Netra™ ct Server Service Manual

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Contents

Figures

Tables

Preface

The *Netra ct Server Service Manual* contains procedures for the removal and replacement of the field-replaceable units (FRUs) in a Netra™ ct server.

The intended reader of this manual is a service provider or experienced system administrator who has experience installing hardware—systems and components—and has used the Solaris™ operating environment. The reader should be comfortable with LAN fundamentals and with networking in general.

Before performing the procedures described in this book, you should have completed the installation and setup of the Netra ct server as described in the *Netra ct Server Installation Guide.*

Safety and Compliance

All Netra ct servers are shipped with the *Netra ct Server Safety and Compliance Manual*, which specifies the environmental and electrical safety requirements for the product and contains compliance certification for various countries.

How This Book Is Organized

Part I "Preparing for Service"

Chapter 1 describes the procedures you need to perform before installing, removing, or replacing field-replaceable units (FRUs) in a Netra ct server.

Chapter 2 gives the hardware and software procedures for powering the Netra ct server on and off.

Chapter 3 provides instructions for handling the cPCI cards and assemblies correctly.

Part II "Troubleshooting the System"

Chapter 4 provides troubleshooting procedures for the Netra ct server.

Part III "Replacing Hot-Swappable FRUs"

Chapter 5 describes the hot-swap software commands.

Chapter 6 gives instructions for removing and replacing hot-swappable cards.

Chapter 7 contains instructions for removing and replacing hard disk drives and removable media.

Chapter 8 gives instructions for removing and replacing hot-swappable subassemblies.

Part IV "Replacing Cold-Swappable FRUs"

Chapter 9 provides instructions for removing and replacing the Netra ct 800 server and Netra ct 400 server.

Chapter 10 gives instructions for removing and replacing cold-swappable cards.

Chapter 11 gives instructions for removing and replacing cold-replaceable subassemblies.

Part V "Illustrated Parts Breakdown"

Chapter 12 gives the illustrated parts breakdown for the Netra ct server.

Part VI "Appendixes, Glossary, and Index"

Appendix A lists the connector pinouts for the cards in the Netra ct server.

Appendix B provides instructions for connecting a terminal console to the server.

Appendix C gives the error messages for the Netra ct server.

Appendix D gives the system specifications for the Netra ct server.

Appendix E tells how to upgrade the memory on the CPU card installed in the Netra ct server.

Using UNIX Commands

This document contains only limited information on basic UNIX® commands and procedures such as shutting down the system, booting the system, and configuring devices.

See one or more of the following for this information:

- *Solaris Handbook for Sun Peripherals* (shipped in AnswerBook2™ form, available in printed form as an at-cost option)
- AnswerBook online documentation for the Solaris software environment
- Other software documentation that you received with your system

Typographic Conventions

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

Shell Prompts

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

Related Documentation

In addition to this manual, the Netra ct server is accompanied by the following manuals:

Title	Part Number
Netra ct Server Start Here	806-5161
Netra ct Server Product Notes	806-3299
Netra ct Server Safety and Compliance Manual	806-3295
Netra ct Server Product Overview	806-3298
Netra ct Server Installation Guide	806-3294
Sun Remote System Control (RSC) User's Guide for Netra ct Server Alarm Card	806-3301

Depending on the options you might have purchased for your machine, you might have also received manuals for network interface cards.

As mentioned above, as a Netra ct server purchaser, you receive a suite of online documentation for the Solaris operating environment.

Accessing Sun Documentation Online

Documentation and product information for the Netra product line is available at:

```
http://www.sun.com/products-n-solutions/hw/networking
```

The `docs.sun.com`^{sm} web site enables you to access Sun technical documentation for the Solaris operating environment on the Web. You can browse the `docs.sun.com` archive or search for a specific book title or subject at:

```
http://docs.sun.com
```

Ordering Sun Documentation

Fatbrain.com, an Internet professional bookstore, stocks select product documentation from Sun Microsystems, Inc.

For a list of documents and how to order them, visit the Sun Documentation Center on Fatbrain.com at:

```
http://www.fatbrain.com/documentation/sun
```

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Please include the part number (806-3296-11) of your document in the subject line of your email.

PART **I**   Preparing for Service

Preparing for FRU Installation and Replacement

This chapter describes the steps you need to take before you install, remove, or replace a field-replaceable unit (FRU) in your Netra ct server. This chapter is divided into the following sections:

- "Tools Required" on page 1-1
- "Attaching the Antistatic Wrist Strap" on page 1-1
- "Determining If You Have a Front-Access or Rear-Access Model" on page 1-3
- "FRU Categories" on page 1-4
- "Device Names" on page 1-5

1.1 Tools Required

You will need the following tools to install, remove, or replace most of the components in a Netra ct server:

- No. 1 Phillips screwdriver
- No. 2 Phillips screwdriver

1.2 Attaching the Antistatic Wrist Strap

Most field-replaceable units have sensitive electronic components that require antistatic precautions.

1. **Get the antistatic wrist strap and electrostatic discharge mat from the ship kit.**

2. **Place the electrostatic discharge mat close to the system.**

3. **Unwrap the first two folds of the wrist strap and wrap the adhesive side firmly against your wrist.**

4. **Peel the liner from the copper foil at the opposite end of the wrist strap and attach the copper end of the strap to a bare metal area on the Netra ct server or on the chassis.**
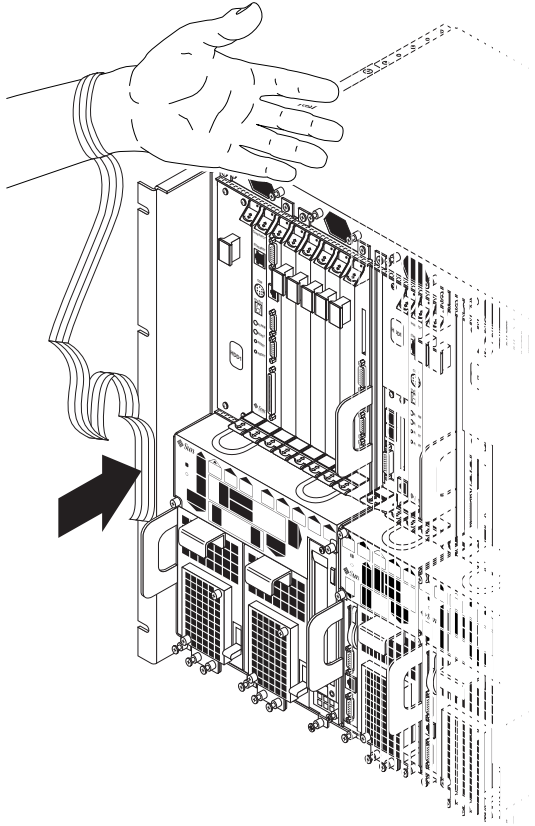
FIGURE 1-1   Attaching the Antistatic Wrist Strap

1.3 Determining If You Have a Front-Access or Rear-Access Model

If you are not sure whether you have a front-access or a rear-access model, go to the front of the chassis and look at the top part of the chassis.

- If you see the DC connectors at the front of the chassis, then you have a *front*-access model (FIGURE 1-2).

- If you do not see DC connectors at the front of the chassis, and metal filler plates fill the gaps where the DC connectors would normally be, then you have a *rear*-access model (FIGURE 1-2). The DC connectors are at the rear of the chassis for the rear-access model.

Front-access model
DC connectors

Rear-access model
Filler panels
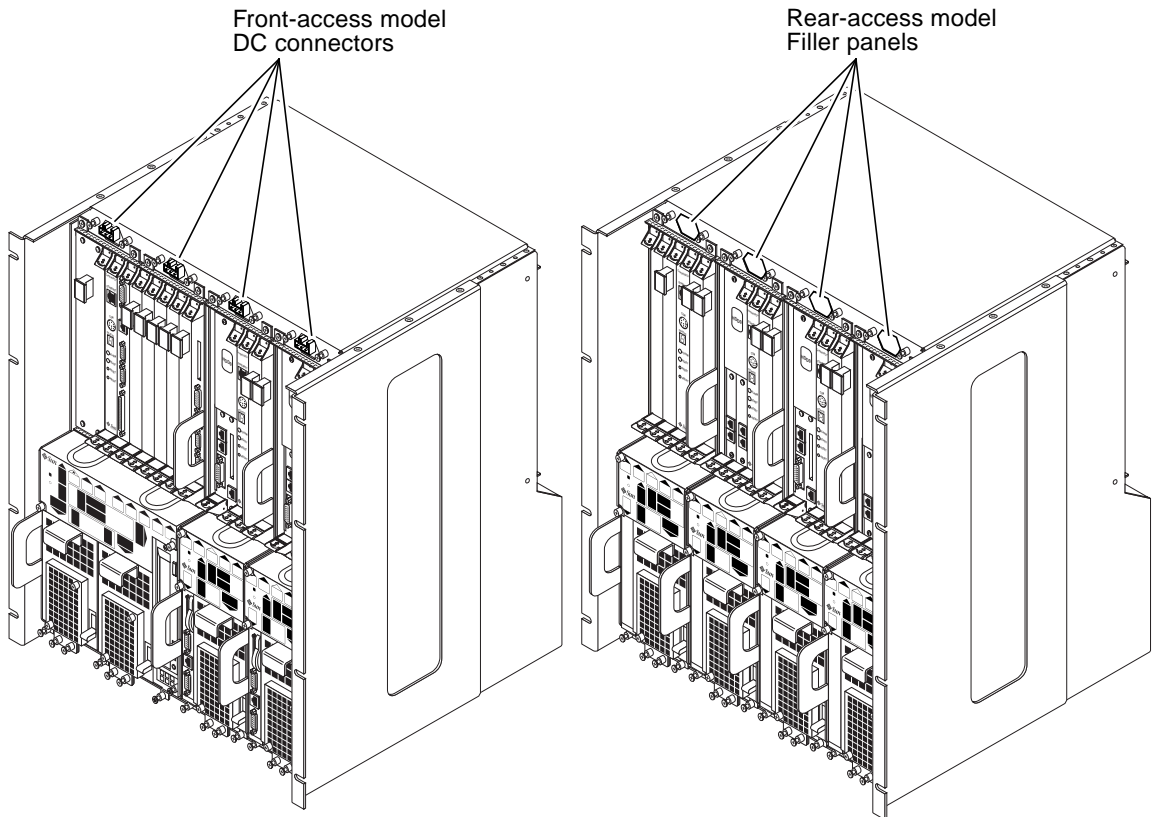
FIGURE 1-2   Front-Access and Rear-Access Models

1.4 FRU Categories

In general, the FRUs in a Netra ct server can be divided into two categories:

- Hot-installable/replaceable (referred to hereafter as *hot-swappable*), meaning that you can install or remove and replace a FRU while the server is running, without interrupting the operation of the server. This category of FRU sometimes requires that you enter hot swap software commands before and after an installation or a removal/replacement to incorporate the new FRU in the system correctly. For more information on the hot swap commands, refer to Chapter 5.

- Non-hot swappable, or *cold-swappable*, meaning that you must halt (and, in some cases, also power off) the server before installing or removing and replacing a FRU. Note that you must halt power only to the server where you would be removing and replacing the FRUs; any other servers installed in the same chassis can remain running.

Redundant power supplies and hard disk drives in a Netra ct 800 server are a variation of the hot-swappable category. You can replace a single power supply in a redundant configuration while the server is running, without having to enter any software commands, or a single hard disk drive after you have unmounted the drive or disengaged it if you are running a disk management software package.

1.4.1 Hot-Swappable FRUs

The FRUs listed below are hot-swappable:

- I/O cards, both front-access and rear-access models
- Alarm cards for both the Netra ct 800 server and the Netra ct 400 server[1]
- Alarm rear transition cards (Netra ct 800 server, rear-access model only)[1]
- Second hard disk drive in a Netra ct 800 server
- CD-ROM/DVD or DAT drives occupying the removeable media module
- Fan trays
- System status panels
- System controller boards
- Second power supply in a Netra ct 800 server
- Power supply air filters
- Main air filters

The instructions for removing and replacing these hot-swappable FRUs are covered in Part III, "Replacing Hot-Swappable FRUs."

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1. The alarm card and alarm rear transition card are hot-swappable when the console is directed to the CPU or CPU transition card. If console is directed to the alarm card or alarm rear transition card, they are no longer hot-swappable.

1.4.2 Cold-Swappable FRUs

The FRUs listed below are cold-swappable:

■ CPU card
■ CPU front transition card (front-access model only)
■ CPU rear transition card (rear-access model only)
■ Single power supply in a Netra ct 400 server
■ Single or lone remaining power supply in a Netra ct 800 server
■ Single hard disk drive in a Netra ct 400 server
■ Single or lone remaining hard disk drive in a Netra ct 800 server
■ Powered-off or empty servers
■ Power distribution units

The instructions for removing and replacing these cold-swappable FRUs are covered in Part IV, "Replacing Cold-Swappable FRUs."

1.5 Device Names

1.5.1 Device Names for I/O Card Slots in the Netra ct Servers

TABLE 1-1 gives the device names for the I/O card slots in the Netra ct 800 server and TABLE 1-2 gives the device names for the I/O card slots in the Netra ct 400 server.

TABLE 1-1   Device Names for I/O Card Slots in the Netra ct 800 Server

Slot Number	Device Name
2	/devices/pci@1f,0/pci@1/pci@1/pci@f
3	/devices/pci@1f,0/pci@1/pci@1/pci@e
4	/devices/pci@1f,0/pci@1/pci@1/pci@d
5	/devices/pci@1f,0/pci@1/pci@1/pci@c
6	/devices/pci@1f,0/pci@1/pci@1/pci@b
7	/devices/pci@1f,0/pci@1/pci@1/pci@a
8	/devices/pci@1f,0/pci@1/pci@1/pci@8

TABLE 1-2 Device Names for I/O Card Slots in the Netra ct 400 Server

Slot Number	Device Name
1	/devices/pci@1f,0/pci@1/pci@1/pci@8
2	/devices/pci@1f,0/pci@1/pci@1/pci@f
4	/devices/pci@1f,0/pci@1/pci@1/pci@e
5	/devices/pci@1f,0/pci@1/pci@1/pci@d

1.5.2 Device Names for Hard Disk Drives

Following are the device names for the hard disk drives installed in the Netra ct servers:

- HDD 0—c0t0d0
- HDD 1—c0t1d0

Powering the Server Off and On

This chapter gives instructions on powering the Netra ct server on and off.

- "Powering On the Server" on page 2-1
- "Powering Off the Server" on page 2-6

Note – Whenever you reboot or power your server on and off, the hot swap states revert back to the default basic hot swap state for all I/O slots. If you want full hot swap on an I/O slot, you must manually reset the I/O slot to full hot swap after rebooting or powering your server on and off.

Note – You can also power the Netra ct server on and off through the alarm card using the `poweroff` and `poweron` commands. Refer to the *Remote System Control (RSC) User's Guide For the Netra ct Server Alarm Card* for more information.

2.1 Powering On the Server

1. **Verify that the power supply locking mechanism(s) on the server you are about to power on are in the locked (⊟), or down, positions.**

   FIGURE 2-1 shows the location of the two power supply locking mechanisms on the Netra ct 800 server, and FIGURE 2-2 shows the location of the single power supply locking mechanism on the Netra ct 400 server. Make sure you lock *both* power supplies if you are powering on a Netra ct 800 server.
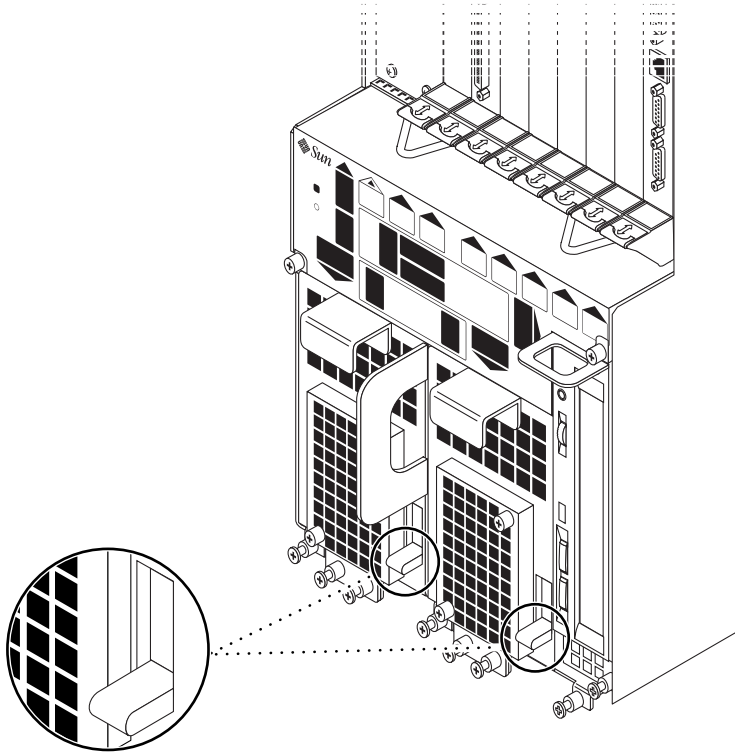
FIGURE 2-1 Locating the Power Supply Locking Mechanism on the Netra ct 800 Server
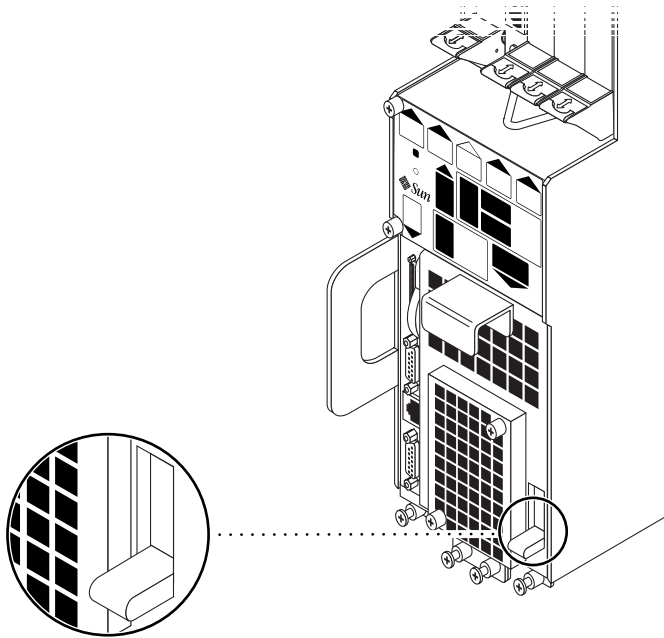
FIGURE 2-2 Locating the Power Supply Locking Mechanism on the Netra ct 400 Server

When the power supply locking mechanism is locked, the green LED on the power suppl(ies) flash, indicating that the power suppl(ies) are powered on, but the server has not been powered on yet. Also, the PDU LEDs on the system status panel should be in this state:

- Green LED (⊘) is ON
- Amber LED (⌿) is OFF

This tells you that the power supply locking mechanism(s) are in the locked (down) position and the power distribution unit(s) are receiving power and functioning properly.

2. Locate the system status panel.

The location of the system status panel in the Netra ct 800 server and Netra ct 400 server is illustrated in FIGURE 2-3.

System status panel,
Netra ct 800 server

System status panels,
Netra ct 400 servers
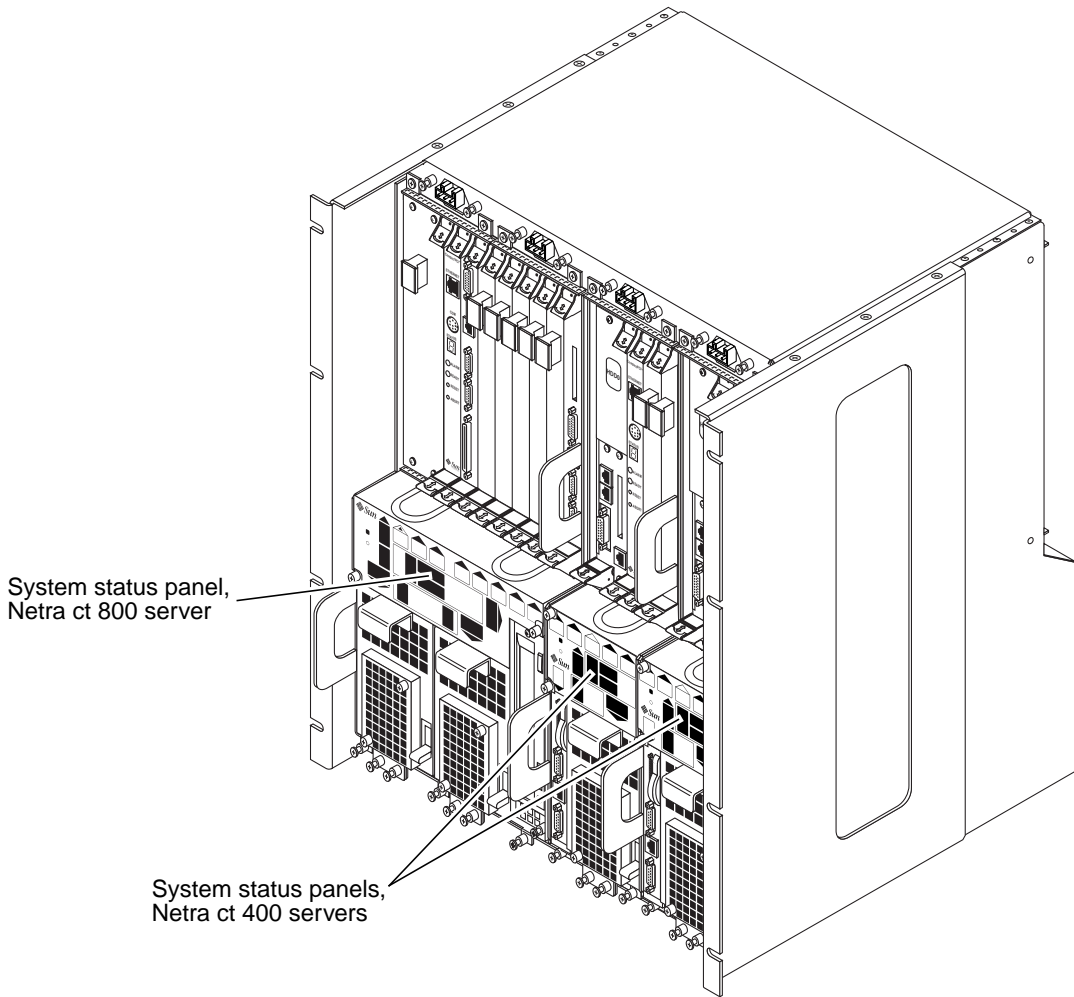
FIGURE 2-3   System Status Panel Locations

3. Locate the system power button on the system status panel and press the system power button to power on the server.

FIGURE 2-4 shows the system power button location for the Netra ct 800 server, and FIGURE 2-5 shows the system power button location for the Netra ct 400 server.

When you first power-on the Netra ct server, some or all of the green Power LEDs on the system status panel flash on and off for several seconds:

- If the `diag-switch` variable is set to *true* and the `diag-level` variable is set to *max* in the OpenBoot™ PROM, then all of the green Power LEDs on the system status panel flash on and off for several seconds.

- If the variables in the OpenBoot PROM are not set as described above, then the green Power LEDs on the system status panel flash on and off for several seconds only for the components that are installed in the server.

Note – Refer to the Solaris documentation that you received with your system for instructions on setting variables in the OpenBoot PROM.
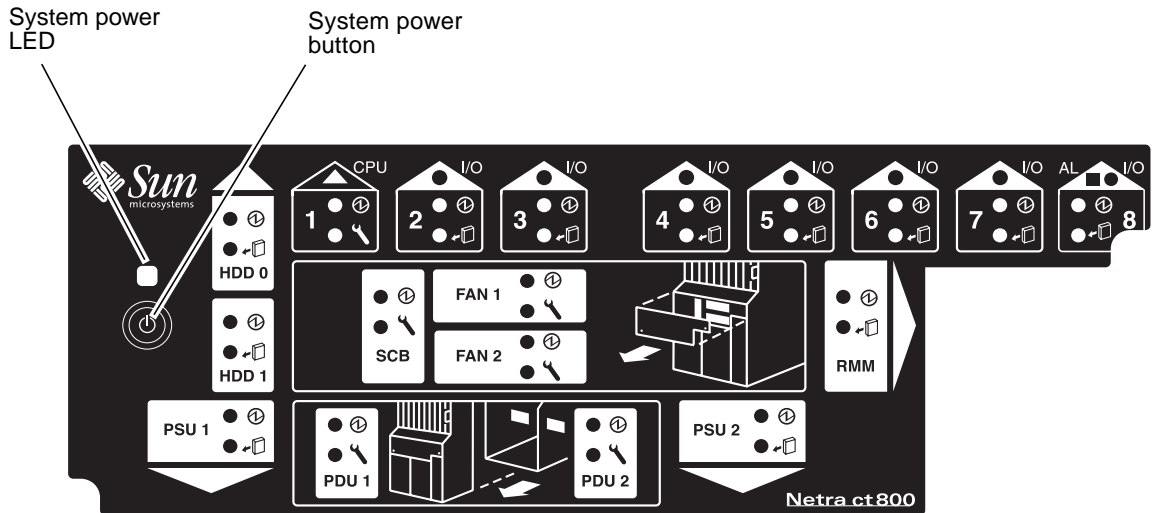
FIGURE 2-4   System Power Button and System Power LED Locations (Netra ct 800 Server)

System power LED

System power button
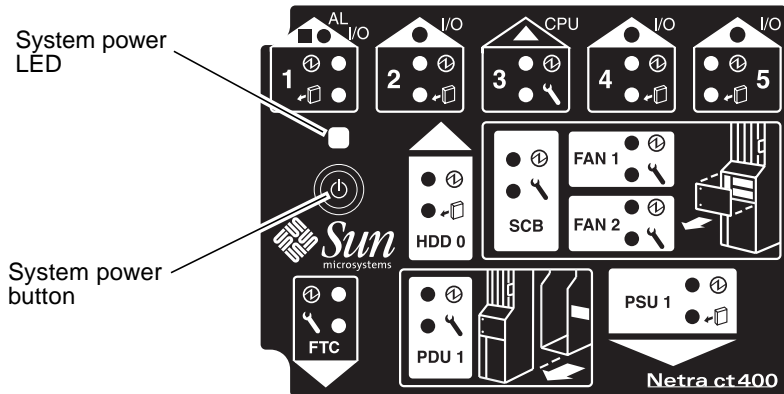
FIGURE 2-5 System Power Button and System Power LED Locations (Netra ct 400 Server)

4. **Verify that the system power LED on the system status panel is on, indicating that the system is completely powered on.**

   FIGURE 2-4 shows the system power LED location for the Netra ct 800 server, and FIGURE 2-5 shows the system power LED location for the Netra ct 400 server.

5. **Verify that the green power (⏀) LED on the power supplies are on, indicating that they are powered on and functioning properly.**

6. **Log into your server and boot up the server.**

   Refer to Appendix B for instructions on connecting a terminal to your server, if necessary.

   Note – The CPU card will display the letters H-E-L-P as the system is booting up. This should go away once the system is completely booted up.

2.2   Powering Off the Server

You can power off the Netra ct server in three ways:

- Graceful hardware power-down
- Ungraceful hardware power-down
- Graceful software power-down

If you do not have a terminal hookup to your server and your CPU is functioning normally, you should go through a graceful hardware power-down for your server. For a graceful hardware power-down, you would press the system power button for

less than four seconds. This will start the orderly power-down sequence in a manner that no persistent OS data structures are corrupted. In the orderly power-down, applications in service may be abnormally terminated and no further services will be invoked by the CPU.

If you do not have a terminal hookup to your server and your CPU is *not* functioning normally, you will not be able to go through a graceful hardware power-down; you will have to go through an ungraceful hardware power-down instead. For an ungraceful hardware power-down, you would press the system power button for *more* than four seconds. This will immediately shut the system down without making any attempts to keep the persistent OS data structures from being corrupted.

A graceful software power-down is a normal power-down using a terminal connected to your server, where you would log onto the server as root, then execute a software command to bring the server down safely.

■ For hardware power-down instructions, go to "To Perform a Hardware Power-Off" on page 2-7.

■ For software power-down instructions, go to "To Perform a Software Power Off" on page 2-9.

▼ To Perform a Hardware Power-Off

Note – You must have the `envmond` software package (`SUNWctevx`) installed on your Netra ct server in order to perform a graceful hardware power-down.

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1. **In preparation for bringing down the operating system and powering off the server, ensure that all significant application activity is quiesced on the server.**

2. **Go to the front of the Netra ct server and locate the system status panel.**

   The location of the system status panels in the Netra ct 800 server and Netra ct 400 server is illustrated in FIGURE 2-3.

3. **Locate the system power button on the system status panel.**

   FIGURE 2-4 shows the system power button location for the Netra ct 800 server, and FIGURE 2-5 shows the system power button location for the Netra ct 400 server.

4. **Press the system power button and release it to go through a graceful hardware power-down.**

   This will start the orderly power-down sequence in a manner that no persistent OS data structures are corrupted. In the orderly power-down, applications in service may be abnormally terminated and no further services will be invoked by the CPU. The system power LED will blink for several seconds, then it will go off.

If the server does not power off when you press the system power button and release it, this means one of two things:

■ The envmond software package is not installed yet, or
■ The CPU is unresponsive for some reason

a. **Log into your server.**

Refer to Appendix B for instructions on connecting a terminal to your server, if necessary.

b. **Verify that the** envmond **software package is installed.**

To verify that you've installed the envmond software package, as root, enter this command:

```
# pkginfo SUNWctevx
```

   ■ If you see the following error message:

```
ERROR: information for "SUNWctevx" was not found
```

   then the envmond software package was not installed. Follow the instructions in the *Netra ct Server Installation Guide* to install the Netra ct server software on the server.

   ■ If you see the following message:

```
system      SUNWctevx       Netra ct Environment Monitor Daemon and FRU policy
```

   then the problem lies with the CPU card. If this is the case, press the system power button for *more than four seconds*. This immediately shuts the system down without making any attempts to keep the persistent OS data structures from being corrupted.

5. **Verify that the green power (⏻) LED on the power supplies are blinking, indicating that the system is in the standby mode.**

   FIGURE 2-4 on page 2-5 shows the system power LED location for the Netra ct 800 server, and FIGURE 2-5 on page 2-6 shows the system power LED location for the Netra ct 400 server.

6. **If you want to completely power off the Netra ct server, push the purple power supply unit locking mechanism(s) up into the unlocked (⊓) position (see** FIGURE 2-1 **on page 2-2 for the Netra ct 800 server or** FIGURE 2-2 **on page 2-3 for the Netra ct 400 server).**

Note – You must unlock the locking mechanism on *both* power supply unit(s) on the Netra ct 800 server in order to completely power off that server.

The green power (⏻) LED(s) on the power supply unit(s) should go off (unlit), indicating that the system is now completely powered off.

▼ To Perform a Software Power Off

1. **In preparation for bringing down the operating system and powering down the server, ensure that all significant application activity is quiesced on the server.**

2. **Log in as root at the system console and enter:**

```
# cd /
# shutdown -i0 -g0 -y
```

   When the server is finished shutting down, the ok prompt is displayed.

3. **Log into your server and boot up the server.**

   Refer to Appendix B for instructions on connecting a terminal to your server, if necessary.

4. **At the ok prompt, enter:**

```
ok power-off
```

5. **Go to the front of the Netra ct server and locate the system status panel (see** FIGURE 2-3 **on page 2-4).**

   The location of the system status panel in the Netra ct 800 server and Netra ct 400 server is illustrated in FIGURE 2-3.

6. **Verify that the green power (⏻) LED on the power supplies are blinking, indicating that the system is in the standby mode.**

   FIGURE 2-4 on page 2-5 shows the system power LED location for the Netra ct 800 server, and FIGURE 2-5 on page 2-6 shows the system power LED location for the Netra ct 400 server.

7. **If you want to completely power off the Netra ct server, push the purple power supply unit locking mechanism(s) up into the unlocked (⬒) position (see** FIGURE 2-1 **on page 2-2 for the Netra ct 800 server or** FIGURE 2-2 **on page 2-3 for the Netra ct 400 server).**

Note – You must unlock the locking mechanism on *both* power supply unit(s) on the Netra ct 800 server in order to completely power off that server.

The green power (⏻) LED(s) on the power supply unit(s) should go off (unlit), indicating that the system is now completely powered off.

Handling Cards and Assemblies

This chapter gives instructions on how to safely handle the CompactPCI cards and assemblies. This chapter is divided into the following sections:

- "Handling CompactPCI Cards" on page 3-1
- "Handling Assemblies" on page 3-2

Consult the *Netra ct Server Safety and Compliance Manual* for safety information prior to performing the procedures in this chapter.

3.1 Handling CompactPCI Cards

Each Netra ct server in a chassis has a CompactPCI bus. All of the cards in a server—the CPU card, alarm card, and I/O cards—are CompactPCI cards.

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

Caution – Do not flex the CompactPCI cards; the surface-mounted components can break if the card is bent.

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

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

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

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

Caution – The system controller card and its modules have surface-mount components that can be broken by flexing the card.

3.2 Handling Assemblies

Assemblies have their own set of handling requirements, similar to the requirements for CompactPCI cards.

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

Troubleshooting the System

Troubleshooting the System

This chapter gives instructions for troubleshooting the Netra ct server. You can troubleshoot the system several ways.

- "Troubleshooting the System Using the System Status Panel" on page 4-1
- "Troubleshooting the System Using envmond" on page 4-7
- "Troubleshooting the System Using prtdiag" on page 4-7
- "Troubleshooting the System Using the SunVTS Test Suite" on page 4-12
- "Troubleshooting the System Using the Power-On Self Test (POST)" on page 4-12
- "Troubleshooting the System Using the Remote System Control (RSC)" on page 4-14
- "Troubleshooting a Power Supply Using the Power Supply Unit LEDs" on page 4-14
- "Troubleshooting a CPU Card" on page 4-16

In addition, Appendix C lists the error messages that might appear when you are operating or servicing your Netra ct server.

4.1 Troubleshooting the System Using the System Status Panel

You can use the system status panel to troubleshoot the Netra ct server.

4.1.1 Locating and Understanding the System Status Panel

The system status panel on the Netra ct server give the majority of troubleshooting information that you will need for your server. FIGURE 4-1 shows the locations of the system status panels on the Netra ct servers. FIGURE 4-2 shows the system status panel for the Netra ct 800 server, and FIGURE 4-3 shows the system status panel for the Netra ct 400 server.
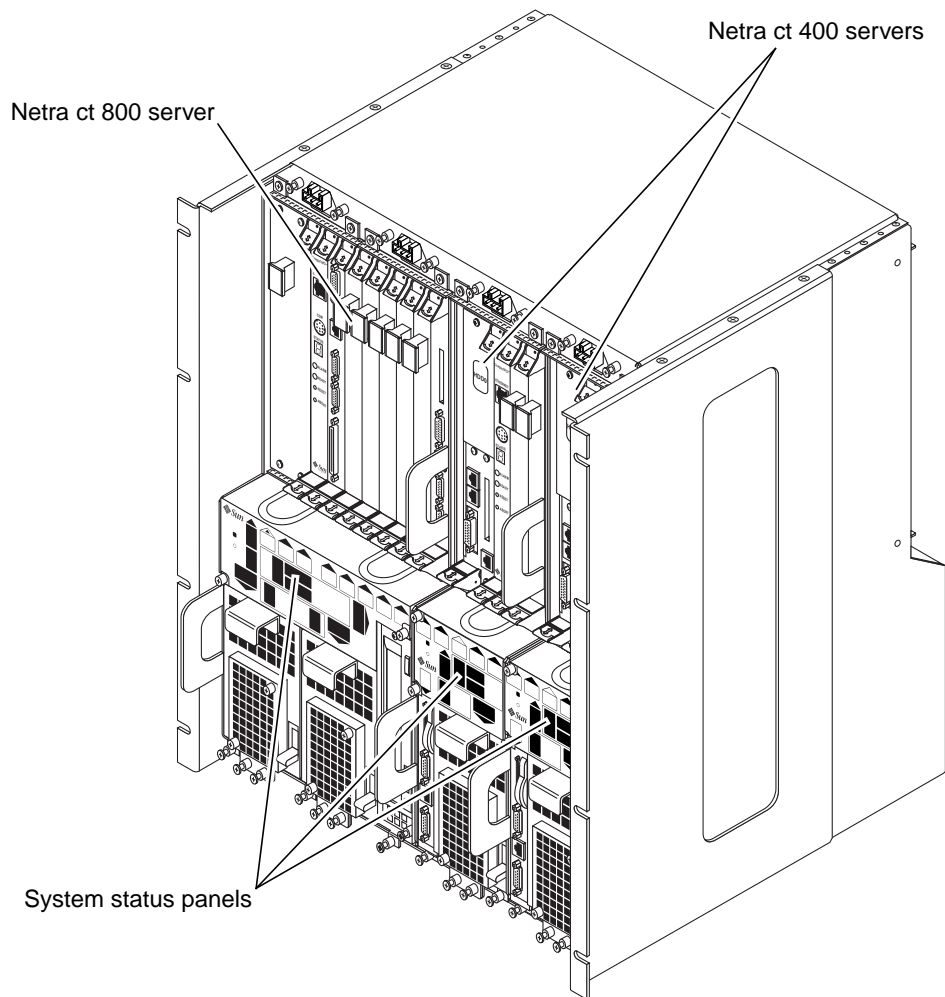
FIGURE 4-1   System Status Panel Locations
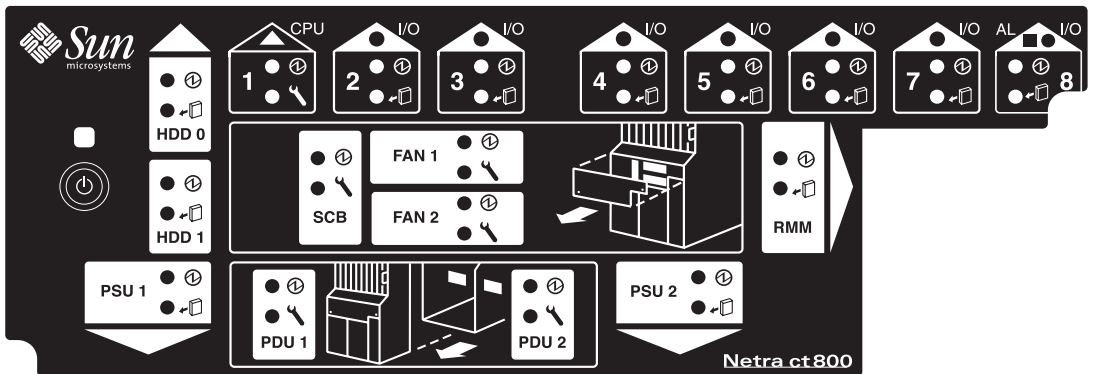
FIGURE 4-2   System Status Panel (Netra ct 800 Server)
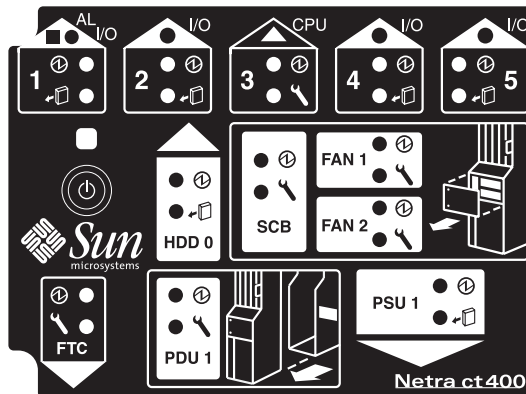
FIGURE 4-3   System Status Panel (Netra ct 400 Server)

4.1.2 Using the System Status Panel LEDs to Troubleshoot the System

When you first power-on the Netra ct server, some or all of the green Power LEDs on the system status panel flash on and off for several seconds:

- If the `diag-switch` variable is set to *true* and the `diag-level` variable is set to *max* in the OpenBoot PROM, then all of the green Power LEDs on the system status panel flash on and off for several seconds.

- If the variables in the OpenBoot PROM are not set as described above, then the green Power LEDs on the system status panel flash on and off for several seconds only for the components that are installed in the server.

Do not attempt to troubleshoot the system until after the LEDs have gone through their initial power-on testing. Refer to the documentation that you received with your Solaris operating environment for more information on making settings in the OpenBoot PROM.

Each major component in the Netra ct 800 server or Netra ct 400 server has a set of LEDs on the system status panel that gives the status on that particular component. Each component will have either the green Power and the amber Okay to Remove LEDs (FIGURE 4-4) or the green Power and amber Fault LEDs (FIGURE 4-5).

Green Power LED   Amber Okay to Remove LED
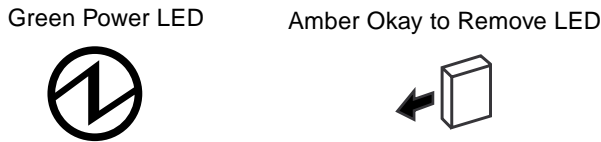
FIGURE 4-4   Power and Okay to Remove LEDs

Green Power LED   Amber Fault LED
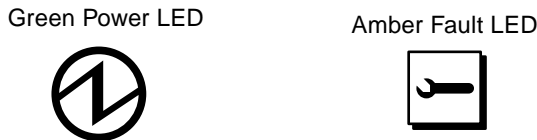
FIGURE 4-5   Power and Fault LEDs

TABLE 4-1 describes which combination of LEDs is used for each component in the Netra ct 800 server, and TABLE 4-2 describes which combination of LEDs is used for each component in the Netra ct 400 server. Note that the components in the Netra ct servers all have the green Power LED, and they will have either the amber Okay to Remove LED *or* the amber Fault LED, but not both.

TABLE 4-1   System Status Panel LEDs for the Netra ct 800 Server

LED	LEDs Available	Component
HDD 0	Power and Okay to Remove	Upper hard disk drive
HDD 1	Power and Okay to Remove	Lower hard disk drive
Slot 1	Power and Fault	CPU card (▲) installed in slot 1
Slot 2	Power and Okay to Remove	I/O card (●) or CPU front transition card installed in slot 2

LED	LEDs Available	Component
Slots 3–7	Power and Okay to Remove	I/O cards (●) installed in slots 3–7
Slot 8	Power and Okay to Remove	Alarm card (■) installed in slot 8
SCB	Power and Fault	System controller board (behind the system status panel)
FAN 1	Power and Fault	Upper fan tray (behind the system status panel)
FAN 2	Power and Fault	Lower fan tray (behind the system status panel)
RMM	Power and Okay to Remove	Removeable media module
PDU 1	Power and Fault	Leftmost power distribution unit (behind the server)
PDU 2	Power and Fault	Rightmost power distribution unit (behind the server)
PSU 1	Power and Okay to Remove	Leftmost power supply unit
PSU 2	Power and Okay to Remove	Rightmost power supply unit

TABLE 4-2   System Status Panel LEDs for the Netra ct 400 Server

LED	LEDs Available	Component
Slot 1	Power and Okay to Remove	Double-wide alarm card(■) installed in slot 1 and 2
Slot 2	Power and Okay to Remove	Single-wide I/O card installed in slot 2 (only if alarm card is not present)
Slot 3	Power and Fault	CPU card (▲) installed in slot 3
Slots 4 and 5	Power and Okay to Remove	I/O cards (●) installed in slots 4 and 5
HDD 0	Power and Okay to Remove	Hard disk drive
SCB	Power and Fault	System controller board (behind the system status panel)
FAN 1	Power and Fault	Upper fan tray (behind the system status panel)
FAN 2	Power and Fault	Lower fan tray (behind the system status panel)
FTC	Power and Fault	CPU front transition card
PDU 1	Power and Fault	Power distribution unit (behind the server)
PSU 1	Power and Okay to Remove	Power supply

- If the component has the Power and amber Okay to Remove LEDs, refer to TABLE 4-3.
- If the component has the Power and Fault LEDs, refer to TABLE 4-4.

