permanently, remove each arm's pivot bracket by removing the two screws on each bracket and setting all removed components aside.
   - If the arms are going to be replaced with new arms, you can leave the pivot brackets attached to the server chassis and continue to Section 3.2.2, "Installing the CMA-800" on page 3-11, Step 4.

3.2.2 Installing the CMA-800

Refer to FIGURE 3-9, throughout the following procedures for identification and orientation of CMA parts.

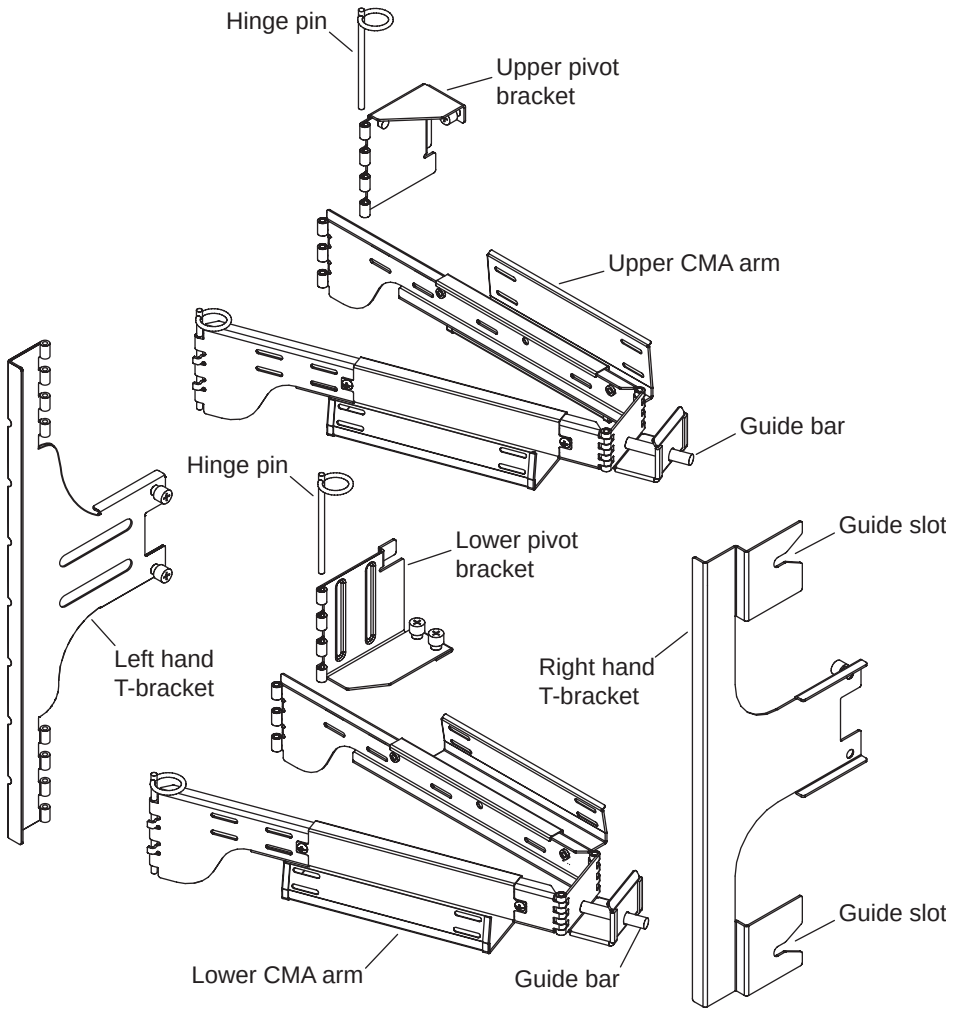


FIGURE 3-9 Upper and Lower CMA Arms and Left-Hand and Right-Hand T-Brackets

---

Note – In the following procedure left-hand and right-hand orientations are as viewed from the rear of the server chassis.

---

1. **Remove the replacement CMA-800 from its shipping container.**
2. **Remove the hinge pin securing the pivot bracket to the lower CMA arm.**
   This step facilitates attaching the bracket to the server chassis (FIGURE 3-9).
3. **Secure the lower pivot bracket to the lower left-hand of the server chassis using the two captive screws (FIGURE 3-10).**

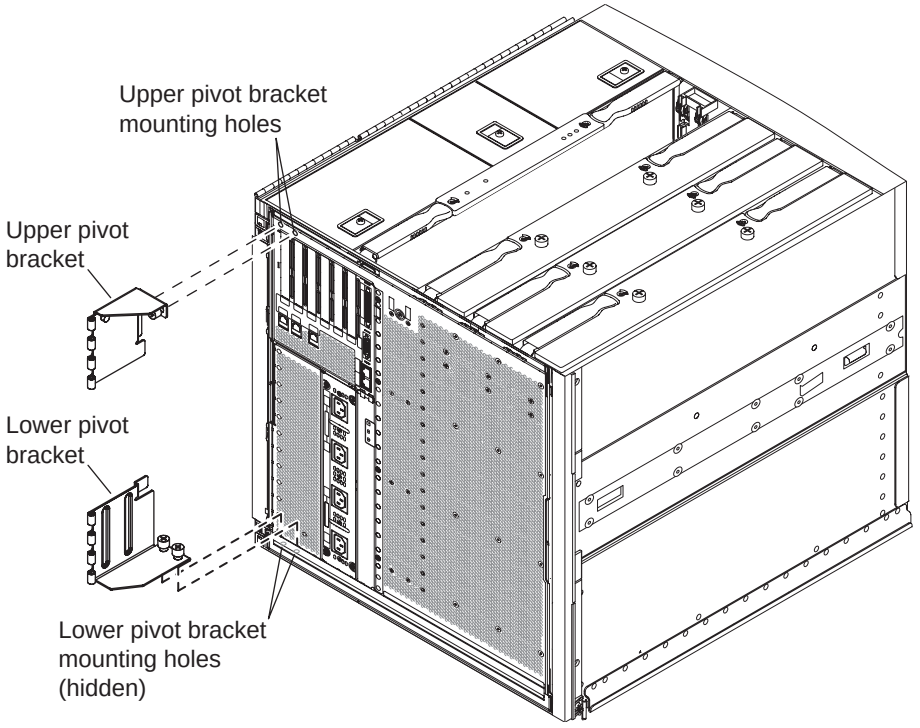


FIGURE 3-10 Upper and Lower Pivot Bracket Mounting Holes

4. **Secure the lower CMA arm to the bracket using the hinge pin removed** Step 2 **(FIGURE 3-11).**

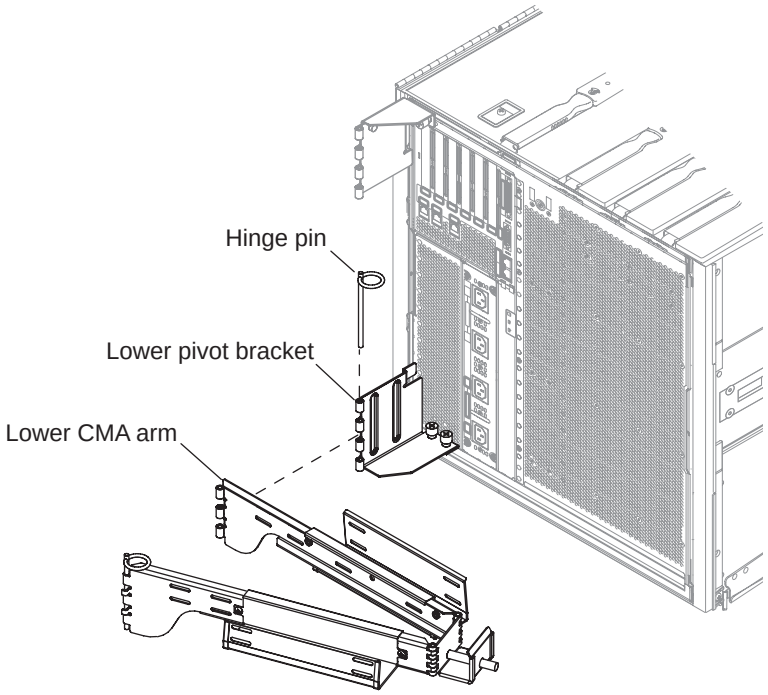


FIGURE 3-11 Attaching Lower CMA Arm and Pivot Bracket

5. **Remove the hinge pin securing the pivot bracket to the upper CMA arm.**

   This step facilitates attaching the bracket to the server chassis (FIGURE 3-9).

6. **Secure the upper pivot bracket to the upper left-hand side of the server chassis using the two captive screws (FIGURE 3-10).**

7. **Secure the upper CMA arm to the bracket using the hinge pin removed in Step 5 (FIGURE 3-12).**

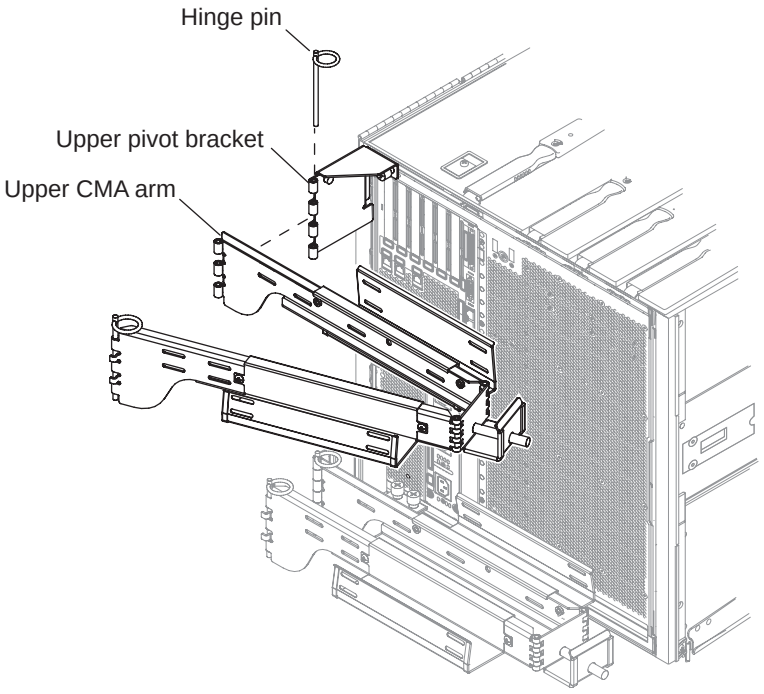


FIGURE 3-12 Attaching Upper CMA Arm and Pivot Bracket

8. **Secure the left-hand T-bracket to the left-hand slide rail using two captive screws (FIGURE 3-13).**

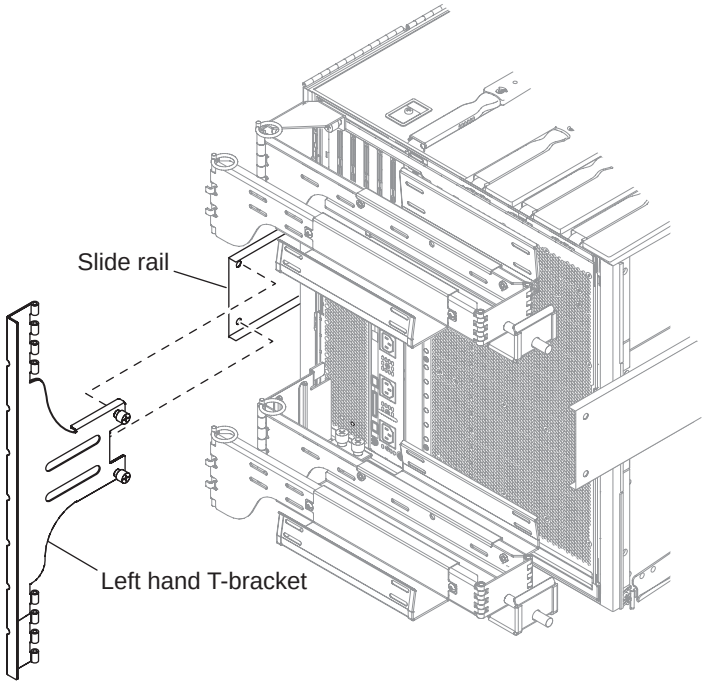


FIGURE 3-13 Attaching Left-Hand T-Bracket

9. **Secure the right-hand T-bracket to the right-hand slide rail using two captive screws (**FIGURE 3-14**).**

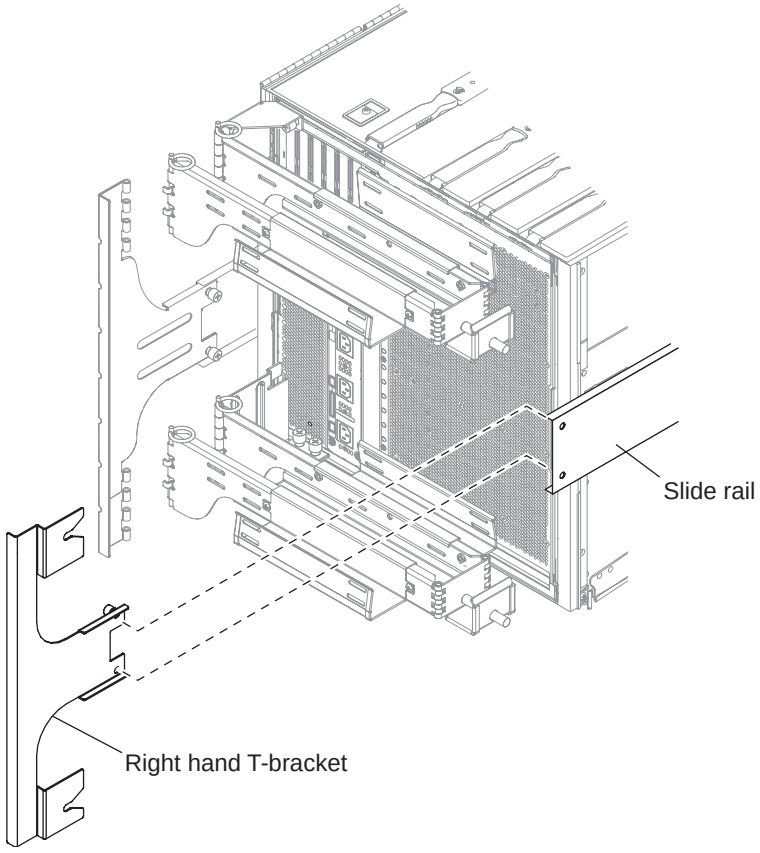


FIGURE 3-14 Attaching Right-Hand T-Bracket

10. **Secure the upper CMA arm to the left-hand T-bracket using a single hinge pin (**FIGURE 3-15**).**

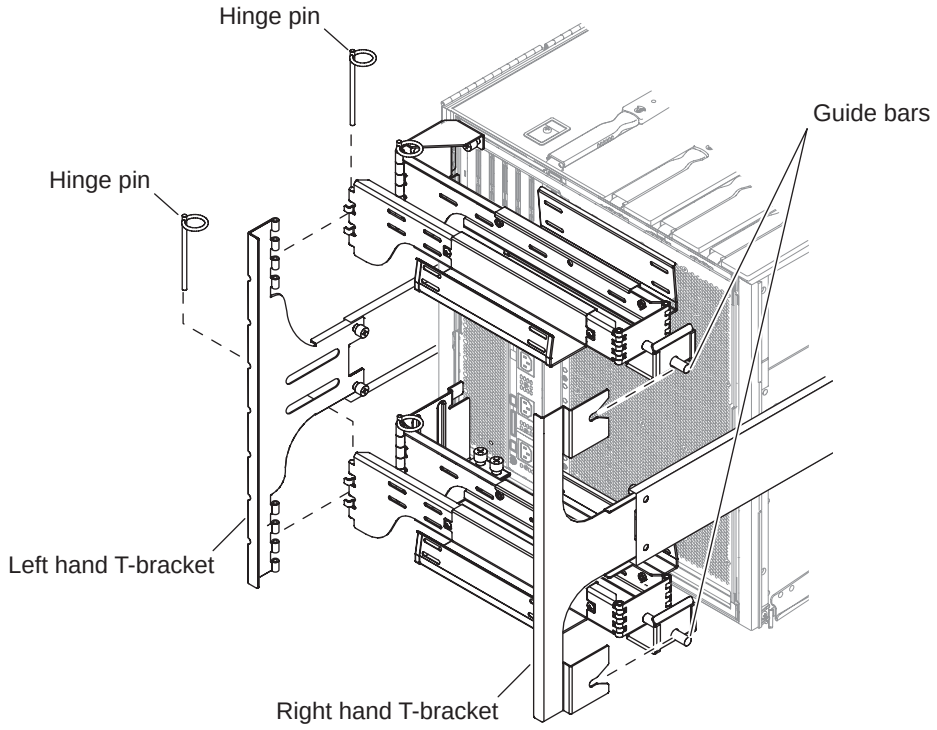


FIGURE 3-15 Attaching the Upper and Lower CMA Arms to the T-Brackets.

11. **Secure the lower CMA arm to the left-hand T-bracket using a single hinge pin (**FIGURE 3-14**).**

12. **Secure both the upper and lower CMA arms by inserting the guide bars of each arm into the slots provided on the right-hand T-bracket.**

13. **Route the cabling through the cable channels and attach as desired.**

3.3 Replacing Handles

3.3.1 Removing the Handles

1. **Bring the server to Standby mode, slide the server out of the system cabinet, and remove the doors.**

   See:

   - Section 2.2, "Bringing the Server to Standby Mode" on page 2-5
   - Section 2.4, "Sliding the Server Out of the System Cabinet" on page 2-7
   - Section 2.5, "Removing the Front Doors" on page 2-11

2. **Remove the four Phillips screws securing the handle and set them aside.**
3. **Remove the handle and set it aside.**
4. **Continue to** Section 3.3.2, "Installing the Handles" on page 3-18**.**

3.3.2 Installing the Handles

1. **Remove the replacement handle from its shipping container.**
2. **Attach the new handle using the four screws you removed previously.**
3. **Install the doors, slide the server into the system cabinet, and power on the server.**

   See:

   - Section 7.1, "Installing the Front Doors" on page 7-1
   - Section 7.2, "Sliding the Server Into the System Cabinet" on page 7-2
   - Section 7.3, "Powering On the Server" on page 7-4

3.4 Replacing Clutches

There are antigravity clutches on the server for CPU/memory boards, IB_SSC assemblies, and L2 repeater boards. The replacement antigravity clutch kit contains one of each type of clutch. Though the clutches are at different locations in the server chassis, the replacement procedure is the same.

3.4.1 Clutch Locations

FIGURE 3-16 shows the location of the clutch for the L2 repeater board.

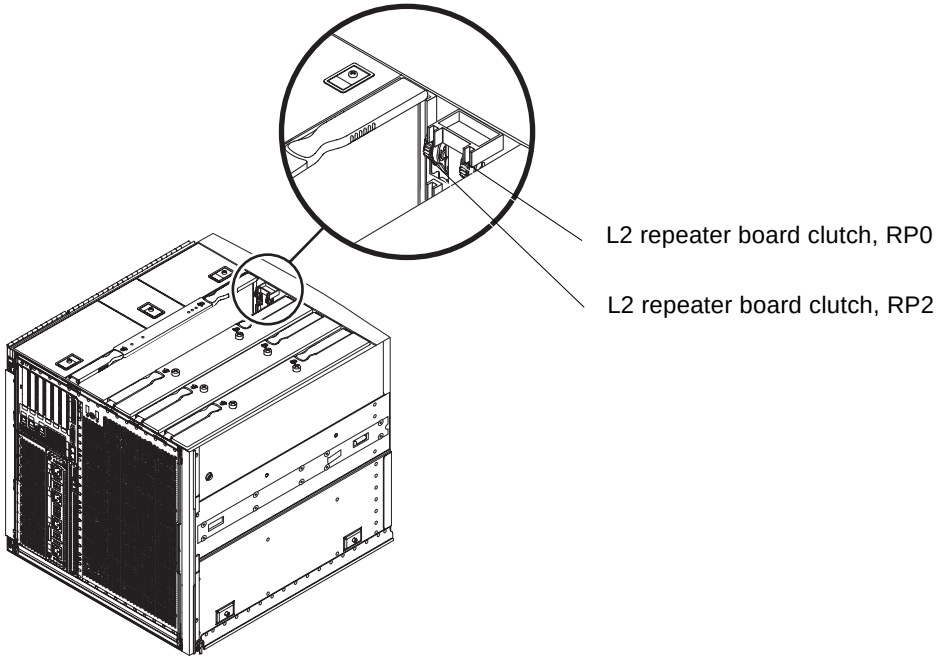


FIGURE 3-16 L2 Repeater Board Clutch Location

FIGURE 3-17 shows the location of the clutch for the CPU/memory board.

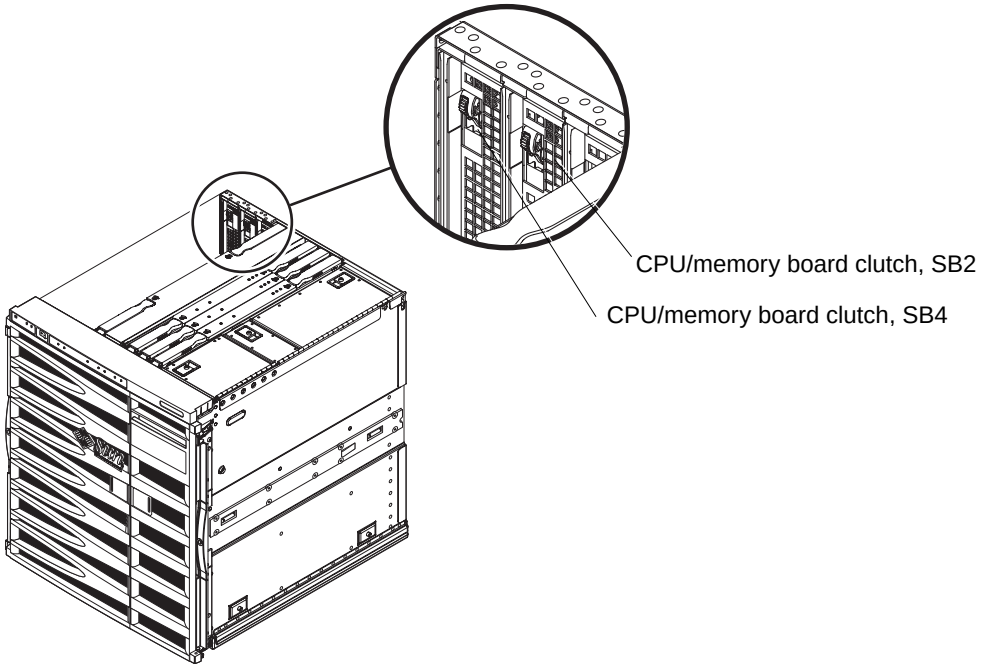


FIGURE 3-17 CPU/Memory Board Clutch Locations

FIGURE 3-18 shows the location of the clutch for the IB_SSC assembly.

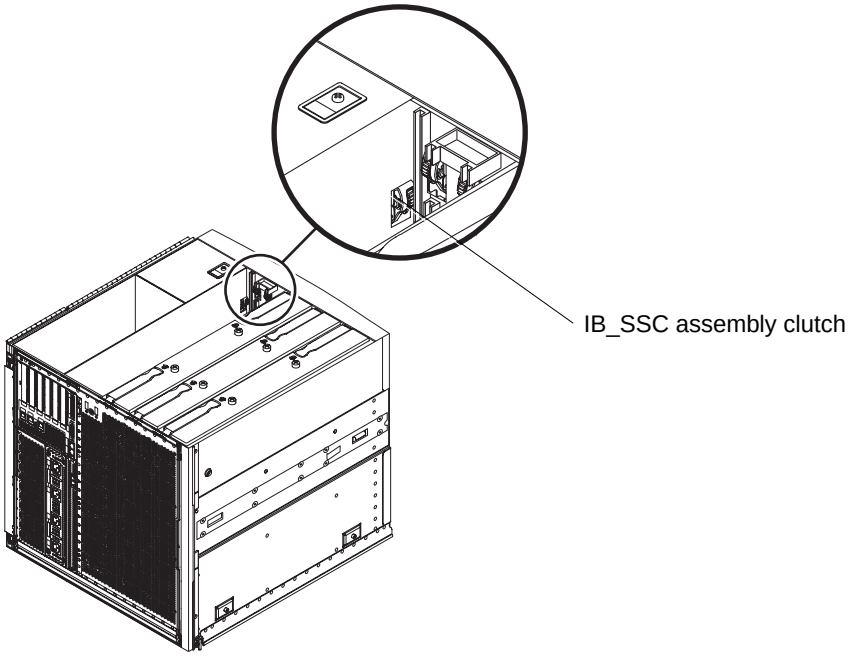


FIGURE 3-18 IB_SSC Assembly Clutch Location

3.4.2 Removing a Clutch

1. **Bring the server to Standby mode and slide the server out of the system cabinet.**

   See:

   - Section 2.2, "Bringing the Server to Standby Mode" on page 2-5
   - Section 2.4, "Sliding the Server Out of the System Cabinet" on page 2-7

2. **Remove the board or assembly from the slot with the defective clutch.**

   See one of the following sections:

   - Section 5.3.1, "Removing a CPU/Memory Board" on page 5-5
   - Section 5.6.1, "Removing the IB_SSC Assembly" on page 5-23
   - Section 5.5.1, "Removing an L2 Repeater Board" on page 5-19

3. **Remove the two screws retaining the faulty clutch and set them aside.**

4. **Remove the clutch and set it aside.**

5. **Continue to** Section 3.4.3, "Installing a Clutch" on page 3-22**.**

3.4.3 Installing a Clutch

1. **Remove the replacement clutch from its shipping container.**
2. **Secure the new clutch using the two screws you removed previously.**
3. **Replace the board you previously removed.**

   See one of the following sections:

   - Section 5.3.2, “Installing a CPU/Memory Board” on page 5-8
   - Section 5.6.2, “Installing the IB_SSC Assembly” on page 5-28
   - Section 5.5.2, “Installing the L2 Repeater Board” on page 5-21.

4. **Slide the server into the system cabinet and power on the server.**

   See:

   - Section 7.2, “Sliding the Server Into the System Cabinet” on page 7-2
   - Section 7.3, “Powering On the Server” on page 7-4

CHAPTER 4

Replacing Storage Components

This chapter describes how to remove and install the removable media bay, tape drive, DVD drive, SCC reader, and hard drives. It contains the following topics:

4.1 Hard Drives

The two hard drives are located at the right front of the server (FIGURE 4-1).

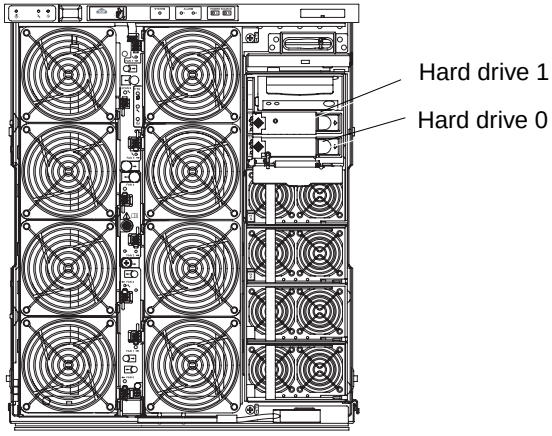


FIGURE 4-1 Location of the Hard Drives

The hard drives have three LEDs (TABLE 4-1).

TABLE 4-1 Hard Drive LEDs

LED Name	On	Off
Activated (green)	Device is activated.	Device is deactivated.
Fault (amber)	Internal fault.	No internal fault.
OK to Remove (blue or amber)	Device can be removed.	Device cannot be removed.

You can remove and install the hard drives without powering off the server.

4.1.1 Removing a Hard Drive

1. **Ensure that the hard drive is backed up.**
2. **Unconfigure the hard drive using dynamic reconfiguration (DR).**
   See the *Netra 1290 Server System Administration Guide*, 819-4374.
3. **Ensure that the OK to Remove ( ) LED is lit.**
4. **Open the right front door of the server.**
5. **Attach a wrist strap and place a grounded ESD mat close to the server.**
   See Section 2.1.4, "Antistatic Precautions" on page 2-3.
6. **Lower the grill in front of the hard drives.**
7. **Open the drive handle by pushing the latch to the right (FIGURE 4-2).**

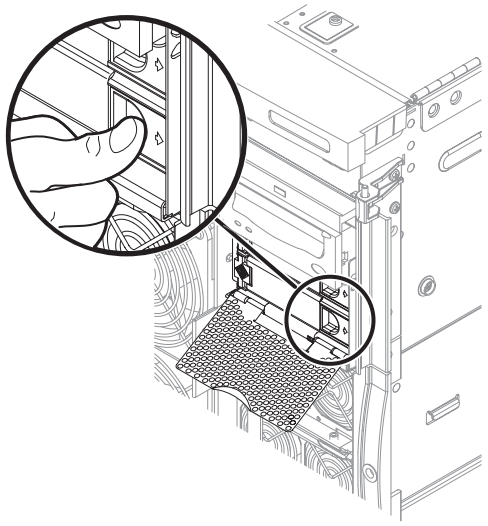


FIGURE 4-2 Releasing the Hard Drive Ejector Handle

8. **Extend the drive handle to disconnect the drive from the server (**FIGURE 4-3**).**

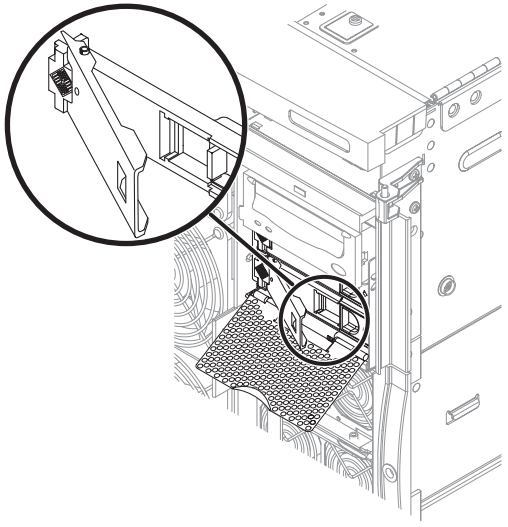


FIGURE 4-3 Ejecting the Hard Drive

9. **Remove the drive from the drive bay while holding the drive handle (**FIGURE 4-4**).**
   The hard drive rear connector is disconnected when the drive is ejected.