Note – Do not use the information in TABLE 4-3 to troubleshoot a power supply unit in a server that has only one power supply unit (a Netra ct 400 server or a Netra ct 800 server with only one power supply). To troubleshoot the power supply in a single power supply system, use the LEDs on the power supply itself. Refer to "Troubleshooting a Power Supply Using the Power Supply Unit LEDs" on page 4-14 for more information. The information given in TABLE 4-3 applies to all other components in the Netra ct 800 server or Netra ct 400 server, including the power supplies in a two power supply Netra ct 800 server.

TABLE 4-3   Meanings of Power and Okay to Remove LEDs

LED State	Power LED	Okay to Remove LED
On, Solid	Component is installed and configured.	Component is Okay to Remove. You can remove the component from the system, if necessary.
On, Flashing	Component is installed but is unconfigured or is going through the configuration process.	Not applicable.
Off	Component was not recognized by the system or is not installed in the slot.	Component is *not* Okay to Remove. Do *not* remove the component while the system is running.

TABLE 4-4   Meanings of Power and Fault LEDs

LED State	Power LED	Fault LED
On, Solid	Component is installed and configured.	Component has failed. Replace the component.
On, Flashing	Component is installed but is unconfigured or is going through the configuration process.	Not applicable.
Off	Component was not recognized by the system or is not installed in the slot.	Component is functioning properly.

4.2 Troubleshooting the System Using `envmond`

You can troubleshoot the system using the `envmond` command. Log into the server console and, as root, enter:

```
# pkill -HUP envmond
```

You should get output on the console similar to the following:

```
Date/time servername envmond[901]: alarmcard.so:Alarm Card is OK.
Date/time servername envmond[901]: powersupply.so:Power Supply 1 is OK.
Date/time servername envmond[901]: powersupply.so:Power Supply 2 is OK.
Date/time servername envmond[901]: fancpu.so:Fan 1 is OK.
Date/time servername envmond[901]: fancpu.so:Fan 2 is OK.
Date/time servername envmond[901]: scsi.so:Hard Disk Drive (HDD) 0 is OK.
```

You should also get this output whenever you reboot your server.

Note – If you get no output after entering the previous command, it might mean that you did not install the `envmond` software from the Supplement for Solaris Operating Environment for Sun Computer Systems CD when you installed the Solaris operating environment onto your Netra ct server. Follow the instructions given in the *Netra ct Server Installation Guide* to install the `envmond` software onto your Netra ct server, then repeat these procedures.

4.3 Troubleshooting the System Using `prtdiag`

You can troubleshoot the system using the `prtdiag` command. Log into the server console and, as root, enter:

```
# /usr/platform/sun4u/prtdiag
```

If you have a Netra ct 800 server, you should get output on the console similar to the following:

CODE EXAMPLE 4-1   `prtdiag` Output for a Netra ct 800 Server

```
System Configuration: Sun Microsystems sun4u Netra ct800 (UltraSPARC-IIi 440MHz)
System clock frequency: 100 MHz
Memory size: 640 Megabytes
============================= FRU Information =============================
FRU         FRU     FRU       Green   Amber      Miscellaneous
Type        Unit#   Present   LED     LED        Information
----------  -----   -------   -----   -----      -------------------------
Midplane    1       Yes               Netra ct800
                                                 Properties:
                                                     Version=0
                                                     Maximum Slots=8
SCB         1       Yes       on      off        System Controller Board
                                                 Properties:
                                                     Version=2
                                                     hotswap-mode=basic
SSB         1       Yes                          System Status Panel
CPU         1       Yes       on      off        CPU board
                                                     temperature(celsius):38
I/O         2       Yes       on      off        CompactPCI IO Slot
                                                 Properties:
                                                     auto-config=disabled
                                                 Board Type:Unknown
                                                 Devices:
                                                     pci
                                                         pci108e,1000
                                                         SUNW,hme
                                                         SUNW,isptwo
I/O         3       Yes       on      off        CompactPCI IO Slot
                                                 Properties:
                                                     auto-config=disabled
                                                 Board Type:Unknown
                                                 Devices:
                                                     pci
                                                         pci108e,1000
                                                         SUNW,hme
                                                         SUNW,isptwo
I/O         4       Yes       on      off        CompactPCI IO Slot
                                                 Properties:
                                                     auto-config=disabled
                                                 Board Type:Unknown
                                                 Devices:
                                                     pci
                                                         pci108e,1000
```

CODE EXAMPLE 4-1 `prtdiag` Output for a Netra ct 800 Server

```
                                                    SUNW,hme
                                                    SUNW,isptwo
I/O       5      Yes       on     off     CompactPCI IO Slot
                                          Properties:
                                             auto-config=disabled
                                          Board Type:Unknown
                                          Devices:
                                             pci
                                                pci108e,1000
                                                SUNW,hme
                                                SUNW,isptwo
I/O       6      Yes       on     off CompactPCI IO Slot
                                          Properties:
                                             auto-config=disabled
I/O       7      Yes       on     off     CompactPCI IO Slot
                                          Properties:
                                             auto-config=disabled
                                          Board Type:Unknown
                                          Devices:
                                             pci
                                                pci108e,1000
                                                SUNW,qfe
                                                pci108e,1000
                                                SUNW,qfe
                                                pci108e,1000
                                                SUNW,qfe
                                                pci108e,1000
                                                SUNW,qfe
                                                pci1176,608
I/O       8      Yes       on     off     CompactPCI IO Slot
                                          Properties:
                                             auto-config=disabled
                                          Board Type:Alarm Card
                                          Devices:
                                             pci
                                                 ebus
                                                 ethernet
PDU       1      Yes       on     off     Power Distribution Unit
PDU       2      Yes       on     off     Power Distribution Unit
PSU       1      Yes       on     on      Power Supply Unit
                                             condition:ok
                                             temperature:ok
                                             ps fan:ok
                                             supply:on
PSU       2      Yes       on     on      Power Supply Unit
                                             condition:ok
                                             temperature:ok
```

```
                                                    ps fan:ok
                                                    supply:on
FAN        1        Yes        on      off     Fan Tray
                                                    condition:ok
                                                    fan speed:low
FAN        2        Yes        on      off     Fan Tray
                                                    condition:ok
                                                    fan speed:low
HDD        0        Yes        on      off     Hard Disk Drive
                                                    condition:ok
HDD        1        Yes        on      off     Hard Disk Drive
                                                    condition:ok
RMM                 Yes        on      on      Removable Media Module
                                                    condition:Unknown


System Board PROM revision:
--------------------------
OBP 3.14.1 2000/04/28 12:56
```

If you have a Netra ct 400 server, you should get output on the console similar to the following:

CODE EXAMPLE 4-2   prtdiag Output for a Netra ct 400 Server

```
System Configuration: Sun Microsystems sun4u Netra ct400 (UltraSPARC-IIi 440MHz)
System clock frequency: 100 MHz
Memory size: 512 Megabytes
============================= FRU Information ==============================
FRU          FRU     FRU        Green   Amber        Miscellaneous
Type         Unit#   Present    LED     LED          Information
----------   -----   -------    -----   -----        --------------------------
Midplane     1       Yes                Netra ct400
                                                     Properties:
                                                         Version=0
                                                         Maximum Slots=5
SCB          1       Yes        on      off     System Controller Board
                                                Properties:
                                                         Version=2
                                                         hotswap-mode=basic
SSB          1       Yes                         System Status Panel
I/O          1       Yes        on      off     CompactPCI IO Slot
                                                Properties:
                                                         auto-config=disabled
                                                Board Type:Alarm Card
                                                Devices:
```

CODE EXAMPLE 4-2   `prtdiag` Output for a Netra ct 400 Server

```
                                                    pci
                                                        ebus
                                                        ethernet
I/O       2     Yes        off     off        CompactPCI IO Slot
                                              Properties:
                                                  auto-config=disabled
CPU       3     Yes        on      off        CPU board
                                                  temperature(celsius):38
I/O       4     Yes        on      off        CompactPCI IO Slot
                                              Properties:
                                                  auto-config=disabled
                                              Board Type:Unknown
                                              Devices:
                                                  pci
                                                      pci108e,1000
                                                      SUNW,hme
                                                      SUNW,isptwo
I/O       5     Yes        on      off        CompactPCI IO Slot
                                              Properties:
                                                  auto-config=disabled
                                              Board Type:Unknown
                                              Devices:
                                                  pci
                                                      pci108e,1000
                                                      SUNW,qfe
                                                      pci108e,1000
                                                      SUNW,qfe
                                                      pci108e,1000
                                                      SUNW,qfe
                                                      pci108e,1000
                                                      SUNW,qfe
PDU       1     Yes        on      off        Power Distribution Unit
PSU       1     Yes        on      off        Power Supply Unit
                                                  condition:ok
                                                  temperature:ok
                                                  ps fan:ok
                                                  supply:on
FAN       1     Yes        on      off        Fan Tray
                                                  condition:ok
                                                  fan speed:low
FAN       2     Yes        on      off        Fan Tray
                                                  condition:ok
                                                  fan speed:low
HDD       0     Yes        on      off        Hard Disk Drive
                                                  condition:ok
```

```
System Board PROM revision:
---------------------------
OBP 3.14.1 2000/04/28 12:56
```

4.4 Troubleshooting the System Using the SunVTS Test Suite

SunVTS is a validation test suite that is provided as a supplement to the Solaris operating environment. The individual tests can stress a device, system or resource so as to detect and pinpoint specific hardware and software failures and provide users with informational messages to resolve any problems found.

For more information on the SunVTS test suite, including instructions for running SunVTS tests specific to the Netra ct server, refer to the Computer Systems Release Notes Supplement for Sun Hardware document or the SunVTS documentation on the Solaris on Sun Hardware Answerbook, both included with your Solaris operating environment.

4.5 Troubleshooting the System Using the Power-On Self Test (POST)

When you first power-up the Netra ct server, some or all of the green Power LEDs on the system status panel will flash on and off for several seconds. The green Power LED for the I/O slot holding the CPU card (slot 1 in the Netra ct 800 server and slot 3 in the Netra ct 400 server) will go to solid green while the green Power LEDs for the remaining components are still flashing on and off; this is an indication that the CPU card has passed the power-on self test (POST).

Before any processing can occur on a system, it must successfully complete the POST. Messages are displayed for each step in the POST process. If there is a critical failure, the system will not complete POST and will not boot. To monitor this process, you must be connected to the TTY A port on the CPU card or CPU transition card. See "Logging In to the Netra ct Server" on page 5-2.

OpenBoot PROM (OBP) variables control the console port. The variables and their possible settings are described below.

To see the console *output* device, as root, enter:

```
ok printenv output-device
```

The screen will display something similar to the following:

```
output-device  ttya
```

The possible settings for this variable are:

- `ttya` (default)
- `ttyb`
- `screen`
- `rsc`

`ttya` and `ttyb` represent the serial ports on the CPU card. `screen` represents the display attached to the first frame buffer installed in the system (not present on the Netra ct server). `rsc` is used by the alarm card.

To see the console *input* device, as root, enter:

```
ok printenv input-device
```

The screen will display something similar to the following:

```
input-device   ttya
```

The possible settings for this variable are:

- `ttya` (default)
- `ttyb`
- `keyboard`
- `rsc`

`ttya` and `ttyb` represent the serial ports on the CPU card. `keyboard` represents the standard system keyboard (not present on the Netra ct server). `rsc` is used by the alarm card. If no system keyboard is connected, the console port defaults to ttya.

Note – Be sure the two variables are consistent with each other. For example, do not set the output-device to `screen` and the input-device to `ttya`.

There is another OBP variable that controls the behavior of the POST process called `diag-level`. By default, this variable is set to `max`, which means POST will run more thorough/verbose tests against the hardware. This variable can also be set to `min`, which will run a less stringent set of tests against the hardware. A minimum level of POST testing also takes less time, so the Solaris operating environment can boot more quickly on a machine with diag-level set to `min`.

To run the *maximum* amount of POST tests, as root, enter:

```
ok setenv diag-level max
```

To run the *minimum* amount of POST tests, as root, enter:

```
ok setenv diag-level min
```

4.6 Troubleshooting the System Using the Remote System Control (RSC)

For information on troubleshooting the alarm card, refer to the *Remote System Control (RSC) User's Guide For the Netra ct Server Alarm Card* (part number 806-3301-xx).

4.7 Troubleshooting a Power Supply Using the Power Supply Unit LEDs

There are two LEDs on each power supply unit: a green (⏻) LED and an amber (➟) LED. You can use the LEDs on the power supply unit to troubleshoot each power supply unit; however, because there is one power supply unit in the Netra ct 400 server and two power supply units in the Netra ct 800 server, the actions to take are different.

4.7.1 Troubleshooting the Power Supply Unit in the Netra ct 400 Server

Following are the states of the LEDs on the power supply unit in the Netra ct 400 server:

- Green, flashing—The power supply unit is in the standby mode; the power supply unit is powered on, but it is not supplying power to the server.
- Green, solid—Both the server and the power supply unit are powered on and functioning properly.
- Amber—A fault was found in the power supply unit. Replace the power supply unit. See "Power Supply Unit" on page 11-19 for those instructions.

4.7.2 Troubleshooting the Power Supply Units in the Netra ct 800 Server

When both power supply units in a Netra ct 800 server are up and running properly, the green (⏻)LEDs on both power supply units will be ON (note that these are the LEDs on the power supply units themselves, *not* the LEDs on the system status panel).

If a power supply unit fails, the amber (🔧) LED on the power supply unit might light, depending on the type of failure that has occurred:

- If a *soft-fault* occurs, such as a stuck fan or a temperature warning, you should get a notification of the error, assuming the envmond daemon is running; however, the amber (🔧) LED on the power supply unit *will not* light for a soft-fault condition. The power supply unit is still supplying power to the system during a soft-fault condition.
- If a *hard-fault* occurs, such as a voltage problem, you should get a notification of the error, assuming envmond is running. In addition, the amber (🔧) LED on the power supply unit *does* light for a hard-fault condition. The power supply unit does *not* supply power to the system during a hard-fault condition.

If one power supply unit fails (either a soft-fault or a hard-fault), but the other power supply unit is still functioning normally, you should replace the faulty power supply unit as soon as possible to keep the system up and running. If both power supply units fail, the action you should take varies depending on which of the two types of fault has occurred:

If	Then
Both power supply units go through a *soft-fault*	Replace one power supply unit at a time in order to keep the system up and running.
One power supply unit goes through a *soft-fault* and the other power supply unit goes through a *hard-fault*	Replace the power supply unit that has gone through a hard-fault first in order to keep the system up and running.
Both power supply units go through a *hard-fault*	The system is down and you should replace at least one of the power supply units to bring the system back up again.

4.8 Troubleshooting a CPU Card

This section describes how to troubleshoot problems related to the CPU card. The information provided here primarily covers those situations when the system containing the CPU card does not boot up or when the CPU card is not fully functional after boot up. Only general troubleshooting tips are provided here. No component level troubleshooting information is included in this section.

The following topics are covered:

- General troubleshooting tips
- General troubleshooting requirements
- Mechanical failures
- Power-on failures
- Failures subsequent to power-on
- Troubleshooting during POST/OBP and during boot process

The following diagnostic procedures are also described:

- OpenBoot PROM on-board diagnostics
- OpenBoot diagnostics

4.8.1 General Troubleshooting Tips

Caution – High voltages are present in the Netra ct server. To avoid physical injury, follow all the safety rules specified in the *Netra ct Server Safety and Compliance Manual* when opening the enclosure and/or removing and installing the board.

The following general troubleshooting tips are useful in isolating the problems related to the CPU card:

1. **Make sure the CPU card is installed properly in the correct slot in the Netra ct server.**

   The CPU card should be installed in I/O slot 1 in the Netra ct 800 server and in I/O slot 3 in the Netra ct 400 server.

2. **Make sure all the necessary cables are attached properly to the CPU transition card.**

   The following figures show the connectors on the different CPU transition cards:

   - CPU front transition card, Netra ct 800 server—FIGURE 4-6
   - CPU front transition card, Netra ct 400 server—FIGURE 4-7
   - CPU rear transition card, Netra ct 800 server—FIGURE 4-8
   - CPU rear transition card, Netra ct 400 server—FIGURE 4-9

Note – The CPU rear transition card is the same for both the Netra ct 800 server and the Netra ct 400 server; only the location in the rear card cage differs.
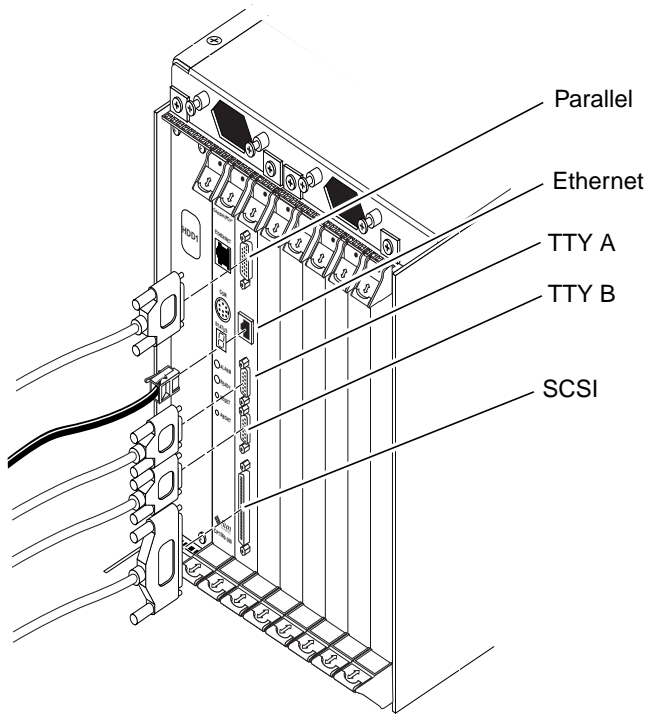
FIGURE 4-6   Connectors on the CPU Front Transition Card (Netra ct 800 Server)

SCSI

Parallel

Ethernet

TTY B (DB9)
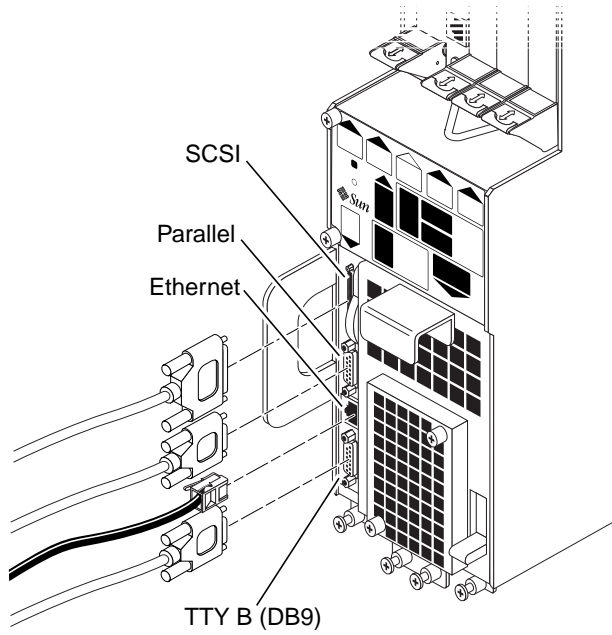
FIGURE 4-7 Connectors on the CPU Front Transition Card (Netra ct 400 Server)

Parallel
TTY A
TTY B
Ethernet A
Ethernet B
SCSI
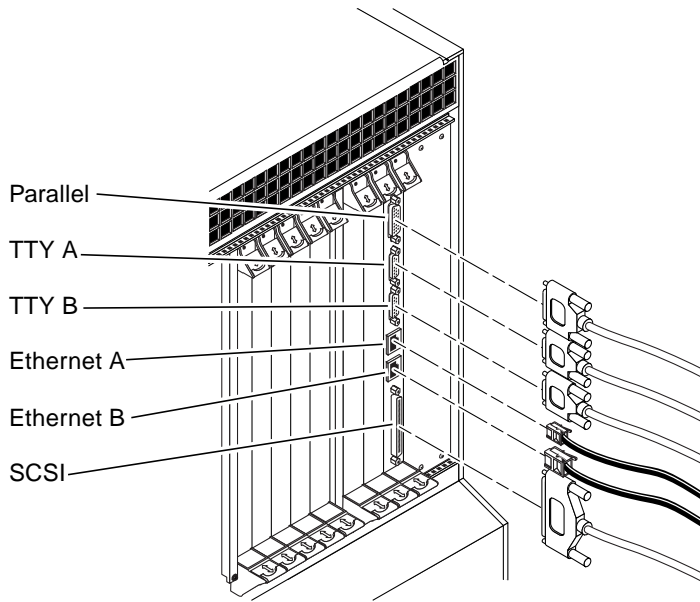
FIGURE 4-8   Connectors on the CPU Rear Transition Card (Netra ct 800 Server)

Parallel
TTY A
TTY B
Ethernet A
Ethernet B
SCSI
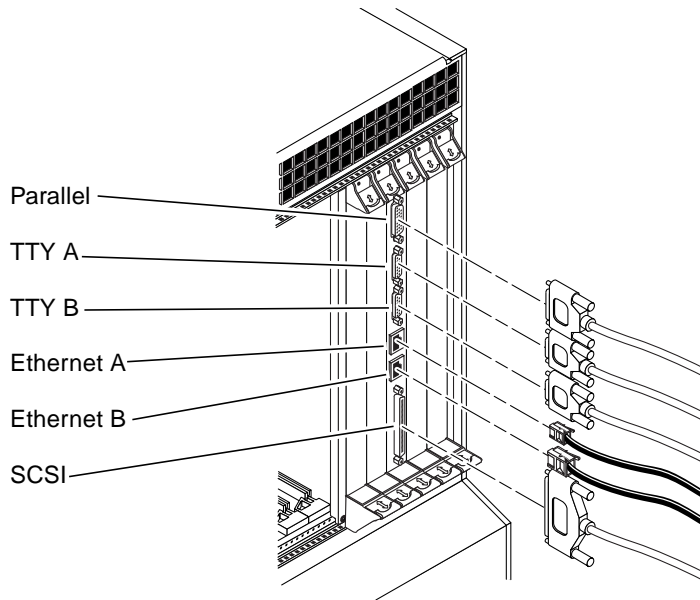
FIGURE 4-9   Connectors on the CPU Rear Transition Card (Netra ct 400 Server)

4.8.2 General Troubleshooting Requirements

The following devices are generally required to take some of the recommended actions in this section:

- Network interface
- TTYA and TTYB connection or an ASCII terminal connection to serial port
- Parallel port interface
- Loopback connectors

4.8.3 Mechanical Failures

Symptom

Unable to insert the CPU card into the backplane.

Action

1. **Verify that there are no mechanical and physical obstructions in the slot where the CPU card is going to be installed.**

2. **Make sure no pins on the board connectors or the CompactPCI backplane connectors are bent or damaged.**

4.8.4 Power-On Failures

This section provides examples of power-on failure symptoms and suggested actions. There can be several reasons for the power-on failures.

- **Make sure the CPU card is installed properly.**

Note – If both Ready and Alarm LEDs on the CPU card are green, the board is partially functional and capable of running POST (power on self-test). It means that the basic functionality of the board is present. If none of the aforementioned LEDs is green, and the board is installed properly, the board is not functional. In that case, contact your Sun supplier or field service engineer.

4.8.5 Failures Subsequent to Power-On

Symptom

Cannot connect successfully to a TTY serial port; there are no POST messages and unable to send keyboard input.

Action

1. **Check the TTY cable for proper setup.**

2. **If you do not see any output after connecting the TTY terminal to the CPU transition card, remove it and connect it to the COM port of the CPU card and try again.**

4.8.6 Troubleshooting During POST/OBP and During Boot Process

This section describes certain possible problems encountered while running POST and OBP and during the boot process.

Symptom

POST error message displays:

```
cannot establish network service
```

Action

● **This might be a hardware address problem. Add or check the media access control (MAC) address to the server and the IP address at the server.**

Symptom

POST detects Ecache error and a message similar to the one below is displayed:

```
STATUS =FAILED
TEST =Memory Addr w/ Ecache
SUSPECT=U5201 and U5202
MESSAGE=Mem Addr line compare error
addr 00000000.00000000
exp 00000000.00000000
obs 88888888.88888888
```

Action

● **This might be a mounting issue with the CPU Mylar film, socket, or heatsink which could have occurred during transportation or due to severe vibration. Contact Sun s Enterprise Services Solution Center.**

Caution – Any attempt to disassemble or replace the aforementioned devices will void the warranty.

4.8.7   OpenBoot PROM On-Board Diagnostics

There are several OBP variables specific to the Netra ct server, such as:

■ `pcia-probe-list`—Probes the bus that runs the first ethernet port (front connection) and standard I/O devices (by default: 1, 2)

■ `pcib-probe-list`—Probes the bus that runs the second ethernet port (rear connection) (by default: 1, 2, 3)

■ `cpci-probe-list`—Probes the bus that runs connections to all cPCI slots in the ct400 or ct800 (by default: 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, a, b, c, d, e, f)

The following section describes the OBP on-board diagnostics. To execute the OBP on-board diagnostics, the system must be at the ok prompt. The OBP on-board diagnostics are listed as follows:

- watch-clock
- watch-net and watch-net-all
- probe-scsi
- test *alias* name, device path, -all

4.8.7.1   `watch-clock`

The `watch-clock` command reads a register in the NVRAM/TOD chip and displays the result as a seconds counter. During normal operation, the seconds counter repeatedly increments from 0 to 59 until interrupted by pressing any key on the PS/2 keyboard. The following identifies the watch-clock output message.

```
ok watch-clock
Watching the seconds register of the real time clock chip
It should be ticking once a second
Type any key to stop
49
ok
```

4.8.7.2   `watch-net` and `watch-net-all`

The `watch-net` and `watch-net-all` commands monitor Ethernet packets on the Ethernet interfaces connected to the system. Good packets received by the system are indicated by a period (.). Errors such as the framing error and the cyclic

redundancy check (CRC) error are indicated with an X and an associated error
description. CODE EXAMPLE 4-3 identifies the watch-net output message and
CODE EXAMPLE 4-4 identifies the watch-net-all output message.

CODE EXAMPLE 4-3   `watch-net` Output Message

```
ok watch-net
Hme register test --- succeeded.
Internal loopback test -- succeeded.
Transceiver check --
Using Onboard Transceiver - Link Up. passed Using Onboard
Transceiver - Link Up. Looking for Ethernet Packets.
.  is a Good Packet.  X  is a Bad Packet.
Type any key to stop.
................................................
....................................................................
....................................................................
........................................................
ok
```

CODE EXAMPLE 4-4   `watch-net-all` Output Message

```
ok watch-net-all
/pci@1f,0/pci@1,1/network@1,1
Hme register test --- succeeded.
Internal loopback test -- succeeded.
Transceiver check -- Using Onboard Transceiver - Link Up. passed
Using Onboard Transceiver - Link Up.
Looking for Ethernet Packets.
.  is a Good Packet.
X  is a Bad Packet.
Type any key to stop. ........ ........
......................................................
....................................................................
....................................................................
..................................
ok
```

4.8.7.3 `probe-scsi`

The `probe-scsi` command transmits an inquiry command to SCSI devices connected to the system unit on-board SCSI interface. If the SCSI device is connected and active, the target address, unit number, device type, and manufacturer name is displayed. CODE EXAMPLE 4-5 identifies the probe-scsi output message.

CODE EXAMPLE 4-5   `probe-scsi` Output Message

```
ok probe-scsi
Primary UltraSCSI bus:
Target 0 Unit 0 Disk SEAGATE ST32272W 0876
Target 6
Unit 0 Removable Read Only device TOSHIBA CD-ROM XM-6201TA1037
ok
```

4.8.7.4 `test` *alias* name, device path, -all

The `test` command, combined with a device alias or device path, enables a device self-test program. If a device has no self-test program, the message: `No selftest method` for *device name* is displayed. To enable the self-test program for a device, type the `test` command followed by the device alias or device path name. TABLE 4-5 lists test *alias name* selections, a description of the selection, and preparation.

TABLE 4-5   Selected OBP On-Board Diagnostic Tests

Type of Test	Description	Preparation
test screen	Tests system video graphics hardware and monitor.	Diag-switch? NVRAM parameter must be true for the test to execute.
test floppy	Tests diskette drive response to commands.	A formatted diskette must be inserted into the diskette drive.
test net	Performs internal/external loopback test of the system auto-selected Ethernet interface.	An Ethernet cable must be attached to the system and to an Ethernet tap or hub or the external loopback test fails.

TABLE 4-5   Selected OBP On-Board Diagnostic Tests

Type of Test	Description	Preparation
test ttya test ttyb	Outputs an alphanumeric test pattern on the system serial ports: ttya, serial port A; ttyb, serial port B.	A terminal must be connected to the port being tested to observe the output.
test keyboard	Executes the keyboard self-test.	Four keyboard LEDs should flash once and a message is displayed: Keyboard Present.
test -all	Sequentially test system-configured devices containing self-test.	Tests are sequentially executed in device-tree order (viewed with the show-devs command).

4.8.8   OpenBoot Diagnostics (OB Diag)

OpenBoot Diagnostics is an interactive tool that tests various hardware and peripheral devices. When obdiag is typed at the ok prompt in OBP, the menu shown in CODE EXAMPLE 4-6 is displayed on the screen.

OBDiag performs root-cause failure analysis on the referenced devices by testing internal registers, confirming subsystem integrity, and verifying device functionality. To run OBDiag:

1. **At the ok prompt, enter** obdiag**.**

This displays the OBDiag menu as shown in CODE EXAMPLE 4-6.

2. **At the OBDiag menu prompt, enter a number from the menu (such as 17 to enable toggle script-debug messages).**

CODE EXAMPLE 4-6   OBDiag Menu

```
0 .... PCI/Cheerio
1 .... EBUS DMA/TCR Registers
2 .... Ethernet
3 .... Ethernet2 <Inactive>
4 .... Parallel Port
5 .... Serial Port C (on optional I/O board) <Inactive>
6 .... Serial Port D (on optional I/O board) <Inactive>
7 .... NVRAM
8 .... Floppy
9 .... Serial port A
10 ... Serial port B
11 ... RAS
12 ... User Flash1
13 ... User Flash2
14 ... All Above
15 ... Quit
16 ... Display this Menu
17 ... Toggle Script-debug
18 ... Enable External Loopback Tests
19 ... Disable External Loopback Tests
Enter (0-14 tests, 15 -Quit, 16 -Menu) ===>
```

⚠ **Caution –** Prior to running `obdiag`, do not run any other OBP command that may change the hardware state of the board. After `obdiag` tests are run, always reset the system to bring it to a known state.

The user may type the relevant numbers at this point to run all or some of the tests. If an error is detected the error message is displayed on the screen. For example, if an error is detected while testing the floppy disk drive, a display similar to the following message is displayed on the screen:

```
TEST= floppy_test
STATUS= FAILED
SUBTEST= floppy_id0_read_test
ERRORS= 1
TTF= 66
SPEED= 440 MHz
PASSES= 1
MESSAGE= Error: Recalibrate failed. floppy missing, improperly
connected, or defective.
```

Some of the individual items on the OBDiag menu are described in further detail in the following paragraphs.

4.8.8.1   PCI/PCIO

The PCI/PCIO diagnostic performs the following:

- `vendor_ID_test`: Verifies that the PCIO ASIC vendor ID is 108e.
- `device_ID_test`: Verifies that the PCIO ASIC device ID is 1000.
- `mixmode_read`: Verifies that the PCI configuration space is accessible as half-word bytes by reading the EBus2 vendor ID address.
- `2_class_test`: Verifies the address class code. Address class codes include bridge device (0 x B, 0 x 6), other bridge device (0 x A and 0 x 80), and programmable interface (0 x 9 and 0 x 0).
- `status_reg_walk1`: Performs walk-one test on status register with mask 0 x 280 (PCIO ASIC is accepting fast back-to-back transactions, DEVSEL timing is 0 x 1).
- `line_size_walk1`: Performs tests a through e.
- `latency_walk1`: Performs walk one test on latency timer.
- `line_walk1`: Performs walk one test on interrupt line.
- `pin_test`: Verifies that the interrupt pin is logic-level high (1) after reset.

CODE EXAMPLE 4-7 identifies the PCI/PCIO output message.

CODE EXAMPLE 4-7   PCI/PCIO Output Message

```
Enter (0-14 tests, 15 -Quit, 16 -Menu) ===> 0

TEST= all_pci/PCIO_test
SUBTEST= vendor_id_test
SUBTEST= device_id_test
SUBTEST= mixmode_read
SUBTEST= e2_class_test
SUBTEST= status_reg_walk1
SUBTEST= line_size_walk1
SUBTEST= latency_walk1
SUBTEST= line_walk1
SUBTEST= pin_test

Enter (0-14 tests, 15 -Quit, 16 -Menu) ===>
```

4.8.8.2   EBus DMA/TCR Registers

The EBUS DMA/TCR registers diagnostic performs the following:

- The `dma_reg_test`: Performs a walking ones bit test for control status register, address register, and byte count register of each channel. Verifies that the control status register is set properly.
- The `dma_func_test`: Validates the DMA capabilities and FIFOs. The test is executed in a DMA diagnostic loopback mode. It initializes the data of transmitting memory with its address, performs a DMA read and write, and verifies that the data received is correct. This is repeated for four channels.

CODE EXAMPLE 4-8 identifies the EBus DMA/TCR registers output message.

CODE EXAMPLE 4-8   EBus DMA/TCR Registers Output Message

```
Enter (0-14 tests, 15 –Quit, 16 –Menu) ===> 1


TEST= all_dma/ebus_test
SUBTEST= dma_reg_test
SUBTEST= dma_func_test


Enter (0-14 tests, 15 –Quit, 16 –Menu) ===>
```

4.8.8.3   Ethernet

The Ethernet diagnostic performs the following:

- `my_channel_reset` resets the Ethernet channel.
- `hme_reg_test` performs Walk1 on the following registers set: global register 1, global register 2, bmac xif register, bmac tx register, and the mif register.
- `MAC_internal_loopback_test` performs Ethernet channel engine internal loopback.
- `10_mb_xcvr_loopback_test` enables the 10Base-T data present at the transmit MII data inputs to be routed back to the receive MII data outputs.
- `100_mb_phy_loopback_test` enables MII transmit data to be routed to the MII receive data path.
- `100_mb_twister_loopback_test` forces the twisted-pair transceiver into loopback mode.

CODE EXAMPLE 4-9 identifies the Ethernet output message.

CODE EXAMPLE 4-9   Ethernet Output Message

```
Enter (0-14 tests, 15 -Quit, 16 -Menu) ===> 2

TEST= ethernet_test
SUBTEST= my_channel_reset
SUBTEST= hme_reg_test
SUBTEST= global_reg1_test
SUBTEST= global_reg2_test
SUBTEST= bmac_xif_reg_test
SUBTEST= bmac_tx_reg_test
SUBTEST= mif_reg_test
Test only supported for National Phy DP83840A
SUBTEST= 10mb_xcvr_loopback_test
selecting internal transceiver
Test only supported for National Phy DP83840A
SUBTEST= 100mb_phy_loopback_test
selecting internal transceiver
Test only supported for National Phy DP83840A
SUBTEST= 100mb_twister_loopback_test
selecting internal transceiver
Test only supported for National Phy DP83840A

Enter (0-14 tests, 15 -Quit, 16 -Menu) ===>
```

4.8.8.4   Parallel Port

The parallel port diagnostic performs the dma_read. This enables ECP mode and ECP DMA configuration, and FIFO test mode. It transfers 16 bytes of data from the memory to the parallel port device and then verifies that the data is in TFIFO. CODE EXAMPLE 4-10 identifies the parallel port output message.

CODE EXAMPLE 4-10   Parallel Port Output Message

```
Enter (0-14 tests, 15 -Quit, 16 -Menu) ===> 4

TEST= parallel_port_test
SUBTEST= dma_read

Enter (0-14 tests, 15 -Quit, 16 -Menu) ===>
```

4.8.8.5 Serial Port A

The serial port A diagnostic invokes the uart_loopback test. This test transmits and receives 128 characters and checks the transaction validity. CODE EXAMPLE 4-11 identifies the serial port A output message.

CODE EXAMPLE 4-11 Serial Port A Output Message

```
Enter (0-14 tests, 15 -Quit, 16 -Menu) ===> 9

TEST= uarta_test

Enter (0-14 tests, 15 -Quit, 16 -Menu) ===>
```

Note – The serial port A diagnostic will stall if the TIP line is installed on serial port A. CODE EXAMPLE 4-12 identifies the serial port A output message when the TIP line is installed on serial port A.

CODE EXAMPLE 4-12 Serial Port A Output Message with TIP Line Installed

```
Enter (0-14 tests, 15 -Quit, 16 -Menu) ===> 9

TEST= uarta_test
UART A in use as console - Test not run.

Enter (0-14 tests, 15 -Quit, 16 -Menu) ===>
```

4.8.8.6 Serial Port B

The serial port B diagnostic is identical to the serial port A diagnostic.
CODE EXAMPLE 4-13 identifies the serial port B output message.

Note – The serial port B diagnostic will stall if the TIP line is installed on serial port B.

CODE EXAMPLE 4-13 Serial Port B Output Message

```
Enter (0-14 tests, 15 -Quit, 16 -Menu) ===> 10

TEST= uartb_test

Enter (0-14 tests, 15 -Quit, 16 -Menu) ===>
```

4.8.8.7   NVRAM

The NVRAM diagnostic verifies the NVRAM operation by performing a write and read to the NVRAM. CODE EXAMPLE 4-14 identifies the NVRAM output message.

CODE EXAMPLE 4-14   NVRAM Output Message

```
Enter (0-14 tests, 15 -Quit, 16 -Menu) ===> 7

TEST= nvram_test
SUBTEST= write/read_patterns
SUBTEST= write/read_inverted_patterns

Enter (0-14 tests, 15 -Quit, 16 -Menu) ===>
```

4.8.8.8   All Above

The All Above diagnostic validates the system unit. CODE EXAMPLE 4-15 shows an
example of the All Above option output message.

CODE EXAMPLE 4-15   All Above Output Message

```
Enter (0-14 tests, 15 -Quit, 16 -Menu) ===> 14

TEST= all_pci/cheerio_test
SUBTEST= vendor_id_test
SUBTEST= device_id_test
...
SUBTEST= bmac_xif_reg_test
SUBTEST= bmac_tx_reg_test
SUBTEST= mif_reg_test
SUBTEST= mac_internal_loopback_test
selecting internal transceiver
Test only supported for National Phy DP83840A
...
SUBTEST= 100mb_twister_loopback_test
selecting internal transceiver
Test only supported for National Phy DP83840A
TEST= ethernet2_test
TEST= parallel_port_test
SUBTEST= dma_read
TEST= uarta_test
...
SUBTEST= write/read_patterns
...
ttya in use as console - Test not run.
TEST= usi_test
ttyb in use as console - Test not run.
TEST= ras_test  env-monitor = disabled
SUBTEST= obd-init-i2c-test
...
TEST= flash_test
SUBTEST= flash-supported?
TEST= flash_test
SUBTEST= flash-supported?

Enter (0-14 tests, 15 -Quit, 16 -Menu) ===>
```

PART **III** Replacing Hot-Swappable FRUs

Hot Swap Software Commands

Certain FRUs in the Netra ct server are hot-swappable (see "Hot-Swappable FRUs" on page 1-4). Hot swap, a key feature of the PICMG standard, means that a CompactPCI card that meets the PICMG standard can be reliably inserted into or extracted from a powered and operating CompactPCI platform without affecting the other functions of the platform. The standard also defines state transitions for the hardware and software connection processes that allow the card to be connected and configured.

The Netra ct server allows for two models of hot swap:

- Basic hot swap
- Full hot swap

The models can be explained by first defining two terms:

- Hardware connection process—the electrical connection (and disconnection) of an I/O board.
- Software connection process—the software management by the operating system of the board (allocating/releasing resources, attaching/detaching device drivers, etc).

In the *basic* hot swap model, the hardware connection process can be performed automatically by the hardware, while the software connection process requires operator assistance.

In the *full* hot swap model, both the hardware and the software connection process are performed automatically.

The Netra ct server uses the `cfgadm` utility to support hot swapping and requires user intervention for hardware connection in the basic hot swap mode.

5.1 Using the `cfgadm` Utility

You can perform the following hot swap procedures using the `cfgadm` utility:

- Deactivate and activate hot-swappable FRUs
- Enable and disable *full* hot swap for I/O slots in a server
- Enable and disable *basic* hot swap for I/O slots in a server

5.1.1 Logging In to the Netra ct Server

In order to use the `cfgadm` utility, you must be able to log in to the server either remotely, where you would log in to the Netra ct server as root through another server on the network, or directly, where you would connect a terminal console directly to your Netra ct server.

For more information on connecting a terminal console to your system, refer to Appendix B.

5.1.2 Running the `cfgadm` Utility

For all `cfgadm` commands, you must know the attachment point ID for the I/O slot that you will be working on. To list the attachment point IDs for the I/O slots in a server, log into the server and, as root, enter the following command:

```
# cfgadm pci
```

For a Netra ct 800 server, you should get feedback similar to the following:

```
Ap_Id                   Type            Receptacle      Occupant        Condition
pci_pci0:cpci_slot2     unknown         empty           unconfigured    unknown
pci_pci0:cpci_slot3     stpcipci/fhs    connected       configured      ok
pci_pci0:cpci_slot4     stpcipci/fhs    connected       configured      ok
pci_pci0:cpci_slot5     unknown         empty           unconfigured    unknown
pci_pci0:cpci_slot6     unknown         empty           unconfigured    unknown
pci_pci0:cpci_slot7     unknown         empty           unconfigured    unknown
pci_pci0:cpci_slot8     stpcipci/fhs    connected       configured      ok
```

For a Netra ct 400 server, you should get feedback similar to the following:

```
Ap_Id                   Type          Receptacle   Occupant       Condition
pci_pci0:cpci_slot1     unknown       empty        unconfigured   unknown
pci_pci0:cpci_slot2     stpcipci/fhs  connected    configured     ok
pci_pci0:cpci_slot4     stpcipci/fhs  connected    configured     ok
pci_pci0:cpci_slot5     unknown       empty        unconfigured   unknown
```

The attachment point ID is shown in the first column of the readout; for example, the attachment point ID for I/O slot 2 in a Netra ct 800 server would be pci_pci0:cpci_slot2.