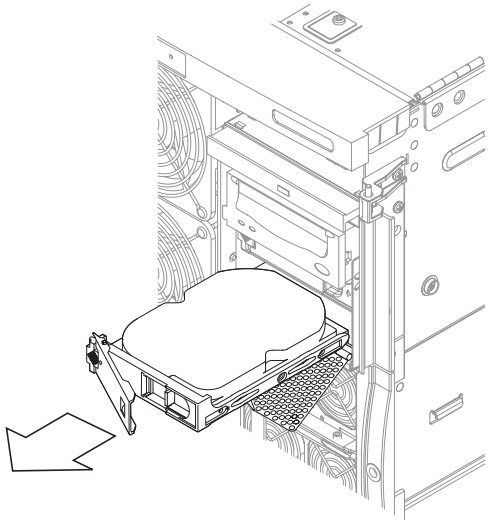


FIGURE 4-4 Removing the Hard Drive

10. **Place the drive on an ESD mat.**
11. **If required, replace the drive as described in** Section 4.1.2, "Installing a Hard Drive" on page 4-4**.**
12. **Raise the grill in front of the hard drives.**
13. **Detach the antistatic wrist strap.**
14. **Close the front door of the server.**
15. **Reconfigure the hard drive, if necessary, by using DR.**
    See the *Netra 1290 Server System Administration Guide*, 819-4374.
16. **Ensure that the OK to Remove ( ) LED is no longer lit.**

4.1.2 Installing a Hard Drive

1. **Open the right front door of the server.**
2. **Attach an antistatic wrist strap.**
   See Section 2.1.4, "Antistatic Precautions" on page 2-3.
3. **Lower the grill in front of the hard drives.**
4. **Insert the hard drive into the bay as far as it will go.**

5. **Close the drive handle to connect the drive to the server.**
6. **Raise the grill in front of the hard drives.**
7. **Detach the antistatic wrist strap.**
8. **Close the front door of the server.**
9. **Reconfigure the hard drive, if necessary, by using DR.**
   See the *Netra 1290 Server System Administration Guide*, 819-4374.
10. **Ensure that the OK to Remove ( ) LED is no longer lit.**

4.2 Removable Media Module

The removable media module is located at the front of the server (FIGURE 4-5).

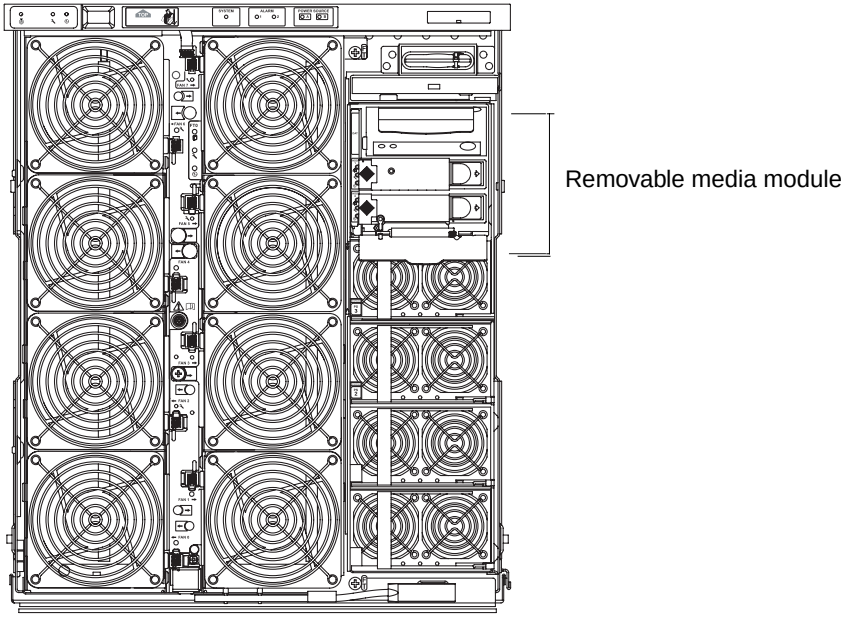


FIGURE 4-5 Removable Media Module Location – Server Front View

To remove the removable media drives and bay, you must power off the server.

4.2.1 Removing the Removable Media Module

1. **Bring the server to Standby mode, slide the server out of the system cabinet, and remove the doors.**

   See:

   - Section 2.2, "Bringing the Server to Standby Mode" on page 2-5
   - Section 2.4, "Sliding the Server Out of the System Cabinet" on page 2-7
   - Section 2.5, "Removing the Front Doors" on page 2-11

2. **Open the media bay access door:**

   a. **Loosen the latch screw (**FIGURE 4-6**).**

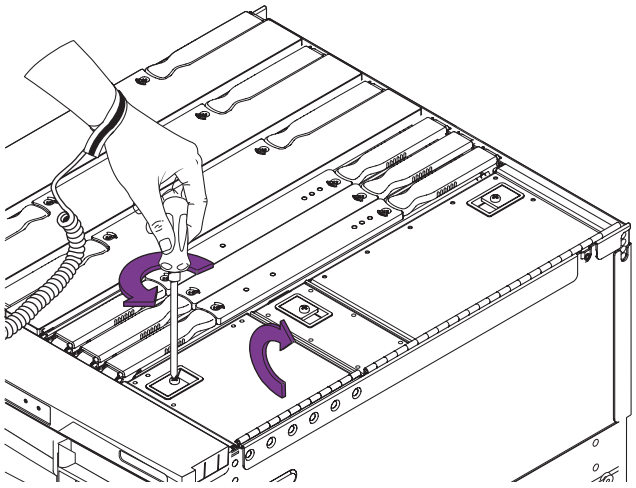


FIGURE 4-6 Opening the Media Bay Access Door

   b. **Release the latch and lift the cover.**

3. **Disconnect the following cables from the IB_SSC assembly (**FIGURE 4-7**):**

   - Hard drive power cable
   - SCSI data cable
   - SCC card reader cable
   - DVD-ROM drive data/power cable

Caution – Do not disconnect the system configuration card (SCC) reader cable end that connects to the SCC reader, or the SCSI data cable end that connects to the removable media backplane. Those cable ends are soldered and cannot be removed.

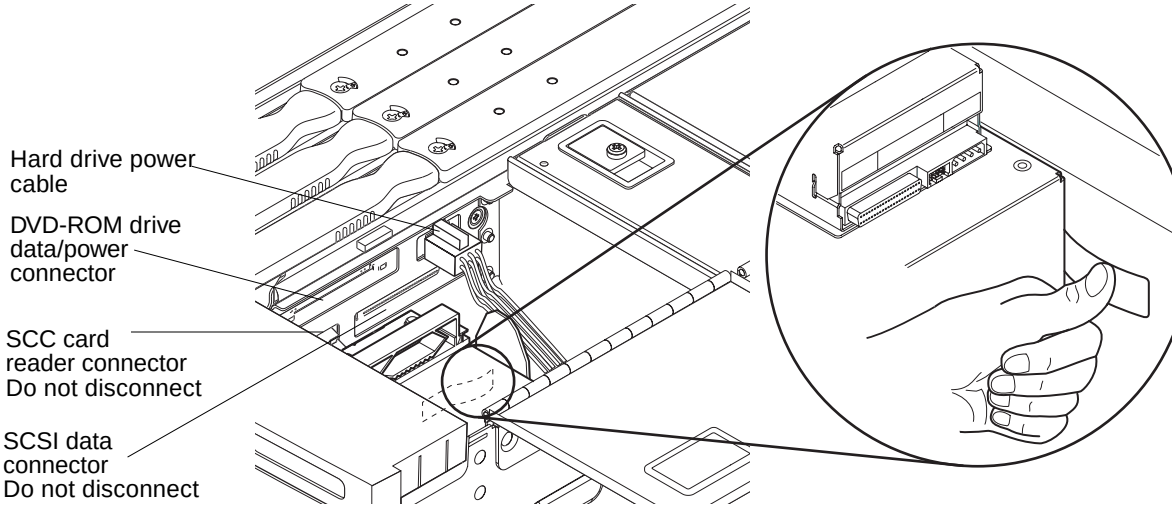


FIGURE 4-7 IB_SSC Assembly Cable and Connector Locations, and the Removable Media Module Retaining Spring

4. **Remove the foam air flow filter in front of the IB_SSC fan intake.**
5. **Locate the convex spring behind the right side of the removable media module. Press it in so it becomes concave (**FIGURE 4-7**).**
6. **Grasp the metal blade located at the front and remove the removable media module a short distance from the server so that you can reach the connectors (**FIGURE 4-8**).**

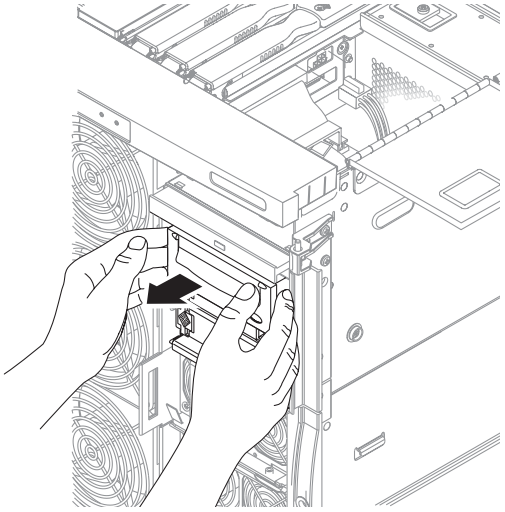


FIGURE 4-8 Sliding the Removable Media Module Out a Short Distance

7. **Remove the removable media module.**

   Ensure that the connectors and cables do not catch on anything (FIGURE 4-9).

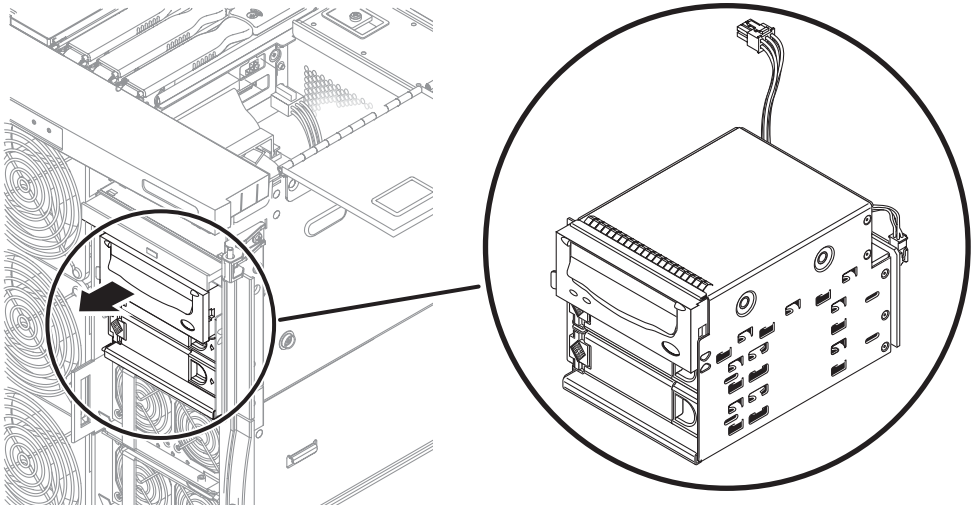


FIGURE 4-9 Removing the Removable Media Module

8. **Place the removable media module on an ESD mat.**

9. **Continue to** Step 3 **of** Section 4.2.2, "Installing the Removable Media Module" on page 4-9**.**

4.2.2 Installing the Removable Media Module

1. **Bring the server to Standby mode, slide the server out of the system cabinet, and remove the doors.**

   See:

   - Section 2.2, "Bringing the Server to Standby Mode" on page 2-5
   - Section 2.4, "Sliding the Server Out of the System Cabinet" on page 2-7
   - Section 2.5, "Removing the Front Doors" on page 2-11

2. **Open the media bay access door:**

   a. **Loosen the latch screw (**FIGURE 4-10**).**

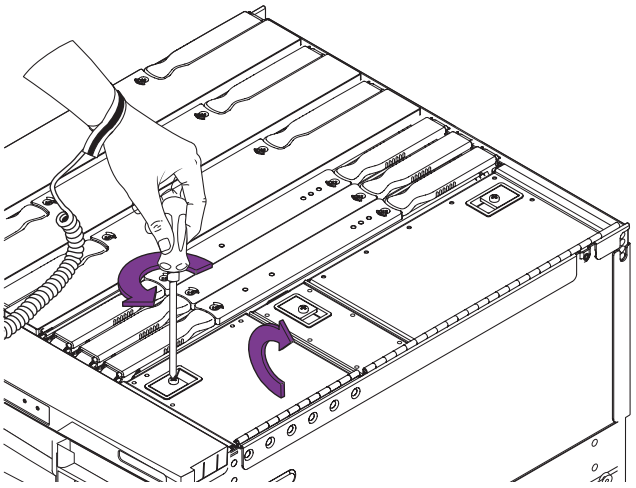


FIGURE 4-10 Opening the Media Bay Access Door

   b. **Release the latch and lift the cover.**

3. **Insert the removable media module partially into the server (**FIGURE 4-8**).**

4. **Push the removable media module fully into the server until the metal tab engages.**

5. **Reconnect the following cables (**FIGURE 4-7**):**

   - Hard drive power cable
   - SCSI data cable
   - SCC card reader cable
   - DVD-ROM drive data/power cable to the IB_SSC assembly

6. **Close the media bay access door and tighten the latch securing screw.**

7. **Install the doors, slide the server into the system cabinet, and power on the server.**

   See:

   - Section 7.1, "Installing the Front Doors" on page 7-1
   - Section 7.2, "Sliding the Server Into the System Cabinet" on page 7-2
   - Section 7.3, "Powering On the Server" on page 7-4

4.3 Tape Drive

Note – The tape drive has a SCSI ID of 5.

The tape drive is located in the removable media module, which is located at the right front of the server (FIGURE 4-11).

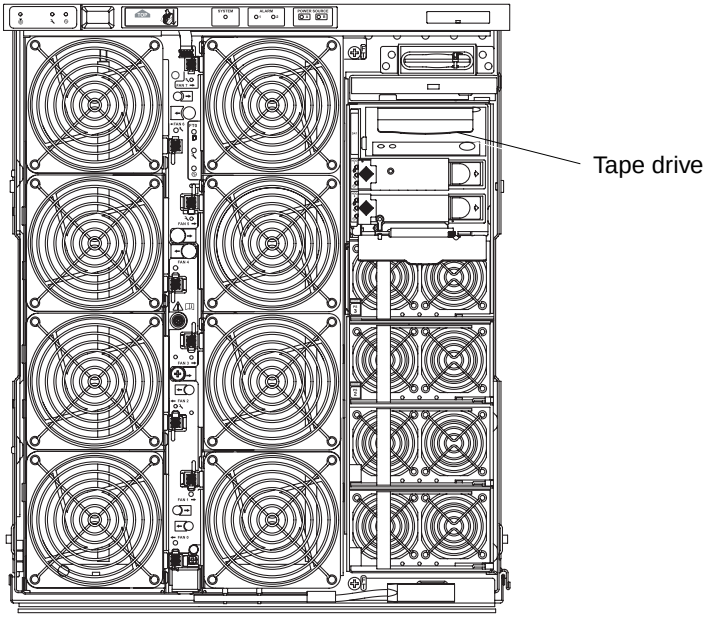


FIGURE 4-11 Tape Drive Location – Server Front View

4.3.1 Removing a Tape Drive

1. **Take the server to Standby mode.**

   See Section 2.2, “Bringing the Server to Standby Mode” on page 2-5.

2. **Open the right front door of the server.**

3. **Attach an antistatic wrist strap and place a grounded ESD mat close to the server.**

   See Section 2.1.4, “Antistatic Precautions” on page 2-3.

4. **Hold the metal tab located on the left of the tape drive and pull the tape drive out of the server.**

5. **Place the tape drive on an ESD mat.**

6. **Remove the four screws securing the baseplate to the drive and set the drive aside (**FIGURE 4-12**).**

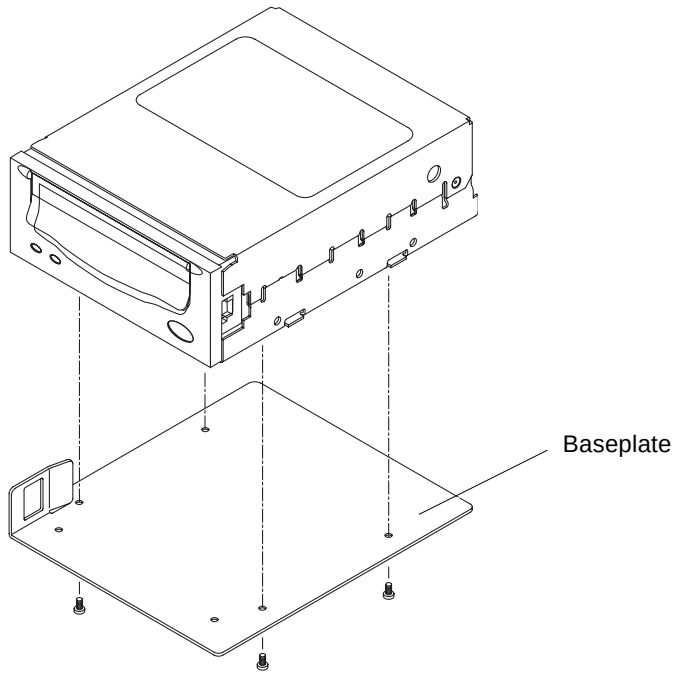


FIGURE 4-12 Removing the Baseplate to the Tape Drive

7. **Take one of the following actions:**

   - If you are not installing a replacement tape drive at this time:

   a. Attach a filler panel with the two countersunk screws (FIGURE 4-13**).**

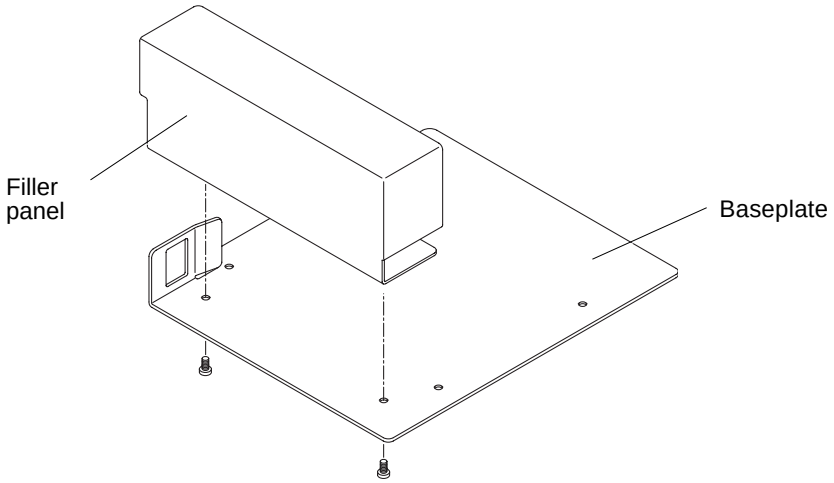


FIGURE 4-13 Installing the Tape Drive Filler Panel

b. Continue to Step 10 **of** Section 4.3.2, "Installing a Tape Drive" on page 4-12**.**

- If you are installing a replacement tape drive, continue to Step 7 of Section 4.3.2, "Installing a Tape Drive" on page 4-12.

4.3.2 Installing a Tape Drive

1. **Take the server o Standby mode.**

   See Section 2.2, "Bringing the Server to Standby Mode" on page 2-5.

2. **Open the right front door of the server.**

3. **Attach an antistatic wrist strap and place a grounded ESD mat close to the server.**

   See Section 2.1.4, "Antistatic Precautions" on page 2-3.

4. **Pull the tape drive filler panel forward to remove it.**

5. **Remove the two countersunk screws that secure the tape drive filler panel to the baseplate (**FIGURE 4-14**).**

6. **Remove the tape drive filler panel.**

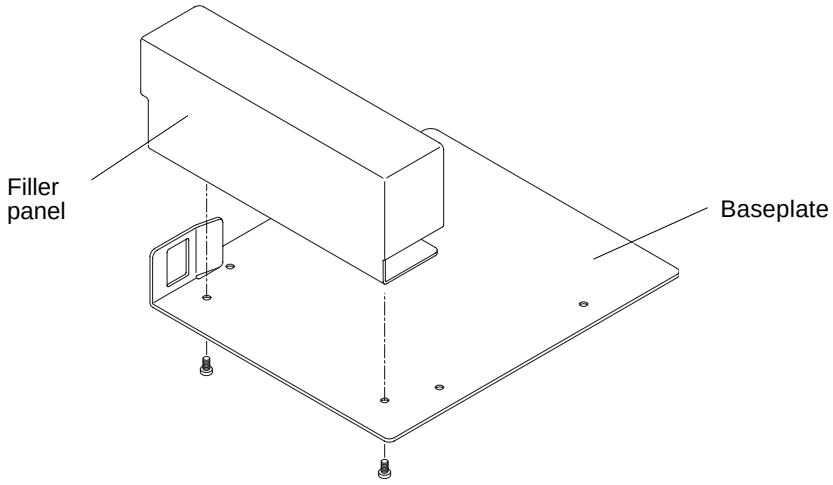


FIGURE 4-14 Dismantling the Tape Drive Filler Panel

7. **Remove the replacement tape drive from the shipping container.**
8. **Align the holes in the baseplate with those on the underside of the tape drive.**
9. **Use the four countersunk screws shipped with the drive to attach the baseplate to the tape drive. (**FIGURE 4-15**).**

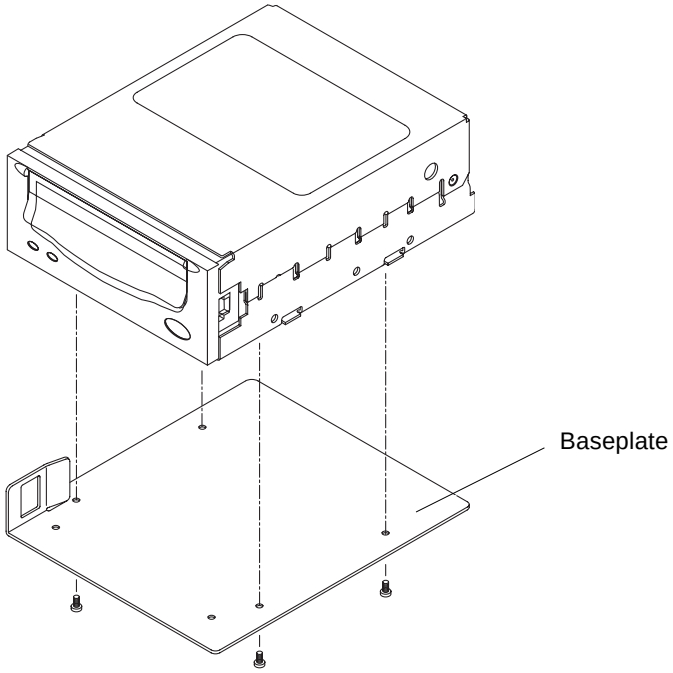


FIGURE 4-15 Attaching the Baseplate to the Tape Drive

10. **Insert the replacement tape drive into the server until the metal latch on the left side engages (**FIGURE 4-16**).**

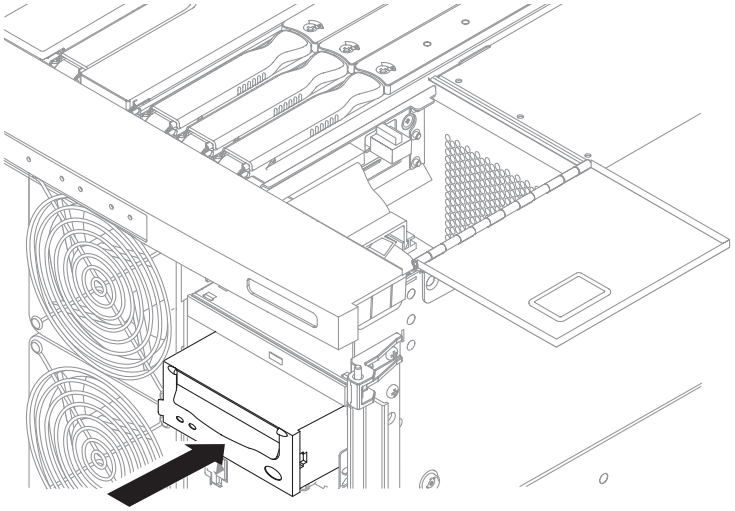


FIGURE 4-16 Inserting a Tape Drive Into the Server

11. **Detach the antistatic wrist strap.**
12. **Close the front door of the server.**
13. **Power on the server.**
    See Section 7.3, “Powering On the Server” on page 7-4.

4.4 DVD-ROM Drive

The DVD-ROM drive is located at the right front of the server (FIGURE 4-11).

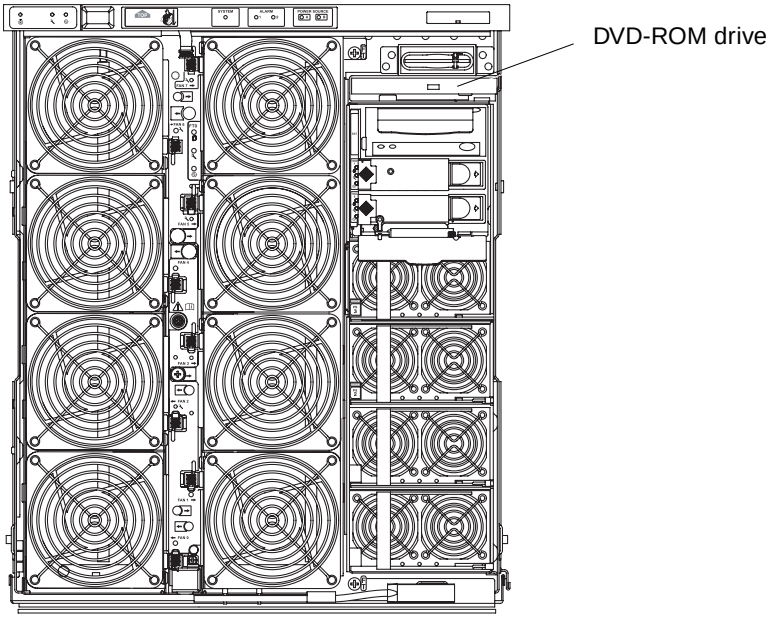


FIGURE 4-17 DVD-ROM Drive Location – Server Front View

4.4.1 Removing the DVD-ROM Drive

1. **Bring the server to Standby mode, slide the server out of the system cabinet, and remove the doors.**

   See:

   - Section 2.2, "Bringing the Server to Standby Mode" on page 2-5
   - Section 2.4, "Sliding the Server Out of the System Cabinet" on page 2-7
   - Section 2.5, "Removing the Front Doors" on page 2-11

2. **Open the media bay access door:**

   a. **Loosen the latch screw (**FIGURE 4-6**).**

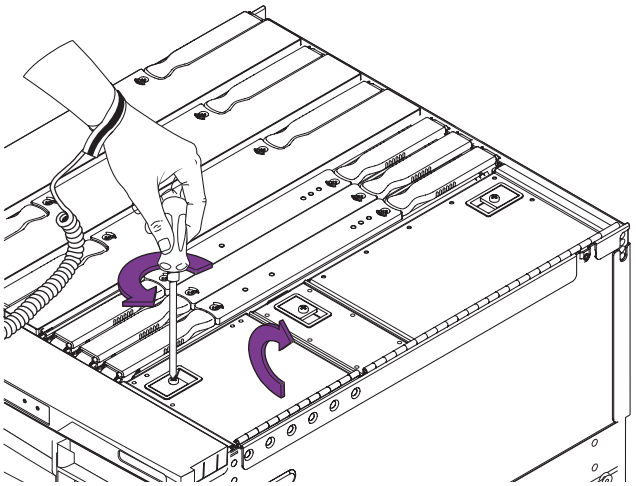


FIGURE 4-18 Opening the Media Bay Access Door

b. Release the latch and lift the cover.

3. Inside the media bay, push the retaining latch to the right (FIGURE 4-19**).**

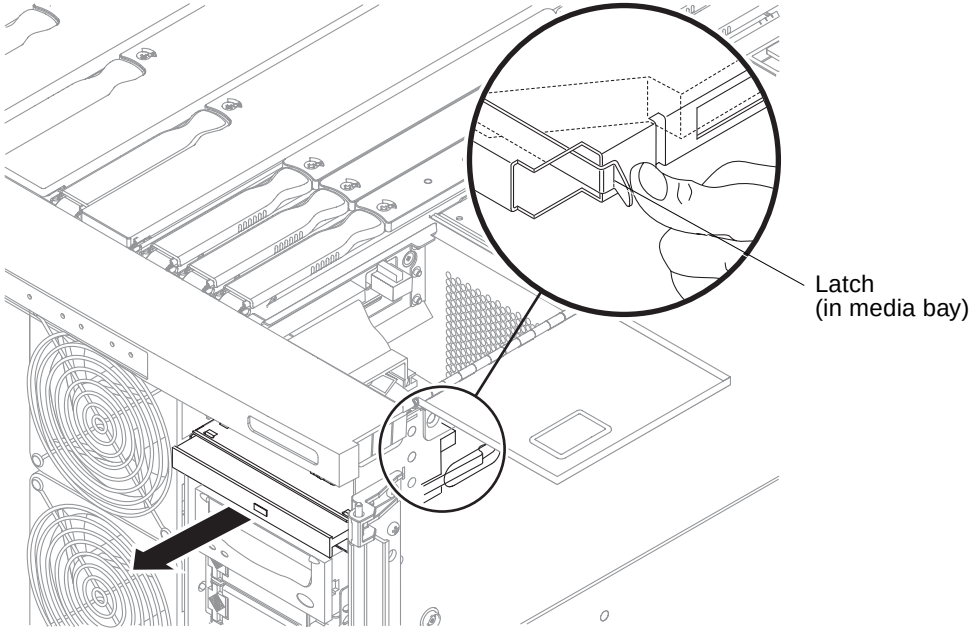


FIGURE 4-19 Removing the DVD-ROM Drive

4. **Firmly pull the DVD-ROM drive from the front of the server (FIGURE 4-19) and set the DVD-ROM drive aside.**

5. **Continue to Step 2 of Section 4.4.2, "Installing the DVD-ROM Drive" on page 4-18.**

4.4.2 Installing the DVD-ROM Drive

1. **Bring the server to Standby mode, slide the server out of the system cabinet, and remove the doors.**

   See:

   - Section 2.2, "Bringing the Server to Standby Mode" on page 2-5
   - Section 2.4, "Sliding the Server Out of the System Cabinet" on page 2-7
   - Section 2.5, "Removing the Front Doors" on page 2-11

2. **Remove the replacement DVD-ROM drive from the shipping container.**

3. **Insert the DVD-ROM drive into the server until the latch engages.**

4. **If open, close the media bay access door and tighten the latch securing screw.**

5. **Install the doors, slide the server into the system cabinet, and power on the server.**

   See:

   - Section 7.1, "Installing the Front Doors" on page 7-1
   - Section 7.2, "Sliding the Server Into the System Cabinet" on page 7-2
   - Section 7.3, "Powering On the Server" on page 7-4

4.5 DVD-ROM Adapter Board

4.5.1 Removing the DVD-ROM Adapter Board

1. **Bring the server to Standby mode, slide the server out of the system cabinet, and remove the doors.**

   See:

   - Section 2.2, "Bringing the Server to Standby Mode" on page 2-5
   - Section 2.4, "Sliding the Server Out of the System Cabinet" on page 2-7
   - Section 2.5, "Removing the Front Doors" on page 2-11

2. **Open the media bay access door:**

a. Loosen the latch screw (FIGURE 4-6).