Note – If you get an error message after entering the cfgadm pci command, it may mean that you did not install the envmond software from the Supplement for Solaris Operating Environment for Sun Computer Systems CD when you installed the Solaris operating environment onto your Netra ct server. Follow the instructions in the *Netra ct Server Installation Guide* to install the envmond software onto your Netra ct server, then return here.

To view the online help for cfgadm, as root, enter:

```
# cfgadm -h pci
```

You should get the following feedback:

```
PCI hotplug specific commands:
   -c [connect|disconnect|configure|unconfigure|insert|remove] ap_id [ap_id...]
   -x enable_slot ap_id [ap_id...]
   -x disable_slot ap_id [ap_id...]
   -x enable_autoconfig ap_id [ap_id...]
   -x disable_autoconfig ap_id [ap_id...]
   -x led[=[fault|power|active|attn],mode=[on|off|blink]] ap_id [ap_id...]
```

You can also view the man page for the cfgadm utility by entering man cfgadm at the prompt.

5.1.2.1 Deactivating and Activating a Hot Swappable FRU

The Netra ct servers are set to basic hot swap by default. This means that if an I/O card becomes faulty and needs replacing, you must manually deactivate the I/O slot using the `cfgadm` utility before you can remove the card, and then manually reactivate the I/O slot after replacing the card.

To deactivate an I/O card, as root, enter:

```
# cfgadm -c unconfigure ap_id
```

where *ap_id* is the attachment point ID. For example, to deactivate an I/O card in slot 4, as root, enter:

```
# cfgadm -c unconfigure pci_pci0:cpci_slot4
```

To activate an I/O card, as root, enter:

```
# cfgadm -c configure ap_id
```

where *ap_id* is the attachment point ID.

5.1.2.2 Enabling Full Hot Swap on I/O Slots

You can use `cfgadm` to enable full hot swap on an I/O slot in a server. Enabling full hot swap on an I/O slot means that you do not have to manually deactivate or activate the I/O card when replacing it in the server; those processes are handled automatically by the system.

To enable full hot swap for an I/O slot in a Netra ct server, as root, enter:

```
# cfgadm -x enable_autoconfig ap_id
```

where *ap_id* is the attachment point ID in the server that you want to have full hot swap enabled on. For example, to enable full hot swap for I/O slot 4, as root, you could enter the following:

```
# cfgadm -x enable_autoconfig pci_pci0:cpci_slot4
```

Note – Whenever you reboot or power your server on and off, the hot swap states revert back to the default basic hot swap state for all I/O slots. You must manually reset the I/O slots to full hot swap after rebooting or powering your server on and off.

Note – If you are enabling full hot swap on an I/O slot that holds an alarm card or alarm rear transition card, you must also verify that you have the `envmond` software installed and running in order for full hot swap to work on the card.

5.1.2.3 Enabling Basic Hot Swap on I/O Slots

If you've enabled full hot swap on an I/O slot in your Netra ct server, you can disable full hot swap, bringing the I/O slot back to the basic hot swap state. To disable full hot swap on an I/O slot, bringing it back to its original basic hot swap state, as root, enter:

```
# cfgadm -x disable_autoconfig ap_id
```

5.1.2.4 Determining the Current Hot Swap State

To determine the current hot swap state for the I/O slots in your server, as root, enter:

```
# prtconf -v
```

The following screens give two example outputs:

TABLE 5-1   Example Output for Basic Hot Swap Systems

```
...
sysctrl, instance #0
    Driver properties:
        name <hotswap-mode> length <5>
            value 'basic'
        name <slot5-autoconfig> length <8>
            value 'disabled'
        name <slot4-autoconfig> length <8>
            value 'disabled'
        name <slot2-autoconfig> length <8>
            value 'disabled'
        name <slot1-autoconfig> length <8>
            value 'disabled'
```

TABLE 5-2   Example Output for Full Hot Swap Systems

```
...
sysctrl, instance #0
    Driver properties:
        name <hotswap-mode> length <5>
            value 'full'
        name <slot5-autoconfig> length <8>
            value 'enabled'
        name <slot4-autoconfig> length <8>
            value 'enabled'
        name <slot2-autoconfig> length <8>
            value 'enabled'
        name <slot1-autoconfig> length <9>
            value 'disabled'
```

- If you see `value 'basic'` underneath the `<hotswap-mode>` line (see TABLE 5-1), then *all* of the I/O slots in the Netra ct server have been set to *basic* hot swap. You should see `value 'disabled'` for every I/O slot in the system in this situation.

- If you see `value 'full'` underneath the `<hotswap-mode>` line (see TABLE 5-2), then *at least one* of the I/O slots in the Netra ct server has been set to *full* hot swap. You must look at the entries for individual I/O slots to determine if they have been set to basic or full hot swap mode in this situation:

  - If you see `value 'enabled'` underneath a `<slot#-autoconfig>` line, then that slot is set to *full* hot swap. For example, in TABLE 5-2, I/O slots 5, 4, and 2 are all set to full hot swap.

- If you see `value 'disabled'` underneath a `<slot#-autoconfig>` line, then that slot is set to *basic* hot swap. For example, in TABLE 5-2, I/O slot 1 is set to basic hot swap.

Removing and Replacing Hot-Swappable Cards

Caution – An energy hazard is present if any I/O slots are left uncovered. If you remove a card from an I/O slot, you must fill it with either a replacement card or a filler panel.

Note – When removing a hot-swappable component, allow several seconds before inserting it or another component in that slot. Rapidly removing and inserting any hot-swappable component might panic or hang the system.

This chapter gives procedures for the installation, removal, and replacement of hot-swappable cards. The procedures differ somewhat between front-access and rear-access servers, so this chapter is organized as follows:

- "Front-Access Models" on page 6-2
- "Rear-Access Models" on page 6-39

Consult the *Netra ct Server Safety and Compliance Manual* for safety information prior to performing the procedures in this chapter.

Note – Read Chapter 3 "Handling Cards and Assemblies" before performing the procedures in this chapter.

6.1 Front-Access Models

This section gives procedures for the installation, removal, and replacement of the following hot-swappable cards for the front-access models of the Netra ct 400 server and Netra ct 800 server:

- "I/O Card" on page 6-2
- "Alarm Card" on page 6-18

Note – The CPU card and CPU front transition card are not hot-swappable, so the procedures for those cards are not covered in this chapter. For removal and replacement procedures for those cards, refer to Chapter 10 "Removing and Replacing Cold-Swappable Cards."

6.1.1 I/O Card

These instructions apply to the installation or removal and replacement of a 6U I/O card from the front-access model versions of the Netra ct servers.

The term *I/O slot* refers to any slot into which you can install an I/O card, such as a Sun Quad FastEthernet™ card. An I/O slot is distinguished from the slot occupied by the CPU card or alarm card. In the Netra ct 800 server, the slot occupied by a front transition card can be occupied by an I/O card, if the front transition card is not present. An I/O card *cannot* be installed in a slot meant for the CPU card or alarm card. All the slots for I/O cards in the Netra ct server support hot swap.

FIGURE 6-1 shows the I/O card slots in a Netra ct 800 server.
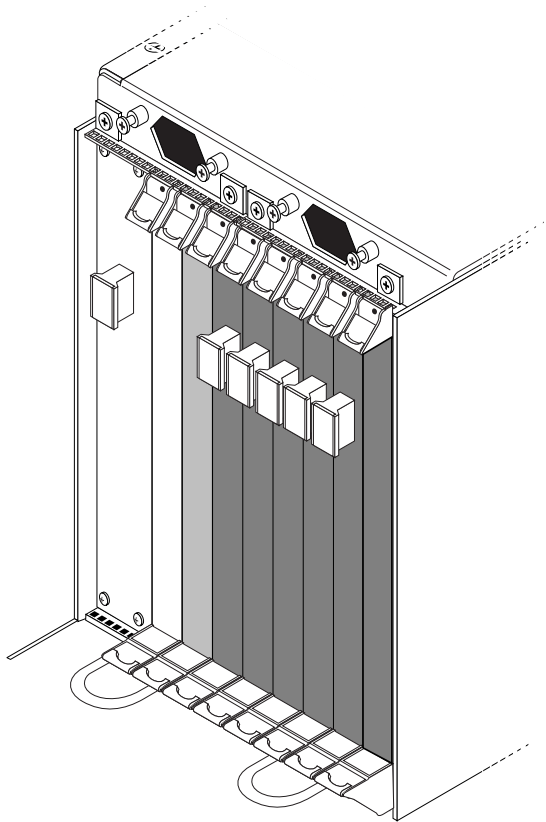
Legend:

▢ CPU front transition or I/O card

▢ I/O cards only

▢ Alarm card only

FIGURE 6-1 I/O Card Slots (Netra ct 800 Server)

FIGURE 6-2 shows the buses on a Netra ct 800 server.
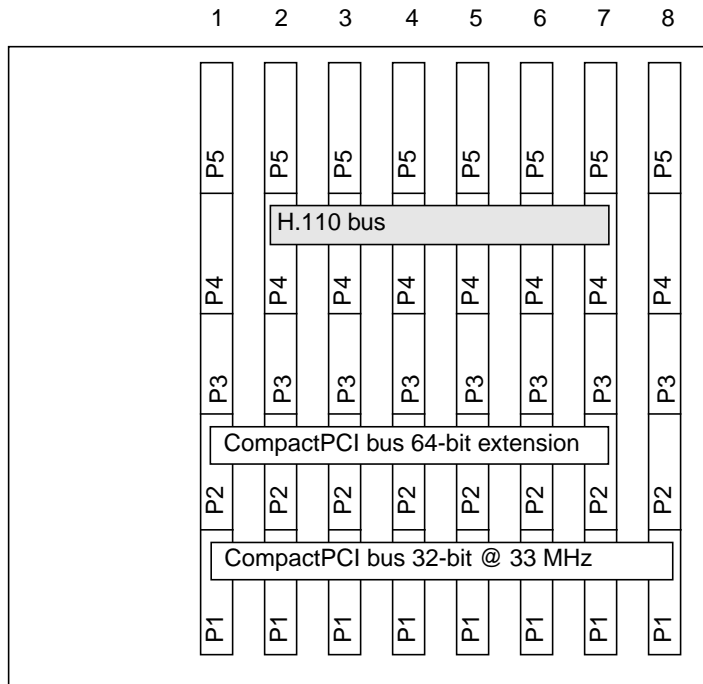
FIGURE 6-2   Buses for the Netra ct 800 Server (Front View)

FIGURE 6-3 shows the I/O card slots in a Netra ct 400 server.
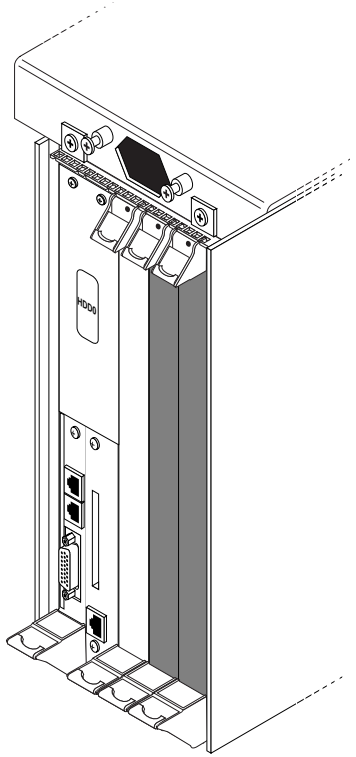
Legend: I/O cards only

FIGURE 6-3   I/O Card Slots (Netra ct 400 Server)

FIGURE 6-4 shows the buses on a Netra ct 400 server.
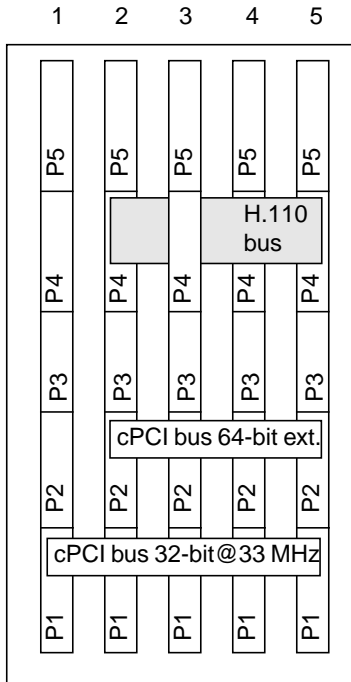
FIGURE 6-4 Buses for the Netra ct 400 Server (Front View)

The individual I/O slots in your server will be set to either *basic* hot swap, the default setting, or *full* hot swap, which must be set manually. Refer to Chapter 5 for more information.

- If you are removing and replacing a *faulty* I/O card in the server, first to go "Removing an I/O Card" on page 6-7, then go to "Installing an I/O Card" on page 6-13.

- If you are installing a *new* I/O card in the server, go to "Installing an I/O Card" on page 6-13.

6.1.1.1 Removing an I/O Card

Note – If you want to manually deconfigure a hot swap I/O card remotely, log into the server and skip to Step **8** on page 6-11.

1. **Perform any necessary card-specific software commands.**

   There are certain card-specific software commands that you might have to perform before removing a hot-swappable I/O card. Refer to the documentation that you received with the I/O card for any card-specific procedures before proceeding with this procedure.

2. **Attach the antistatic wrist strap.**

   Refer to "Attaching the Antistatic Wrist Strap" on page 1-1.

3. **Locate the I/O card that you want to remove from the server.**
   - FIGURE 6-1 on page 6-3 shows the I/O card slots in a Netra ct 800 server.
   - FIGURE 6-3 on page 6-5 shows the I/O card slots in a Netra ct 400 server.

4. **Using a No. 2 Phillips screwdriver, loosen the two captive screws inside the card's ejection levers, one on top and one on the bottom (**FIGURE 6-5**).**
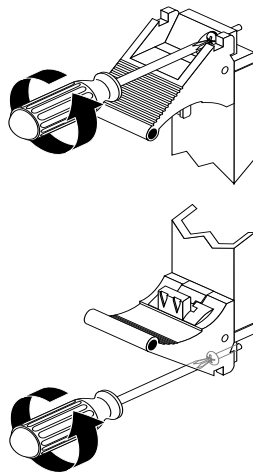
FIGURE 6-5   Loosening the Ejection Lever Captive Screws

5. **Unlock the ejection levers.**

Caution – Only unlock the ejection levers at this point; do *not* unseat the I/O card until the I/O card LEDs on the system status panel are in the proper state.

Note – If the server is set to full hot-swap mode, unlocking the ejection levers automatically starts the software driver *detachment* process. If you decide that you do *not* want to remove the card, you must completely unseat the card, reseat it, then lock the ejection levers again in order to start the software driver *attachment* process. Simply locking the ejection levers after unlocking them will not start the driver attachment process.

There are several different models of locking ejection levers, so the method you would use to unlock the ejection levers will vary depending on the model of the ejection lever used on the card; for example, one model uses red tabs at the top and bottom to unlock the card (FIGURE 6-6). Refer to the documentation that came with the I/O card for instructions on unlocking the card.

FIGURE 6-6 Unlocking the Ejection Levers

6. **Locate the LEDs on the system status panel for the I/O card that you want to remove to determine if the card has been deactivated.**

The system status panel on each server has LEDs that show the status of the I/O card installed in each set of the slots in that particular server. FIGURE 6-7 shows the locations of the I/O card LEDs on the Netra ct 800 server and FIGURE 6-8 shows the locations of the I/O card LEDs on the Netra ct 400 server. Keep in mind that some

I/O card slots might contain devices or cards other than I/O cards, such as a CPU front transition card or an alarm card. See FIGURE 6-1 and FIGURE 6-3 for possible system configurations.

Caution – Do not deactivate any other I/O cards until you see that the first I/O card has been deactivated. Deactivating more than one card at the same time may lead to unpredictable results.
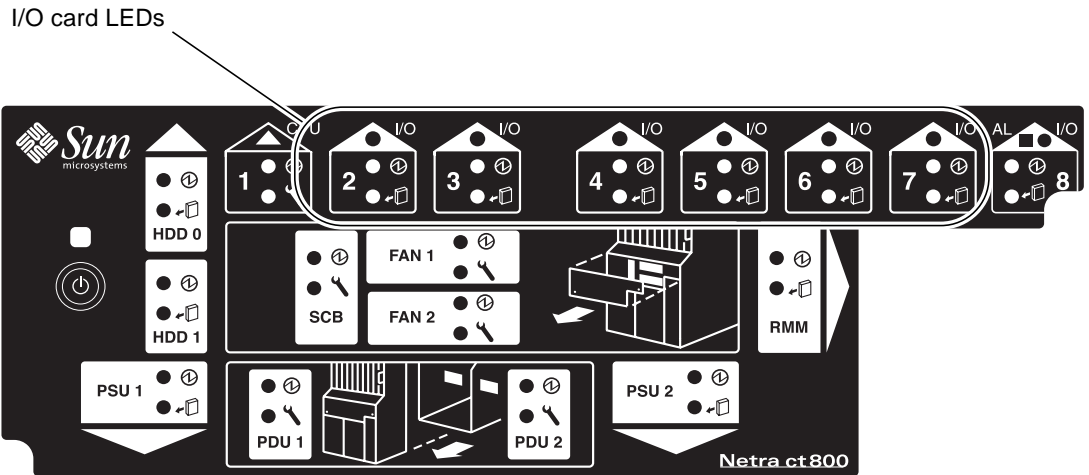
I/O card LEDs

FIGURE 6-7   Locating the I/O Card LEDs on the System Status Panel (Netra ct 800 Server)
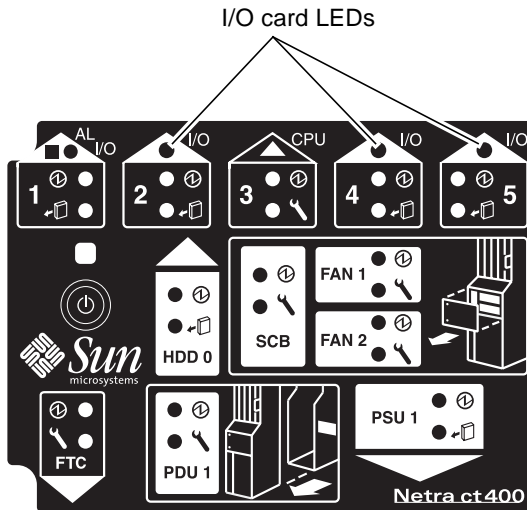
FIGURE 6-8   Locating the I/O Card LEDs on the System Status Panel (Netra ct 400 Server)

The amber Okay to Remove LED ( ) on the system status panel tells whether the I/O card can be safely removed or not:

Status of the Okay to Remove LED ( )	Indication	Go to
On	The I/O slot that holds the I/O card has been set to *full* hot swap. You can remove the I/O card from the slot.	Step 10 on page 6-12
Off	The I/O slot that holds the I/O card has been set to *basic* hot swap. You must use the cfgadm utility to deactivate the I/O card before you can remove it.	Step 7 on page 6-10

7. **Log into the Netra ct server.**

Refer to "Logging In to the Netra ct Server" on page 5-2, then return to this procedure.

8. **Identify the attachment-point ID that corresponds to the I/O slot where you will be removing the I/O card.**

As root, enter:

```
# cfgadm pci
```

For a Netra ct 800 server, you should get feedback similar to the following:

```
Ap_Id                   Type          Receptacle    Occupant        Condition
pci_pci0:cpci_slot2     unknown       empty         unconfigured    unknown
pci_pci0:cpci_slot3     stpcipci/fhs  connected     configured      ok
pci_pci0:cpci_slot4     stpcipci/fhs  connected     configured      ok
pci_pci0:cpci_slot5     unknown       empty         unconfigured    unknown
pci_pci0:cpci_slot6     unknown       empty         unconfigured    unknown
pci_pci0:cpci_slot7     unknown       empty         unconfigured    unknown
pci_pci0:cpci_slot8     stpcipci/fhs  connected     configured      ok
```

For a Netra ct 400 server, you should get feedback similar to the following:

```
Ap_Id                   Type          Receptacle    Occupant        Condition
pci_pci0:cpci_slot1     unknown       empty         unconfigured    unknown
pci_pci0:cpci_slot2     stpcipci/fhs  connected     configured      ok
pci_pci0:cpci_slot4     stpcipci/fhs  connected     configured      ok
pci_pci0:cpci_slot5     unknown       empty         unconfigured    unknown
```

The attachment-point ID is shown in the first column of the readout; for example, the attachment-point ID for I/O slot 4 in a Netra ct 800 server would be pci_pci0:cpci_slot4.

9. **Deactivate the I/O card with the** cfgadm **dynamic reconfiguration software:**

```
# cfgadm -c unconfigure ap_id
```

where *ap_id* is the attachment-point ID. For example, to deactivate the I/O card in slot 4, as root, enter:

```
# cfgadm -c unconfigure pci_pci0:cpci_slot4
```

The amber Okay to Remove LED (↤▯) on the system status panel for the I/O slot should go ON, indicating that you can remove the I/O card from the slot.

⚠ **Caution –** Do not remove the I/O card if the amber Okay to Remove LED (↤▯) is unlit. The amber Okay to Remove LED tells you if you can remove a hot-swappable card safely. Removing a hot-swappable card from an I/O slot when the amber Okay to Remove LED is unlit might panic the system.

10. **When it is safe to remove the I/O card, disconnect any cables connected to the I/O card.**

11. **Press outward on the two ejection levers on the card to unseat the card from the card cage.**

12. **Carefully slide the card out of the slot and place it on the electrostatic discharge mat.**

13. **Secure a blank filler panel over the empty I/O slots, if necessary.**

If you are not going to replace the I/O card right away, you must install a blank filler panel over the opening to ensure proper airflow in the system. The slot filler panel is secured to the card cage using two screws, one at the top of the filler panel, the other at the bottom.

6.1.1.2   Installing an I/O Card

⚠ **Caution –** When moving a number of cards to different slots in the system, move the cards one at a time. If you move multiple cards in rapid succession and at the same time, you may panic or hang the system.

1. **Attach the antistatic wrist strap.**

   Refer to "Attaching the Antistatic Wrist Strap" on page 1-1.

2. **Remove the slot filler panel, if necessary.**

   The slot filler panel is secured to the card cage using two screws, one at the top of the filler panel, the other at the bottom. Store the slot filler panel in a safe place; you may have to use it again if you have to remove an I/O card for an extended period of time.

3. **Get the replacement I/O card from the ship kit.**

4. **Verify that the ejection levers are unlocked.**

   You will not be able to install the card properly if the ejection levers are locked.

5. **Keeping the card vertical, slide the card into the slot between the two guides.**

   The cuts in the handle of the card must align with the square cutouts in the I/O slot. When the card is completely seated in the card cage, the two ejection levers should flip inward, and the notches in the ejection levers should fit smoothly in the rectangular cutouts in the bottom and top plates.
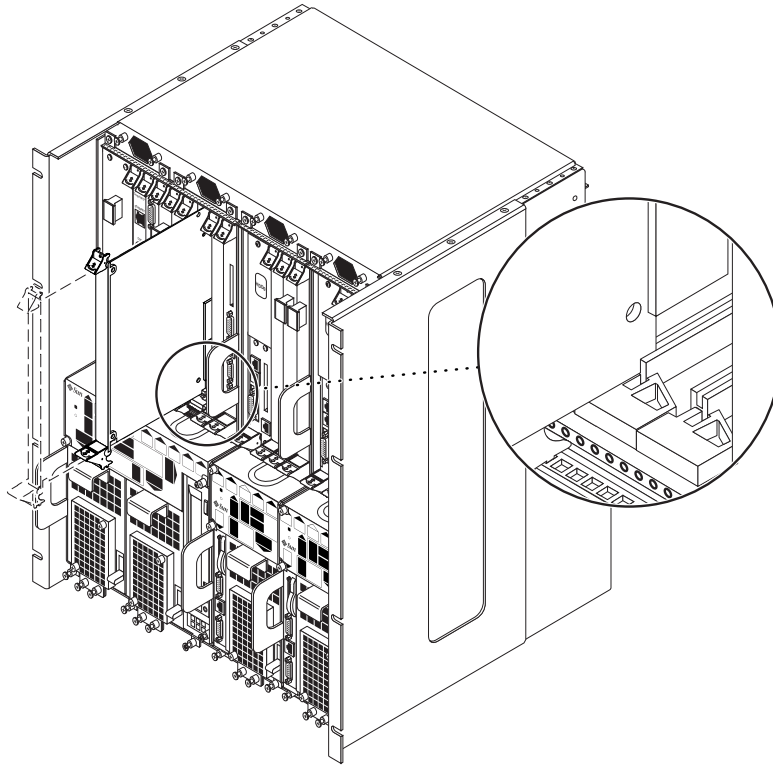
FIGURE 6-9   Aligning the Card with the Card Cage Cutouts

6. Lock the ejection levers.

There are several different models of locking ejection levers, so the method you would use to lock the ejection levers will vary depending on the model of the ejection lever used on the card. Refer to the documentation that came with the I/O card for instructions on locking the ejection levers.
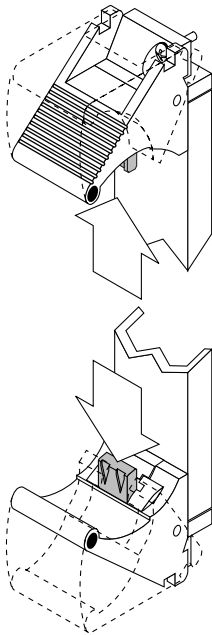
7. Locate the LEDs on the system status panel for the I/O card that you just installed to determine if the card has been activated.

FIGURE 6-7 shows the locations of the I/O card LEDs on the Netra ct 800 server and FIGURE 6-8 shows the locations of the I/O card LEDs on the Netra ct 400 server.

The amber Okay to Remove LED (↵🗔) on the system status panel tells whether the I/O card has been activated:

Status of the Okay to Remove LED (↵🗔)	Indication	Go to
On	The I/O slot that holds the I/O card has been set to *basic* hot swap. You must use the cfgadm utility to activate the I/O card.	Step 8 on page 6-15
Off	The I/O slot that holds the I/O card has been set to *full* hot swap. The card has been activated.	Step 12 on page 6-17

8. **Log into the Netra ct server.**

   Refer to "Logging In to the Netra ct Server" on page 5-2, and then return to this procedure.

9. **Identify the attachment-point ID that corresponds to the I/O slot where you installed the I/O card.**

   As root, enter:

   ```
   # cfgadm pci
   ```

   For a Netra ct 800 server, you should get feedback similar to the following:

   ```
   Ap_Id                   Type          Receptacle      Occupant        Condition
   pci_pci0:cpci_slot2     unknown       empty           unconfigured    unknown
   pci_pci0:cpci_slot3     stpcipci/fhs  connected       configured      ok
   pci_pci0:cpci_slot4     unknown       disconnected    unconfigured    unknown
   pci_pci0:cpci_slot5     unknown       empty           unconfigured    unknown
   pci_pci0:cpci_slot6     unknown       empty           unconfigured    unknown
   pci_pci0:cpci_slot7     unknown       empty           unconfigured    unknown
   pci_pci0:cpci_slot8     stpcipci/fhs  connected       configured      ok
   ```

For a Netra ct 400 server, you should get feedback similar to the following:

```
Ap_Id                   Type          Receptacle     Occupant        Condition
pci_pci0:cpci_slot1     unknown       empty          unconfigured    unknown
pci_pci0:cpci_slot2     unknown       disconnected   unconfigured    unknown
pci_pci0:cpci_slot4     stpcipci/fhs  connected      configured      ok
pci_pci0:cpci_slot5     unknown       empty          unconfigured    unknown
```

The attachment-point ID is shown in the first column of the readout; for example, the attachment-point ID for I/O slot 4 in a Netra ct 800 server would be `pci_pci0:cpci_slot4`. Note that the information for the card installed in I/O slot 4 in the example feedback shows it as unknown (Type), disconnected (Receptacle), unconfigured (Occupant), and unknown (Condition). This confirms that the I/O slot has been set to basic hot swap and that the card in the I/O slot has not yet been activated.

10. **Connect the I/O card with the** `cfgadm` **dynamic reconfiguration software:**

```
# cfgadm -c connect ap_id
```

where *ap_id* is the attachment-point ID. For example, to connect the I/O card in slot 4, as root, enter:

```
# cfgadm -c connect pci_pci0:cpci_slot4
```

The amber Okay to Remove LED (↵▯) on the system status panel for the I/O slot should go OFF, indicating that the card has been connected.

11. **Activate the I/O card with the** `cfgadm` **dynamic reconfiguration software:**

```
# cfgadm -c configure ap_id
```

where *ap_id* is the attachment-point ID. For example, to activate the I/O card in slot 4, as root, enter:

```
# cfgadm -c configure pci_pci0:cpci_slot4
```

If you were to enter the `cfgadm pci` command again at this point, you should see the fields changed for the card in I/O slot 4:

```
Ap_Id                   Type          Receptacle   Occupant       Condition
pci_pci0:cpci_slot2     unknown       empty        unconfigured   unknown
pci_pci0:cpci_slot3     stpcipci/fhs  connected    configured     ok
pci_pci0:cpci_slot4     stpcipci/fhs  connected    configured     ok
pci_pci0:cpci_slot5     unknown       empty        unconfigured   unknown
pci_pci0:cpci_slot6     unknown       empty        unconfigured   unknown
pci_pci0:cpci_slot7     unknown       empty        unconfigured   unknown
pci_pci0:cpci_slot8     stpcipci/fhs  connected    configured     ok
```

12. **Using a No. 2 Phillips screwdriver, tighten the two captive screws inside the card's ejection levers, one on top and one on the bottom.**

FIGURE 6-10 Tightening the Ejection Lever Captive Screws

13. **Connect to the replacement I/O card any cables that you unplugged from the failed I/O card.**

14. **Perform any I/O card-specific software configuration procedures, if necessary.**

    Refer to the documentation that you received with your CompactPCI I/O card for more information.

6.1.2   Alarm Card

⚠ **Caution –** The maximum voltage that can be applied to an alarm card is 60 VDC, as specified in UL1950 and IEC 60950. The maximum current is 500mA.

⚠ **Caution –** The console is directed to the TTY A port (also known as the COM 1 port) on the CPU or CPU transition card by default. As long as the console is directed to the TTY A port on the CPU or CPU transition card, the alarm card or alarm rear transition card is hot-swappable. If you redirect the console to rsc on the alarm card, the alarm card is no longer hot-swappable. You must redirect console back to the TTY A port on the CPU or CPU transition card and reboot the system if you want the alarm card or alarm rear transition card to be hot-swappable.

There are two different types of alarm cards used in the Netra ct server:

- The 6U, single-slot alarm card used in the Netra ct 800 server
- The 3U, dual-slot alarm card used in the Netra ct 400 server

The I/O slot(s) that hold the alarm card in the servers is set to either *basic* hot swap, the default setting, or *full* hot swap, which must be set manually. Refer to Chapter 5 for more information.

- To remove and replace the 6U, single-slot alarm card used in the Netra ct 800 server, go to "Removing and Replacing an Alarm Card in the Netra ct 800 Server" on page 6-18.

- To remove and replace the 3U, dual-slot alarm card used in the Netra ct 400 server, go to "Removing and Replacing an Alarm Card in the Netra ct 400 Server" on page 6-29.

6.1.2.1   Removing and Replacing an Alarm Card in the Netra ct 800 Server

- If you are removing and replacing a *faulty* alarm card in the server, first to go "Removing an Alarm Card (Netra ct 800 Server)" on page 6-19, then go to "Installing an Alarm Card (Netra ct 800 Server)" on page 6-24.

- If you are installing a *new* alarm card in the server, go to "Installing an Alarm Card (Netra ct 800 Server)" on page 6-24.

Removing an Alarm Card (Netra ct 800 Server)

Note – If you want to manually unconfigure a hot-swap alarm card remotely, log in to the server and skip to Step 10 on page 6-23.

---

1. **Log into the Netra ct server.**

   Refer to "Logging In to the Netra ct Server" on page 5-2, then return to this procedure.

2. **As root, enter the following command:**

   ```
   # pkill -USR1 envmond
   ```

3. **Change directories to the rsc directory:**

   ```
   # cd /usr/platform/SUNW,UltraSPARC-IIi-Netract/rsc
   ```

4. **Create a backup file to record the RSC configuration settings on a remote system.**

   As root, enter:

   ```
   # ./rscadm show > remote-filename
   ```

   where *remote-filename* is a meaningful file name that includes the name of the server that RSC controls.

5. **Attach the antistatic wrist strap.**

   Refer to "Attaching the Antistatic Wrist Strap" on page 1-1.

6. **Locate the alarm card for the Netra ct 800 server.**

Single-wide
6U alarm card
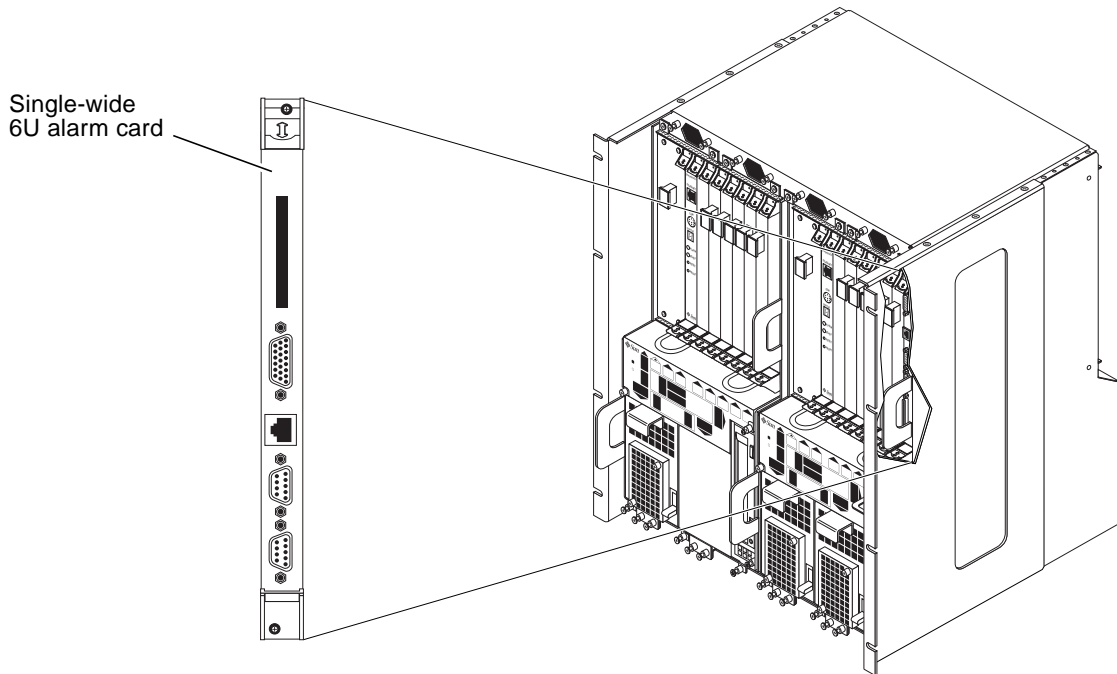
FIGURE 6-11 Location of Alarm Card in Netra ct 800 Server

7. Using a No. 2 Phillips screwdriver, loosen the two captive screws inside the card's ejection levers, one on top and one on the bottom (FIGURE 6-5 **on page 6-7).**

8. Unlock the ejection levers.

⚠️

Caution – Only unlock the ejection levers at this point; do *not* unseat the alarm card until the amber Okay to Remove LED (↜▢) on the system status panel is in the proper (lit) state.

Note – If the server is set to full hot-swap mode, unlocking the ejection levers automatically starts the software driver *detachment* process. If you decide that you do *not* want to remove the card, you must completely unseat the card, reseat it, then lock the ejection levers again in order to start the software driver *attachment* process. Simply locking the ejection levers after unlocking them will not start the driver attachment process.
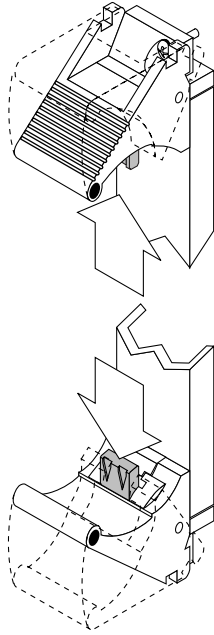
FIGURE 6-12 Unlocking the Ejection Levers

9. Locate the LEDs on the system status panel for the alarm card to determine if the card has been deactivated (FIGURE 6-13**).**

Caution – Do not deactivate any other cards until you see that the alarm card has been deactivated. Deactivating more than one card at the same time may lead to unpredictable results.

Alarm card slot LEDs

FIGURE 6-13 Locating the Alarm Card LEDs on the System Status Panel (Netra ct 800 Server)

The amber Okay to Remove LED (⬅▢) on the system status panel indicates whether the alarm card can be safely removed or not:

Status of the Okay to Remove LED (⬅▢)	Indication	Go to
On	The I/O slot that holds the alarm card has been set to *full* hot swap. You can remove the alarm card from the slot.[1]	Step 12 on page 6-23
Off	The I/O slot that holds the alarm card has been set to *basic* hot swap. You must use the `cfgadm` utility to deactivate the alarm card before you can remove it.	Step 10 on page 6-23

1. The `envmond` software must be installed and running for full hot swap to work on an alarm card.

10. **Identify the attachment-point ID that corresponds to I/O slot 8, which is the I/O slot that holds the alarm card.**

    As root, enter:

    ```
    # cfgadm pci
    ```

    For a Netra ct 800 server, you should get feedback similar to the following:

    ```
    Ap_Id                    Type           Receptacle     Occupant        Condition
    pci_pci0:cpci_slot2      unknown        empty          unconfigured    unknown
    pci_pci0:cpci_slot3      stpcipci/fhs   connected      configured      ok
    pci_pci0:cpci_slot4      stpcipci/fhs   connected      configured      ok
    pci_pci0:cpci_slot5      unknown        empty          unconfigured    unknown
    pci_pci0:cpci_slot6      unknown        empty          unconfigured    unknown
    pci_pci0:cpci_slot7      unknown        empty          unconfigured    unknown
    pci_pci0:cpci_slot8      stpcipci/fhs   connected      configured      ok
    ```

    The attachment-point ID is shown in the first column of the readout; for example, the attachment-point ID for I/O slot 8 in a Netra ct 800 server would be `pci_pci0:cpci_slot8`.

11. **Deactivate the alarm card with the** `cfgadm` **dynamic reconfiguration software:**

    ```
    # cfgadm -c unconfigure ap_id
    ```

    where *ap_id* is the attachment-point ID for the I/O slot 8, which holds the alarm card. For example, to deactivate the alarm card using the output given in the example above, as root, you would enter:

    ```
    # cfgadm -c unconfigure pci_pci0:cpci_slot8
    ```

    The amber Okay to Remove LED (↩▯) on the system status panel for the alarm slot should go ON, indicating that you can remove the alarm card from the slot.

    Caution – Do not remove the alarm card if the amber Okay to Remove LED (↩▯) is unlit. Removing a hot-swappable card from an I/O slot when the amber Okay to Remove LED is unlit might panic the system.

12. **When it is safe to remove the alarm card, disconnect any cables connected to the card, if necessary.**

13. **Press outward on the two ejection levers on the card to unseat the card from the card cage.**

14. **Carefully slide the card out of the slot and place it on the electrostatic discharge mat.**

15. **Secure a blank filler panel over the empty I/O slot, if necessary.**

    If you are not going to replace the alarm card right away, you must install a blank filler panel over the opening to ensure proper airflow in the system. The slot filler panel is secured to the card cage using two screws, one at the top of the filler panel, the other at the bottom.

16. **Determine if you are removing an alarm card from a front-access or rear-access model server.**

    The same alarm card is used in both the front-access and rear-access models of the Netra ct 800 server.

    ■ If you are removing an alarm card from a *front-access* model of the Netra ct 800 server, you do not have to remove any additional hardware.

    ■ If you are removing an alarm card from a *rear-access* model of the Netra ct 800 server, you must also remove the alarm rear transition card. Go to "Removing an Alarm Rear Transition Card" on page 6-51.

Installing an Alarm Card (Netra ct 800 Server)

⚠

Caution – When moving a number of cards to different slots in the system, move the cards one at a time. If you move multiple cards in rapid succession, you may panic or hang the system.

1. **Attach the antistatic wrist strap.**

   Refer to "Attaching the Antistatic Wrist Strap" on page 1-1.

2. **Determine if you are replacing an alarm card in the *front-access* model of the Netra ct 800 server or the *rear-access* model.**

   The same alarm card is used in both the front-access and rear-access models of the Netra ct 800 server.

   ■ If you are replacing an alarm card in the *front-access* model of the Netra ct 800 server, go to Step 3.

   ■ If you are replacing an alarm card in the *rear-access* model of the Netra ct 800 server, replace the alarm rear transition card first using the instructions in "Installing an Alarm Rear Transition Card" on page 6-53. Once you've completed those instructions, return here to replace the alarm card.

3. **Remove the slot filler panel, if necessary.**

   The slot filler panel is secured to the card cage using two screws, one at the top of the filler panel, the other at the bottom. Store the slot filler panel in a safe place; you may have to use it again if you have to remove an alarm card for an extended period of time.

4. **Get the replacement alarm card from the ship kit.**

5. **Verify that the ejection levers are unlocked.**

   You will not be able to install the card properly if the ejection levers are locked.

6. **Keeping the card vertical, slide the card into the slot between the two guides.**

   The teeth in the handle of the card must align with the square cutouts in the I/O slot. When the card is completely seated in the card cage, the two ejection levers should flip inward, and the teeth in the ejection levers should fit smoothly in the rectangular cutouts in the bottom and top plates. FIGURE 6-9 on page 6-14 shows how to insert an I/O card into a slot; the same principle applies to an alarm card.

   Note that when you plug in the alarm card, the `rsc login` prompt will appear on your console terminal, if you have a console terminal attached to your server.

7. **Lock the ejection levers.**

8. **Locate the LEDs on the system status panel for the alarm card that you just installed to determine if the card has been activated.**

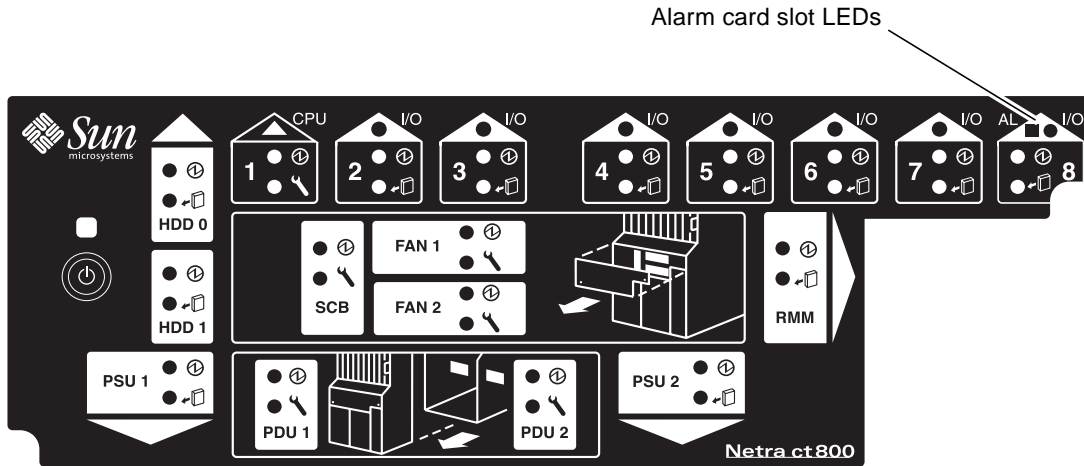   FIGURE 6-13 on page 6-22 shows the location of the alarm card LEDs on the Netra ct 800 server.

   The amber Okay to Remove LED (↵▯) on the system status panel indicates whether the alarm card has been activated:

Status of the Okay to Remove LED (↵▯)	Indication	Go to
On	The I/O slot that holds the alarm card has been set to *basic* hot swap. You must use the `cfgadm` utility to activate the card.	Step 9 on page 6-26
Off	The I/O slot that holds the alarm card has been set to *full* hot swap. The card has been activated.[1]	Step 13 on page 6-27

1. The `envmond` software must be installed and running for full hot swap to work on an alarm card.

9. **Log into the Netra ct server.**

   Refer to "Logging In to the Netra ct Server" on page 5-2, and then return to this procedure.

10. **Identify the attachment-point ID that corresponds to the I/O slot 8, which holds the alarm card.**

    As root, enter:

    ```
    # cfgadm pci
    ```

    For a Netra ct 800 server, you should get feedback similar to the following:

    ```
    Ap_Id                    Type           Receptacle      Occupant        Condition
    pci_pci0:cpci_slot2      unknown        empty           unconfigured    unknown
    pci_pci0:cpci_slot3      stpcipci/fhs   connected       configured      ok
    pci_pci0:cpci_slot4      unknown        disconnected    unconfigured    unknown
    pci_pci0:cpci_slot5      unknown        empty           unconfigured    unknown
    pci_pci0:cpci_slot6      unknown        empty           unconfigured    unknown
    pci_pci0:cpci_slot7      unknown        empty           unconfigured    unknown
    pci_pci0:cpci_slot8      unknown        disconnected    unconfigured    unknown
    ```

    The attachment-point ID is shown in the first column of the readout; for example, the attachment-point ID for I/O slot 8 in a Netra ct 800 server would be `pci_pci0:cpci_slot8`. Note that the information for the card installed in I/O slot 8 in the example feedback shows it as unknown (Type), disconnected (Receptacle), unconfigured (Occupant), and unknown (Condition). This confirms that the I/O slot has been set to basic hot swap and that the card in the I/O slot has not yet been activated.

11. *Connect* **the alarm card with the** `cfgadm` **dynamic reconfiguration software:**

    ```
    # cfgadm -c connect ap_id
    ```

    where *ap_id* is the attachment-point ID. For example, to connect the alarm card in slot 8, as root, enter:

    ```
    # cfgadm -c connect pci_pci0:cpci_slot8
    ```

    The amber Okay to Remove LED (◄▯) on the system status panel for the I/O slot should go OFF, indicating that the card has been connected.

12. *Activate* **the alarm card with the** `cfgadm` **dynamic reconfiguration software:**

```
# cfgadm -c configure ap_id
```

where *ap_id* is the attachment-point ID. For example, to activate the alarm card in slot 8, as root, enter:

```
# cfgadm -c configure pci_pci0:cpci_slot8
```

If you were to enter the `cfgadm pci` command again at this point, you should see the fields changed for the card in I/O slot 8:

```
Ap_Id                 Type          Receptacle     Occupant       Condition
pci_pci0:cpci_slot2   unknown       empty          unconfigured   unknown
pci_pci0:cpci_slot3   stpcipci/fhs  connected      configured     ok
pci_pci0:cpci_slot4   unknown       empty          unconfigured   unknown
pci_pci0:cpci_slot5   unknown       empty          unconfigured   unknown
pci_pci0:cpci_slot6   unknown       empty          unconfigured   unknown
pci_pci0:cpci_slot7   unknown       empty          unconfigured   unknown
pci_pci0:cpci_slot8   stpcipci/fhs  connected      configured     ok
```

13. **Change directories to the rsc directory:**

```
# cd /usr/platform/SUNW,UltraSPARC-IIi-Netract/rsc
```

14. **Restore the RSC configuration settings from the remote system.**

As root, enter:

```
# ./rscadm set < remote-filename
```

where *remote-filename* is the file name that you used to create the backup file in Step 1 on page 6-19.

15. **As root, enter the following command:**

```
# pkill -HUP envmond
```

16. **Download the latest firmware to run on RSC:**

```
# ./rscadm download file
```

For example, to download the firmware to run on RSC, you would normally enter the following command:

```
# ./rscadm download ../lib/images/rscfw
```

It may take several minutes for the firmware to download completely.

Note – You may see the following error messages as you're downloading the latest firmware:

```
envmond[206]: heartbeat.so: Alarm card firmware not responding.
envmond[206]: heartbeat.so:Alarm Card Failed.
```

After approximately 60 seconds, the alarm card should go through a self-test and the following message should appear:

```
envmond[206]: alarmcard.so:Alarm Card is OK.
```

If this message appears after approximately 60 seconds, then the firmware was downloaded successfully and you can ignore the earlier error messages.

17. **Using a No. 2 Phillips screwdriver, tighten the two captive screws inside the card's ejection levers, one on top and one on the bottom (**FIGURE 6-10**).**

18. **Connect to the replacement alarm card any cables that you unplugged from the failed alarm card.**
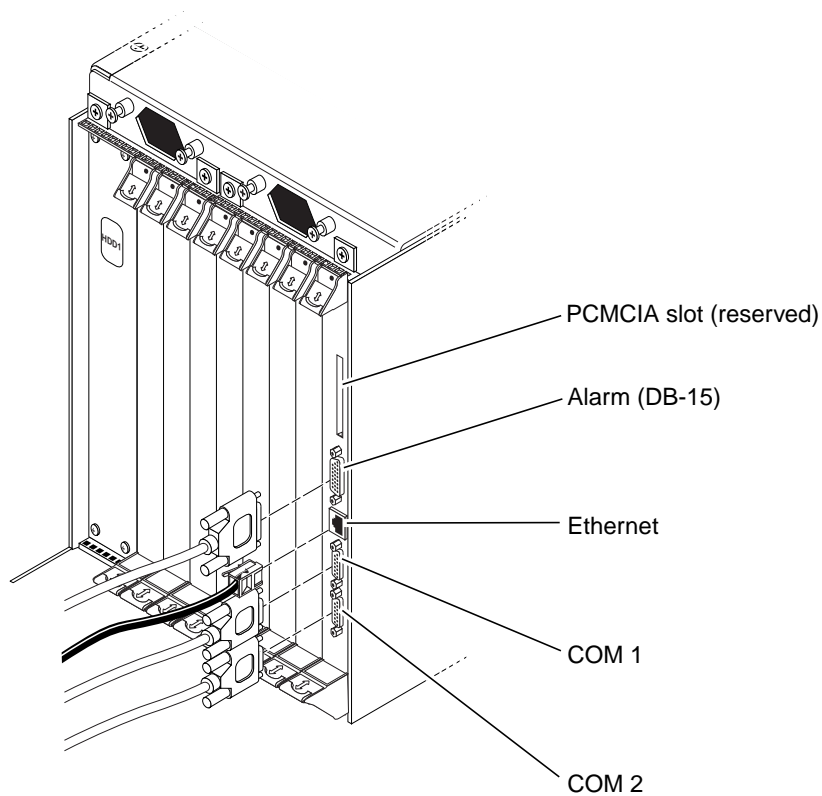
FIGURE 6-14 Plugging in Cables in Alarm Card in Netra ct 800 Server

6.1.2.2   Removing and Replacing an Alarm Card in the Netra ct 400 Server

- If you are removing and replacing a *faulty* alarm card in the server, first to go "Removing an Alarm Card (Netra ct 400 Server)" on page 6-30, then go to "Installing an Alarm Card (Netra ct 400 Server)" on page 6-35.

- If you are installing a *new* alarm card in the server, go to "Installing an Alarm Card (Netra ct 400 Server)" on page 6-35.

Removing an Alarm Card (Netra ct 400 Server)

Note – If you want to manually unconfigure a hot swap alarm card remotely, log in to the server and skip to Step 11 on page 6-34.

---

1. **Log into the Netra ct server.**

   Refer to "Logging In to the Netra ct Server" on page 5-2, then return to this procedure.

2. **As root, enter the following command:**

   ```
   # pkill -USR1 envmond
   ```

3. **Change directories to the rsc directory:**

   ```
   # cd /usr/platform/SUNW,UltraSPARC-IIi-Netract/rsc
   ```

4. **Create a backup file to record the RSC configuration settings on a remote system.**

   As root, enter:

   ```
   # ./rscadm show > remote-filename
   ```

5. **Attach the antistatic wrist strap.**

   Refer to "Attaching the Antistatic Wrist Strap" on page 1-1.

6. **Locate the double-wide 3U alarm card for the Netra ct 400 server.**

Double-wide
3U alarm card
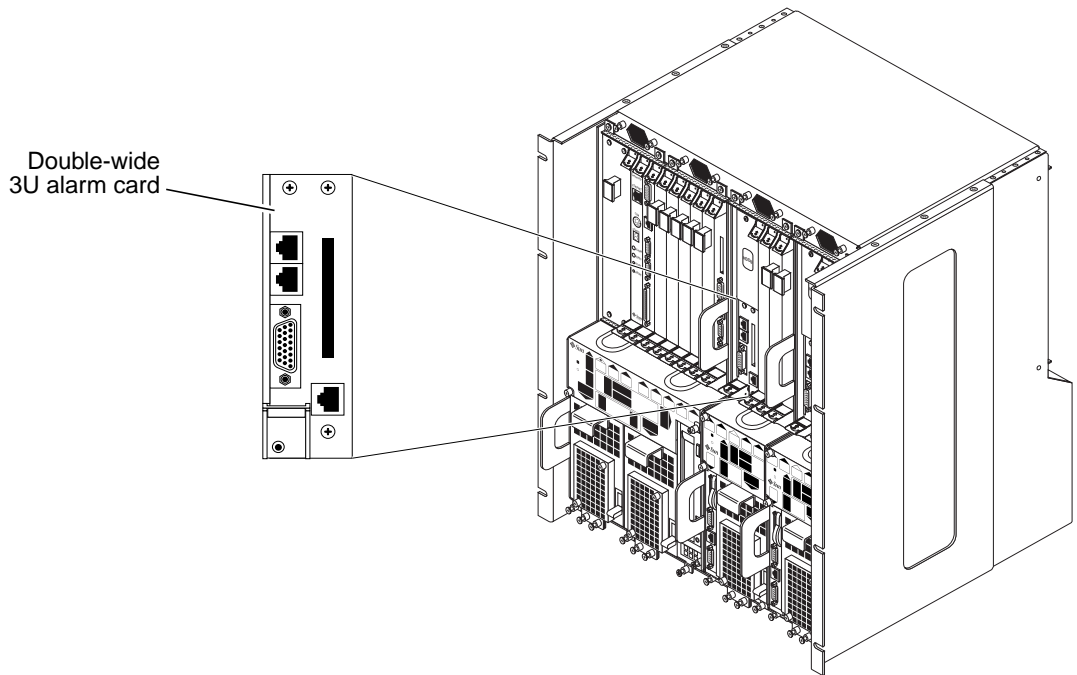
FIGURE 6-15 Location of Alarm Card in Netra ct 400 Server

7. **Using a No. 2 Phillips screwdriver, loosen the captive screw inside the card's ejection lever on the bottom left side.**

8. **Loosen the three remaining captive screws, two on the top and one on the bottom.**

9. **Unlock the ejection lever on the card.**

⚠

Caution – Only unlock the ejection lever at this point; do *not* unseat the alarm card until the alarm card LEDs on the system status panel are in the proper state.

Note – If the server is set to full hot-swap mode, unlocking the ejection levers automatically starts the software driver *detachment* process. If you decide that you do *not* want to remove the card, you must completely unseat the card, reseat it, then lock the ejection levers again in order to start the software driver *attachment* process. Simply locking the ejection levers after unlocking them will not start the driver attachment process.
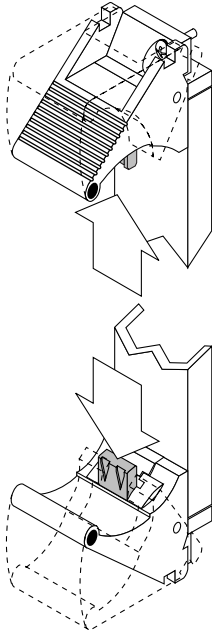
FIGURE 6-16 Unlocking the Ejection Lever

10. Locate the LEDs on the system status panel for the alarm card to determine if the card has been deactivated.

FIGURE 6-17 shows the locations of the alarm card slot LEDs on the Netra ct 400 server.

Caution – Do not deactivate any other cards until you see that the alarm card has been deactivated. Deactivating more than one card at the same time might lead to unpredictable results.

Alarm card slot LEDs

FIGURE 6-17 Locating the Alarm Card LEDs on the System Status Panel (Netra ct 400 Server)

The amber Okay to Remove LED (↵) on the system status panel indicates whether the alarm card can be safely removed:

Status of the Okay to Remove LED (↵)	Indication	Go to
On	The I/O slot that holds the alarm card has been set to *full* hot swap. You can remove the alarm card from the slot.[1]	Step 13 on page 6-34
Off	The I/O slot that holds the alarm card has been set to *basic* hot swap. You must use the cfgadm utility to deactivate the alarm card before you can remove it.	Step 11 on page 6-34

1. The envmond software must be installed and running for full hot swap to work on an alarm card.

11. **Identify the attachment-point ID that corresponds to I/O slot 1, which is the I/O slot that controls the alarm card.**

As root, enter:

```
# cfgadm pci
```

For a Netra ct 400 server, you should get feedback similar to the following:

```
Ap_Id                   Type            Receptacle      Occupant        Condition
pci_pci0:cpci_slot1     stpcipci/fhs    connected       configured      ok
pci_pci0:cpci_slot2     unknown         empty           unconfigured    unknown
pci_pci0:cpci_slot4     stpcipci/fhs    connected       configured      ok
pci_pci0:cpci_slot5     unknown         empty           unconfigured    unknown
```

The attachment-point ID is shown in the first column of the readout; for example, the attachment-point ID for I/O slot 1 in a Netra ct 400 server would be `pci_pci0:cpci_slot1`.

12. **Deactivate the alarm card with the** `cfgadm` **dynamic reconfiguration software:**

```
# cfgadm -c unconfigure ap_id
```

where *ap_id* is the attachment-point ID for the I/O slot 1, which holds the alarm card. For example, to deactivate the alarm card using the output given in the example above, as root, you would enter:

```
# cfgadm -c unconfigure pci_pci0:cpci_slot1
```

The amber Okay to Remove LED ( ) on the system status panel for the alarm slot should go ON, indicating that you can remove the alarm card from the slot.

Caution – Do not remove the alarm card if the amber Okay to Remove LED ( ) is not ON. Removing a hot-swappable card from an I/O slot when the amber Okay to Remove LED is not on might panic the system.

13. **When it is safe to remove the alarm card, disconnect any cables connected to the card, if necessary.**

14. **Press outward on the ejection lever on the card to unseat the card from the card cage.**

15. **Slide the card out of the slot and place it on the electrostatic discharge mat.**

16. **Secure a blank filler panel over the empty I/O slots, if necessary.**

    If you are not going to replace the alarm card right away, you must install a blank filler panel over the opening to ensure proper airflow in the system. The slot filler panel is secured to the card cage using three screws, two at the top of the filler panel, one at the bottom.

Installing an Alarm Card (Netra ct 400 Server)

1. **Attach the antistatic wrist strap.**

   Refer to "Attaching the Antistatic Wrist Strap" on page 1-1.

2. **Remove the slot filler panel, if necessary.**

   The slot filler panel is secured to the card cage using thee screws, two at the top of the filler panel, one at the bottom. Store the slot filler panel in a safe place; you may have to use it again if you have to remove an alarm card for an extended period of time.

3. **Get the replacement alarm card from the ship kit.**

4. **Verify that the ejection levers are unlocked.**

   You will not be able to install the card properly if the ejection levers are locked.

5. **Keeping the card vertical, slide the card into the slot in between the two guides.**

   The teeth in the handle of the card must align with the square cutouts in the I/O slot. When the card is completely seated in the card cage, the two ejection levers should flip inward, and the teeth in the ejection levers should fit smoothly in the rectangular cutouts in the bottom and top plates.

   Note that when you plug in the alarm card, the `rsc login` prompt will appear on your console (if you have a console attached to your server).

6. **Lock the ejection levers.**

7. **Locate the LEDs on the system status panel for the alarm card that you just installed to determine if the card has been activated.**

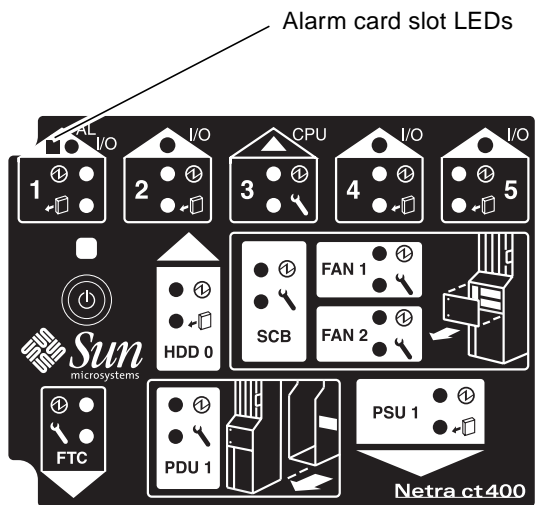   FIGURE 6-17 on page 6-33 shows the location of the alarm card LEDs on the Netra ct 400 server.

The amber Okay to Remove LED (◄▯) on the system status panel indicates whether the alarm card has been activated:

Status of the Okay to Remove LED (◄▯)	Indication	Go to
On	The I/O slot that holds the alarm card has been set to *basic* hot swap. You must use the cfgadm utility to activate the card.	Step 8 on page 6-36
Off	The I/O slot that holds the alarm card has been set to *full* hot swap. The card has been activated.[1]	Step 12 on page 6-37

1. The envmond software must be installed and running for full hot swap to work on an alarm card.

8. **Log in to the Netra ct server.**

Refer to "Logging In to the Netra ct Server" on page 5-2, and then return to this procedure.

9. **Identify the attachment-point ID that corresponds to the I/O slot 1, which controls the alarm card.**

As root, enter:

```
# cfgadm pci
```

For a Netra ct 400 server, you should get feedback similar to the following:

```
Ap_Id                   Type          Receptacle     Occupant       Condition
pci_pci0:cpci_slot1     unknown       disconnected   unconfigured   unknown
pci_pci0:cpci_slot2     unknown       empty          unconfigured   unknown
pci_pci0:cpci_slot4     stpcipci/fhs  connected      configured     ok
pci_pci0:cpci_slot5     unknown       empty          unconfigured   unknown
```

The attachment-point ID is shown in the first column of the readout; for example, the attachment-point ID for I/O slot 1 in a Netra ct 400 server would be pci_pci0:cpci_slot1. Note that the information for the card installed in I/O slot 1 in the example feedback shows it as unknown (Type), disconnected (Receptacle), unconfigured (Occupant), and unknown (Condition). This confirms that the I/O slot has been set to basic hot swap and that the card in the I/O slot has not yet been activated.

10. *Connect* **the alarm card with the** `cfgadm` **dynamic reconfiguration software:**

```
# cfgadm -c connect ap_id
```

where *ap_id* is the attachment-point ID. For example, to connect the alarm card in slot 1, as root, enter:

```
# cfgadm -c connect pci_pci0:cpci_slot1
```

The amber Okay to Remove LED ( ) on the system status panel for the I/O slot should go OFF, indicating that the card has been connected.

11. *Activate* **the alarm card with the** `cfgadm` **dynamic reconfiguration software:**

```
# cfgadm -c configure ap_id
```

where *ap_id* is the attachment-point ID. For example, to activate the alarm card in slot 1, as root, enter:

```
# cfgadm -c configure pci_pci0:cpci_slot1
```

If you were to enter the `cfgadm pci` command again at this point, you should see the fields changed for the card in I/O slot 1:

```
Ap_Id                  Type          Receptacle    Occupant      Condition
pci_pci0:cpci_slot1    stpcipci/fhs  connected     configured    ok
pci_pci0:cpci_slot2    unknown       disconnected  unconfigured  unknown
pci_pci0:cpci_slot4    stpcipci/fhs  connected     configured    ok
pci_pci0:cpci_slot5    unknown       empty         unconfigured  unknown
```

12. **Change directories to the rsc directory:**

```
# cd /usr/platform/SUNW,UltraSPARC-IIi-Netract/rsc
```

13. **Restore the RSC configuration settings from the remote system.**

   As root, enter:

   ```
   # ./rscadm set < remote-filename
   ```

   where *remote-filename* is the file name that you used to create the backup file in Step 1 on page 6-30.

14. **As root, enter the following command:**

   ```
   # pkill -HUP envmond
   ```

15. **Download the latest firmware to run on RSC:**

   ```
   # ./rscadm download file
   ```

   For example, to download the firmware to run on RSC, you would normally enter the following command:

   ```
   # ./rscadm download ../lib/images/rscfw
   ```

   It may take several minutes for the firmware to download completely.

   Note – You may see the following error messages as you're downloading the latest firmware:

   ```
   envmond[206]: heartbeat.so: Alarm card firmware not responding.
   envmond[206]: heartbeat.so:Alarm Card Failed.
   ```

   After approximately 60 seconds, the alarm card should go through a self-test and the following message should appear:

   ```
   envmond[206]: alarmcard.so:Alarm Card is OK.
   ```

   If this message appears after approximately 60 seconds, then the firmware was downloaded successfully and you can ignore the earlier error messages.

   ---

16. **Using a No. 2 Phillips screwdriver, tighten the captive screw inside the card's ejection lever on the bottom left side.**

17. **Tighten the three remaining captive screws, two on the top and one on the bottom.**

18. **Connect to the replacement alarm card any cables that you unplugged from the failed alarm card.**

COM 2

COM 1

PCMCIA slot (reserved)

Alarm (DB-15)

Ethernet
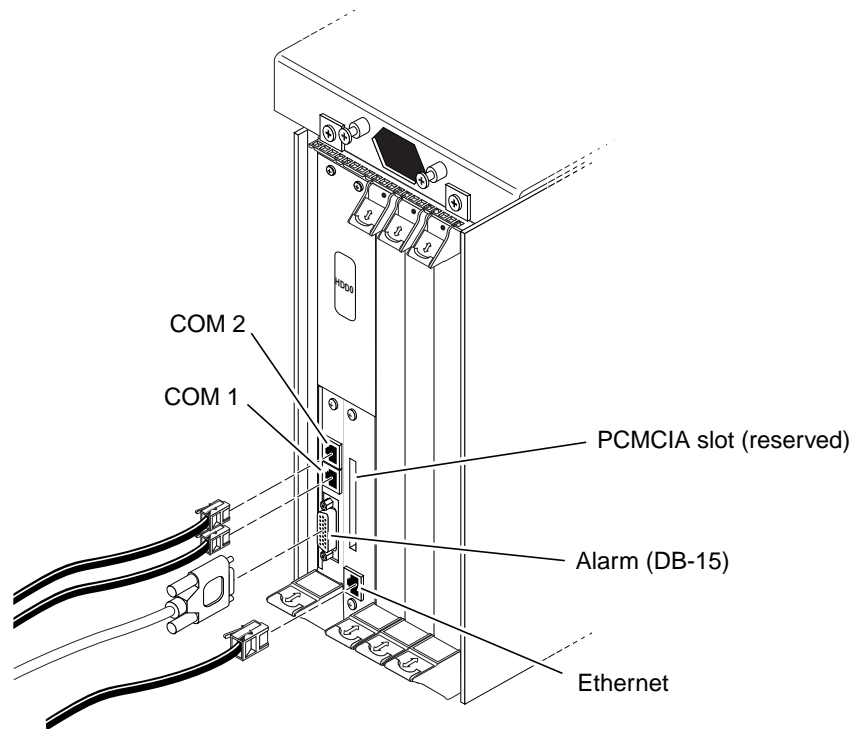
FIGURE 6-18 Connectors on the Alarm Card (Netra ct 400 Server)

6.2   Rear-Access Models

This section gives procedures for the installation, removal, and replacement of the following hot-swappable cards for rear-access models of the Netra ct 400 server and Netra ct 800 server:

- "Front I/O Card and I/O Rear Transition Card" on page 6-40
- "Alarm Rear Transition Card (Netra ct 800 Server Only)" on page 6-51

Note – The CPU rear transition card is *not* hot-swappable, so the procedures for that card are not covered in this chapter. For installation, removal, and replacement procedures for that card, refer to Chapter 10 "Removing and Replacing Cold-Swappable Cards."

6.2.1 Front I/O Card and I/O Rear Transition Card

The I/O rear transition card set includes:

- The front I/O card
- The I/O rear transition card

When one of these two cards fails, you must replace *both* the front I/O card *and* the I/O rear transition card.

The front I/O card contains the ASICs for the associated I/O card and is installed from the front of the server; however, no cables are connected to the front I/O card.

The I/O rear transition card extends the ports for a particular I/O card to the rear of the server. The I/O rear transition card and the front I/O card must be installed in the same slot in order for the I/O rear transition card to work. For example, if you install an I/O rear transition card in I/O slot 3 at the rear of a Netra ct 800 server, you must also install the accompanying front I/O card in I/O slot 3 at the front of the server.

When one of the two cards fails, you must replace *both* the front I/O card *and* the I/O rear transition card. FIGURE 6-19 and FIGURE 6-20 give graphical representations of how the front I/O cards should align with the I/O rear transition cards (I/O RTCs). Note that, if you are facing the *front* of the server, the I/O slots read from *left to right*, whereas they read from *right to left* if you are facing the *rear* of the server.

FIGURE 6-19 shows the buses on a Netra ct 800 server and FIGURE 6-20 shows the buses on a Netra ct 400 server.
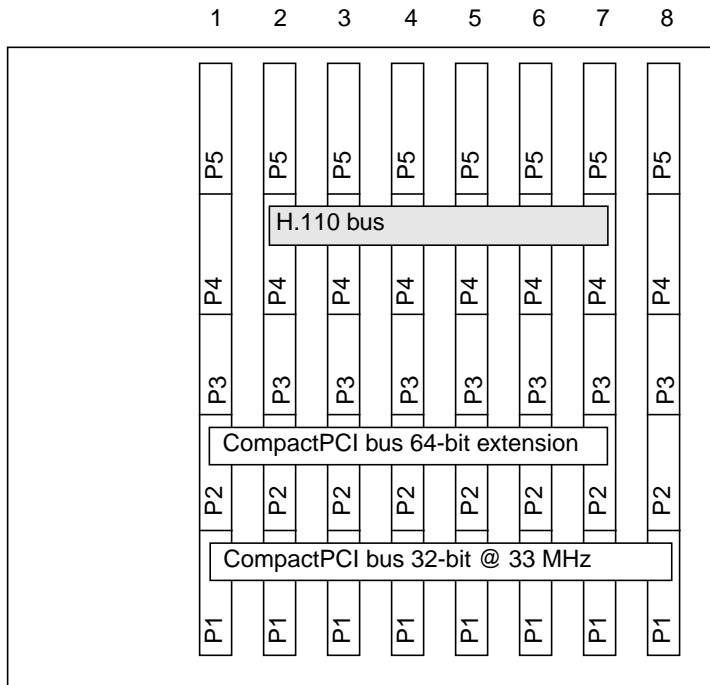
FIGURE 6-19 Buses for the Netra ct 800 Server (Front View)
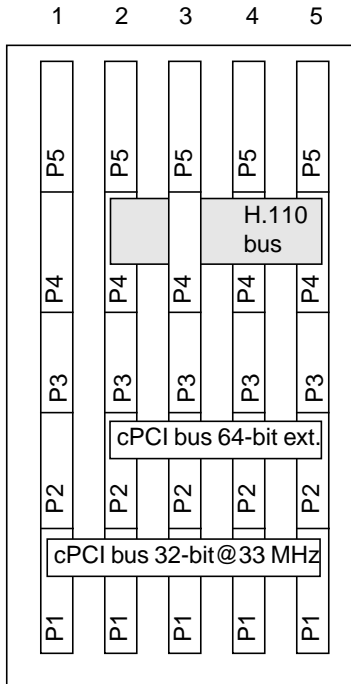
FIGURE 6-20 Buses for the Netra ct 400 Server (Front View)

The individual I/O slots in your server will be set to either *basic* hot swap, the default setting, or *full* hot swap, which must be set manually. Refer to Chapter 5 "Hot Swap Software Commands" for more information.

- If you are removing and replacing *faulty* cards in the server, first to go "Removing a Front I/O Card and I/O Rear Transition Card" on page 6-43, then go to "Installing a Front I/O Card and I/O Rear Transition Card" on page 6-47.

- If you are installing *new* cards in the server, go to "Installing a Front I/O Card and I/O Rear Transition Card" on page 6-47.

6.2.1.1 Removing a Front I/O Card and I/O Rear Transition Card

⚠ **Caution –** You must always remove the front I/O card before removing the I/O rear transition card. If you remove the I/O rear transition card first, you might panic the system.

Note – If you want to manually deconfigure a hot swap I/O card remotely, log into the server and skip to Step 7 on page 6-45.

1. **Attach the antistatic wrist strap.**

   Refer to "Attaching the Antistatic Wrist Strap" on page 1-1.

2. **Locate the front I/O card that you want to remove from the server.**

   - FIGURE 6-1 on page 6-3 shows the I/O card slots in a Netra ct 800 server.
   - FIGURE 6-3 on page 6-5 shows the I/O card slots in a Netra ct 400 server.

   There are labels under the I/O slots that give the I/O slot numbers for the Netra ct 800 server and Netra ct 400 server. Make a note of that I/O slot number.

3. **Using a No. 2 Phillips screwdriver, loosen the two captive screws inside the front I/O card's ejection levers, one on top and one on the bottom (**FIGURE 6-5 **on page 6-7).**

4. **Unlock the ejection levers.**

⚠ **Caution –** Only unlock the ejection levers at this point; do *not* unseat the I/O card until the I/O card LEDs on the system status panel are in the proper state.

⚠ **Caution –** If the server is set to full hot-swap mode, do not rapidly unlock and lock the ejection levers. When you unlock the ejection lever, you will begin the software driver detachment process. This detachment process must end before you can safely lock the ejection levers, which begins the software drive process. If you unlock and lock the ejection levers rapidly, you can panic or hang the system.

There are several different models of locking ejection levers, so the method you would use to unlock the ejection levers will vary depending on the model of the ejection lever used on the card; for example, one model uses red tabs at the top and bottom to unlock the card (FIGURE 6-6 on page 6-8). Refer to the documentation that came with the I/O card for instructions on unlocking the card.

5. **Locate the LEDs on the system status panel for the front I/O card and I/O rear transition card that you want to remove to determine if the cards have been deactivated.**

The system status panel on each server has LEDs that shows the status of the front I/O card and I/O rear transition card installed in each set of slots in that particular server. FIGURE 6-7 on page 6-9 shows the locations of the I/O card LEDs on the Netra ct 800 server and FIGURE 6-8 on page 6-10 shows the locations of the I/O card LEDs on the Netra ct 400 server.

The amber Okay to Remove LED (◄⬜) on the system status panel tells whether the front I/O card and I/O rear transition card can be safely removed or not:

Status of the Okay to Remove LED (◄⬜)	Indication	Go to
On	The I/O slot that holds the cards has been set to *full* hot swap. You can remove the cards from the slot.	Step 9 on page 6-46
Off	The I/O slot that holds the cards has been set to *basic* hot swap. You must use the cfgadm utility to deactivate the cards before you can remove them.	Step 6 on page 6-44

6. **Log into the Netra ct server.**

Refer to "Logging In to the Netra ct Server" on page 5-2, and then return to this procedure.

7. **Identify the attachment-point ID that corresponds to the I/O slot where you will be removing the cards.**

As root, enter:

```
# cfgadm pci
```

For a Netra ct 800 server, you should get feedback similar to the following:

```
Ap_Id                   Type          Receptacle    Occupant        Condition
pci_pci0:cpci_slot2     unknown       empty         unconfigured    unknown
pci_pci0:cpci_slot3     stpcipci/fhs  connected     configured      ok
pci_pci0:cpci_slot4     stpcipci/fhs  connected     configured      ok
pci_pci0:cpci_slot5     unknown       empty         unconfigured    unknown
pci_pci0:cpci_slot6     unknown       empty         unconfigured    unknown
pci_pci0:cpci_slot7     unknown       empty         unconfigured    unknown
pci_pci0:cpci_slot8     stpcipci/fhs  connected     configured      ok
```

For a Netra ct 400 server, you should get feedback similar to the following:

```
Ap_Id                   Type          Receptacle    Occupant        Condition
pci_pci0:cpci_slot1     unknown       empty         unconfigured    unknown
pci_pci0:cpci_slot2     stpcipci/fhs  connected     configured      ok
pci_pci0:cpci_slot4     stpcipci/fhs  connected     configured      ok
pci_pci0:cpci_slot5     unknown       empty         unconfigured    unknown
```

The attachment-point ID is shown in the first column of the readout; for example, the attachment-point ID for I/O slot 4 in a Netra ct 800 server would be `pci_pci0:cpci_slot4`.

8. **Deactivate the I/O cards with the** `cfgadm` **dynamic reconfiguration software:**

```
# cfgadm -c unconfigure ap_id
```

where *ap_id* is the attachment-point ID. For example, to deactivate the I/O cards in I/O slot 4, as root, enter:

```
# cfgadm -c unconfigure pci_pci0:cpci_slot4
```

The amber Okay to Remove LED (↰▢) on the system status panel for the I/O slot should go ON, indicating that you can remove the I/O cards from the slot.

9. **When it is safe to remove the I/O cards, press outward on the two ejection levers on the *front* I/O card to unseat the card from the card cage.**

⚠️ **Caution –** Do *not* remove the I/O rear transition card before you've removed the front I/O card. Doing so might panic the system.

10. **Carefully slide the card out of the slot and place it on the electrostatic discharge mat.**

11. **Go to the rear of the system and, using the I/O slot number noted in Step 2 on page 6-43, locate the I/O rear transition card.**

⚠️ **Caution –** Make sure that you have located the I/O rear transition card that occupies the same slot as the failed front I/O card before proceeding. If you remove an I/O rear transition card that does *not* match the failed front I/O card, you will disrupt service to a functioning I/O rear transition card.

12. **Disconnect any cables connected to the I/O rear transition card, if necessary.**

13. **Using a No. 2 Phillips screwdriver, loosen the two captive screws inside the I/O rear transition card's ejection levers, one on top and one on the bottom (**FIGURE 6-5 **on page 6-7).**

14. **Unlock the ejection levers.**

15. **Press outward on the two ejection levers on the card to unseat the card from the card cage.**

16. **Carefully slide the I/O rear transition card out of the slot and place it on the electrostatic discharge mat.**

17. **Secure blank filler panels over the empty I/O slots, if necessary.**

If you are not going to replace the I/O cards right away, you must install blank filler panels over the openings to ensure proper airflow in the system. The slot filler panels are secured to the card cage using two screws, one at the top of the filler panel, the other at the bottom.

6.2.1.2   Installing a Front I/O Card and I/O Rear Transition Card

⚠

Caution – When moving a number of cards to different slots in the system, move the cards one at a time. If you move multiple cards in rapid succession and at the same time, you may panic or hang the system.

1. **Attach the antistatic wrist strap.**

   Refer to "Attaching the Antistatic Wrist Strap" on page 1-1.

2. **Remove the slot filler panels, if necessary.**

   The slot filler panels are secured to the card cage using two screws, one at the top of the filler panel, the other at the bottom. Store the slot filler panels in a safe place; you may have to use them again if you have to remove I/O cards for an extended period of time.

3. **Get the replacement I/O rear transition card from the ship kit.**

4. **Verify that the ejection levers are unlocked.**

   You will not be able to install the card properly if the ejection levers are locked.

5. **Go to the rear of the system and, keeping the card vertical, slide the I/O rear transition card between the two guides (**FIGURE 6-9 **on page 6-14).**

   The teeth in the handle of the card must align with the square cutouts in the I/O slot. When the card is completely seated in the card cage, the two ejection levers should flip inward, and the teeth in the ejection levers should fit smoothly in the rectangular cutouts in the bottom and top plates.

6. **Lock the ejection levers.**

   There are several different models of locking ejection levers, so the method you would use to lock the ejection levers will vary depending on the model of the ejection lever used on the card. Refer to the documentation that came with the I/O card for instructions on locking the ejection levers.

7. **Connect to the replacement I/O rear transition card any cables that you unplugged from the failed I/O rear transition card.**

8. **Get the replacement front I/O card from the ship kit.**

9. **Verify that the ejection levers are unlocked.**

   You will not be able to install the card properly if the ejection levers are locked.

10. **Go to the front of the system and, keeping the card vertical, slide the front I/O card between the two guides (**FIGURE 6-9 **on page 6-14).**

Make sure that you are installing the front I/O card in the same I/O slot as the I/O rear transition card before proceeding. The cards will not operate if you do not have them installed in the same I/O slot. There are labels under the I/O slots that give the I/O slot numbers for the Netra ct 800 server and Netra ct 400 server.

The teeth in the handle of the card must align with the square cutouts in the I/O slot. When the card is completely seated in the card cage, the two ejection levers should flip inward and the teeth in the ejection levers should fit smoothly in the rectangular cutouts in the bottom and top plates.

11. Lock the ejection levers on the front I/O card.

12. Locate the LEDs on the system status panel for the I/O cards that you just installed to determine if the cards have been activated.

FIGURE 6-7 on page 6-9 shows the locations of the I/O card LEDs on the Netra ct 800 server and FIGURE 6-8 on page 6-10 shows the locations of the I/O card LEDs on the Netra ct 400 server.

The amber Okay to Remove LED (↤▯) on the system status panel tells whether the I/O cards have been activated:

Status of the Okay to Remove LED (↤▯)	Indication	Go to
On	The I/O slot that holds the cards has been set to *basic* hot swap. You must use the `cfgadm` utility to activate the cards.	Step 13 on page 6-48
Off	The I/O slot that holds the cards has been set to *full* hot swap. The cards have been activated.	Step 17 on page 6-50

13. Log into the Netra ct server.

Refer to "Logging In to the Netra ct Server" on page 5-2, and then return to this procedure.

14. **Identify the attachment-point ID that corresponds to the I/O slot where you installed the I/O cards.**

    As root, enter:

    ```
    # cfgadm pci
    ```

    For a Netra ct 800 server, you should get feedback similar to the following:

    ```
    Ap_Id                   Type         Receptacle      Occupant        Condition
    pci_pci0:cpci_slot2     unknown      empty           unconfigured    unknown
    pci_pci0:cpci_slot3     stpcipci/fhs connected       configured      ok
    pci_pci0:cpci_slot4     unknown      disconnected    unconfigured    unknown
    pci_pci0:cpci_slot5     unknown      empty           unconfigured    unknown
    pci_pci0:cpci_slot6     unknown      empty           unconfigured    unknown
    pci_pci0:cpci_slot7     unknown      empty           unconfigured    unknown
    pci_pci0:cpci_slot8     stpcipci/fhs connected       configured      ok
    ```

    For a Netra ct 400 server, you should get feedback similar to the following:

    ```
    Ap_Id                   Type         Receptacle      Occupant        Condition
    pci_pci0:cpci_slot1     unknown      empty           unconfigured    unknown
    pci_pci0:cpci_slot2     stpcipci/fhs connected       configured      ok
    pci_pci0:cpci_slot4     stpcipci/fhs connected       configured      ok
    pci_pci0:cpci_slot5     unknown      empty           unconfigured    unknown
    ```

    The attachment-point ID is shown in the first column of the readout; for example, the attachment-point ID for I/O slot 4 in a Netra ct 800 server would be `pci_pci0:cpci_slot4`. Note that the information for the cards installed in I/O slot 4 in the example feedback shows it as unknown (Type), disconnected (Receptacle), unconfigured (Occupant), and unknown (Condition). This confirms that the I/O slots have been set to basic hot swap and that the cards in the I/O slots have not yet been activated.

15. **Connect the I/O cards with the** `cfgadm` **dynamic reconfiguration software:**

    ```
    # cfgadm -c connect ap_id
    ```

    where *ap_id* is the attachment-point ID. For example, to connect the I/O cards in slot 4, as root, enter:

    ```
    # cfgadm -c connect pci_pci0:cpci_slot4
    ```

The amber Okay to Remove LED (↩🗌) on the system status panel for the I/O slot should go OFF, indicating that the card has been connected.

16. **Activate the I/O cards with the** `cfgadm` **dynamic reconfiguration software:**

```
# cfgadm -c configure ap_id
```

where *ap_id* is the attachment-point ID. For example, to activate the I/O cards in slot 4, as root, enter:

```
# cfgadm -c configure pci_pci0:cpci_slot4
```

If you were to enter the `cfgadm pci` command again at this point, you should see the fields changed for the cards in I/O slot 4:

```
Ap_Id                  Type            Receptacle      Occupant        Condition
pci_pci0:cpci_slot2    unknown         empty           unconfigured    unknown
pci_pci0:cpci_slot3    stpcipci/fhs    connected       configured      ok
pci_pci0:cpci_slot4    stpcipci/fhs    connected       configured      ok
pci_pci0:cpci_slot5    unknown         empty           unconfigured    unknown
pci_pci0:cpci_slot6    unknown         empty           unconfigured    unknown
pci_pci0:cpci_slot7    unknown         empty           unconfigured    unknown
pci_pci0:cpci_slot8    stpcipci/fhs    connected       configured      ok
```

17. **Using a No. 2 Phillips screwdriver, tighten the two captive screws inside the card's ejection levers, one on top and one on the bottom (**FIGURE 6-10 **on page 6-17).**

Do this for both the front I/O card and the I/O rear transition card.

18. **Perform any I/O card-specific software configuration procedures, if necessary.**

Refer to the documentation that you received with your CompactPCI I/O cards for more information.