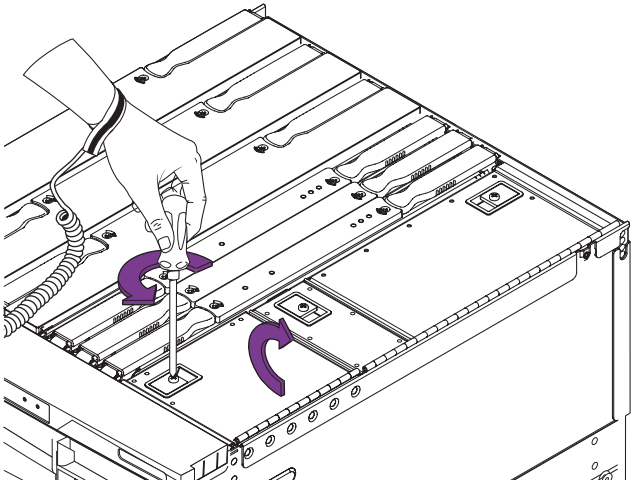


FIGURE 4-20 Opening the Media Bay Access Door

b. Release the latch and lift the cover.

3. **Disconnect the DVD-ROM drive data/power cable from the IB_SSC board and from the DVD-ROM drive (FIGURE 4-21).**

Caution – Do not disconnect the SCSI data cable end that connects the removable media adapter board. That cable end is soldered and cannot be removed.

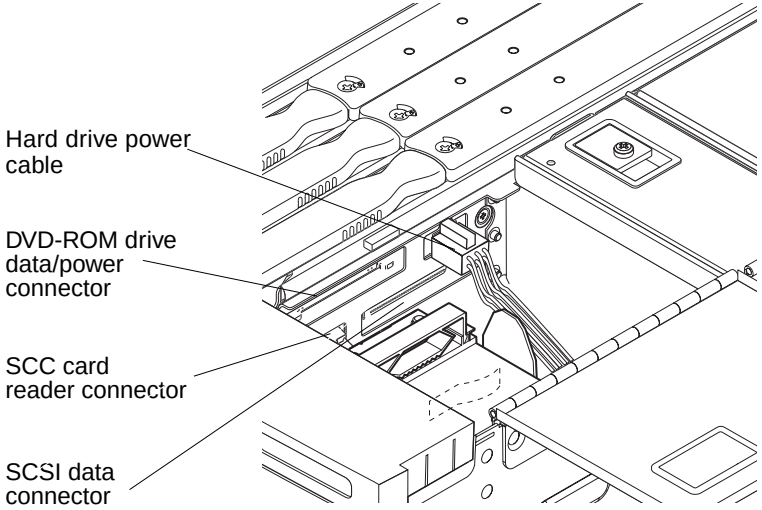


FIGURE 4-21 IB_SSC Assembly Cable and Connector Locations

4. **Remove the DVD-ROM adapter board, which is the small board located at the back of the DVD-ROM drive (**FIGURE 4-22**).**

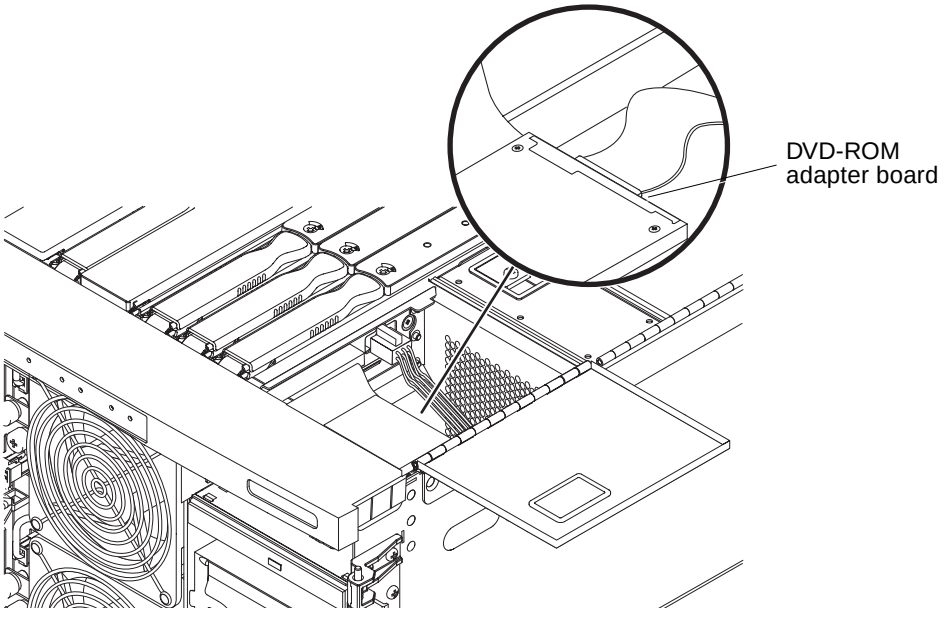


FIGURE 4-22 DVD-ROM Adapter Board

5. **Continue to** Step 3 **of** Section 4.5.2, "Installing the DVD-ROM Adapter Board" on page 4-21**.**

4.5.2 Installing the DVD-ROM Adapter Board

1. **Bring the server to Standby mode, slide the server out of the system cabinet, and remove the doors.**

   See:

   - Section 2.2, "Bringing the Server to Standby Mode" on page 2-5
   - Section 2.4, "Sliding the Server Out of the System Cabinet" on page 2-7
   - Section 2.5, "Removing the Front Doors" on page 2-11

2. **Open the media bay access door:**

   a. **Loosen the latch screw (**FIGURE 4-6**).**

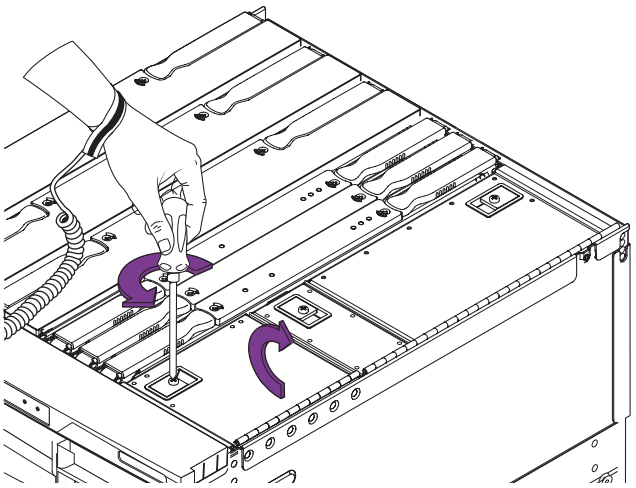


FIGURE 4-23 Opening the Media Bay Access Door

   b. **Release the latch and lift the cover.**

3. **Remove the replacement DVD-ROM adapter board from its shipping container.**
4. **Install the replacement adapter board onto the DVD-ROM drive.**
5. **Reconnect the DVD-ROM drive data/power cable to the IB_SSC board and to the DVD-ROM drive (**FIGURE 4-21**).**
6. **Close the media bay access door and tighten the latch securing screw.**

7. **Install the doors, slide the server into the system cabinet, and power on the server.**

   See:

   - Section 7.1, "Installing the Front Doors" on page 7-1
   - Section 7.2, "Sliding the Server Into the System Cabinet" on page 7-2
   - Section 7.3, "Powering On the Server" on page 7-4

4.6 SCC Reader

Caution – Use proper ESD grounding techniques when handling components. Wear an antistatic wrist strap and use an ESD-protected mat. Store ESD-sensitive components in its ESD safe packaging box before placing them on any surface.

Caution – This procedure requires the server to be extended out of the system cabinet on its slides. Before attempting this procedure, you must extend the system cabinet stabilizer bar.

You must open the media bay access door at the top of the server to remove or install the SCC reader.

4.6.1 Removing the SCC Reader

1. **Bring the server to Standby mode, slide the server out of the system cabinet, and remove the doors.**

   See:

   - Section 2.2, "Bringing the Server to Standby Mode" on page 2-5
   - Section 2.4, "Sliding the Server Out of the System Cabinet" on page 2-7
   - Section 2.5, "Removing the Front Doors" on page 2-11

2. **Remove the system configuration card (SCC).**

3. **Open the media bay access door:**

   a. **Loosen the latch screw (**FIGURE 4-6**).**

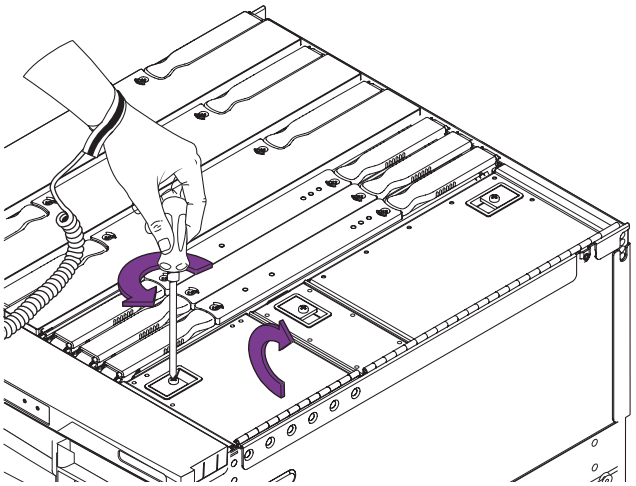


FIGURE 4-24 Opening the Media Bay Access Door

b. Release the latch and lift the cover.

4. **Disconnect the SCC reader cable from the IB_SSC board (**FIGURE 4-25**).**

Caution – Do not disconnect the SCC reader cable from the SSC card reader. The cable end that is attached to the SCC card reader *cannot* be removed.

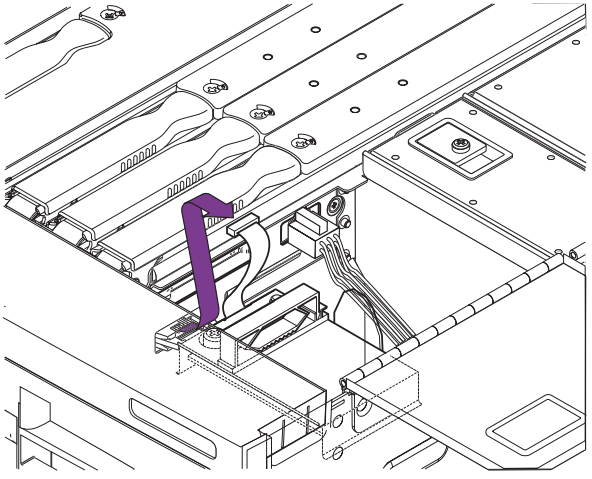


FIGURE 4-25 Disconnecting the SCC Reader Cable

5. **Loosen the captive screw securing the SCC reader (**FIGURE 4-26**).**

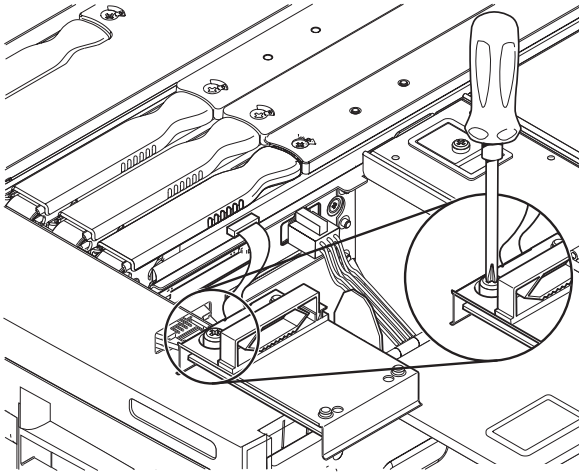


FIGURE 4-26 Loosening the SCC Reader Captive Screw

6. **Lift the reader off the locating pins (**FIGURE 4-27**).**

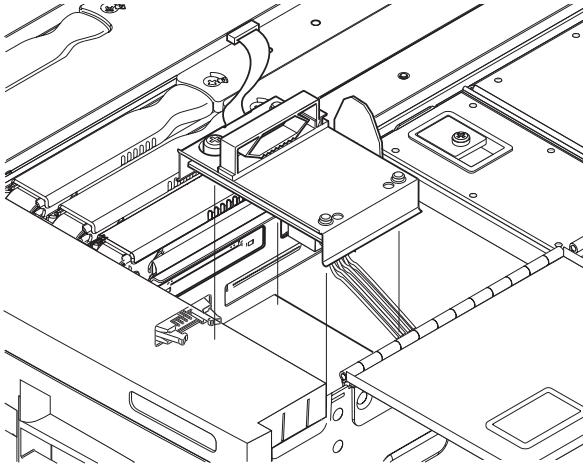


FIGURE 4-27 Removing the SCC Reader

7. **Set the reader aside.**
8. **Continue to** Step 3 **of** Section 4.6.2, "Installing the SCC Reader" on page 4-25**.**

4.6.2 Installing the SCC Reader

1. **Bring the server to Standby mode, slide the server out of the system cabinet, and remove the doors.**

   See:

   - Section 2.2, "Bringing the Server to Standby Mode" on page 2-5
   - Section 2.4, "Sliding the Server Out of the System Cabinet" on page 2-7
   - Section 2.5, "Removing the Front Doors" on page 2-11

2. **Open the media bay access door:**

   a. **Loosen the latch screw (**FIGURE 4-6**).**

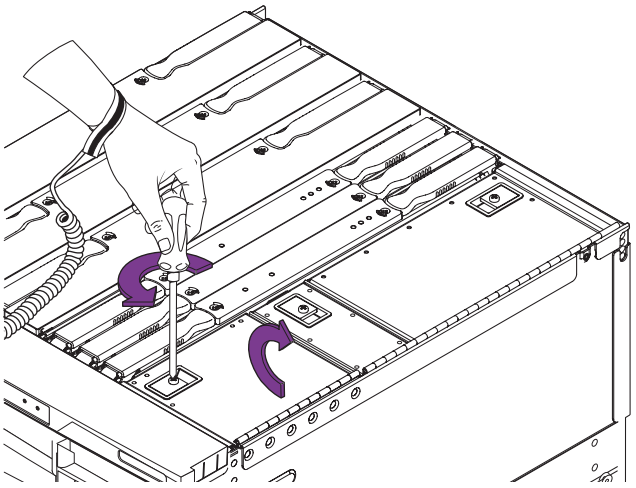


FIGURE 4-28 Opening the Media Bay Access Door

   b. **Release the latch and lift the cover.**

3. **Remove the replacement SCC reader from its shipping container.**
4. **Connect the SCC reader cable (**FIGURE 4-25**) to the IB_SSC board.**
5. **Set the reader on the locating pins (**FIGURE 4-29**).**

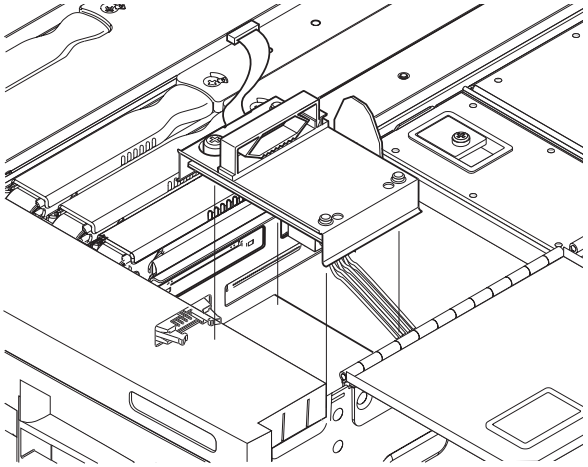


FIGURE 4-29 Installing the SCC Reader

6. **Press firmly to seat it.**
7. **Tighten the captive screw securing the SCC reader (**FIGURE 4-30**).**

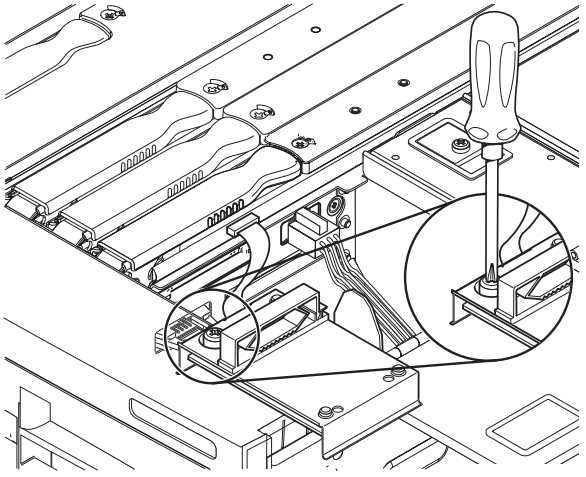


FIGURE 4-30 Tightening the SCC Reader Captive Screw

8. **Close the media bay access door and tighten the latch securing screw.**
9. **Install the doors, slide the server into the system cabinet, and power on the server.**

   See:

   - Section 7.1, “Installing the Front Doors” on page 7-1

- Section 7.2, “Sliding the Server Into the System Cabinet” on page 7-2
- Section 7.3, “Powering On the Server” on page 7-4

CHAPTER 5

Replacing Board Components

This chapter explains how to remove and install board components into the Netra 1290 chassis. This chapter contains the following topics:

5.1 Handling Boards

Caution – There is a separate chassis ground located on the rear of the server. It is important to ensure that the server is properly grounded.

Caution – The server is sensitive to static electricity. To prevent damage to the board, connect an antistatic wrist strap between you and the server.

Caution – The boards have surface-mount components that can be broken by flexing the boards.

To minimize the amount of board flexing, observe the following precautions:

- Hold the board only by the handle and by the green fingerhold panels, where the board stiffener is located. Do not hold the board *only* at the ends.

- When removing the board from the packaging, keep the board vertical until you lay it on the cushioned ESD mat.
- Do not place the board on a hard surface. Use a cushioned antistatic mat. The board connectors and components have very thin pins that bend easily.
- Be careful of small component parts located on both sides of the board.
- Do not use any test instrumentation probes on the components. The soldered pins are easily damaged or shorted by the probe points.
- Transport the board in its packaging box.

Caution – The heat sinks can be damaged by incorrect handling. Do not touch the heat sinks while replacing or removing boards. If a heat sink is loose or broken, obtain a replacement board.

Caution – The heat sinks can be damaged by improper packaging. When storing or shipping a board, ensure that the heat sinks have sufficient protection.

5.2 Filler Boards and Filler Panels

Filler boards and panels, which are physically inserted into a board or card slot, are used for EMI protection and for air flow (TABLE 5-1).

TABLE 5-1 Overheating Precautions Using Filler Boards and Filler Panels

If you remove	Do the following
CPU/memory board	Install a filler board in a server to prevent the server from overheating.
Tape drive or I/O card	In order to provide full EMI protection, ensure that filler panels are installed when removing the tape drive or I/O card.

Caution – To prevent the server from overheating, always install a filler board when you permanently remove a CPU/memory board from a server (FIGURE 5-1).

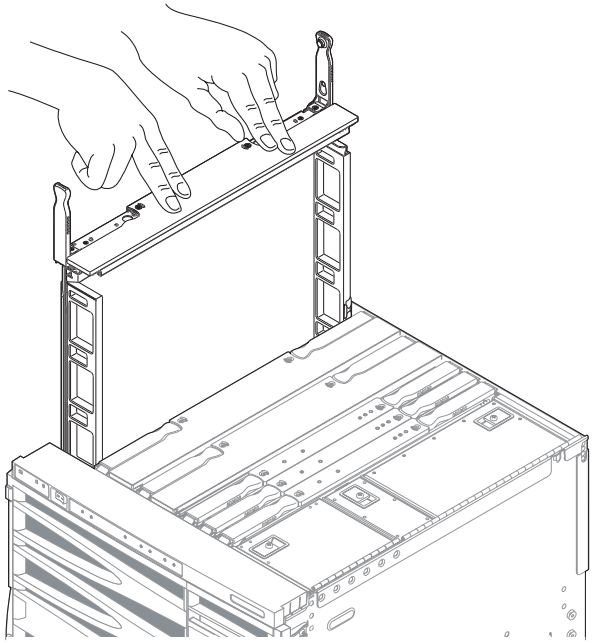


FIGURE 5-1 Inserting a CPU/Memory Filler Board

5.3 CPU/Memory Boards

The CPU/memory boards (SB0, SB2, and SB4) are removed and replaced from the top of the server (FIGURE 5-2). When you remove a CPU/memory board from the server, place it in its ESD-safe packaging box. The CPU/memory board box provides two ESD safe work surfaces.

Each CPU/memory board can support:

- Up to four CPU processors
- Up to 32 DIMMs (dual inline memory modules)
- Up to eight Ecache modules

Each CPU processor can support:

- Two DIMM banks (four DIMMs per bank)
- Up to eight Gbytes of memory
- Two Ecache modules

The memory controller is integrated in the CPU processor. The CPU/memory board has a metal cover that covers the CPU processors and Ecache.

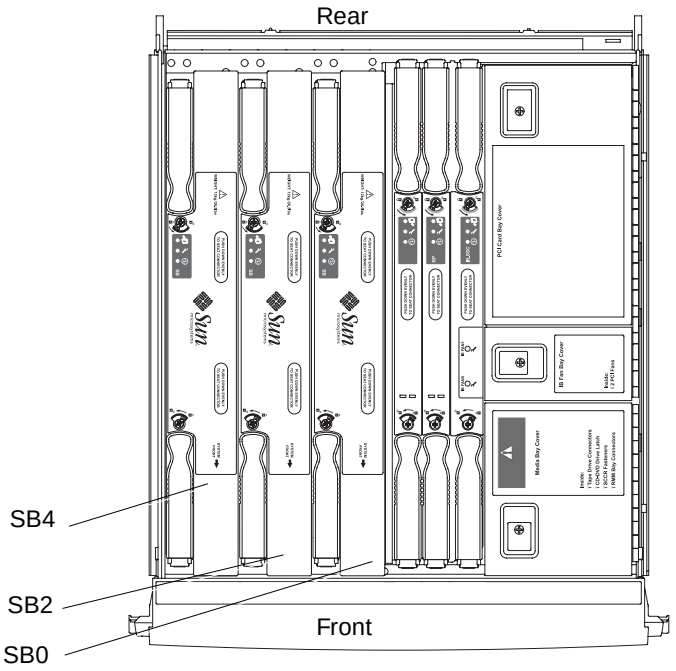


FIGURE 5-2 Top View of the CPU/Memory Boards

There are three LEDs on the CPU/memory board (TABLE 5-2).

TABLE 5-2 CPU/Memory Board LED Functions

LED Name	On	Off
Activated LED (green)	Device is activated.	Device is deactivated
Fault LED (amber)	Internal fault.	No internal fault.
OK to Remove (blue or amber)	Assembly can be removed.	Assembly cannot be removed.

5.3.1 Removing a CPU/Memory Board

Caution – The CPU/memory board is heavy and weighs approximately 26.5 pounds (12 kg). Take care when removing the board from the server.

Caution – To prevent the server from overheating, always install a filler board when you permanently remove a CPU/memory board from a server.

Caution – Spring fingers and EMI gaskets might detach from the CPU/memory board and fall into the server. This might cause damage. Ensure that the EMI gaskets and spring fingers do not fall into the server.

1. **Ensure that you have a filler board, if necessary or a replacement board ready.**

   See Section 5.2, "Filler Boards and Filler Panels" on page 5-2.

2. **Unconfigure and power off the CPU/memory board using the `cfgadm` command as superuser.**

   ```
   # cfgadm -c disconnect ap-id
   ```

   where *ap-id* is one of the following: `N0.SB0`, `N0.SB2`, or `N0.SB4`.

   This command removes the resources from the Solaris Operating System and the OpenBoot PROM, and powers off the board. The green Power LED flashes briefly as the CPU/memory board is cooling down.

Caution – For safe removal from a powered server, the green Power LED must be off and the amber Hot-plug OK LED must be on.

3. **Attach a wrist strap and place a grounded ESD mat close to the server.**

   See Section 2.1.4, "Antistatic Precautions" on page 2-3.

4. **Slide the server out of the system cabinet.**

   See Section 2.4, "Sliding the Server Out of the System Cabinet" on page 2-7.

5. **Unlock the ejector levers on the CPU/memory board using a No. 2 Phillips screwdriver (FIGURE 5-3).**

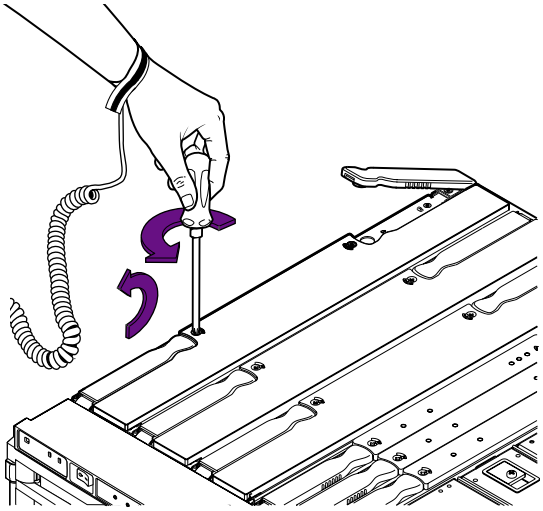


FIGURE 5-3 Unlocking the CPU/Memory Board Ejector Levers

The ejectors pop out slightly.

6. **Raise both ejector levers simultaneously until they are vertical (**FIGURE 5-4**).**

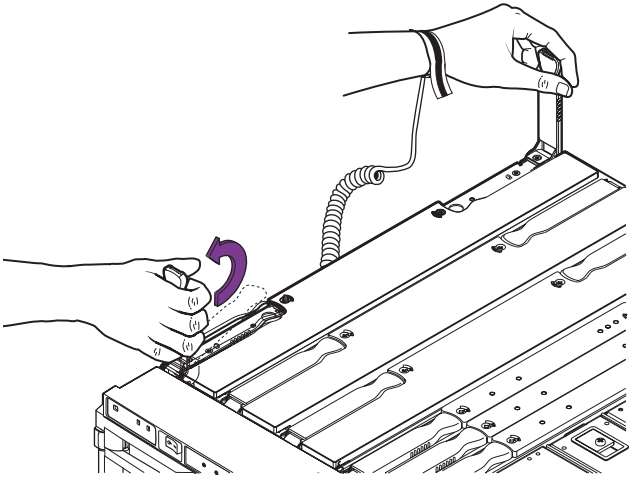


FIGURE 5-4 Raising the CPU/Memory Board Ejector Levers

This action unseats the board from the backplane connector.

7. **Grasp the ejector levers and pull upward to raise the CPU/memory board until the green panels are visible.**

Note – Any green part is a part that you can touch.

The antigravity clutch holds the board in position so that it can be released without the board sliding down into the server.

8. **Grasp the green panels and raise the CPU/memory board out of the server** (FIGURE 5-5)**.**

9. **Place the board in its ESD safe packaging box or on a grounded ESD mat.**

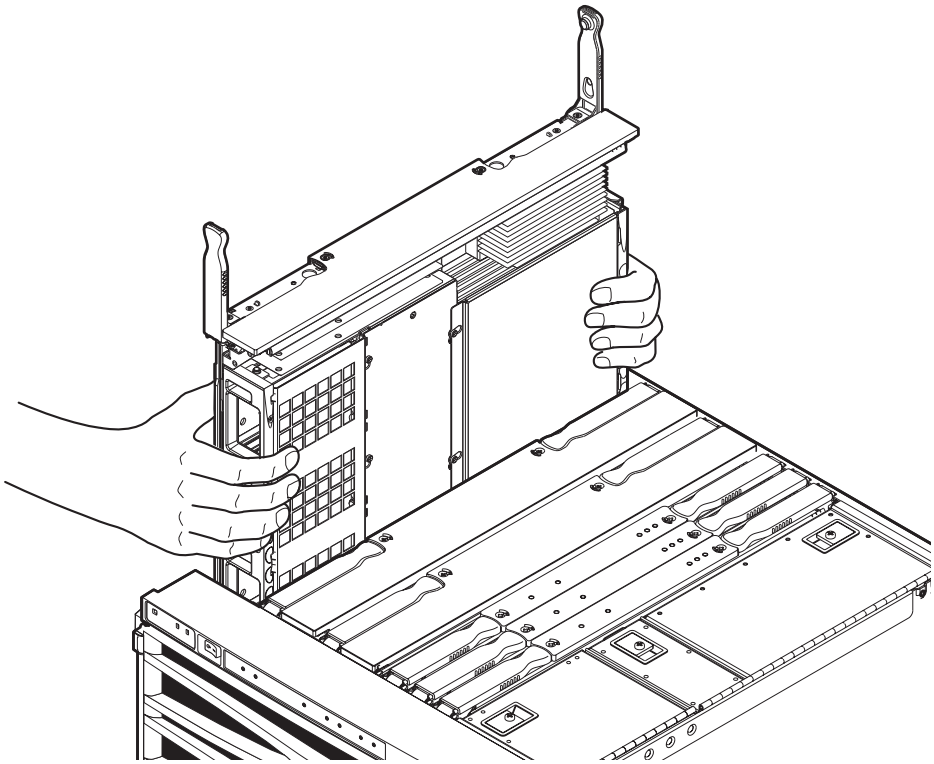


FIGURE 5-5 Raising a CPU/Memory Board From the Server

10. **Determine your next step:**

- If your are replacing (hot-swapping) the CPU/memory board:

a. **Remove the DIMMs for the replacement board (if necessary).**

See Section 5.4.2, “Removing DIMMs” on page 5-14.

b. Continue to Step 5 **of** Section 5.3.2, "Installing a CPU/Memory Board" on page 5-8**.**

- If you *will not* replace the CPU/memory board:

a. Insert a filler board into the empty slot.