6.2.2   Alarm Rear Transition Card (Netra ct 800 Server Only)

⚠

Caution – The maximum voltage that can be applied to an alarm card is 60 VDC, as specified in UL1950 and IEC 60950. The maximum current is 500mA.

The procedures in this section describe how to remove and replace an alarm rear transition card in a Netra ct 800 server only; there is no alarm rear transition card option available for the Netra ct 400 server.

The alarm rear transition card for the Netra ct 800 server consists of two separate cards:

- The alarm card
- The alarm rear transition card

When one of the two cards fail, you must replace *both* the alarm card *and* the alarm rear transition card.

The alarm card is installed from the front of the Netra ct 800 server. It is the same alarm card that is used in the front-access model of the Netra ct 800 server.

The alarm rear transition card extends the ports on the alarm card installed at the front of the server to the alarm rear transition card installed at the rear of the server. The alarm card must be installed in the front of the server in order for the alarm rear transition card to work.

- If you are removing and replacing *faulty* cards in the server, first to go "Removing an Alarm Rear Transition Card" on page 6-51, then go to "Installing an Alarm Rear Transition Card" on page 6-53.
- If you are installing *new* cards in the server, go to "Installing an Alarm Rear Transition Card" on page 6-53.

6.2.2.1   Removing an Alarm Rear Transition Card

1. **Attach the antistatic wrist strap.**

   Refer to "Attaching the Antistatic Wrist Strap" on page 1-1.

2. **Remove the alarm card from the front of the Netra ct 800 server.**

   Refer to "Removing an Alarm Card (Netra ct 800 Server)" on page 6-19 for those instructions, then return here.

Caution – Do not proceed with these instructions unless you have removed the alarm card from the front of the server using those instructions. If the I/O slot holding the alarm card is set to basic hot swap, you will have to manually deactivate the I/O slot that holds the alarm card, and removing the alarm rear transition card without going through those procedures might panic or hang your system.

3. **After you have removed the alarm card from the front of the Netra ct 800 server, go to the rear of the server and locate the alarm rear transition card.**

   The alarm rear transition card will be installed in slot 8 at the rear of the server, as shown in FIGURE 6-21.

	Front of chassis		Midplane	
	Hard disk drives			Rear of chassis
Slot 1	CPU card		CPU RTC	Slot 1
Slot 2	Front I/O card		I/O RTC	Slot 2
Slot 3	Front I/O card		I/O RTC	Slot 3
Slot 4	Front I/O card		I/O RTC	Slot 4
Slot 5	Front I/O card		I/O RTC	Slot 5
Slot 6	Front I/O card		I/O RTC	Slot 6
Slot 7	Front I/O card		I/O RTC	Slot 7
Slot 8	Alarm card		Alarm RTC	Slot 8
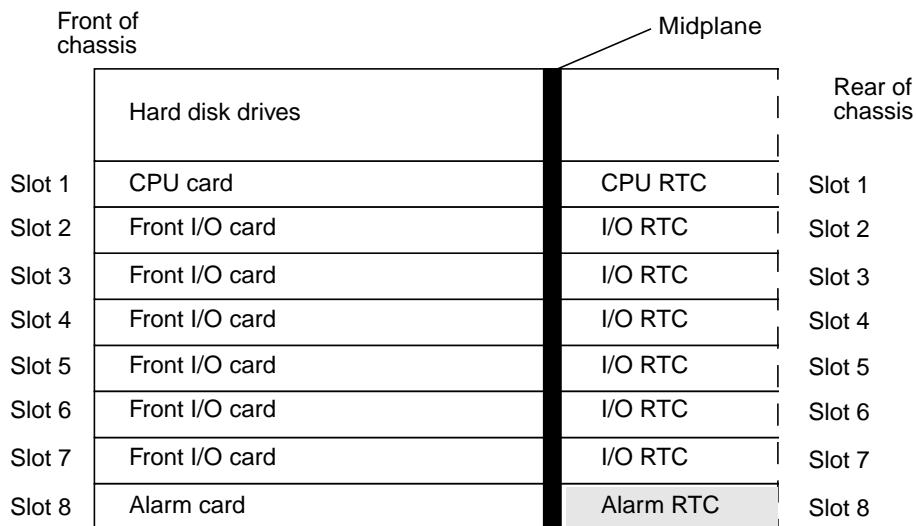
FIGURE 6-21 Locating the Alarm Rear Transition Card (RTC) in the Rear-Access Model of Netra ct 800 Server (Top View)

4. **Unplug any cables attached to the alarm rear transition card, if necessary.**

5. **Using a No. 2 Phillips screwdriver, loosen the two captive screws inside the card's ejection levers, one on top and one on the bottom.**

6. **Unlock the ejection levers on the card.**

7. **Press outward on the two ejection levers on the card to unseat the card from the card cage.**

8. **Slide the card out of the slot and place it on the electrostatic discharge mat.**

9. **Secure blank filler panels over the empty I/O slot, if necessary.**

   If you are not going to replace the alarm card and alarm rear transition card right away, you must install blank filler panels over the openings to ensure proper airflow in the system. The slot filler panels are secured to the card cage using two screws, one at the top of the filler panel, the other at the bottom.

6.2.2.2 Installing an Alarm Rear Transition Card

1. **Attach the antistatic wrist strap.**

   Refer to "Attaching the Antistatic Wrist Strap" on page 1-1.

2. **Remove the slot filler panel, if necessary.**

   The slot filler panel is secured to the card cage using two screws, one at the top of the filler panel, the other at the bottom.

3. **Get the replacement alarm rear transition card from the ship kit.**

4. **Verify that the ejection levers are unlocked.**

   You will not be able to install the card properly if the ejection levers are locked.

5. **Keeping the card vertical, slide the card into the slot between the two guides (**FIGURE 6-9**).**

   The teeth in the handle of the card must align with the square cutouts in the I/O slot. When the card is completely seated in the card cage, the two ejection levers should flip inward, and the teeth in the ejection levers should fit smoothly in the rectangular cutouts in the bottom and top plates. FIGURE 6-9 on page 6-14 shows how to insert an I/O card into a slot; the same principal applies to an alarm rear transition card.

6. **Using a No. 2 Phillips screwdriver, tighten the two captive screws inside the card's ejection levers, one on top and one on the bottom.**

7. **Lock the ejection levers on the card.**

8. **Plug all appropriate cables into the alarm rear transition card.**
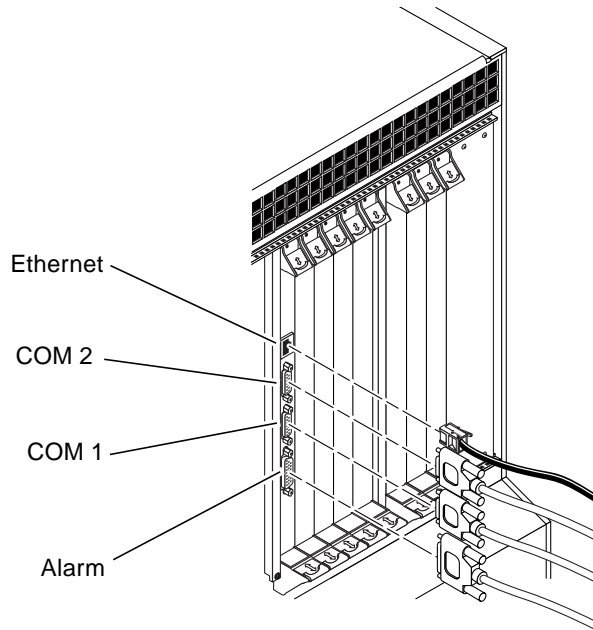
FIGURE 6-22 Connectors on the Alarm Rear Transition Card

9. **Get the replacement alarm card from the ship kit.**

10. **Verify that the ejection levers are unlocked.**

   You will not be able to install the card properly if the ejection levers are locked.

11. **Go to the front of the server and install the replacement alarm card in slot 8 in the Netra ct 800 server.**

   Refer to "Installing an Alarm Card (Netra ct 800 Server)" on page 6-24 for those instructions, including the power-on instructions.

Removing and Replacing Hard Disk Drives and Removeable Media

Note – When removing a hot-swappable component, allow several seconds before inserting it or another component in that slot. Rapidly removing and inserting any hot-swappable component might panic or hang the system.

This chapter gives procedures for the installation, removal, and replacement of hard disk drives and removeable media. It is organized as follows:

■ "Hard Disk Drive" on page 7-1
■ "CD-ROM/DVD or DAT Drive (Netra ct 800 Server Only)" on page 7-8

Consult the *Netra ct Server Safety and Compliance Manual* for safety information prior to performing the procedures in this chapter.

Note – Read Chapter 3 "Handling Cards and Assemblies" before performing the procedures in this chapter.

7.1   Hard Disk Drive

This section tells you how to remove and replace an internal hard disk drive. An internal hard disk drive is one that fits in a bay within a server. It is distinguished from an external hard disk drive, which is attached by a cable that connects to an I/O card in the server.

A hard disk drive is a hot-swappable component only if the hard disk drive is not being used by the server. For example, if a hard disk drive is being used as the primary boot drive, then that hard disk drive is not hot-swappable unless disk

management software is used to mirror the boot drive to a second hard disk drive installed in the server. For that reason, a hard disk drive in a Netra ct 400 server is a hot-swappable disk drive only if the Netra ct 400 server is running on the Solaris operating environment over the network, and not off of the hard disk drive.

The remove and replace instructions for hot-swappable drives are covered here; the remove and replace instructions for cold-swappable drives are covered in Chapter 11 "Removing and Replacing Cold-Swappable Subassemblies" in the section "Hard Disk Drive" on page 11-1.

- If you are removing and replacing a *faulty* hard disk drive in the server, first to go "Removing a Hard Disk Drive" on page 7-2, then go to "Installing a Hard Disk Drive" on page 7-7.

- If you are installing a *new* hard disk drive in the server, go to "Installing a Hard Disk Drive" on page 7-7.

7.1.1   Removing a Hard Disk Drive

Note – The instructions in this section do *not* cover unconfiguration procedures that might be necessary if you are removing a hard disk drive that is under the control of any disk management software, such as Volume Manager or Solstice DiskSuite. If you are running disk management software on your system, refer to the documentation that came with the disk management software for instructions on releasing a hard disk drive from the control of the software before proceeding with these instructions.

1. **Attach the antistatic wrist strap.**

   Refer to "Attaching the Antistatic Wrist Strap" on page 1-1.

2. **Locate the drive bay cover on your system.**

   The hard disk drives will be behind the drive bay cover on your system. There would be a maximum of two hard disk drives behind the drive bay cover in a Netra ct 800 server and one behind the drive bay cover in a Netra ct 400 server.

Drive bay cover, Netra ct 800 server

Drive bay cover, Netra ct 400 server
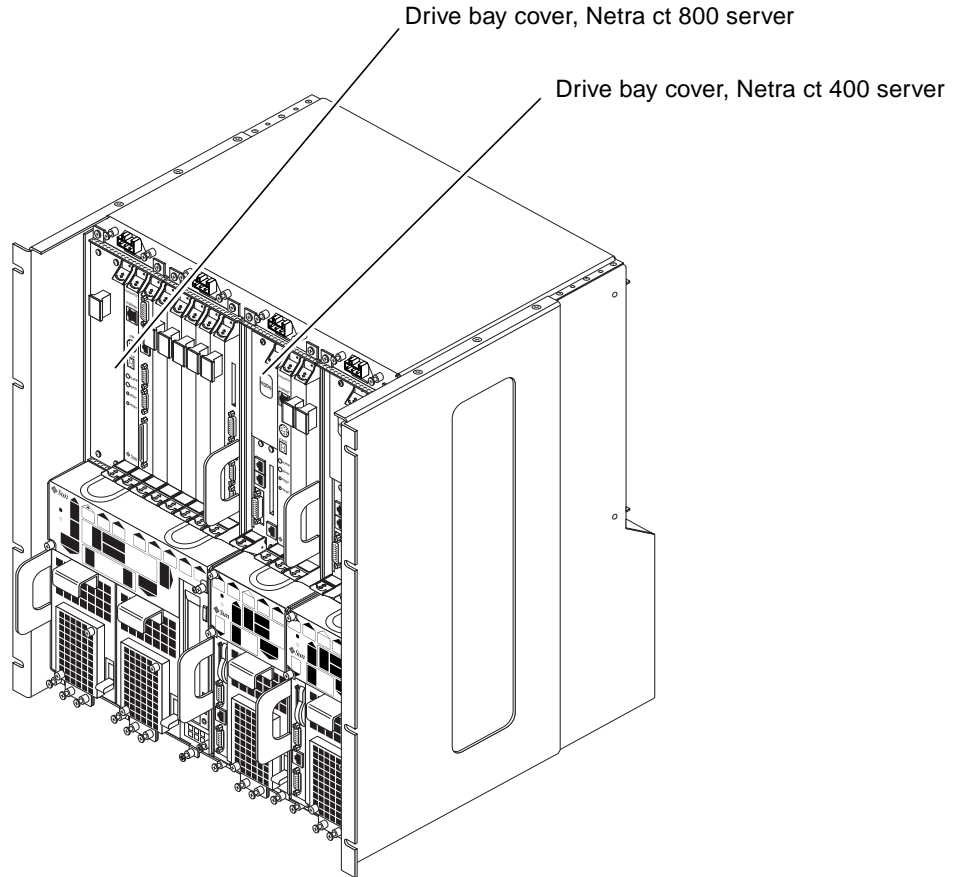
FIGURE 7-1   Drive Bay Cover Locations

3. Loosen the captive screws that hold the drive bay cover in place.

- For the Netra ct 800 server, use a No. 1 Phillips screwdriver to loosen the four captive screws (two on top and two on the bottom).

- For the Netra ct 400 server, use a No. 2 Phillips screwdriver to loosen the one captive screw on top.

4. Remove the drive bay cover.

5. Locate the hard disk drive that you want to replace.

In a Netra ct 800 server, HDD0 is the upper hard disk drive and HDD1 is the lower hard disk drive.

6. **Log in to the server and get the attachment-point IDs for the hard disk drives installed in your server.**

   As root, enter:

   ```
   # cfgadm -a c0
   ```

   You should get feedback similar to the following:

   ```
   Ap_Id                           Type        Receptacle   Occupant     Condition
   c0                              scsi-bus    connected    configured   unknown
   c0::dsk/c0t0d0                  disk        connected    configured   unknown
   c0::dsk/c0t1d0                  disk        connected    configured   unknown
   c0::dsk/c0t6d0                  CD-ROM      connected    configured   unknown
   ```

   In the sample feedback above, the attachment-point ID for the upper hard disk drive (HDD 0) is `c0::dsk/c0t0d0` and attachment-point ID for the lower hard disk drive (HDD 1) is `c0::dsk/c0t1d0`.

7. **List all mounted partitions on the disk that you want to remove.**

   As root, enter:

   ```
   # cfgadm -c unconfigure ap_id
   ```

   where *ap_id* is the attachment-point ID for the hard disk drive that you want to remove. For example, to list the mounted partitions on the lower hard disk drive (HDD 1), as root, enter:

   ```
   # cfgadm -c unconfigure c0::dsk/c0t1d0
   ```

   You should get feedback similar to the following:

   ```
   cfgadm: Component system is busy, try again: failed to offline:
   /devices/pci@1f,0/pci@1,1/scsi@2/sd@1,0

        Resource                 Information
   ------------------   --------------------------
   /dev/dsk/c0t1d0s7    mounted filesystem "/mnt"
   ```

> **Note –** If you didn't get any feedback after entering the command, then you do not have any partitions mounted and the hard disk drive was successfully deactivated. Go to Step 10 on page 7-5.

8. **Unmount the mounted partition(s).**

   For every filesystem that was listed in the previous step, as root, enter:

   ```
   # unmount filesystem
   ```

   For example, using the feedback from the previous step, you would enter:

   ```
   # unmount /mnt
   ```

9. **Deactivate the hard disk drive.**

   As root, enter:

   ```
   # cfgadm -c unconfigure ap_id
   ```

   where *ap_id* is the attachment-point ID for the hard disk drive that you want to remove. For example, to deactivate the lower hard disk drive (HDD 1), as root, enter:

   ```
   # cfgadm -c unconfigure c0::dsk/c0t1d0
   ```

10. **Verify that the hard disk drive has been deactivated.**

    As root, enter:

    ```
    # cfgadm -a c0
    ```

    You should get feedback similar to the following:

```
Ap_Id                    Type          Receptacle   Occupant     Condition
c0                       scsi-bus      connected    configured   unknown
c0::dsk/c0t0d0           disk          connected    configured   unknown
c0::dsk/c0t1d0           unavailable   connected    unconfigured unknown
c0::dsk/c0t6d0           CD-ROM        connected    configured   unknown
```

Note that in the sample feedback above, the Type column for the lower hard disk drive (`c0::dsk/c0t1d0`) is now `unavailable`, and the Occupant column now shows it as `unconfigured`.

You can also use the hard disk drive (HDD) LEDs on the system status panel to verify that the hard disk drive has been deactivated (FIGURE 7-2). The Okay to Remove LED (↵▯) on the system status panel for the hard disk drive should go ON, indicating that you can remove the hard disk drive from the slot.
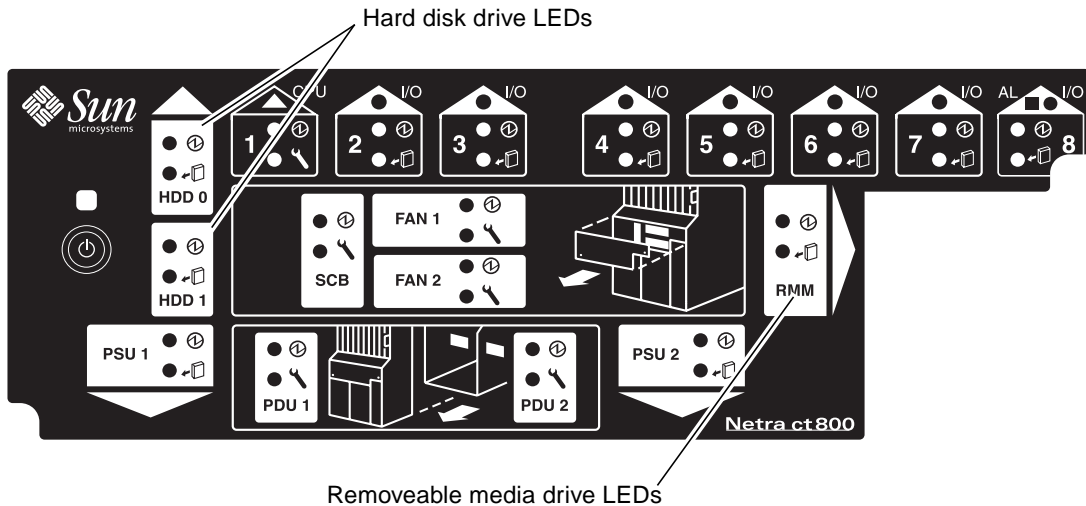
Hard disk drive LEDs

FIGURE 7-2   Locating the Hard Disk Drive LEDs on the System Status Panel (Netra ct 800 Server)

11. **Unlatch the disk drive handle to release it.**

    Push down in the direction of the arrow to release the bracket handle latch.

12. **Pull the bracket handle out and swing it open.**

13. **Continue to pivot the disk drive bracket handle against the chassis, applying mild pressure until the drive disconnects.**

14. **Slide the drive out of the chassis and place it on the electrostatic discharge mat.**

15. **Secure the drive bay cover over the drive bays (**FIGURE 7-1 **on page 7-3).**

    You must install the drive bay cover over the drive bays to ensure proper airflow in the system.

7.1.2　　Installing a Hard Disk Drive

1. **Attach the antistatic wrist strap.**

   Refer to "Attaching the Antistatic Wrist Strap" on page 1-1.

2. **Remove the drive bay cover (**FIGURE 7-1 **on page 7-3).**

3. **Hold the bracket handle on the disk drive open.**

4. **Slide the replacement disk drive into the drive slot.**

5. **Gently push the drive until the locking handle engages.**

6. **Close the locking handle completely, using gentle downward pressure.**

7. **Replace the drive bay cover.**

8. **Log in to the server and, as root, activate the replacement hard disk drive:**

   ```
   # cfgadm -c configure ap_id
   ```

   where *ap_id* is the attachment-point ID for the hard disk drive that you just installed.
   For example, to activate the lower hard disk drive (HDD 1), as root, enter:

   ```
   # cfgadm -c configure c0::dsk/c0t1d0
   ```

9. **Verify that the hard disk drive has been activated.**

   As root, enter:

   ```
   # cfgadm -a c0
   ```

   You should get feedback similar to the following:

   ```
   Ap_Id                       Type         Receptacle   Occupant     Condition
   c0                          scsi-bus     connected    configured   unknown
   c0::dsk/c0t0d0              disk         connected    configured   unknown
   c0::dsk/c0t1d0              disk         connected    configured   unknown
   c0::dsk/c0t6d0              CD-ROM       connected    configured   unknown
   ```

Note that in the sample feedback above, the Type column for the lower hard disk drive (c0::dsk/c0t1d0) is now disk, and the Occupant column now shows it as configured.

You can also use the hard disk drive (HDD) LEDs on the system status panel to verify that the hard disk drive has been activated (FIGURE 7-2 on page 7-6). The Okay to Remove LED ( ) on the system status panel for the hard disk drive should go OFF, indicating that the hard disk drive has been activated.

10. **If your hard disk(s) are under the control of RAID software, perform the necessary steps to bring the disks online.**

11. **Perform any other necessary software procedures on the hard disk drive to bring it online, including mounting the partitions and creating filesystems.**

7.2 CD-ROM/DVD or DAT Drive (Netra ct 800 Server Only)

This section tells you how to replace a CD-ROM/DVD or Digital Audio Tape (DAT) drive in a Netra ct 800 server. CD-ROM/DVD and DAT drives are referred to as *removeable media* drives. The removeable media drives are hot-swappable components. Note that internal removeable media drives are not available for the Netra ct 400 server.

Following are the SCSI IDs for the devices used in the removeable media module:

- CD-ROM/DVD—SCSI ID 6
- DAT—SCSI ID 5
- If you are removing and replacing a *faulty* removeable media drive in the server, first to go "Removing a CD-ROM/DVD or DAT Drive" on page 7-9, then go to "Installing a CD-ROM/DVD or DAT Drive" on page 7-11.
- If you are installing a *new* removeable media drive in the server, go to "Installing a CD-ROM/DVD or DAT Drive" on page 7-11.

7.2.1 Removing a CD-ROM/DVD or DAT Drive

1. **Attach the antistatic wrist strap.**

   Refer to "Attaching the Antistatic Wrist Strap" on page 1-1.

2. **Log in to the server and get the attachment-point IDs for the removeable media drive installed in your server.**

   As root, enter:

   ```
   # cfgadm -a c0
   ```

   You should get feedback similar to the following:

   ```
   Ap_Id                        Type        Receptacle  Occupant    Condition
   c0                           scsi-bus    connected   configured  unknown
   c0::dsk/c0t0d0               disk        connected   configured  unknown
   c0::dsk/c0t1d0               disk        connected   configured  unknown
   c0::dsk/c0t6d0               CD-ROM      connected   configured  unknown
   ```

   In the sample feedback above, the attachment-point ID for the removeable media drive is c0::dsk/c0t6d0. Note that a different entry would appear under the Type column for a DAT drive.

3. **Kill the Volume Manager daemon.**

   As root, enter:

   ```
   # /etc/init.d/volmgt stop
   ```

4. **Deactivate the removeable media drive.**

   As root, enter:

   ```
   # cfgadm -c unconfigure ap_id
   ```

   where *ap_id* is the attachment-point ID for the removeable media drive that you want to remove. For example, to deactivate the removeable media drive using the feedback given above, as root, enter:

   ```
   # cfgadm -c unconfigure c0::dsk/c0t6d0
   ```

5. **Verify that the removeable media drive has been deactivated.**

As root, enter:

```
# cfgadm -a c0
```

You should get feedback similar to the following:

```
Ap_Id                           Type        Receptacle  Occupant      Condition
c0                              scsi-bus    connected   configured    unknown
c0::dsk/c0t0d0                  disk        connected   configured    unknown
c0::dsk/c0t1d0                  disk        connected   configured    unknown
c0::dsk/c0t6d0                  unavailable connected   unconfigured unknown
```

Note that in the sample feedback above, the Type column for the removeable media drive (c0::dsk/c0t6d0) is now unavailable, and the Occupant column now shows it as unconfigured.

You can also use the removeable media module (RMM) LEDs on the system status panel to verify that the removeable media drive has been deactivated (FIGURE 7-2 on page 7-6). The Okay to Remove LED (↵▯) on the system status panel for the removeable media module should go ON, indicating that you can remove the removeable media drive from the slot.

6. **Using a No. 2 Phillips screwdriver, loosen the captive screw that holds the removeable media module in place.**

7. **Pull the module from the system and place it on the electrostatic discharge mat.**
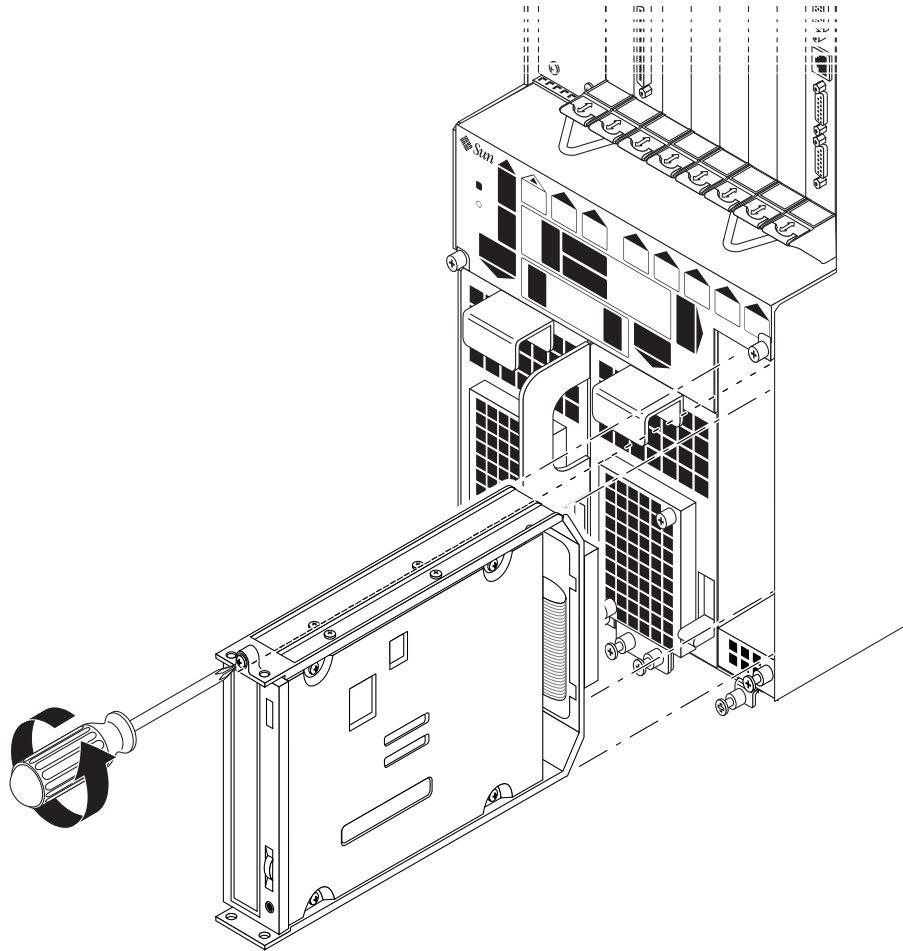
FIGURE 7-3   Removing the Removeable Media Module from a Netra ct 800 Server

7.2.2   Installing a CD-ROM/DVD or DAT Drive

1. **Attach the antistatic wrist strap.**

   Refer to "Attaching the Antistatic Wrist Strap" on page 1-1.

2. **Insert the removeable media module into the server.**

3. **Using a No. 2 Phillips screwdriver, tighten the screw on the removeable media module to secure it to the server.**

4. **Log in to the server and, as root, activate the replacement removeable media drive:**

```
# cfgadm -c configure ap_id
```

where *ap_id* is the attachment-point ID for the removeable media drive that you just installed. For example, to activate the removeable media drive, as root, enter:

```
# cfgadm -c configure c0::dsk/c0t6d0
```

5. **Verify that the removeable media drive has been activated.**

As root, enter:

```
# cfgadm -a c0
```

You should get feedback similar to the following:

```
Ap_Id                         Type        Receptacle   Occupant     Condition
c0                            scsi-bus    connected    configured   unknown
c0::dsk/c0t0d0                disk        connected    configured   unknown
c0::dsk/c0t1d0                disk        connected    configured   unknown
c0::dsk/c0t6d0                CD-ROM      connected    configured   unknown
```

Note that in the sample feedback above, the Type column for the removeable media drive (`c0::dsk/c0t6d0`) is now `CD-ROM`, and the Occupant column now shows it as `configured`. Note that a different entry would appear under the Type column for a DAT drive.

You can also use the removeable media module (RMM) LEDs on the system status panel to verify that the removeable media drive has been activated (FIGURE 7-2 on page 7-6). The Okay to Remove LED (↩🗍) on the system status panel for the removeable media drive should go OFF, indicating that the removeable media drive has been activated.

6. **Start the Volume Manager daemon.**

As root, enter:

```
# /etc/init.d/volmgt start
```

Removing and Replacing Hot-Swappable Subassemblies

Note – When removing a hot-swappable component, allow several seconds before inserting it or another component in that slot. Rapidly removing and inserting any hot-swappable component might panic or hang the system.

This chapter specifies procedures for the installation, removal, and replacement of hot-swappable Netra ct server subassemblies. It is organized as follows:

- "System Status Panel" on page 8-1
- "System Controller Board" on page 8-7
- "Main Air Filter" on page 8-11
- "Power Supply Unit" on page 8-14
- "Power Supply Unit Air Filter" on page 8-18
- "Fan Tray" on page 8-22

Consult the *Netra ct Server Safety and Compliance Manual* for safety information prior to performing the procedures in this chapter.

Note – Read Chapter 3 before performing the procedures in this chapter.

8.1 System Status Panel

This section tells you how to remove and replace a system status panel. The instructions provided here apply to the removal and replacement of the system status panel from both a Netra ct 400 server and a Netra ct 800 server.

8.1.1 Removing the System Status Panel

1. **Attach the antistatic wrist strap.**

   Refer to "Attaching the Antistatic Wrist Strap" on page 1-1.

2. **Go to the front of the Netra ct server and locate the system status panel.**

   The location of the system status panel in the Netra ct 800 server and Netra ct 400 server is illustrated in FIGURE 8-1.
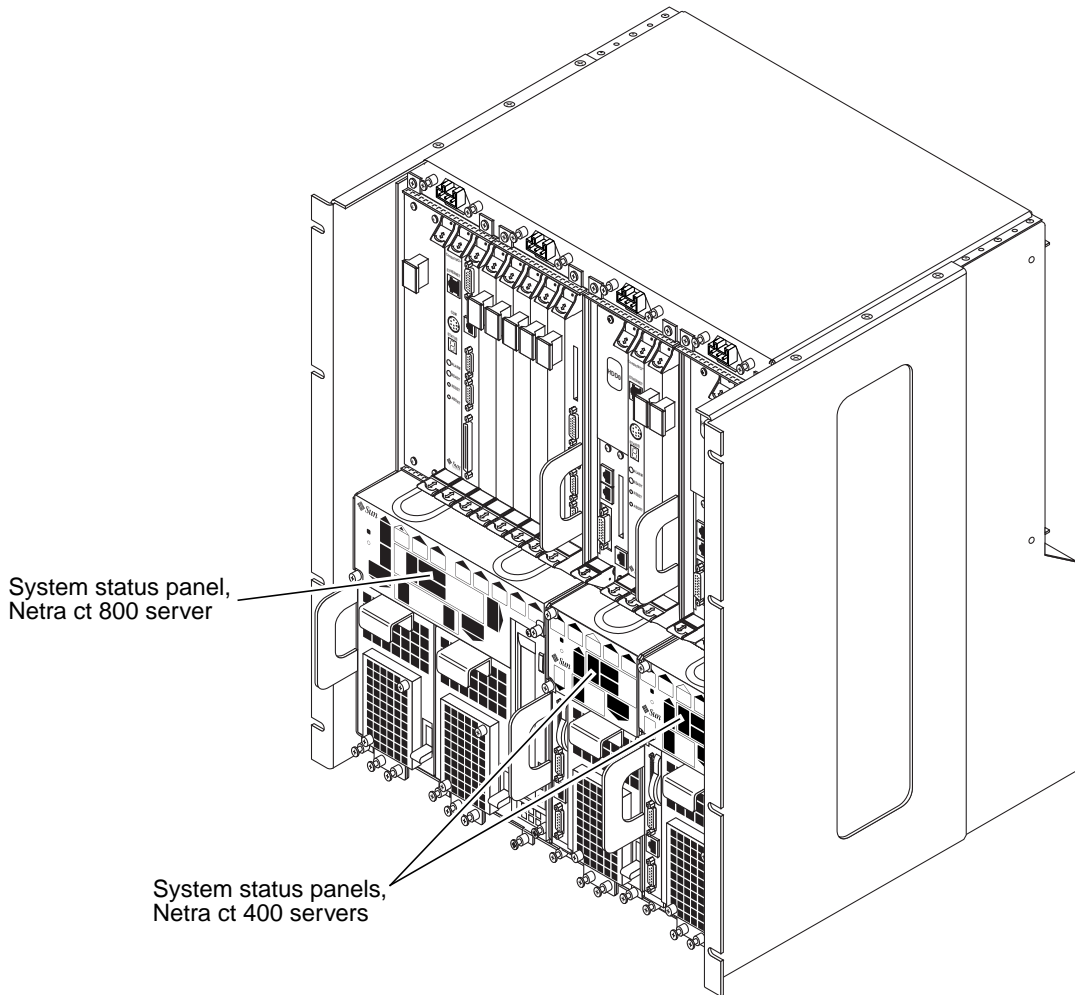

System status panel,
Netra ct 800 server

System status panels,
Netra ct 400 servers

FIGURE 8-1   System Status Panel Locations

3. Using a No. 2 Phillips screwdriver, loosen the two captive screws that hold the system status panel in place.

FIGURE 8-2 shows the location of the captive screws on the Netra ct 800 server, and FIGURE 8-3 shows the location of the captive screws on the Netra ct 400 server.
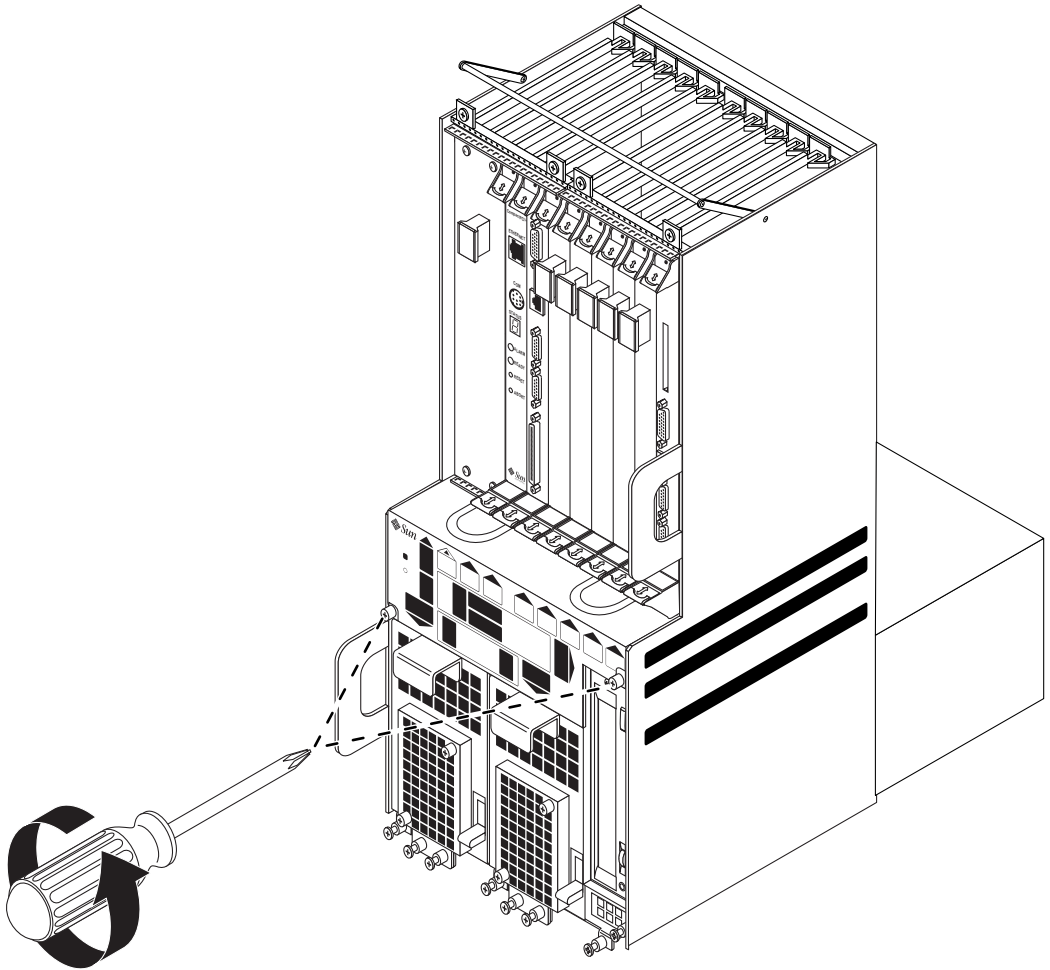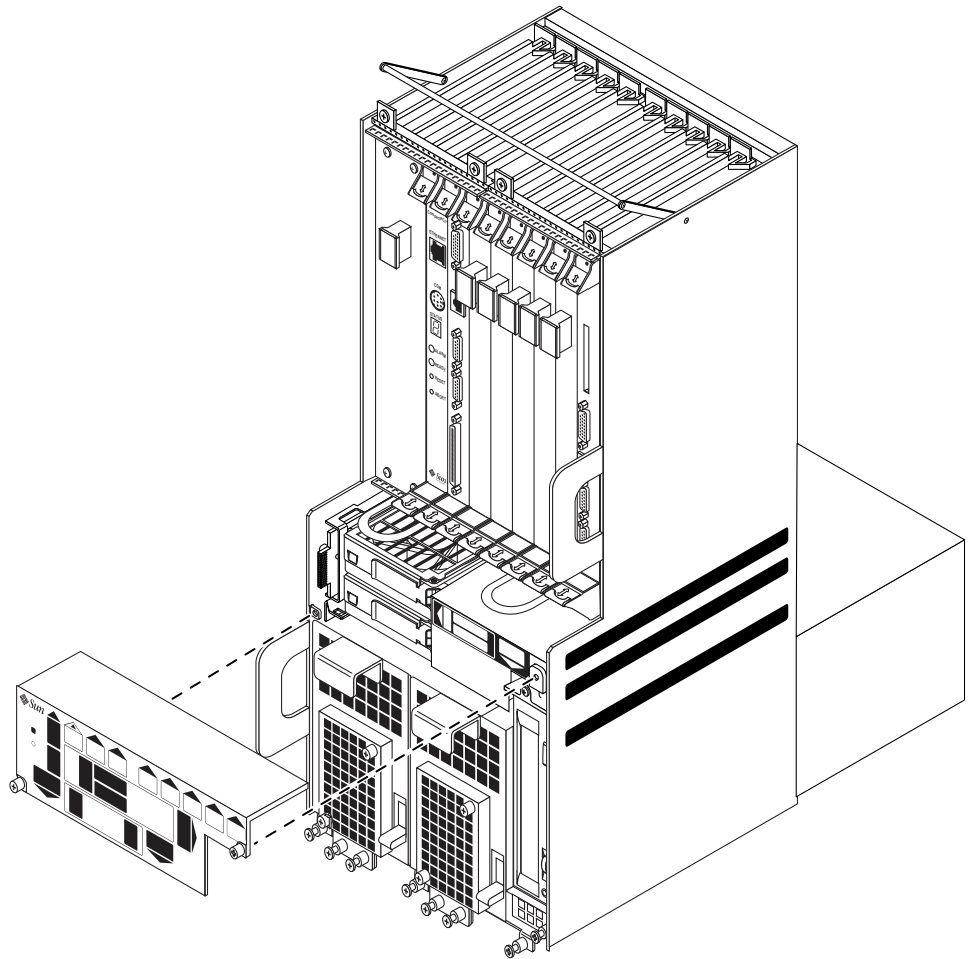

FIGURE 8-2   Removing the System Status Panel (Netra ct 800 Server)
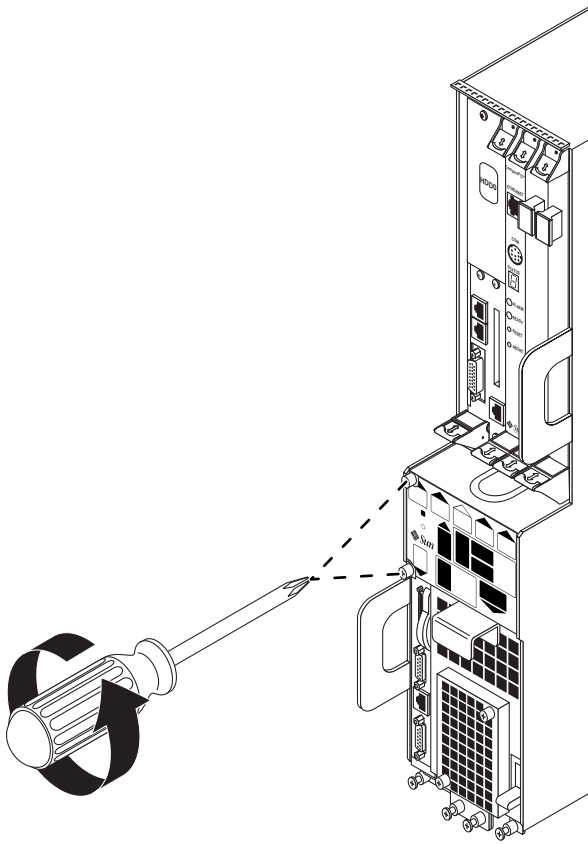
FIGURE 8-3   Removing the System Status Panel (Netra ct 400 Server)

4. Pull the system status panel away from the Netra ct server and place it on the electrostatic discharge mat.

You may have to pull on the screws to remove the system status panel from the server.

8.1.2 Replacing the System Status Panel

1. **Attach the antistatic wrist strap.**

   Refer to "Attaching the Antistatic Wrist Strap" on page 1-1.

2. **Carefully position the system status panel into place on the system.**

   FIGURE 8-4 shows how to position the panel into place on the Netra ct 800 server and FIGURE 8-5 shows how to position the panel into place on the Netra ct 400 server.

FIGURE 8-4   Positioning the System Status Panel (Netra ct 800 Server)
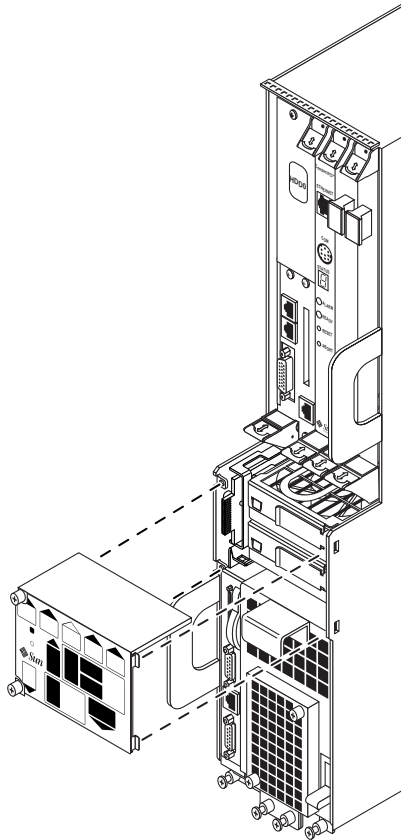
FIGURE 8-5　Positioning the System Status Panel (Netra ct 400 Server)

3. Push the system status panel into place against the server, paying special attention to the connector on the left side of the panel, making sure that the connector on the left back of the system status panel mates fully with the system controller board.

Note – Be careful not to press the power switch when you are pressing the left side of the system status panel into place.

4. Using a No. 2 Phillips screwdriver, tighten the two captive screws to secure the system status panel to the system.

FIGURE 8-2 shows the location of the captive screws on the Netra ct 800 server, and FIGURE 8-3 shows the location of the captive screws on the Netra ct 400 server.

8.2   System Controller Board

This section tells you how to remove and replace a system controller board. Each server has a single system controller board. You must remove the system status panel before you can access the system controller board.

8.2.1   Removing the System Controller Board

Note – If another field-replaceable unit (FRU) fails in a Netra ct server, such as a fan tray, do not remove the system controller board from the server before replacing the failed FRU. The system will lose track of the status of the failed FRU if you remove the system controller board before replacing the failed FRU. You must remove and replace the failed FRU before you can remove the system controller board.

Caution – Do not remove a system controller board from the server if the amber Okay to Remove LED ( ) is ON for any I/O slot in the server. If you cannot get the amber Okay to Remove LED to the OFF state for all the I/O slots in the server, you can work around the situation by enabling basic hot swap on all the I/O slots (refer to "Enabling Basic Hot Swap on I/O Slots" on page 5-5). Once you've enabled basic hot swap on all I/O slots, you can safely remove the system controller board.

1. **Go to the front of the system and use the system status panel to determine if the system controller board has failed.**

   FIGURE 8-6 shows the locations of the system controller board LEDs on the Netra ct 800 server, and FIGURE 8-7 shows the locations of the system controller board LEDs on the Netra ct 400 server.
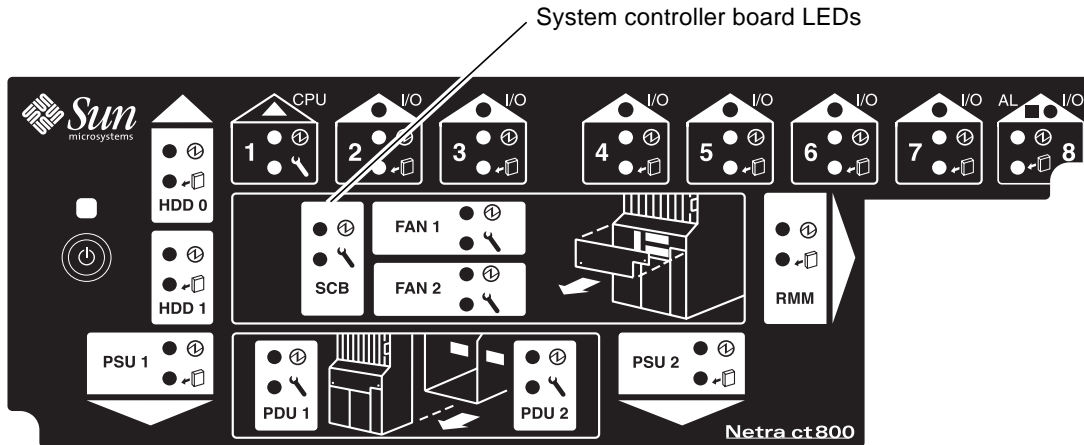
System controller board LEDs

FIGURE 8-6 Locating the System Controller Board LEDs on the System Status Panel (Netra ct 800 Server)
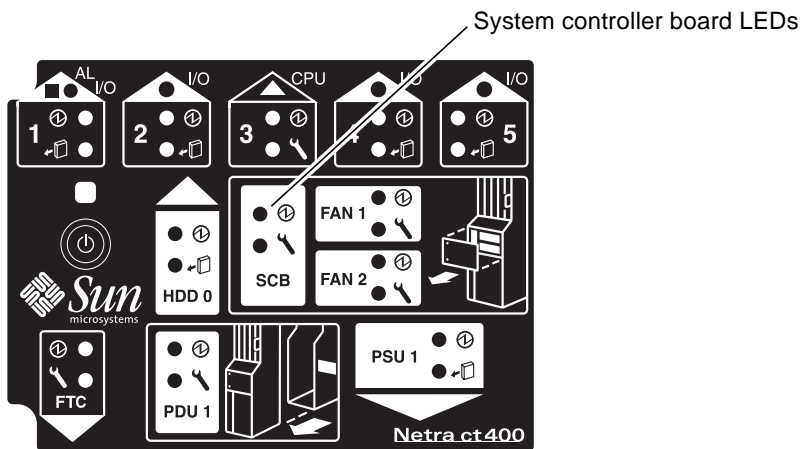
System controller board LEDs

FIGURE 8-7 Locating the System Controller Board LEDs on the System Status Panel (Netra ct 400 Server)

2. **Verify that the amber Okay to Remove LED ( ) is unlit for all I/O slots in the server.**

You cannot remove the system controller board if the Okay to Remove LED is lit for any I/O slot in the server.

3. **Remove the system status panel as described in Section 8.1.1 "Removing the System Status Panel" on page 8-2.**

   Do not remove the antistatic wrist strap after you've removed the system status panel.

4. **Pull down on the ejection lever to unseat the system controller board (**FIGURE 8-8**).**
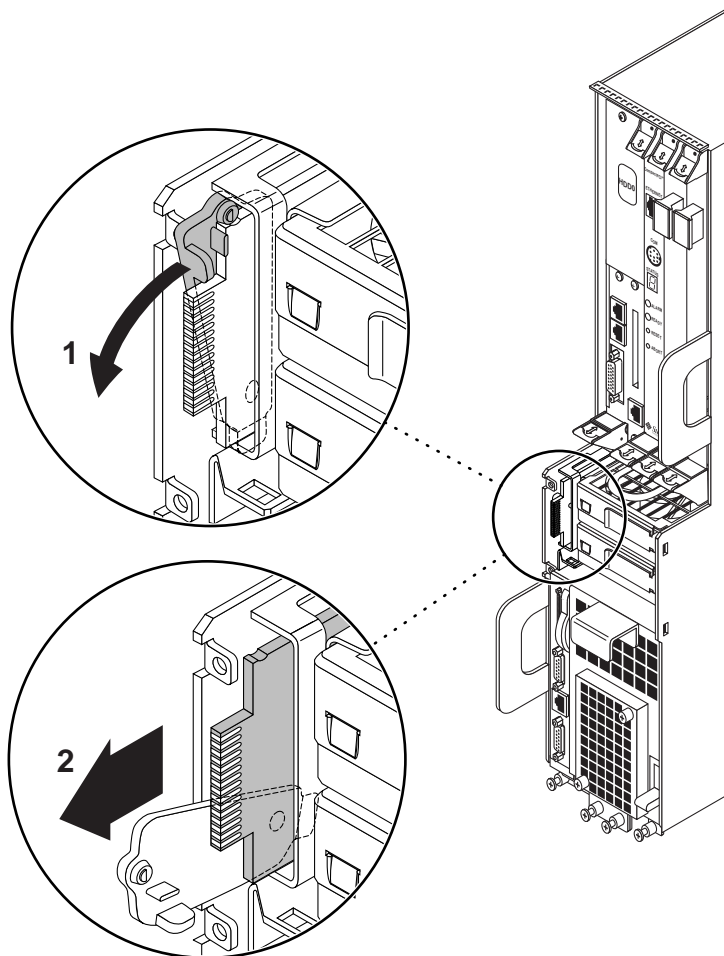

FIGURE 8-8   Removing a System Controller Board

5. **Slide the board out and place it on the electrostatic discharge mat.**

8.2.2 Replacing the System Controller Board

1. **Attach the antistatic wrist strap.**

   Refer to "Attaching the Antistatic Wrist Strap" on page 1-1.

2. **Push the ejection lever all the way down.**

3. **Line up the system controller board with its slot using the upper and lower rails, making sure that the component side of the board faces the left of the server.**

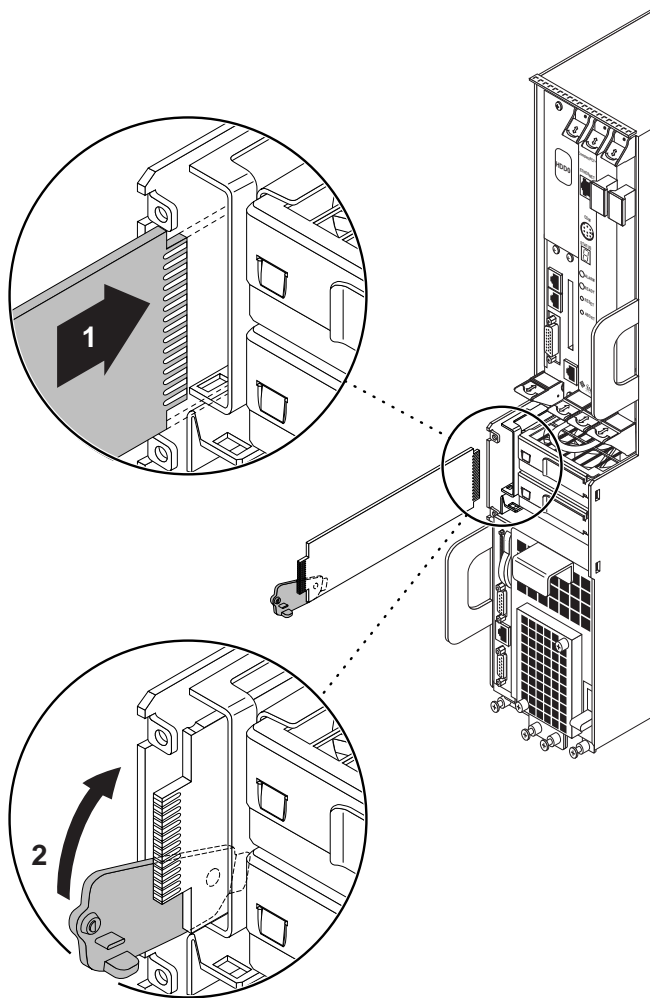   The wide connector should be inserted first, as shown in FIGURE 8-9.

FIGURE 8-9   Inserting a System Controller Board

4. **Slide the board into the slot (**FIGURE 8-9**).**

5. **Flip the ejection lever up as you slide the board into the slot to completely seat it in the card cage.**

   The notch on the ejection lever should fit into the cutout.

⚠️ **Caution –** Do not force any board into a slot; this can cause damage to the board and system. The board should insert and seat smoothly. If it binds, remove the board and inspect the card cage slot for any obvious obstructions.

When the board is completely seated, you should see a brief flash of light behind the board.

- If the light flashes on and off, and remains off, then the board is seated and functioning properly.
- If the light flashes on and remains on, then the board is either not seated properly or is faulty. If the light continues to stay on after repeated attempts, then the board is faulty.

6. **Replace the system status panel, as described in Section 8.1.2 "Replacing the System Status Panel" on page 8-5.**

8.3 Main Air Filter

This section describes how to remove and replace the main system air filter. It should be replaced every three to six months. If your server environment is especially dirty, you may have to replace it more frequently. The part number for the main air filter for the Netra ct 800 server is X7163A; the part number for the main air filter for the Netra ct 400 server is X7162A.

8.3.1 Removing the Main Air Filter

1. **Locate the main air filter loop(s).**

   FIGURE 8-10 shows the location of the main air filter loops for the Netra ct 800 server and FIGURE 8-11 shows the location of the main air filter loop for the Netra ct 400 server.
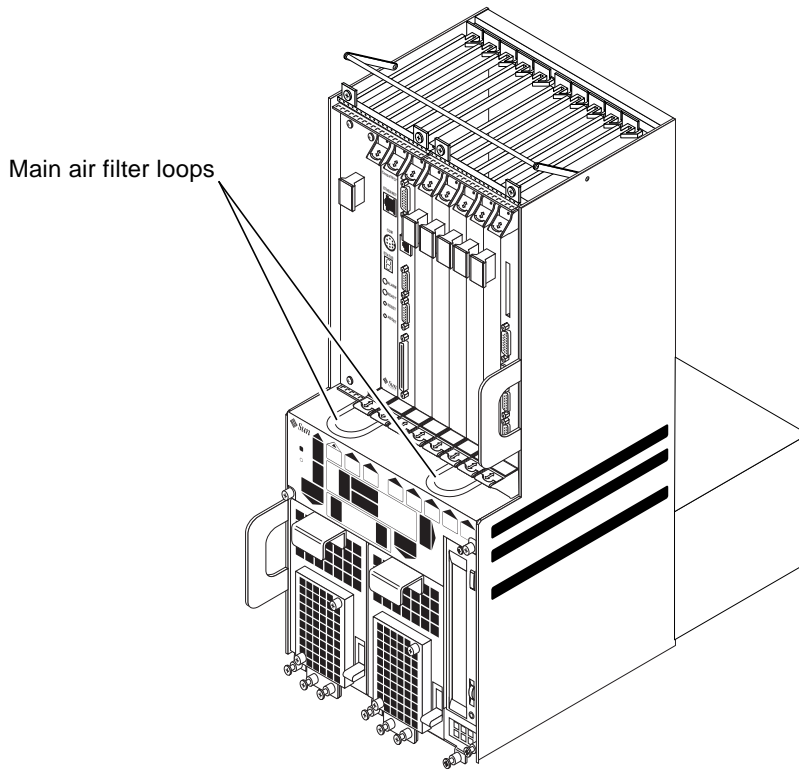
Main air filter loops

FIGURE 8-10 Locating the Main Air Filter (Netra ct 800 Server)
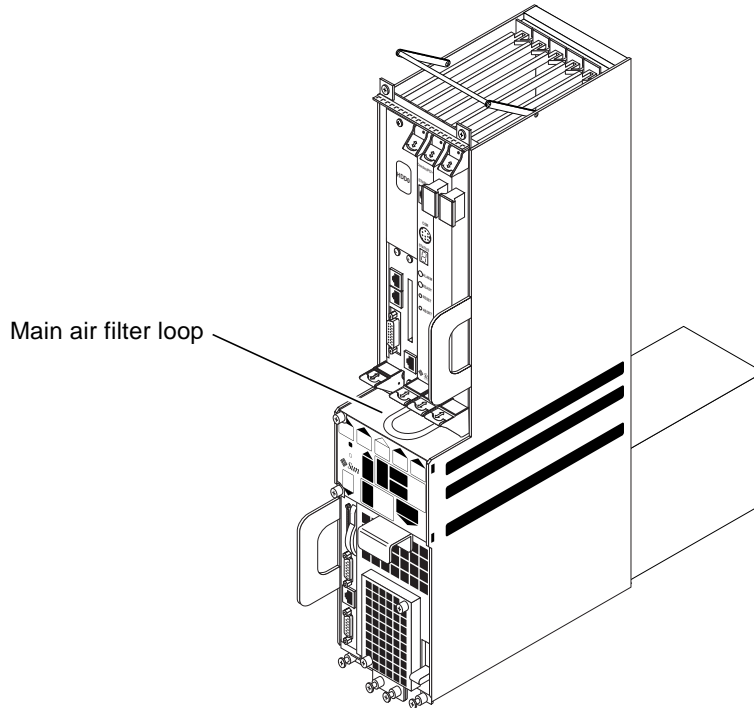
Main air filter loop

FIGURE 8-11 Locating the Main Air Filter (Netra ct 400 Server)

2. **Grasp the main air filter by the loop(s) and pull it from the server.**

8.3.2　Replacing the Main Air Filter

1. **Insert the main air filter in the server with the metal crossbar facing down and push it into the slot until you feel resistance.**

2. **Press** *down* **on the filter and push it the rest of the way into the server.**

   Press firmly against the center of the main air filter to make sure it's completely inserted.

8.4 Power Supply Unit

The second power supply unit in a Netra ct 800 server is hot-swappable, as described in Section 1.4 "FRU Categories" on page 1-4. The remaining power supply unit in a Netra ct 800 server and the lone power supply unit in a Netra ct 400 server are cold-swappable. If you are replacing a *hot-swappable* power supply unit, then follow the instructions in this section; if you are replacing a *cold-swappable* power supply unit, then go to "Power Supply Unit" on page 11-19.

Note that your Netra ct 800 server will continue to operate normally with only one power supply unit; however, you will not have complete redundancy for the power supplies until you replace the failed power supply unit.

8.4.1 Removing a Hot-Swappable Power Supply Unit

1. **Attach the antistatic wrist strap.**

   Refer to "Attaching the Antistatic Wrist Strap" on page 1-1.

2. **Determine the state of the power supply unit that you want to remove.**

   You may have to get troubleshooting information from the LEDs on the power supply unit itself to determine its state. Refer to "Troubleshooting a Power Supply Using the Power Supply Unit LEDs" on page 4-14 for more information.

3. **Verify that the power supply unit that you want to remove is hot-swappable.**

   Use the power supply unit (PSU) LEDs on the *system status panel* to locate the power supply unit that can be removed. FIGURE 8-12 shows the location of the power supply unit LEDs on the Netra ct 800 server system status panel.

   In a redundant system, a power supply unit is hot-swappable and can be removed only if the amber Okay to Remove LED (↵▯) on the *system status panel* is ON.

Note – Do *not* remove a power supply unit if the amber Okay to Remove LED (↵▯) on the system status panel is OFF; that means that the power supply unit is *not* hot-swappable, and your server will be powered off if you remove that power supply unit.
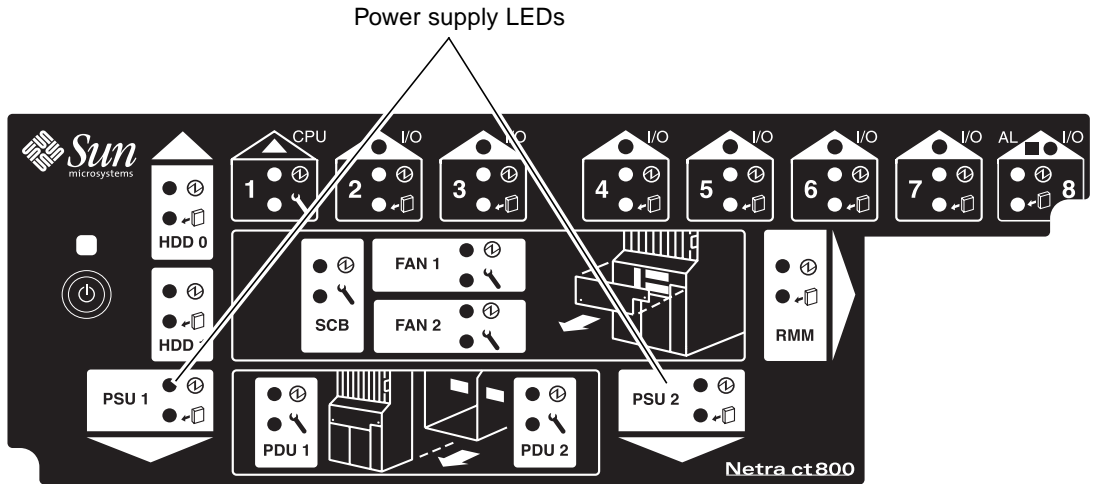

Power supply LEDs

FIGURE 8-12 Locating the Power Supply Unit LEDs on the System Status Panel (Netra ct 800 Server)

4. Push the purple locking mechanism up into the unlocked (⌐) position.

FIGURE 8-13 shows the location of the locking mechanism for a power supply unit in a Netra ct 800 server. The two LEDs on the power supply unit should go off. In addition, after several seconds, the amber Okay to Remove LED (⬅▢) on the system status panel for the remaining power supply unit in the Netra ct 800 server should go to OFF. This tells you that the remaining power supply unit is no longer hot-swappable as long as you have the first power supply unit disabled.
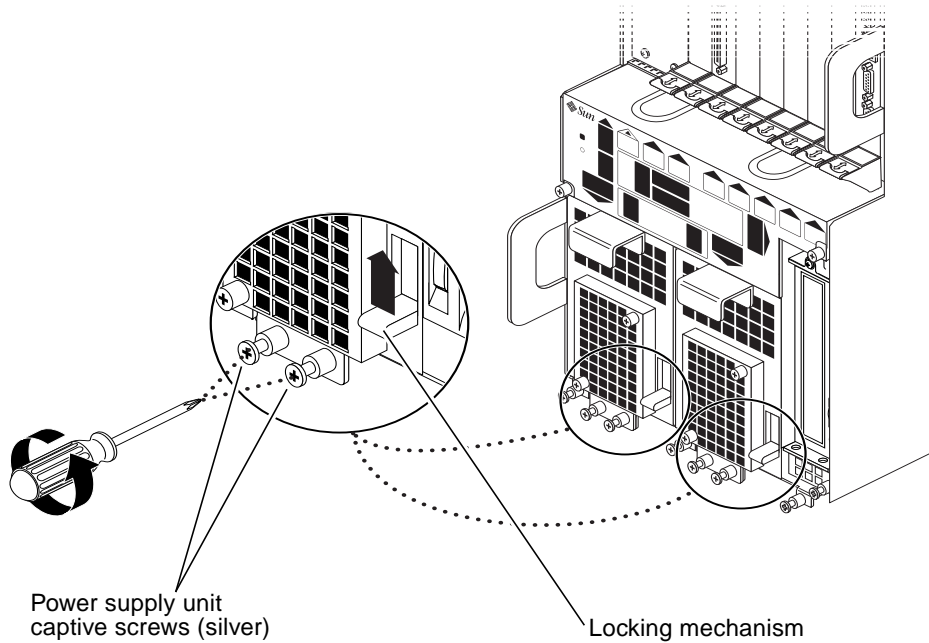
Power supply unit
captive screws (silver)

Locking mechanism

FIGURE 8-13 Unlocking a Power Supply Unit

5. Using a No. 2 Phillips screwdriver, loosen the two *silver* captive screws at the base of the power supply unit.

FIGURE 8-13 shows the location of the captive screws for a power supply unit on a Netra ct 800 server.

Note – Do not loosen the *black* captive screws at the base of the system; those screws hold the server in place.

---

6. Grasp the handle on the power supply unit, slide it out of the server and place it on the electrostatic discharge mat.
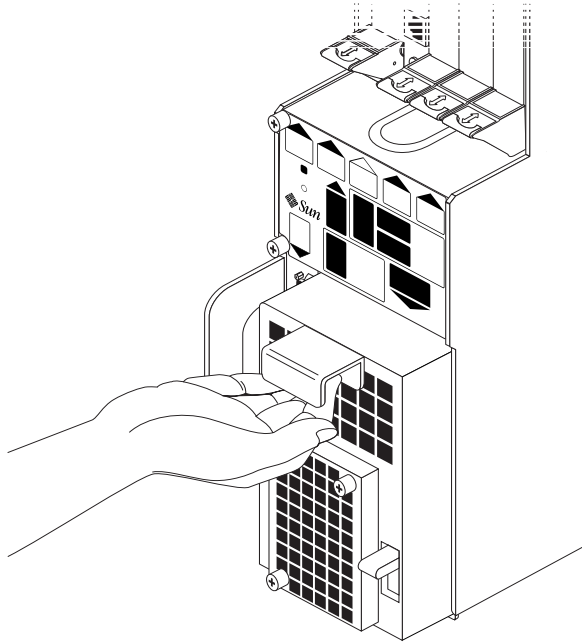
FIGURE 8-14 Removing a Power Supply Unit

8.4.2 Replacing a Hot-Swappable Power Supply Unit

1. **Attach the antistatic wrist strap.**

   Refer to "Attaching the Antistatic Wrist Strap" on page 1-1.

2. **Slide the power supply unit into the slot.**

3. **Using a No. 2 Phillips screwdriver, tighten the two silver captive screws beneath the power supply unit to secure the power supply unit to the server.**

   FIGURE 8-13 shows the location of the captive screws for the power supply unit on a Netra ct 800 server.

4. **Push the locking mechanism down into the locked ( ) position.**

   FIGURE 8-13 shows the location of the locking mechanisms for the power supply unit on a Netra ct 800 server.

5. **Verify that the power supply unit you just installed is functioning properly.**

   FIGURE 8-12 shows the location of the power supply unit LEDs (PSU) on the system status panel on the Netra ct 800 server.

The amber LEDs (↵▯) on the system status panel for both power supply units in the Netra ct 800 server should go ON. This tells you that you have two functioning, redundant power supply units in the server, and either of them is now hot-swappable.

8.5 Power Supply Unit Air Filter

This section tells you how to replace a power supply unit air filter in the Netra ct 400 server and the Netra ct 800 server. You should replace the power supply unit air filter every three to six months. If your server environment is especially dirty, you may have to replace it more frequently. The part number for the power supply unit air filter for the Netra ct 800 server and the Netra ct 400 server is X7182A.

8.5.1 Removing a Power Supply Unit Air Filter

Caution – When performing the steps in this procedure, make sure that you do not let the screwdriver enter the power supply apertures.

1. **Go to the front of the system and, using a No. 2 Phillips screwdriver, unscrew the two captive screws that hold the power supply unit air filter in place.**

   FIGURE 8-15 shows the location of the power supply unit air filter captive screws on the Netra ct 800 server, and FIGURE 8-16 shows the location of the power supply unit air filter captive screws on the Netra ct 400 server.
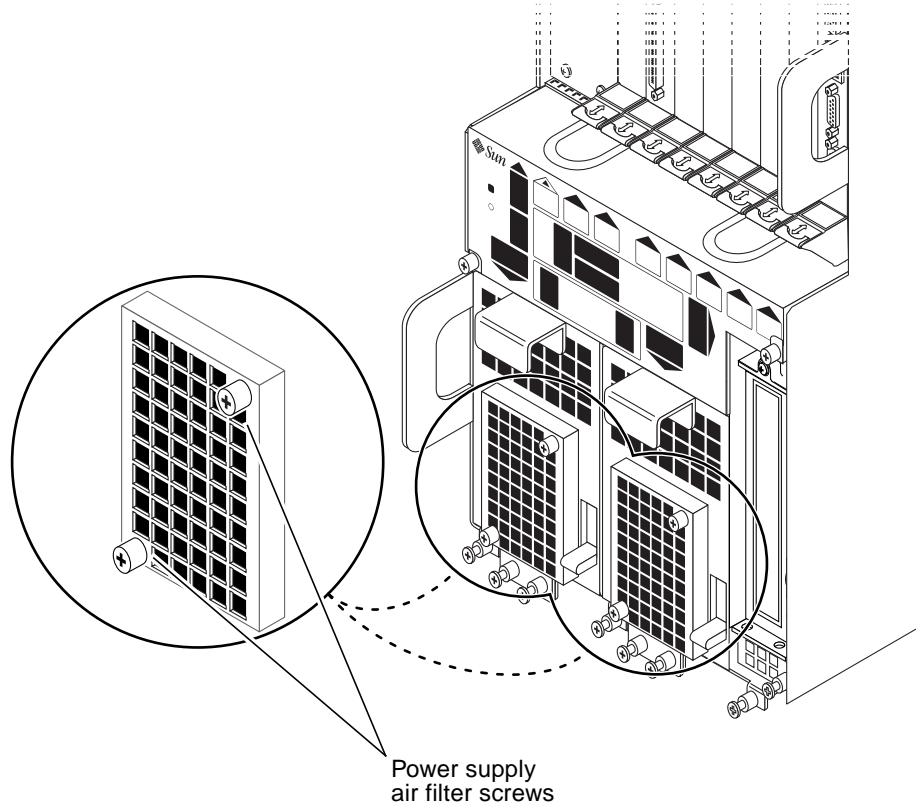
Power supply
air filter screws

FIGURE 8-15 Removing a Power Supply Unit Air Filter from a Netra ct 800 Server
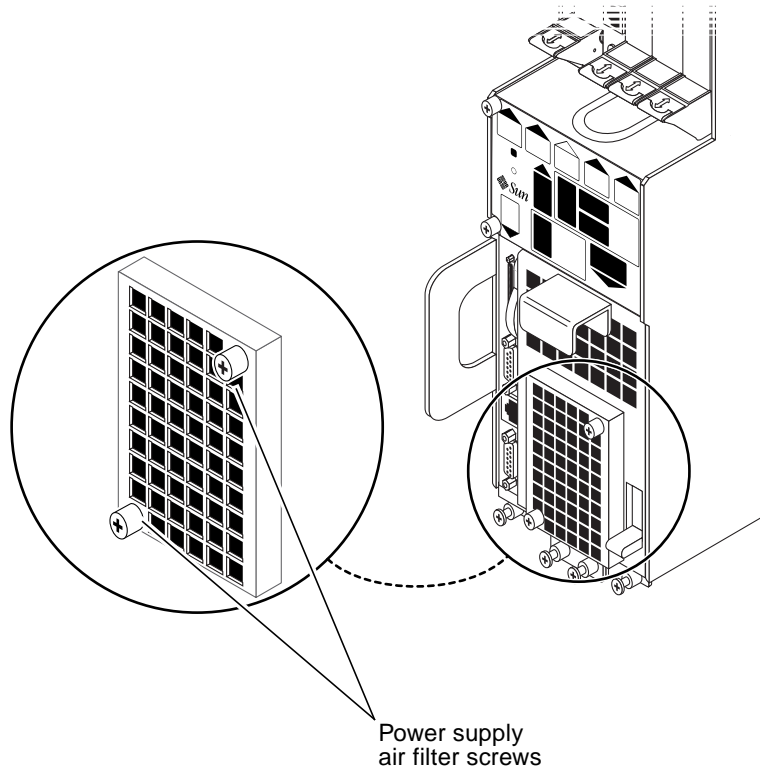
FIGURE 8-16 Removing a Power Supply Unit Air Filter from a Netra ct 400 Server

2. Remove the power supply unit air filter outer cover and set it aside.

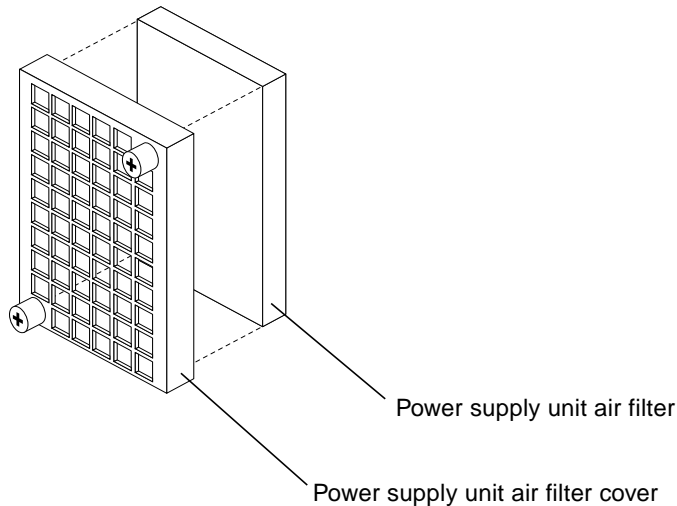**3. Remove the power supply unit air filter.**

Power supply unit air filter

Power supply unit air filter cover

FIGURE 8-17 Removing a Power Supply Unit Air Filter

⚠️ **Caution –** There is an energy hazard present as long as the power supply unit air filter is not installed. You must replace the power supply unit air filter immediately and replace the outer cover for the safe operation of your system.

8.5.2   Replacing a Power Supply Unit Air Filter

1. **Insert the power supply unit air filter (**FIGURE 8-17**).**

2. **Place the power supply unit air filter outer cover in the proper position.**

3. **Using a No. 2 Phillips screwdriver, tighten the two captive screws to secure the power supply unit air filter outer cover in place.**

   FIGURE 8-15 shows the location of the power supply unit air filter captive screws on the Netra ct 800 server, and FIGURE 8-16 shows the location of the power supply unit air filter captive screws on the Netra ct 400 server.

8.6 Fan Tray

This section describes you how to remove and replace a fan tray in both the Netra ct 800 server and the Netra ct 400 server.

If the `envmond` software is installed and running, the `envmond` software will control the speed of the fans, depending on the ambient air temperature. When the server is first powered on, if the temperature is below 11˚F (44˚C), the `envmond` software decreases the fan speeds of both fan trays to 75%. If the temperature rises above 133˚F (56˚C), the `envmond` software increases the fan speeds of both fan trays to 100%. If the temperature rises above 158˚F (70˚C), the `envmond` software sends out a warning that the system is overheating. If the temperature rises above 167˚F (75˚C), the system shuts down automatically.

Note that the temperatures above are not ambient air temperatures, but rather the CPU temperatures that are monitored by a thermistor located under the heatsink on the CPU card. Also, the `envmond` daemon controls the speed of the fans, so you must have the `envmond` daemon installed and running.

If one fan tray fails, the other fan tray will kick up to 100%, regardless of the temperature. If one fan tray fails, you must replace the failed fan tray as soon as possible. Even though the system can run on one fan tray, if the temperature rises, a single fan tray may not be able to cool the system properly.

If the `envmond` software is not installed, then the fan speeds will remain at 100%, regardless of any changes in ambient air temperature.

8.6.1 Removing a Fan Tray

1. **Go to the front of the system and use the system status panel to determine if a fan tray has failed.**

   FIGURE 8-18 shows the locations of the fan tray LEDs on the Netra ct 800 server and FIGURE 8-19 shows the locations of the fan tray LEDs on the Netra ct 400 server.
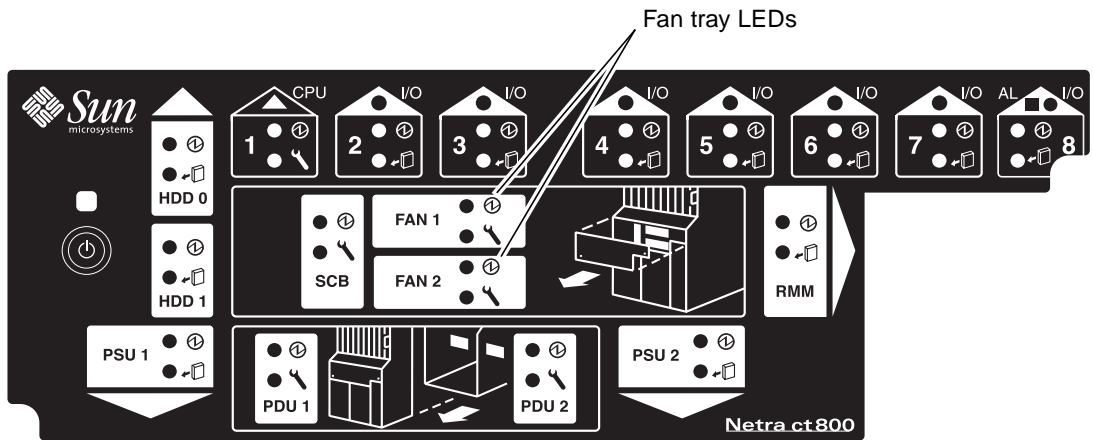
FIGURE 8-18 Locating the Fan Tray LEDs on the System Status Panel (Netra ct 800 Server)
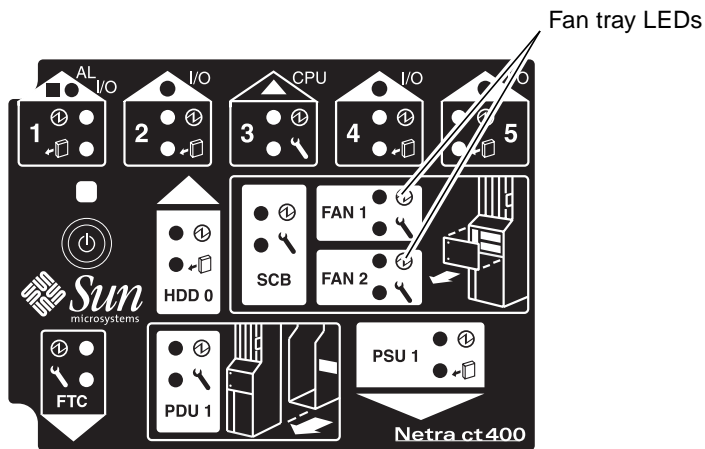

FIGURE 8-19 Locating the Fan Tray LEDs on the System Status Panel (Netra ct 400 Server)

A fan tray has failed if the amber Fault LED (⊃▬) on the system status panel is ON.

2. **Make a note of which fan tray has failed.**

   You must remove the system status panel in order to access the fan trays, and you will not be able to determine which fan tray has failed after you've removed the system status panel.

3. **Remove the system status panel from the system.**

   Refer to "Removing the System Status Panel" on page 8-2 for those instructions.

4. Locate the fan tray that has failed.

- If the *Fan 1* LEDs were in a failed state on the system status panel, the *upper* fan tray has failed.

- If the *Fan 2* LEDs were in a failed state on the system status panel, the *lower* fan tray has failed.

FIGURE 8-20 shows the locations of the fan trays in a Netra ct 800 server and FIGURE 8-21 shows the locations of the fan trays in a Netra ct 400 server.
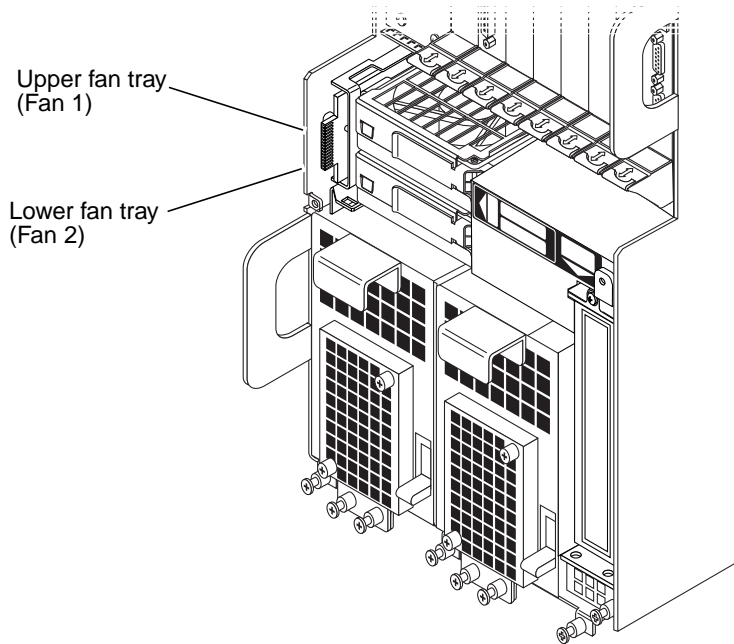

Upper fan tray
(Fan 1)

Lower fan tray
(Fan 2)

FIGURE 8-20 Locating the Fan Trays in a Netra ct 800 Server

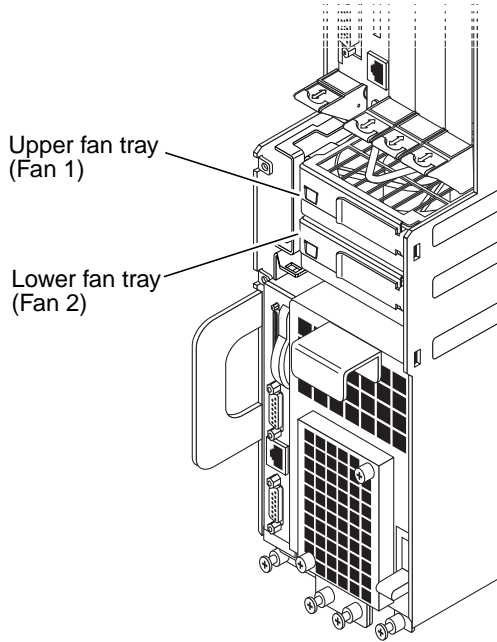Upper fan tray
(Fan 1)

Lower fan tray
(Fan 2)

FIGURE 8-21 Locating the Fan Trays in a Netra ct 400 Server

5. Pull on the fan tray handle and remove the fan tray from the system.
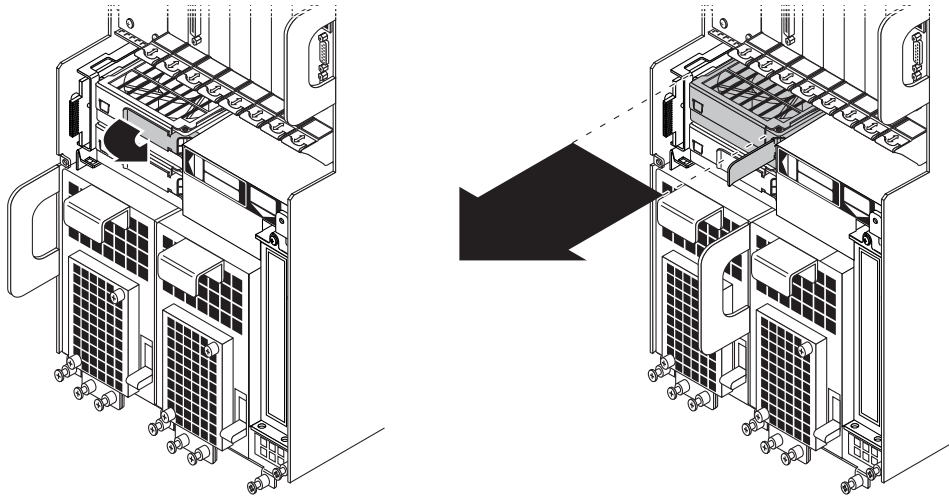
FIGURE 8-22 Removing a Fan Tray

8.6.2   Replacing a Fan Tray

1. **Insert the fan tray into the system, making sure the handle on the fan tray is on the right, and press the fan tray handle to lock the fan tray into place (**FIGURE 8-22**).**

2. **Install the system status panel on the system.**

   Refer to "Replacing the System Status Panel" on page 8-5 for those instructions.

3. **Verify that the fan tray LEDs are lit properly.**

   FIGURE 8-18 shows the locations of the fan tray LEDs on the Netra ct 800 server and FIGURE 8-19 shows the locations of the fan tray LEDs on the Netra ct 400 server.

   A fan tray is functioning properly if the amber Fault LED (⊶) on the system status panel is OFF and the green Power LED (⏻) is ON.