Caution – A filler board *must* be installed to prevent overheating when the server is powered on.

b. Lower the filler board using the ejector levers until the levers are forced approximately 45 degrees towards the inside of the board.

c. Reposition your grip on the levers and then push down on the levers to lock them into place.

d. Slide the server back into the system cabinet.

See Section 7.2, "Sliding the Server Into the System Cabinet" on page 7-2.

5.3.2 Installing a CPU/Memory Board

1. **Attach a wrist strap and place a grounded ESD mat close to the server.**

   See Section 2.1.4, "Antistatic Precautions" on page 2-3.

2. **Slide the server out of the system cabinet.**

   See Section 2.4, "Sliding the Server Out of the System Cabinet" on page 2-7.

3. **Unlock the ejector levers on the CPU/memory filler board using a No. 2 Phillips screwdriver (**FIGURE 5-3**).**

4. **Lift the filler board from the server.**

5. **Remove the replacement CPU/memory board from its shipping container.**

6. **Install DIMMs on the replacement CPU/memory board, if required.**

   See Section 5.4.3, "Installing DIMMs" on page 5-17.

7. **Visually inspect the server and CPU/memory board connectors for damage.**

Caution – *Do not force* any board into a slot; it can cause damage to the board and server. The board should insert and seat smoothly. If it binds, remove the board and inspect the card cage slot for any obvious obstructions. Also inspect both the board and the backplane for bent pins or other damage.

8. **Grasp the green side panels and gently insert the CPU/memory board into the grooves until the antigravity clutch is engaged (**FIGURE 5-6**).**

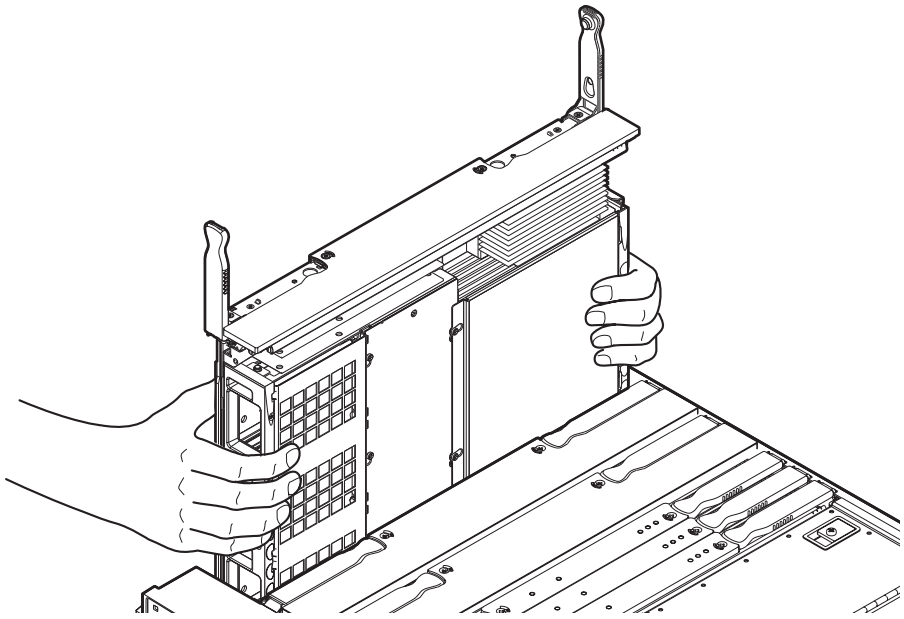


FIGURE 5-6 Installing a CPU/Memory Board

The antigravity clutch holds the board in position so that it can be released without the board sliding down into the server.

9. **Slowly push down from the center top of the CPU/memory board until the top face of the board is approximately three or four inches (7.5 cm to 10 cm) from the top of chassis (**FIGURE 5-7**).**

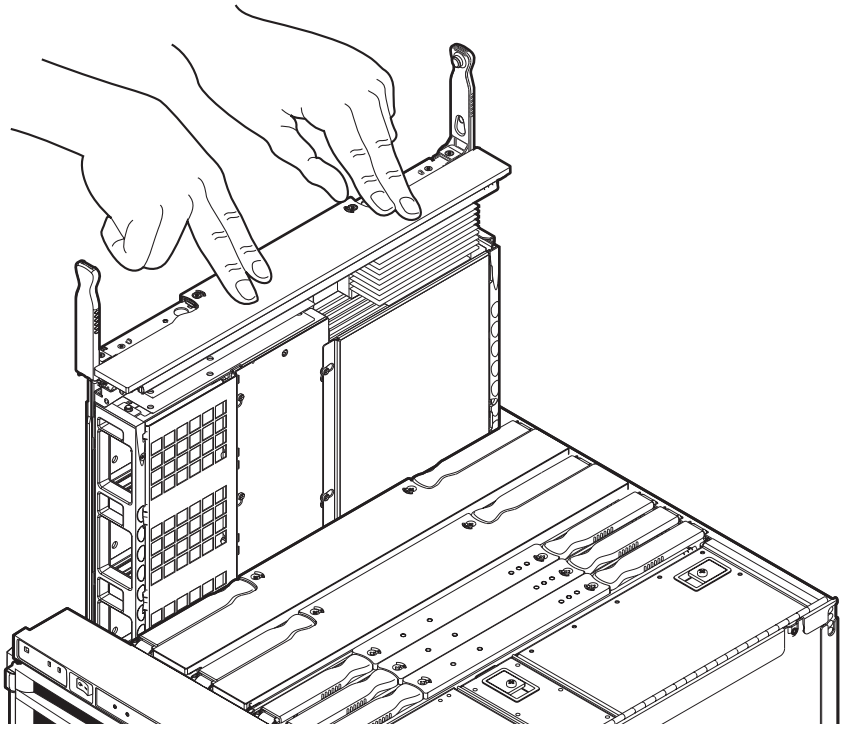


FIGURE 5-7 Partially Inserting the CPU/Memory Board Into the Server

10. **When the board is approximately three or four inches (7.5 cm to 10 cm) from the top of the chassis, change your grip and grasp the ejector levers so that they are oriented in the vertical position, 90 degrees straight out from the board (**FIGURE 5-8**).**

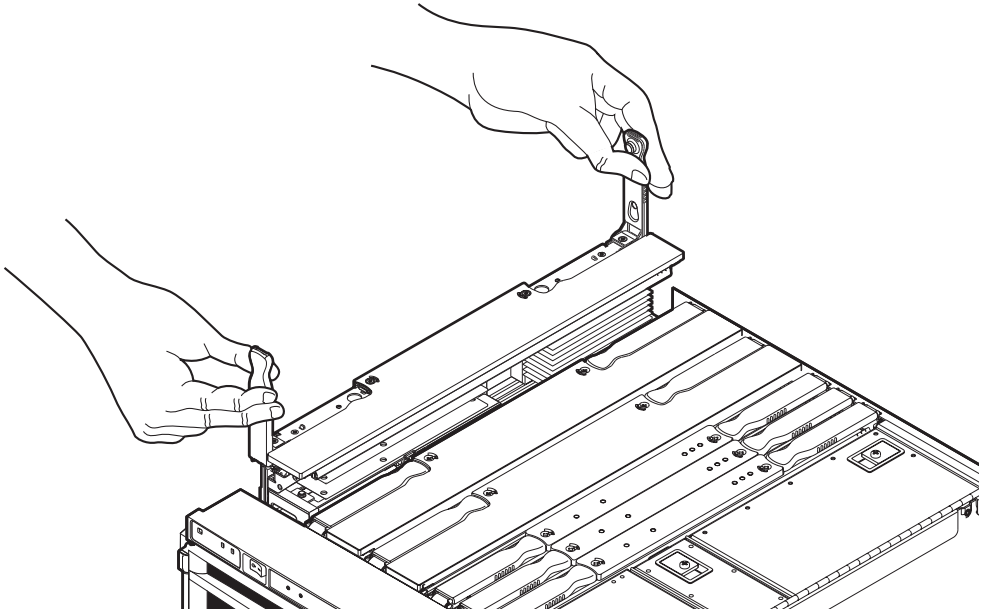


FIGURE 5-8 Changing Hand Grip and Lowering the CPU/Memory Board Into the Server

Caution – Metal pins on the underside of the ejector levers help to cushion the CPU/memory board after the antigravity clutch is released. If the levers are not 90 degrees straight out from the top of the board, there is a chance the connectors could be damaged.

11. **To complete the seating, lower the board using the ejector levers until the levers are forced approximately 45 degrees towards the inside of the board.**
12. **Reposition your grip on the levers and then push down on the levers to lock them into place.**
13. **Slide the server back into the system cabinet.**

    See Section 7.2, “Sliding the Server Into the System Cabinet” on page 7-2.

14. **Power on, test, and configure the installed board using the `cfgadm` command as superuser.**

```
# cfgadm -c configure ap-id
```

where *ap-id* is one of the following: `N0.SB0`, `N0.SB2`, or `N0.SB4`.

The command powers the board on, tests it, attaches the board, and brings all of its resources back to the Solaris Operating System.

5.4 DIMMs

The CPU/memory board has 32 DIMM sockets, which are divided into eight banks of four DIMMs per bank (FIGURE 5-9). Each CPU processor has two corresponding DIMM banks. A CPU processor is not required to have any DIMMs installed in its corresponding DIMM bank. However, a populated DIMM bank must have a corresponding CPU processor installed.

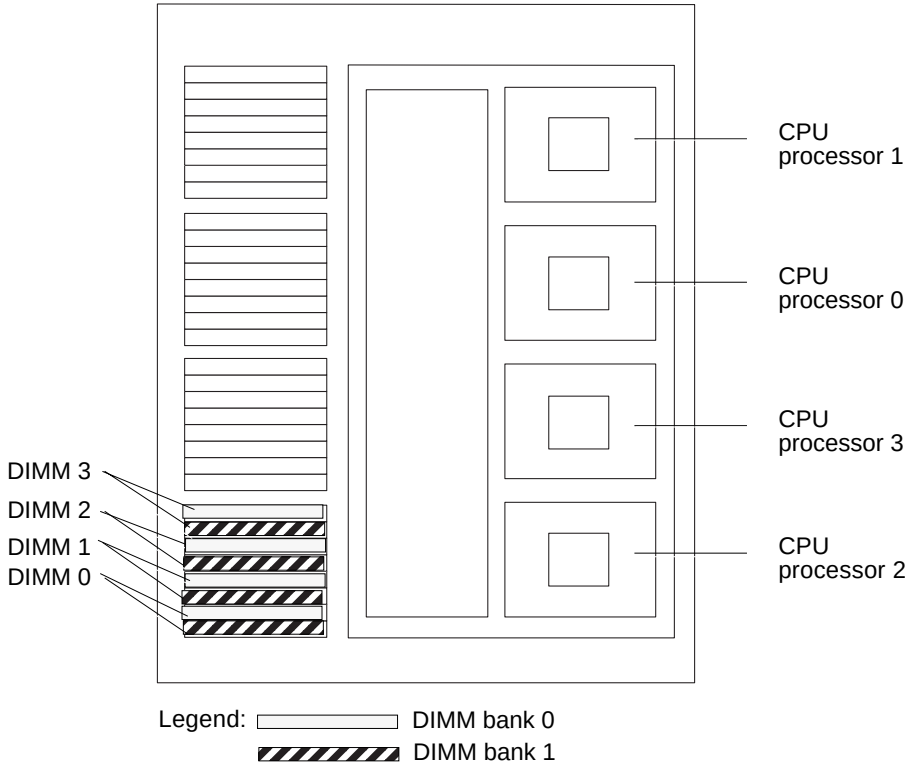


FIGURE 5-9 DIMM Slot Numbers

The DIMM number and bank number are repeated in the same order for each CPU processor. DIMM number 3, bank 0 is the first DIMM, and DIMM number 3, bank 1 is the second DIMM in each DIMM bank. The CPU processor number is noted on the metal cover.

5.4.1 DIMM Bank Configuration Guidelines

Follow these DIMM configuration guidelines:

- Each DIMM bank must be fully populated with the same capacity DIMM.
- Install the larger capacity DIMMs into banks before installing the smaller capacity DIMMs into banks.
- The minimum number of DIMMs you can install per CPU processor is four DIMMs for one bank.

- If the number of CPU processors on each CPU/memory board is the same, place DIMM banks on CPU/memory boards that have fewer populated DIMM banks before placing DIMMs on CPU/memory boards that already have more populated DIMM banks.
- If some CPU/memory boards have more CPU processors than others, place DIMMs in DIMM banks on the board with the most CPU processors. There will be CPU processors without corresponding DIMMs on other boards.

5.4.2 Removing DIMMs

Caution – The server is sensitive to static electricity. Ensure that you are wearing a grounded wrist strap when handling server components. Always place components on a grounded ESD mat close to the server

1. **Remove the applicable CPU/memory board.**

   See Section 5.3.1, "Removing a CPU/Memory Board" on page 5-5.

2. **Place the CPU/memory board on the ESD mat.**

3. **Remove the four screws that retain the DIMM cover. Remove the cover (**FIGURE 5-10**).**

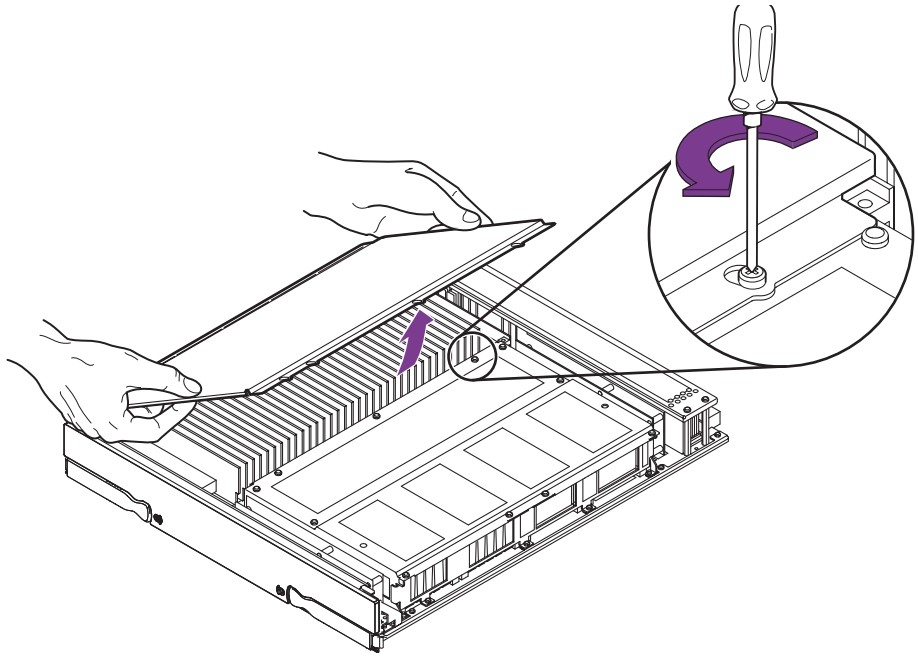


FIGURE 5-10 Removing the DIMM Cover

4. **Locate the slot for the DIMM you need to replace.**

5. **Eject the DIMM by pressing down on the ejection levers on both sides of the DIMM connector (**FIGURE 5-11**).**

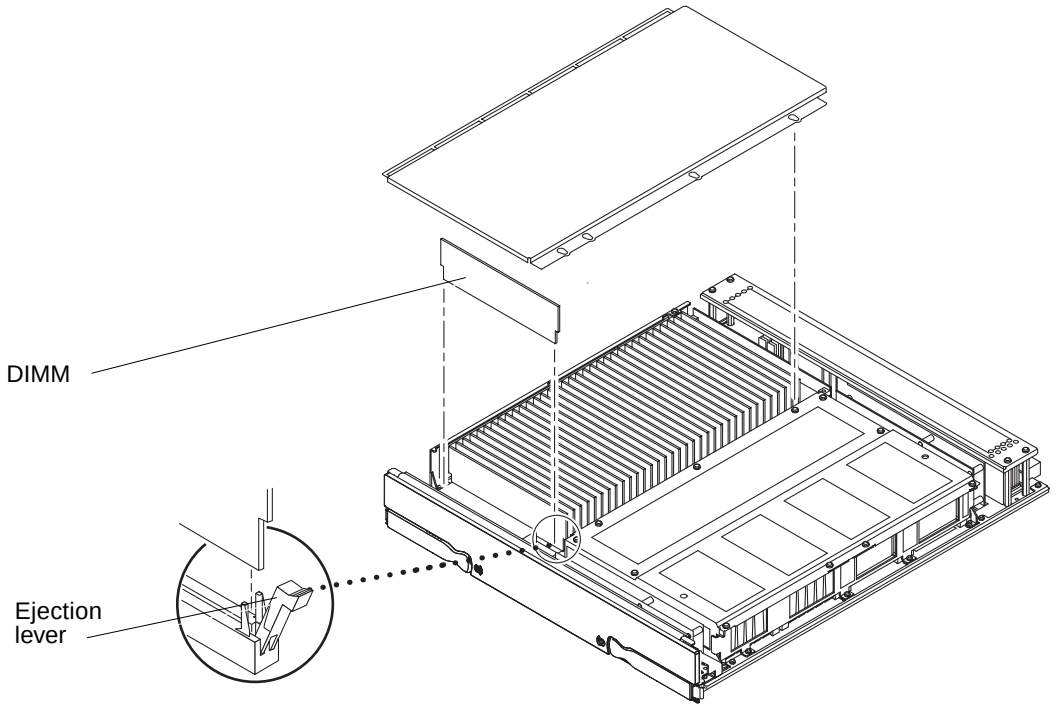


FIGURE 5-11 Removing a DIMM

6. **Holding the DIMM by its edges, remove it from the slot and place it on an antistatic surface.**

7. **If you are not going to install new DIMMs, replace the DIMM cover and secure it using the four screws.**

8. **Replace the CPU/memory board.**

   See Section 5.3.2, “Installing a CPU/Memory Board” on page 5-8.

5.4.3 Installing DIMMs

Install one bank completely on each board before installing the remaining banks on any board.

Note – All banks must have the same size DIMMs. However, DIMMs from different manufacturers are interchangeable in a single bank if the DIMMs all have the same capacity and speed. Sort the DIMMs into banks using the same size DIMMs.

Caution – The server and DIMMs are sensitive to static electricity. To prevent damage to the DIMMs, ensure that you are wearing a grounded wrist strap when handling them. Always place components on a grounded ESD mat close to the server.

---

1. **Remove the CPU/memory board.**

   See Section 5.3.1, "Removing a CPU/Memory Board" on page 5-5.

2. **Place the CPU/memory board on an ESD mat on a work surface.**

3. **Remove the four screws retaining the DIMM cover. Remove the cover (**FIGURE 5-10**).**

4. **Carefully remove the new DIMM from its protective packaging and place it on an antistatic surface.**

   The DIMM bag makes a good antistatic surface.

5. **Press down on the ejector levers at both ends of the DIMM connector slot that will receive the new DIMM.**

   The connector slot will not accept the DIMM unless the levers are in the insert (open) position.

6. **Align the short-side key and the long-side key on the DIMM with the short side and long side of the DIMM connector.**

Note – If you are installing four DIMMs, insert the DIMMs into the same bank.

---

7. **Place your thumbs on the top edge of the DIMM. Push the DIMM firmly into its connector (**FIGURE 5-12**).**

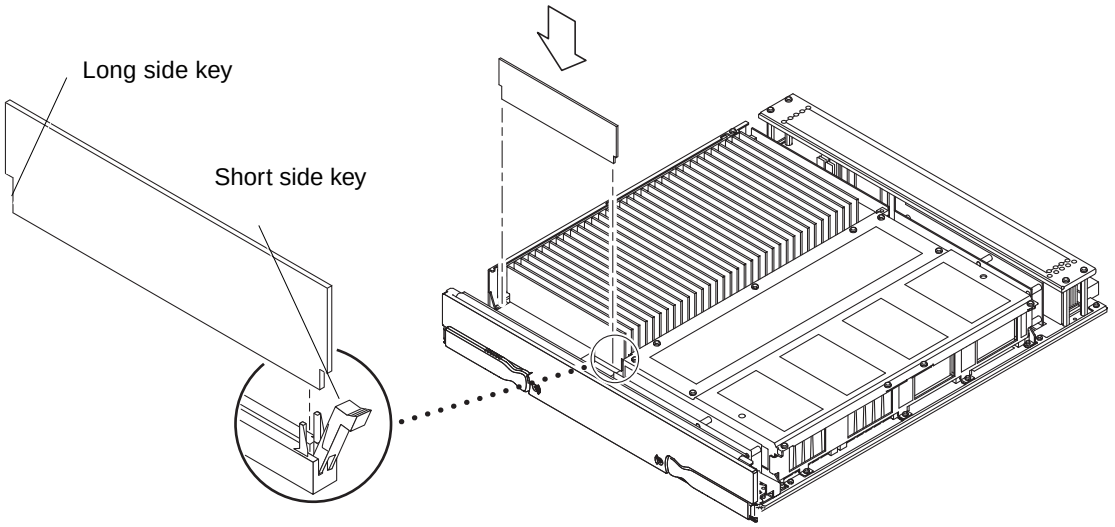


FIGURE 5-12 Installing a DIMM

8. **Press down firmly on the entire edge of the DIMM.**
   The ejector levers will be in the upright position.
9. **Install each DIMM in the same manner.**
10. **Replace the DIMM cover and secure the cover with the four screws.**
11. **Reinstall the CPU/memory board.**
    See Section 5.3.2, “Installing a CPU/Memory Board” on page 5-8.

5.5 L2 Repeater Board

Caution – This procedure requires the server to be extended out of the system cabinet on its slides. Before attempting this procedure, you must extend the system cabinet stabilizer bar.

The server supports up to two L2 repeater boards, RP0 and RP1, which are located at the top of the server (FIGURE 5-13).

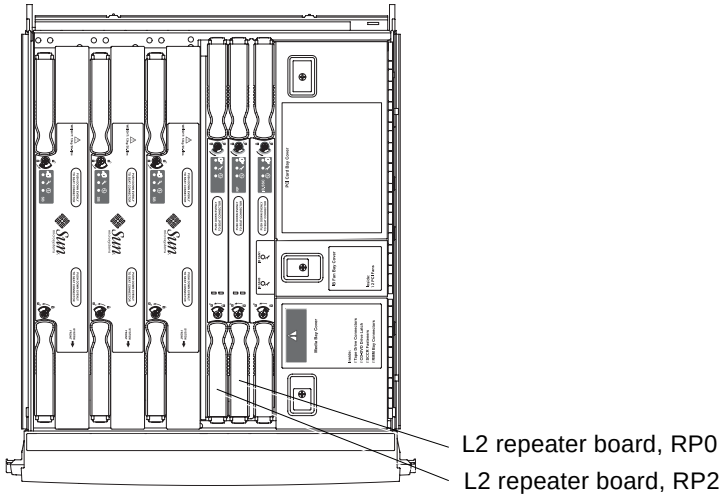


FIGURE 5-13 Location of Boards, Modules, and Bays—Server Top View

There are three LEDs on the L2 repeater board. TABLE 5-3 lists the LED names and functions.

TABLE 5-3 L2 Repeater Board LED Functions

LED Name	On	Off
Activated LED (green)	Board is activated.	Board is deactivated.
Fault LED (amber)	Internal fault.	No internal fault.
OK to Remove LED (blue or amber)	Board can be removed.	Board can not be removed.

5.5.1 Removing an L2 Repeater Board

Caution – Spring fingers and EMI gaskets might detach from the L2 repeater board and fall into the server. This might cause damage. Ensure that the EMI gaskets and spring fingers do not fall into the server.

1. **Take the server to Standby mode.**

   See Section 2.2, "Bringing the Server to Standby Mode" on page 2-5.

2. **Remove power to the server by disconnecting the four power cables, AC0/DC0 through AC3/DC3 (**FIGURE B-1**).**

3. **Extend and lock the system cabinet stabilizer bar and slide the server out of the system cabinet until the locking latches click.**

   See Section 2.4, "Sliding the Server Out of the System Cabinet" on page 2-7.

4. **Attach a wrist strap.**

   See Section 2.1.4, "Antistatic Precautions" on page 2-3.

5. **Place a grounded ESD mat close to the server.**

6. **Unlock the ejector levers with a No. 2 Phillips screwdriver (**FIGURE 5-3**).**

   The ejectors pop out slightly.

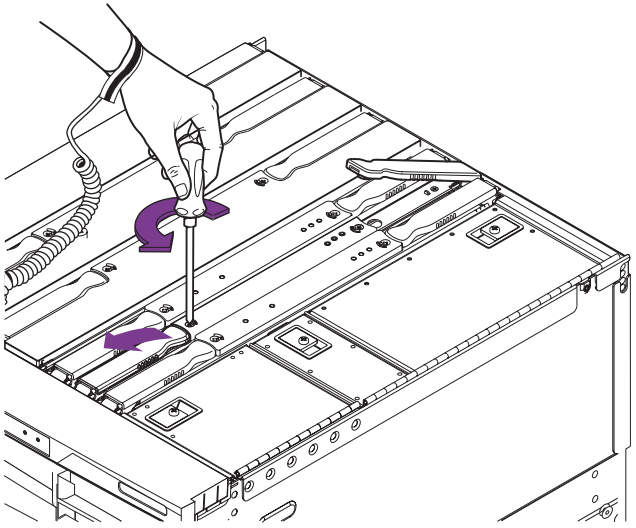


FIGURE 5-14 Unlocking the L2 Repeater Board Ejector Levers

7. **If you are removing the L2 repeater board next to the media bay, lift the cover to the media bay.**

8. **Raise the ejector levers simultaneously until they are 90 degrees straight out from the board.**

   This action unseats the board from the connector.

9. **Grasp the ejector levers and pull upward to raise the L2 repeater board until the green panels are visible** (FIGURE 5-15).

   The antigravity clutch holds the board in position so that it can be released without the board sliding down into the server.

Note – Any plastic green panels are parts that you can touch.

10. **Grasp the green panels and raise the L2 repeater board out of the server (**FIGURE 5-15**).**

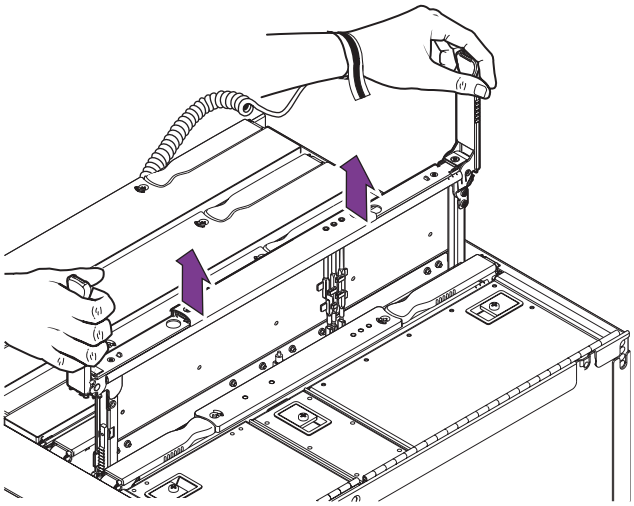


FIGURE 5-15 Raising an L2 Repeater Board

11. **Place the board on a grounded ESD mat.**
12. **Continue to** Step 2 **of** Section 5.5.2, "Installing the L2 Repeater Board" on page 5-21**.**

5.5.2 Installing the L2 Repeater Board

Caution – *Do not force* any board into a slot; it can cause damage to the board and server. The board should insert and seat smoothly. If it binds, remove the board and inspect the card cage slot for any obvious obstructions. Also inspect both the board and the backplane for bent pins or other damage.

Caution – Ensure that the protective covering is removed from the replacement L2 repeater board connectors prior to installation of the board or damage to the board and or backplane connectors can result.

1. **Attach a wrist strap to your wrist. Connect the ESD wrist strap to the server.**

   See Section 2.1.4, "Antistatic Precautions" on page 2-3.

2. **Visually inspect the connector(s) for damage.**

3. **Hold the green side panels and gently insert the L2 repeater board into the grooves until the antigravity clutch is engaged.**

   The antigravity clutch holds the board in position so that it can be released without the board sliding down into the server.

4. **Slowly push down from the center top of the L2 repeater board until the top face of the board is approximately three or four inches (7.5 cm to 10 cm) from the top of the chassis.**

5. **When the board is approximately three or four inches (7.5 cm to 10 cm) from the top of the chassis, change your grip and grasp the ejector levers so that they are oriented in the vertical position, 90 degrees straight out from the board.**

Caution – Metal pins on the underside of the ejector levers help to cushion the L2 repeater board after the antigravity clutch is released. If the levers are not 90 degrees straight out from the top of the board, there is a chance the connectors could be damaged.

6. **To complete the seating, lower the board using the ejector levers until the levers are forced approximately 45 degrees toward the inside of the board.**

7. **Reposition your grip on the levers and then push down on the levers to lock them into place** (FIGURE 5-15)**.**

   You can release the levers when the board is inserted halfway in order to change your grip.