PART IV   Replacing Cold-Swappable FRUs

Removing and Replacing the Servers

This chapter specifies procedures for the installation, removal, and replacement of the Netra ct 800 server and Netra ct 400 server. The server and the midplane are considered a single FRU.

Consult the *Netra ct Server Safety and Compliance Manual* for safety information prior to performing the procedures in this chapter.

Note – Read Chapter 3 "Handling Cards and Assemblies" before performing the procedures in this chapter.

9.1 Servers

You can power down and remove one server without affecting the other servers in the chassis.

9.1.1 Removing a Server

The instructions in this section cover both of these situations:

- Removing a failed server
- Removing a functioning server so that you can access a component behind the server, such as a power distribution unit or a front-access cable.

1. **Completely power off the Netra ct server.**

   Refer to "Powering Off the Server" on page 2-6 for those instructions. You must push the purple power supply unit locking mechanism into the unlocked position before you can remove the server.

2. **Disconnect the DC input power cable(s) from the appropriate DC connectors.**

   For rear-access models, disconnect the DC input power cable(s) from the DC connectors at the rear of the chassis; for front-access models, disconnect the DC input power cable(s) from the DC connectors at the front of the chassis. Note that the following is always true:

   ■ A Netra ct 800 server has *two* power distribution units supplying power to it.

   ■ A Netra ct 400 server has *one* power distribution unit supplying power to it.

   FIGURE 9-1 shows sample server configurations and which power distribution units would be used for each. You do not have to disconnect the DC input power cables from any power distribution units other than the ones supplying power to server that you want to remove; doing so will power off other servers in the chassis.
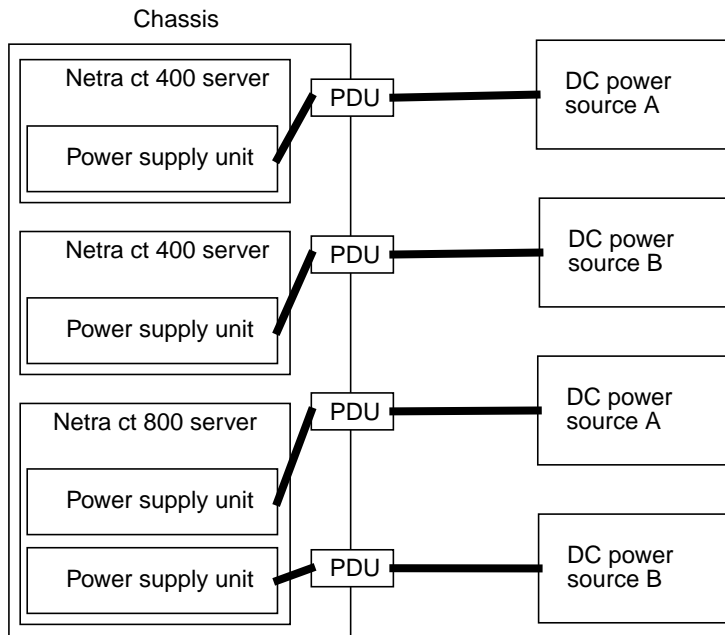

FIGURE 9-1 Power Supply Units and Power Distribution Units (PDUs)

Caution – Do *not* attempt to remove the server from the chassis without first performing the next step or you might damage certain major system components.

3. **If you have a** *rear-access* **model, unseat all the rear transition cards from the server that you are going to replace.**

   You do not have to completely remove the rear transition cards from the chassis; you only need to pull them out an inch or two so that they are disengaged from the rear of the server that you are going to replace.

4. **Determine if you need to unplug the cables connected to the server and remove all the components from the server.**

   ■ If you are removing a *faulty* Netra ct 800 server or Netra ct 400 server, you must unplug all the cables and remove all the components from the faulty server so that you can reinstall them in the replacement server later on. Go to Step 5.

   ■ If you are removing a *functioning* Netra ct 800 server or Netra ct 400 server in order to access a component behind the server (for example, a power distribution unit or a front-access cable), you do *not* have to unplug all the cables and remove all the components from the server. Go to Step 8.

5. **Label all the cables connected to the server.**

   You will be disconnecting the cables from the server in the next step, and you will want to plug the cables back into the same ports after you've replaced the server.

6. **Unplug all cables from the cards installed in the server.**

   ■ For rear-access models, go to the back of the chassis and unplug all the cables from the cards installed at the rear of the chassis for the server that you are going to replace.

   ■ For front-access models, go to the front of the chassis and unplug all the cables from the cards installed at the front of the server that you are going to replace.

7. **Remove all the components from the server.**

   You will reinstall them in the replacement server later on.

   Remove the components using the instructions in the following sections, whether you have a front-access or a rear-access model:

   ■ "Removing a CD-ROM/DVD or DAT Drive" on page 7-9 (Netra ct 800 server)
   ■ "Removing a SCSI Termination Board" on page 11-7 (Netra ct 800 server)
   ■ "Removing the System Status Panel" on page 8-2
   ■ "Removing the System Controller Board" on page 8-7
   ■ "Removing the Main Air Filter" on page 8-11
   ■ "Removing a Fan Tray" on page 8-22
   ■ "Removing a CPU Card" on page 10-2
   ■ "Removing an Alarm Card (Netra ct 800 Server)" on page 6-19
   ■ "Removing an Alarm Card (Netra ct 400 Server)" on page 6-30
   ■ "Removing a Hard Disk Drive" on page 11-2
   ■ "Removing a Cold-Swappable Power Supply Unit" on page 11-19

Remove the following components if you have a *front-access* model:

- "Removing an I/O Card" on page 6-7
- "Removing the Front-Access Cable" on page 11-16
- "Removing a CPU Front Transition Card" on page 10-10 (front-access models)

Remove the following components if you have a *rear-access* model:

- "Removing a Front I/O Card and I/O Rear Transition Card" on page 6-43
- "Removing a CPU Rear Transition Card" on page 10-27
- "Removing an Alarm Rear Transition Card" on page 6-51

8. **Using a No. 2 Phillips screwdriver, loosen the captive screws that secure the server to the chassis.**

   - If you are removing a Netra ct 800 server, loosen the *four* black captives screws at the top of the server and the *three* black captive screws at the bottom of the server (FIGURE 9-2).

   - If you are removing a Netra ct 400 server, loosen the *two* black captive screws at the top of the server and the *two* black captive screws at the bottom of the server (FIGURE 9-3).
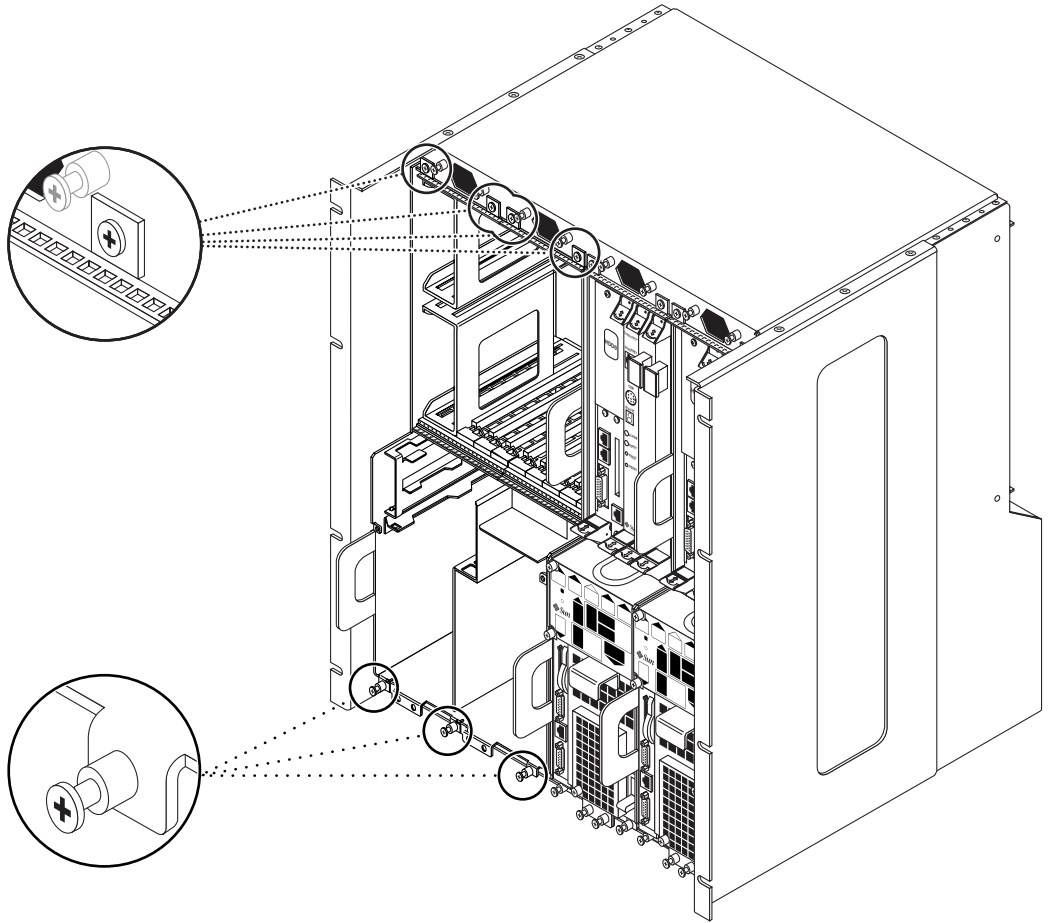
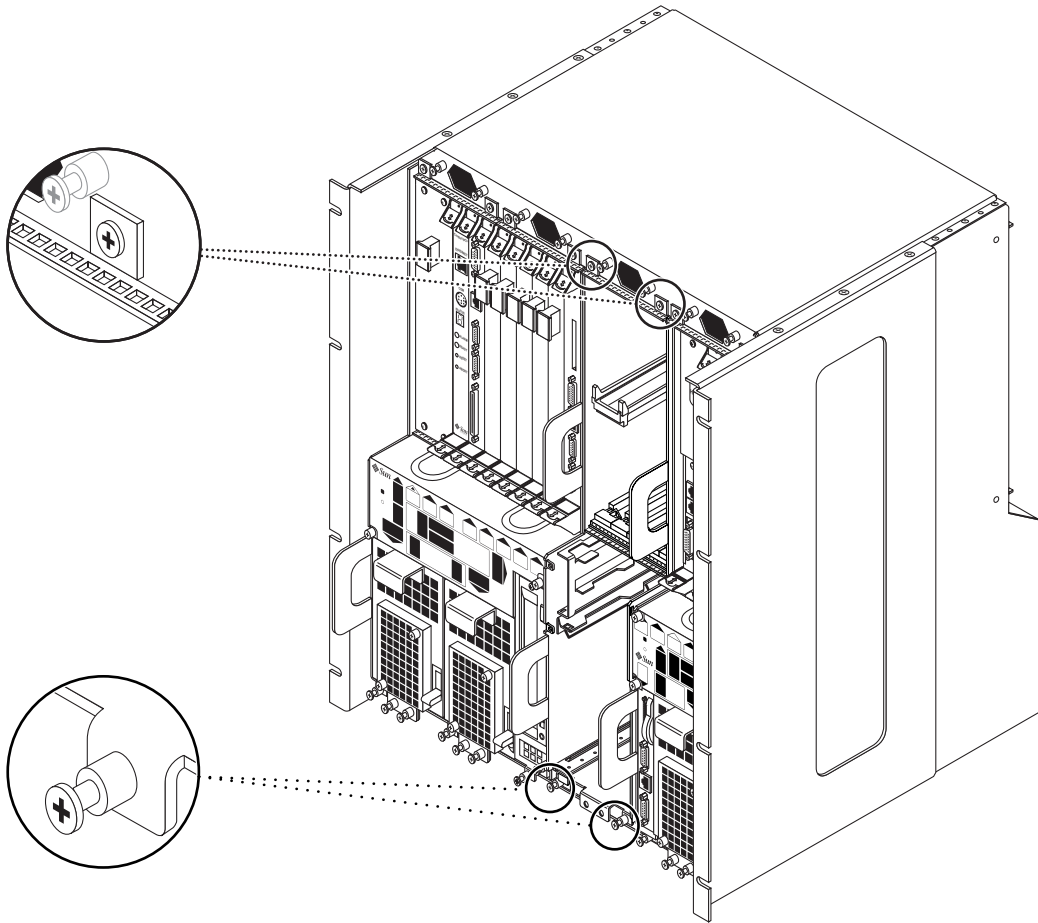**FIGURE 9-2**   Loosening the Screws at the Top and Bottom of a Netra ct 800 Server

FIGURE 9-3 Loosening the Screws at the Top and Bottom of a Netra ct 400 Server

9. **Grasp the flat vertical purple handles at the lower left and middle right of the server and slowly pull the server out of the chassis until the purple server bar at the top of the server is visible.**

10. **With your right hand, grasp the purple bar at the top of the server and completely pull the server out of the chassis using the flat vertical handle and the bar.**

   FIGURE 9-4 shows how to remove a Netra ct 800 server from the chassis and FIGURE 9-5 shows how to remove a Netra ct 400 server from the chassis.
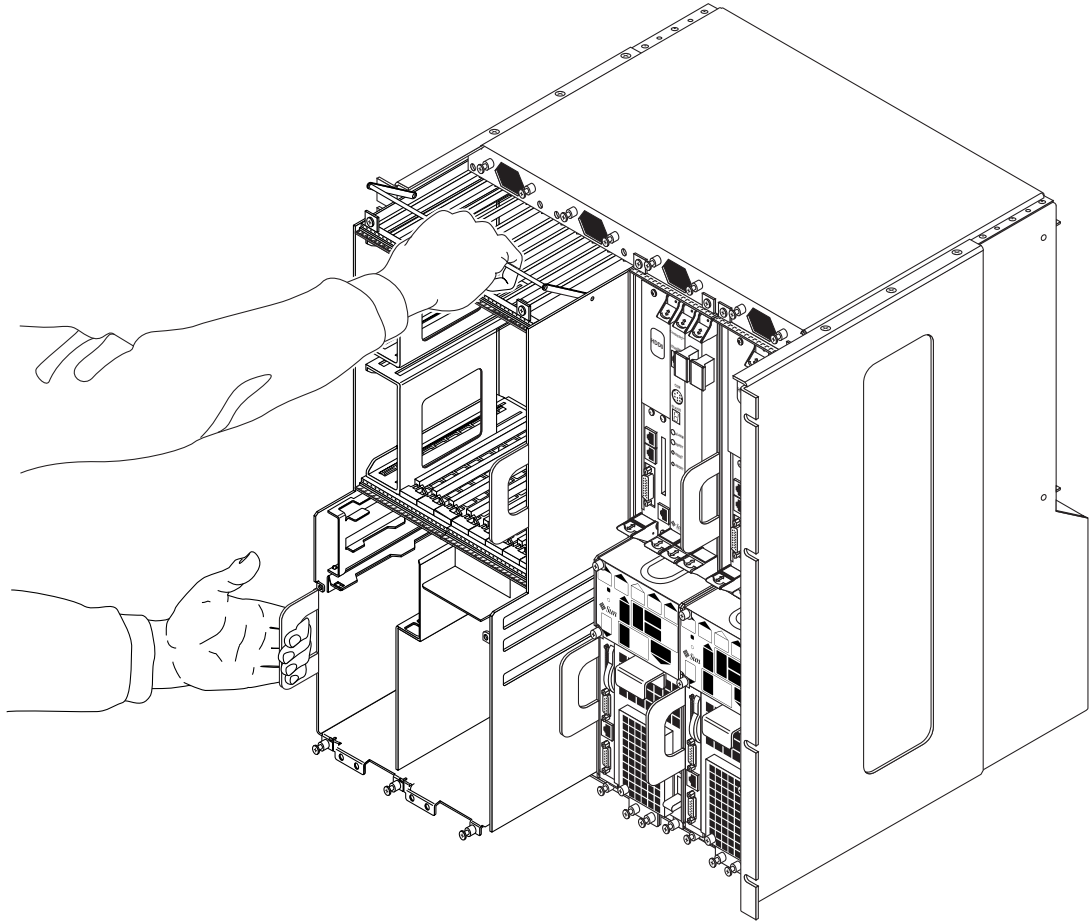
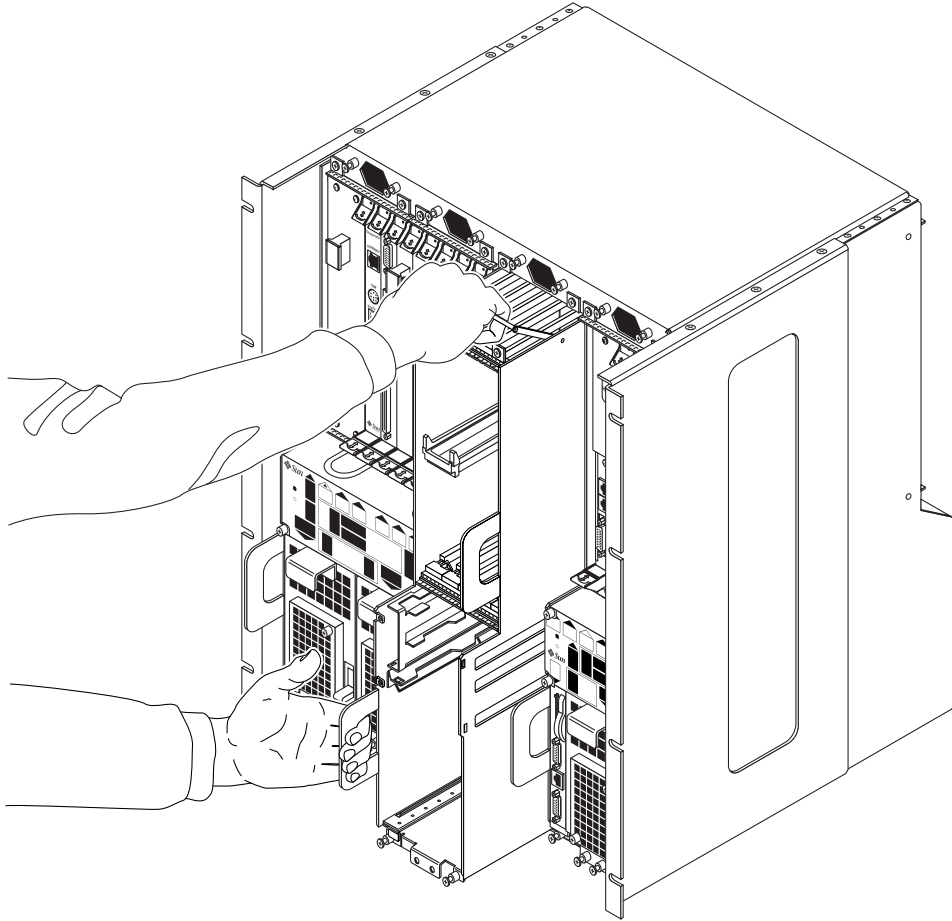**FIGURE 9-4** Removing or Inserting a Netra ct 800 Server

FIGURE 9-5   Removing or Inserting a Netra ct 400 Server

11. Set the server aside on a flat surface.

9.1.2   Replacing a Server

See the *Netra ct Server Product Overview* for combinations of Netra ct 400 server and Netra ct 800 server supported within a chassis.

1. **With your left hand, grasp the flat vertical purple handle to the left of the power supply unit.**

2. **With your right hand, grasp the purple server bar at the top of the server and insert the server into the chassis using the flat vertical handle and the server bar.**

   FIGURE 9-4 shows how to insert a Netra ct 800 server into the chassis and FIGURE 9-5 shows how to insert a Netra ct 400 server into the chassis.

   Caution – If you have a *rear-access* model server, you must verify that all the rear-access model cards have been completely unseated before proceeding with these procedures. If you attempt to insert a server without unseating the rear-access model cards, you will damage the connector pins on the midplane when you insert the server.

   ---

3. **Push the purple server bar at the top of the server down and gently push the server the remaining distance into the chassis.**

4. **Using a No. 2 Phillips screwdriver, tighten the captive screws that secure the server to the chassis.**

   - If you are installing a Netra ct 800 server, tighten the *four* black captives screws at the top of the server and the *three* black captive screws at the bottom of the server (FIGURE 9-2).

   - If you are installing a Netra ct 400 server, tighten the *two* black captive screws at the top of the server and the *two* black captive screws at the bottom of the server (FIGURE 9-3).

5. **If you have a *rear-access* model, reseat all the rear transition cards into the server that you just replaced.**

6. **Determine if you need to connect the cables to the cards in the server and reinstall all the components from the server.**

   - If you are installing a *replacement* Netra ct 800 server or Netra ct 400 server, you must connect all the cables and reinstall all the components that you removed from the faulty server. Go to Step 7.

   - If you are installing a *functioning* Netra ct 800 server or Netra ct 400 server that you had to remove in order to access a component behind the server (for example, a power distribution unit or a front-access cable), you do *not* have to connect the cables and reinstall the components. Go to Step 9.

7. **Reinstall all the components that you removed from the faulty server.**

   Replace the following components, whether you have a front-access or a rear-access model:

   - "Installing a CD-ROM/DVD or DAT Drive" on page 7-11 (Netra ct 800 server)
   - "Replacing a SCSI Termination Board" on page 11-8 (Netra ct 800 server)
   - "Replacing the System Status Panel" on page 8-5
   - "Replacing the System Controller Board" on page 8-10
   - "Replacing the Main Air Filter" on page 8-13
   - "Replacing a Fan Tray" on page 8-26
   - "Replacing the CPU Card" on page 10-6
   - "Installing an Alarm Card (Netra ct 800 Server)" on page 6-24
   - "Installing an Alarm Card (Netra ct 400 Server)" on page 6-35
   - "Replacing a Hard Disk Drive" on page 11-4
   - "Replacing a Cold-Swappable Power Supply Unit" on page 11-22

   Replace the following components if you have a *front-access* model:

   - "Installing an I/O Card" on page 6-13
   - "Replacing a Front-Access Cable" on page 11-19
   - "Replacing a CPU Front Transition Card" on page 10-13 (front-access models)

   Replace the following components if you have a *rear-access* model:

   - "Installing a Front I/O Card and I/O Rear Transition Card" on page 6-47
   - "Replacing a CPU Rear Transition Card" on page 10-29
   - "Installing an Alarm Rear Transition Card" on page 6-53

8. **Plug all the cables into the server.**

9. **Connect the DC input power cable(s) to the DC connector(s) for the server you just replaced.**

10. **Power on the server.**

    Refer to "Powering On the Server" on page 2-1 for those instructions.

Removing and Replacing Cold-Swappable Cards

Caution – An energy hazard is present if any I/O slots are left uncovered. If you remove a card from an I/O slot, you must fill it with either a replacement card or a filler panel.

This chapter gives procedures for the installation, removal and replacement of cold-swappable cards. The procedures differ somewhat between front-access and rear-access models, so this chapter is divided into the following sections:

- "Front-Access Models" on page 10-1
- "Rear-Access Models" on page 10-19

Consult the *Netra ct Server Safety and Compliance Manual* for safety information prior to performing the procedures in this chapter.

Note – Read Chapter 3 "Handling Cards and Assemblies" before performing the procedures in this chapter.

10.1   Front-Access Models

This section gives procedures for the installation, removal and replacement of the following cold-swappable cards for front-access models of both the Netra ct 400 server and Netra ct 800 server:

- "CPU Card" on page 10-2
- "CPU Front Transition Card" on page 10-10
- "CPU Shunt Card (Netra ct 800 Server Only)" on page 10-17

10.1.1   CPU Card

This section tells you how to replace a CPU card, in both a Netra ct 400 server and a Netra ct 800 server. Both the Netra ct 400 server and the Netra ct 800 server have a dedicated location for the card, indicated by the red card guides.

10.1.1.1   Removing a CPU Card

1. **Power off the server.**

   Refer to "Powering Off the Server" on page 2-6 for those instructions.

2. **Attach the antistatic wrist strap.**

   Refer to "Attaching the Antistatic Wrist Strap" on page 1-1.

3. **Locate the CPU card.**

   In the Netra ct 800 server, the CPU card will be installed in slot 1. In the Netra ct 400 server, the CPU card will be installed in slot 3. Refer to FIGURE 10-1.

CPU card, slot 1 in Netra ct 800 server

CPU card, slot 3 in Netra ct 400 server
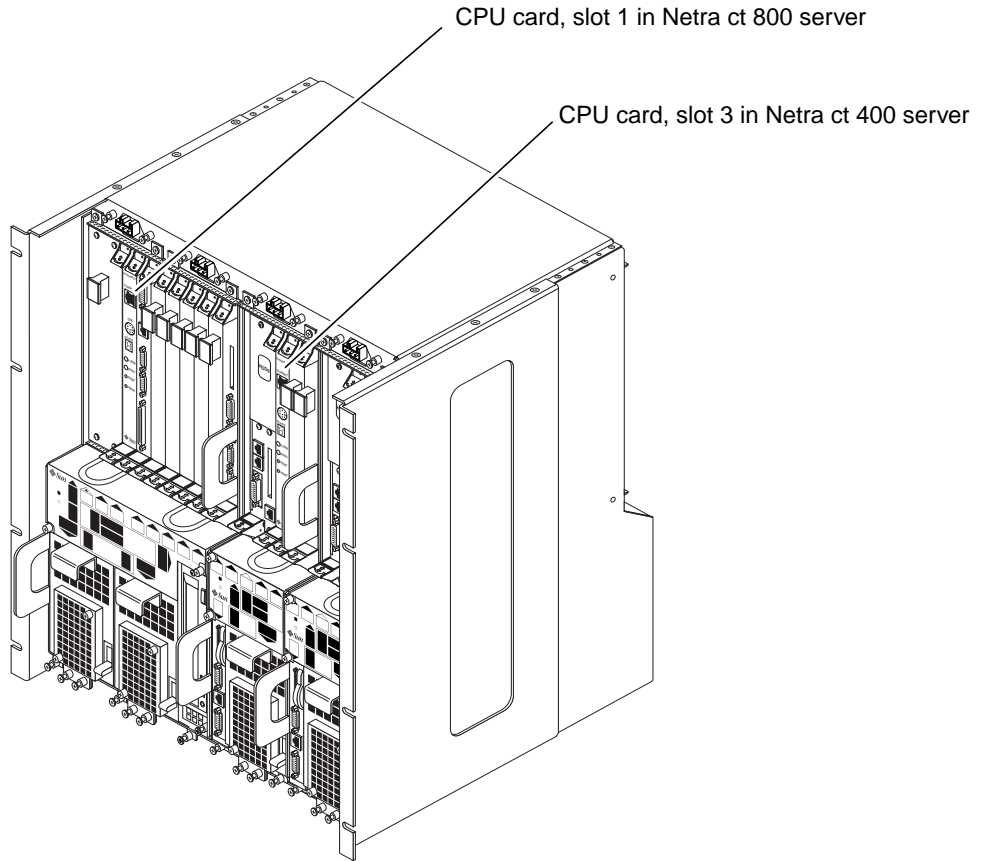
FIGURE 10-1 CPU Card Locations

4. **Unplug any cables connected to the CPU card.**

5. **Using a No. 1 Phillips screwdriver, loosen the two captive screws inside the card's ejection levers, one on top and one on the bottom (**FIGURE 10-2**).**
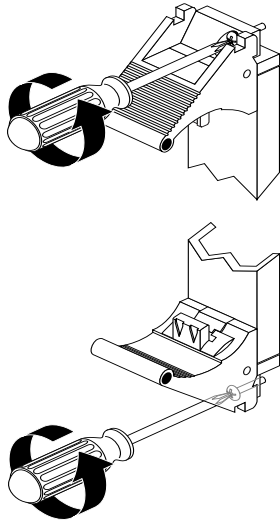
FIGURE 10-2 Loosening the Ejection Lever Captive Screws

6. **Press outward on the two ejection levers on the card to unseat the card from the card cage.**

7. **Slide the card out of the slot and place it on the electrostatic discharge mat.**

8. **If you want to preserve the host ID on your CPU card, remove the host ID board from the CPU card and store it in a safe location (**FIGURE 10-3**).**

   The host ID board contains the Ethernet address and host ID information. You will place it on the replacement CPU card later on to retain your existing Ethernet address and host ID information.
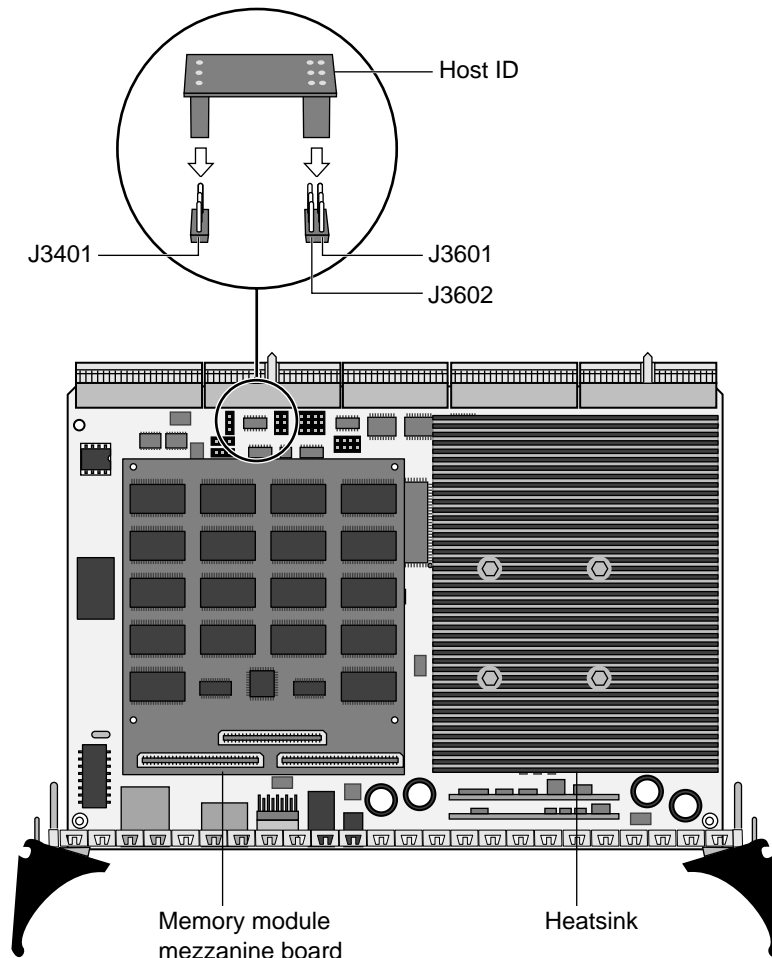
FIGURE 10-3 Removing the Host ID Board

9. **Remove any optional memory cards from the CPU card, if necessary.**

10. **Remove the CPU front transition card.**

    The CPU LED on the system status panel cannot determine if the CPU or the CPU front transition card has failed, so you must replace both cards when one of them fails. Go to "Removing a CPU Front Transition Card" on page 10-10 for those instructions.

10.1.1.2   Replacing the CPU Card

1. **Attach a wrist strap to your wrist and to a bare metal area on the system.**

2. **Replace the CPU front transition card, if you have not done so already.**

   You must replace the CPU front transition card before you can replace the CPU card. Go to "Replacing a CPU Front Transition Card" on page 10-13 for those instructions, and then return here.

3. **Reinstall any optional memory cards onto the replacement CPU card, if necessary.**

4. **If you wanted to preserve the host ID on your CPU card, install the host ID board from the failed CPU card onto the replacement CPU card (**FIGURE 10-3 **on page 10-5).**

   Note – The J3401 jumper shown in FIGURE 10-3 is only a mechanical stabilizer for the host ID board. It does not contain any signals.

   ---

5. **Keeping the CPU card vertical, slide the card into the slot between the two guides.**

   The teeth in the handle of the card must align with the square cutouts in the I/O slot. When the card is completely seated in the card cage, the two ejection levers should flip inward, and the teeth in the ejection levers should fit smoothly in the rectangular cutouts in the bottom and top plates. FIGURE 10-4 shows how to insert an I/O card into a slot; the same principal applies to a CPU card.
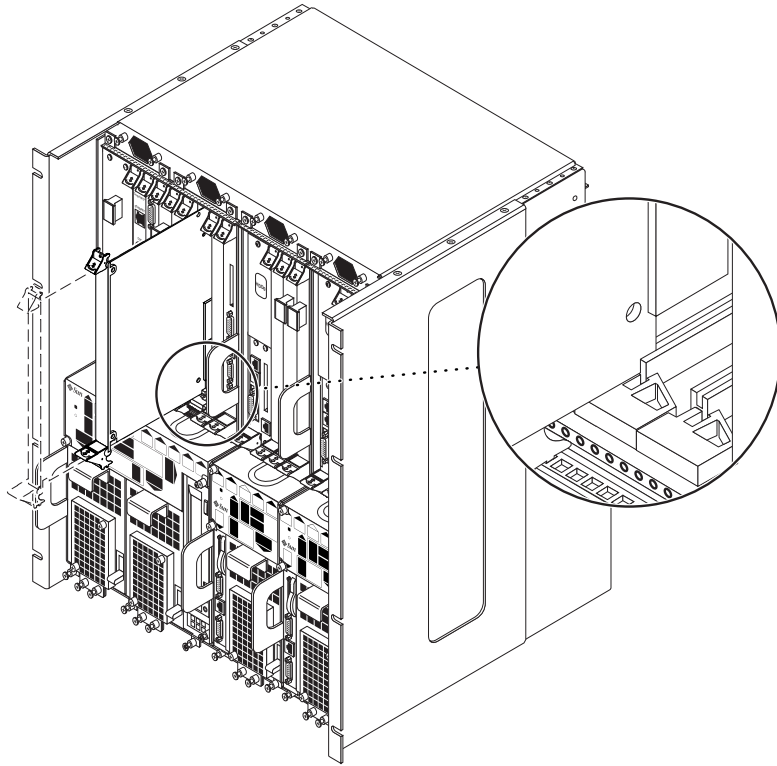
FIGURE 10-4 Aligning the Card with the Card Cage Cutouts

6. **Using a No. 1 Phillips screwdriver, tighten the two captive screws inside the card's ejection levers, one on top and one on the bottom.**
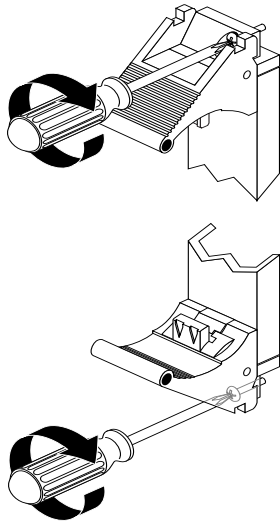
FIGURE 10-5 Tightening the Ejection Lever Captive Screws

7. Make the necessary cable connections to the CPU card, if necessary.

FIGURE 10-6 shows the connectors on the CPU card. Note that the only cables that should be connected to the CPU card would be a cable connected to the COM port (TTY A) for the front-access model of the Netra ct 400 server and the ethernet cable connected to the ethernet A port.
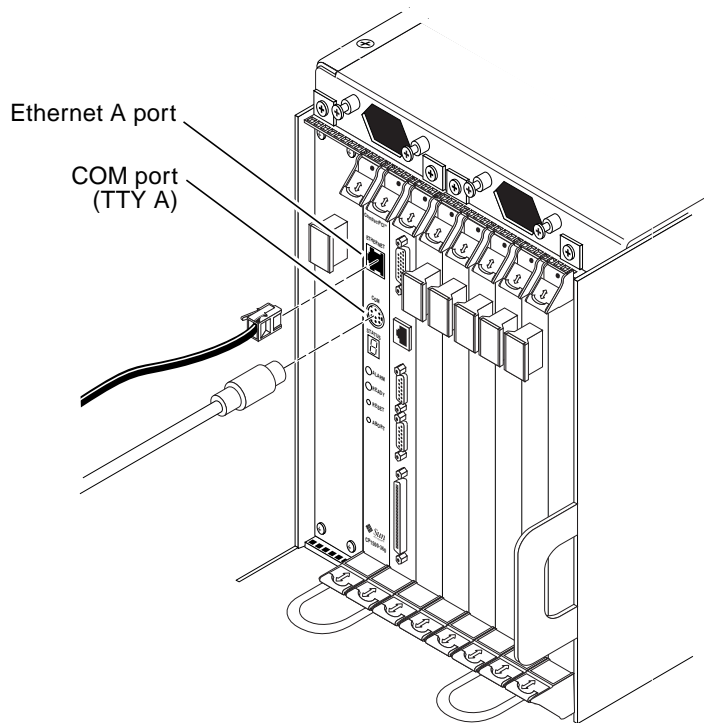
FIGURE 10-6 Connectors on the CPU Card

8. **Power on the server.**

   Refer to "Powering On the Server" on page 2-1 for those instructions.

9. **Verify that the CPU card LEDs are lit properly.**

   The green Power LED (⟲) for the CPU will blink for a moment while the CPU is going through POST, then the green Power LED (⟲) should go ON, which means the CPU card is functioning properly.

10.1.2 CPU Front Transition Card

This section tells how to remove and replace a CPU front transition card. This card is present only in the front-access model of the Netra ct server.

10.1.2.1 Removing a CPU Front Transition Card

1. **Power off the server.**

   Refer to "Powering Off the Server" on page 2-6 for those instructions.

2. **Attach the antistatic wrist strap.**

   Refer to "Attaching the Antistatic Wrist Strap" on page 1-1.

3. **Go to the front of the system and remove the CPU card, if you have not done so already.**

   Because the CPU LED on the system status panel cannot determine if the CPU or the CPU front transition card has failed, you must replace both cards when one of them fails. Refer to "Removing a CPU Card" on page 10-2 to remove the CPU card, then return here.

4. **Locate the CPU front transition card.**

   FIGURE 10-7 shows the location of the CPU front transition card in a Netra ct 800 server and FIGURE 10-8 shows the location of the CPU front transition card in a Netra ct 400 server.
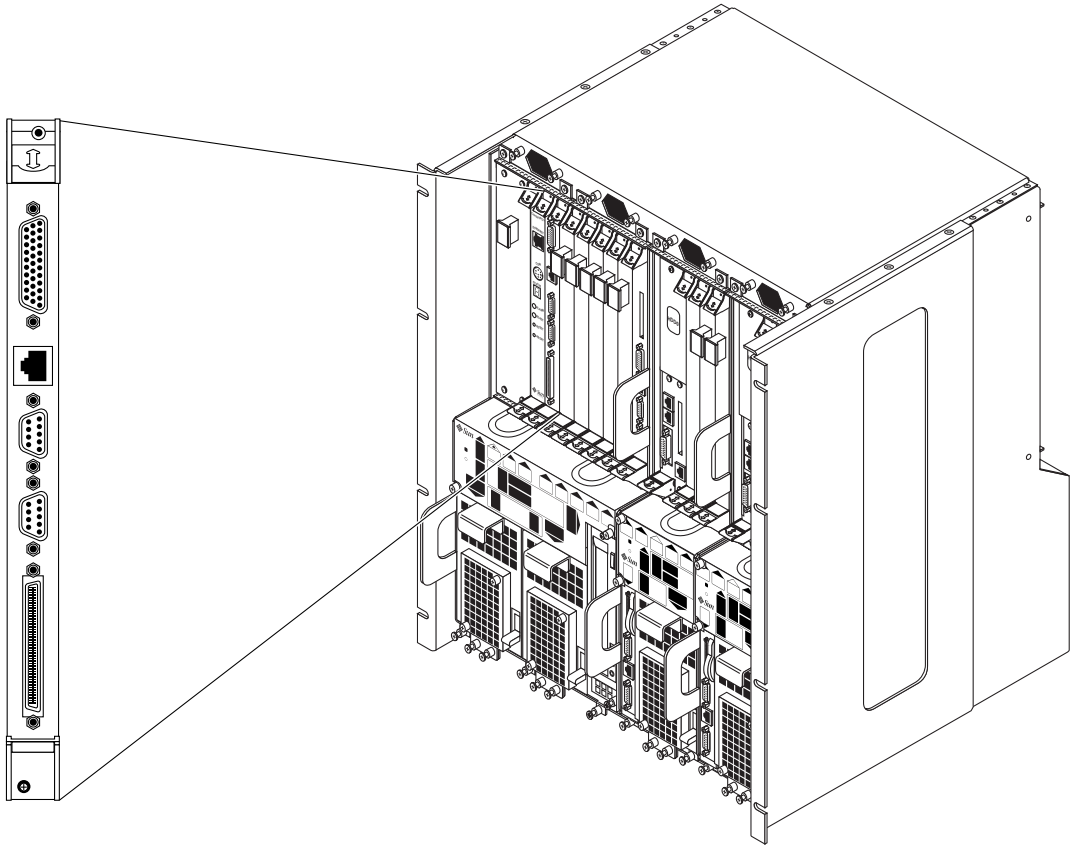
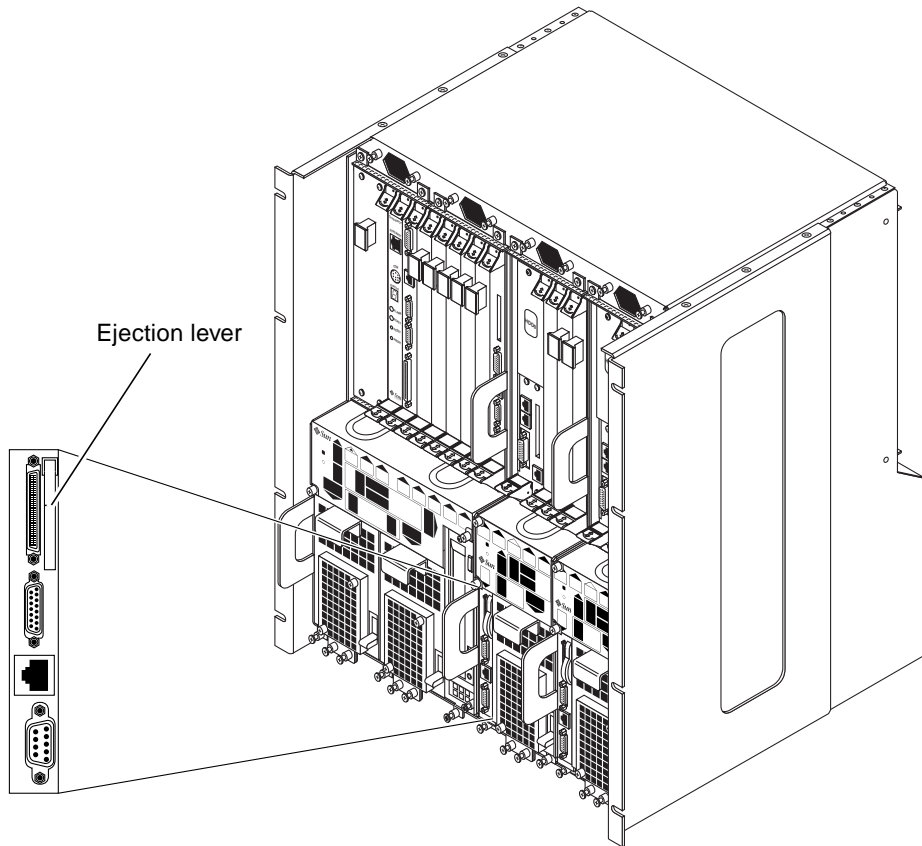**FIGURE 10-7** CPU Front Transition Card Locations in a Netra ct 800 Server

Ejection lever

FIGURE 10-8 CPU Front Transition Card Location in a Netra ct 400 Server

5. **Disconnect any cables attached to the CPU front transition card.**

6. **Determine if you are removing the CPU front transition card from a Netra ct 800 server or from a Netra ct 400 server.**

   ■ If you are removing the CPU front transition card from a *Netra ct 800 server*, follow these instructions to completely remove the card from the server:

   a. **Using a No. 2 Phillips screwdriver, loosen the two captive screws inside the card's ejection levers, one on top and one on the bottom (**FIGURE 10-2 **on page 10-4).**

   b. **Press outward on the two ejection levers on the card to unseat the card from the card cage.**

   c. **Slide the card out of the slot and place it on the electrostatic discharge mat.**

- If you are removing the CPU front transition card from a *Netra ct 400 server*, follow these instructions to completely remove the card from the server:

a. **Using a No. 2 Phillips screwdriver, loosen the captive screw inside the card's ejection lever.**

b. **Flip up on the ejector lever to unseat the card from the card cage (**FIGURE 10-8**).**

c. **Slide the card out of the slot and place it on the electrostatic discharge mat.**

10.1.2.2   Replacing a CPU Front Transition Card

1. **Attach the antistatic wrist strap.**

   Refer to "Attaching the Antistatic Wrist Strap" on page 1-1.