8. **Slide the server into the system cabinet and power on the server.**

   See:

   - Section 7.2, "Sliding the Server Into the System Cabinet" on page 7-2
   - Section 7.3, "Powering On the Server" on page 7-4

5.6 IB_SSC Assembly

The IB_SSC assembly, IB_SSC, is located on the top of the server (FIGURE 5-16).

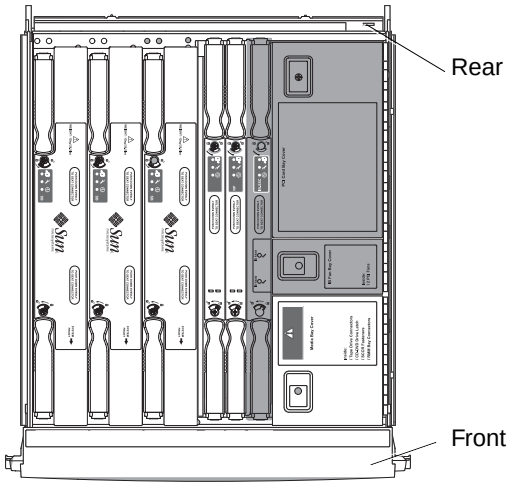


FIGURE 5-16 IB_SSC Assembly Location – Server Top View

TABLE 5-4 lists the IB_SSC assembly LED functions.

TABLE 5-4 IB_SCC Assembly LED Functions

IB_SSC LED Name		On	Off
Activated LED (green)		Board is activated.	Board is deactivated.
Fault LED (amber)		Fault is present.	No fault is present.
OK to Remove (blue or amber)		Assembly can be removed.	Assembly cannot be removed.

5.6.1 Removing the IB_SSC Assembly

Caution – The IB_SSC assembly is heavy and weighs approximately 24 pounds (11 kg); it is also an awkward shape to handle. Take care when removing the board from the server.

Caution – Spring fingers and EMI gaskets might detach from the IB_SSC assembly and fall into the server. This might cause damage. Ensure that the EMI gaskets and spring fingers do not fall into the server.

1. **Bring the server to Standby mode.**

   See Section 2.2, "Bringing the Server to Standby Mode" on page 2-5

Note – Removing and replacing the power distribution board does not require removing I/O cards.

---

2. **If you are going to remove I/O cards, do the following:**

   a. **Prepare an ESD safe work surface for the I/O cards you are going to remove.**

   b. **Remove all I/O cables and label them. Label all I/O cables that are attached to the IB_SSC assembly at the rear of the server.**

3. **Extend and lock the system cabinet stabilizer bar and slide the server out of the system cabinet until the locking latches click.**

   See Section 2.4, "Sliding the Server Out of the System Cabinet" on page 2-7.

4. **Attach a wrist strap. Place a grounded ESD mat close to the server.**

   See Section 2.1.4, "Antistatic Precautions" on page 2-3.

5. **At the top of the server, open the media bay cover (**FIGURE 5-17**).**

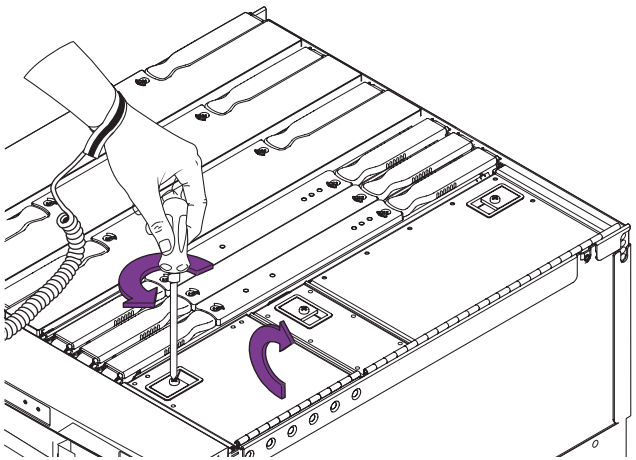


FIGURE 5-17 Opening the Media Bay Cover – Server Top View

6. **Disconnect the I/O cables from the IB_SSC assembly to the removable media modules (**FIGURE 5-18**). Secure the cables out of the way.**

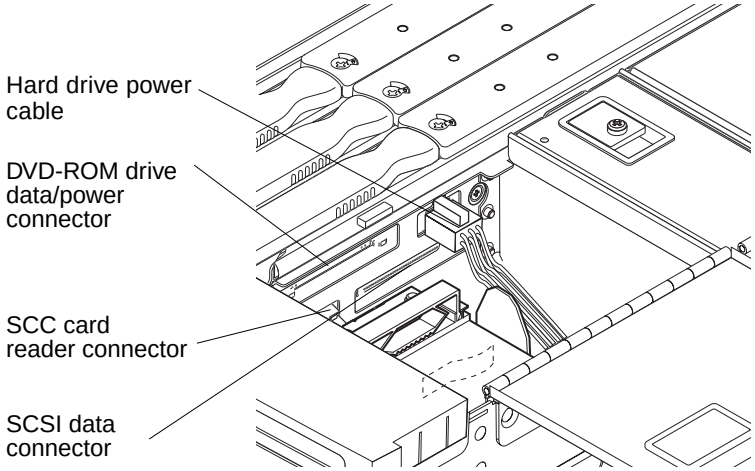


FIGURE 5-18 IB_SSC Assembly Cable and Connector Locations

Caution – Do not disconnect the SSC card reader cable end that connects to the SSC card reader or the SCSI data cable end that connects removable media backplane. Those cable ends are soldered and cannot be removed.

7. **Remove the I/O cards from the I/O bay.**

   See Section 5.7.1, "Removing an I/O Card" on page 5-30.

Note – If you are replacing the power distribution board, you can leave the I/O cards installed.

8. **From the right of the server, unlock the ejector levers on the IB_SSC assembly with a No. 2 Phillips screwdriver (FIGURE 5-3).**

   The ejectors pop out slightly.

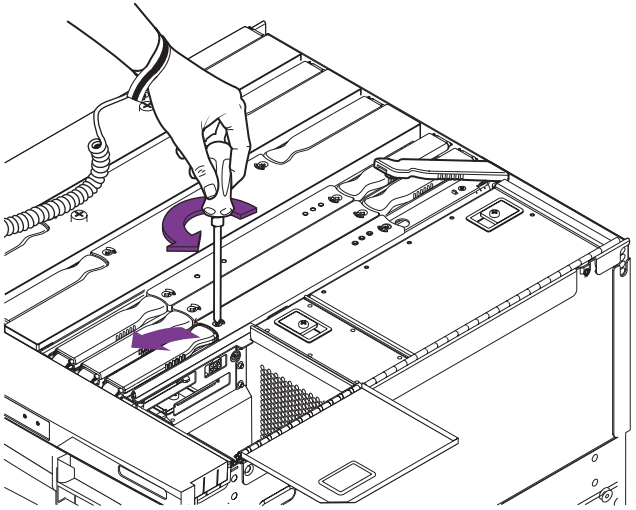


FIGURE 5-19 Unlocking the IB_SSC Assembly Ejector Levers

9. **Raise the ejector levers simultaneously until they are 90 degrees straight out from the board.**

   This action unseats the board from the connector on the backplane.

10. **Grasp the ejector levers and pull to raise the IB_SSC assembly until the green panels are visible** (FIGURE 5-20)**.**

    The antigravity clutch holds the IB_SSC assembly in position so that it can be released without the board sliding down into the server.

Note – Any green part is a part that you can touch.

---

11. **Hold the green panels and raise the assembly out of the server.**

Caution – The IB_SSC assembly is heavy and weighs approximately 24 pounds (11 kg); it is also an awkward shape to handle. Take care when removing the board from the server.

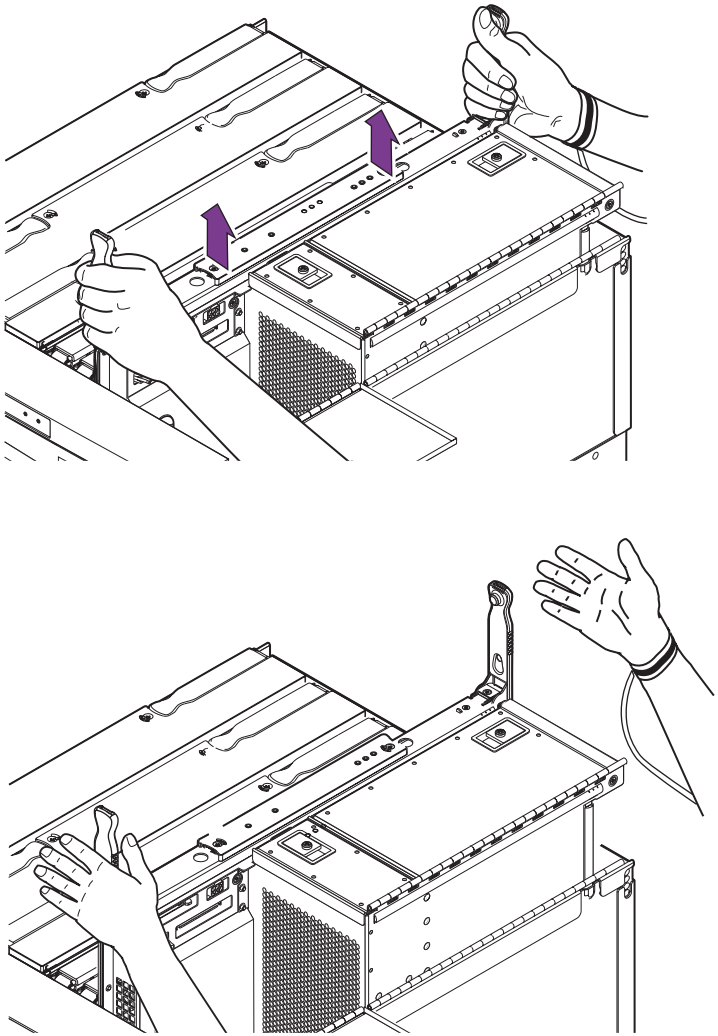


FIGURE 5-20 Raising the IB_SSC Assembly Halfway Using the Antigravity Guides

12. **Place the assembly in its ESD safe packaging box.**
13. **Place the packaged IB_SSC assembly on a grounded ESD mat.**

    Continue to Step 2 of Section 5.6.2, "Installing the IB_SSC Assembly" on page 5-28.

5.6.2 Installing the IB_SSC Assembly

1. **Attach a wrist strap to your wrist. Connect the ESD wrist strap to the server.**

   See Section 2.1.4, "Antistatic Precautions" on page 2-3.
2. **Ensure the removable media cables are safely out of the way.**

Caution – *Do not force* any board into a slot; it can cause damage to the board and server. The board should insert and seat smoothly. If it binds, remove the board and inspect the card cage slot for any obvious obstructions. Also inspect both the board and the backplane for bent pins or other damage.

3. **Visually inspect the connector(s) for damage.**
4. **Hold the green side panels and gently insert the assembly into the grooves until the antigravity clutch is engaged (**FIGURE 5-20**).**

   The antigravity clutch holds the assembly into position so that it can be released without the assembly sliding down into the server.
5. **Push down slowly at the center top of the assembly until the top face of the assembly is approximately three or four inches (7.5 cm to 10 cm) from the top of the chassis.**
6. **Change your grip and grasp the ejector levers so that they are oriented in the vertical position, 90 degrees straight out from the assembly.**

Caution – Metal pins on the underside of the ejector levers help to cushion the CPU/memory board after the antigravity clutch is released. If the levers are not 90 degrees straight out from the top of the board there is a chance the connectors could be damaged.

7. **Lower the assembly using the ejector levers until the levers are forced to approximately 45 degrees towards the inside of the assembly.**
8. **Reposition your grip on the levers and then push down on the levers to lock them into place.**

9. **Install the I/O cards.**

   See Section 5.7.2, “Installing an I/O Card” on page 5-32.

10. **Reconnect the I/O cables at the rear of the server.**

11. **Reconnect the I/O cables from the removable media modules to the IB_SSC assembly.**

12. **Close the removable media bay and I/O bay covers.**

13. **Slide the server into the system cabinet and power on the server.**

    See:

    - Section 7.2, “Sliding the Server Into the System Cabinet” on page 7-2
    - Section 7.3, “Powering On the Server” on page 7-4

5.7 I/O Cards

I/O cards are located in the I/O bay (FIGURE 5-21).

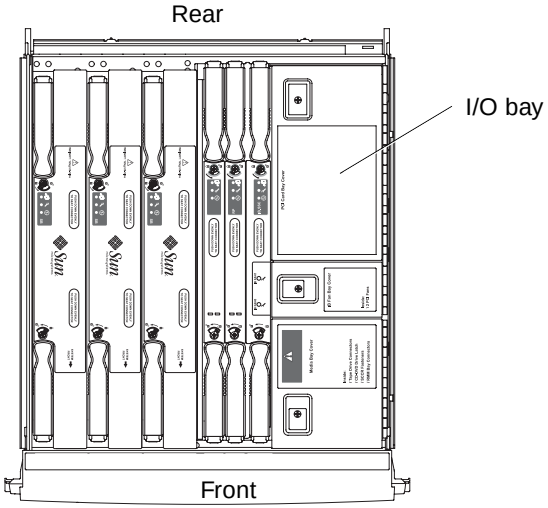


FIGURE 5-21 I/O Bay Location

5.7.1 Removing an I/O Card

Caution – If you remove a I/O card and are not going to replace it, you must fit a I/O card filler panel in its place to maintain EMI integrity.

1. **Bring the server to Standby mode and slide the server out of the system cabinet.**

   See:

   - Section 2.2, "Bringing the Server to Standby Mode" on page 2-5
   - Section 2.4, "Sliding the Server Out of the System Cabinet" on page 2-7

2. **Remove the appropriate I/O connectors from the rear of the server.**

3. **Open the I/O bay cover (**FIGURE 5-22**).**

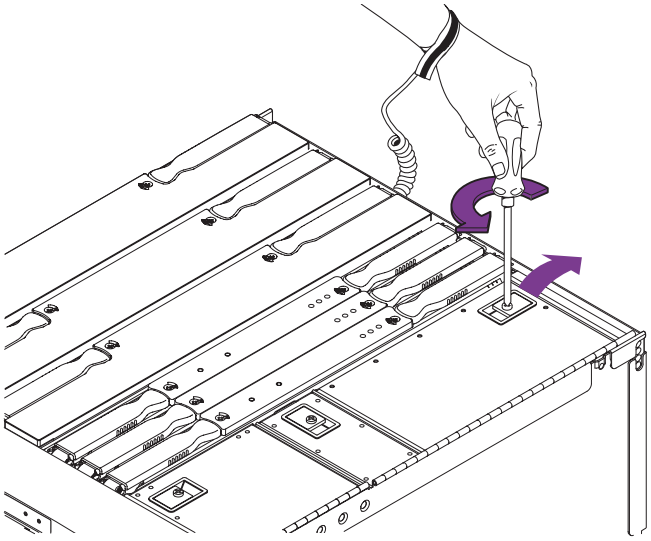


FIGURE 5-22 Opening the I/O Bay Cover

4. **Identify the card to be removed.**

5. **Remove the retaining screw (**FIGURE 5-23**).**

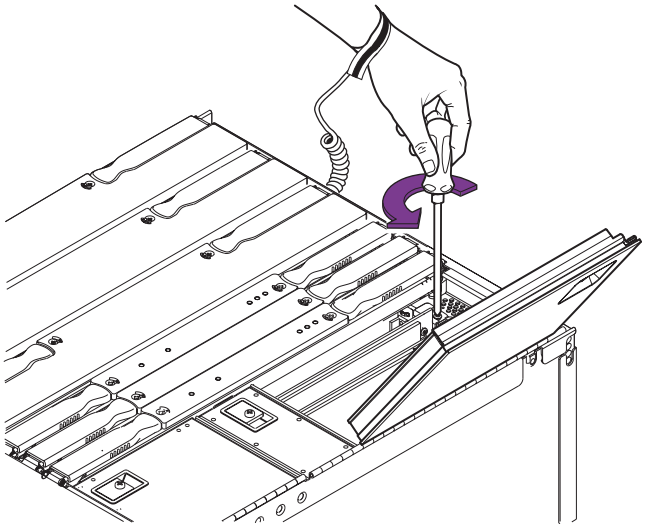


FIGURE 5-23 Removing the I/O Card Retaining Screw

Gently pull the card upward until it is free of the IB_SSC receptacle (FIGURE 5-24).

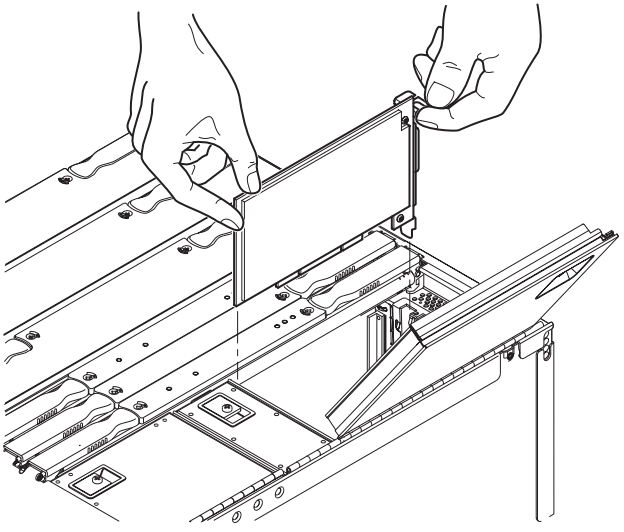


FIGURE 5-24 Removing a I/O Card

6. **Place the I/O card on a grounded ESD mat.**
7. **Consider your next steps:**

- If you are replacing an I/O card, continue to Step 3 of Section 5.7.2, "Installing an I/O Card" on page 5-32.
- If you are not going to install a I/O card, install a filler panel into the slot.

a. Close the I/O bay cover and secure it.

b. Reconnect the appropriate cable(s) into the I/O connector(s) at the rear of the server.

c. Slide the server into the system cabinet and power on the server.

See:

- Section 7.2, "Sliding the Server Into the System Cabinet" on page 7-2
- Section 7.3, "Powering On the Server" on page 7-4

5.7.2 Installing an I/O Card

1. **Bring the server to Standby mode and slide the server out of the system cabinet.**

   See:

   - Section 2.2, "Bringing the Server to Standby Mode" on page 2-5
   - Section 2.4, "Sliding the Server Out of the System Cabinet" on page 2-7

2. **Open the I/O bay cover.**
3. **Install the I/O card.**

   a. Remove the filler panel (if installed).

   b. Press the card gently into the IB_SSC receptacle until it is fully seated. Secure the card with a retaining screw.

4. **Close the I/O bay cover and secure it.**
5. **Connect the appropriate cable into the I/O connector at the rear of the server.**
6. **Slide the server into the system cabinet and power on the server.**

   See:

   - Section 7.2, "Sliding the Server Into the System Cabinet" on page 7-2
   - Section 7.3, "Powering On the Server" on page 7-4

CHAPTER 6

Replacing Chassis Components

This chapter describes how to remove and install chassis components.

This chapter contains the following topics:

6.1 Main Fans

Note – You can replace individual fans without powering off the server. To replace the main fan *tray*, you *must* take the server to Standby mode and remove power from the server.

6.1.1 Main Fan Failures

Failure of main fans 6 and 7 can cause reduced system availability. In all procedures observe these cautions:

Caution – Use proper ESD grounding techniques when handling components. Wear an antistatic wrist strap and use an ESD-protected mat. Store ESD-sensitive components in its ESD safe packaging box before placing them on any surface.

Caution – Do not operate for extended periods with a fan removed. Doing so might cause system shutdown.

Each of the eight main fans has one fault ( ) LED. The fault LED is lit when there is a fan fault or failure. The fault LED is off when there is no fault. TABLE 6-1, TABLE 6-2 and TABLE 6-3 list fan problems or failures, what steps to take, and what the system reports.

TABLE 6-1 Fan Failure Procedures – One CPU/Memory Board (4 CPUs) Configuration

Problem	Resolution	System Availability
If the system is operating at up to 35 degrees C ambient temperature:		
One or more man fans has slowed or stopped.	Hot-swap the fan.	No impact.
If the system is operating between 35 to 40 degrees C ambient temperature:		
Main fan 0 through 6 is running slow or stopped.	Hot-swap the fan.	System reports alarms but continues to operate. No impact on system availability.
Main fan 7 is running slow.	Replace the faulty fan. Consider replacing the entire fan tray as a preventive maintenance action.	System reports alarms but continues to operate. No impact on system availability.
Main fan 7 has stopped.	Replace the faulty fan. You can hot-swap the fan if CPU/memory board SB0 (CPU processor 2) has been disabled.	System reports alarms but continues to operate. No impact on system availability.

TABLE 6-2 Fan Failure Procedures – Two CPU/Memory Boards (8 CPUs) Configuration

Problem	Resolution	System Availability
If the system is operating up to 35 degrees C or between 35 to 40 degrees C ambient temperature:		
Main fan 0 through 5 or system fan 7 is running slow or stopped.	Hot-swap the fan.	System reports alarms but continues to operate. No impact on system availability.
Main fan 6 is running slow.	Replace the faulty fan. Consider replacing the entire fan tray as a preventive maintenance action.	System reports alarms but continues to operate. No impact on system availability.
Main fan 6 has stopped.	Replace the faulty fan. You can hot-swap the fan if CPU/memory board SB0 (CPU processor 2) has been disabled.	System reboots within nine minutes with CPU/memory board SB2 (CPU processor 2) disabled.

TABLE 6-3 Fan Failure Procedures – Three CPU/Memory Boards (12 CPUs) Configuration

Problem	Resolution	System Availability
If the system is operating up to 35 degrees C or between 35 to 40 degrees C ambient temperature:		
Main fan 0 through 5 or system fan 7 is running slow or stopped.	Hot-swap the fan.	No impact.
Main fan 6 is running slow.	Replace the faulty fan. Consider replacing the entire fan tray as a preventive maintenance action.	System reports alarms but continues to operate. No impact on system availability.
Main fan 6 has stopped.	Replace the faulty fan. You can hot-swap the fan if CPU/memory board SB2 (CPU processor 2) and SB4 (CPU processor 2) have been disabled.	System reboots within seven minutes with CPU/memory board SB4 (CPU processor 2) and CPU/memory board SB2 (CPU processor 2) disabled.

6.1.2 Removing a Main Fan

1. **Open the front doors to the server.**
2. **Attach the wrist strap.**
   See Section 2.1.4, “Antistatic Precautions” on page 2-3.
3. **Identify the fan that is faulty and needs to be replaced.**
   The fault ( ) LED on the panel between the two columns of fans should be lit.
4. **Identify the fan’s power connector and captive retaining screw.**
5. **Disconnect the power connector (**FIGURE 6-1**).**

Caution – Wait at least ten seconds before proceeding with the next step. This enables the fan to stop spinning.

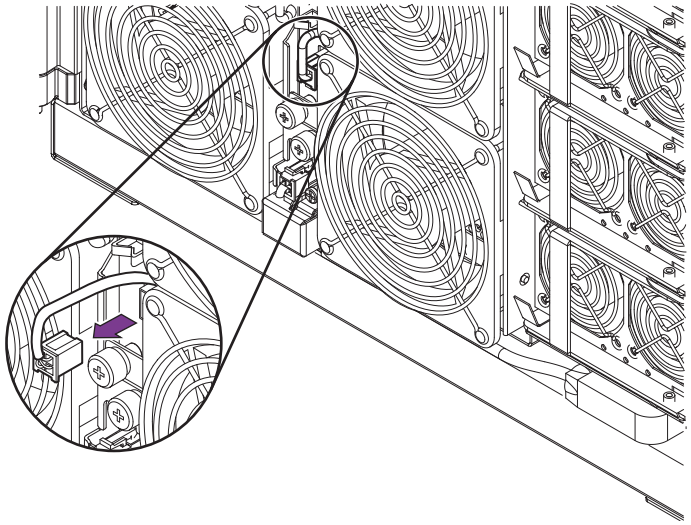


FIGURE 6-1 Disconnecting the Fan Power Connector

6. **Loosen the appropriate captive screw that secures the fan (**FIGURE 6-2**).**

Caution – There is no finger guard on the reverse side of the fan. Take care and hold the fan only by the sides of the assembly.

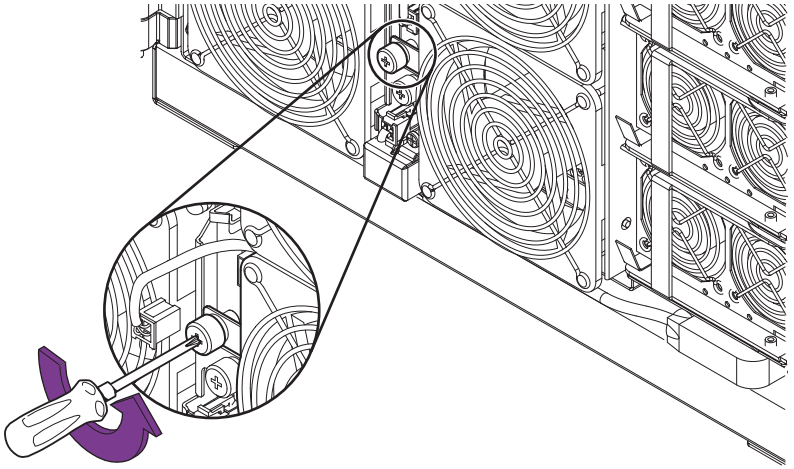


FIGURE 6-2 Loosening the Fan's Captive Screw

7. **Remove the fan and place on an ESD mat (**FIGURE 6-3**).**

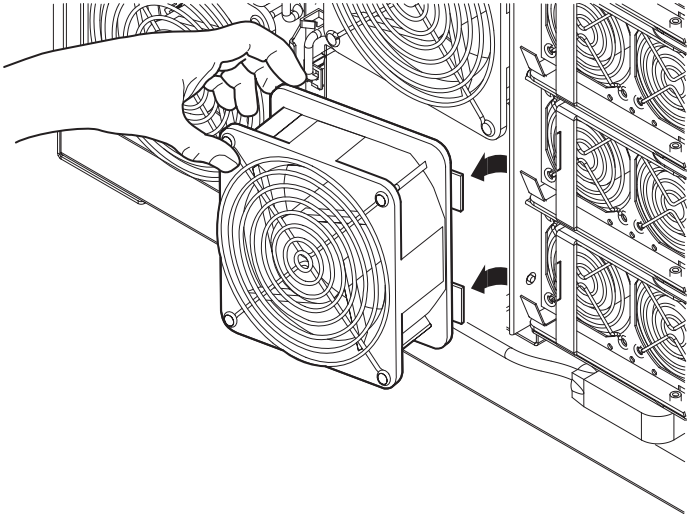


FIGURE 6-3 Removing a Fan

6.1.3 Installing a Main Fan

1. **Open the front doors of the server.**
2. **Attach a wrist strap.**

   See Section 2.1.4, “Antistatic Precautions” on page 2-3.
3. **Orient the fan so that the two lugs on the metal carrier engage in the cutouts in the fan tray (FIGURE 6-4).**

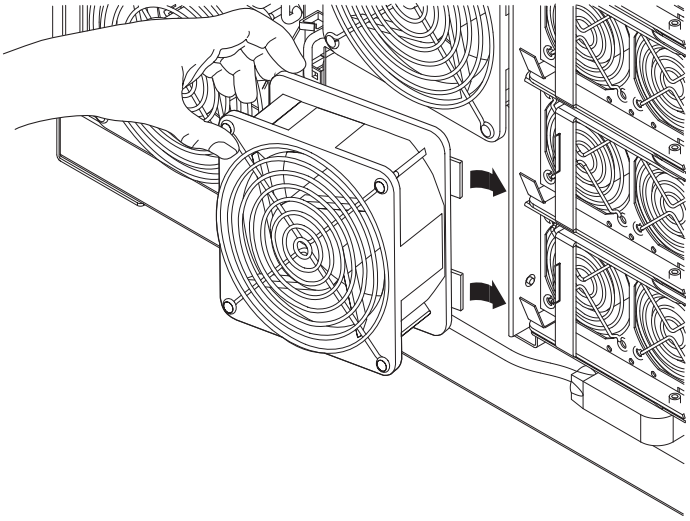


FIGURE 6-4 Inserting a Fan Into the Fan Tray

4. **Tighten the captive screw to secure the fan (FIGURE 6-2).**
5. **Replace the power connector to the fan (FIGURE 6-1).**

   If the server is powered on, the fault LED ( ) will not be lit.

Note – If a fan failed and the server has shut down to Standby mode, the fault LED will not be extinguished until you power on the server.

Caution – If the server is powered on, or the newly installed fan is fan 3, the fan starts immediately after you insert the fan and attach the power connector.

6.2 Main Fan Tray

Caution – The fan tray is not hot-pluggable. Attempting to hot-plug the fan tray while the server is powered on might result in damage. When an overtemperature is detected, the server shuts down.

Caution – Use proper ESD grounding techniques when handling components. Wear an antistatic wrist strap and use an ESD-protected mat. Store ESD-sensitive components in its ESD safe packaging box before placing them on any surface.

The main fan tray has three LEDs – power, fault, and OK to Remove. The LEDs are located on the panel between the two columns of fans. TABLE 6-4 lists the main fan tray LED functions.

TABLE 6-4 Main Fan Tray LED Functions

LED Name		On	Off
Activated LED (green)		Device is activated.	Device is deactivated.
Fault LED (amber)		Internal fault or failure.	No internal fault or failure.
OK to Remove (blue or amber)		Fan assembly can be removed.	Fan assembly cannot be removed.

6.2.1 Removing the Main Fan Tray

1. **Take the server to Standby mode.**

   See Section 2.2, "Bringing the Server to Standby Mode" on page 2-5.

2. **Remove power to the server by disconnecting the four power cables, AC0/DC0 through AC3/DC3 (**FIGURE B-1**).**

3. **Open the front doors of the server.**

4. **Attach a wrist strap. Place a grounded ESD mat close to the server.**

   See Section 2.1.4, "Antistatic Precautions" on page 2-3.

5. **Unlatch and disconnect the fan tray power connector (**FIGURE 6-5**).**

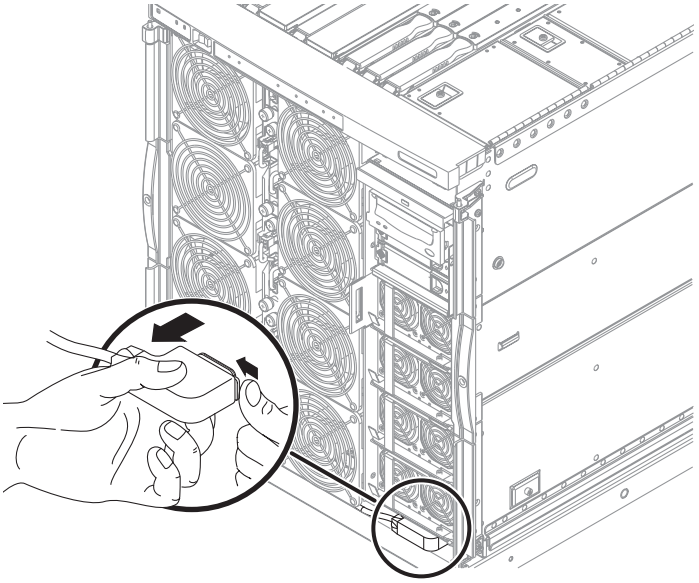


FIGURE 6-5 Removing the Fan Tray Power Connector

6. **Remove the system indicator board connector retaining clip and disconnect the connector.**

   See Section 6.7.1, “Removing the System Indicator Board” on page 6-23.

7. **Loosen the two captive screws to the fan tray in the following order (FIGURE 6-6).**

   There is one captive screw at the top and one at the bottom right side of the fan tray.

   a. **Loosen the bottom captive screw.**

   b. **Loosen the top captive screw while supporting the weight of the fan tray with your other hand.**

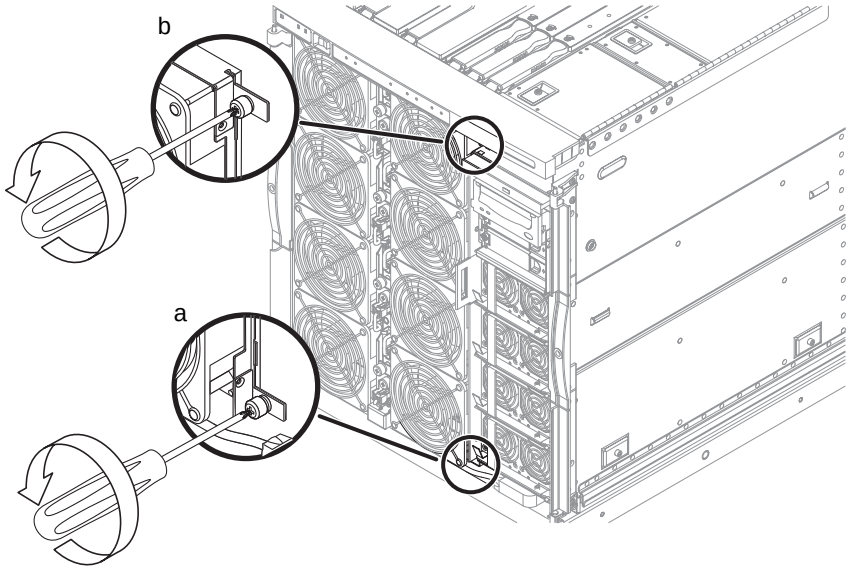


FIGURE 6-6 Loosening the Fan Tray Captive Screws

8. **Pull the tray slightly to the right to disengage the mounting pins (**FIGURE 6-7**).**

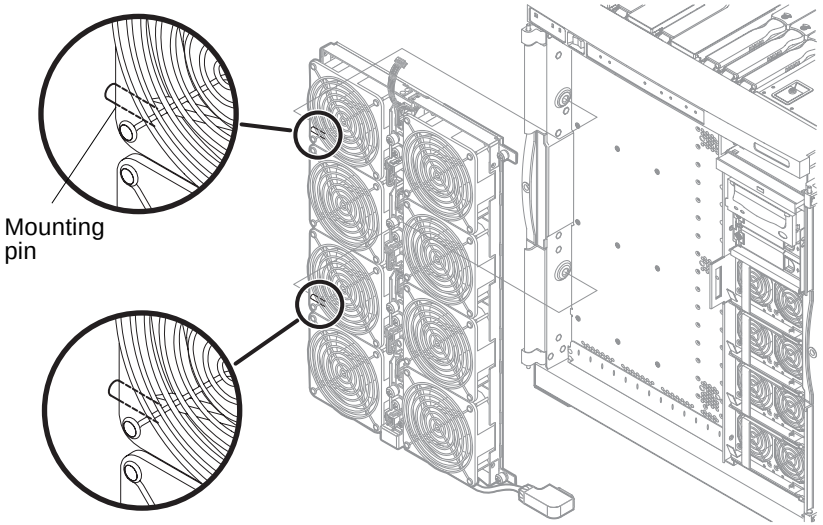


FIGURE 6-7 Removing the Fan Tray

Caution – The fan tray is heavy. Take care when disengaging the tray from its mountings.

9. **Remove the tray and place it on an ESD mat.**

   Continue to Step 3 of Section 6.2.2, "Installing the Main Fan Tray" on page 6-10.

6.2.2 Installing the Main Fan Tray

1. **Open the front doors of the server.**
2. **Attach a wrist strap. Place a grounded ESD mat close to the server.**

   See Section 2.1.4, "Antistatic Precautions" on page 2-3.
3. **Orient the tray so that the mounting pins align with the cutouts in the server chassis on the left side.**
4. **Gently push the tray into place.**
5. **Secure the fan tray by tightening the two captive screws, one at the top and one at the bottom right side (**FIGURE 6-6**).**

6. **Connect the fan tray power connector.**

   Lock it by pushing it slightly upwards while pressing the locking clip to the right with a screwdriver (FIGURE 6-5).

7. **Connect the system indicator board connector to the receptacle at the top of the fan tray (FIGURE 6-8).**

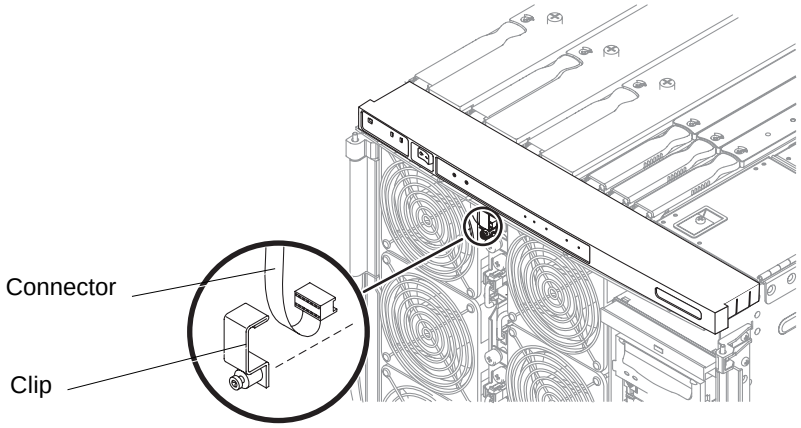


FIGURE 6-8 Replacing the System Indicator Board Connector Retaining Clip

8. **Replace the retaining clip (FIGURE 6-8)**
9. **Remove the wrist strap.**
10. **Close the front doors to the server.**

6.3 IB_SSC Fans

Two IB_SSC fans supply cooling for the IB_SSC unit.

Caution – Use proper ESD grounding techniques when handling components. Wear an antistatic wrist strap and use an ESD-protected mat. Store ESD-sensitive components in its ESD safe packaging box before placing them on any surface.

IB_SSC fan0 and IB_SSC fan1 are located at the top of the server. Each IB_SSC fan has one LED, fault LED ( ). The LED is lit when there is a fault. The LED is off when there is no fault.

6.3.1 Removing an IB_SSC Fan

1. **Bring the server to Standby mode and slide the server out of the system cabinet.**

   See:

   - Section 2.2, "Bringing the Server to Standby Mode" on page 2-5
   - Section 2.4, "Sliding the Server Out of the System Cabinet" on page 2-7

2. **Attach a wrist strap. Place a grounded ESD mat close to the server.**

   See Section 2.1.4, "Antistatic Precautions" on page 2-3.

3. **At the top of the server, open the IB_SSC fan cover.**

   a. **Loosen the latch screw.**

   b. **Unlatch the cover and open it (**FIGURE 6-9**).**

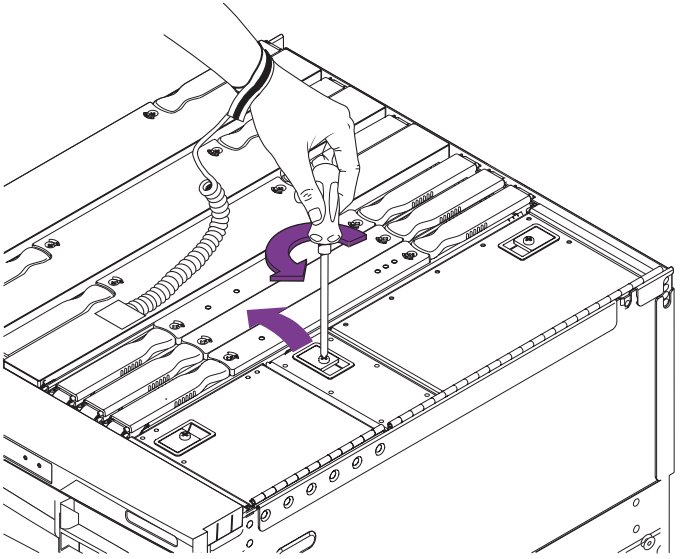


FIGURE 6-9 Opening the IB_SSC Fan Cover

4. **Identify the fan to be removed and disconnect the power connector (**FIGURE 6-10**).**

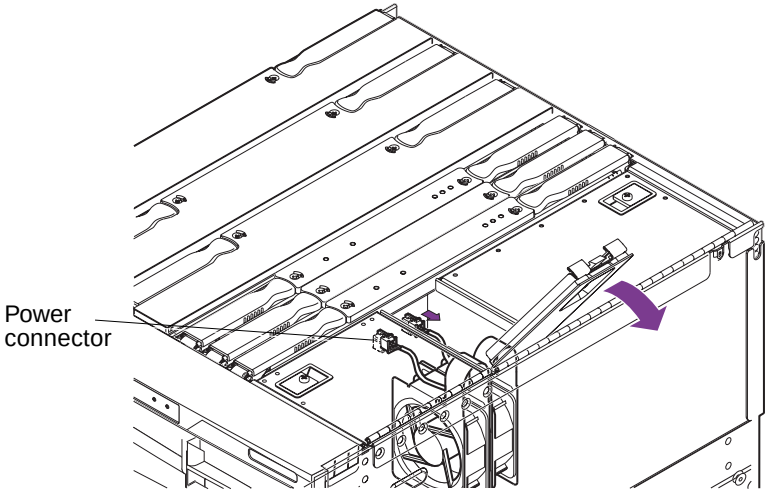


FIGURE 6-10 Identifying the Fan Power Connector

Caution – Wait for the fan to stop turning before removing it. This might take up to 10 seconds. The remaining fan will still be rotating. There are no finger guards. Take care not to touch any part of the fan.

Caution – Do not operate the server for an extended time period with a fan removed. Doing so might cause overheating and system shutdown.

5. **From the right side of the server, lift the fan out of the chassis using the metal loop (**FIGURE 6-11**).**

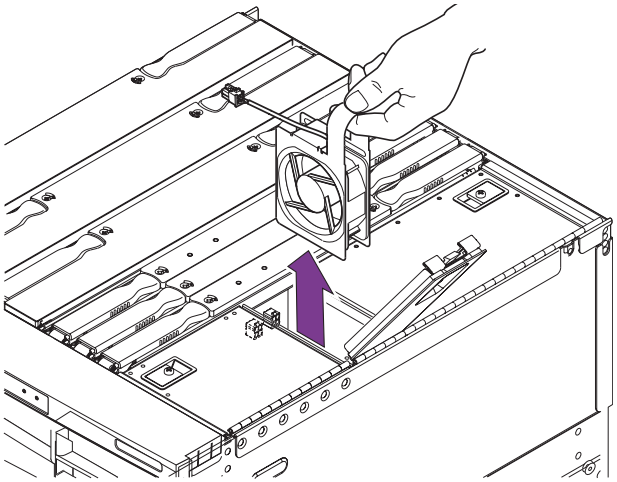


FIGURE 6-11 Removing an IB_SSC Fan

6. **Continue to** Step 4 **of** Section 6.3.2, "Installing an IB_SSC Fan" on page 6-14**.**

6.3.2 Installing an IB_SSC Fan

1. **Bring the server to Standby mode and slide the server out of the system cabinet.**

   See:

   - Section 2.2, "Bringing the Server to Standby Mode" on page 2-5
   - Section 2.4, "Sliding the Server Out of the System Cabinet" on page 2-7

2. **Attach a wrist strap. Place a grounded ESD mat close to the server.**

   See Section 2.1.4, "Antistatic Precautions" on page 2-3.

3. **Open the IB_SSC fan cover.**

   a. **Loosen the latch screw.**

   b. **Unlatch the cover and open it (**FIGURE 6-9**).**

4. **Lower the fan into the chassis using the metal loop.**

5. **Connect the power connector to the fan (**FIGURE 6-10**).**

Caution – If the server is powered on, the fan will start as soon as the connector is inserted.

6. **Close and latch the IB_SSC fan cover.**

7. **Remove the wrist strap.**

8. **Slide the server into the system cabinet and power on the server.**

   See:

   - Section 7.2, “Sliding the Server Into the System Cabinet” on page 7-2
   - Section 7.3, “Powering On the Server” on page 7-4

6.4 Power Supplies

This section describes how to remove and install the various parts of the power subsystems. The power supplies are located at the front of the server below the hard drives (FIGURE 6-12). Each power supply has three LEDs (TABLE 6-5).

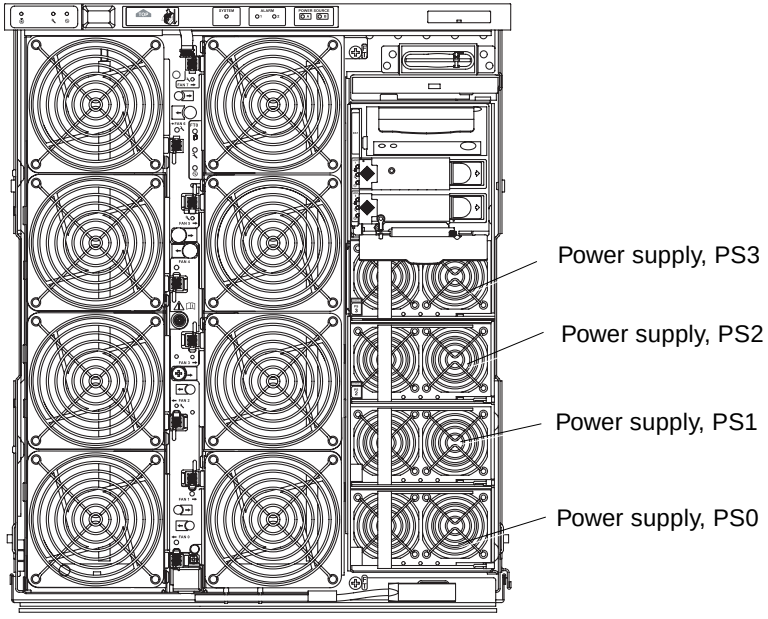


FIGURE 6-12 Power Supply Locations

TABLE 6-5 Power Supply LED Descriptions

LED Name	On	Off	Blinking
Activated LED (green)	Power supply activated and operating normally.	Power supply deactivated.	Server is in Standby mode.
Predictive fault LED (amber)	Power supply detected a pending internal fault. Consider replacing the power supply.	Power supply fan speed is not below a specified minimum level.	Power supply fan speed is below a specified minimum level.
Fault LED (amber)	Fault present. Replace the power supply.	No fault present.	N/A

Caution – Use proper ESD grounding techniques when handling components. Wear an antistatic wrist strap and use an ESD-protected mat. Store ESD-sensitive components in its ESD safe packaging box before placing them on any surface

6.4.1 Removing a Power Supply

Note – You can replace a power supply without powering down the server. The power supplies are hot-swappable. However, in order for the server to continue to function correctly, a minimum of two power supplies must be powered on and operating.

1. **Open the right front door of the server.**
2. **Attach a wrist strap to your wrist. Connect the ESD wrist strap to the server.**
   See Section 2.1.4, "Antistatic Precautions" on page 2-3.
3. **Identify the power supply to be removed.**
4. **Unlatch the power supply (**FIGURE 6-13 and FIGURE 6-14**).**
   a. **Push in the green spring on the left of the power supply (marked "1") and pull open the ejector lever (marked "2").**
   b. **Remove the power supply from the server (**FIGURE 6-14**).**

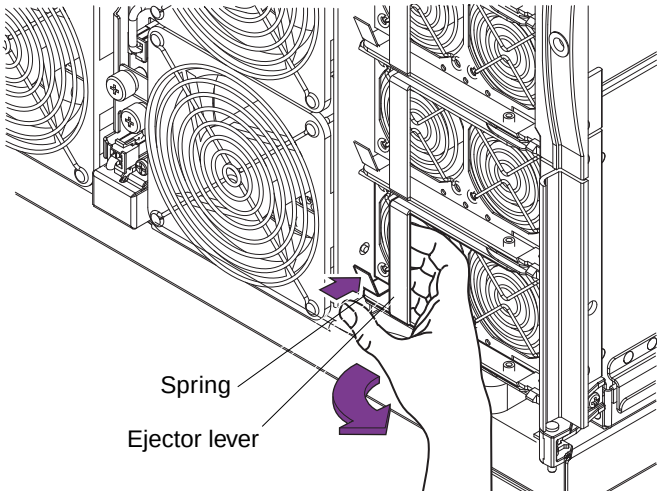


FIGURE 6-13 Unlatching a Power Supply

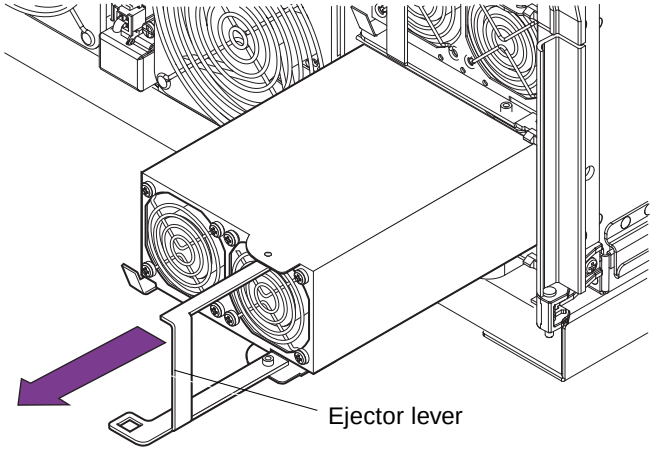


FIGURE 6-14 Removing a Power Supply

5. **Place it on an ESD mat.**

6.4.2 Installing a Power Supply

1. **Open the right front door of the server.**

2. **Attach a wrist strap to your wrist. Connect the ESD wrist strap to the server.**
   See Section 2.1.4, "Antistatic Precautions" on page 2-3.
3. **Extend the ejector lever from the power supply (**FIGURE 6-14**).**
4. **Push the power supply fully into its slot and close the ejector lever.**
5. **Close the front door.**
6. **Remove the wrist strap.**

6.5 Power Inlet Box

Caution – Use proper ESD grounding techniques when handling components. Wear an antistatic wrist strap and use an ESD-protected mat. Store ESD-sensitive components in its ESD safe packaging box before placing them on any surface

The power inlet box is located at the left rear of the server just to the right of the metal perforations (FIGURE 6-15).

6.5.1 Removing the Power Inlet Box

1. **Take the server to Standby mode.**
   See Section 2.2, "Bringing the Server to Standby Mode" on page 2-5.
2. **Remove power to the server by disconnecting the four power cables, AC0/DC0 through AC3/DC3 (**FIGURE B-1**).**
3. **Attach a wrist strap to your wrist. Connect the ESD wrist strap to the server.**
   See Section 2.1.4, "Antistatic Precautions" on page 2-3.
4. **Remove the four No. 2 Phillips screws retaining the inlet box (**FIGURE 6-15**).**

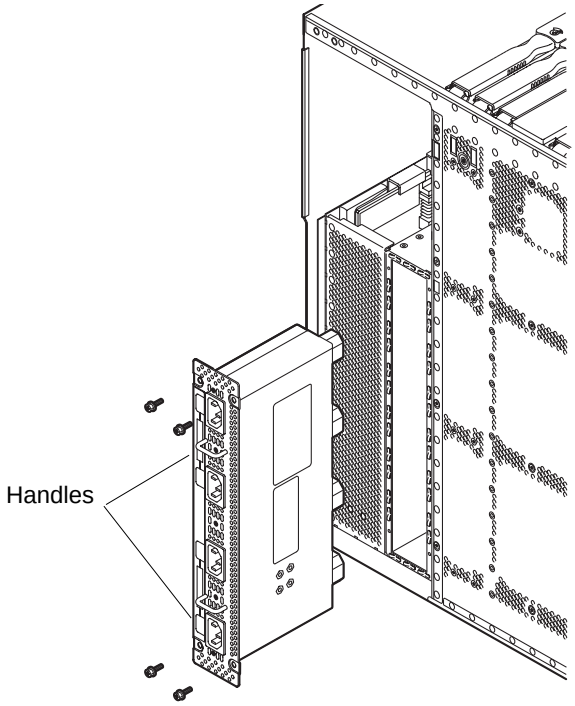


FIGURE 6-15 Removing the Power Inlet Box

5. **Remove the inlet box using the two handles and place it on an ESD mat.**
6. **Continue to** Section 6.5.2, “Installing the Power Inlet Box” on page 6-19**.**

6.5.2 Installing the Power Inlet Box

1. **Insert the power inlet box into the rear of the server and secure the inlet box by using the four No. 2 Phillips screws (**FIGURE 6-15**).**
2. **Return power to the server by reconnecting the four power cables, AC0/DC0 through AC3/DC3 (**FIGURE B-1**).**
3. **Detach the wrist strap.**
4. **Power on the server.**

   See Section 7.3, “Powering On the Server” on page 7-4.

6.6 Power Distribution Board

Caution – Use proper ESD grounding techniques when handling components. Wear an antistatic wrist strap and use an ESD-protected mat. Store ESD-sensitive components in its ESD safe packaging box before placing them on any surface

The power distribution board is located in the server. It is accessible from the rear of the server after your remove the IB_SSC assembly (FIGURE 6-17).

6.6.1 Removing the Power Distribution Board

1. **Take the server to Standby mode.**

   See Section 2.2, "Bringing the Server to Standby Mode" on page 2-5.

2. **Remove power to the server by disconnecting the four power cables, AC0/DC0 through AC3/DC3 (**FIGURE B-1**).**

3. **Extend and lock the system cabinet stabilizer bar and slide the server out of the system cabinet until the locking latches click.**

   See Section 2.4, "Sliding the Server Out of the System Cabinet" on page 2-7.

4. **Open the right front door.**

5. **Attach a wrist strap to your wrist. Connect the ESD wrist strap to the server.**

   See Section 2.1.4, "Antistatic Precautions" on page 2-3.

6. **Remove the IB_SSC assembly.**

   See Section 5.6.1, "Removing the IB_SSC Assembly" on page 5-23.

7. **Unlatch all power supplies. Do not completely remove them from the server.**

   See Section 6.4.1, "Removing a Power Supply" on page 6-16.

8. **Raise the power distribution board ejector lever until it is vertical (**FIGURE 6-16**).**

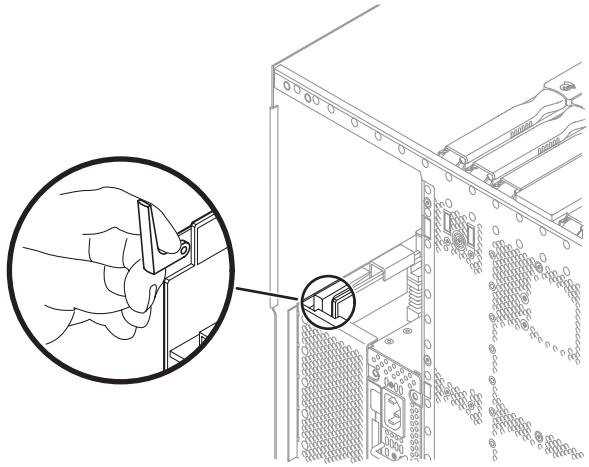


FIGURE 6-16 Unlatching the Power Distribution Board Ejector Lever

9. **Remove the board from the server using the metal handle (**FIGURE 6-17) and p**lace the board on an ESD mat.**

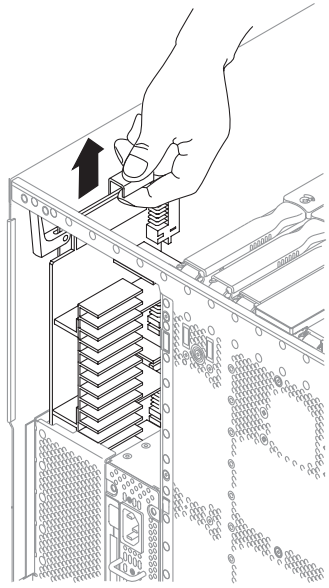


FIGURE 6-17 Removing the Power Distribution Board

10. **Continue to** Section 6.6.2, “Installing the Power Distribution Board” on page 6-22**.**

6.6.2 Installing the Power Distribution Board

1. **Extend and lock the system cabinet stabilizer bar and slide the server out of the system cabinet until the locking latches click.**

   See Section 2.4, "Sliding the Server Out of the System Cabinet" on page 2-7.

2. **Attach a wrist strap to your wrist. Connect the ESD wrist strap to the server.**

   See Section 2.1.4, "Antistatic Precautions" on page 2-3.

3. **Align the power distribution board with the card guides. Gently slide it down to engage with the backplane (FIGURE 6-18).**

4. **Press down firmly to ensure the connector at the base of the board is firmly mated with the receptacle on the backplane.**

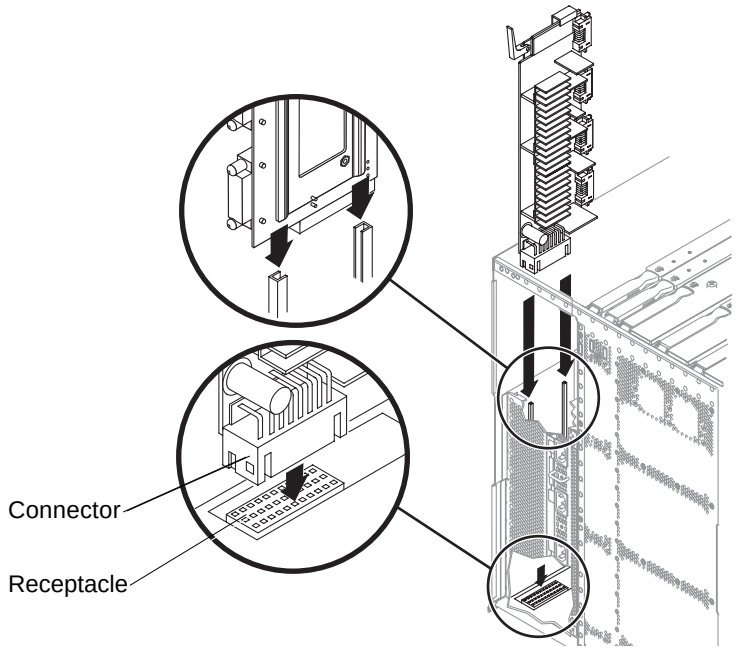


FIGURE 6-18 Inserting the Power Distribution Board

5. **Move the ejector lever to the horizontal position (FIGURE 6-16).**

6. **Re-engage the power supplies.**

7. **Install the IB_SSC assembly.**

   See Section 5.6.2, "Installing the IB_SSC Assembly" on page 5-28.

8. **Remove the wrist strap.**
9. **Slide the server into the system cabinet.**

   See Section 7.2, “Sliding the Server Into the System Cabinet” on page 7-2.
10. **Return power to the server by reconnecting the four power cables, AC0/DC0 through AC3/DC3 (**FIGURE B-1**).**
11. **Power on the server.**

    See Section 7.3, “Powering On the Server” on page 7-4.

6.7 System Indicator Board

The system indicator board is an indicator panel with various system LEDs and the On/Standby switch (FIGURE 6-19).

FIGURE 6-19 System Indicator Board LEDs

To remove and replace the board, you must power off the server.

6.7.1 Removing the System Indicator Board

Caution – Use proper ESD grounding techniques when handling components. Wear an antistatic wrist strap and use an ESD-protected mat. Store ESD-sensitive components in its ESD safe packaging box before placing them on any surface.

1. **Take the server to Standby mode.**

   See Section 2.2, “Bringing the Server to Standby Mode” on page 2-5.
2. **Remove power to the server by disconnecting the four power cables, AC0/DC0 through AC3/DC3 (**FIGURE B-1**).**

3. **Extend and lock the system cabinet stabilizer bar and slide the server out of the system cabinet until the locking latches click.**

   See Section 2.4, "Sliding the Server Out of the System Cabinet" on page 2-7.

4. **Open the front doors to the server.**

5. **Attach a wrist strap. Place a grounded ESD mat close to the server.**

   See Section 2.1.4, "Antistatic Precautions" on page 2-3.

6. **Open the media bay access door.**

7. **Press in the back of the system indicator board plastic housing.**

   Push very hard on the plastic latching clips to release the upper housing from the lower housing (FIGURE 6-20).

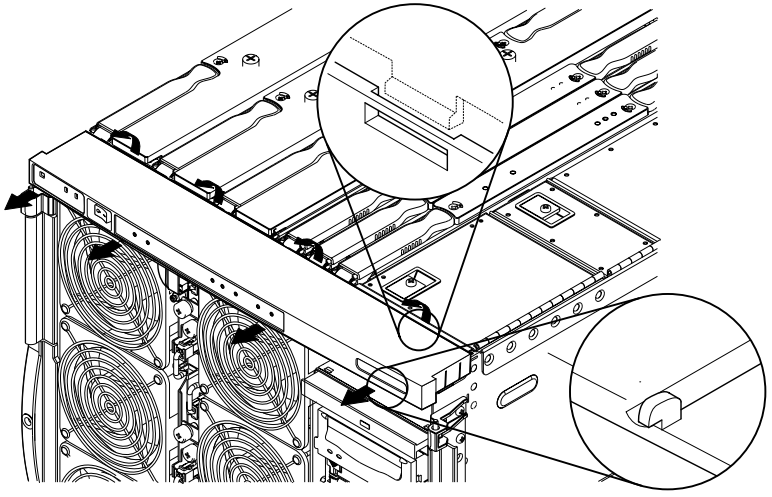


FIGURE 6-20 Removing the System Indicator Board Cover

8. **Remove the clip on the fan tray that retains the system indicator board connector. and remove the connector (FIGURE 6-21).**

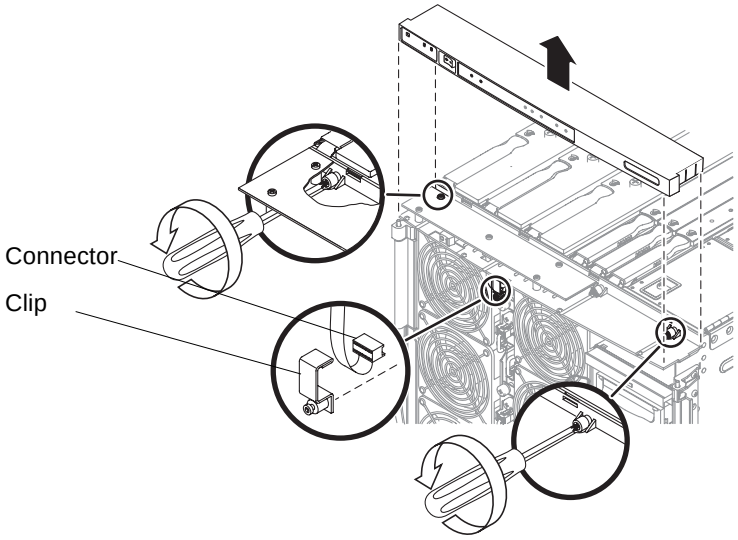


FIGURE 6-21 Removing the System Indicator Board Clip and Connector

9. **Loosen the two captive screws securing the indicator board to the top of the chassis (**FIGURE 6-21**).**
10. **Remove the module and place it on an ESD mat (**FIGURE 6-21**).**
11. **Continue to** Step 2 **of** Section 6.7.2, "Installing the System Indicator Board" on page 6-25**.**

6.7.2 Installing the System Indicator Board

Caution – Use proper ESD grounding techniques when handling components. Wear an antistatic wrist strap and use an ESD-protected mat. Store ESD-sensitive components in its ESD safe packaging box before placing them on any surface.

1. **Attach a wrist strap. Place a grounded ESD mat close to the server.**

   See to Section 2.1.4, "Antistatic Precautions" on page 2-3.
2. **Secure the indicator board using the two captive screws (**FIGURE 6-21**).**
3. **Connect the indicator board connector to the receptacle at the top of the fan tray, and replace the retaining clip (**FIGURE 6-21**).**

4. **Push hard on the back of the system indicator board housing onto the chassis until the plastic latching clips engage (**FIGURE 6-20**).**

   This action connects the upper housing to the lower housing.

5. **Remove the wrist strap.**

6. **Close the front doors to the server.**

7. **Slide the server into the system cabinet.**

   See Section 7.2, “Sliding the Server Into the System Cabinet” on page 7-2.

8. **Return power to the server by reconnecting the four power cables, AC0/DC0 through AC3/DC3 (**FIGURE B-1**).**

9. **Power on the server.**

   See Section 7.3, “Powering On the Server” on page 7-4.

6.8 Backplane Overview and Cautions

Caution – Use proper ESD grounding techniques when handling components. Wear an antistatic wrist strap and use an ESD-protected mat. Store ESD-sensitive components in its ESD-safe packaging box before placing them on any surface.

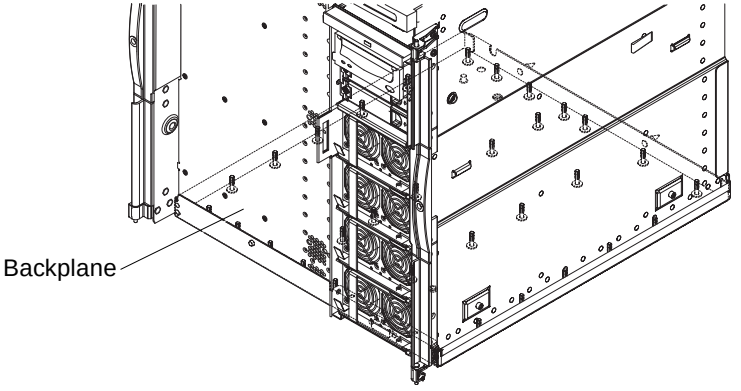


FIGURE 6-22 Backplane Location in the Server

6.8.1 Removing the Backplane

1. **Prepare ESD surfaces on which to place the boards and components you will remove.**

   The fan tray, IB_SSC assembly, and power distribution board need a large amount of space.

2. **Take the server to Standby mode.**

   See Section 2.2, "Bringing the Server to Standby Mode" on page 2-5.

3. **Remove power to the server by disconnecting the four power cables, AC0/DC0 through AC3/DC3 (**FIGURE B-1**).**

4. **Extend and lock the system cabinet stabilizer bar and slide the server out of the system cabinet until the locking latches click.**

   See Section 2.4, "Sliding the Server Out of the System Cabinet" on page 2-7.

5. **Attach a wrist strap.**

   See Section 2.1.4, "Antistatic Precautions" on page 2-3.

6. **Remove and label the I/O cables.**

7. **Open the front doors.**

8. **Remove the main fan tray located at the front of the server.**

   See Section 6.2.1, "Removing the Main Fan Tray" on page 6-7.

9. **Unseat all of the power supplies.**

   Section 6.4.1, "Removing a Power Supply" on page 6-16.

10. **From the right of the server, remove the IB_SSC board. Do not remove the I/O cards.**

    See Section 5.6.1, "Removing the IB_SSC Assembly" on page 5-23.

Note – Completely removing the IB_SSC assembly is necessary in order to remove the power distribution board.

---

11. **Remove the power distribution board.**

    See Section 6.6.1, "Removing the Power Distribution Board" on page 6-20.

12. **Disengage and raise the following boards at least two inches above the server, but** *do not* **completely remove them:**

    - CPU/memory boards

      See Section 5.3.1, "Removing a CPU/Memory Board" on page 5-5.

- L2 repeater boards

  See Section 5.5.1, “Removing an L2 Repeater Board” on page 5-19.

13. **From beneath the server, loosen 30 of the 31 captive screws securing the backplane to the chassis (FIGURE 6-23).**

    Leave the screw at the center of the front secured.

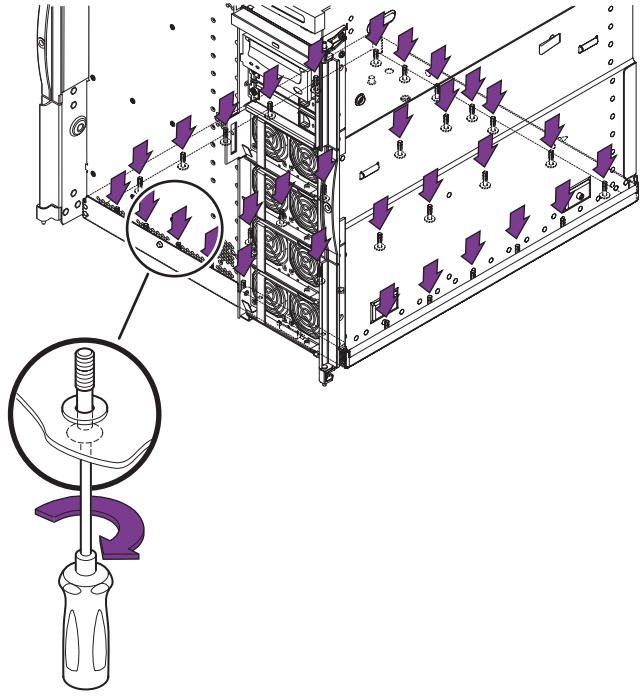


FIGURE 6-23 Removing the Backplane Securing Screws

14. **Completely loosen the backplane from the server.**

    There are two different backplane designs:

    - If the server does not have a release button, loosen the center front screw (FIGURE 6-23). Keep one hand under the backplane while loosening the center front screw. Go to Step 15.
    - If the server has a release button, with one hand, hold the backplane up and press in the release button at the front of the chassis (FIGURE 6-24).

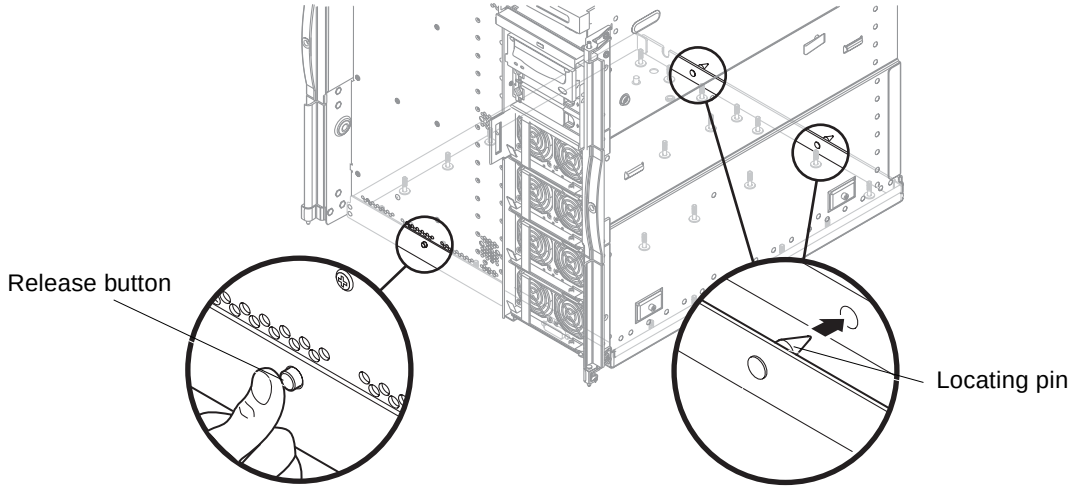


FIGURE 6-24 Backplane Release Button (if Fitted)

Caution – The backplane is heavy. Be ready to take its weight to prevent risk of injury.

15. **Lower the front of the backplane and pull it forward (**FIGURE 6-25**).**

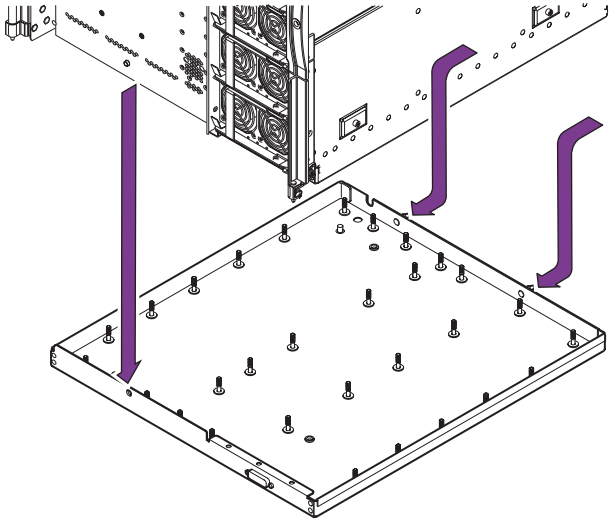


FIGURE 6-25 Removing the Backplane

This action releases the locating pins from the slots at the rear of the chassis.

16. **Remove the backplane and place it on an ESD mat.**
17. **Locate the release button attachment (threaded collar) on the outside of the chassis. The threaded collar has two flattened edges to grip.**
    a. **Using pliers, unfasten the threaded collar from the release button.**
    b. **Remove the release button from inside the server.**
18. **Continue to** Step 2 **of** Section 6.8.2, "Installing the Backplane" on page 6-30**.**

6.8.2 Installing the Backplane

1. **Attach a wrist strap. Place grounded ESD mats close to the server.**
   See Section 2.1.4, "Antistatic Precautions" on page 2-3.
2. **Orient the backplane with the locating pins to the rear.**
3. **Insert the locating pins into the slots at the rear of the chassis (**FIGURE 6-24**).**
4. **Raise the front of the backplane and tighten the center front screw first while supporting the weight of the backplane with your other hand.**
5. **Tighten the 30 captive screws beneath the backplane.**

6. **Install or re-engage the assemblies and boards in the following order:**

   a. **Seat the CPU/memory boards and L2 repeater boards.**

      See Section 5.3.2, “Installing a CPU/Memory Board” on page 5-8 and Section 5.5.2, “Installing the L2 Repeater Board” on page 5-21.

   b. **Install the power distribution board.**

      See Section 6.6.2, “Installing the Power Distribution Board” on page 6-22.

   c. **From the right of the server, install the IB-SSC assembly.**

   d. **Re-seat all power supplies.**

      See Section 6.4.2, “Installing a Power Supply” on page 6-17.

   e. **Install the main fan tray.**

      See Section 6.2.2, “Installing the Main Fan Tray” on page 6-10.

   f. **At the rear of the server, reconnect the I/O cables.**

7. **Remove the wrist strap.**

8. **Slide the server into the system cabinet and secure it.**

   See Section 7.2, “Sliding the Server Into the System Cabinet” on page 7-2.

9. **Return power to the server by reconnecting the four power cables, AC0/DC0 through AC3/DC3 (**FIGURE B-1**).**

10. **Power on the server.**

    See Section 7.3, “Powering On the Server” on page 7-4.

CHAPTER 7

Finishing Component Replacement

The chapter describes procedures to perform after replacing components. Topic include:

7.1 Installing the Front Doors

1. **While holding the door with one hand, align the left door with the screw coming from the green latch at the bottom.**

   Hold the green latch down in order to properly align the door with the screw (FIGURE 7-1).

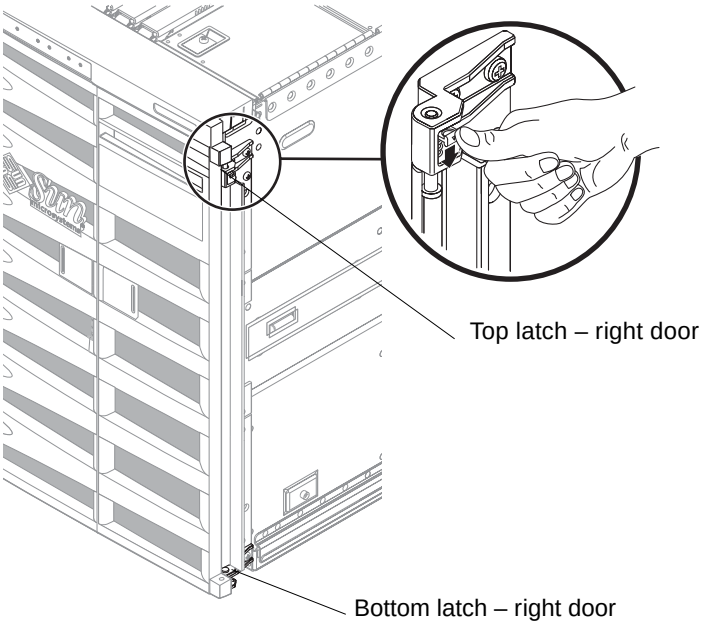


FIGURE 7-1 Front Door Latches

2. **Align the left door to the upper screw coming out of the upper green latch and press the green latch down to properly align the door with the screw.**

   Ensure that both the top and bottom of the door are securely fastened.

3. **Repeat Step 1 through Step 2 to replace the other door.**

4. **Close both doors.**

7.2 Sliding the Server Into the System Cabinet

1. **Disconnect the antistatic wrist strap from the server chassis.**

2. **Press the green latches on each rail and slide the server into the system cabinet.**

3. **Tighten the captive screws on the side handles (FIGURE 7-2).**

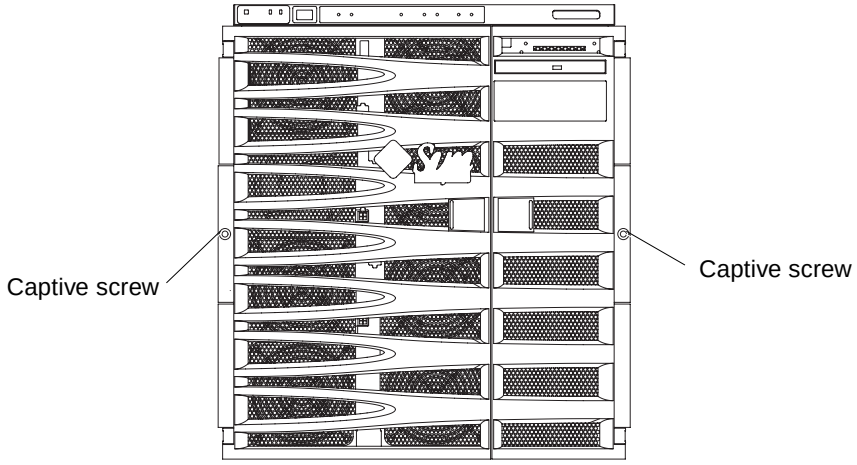


FIGURE 7-2 Side Handles Captive Screws

4. **Tighten the slide rail lock nuts at the rear of the server (**FIGURE 7-3**)**

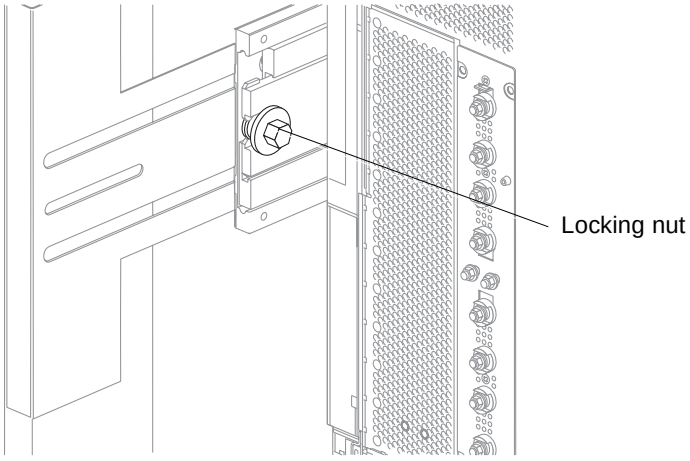


FIGURE 7-3 Slide Rail Lock Nut

5. **Retract the system cabinet stabilization bar (**FIGURE 7-4**).**

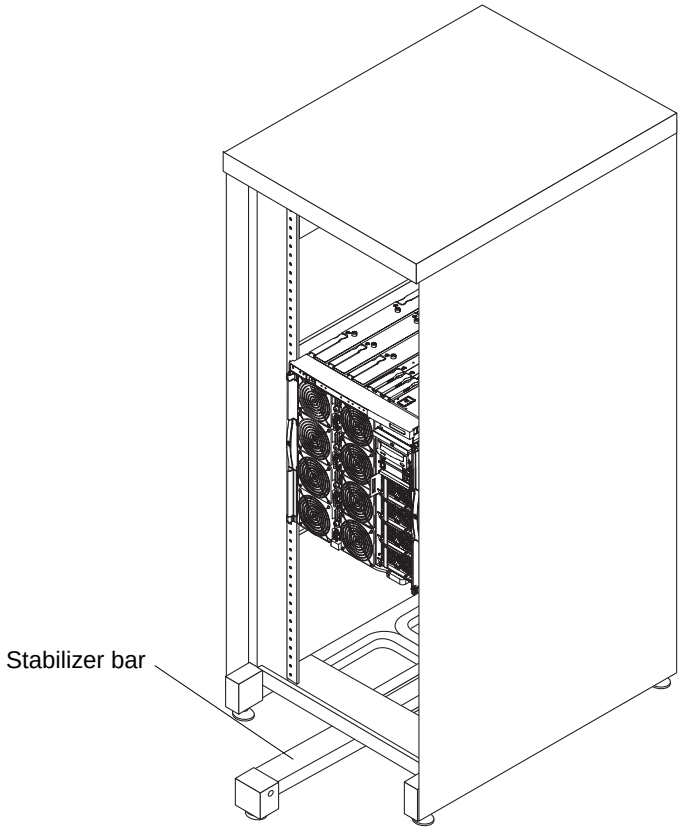


FIGURE 7-4 Sun Rack 900 System Cabinet With Stabilizer Bar Extended

7.3 Powering On the Server

When all the power cables are connected and external circuit breakers are switched on, the server enters Standby mode. The Source A and Source B indicators are the only indicator LEDs to be illuminated on the system indicator board. The IB_SSC assembly Active LED is lit, but not visible from the front of the server.

Powering the server on from Standby mode can be achieved in either of two ways:

- Operating the On/Standby switch
- Sending the `poweron` command by means of the LOM port

The power (On/Standby) switch of the Netra 1290 server is a rocker type, momentary action switch. It controls only low voltage signals. No high voltage circuits pass through it.

Note – The power switch is not an On/Off switch, it is an On/Standby switch. It does not isolate the equipment.

Once the server is powered on, if the `auto-boot?` variable has been set `true` in the OpenBoot PROM, the server will automatically boot into the Solaris Operating System.

7.3.1 Powering On Using the On/Standby Switch

1. **Check that power is applied to the server and that it is correctly in Standby mode.**
2. **Momentarily press the On/Standby switch to the right.**

   The server powers on completely. The System Active indicator illuminates and the server executes the power-on self-test (POST).

7.3.2 Powering On Using the LOM `poweron` Command

- **At the `lom>` prompt, type:**

```
lom>poweron
```

The SC first powers on all the power supplies, followed by the fan tray. Finally the SC powers on the system boards. If the value of the OpenBoot PROM variable `auto-boot?` is `true` then the server also boots the Solaris Operating System.

Individual modules can also be powered on using the `poweron` command. For further details see the *Sun Fire Entry-Level Midrange System Controller Command Reference Manual*, 819-1268.

The System Active indicator is lit. The server executes the power-on self-tests (POST).

Note – The `poweron all` command only powers on individual components. It does not boot the Solaris software.

See the *Sun Fire Entry-Level Midrange System Controller Command Reference Manual*, 819-1268, for a full description of the `poweron` command.

APPENDIX **A**

Specifications

This appendix provides the Netra 1290 server specifications. This appendix is divided into the following sections:

A.1 Physical Specifications

TABLE A-1 Physical Specifications of the Netra 1290 Server

	Netra 1290 Server Dimensions	Measurements
Width	including slides	17.50 in. (445.0 mm)
	including mounting cradle	22.20 in. (564.8 mm)
	including wooden pallet	23.62 in. (600.0 mm)
Depth	of system only	22.00 in. (558.0 mm)
	including slides	22.40 in. (568.0 mm)
	including mounting cradle	22.00 in. (558.2 mm)
	including wooden pallet	27.76 in. (705.0 mm)
Height	12 RU nominal	21.00 in. (533.4 mm)
	including mounting cradle	25.30 in. (642.1 mm)
	including wooden pallet	36.97 in. (939.0 mm)

TABLE A-1 Physical Specifications of the Netra 1290 Server *(Continued)*

	Netra 1290 Server Dimensions	Measurements
Weight	of system only	236.0 lbs (107 kg)
	including mounting cradle	286.0 lbs (130 kg)
	including cable management and slides	310.0 lbs (141 kg)

A.2 Environmental Requirements

You can operate and store the server safely in the conditions detailed in TABLE A-2.

TABLE A-2 Operating and Storage Specifications

Specification	Operating	Storage
Ambient temperature*	41° to 104°F (5° to 40°C) up to 5905 feet (1800 meters)‡	–40° to 149°F (–40° to 65°C*)
Relative humidity†	10 to 90% non condensing 80.6° (27°C) maximum wet bulb	10 to 90% non condensing 100.4° (38°C) maximum wet bulb
Elevation	maximum 9840 feet (3000 meters)	maximum 39370 feet (12000 meters)

* Does not apply to removable media devices.

† Subject to a maximum absolute humidity of 0.024 kg of water per kg of dry air.

‡ Maximum ambient operating temperature is derated by 1 degree C per 500m elevation.

A.3 Acoustic Noise Emissions

The acoustic noise emissions on a Netra 1290 server are as follows:

- Operating acoustic noise is 7.0 B (LWAd (1B=10dB))
- Idling acoustic noise is 7.0 B (LWAd (1B=10dB))

Declared noise emissions are in accordance with ISO 9296 standards.

A.4 Electrical Specifications

TABLE A-3 Electrical Specifications

Electrical Element	DC Version Requirement	AC Version Requirement
Voltage	-40 VDC, -60 VDC nominal	100 to 240V single phase AC, 47-63 Hz
Current (per power supply)	49A maximum per input at -48VDC	9.8A maximum per input at 180VAC
Current (total)	99.5A maximum total for all inputs at -40VDC	20A maximum total for all inputs at 180 VAC
Power*	3980 Watts	3600 Watts

* Total input power is approximately equally divided among the operating power supplies.

A.5 NEBS Level 3 Compliance

The DC-powered version of the Netra 1290 server meets NEBS Level 3 requirements per SR-3580, including the appropriate sections of GR-63-CORE (*Network Equipment-Building System Requirements: Physical Protection*) and GR-1089-CORE (*Electromagnetic Compatibility and Electrical Safety - Generic Criteria for Network Telecommunications Equipment*).

Caution – To maintain NEBS compliance, the network management (NET MGT) Ethernet port and the RJ45 serial management (SERIAL MGT) port must use shielded cables and both ends of the shield must be grounded.

APPENDIX **B**

Connectors

This appendix describes the various cables and connectors that should be made available in order for the installation to be completed. Topic include:

B.1 Netra 1290 Server Connectors

The Netra 1290 server has the following connectors on the rear of the server:

- Two Gigabit Ethernet RJ-45 ports
- Up to six I/O ports
- Two serial ports (one reserved)
- Alarms port
- 10/100 Ethernet port
- SCSI port

FIGURE B-1 shows the locations and describes the back panel ports and power inlets for the server.

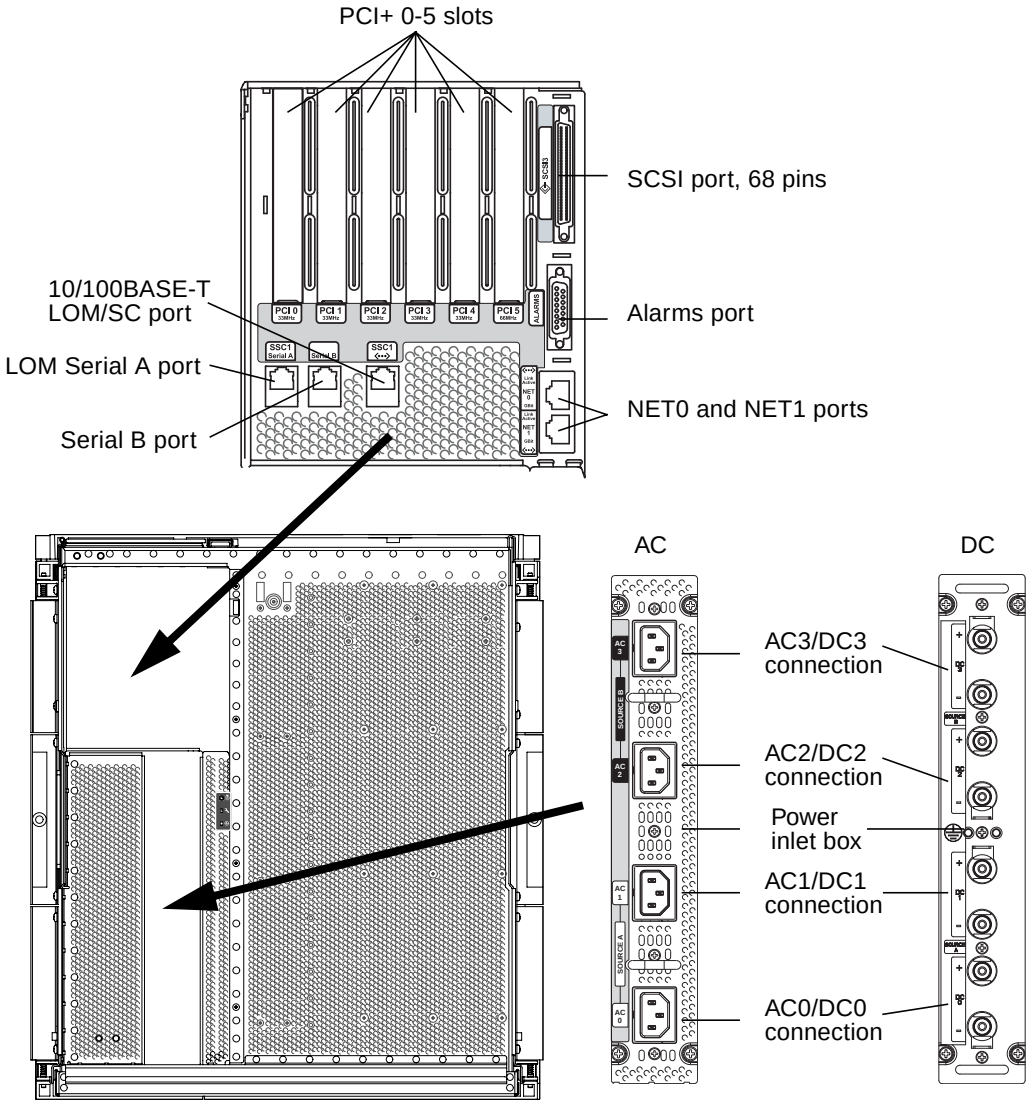


FIGURE B-1 Netra 1290 Server External I/O Connections

B.2 Gigabit Ethernet Connectors

The Gigabit Ethernet connectors are shielded RJ-45 connectors (FIGURE B-2). TABLE B-1 lists the connector pinouts.

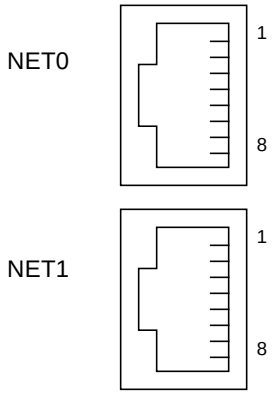


FIGURE B-2 RJ-45 Gigabit Ethernet Connectors

TABLE B-1 Gigabit Ethernet Connector Pinout

Pin	Signal Name	Pin	Signal Name
1	TRD0_H	5	TRD2_L
2	TRD0_L	6	TRD1_L
3	TRD1_H	7	TRD3_H
4	TRD2_H	8	TRD3_L

B.3 LOM Serial A and Serial B Connectors

FIGURE B-3 illustrates the RJ-45 serial connectors. The Serial B port is reserved. TABLE B-2 describes the pinouts.

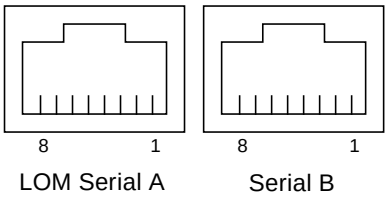


FIGURE B-3 RJ-45 Serial Connectors

TABLE B-2 RJ-45 Serial Connector Pinouts

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

B.4 SCSI Connector

FIGURE B-4 illustrates the 68-pin SCSI connector and the SCSI icon. TABLE B-3 describes the SCSI connector pinouts.

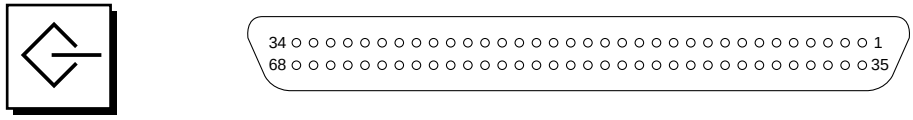


FIGURE B-4 68-Pin SCSI Connector

TABLE B-3 68-Pin SCSI Connector Pinouts

Pin No.	Signal Name	Type	Pin No.	Signal Name	Type	Pin No.	Signal Name	Type
1	+DB(12)	I/O	24	+ACK	I/O	47	–DB(7)	I/O
2	+DB(13)	I/O	25	+RST	I/O	48	-DB(P0)	I/O
3	+DB(14)	I/O	26	+MSG	I/O	49	Ground	GND
4	+DB(15)	I/O	27	+SEL	I/O	50	Ground	GND
5	+DB(P1)	I/O	28	+C/D	I/O	51	Termpwr	POWER
6	+DB(0)	I/O	29	+REQ	I/O	52	Termpwr	POWER
7	+DB(1)	I/O	30	+I/O	I/O	53	Reserved	NA
8	+DB(2)	I/O	31	+DB(8)	I/O	54	Ground	GND
9	+DB(3)	I/O	32	+DB(9)	I/O	55	–ATN	I/O
10	+DB(4)	I/O	33	+DB(10)	I/O	56	Ground	GND
11	+DB(5)	I/O	34	+DB(11)	I/O	57	–BSY	I/O
12	+DB(6)	I/O	35	–DB(12)	I/O	58	–ACK	I/O
13	+DB(7)	I/O	36	–DB(13)	I/O	59	–RST	I/O
14	+DB(P0)	I/O	37	–DB(14)	I/O	60	–MSG	I/O
15	Ground	GND	38	–DB(15)	I/O	61	–SEL	I/O
16	Diffsens	ANAL	39	–DB(P1)	I/O	62	–C/D	I/O
17	Termpwr	POWER	40	–DB(0)	I/O	63	–REQ	I/O
18	Termpwr	POWER	41	–DB(1)	I/O	64	–I/O	I/O
19	Reserved	NA	42	–DB(2)	I/O	65	–DB(8)	I/O
20	Ground	GND	43	–DB(3)	I/O	66	–DB(9)	I/O

TABLE B-3 68-Pin SCSI Connector Pinouts *(Continued)*

Pin No.	Signal Name	Type	Pin No.	Signal Name	Type	Pin No.	Signal Name	Type
21	+ATN	I/O	44	–DB(4)	I/O	67	–DB(10)	I/O
22	Ground	GND	45	–DB(5)	I/O	68	–DB(11)	I/O
23	+BSY	I/O	46	–DB(6)	I/O			

B.4.1 SCSI Implementation

For the PCI+ IB_SSC assemblies the embedded SCSI subsystem is a SCSI Ultra-320 (UltraSCSI) low-voltage differential parallel interface:

- 16-bit SCSI bus
- 320-MBps data transfer rate

Maximum cable length supported is 33 ft. (10 meters).

B.5 10/100BASE-T LOM/System Controller Ethernet Connector

FIGURE B-5 illustrates the RJ-45 system controller and Ethernet connector, and the icon. TABLE B-4 describes the pinouts for the twisted-pair Ethernet connector.

FIGURE B-5 RJ-45 Twisted-Pair Ethernet Socket

TABLE B-4 Twisted-Pair Ethernet Connector Pinouts

Pin	Description	Pin	Description
1	TXD+	5	Common mode termination
2	TXD–	6	RXD–
3	RXD+	7	Common mode termination
4	Common mode termination	8	Common mode termination

B.5.1 Twisted-Pair Ethernet Cable-Type Connectivity

The following types of twisted-pair Ethernet cables can be connected to the 8-pin twisted pair Ethernet connector.

For 10BASE-T applications, use a shielded twisted-pair (STP) cable (TABLE B-5):

- Category 3 (STP-3, *voice* grade)
- Category 4 (STP-4)
- Category 5 (STP-5, *data* grade)

For 100BASE-T applications, use shielded twisted-pair category 5 (STP-5, data grade) cable (TABLE B-5).

TABLE B-5 Cable Lengths for Twisted-Pair Ethernet and Shielded Twisted-Pair Ethernet Cables

Cable Type	Application(s)	Max Length (Metric)	Max Length (Imperial)
Shielded twisted-pair category 5 (STP-5, data grade)	10BASE-T	1000 m	3282 ft
Shielded twisted-pair category 5 (STP-5, data grade)	100BASE-T	100 m	327 ft

B.6 Alarms Port

The alarms service port connector (FIGURE B-6) is a male DB-15 connector. TABLE B-6 lists the pinouts.

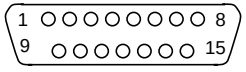


FIGURE B-6 DB-15 (Male) Alarms Service Port Connector

TABLE B-6 DB-15 (Male) Alarms Service Port Connector

Pin	Signal Name	Description	State
1	Not connected		
2	Not connected		
3	Not connected		
4	Not connected		
5	SYSTEM_NO	UNIX Running	Normally open

TABLE B-6 DB-15 (Male) Alarms Service Port Connector *(Continued)*

Pin	Signal Name	Description	State
6	SYSTEM_NC	UNIX Running	Normally closed
7	SYSTEM_COM	UNIX Running	Common
8	SYSTEM_NO	Alarm1	Normally open
9	SYSTEM_NC	Alarm1	Normally closed
10	SYSTEM_COM	Alarm1	Common
11	ALARM2_NO	Alarm2	Normally open
12	ALARM2_NO	Alarm2	Normally closed
13	ALARM2_COM	Alarm2	Common
14	Not connected		
15	Not connected		

APPENDIX C

Maintenance

This chapter describes maintenance procedures for your Netra 1290 server. Topic include:

C.1 Periodic Maintenance

You must clean or change the air filters periodically. Follow these guidelines.

- Inspect the air filter for debris and trapped particles every three months of operation.
- Consider the level of debris found on the air filter when scheduling a time to remove and clean the air filter.
- If the air filter collects a considerable amount of debris in less than three months, investigate the air supply system for sources of contamination and take corrective action.

C.1.1 Replacing or Cleaning the Air Filters

The Netra 1290 server has two air filters that require periodic inspection and cleaning. You can clean or change the air filters in the server without powering off the server.

Note – Do not clean the air filters when they are attached to the server. Remove the front doors with the air filters attached. See Section 2.5, "Removing the Front Doors" on page 2-11.

Caution – Keep the amount of time that unfiltered air passes through the server to a minimum. Running the server without air filters will not protect the server from drawing in debris from the air. Have spare air filters on-site so that replacement air filters are available when needed.

1. **Open and remove the front doors.**

   See Section 2.5, "Removing the Front Doors" on page 2-11.

2. **Locate the two air filters (FIGURE C-1).**

   The air filters are located behind the front doors of the server.

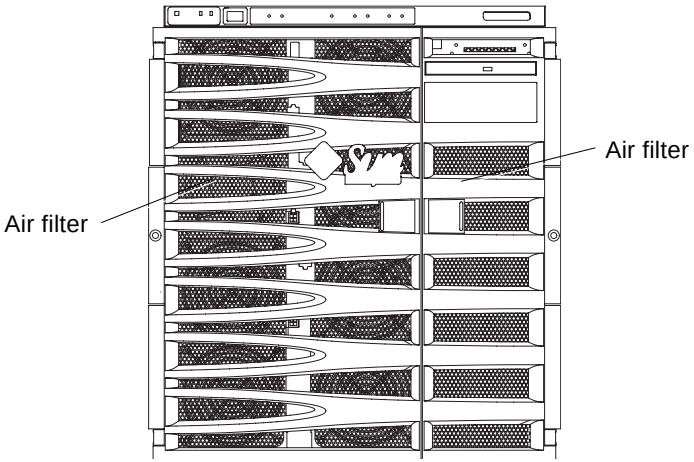


FIGURE C-1 Location of the Air Filters

3. **Remove the air filters.**

4. **Clean the air filters or install new replacement air filters.**

   Keep the amount of time that unfiltered air passes through the server to a minimum. See the Caution earlier in this section.

   - If you are going to clean the air filters:
     - Wash them in warm soapy water and let them air dry.

       Alternatively, you can also use compressed air to dry the filter.

Caution – Do not replace them until they have air dried.

   - Reinstall the air filters (FIGURE C-2).

- If you are going to install replacement filters, install them into the server (FIGURE C-2).

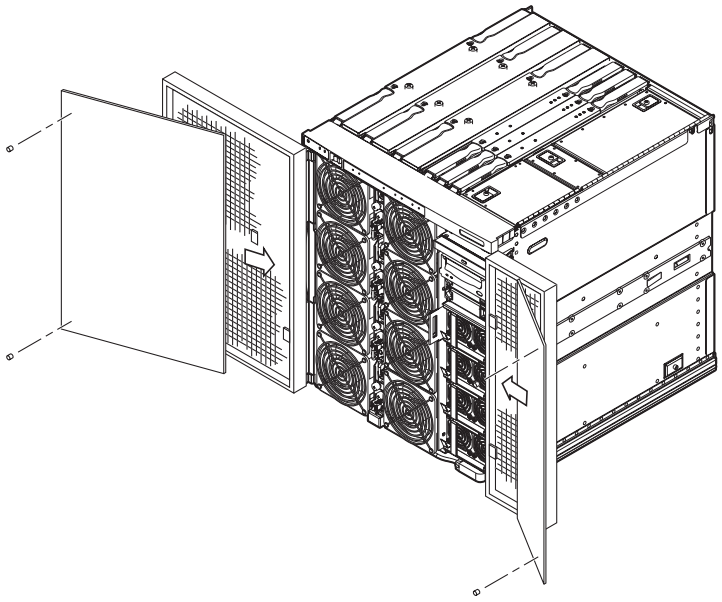


FIGURE C-2 Installing the Netra 1290 Server Air Filters

5. **Replace then close the front doors.**

   See Section 7.1, "Installing the Front Doors" on page 7-1.

C.2 Transporting the Server

C.2.1 Transporting the Server Between Cabinets

If you need to transport the server from one system cabinet to another system cabinet, attach the shipping cradle (also referred to as a plinth). The shipping cradle protects the bottom of the server during transit and handling.

Note – Use a lifting device to transport the server mounted on the shipping cradle.

C.2.1.1 Securing the Server onto the Shipping Cradle

1. **If the handles are not attached to the shipping cradle, attach them now:**

Note – In the following illustrations, right and left orientation are as you face the word "FRONT" on the base plate (FIGURE C-3). The top and bottom halves of the base plate are identical. Start with either the top or bottom half facing upward.

---

   a. **Align the two guide posts on the handle with the entry holes on the L-shaped shipping cradle cutouts (FIGURE C-3).**

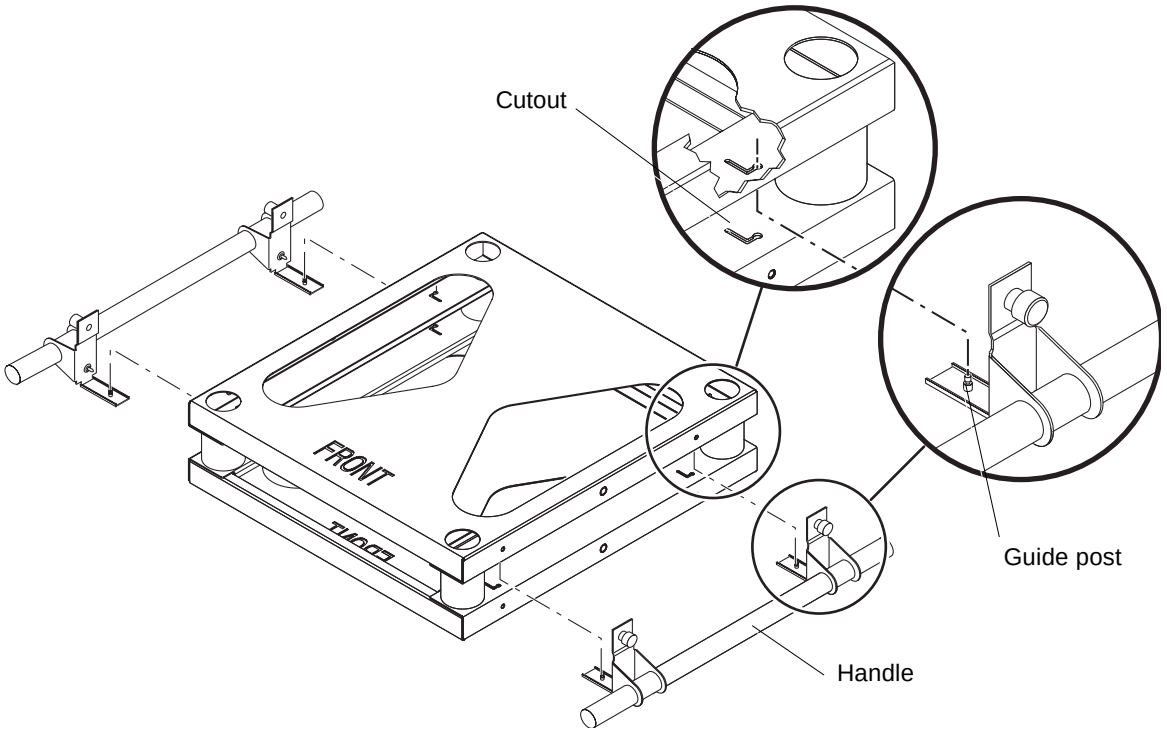


FIGURE C-3 Shipping Cradle Details

   b. **Raise the handle so that the tops of the front and rear guide posts fit into the entry holes in the cutouts (FIGURE C-3 and FIGURE C-4).**

      The grooves in the guide posts fit into the narrow slots in the cutouts.

   c. **Slide the handle and guide posts toward the front of the shipping cradle (FIGURE C-4).**

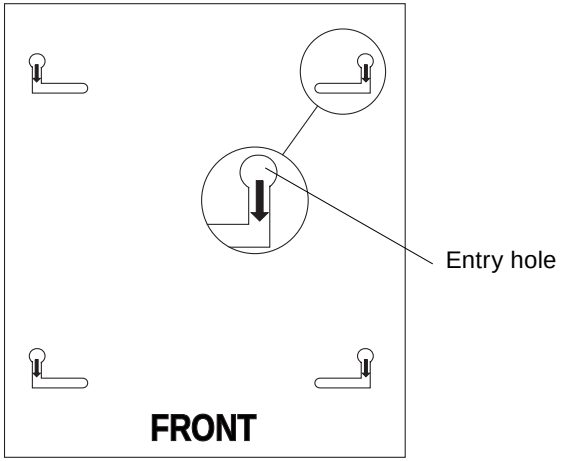


FIGURE C-4 Cutouts (not to scale)

Note – Do not tighten the captive screws on the handles. Leave both handles loosely attached. There must be room between the handles to place the server on the shipping cradle.

---

d. Attach the other handle in the same manner. Complete Step a **through** Step c**.**

1. **Take the server to Standby mode.**

   See Section 2.2, “Bringing the Server to Standby Mode” on page 2-5.

2. **Disconnect all cables attached to the server.**

3. **Remove the cable management arm (CMA) from the rear of the server (if installed).**

   See Section 3.1.1, “Removing the CMA–Lite” on page 3-2 or Section 3.2.1, “Removing the CMA-800” on page 3-4.

4. **(Optional) Remove the front doors.**

   This protects the doors from potential damage during the move.

5. **Extend and lock the system cabinet stabilizer bar and slide the server out of the system cabinet until the locking latches click.**

   See Section 2.4, “Sliding the Server Out of the System Cabinet” on page 2-7.

6. **Ready the lifting device by sliding the lifting device forks completely through the shipping cradle opening to provide maximum support.**

7. **Raise the shipping cradle up to the server. Place the front of the shipping cradle toward the front of the server (FIGURE C-5).**

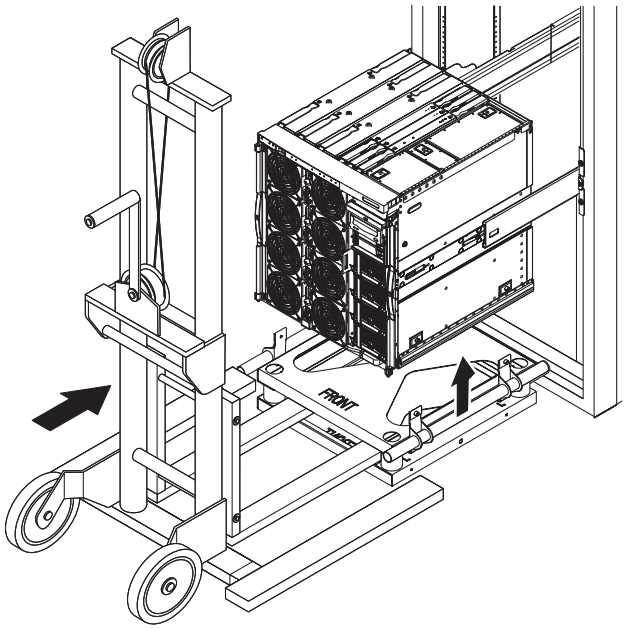


FIGURE C-5 Lifting Device and Shipping Cradle

The upper captive screws on the handles align with the corresponding mounting holes on the server in this orientation.

8. **Slide the shipping cradle handles inward until they contact the sides of the server.**
9. **Tighten all eight captive screws (FIGURE C-6):**
   a. **Secure the handle to the server with the upper four captive screws.**
   b. **Secure the handle to the cradle base plate with the four lower captive screws.**

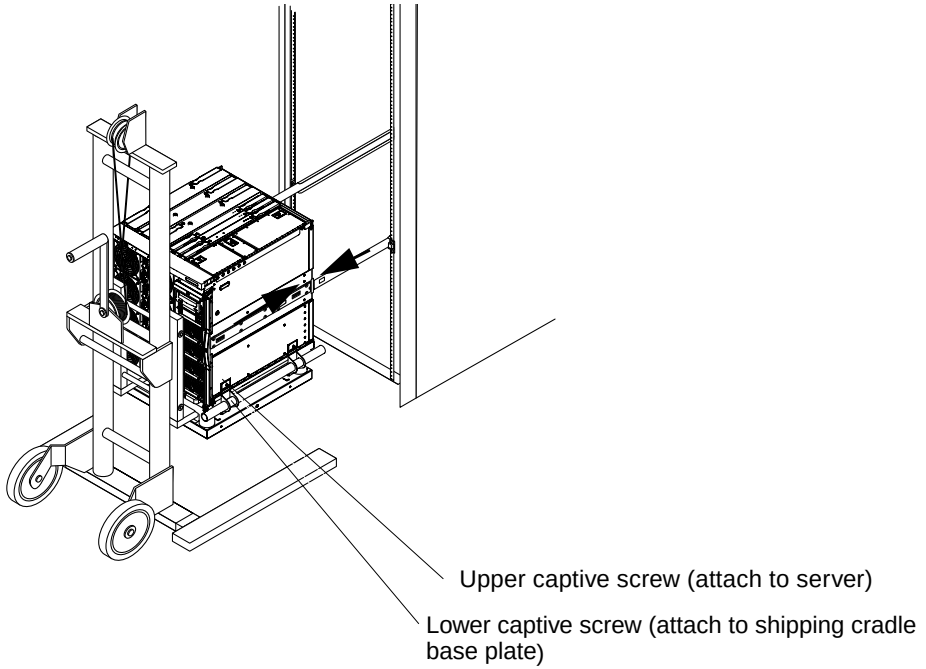


FIGURE C-6 Securing the Captive Screws

Note – If necessary, reposition the server on the shipping cradle to align the captive screws with the corresponding holes.

Caution – Do not place the full weight of the server on the shipping cradle until all eight captive screws are secured.

Caution – Do not perform the following step until the weight of the server is fully supported. The server weighs 240 to 290 pounds (109 to 132 kg).

---

10. **With the lifting device fully supporting the weight of the server, press the silver slide rail lock buttons on the right and left slide assemblies. Pull the server away from the cabinet.**

    This action pulls the inner rails that are attached to the server out of the slide rail assemblies that are attached to the system cabinet (FIGURE C-7).

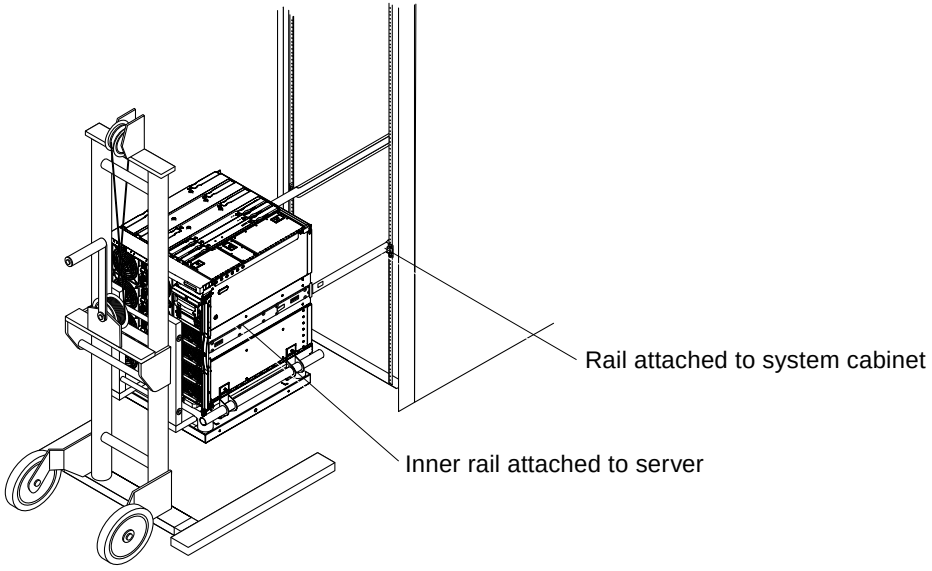


FIGURE C-7 Detaching the Cabinet Slides From the Server

C.2.1.2 Transporting the Server

1. **Complete** Step 1 **through** Step 10 **in** Section C.2.1.1, "Securing the Server onto the Shipping Cradle" on page C-4**.**
2. **If the new cabinet does not already have rails for this server, remove the rails from the old cabinet and install the rails to the new cabinet.**
3. **Extend the cabinet stabilizer of the new cabinet and lock it in position.**

Caution – Failure to extend and lock the stabilizer bar before you slide a server out of the system cabinet can cause the system cabinet to tip over.

4. **Extend the outer rails from the cabinet and latch them in the extended position.**
5. **With the lifting device supporting the weight of the server, raise the server until it is level with the outer rails on the cabinet (**FIGURE C-7**).**
6. **Carefully move the lifting device forward until the inner rails on the server are fully engaged with the outer rails on the cabinet (**FIGURE C-7**).**

   The latches on each side must click out, locking the rails.

7. **With the lifting device still supporting the weight of the server, loosen all eight captive screws (FIGURE C-6):**

   a. **Loosen the upper four captive screws that secure the handle to the server.**

   b. **Loosen the lower four captive screws that secure the handle to the cradle baseplate.**

8. **Pull both shipping cradle handles away from the server.**

   This disconnects the shipping cradle from the server. Store the shipping cradle for future use.

9. **Slide the server into the system cabinet.**

   See Section 7.2, "Sliding the Server Into the System Cabinet" on page 7-2.

10. **Reattach the cable management arm (if applicable).**

    See Section 3.1.2, "Installing the CMA–Lite" on page 3-3 or Section 3.2.2, "Installing the CMA-800" on page 3-11.

11. **Reconnect all cabling.**

    Use the cable management arm (if attached) to support and protect the cabling.

12. **Reattach the front doors to the server (if applicable).**

C.2.2 Transporting a System Cabinet With Installed Systems

If you have one or more servers installed in a system cabinet and you need to transport the entire system cabinet, you must tighten the slide rail locking nuts at the rear of each slide rail before transporting the system cabinet. If you have servers installed in a cabinet without the locking nuts, install them using the locking nuts and spacers provided originally with your server or in the slide rail mounting kit.

Note – Slide rail mounting kits contain a pair of spacers provided by the manufacturer along with the rails. The manufacturer's spacers must be discarded and replaced by the Sun spacers provided in the slide rail mounting kit.

---

1. **Extend the cabinet stabilizer bar and lock it in position.**

2. **Slide the server out of the system cabinet.**

3. **Remove and discard the manufacturers spacers provided with the slide rails in the kit.**

4. **From the rear of the server, insert and tighten the supplied spacers onto the bolts (**FIGURE C-8**).**

   The spacers shoulders must face outwards.

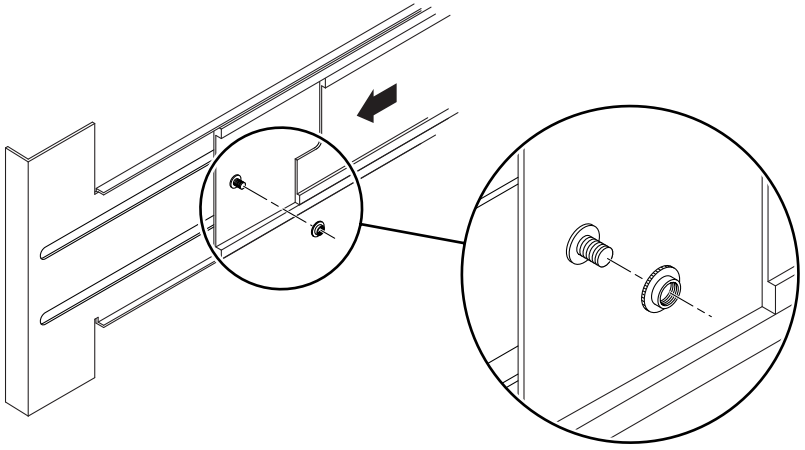


FIGURE C-8 Inserting and Tightening the Slide Rail Spacer

5. **Slide the server into the system cabinet.**
6. **From the rear of the server, insert and tighten the lock nuts (**FIGURE C-9**).**

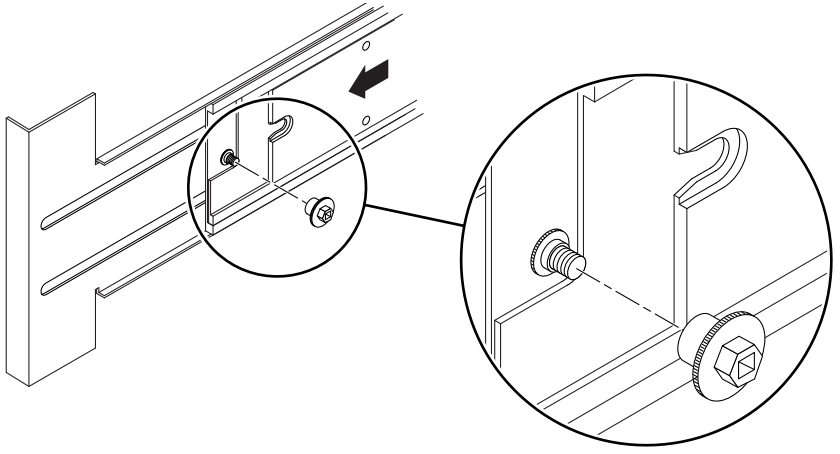


FIGURE C-9 Inserting and Tightening the Slide Rail Lock Nuts

7. **Repeat** Step 2 **through** Step 6 **for each server in the system cabinet.**

8. Retract the **cabinet stabilizer bar.**

   It is now safe to transport the system cabinet with installed servers.

C.2.3 After Transporting the System Cabinet With Servers Installed

1. **Ensure that the server is in a location where it will not be moved for a while.**
2. **Extend the cabinet stabilizer bar and lock it in position.**
3. **From the rear of the server, remove the slide rail locking nuts from each rail (**FIGURE C-9**).**
4. **Slide the server out of the system cabinet.**
5. **From the rear of the server, remove the threaded washer from each bolt, which is connected to the slide (**FIGURE C-8**).**
6. **Repeat** Step 3 **through** Step 5 **for the other slide rail.**
7. **Repeat** Step 3 **through** Step 6 **for each server installed in the system cabinet.**
8. **Slide the server back into the system cabinet.**
9. Retract the **cabinet stabilizer bar.**

Index

E

F

H

I

S

T

V

W

X