2. **Determine if you are installing the CPU front transition card into a Netra ct 800 server or a Netra ct 400 server.**

   - If you are installing the CPU front transition card into a *Netra ct 800 server*, follow these instructions to completely install the card into the server:

   a. **Keeping the card vertical, slide the card into the slot in between the two guides (**FIGURE 10-4 **on page 10-7).**

   The teeth in the handle of the card must align with the square cutouts in the I/O slot. When the card is completely seated in the card cage, the two ejection levers should flip inward, and the teeth in the ejection levers should fit smoothly in the rectangular cutouts in the bottom and top plates. FIGURE 10-4 on page 10-7 shows how to insert an I/O card into a slot; the same principal applies to a CPU front transition card.

   b. **Lock the ejection levers.**

   c. **Using a No. 2 Phillips screwdriver, tighten the two captive screws inside the card's ejection levers, one on top and one on the bottom (**FIGURE 10-5 **on page 10-8).**

   - If you are installing the CPU front transition card into a *Netra ct 400 server*, follow these instructions to completely install the card into the server:

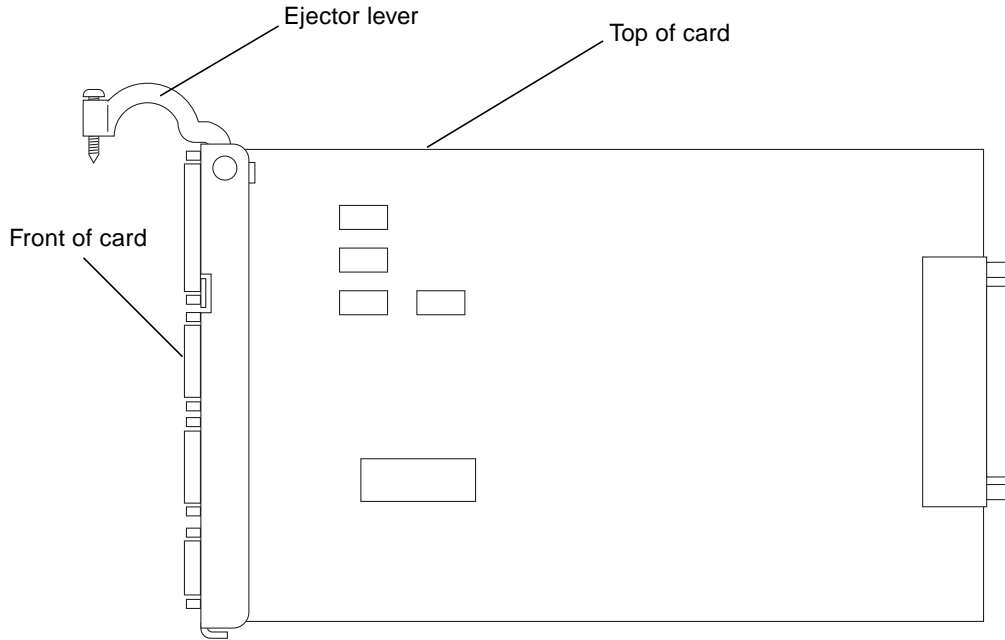   a. **Flip the ejector lever up to a 90-degree angle (**FIGURE 10-9**).**

FIGURE 10-9 Proper Orientation for the Ejector Lever for Netra ct 400 Server CPU Front Transition Card

b. **Keeping the card vertical, slide the card into the slot.**

c. **Press down on the ejector lever to seat the card into the card cage (**FIGURE 10-8 **on page 10-12).**

d. **Using a No. 2 Phillips screwdriver, tighten the captive screw inside the card's ejection lever.**

3. **Make the necessary cable connections to the CPU front transition card.**

FIGURE 10-10 shows the connectors on the CPU front transition card for the Netra ct 800 server, and FIGURE 10-11 shows the connectors on the CPU front transition card for the Netra ct 400 server. Note that the TTY A port is located on the CPU card itself (COM port) for the Netra ct 400 server.
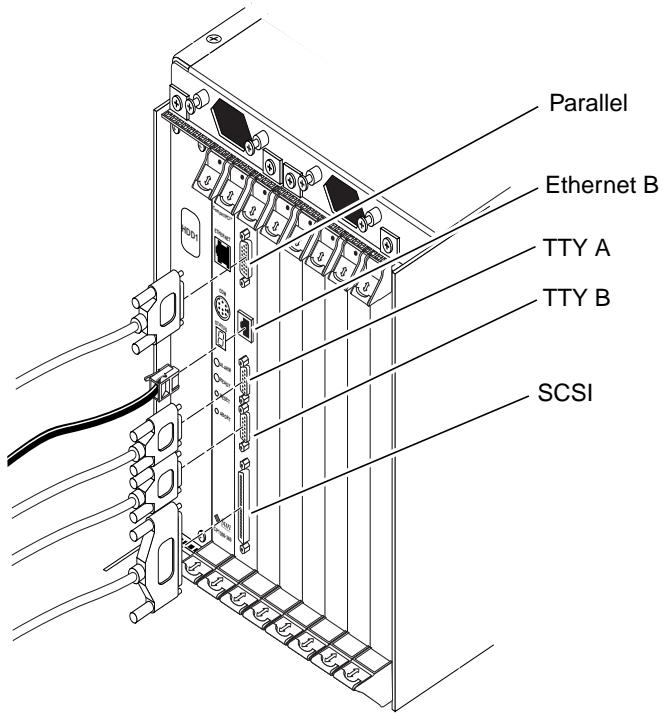
FIGURE 10-10 Connectors on the CPU Front Transition Card (Netra ct 800 Server)

SCSI

Parallel

Ethernet B

TTY B (DB9)
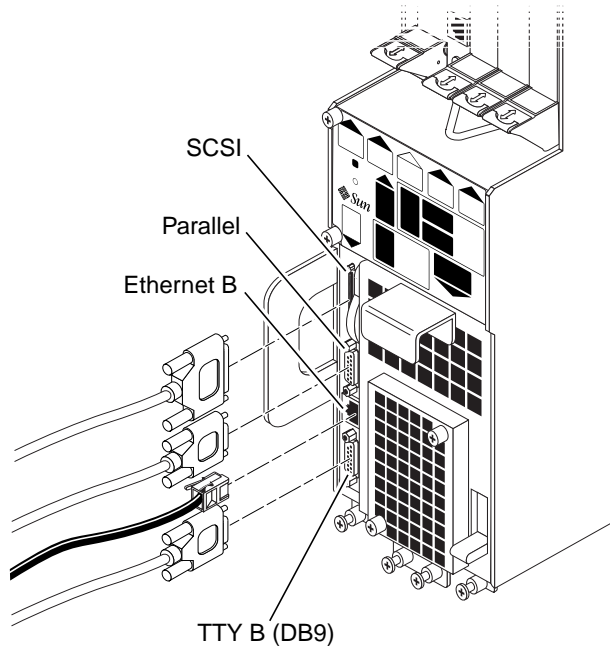
FIGURE 10-11 Connectors on the CPU Front Transition Card (Netra ct 400 Server)

4. After you have replaced the CPU front transition card, get the replacement CPU card from the ship kit.

5. Go to the front of the server and install the replacement CPU card.

Refer to "Replacing the CPU Card" on page 10-6 for those instructions, then return here.

6. Power on the server.

Refer to "Powering On the Server" on page 2-1 for those instructions.

7. Verify that the CPU LEDs on the system status panel are lit properly.

The CPU LEDs will give you diagnostic information on both the CPU and the CPU front transition card.

The green Power LED (⏻) for the CPU and CPU front transition cards will blink for a moment while the CPU is going through POST, then the green Power LED (⏻) should go ON, which means the CPU and CPU front transition cards are functioning properly.

10.1.3   CPU Shunt Card (Netra ct 800 Server Only)

In the front-access model of the Netra ct 800 server, the CPU shunt card brings the signals from the CPU card installed in I/O slot 1 to the CPU front transition card installed in I/O slot 2. It is mounted on the midplane, accessible from the rear of the chassis. There is no CPU shunt card for the Netra ct 400 server.

10.1.3.1   Removing a CPU Shunt Card

1. **Power off the server.**

   Refer to "Powering Off the Server" on page 2-6 for those instructions.

2. **Go to the front of the chassis and disconnect the DC input power cables from the DC connectors that supply power to the Netra ct 800 server.**

   Note that you should be disconnecting two DC input power cables from the DC connectors for a Netra ct 800 server.

3. **Attach the antistatic wrist strap.**

   Refer to "Attaching the Antistatic Wrist Strap" on page 1-1.

4. **Remove the Netra ct 800 server from the chassis.**

   Refer to "Removing a Server" on page 9-1 for those instructions. Note that you do not have to unplug the cables or remove components for this procedure.

5. **After you've removed the Netra ct 800 server from the chassis, go to the rear of the Netra ct 800 server and locate the CPU shunt card.**
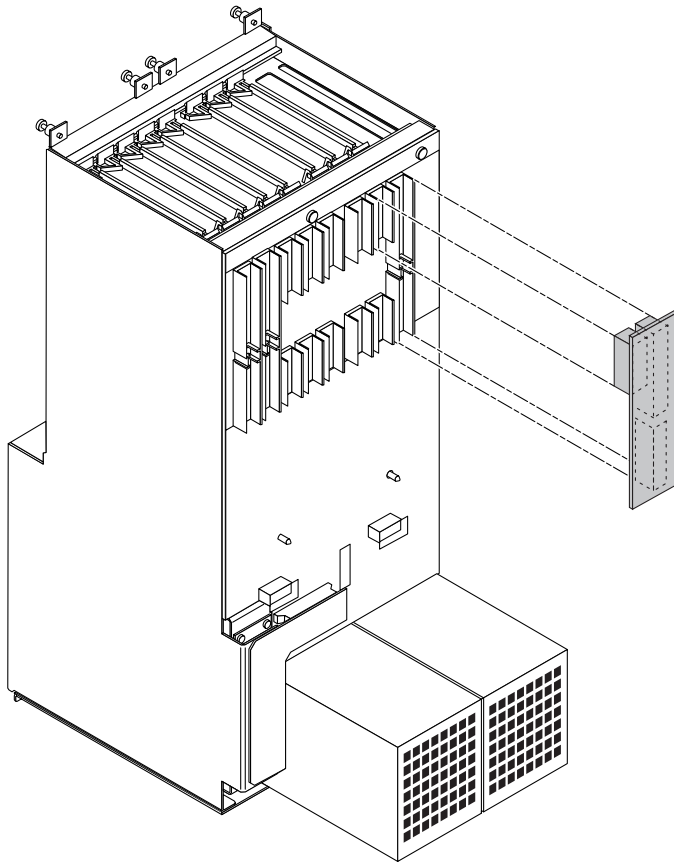
FIGURE 10-12 Locating the CPU Shunt Cart

6. **Grasp the CPU shunt card firmly and, rocking the card slightly from side to side, carefully pull it free from the midplane.**

7. **Place the CPU shunt card on the electrostatic discharge mat.**

10.1.3.2   Replacing a CPU Shunt Card

1. **Attach the antistatic wrist strap.**

   Refer to "Attaching the Antistatic Wrist Strap" on page 1-1.

2. **Get the replacement CPU shunt card from the ship kit.**

3. **Go to the rear of the Netra ct 800 server and gently seat the CPU shunt card into the midplane.**

   The notch in the CPU shunt card should fit into the cutout in the midplane.

4. **Reinstall the Netra ct 800 server back into the chassis.**

   Refer to "Replacing a Server" on page 9-9 for those instructions.

5. **Connect the DC input power cables to the DC connectors at the front of the chassis.**

6. **Power on the server.**

   Refer to "Powering On the Server" on page 2-1 for those instructions.

10.2   Rear-Access Models

This section gives procedures for the installation, removal and replacement of the following cold-swappable cards for rear-access models of both the Netra ct 400 server and Netra ct 800 server:

- "CPU Card" on page 10-19
- "CPU Rear Transition Card" on page 10-26

10.2.1   CPU Card

This section tells you how to replace a CPU card, in both a Netra ct 400 server and a Netra ct 800 server. Both the Netra ct 400 server and the Netra ct 800 server have a dedicated location for the card, indicated by the red card guides.

10.2.1.1   Removing a CPU Card

1. **Power off the server.**

   Refer to "Powering Off the Server" on page 2-6 for those instructions.

2. **Attach the antistatic wrist strap.**

   Refer to "Attaching the Antistatic Wrist Strap" on page 1-1.

3. **Locate the CPU card.**

   In the Netra ct 800 server, the CPU card will be installed in slot 1. In the Netra ct 400 server, the CPU card will be installed in slot 3. Refer to FIGURE 10-1.
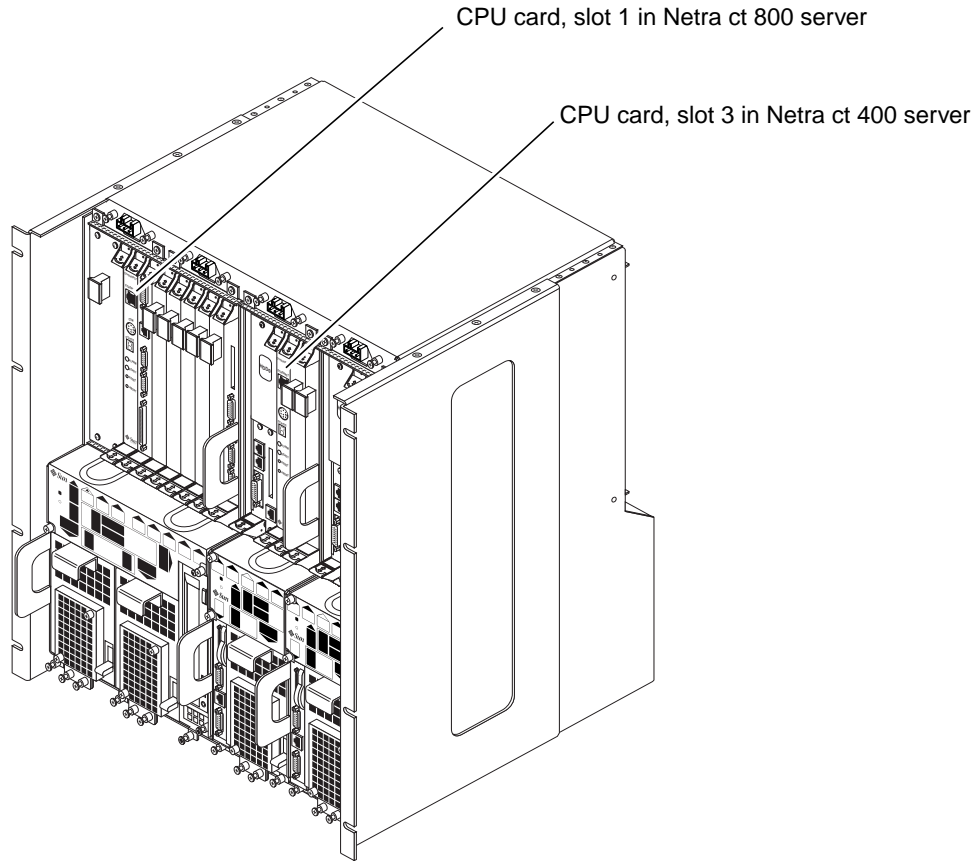
CPU card, slot 1 in Netra ct 800 server

CPU card, slot 3 in Netra ct 400 server

FIGURE 10-13 CPU Card Locations

4. **Unplug any cables connected to the CPU card.**

5. **Using a No. 2 Phillips screwdriver, loosen the two captive screws inside the card's ejection levers, one on top and one on the bottom (**FIGURE 10-2**).**
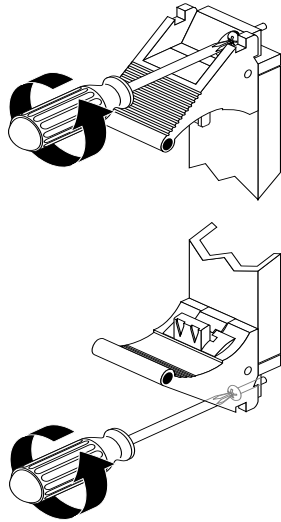
FIGURE 10-14 Loosening the Ejection Lever Captive Screws

6. **Press outward on the two ejection levers on the card to unseat the card from the card cage.**

7. **Slide the card out of the slot and place it on the electrostatic discharge mat.**

8. **If you want to preserve the host ID on your CPU card, remove the host ID board from the CPU card and store it in a safe location (**FIGURE 10-3**).**

   The host ID board contains the Ethernet address and host ID information. You will place it on the replacement CPU card later on to retain your existing Ethernet address and host ID information.

Host ID

J3401

J3601

J3602

Memory module
mezzanine board

Heatsink
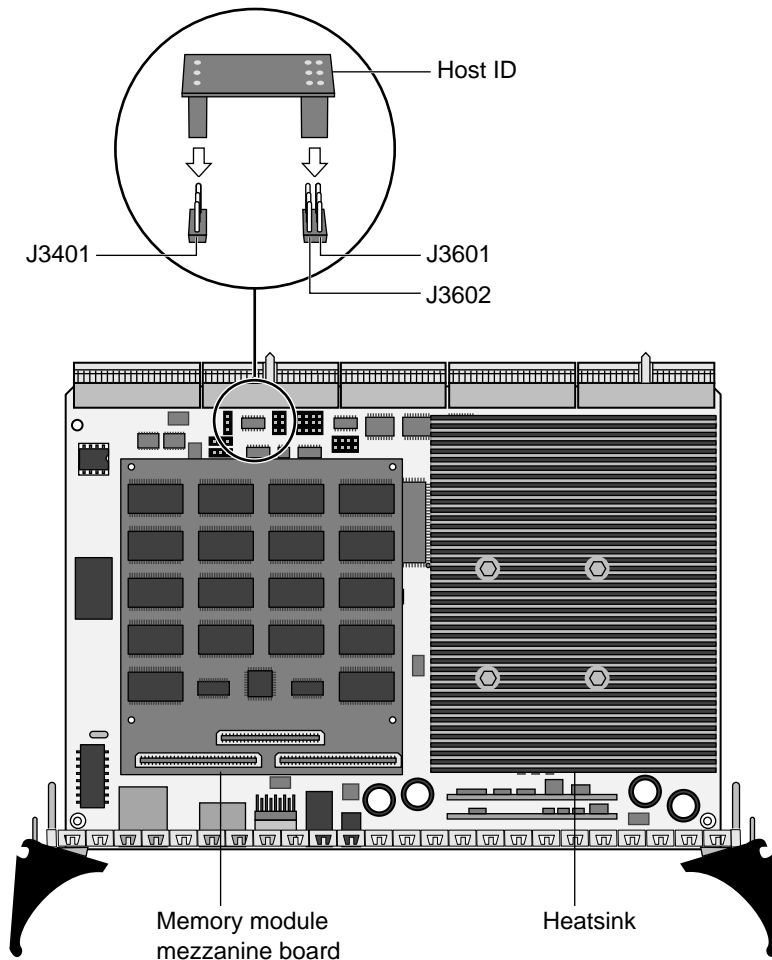
FIGURE 10-15 Removing the Host ID Board

9. Remove any optional memory cards from the CPU card, if necessary.

10. Remove the CPU rear transition card.

The CPU LED on the system status panel cannot determine if the CPU or the CPU rear transition card has failed, so you must replace both cards when one of them fails. Go to "Removing a CPU Rear Transition Card" on page 10-27 for those instructions.

10.2.1.2   Replacing the CPU Card

1. **Attach a wrist strap to your wrist and to a bare metal area on the system.**

2. **Replace the CPU rear transition card, if you have not done so already.**

   You must replace the CPU rear transition card before you can replace the CPU card. Go to "Replacing a CPU Rear Transition Card" on page 10-29 for those instructions, and then return here.

3. **Reinstall any optional memory cards onto the replacement CPU card, if necessary.**

4. **If you wanted to preserve the host ID on your CPU card, install the host ID board from the failed CPU card onto the replacement CPU card (FIGURE 10-3 on page 10-5).**

   Note – The J3401 jumper shown in FIGURE 10-3 is only a mechanical stabilizer for the host ID board. It does not contain any signals.

   ---

5. **Keeping the CPU card vertical, slide the card into the slot between the two guides.**

   The teeth in the handle of the card must align with the square cutouts in the I/O slot. When the card is completely seated in the card cage, the two ejection levers should flip inward, and the teeth in the ejection levers should fit smoothly in the rectangular cutouts in the bottom and top plates. FIGURE 10-4 shows how to insert an I/O card into a slot; the same principal applies to a CPU card.

FIGURE 10-16 Aligning the Card with the Card Cage Cutouts

6. **Using a No. 2 Phillips screwdriver, tighten the two captive screws inside the card's ejection levers, one on top and one on the bottom.**
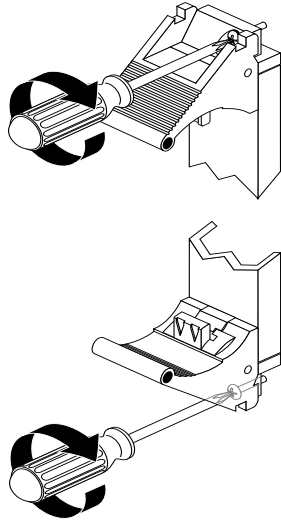
FIGURE 10-17 Tightening the Ejection Lever Captive Screws

7. Make the necessary cable connections to the CPU card, if necessary.

FIGURE 10-6 shows the connectors on the CPU card. Note that the only cables that should be connected to the CPU card would be a cable connected to the COM port (TTY A) for the front-access model of the Netra ct 400 server and the ethernet cable connected to the ethernet A port.
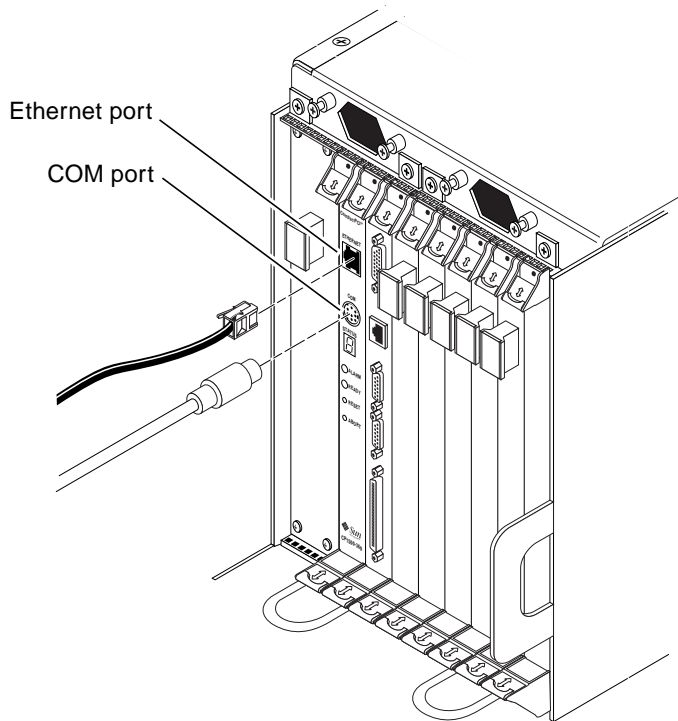
FIGURE 10-18 Connectors on the CPU Card

8. Power on the server.

Refer to "Powering On the Server" on page 2-1 for those instructions.

9. Verify that the CPU card LEDs are lit properly.

The green Power LED (⏻) for the CPU will blink for a moment while the CPU is going through POST, then the green Power LED (⏻) should go ON, which means the CPU card is functioning properly.

10.2.2   CPU Rear Transition Card

This section tells how to remove and replace a CPU rear transition card. This card is present only in the rear-access model of the Netra ct server.

Note – The procedures in this section apply only to the *rear-access* model of the Netra ct server; the procedures in this section do not apply to a front-access model of the Netra ct server.

10.2.2.1   Removing a CPU Rear Transition Card

1. **Power off the server.**

   Refer to "Powering Off the Server" on page 2-6 for those instructions.

2. **Attach the antistatic wrist strap.**

   Refer to "Attaching the Antistatic Wrist Strap" on page 1-1.

3. **Go to the front of the system and remove the CPU card, if you have not done so already.**

   Because the CPU LED on the system status panel cannot determine if the CPU or the CPU rear transition card has failed, you must replace both cards when one of them fails. Refer to "Removing a CPU Card" on page 10-19 to remove the CPU card, then return here.

4. **Go to the rear of the system and locate the CPU rear transition card.**

   FIGURE 10-19 shows the location of the CPU rear transition card on the Netra ct 800 server, and FIGURE 10-20 shows the location of the CPU rear transition card on the Netra ct 400 server.
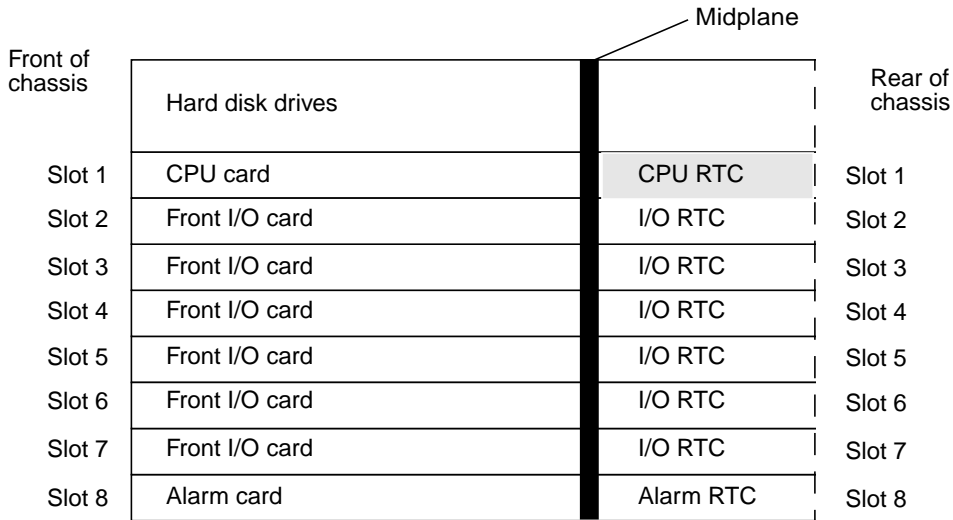
FIGURE 10-19 Locating the CPU Rear Transition Card in the Rear-Access Model of a Netra ct 800 Server (Top View)
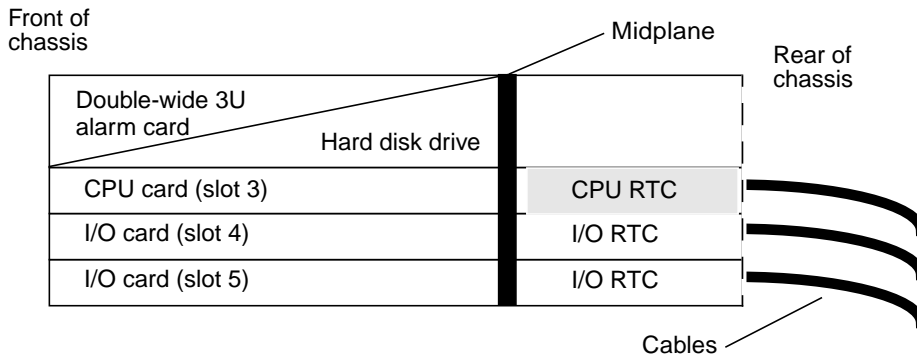

FIGURE 10-20 Locating the CPU Rear Transition Card in the Rear-Access Model of a Netra ct 400 Server (Top View)

5. **Unplug any cables attached to the CPU rear transition card.**

6. **Using a No. 2 Phillips screwdriver, loosen the two captive screws inside the card's ejection levers, one on top and one on the bottom (**FIGURE 10-2 **on page 10-4).**

7. **Press out on the ejection levers to unseat the card.**

8. **Slide the card out of the slot and place it on the electrostatic discharge mat.**

10.2.2.2   Replacing a CPU Rear Transition Card

1. Attach the antistatic wrist strap.

Refer to "Attaching the Antistatic Wrist Strap" on page 1-1.

2. Get the replacement CPU rear transition card from the ship kit.

3. Keeping the CPU rear transition card vertical, slide the card into the slot in between the two guides (FIGURE 10-4**).**

The teeth in the handle of the card must align with the square cutouts in the I/O slot. When the card is completely seated in the card cage, the two ejection levers should flip inward, and the teeth in the ejection levers should fit smoothly in the rectangular cutouts in the bottom and top plates. FIGURE 10-4 on page 10-7 shows how to insert an I/O card into a slot; the same principal applies to a CPU rear transition card.
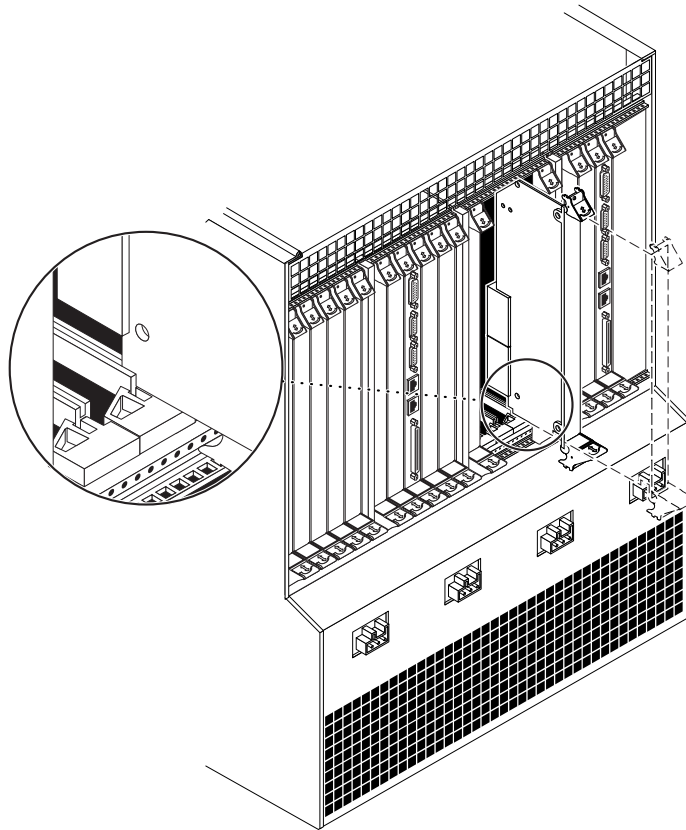
FIGURE 10-21 Aligning the Card with the Rear Card Cage Cutouts

4. **Using a No. 2 Phillips screwdriver, tighten the two captive screws inside the card's ejection levers, one on top and one on the bottom (**FIGURE 10-5 **on page 10-8).**

5. **Make the necessary cable connections to the CPU rear transition card.**

   FIGURE 10-22 shows the connectors on the CPU rear transition card for the Netra ct 800 server and FIGURE 10-23 shows the connectors on the CPU rear transition card for the Netra ct 400 server.
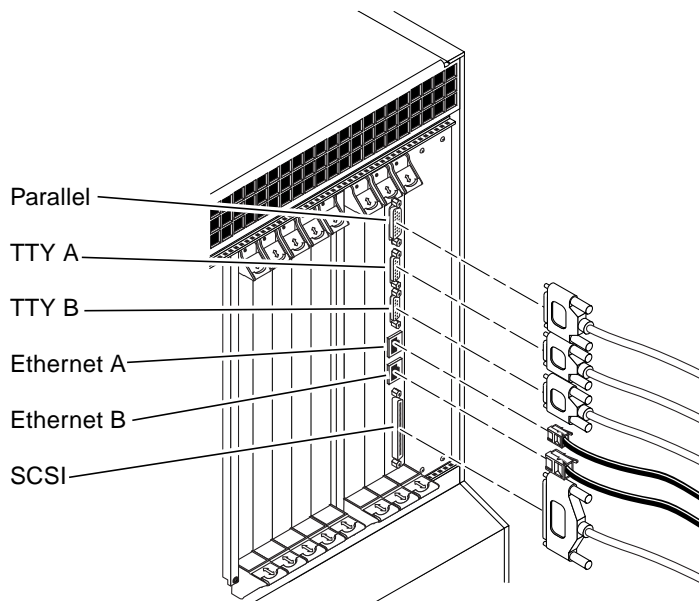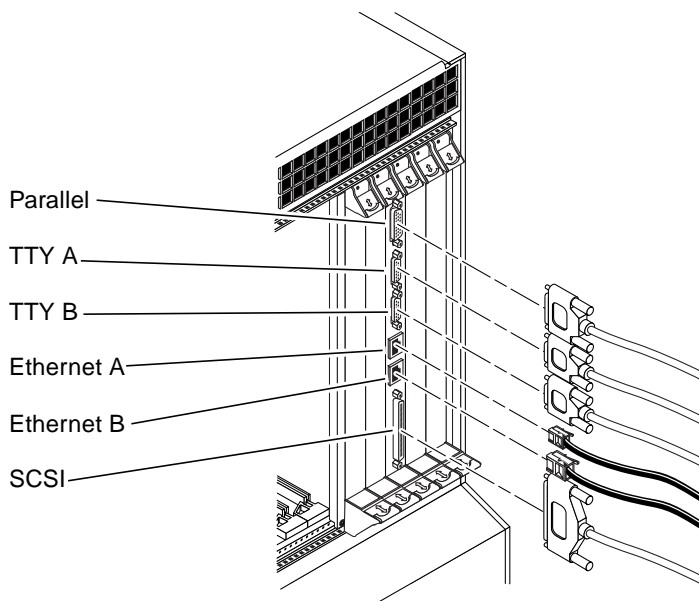

FIGURE 10-22 Connectors on the CPU Rear Transition Card (Netra ct 800 Server)

Parallel
TTY A
TTY B
Ethernet A
Ethernet B
SCSI

FIGURE 10-23 Connectors on the CPU Rear Transition Card (Netra ct 400 Server)

6. **After you have replaced the CPU rear transition card, get the replacement CPU card from the ship kit.**

7. **Go to the front of the server and install the replacement CPU card.**

   Refer to "Replacing the CPU Card" on page 10-23 for those instructions, then return here.

8. **Power on the server.**

   Refer to "Powering On the Server" on page 2-1 for those instructions.

9. **Verify that the CPU LEDs are lit properly.**

   The CPU LEDs will give you diagnostic information on both the CPU and the CPU rear transition card.

   The green Power LED (⏻) for the CPU and CPU rear transition cards will blink for a moment while the CPU is going through POST, then the green Power LED (⏻) should go ON, which means the CPU and CPU rear transition cards are functioning properly.

Removing and Replacing Cold-Swappable Subassemblies

This chapter specifies procedures for the initial installation, removal, and replacement of cold-swappable Netra ct server subassemblies. It is divided into the following sections:

- "Hard Disk Drive" on page 11-1
- "Disk Adapter Module (Netra ct 400 Server Only)" on page 11-5
- "SCSI Termination Board (Netra ct 800 Server Only)" on page 11-7
- "Power Distribution Unit" on page 11-8
- "Front-Access Cable (Front-Access Models Only)" on page 11-16
- "Power Supply Unit" on page 11-19

Consult the *Netra ct Server Safety and Compliance Manual* for safety information prior to performing the procedures in this chapter.

Note – Read Chapter 3 "Handling Cards and Assemblies" before performing the procedures in this chapter.

11.1 Hard Disk Drive

This section tells you how to remove and replace an internal hard disk drive. An internal hard disk drive is one that fits in a bay within a server. It is distinguished from an external hard disk drive, which is attached by a cable that connects to an I/O card in the server.

Though the Netra ct 400 server has one disk bay and the Netra ct 800 server has two, the procedures for removal and replacement of a disk are the same for both types of servers.

A hard disk drive is a cold-swappable component if it is being used by the server. For example, if a hard disk drive is being used as the primary boot drive, then that hard disk drive is a cold-swappable component unless disk management software is used to mirror the boot drive to a second hard disk drive installed in the server. For that reason, a hard disk drive in a Netra ct 400 server is a cold-swappable disk drive, unless it is running on the Solaris operating environment over the network and not off of the hard disk drive, in which case it becomes a hot-swappable component.

Instructions for removing and replacing a cold-swappable hard disk drive are covered here; instructions for removing and replacing a hot-swappable hard disk drive are covered in "Hard Disk Drive" on page 7-1.

11.1.1 Removing a Hard Disk Drive

Note – The instructions in this section do *not* cover unconfiguration procedures that might be necessary if you are removing a hard disk drive that is under the control of any disk management software, such as Volume Manager or Solstice DiskSuite. If you are running disk management software on your system, refer to the documentation that came with the disk management software for instructions on releasing a hard disk drive from the control of the software before proceeding with these instructions.

---

1. **Complete the power off steps.**

   Refer to "Powering Off the Server" on page 2-6 for those instructions.

2. **Attach the antistatic wrist strap.**

   Refer to "Attaching the Antistatic Wrist Strap" on page 1-1.

3. **Locate the drive bay cover on your system.**

   The hard disk drives will be behind the drive bay cover on your system. There would be a maximum of two hard disk drives behind the drive bay cover in a Netra ct 800 server and one behind the drive bay cover in a Netra ct 400 server.
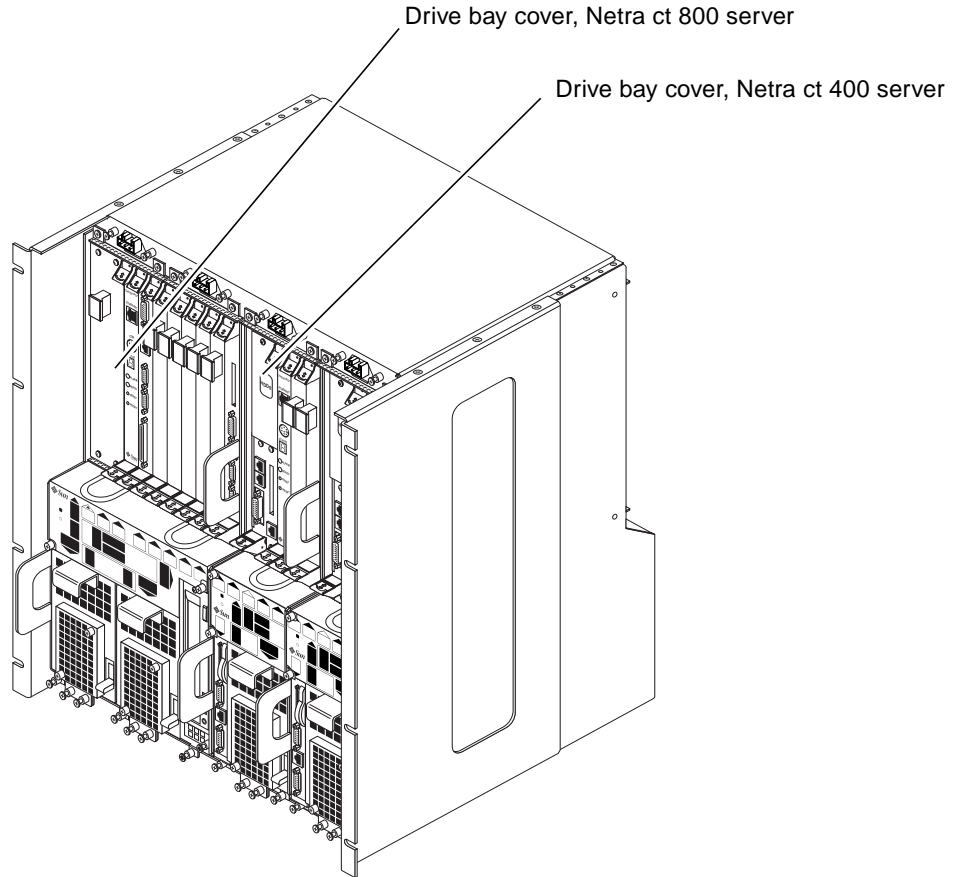
Drive bay cover, Netra ct 800 server

Drive bay cover, Netra ct 400 server

FIGURE 11-1 Drive Bay Cover Locations

4. Loosen the captive screws that hold the drive bay cover in place.

- For the Netra ct 800 server, use a No. 1 Phillips screwdriver to loosen the four captive screws (two on top and two on the bottom).

- For the Netra ct 400 server, use a No. 2 Phillips screwdriver to loosen the one captive screw on top.

5. Remove the drive bay cover.

6. Determine which disk drive you want to remove.

7. Unlatch the disk drive handle to release it.

Push down in the direction of the arrow to release the bracket handle latch.

8. Pull the bracket handle out and swing it open.

9. **Continue to pivot the disk drive bracket handle against the chassis, applying mild pressure until the drive disconnects.**

10. **Slide the drive out of the chassis and place it on the electrostatic discharge mat.**

11. **Secure the drive bay cover over the drive bays (**FIGURE 11-1 **on page 11**-**3).**

    You must install the drive bay cover over the drive bays to ensure proper airflow in the system.

11.1.2 Replacing a Hard Disk Drive

1. **Attach the antistatic wrist strap.**

   Refer to "Attaching the Antistatic Wrist Strap" on page 1-1.

2. **Remove the drive bay cover (**FIGURE 11-1 **on page 11**-**3).**

3. **Hold the bracket handle on the disk drive open.**

4. **Slide the replacement disk drive into the drive slot.**

5. **Gently push the drive until the locking handle engages.**

6. **Close the locking handle completely, using gentle downward pressure.**

7. **Replace the drive bay cover.**

8. **Complete the power on steps.**

   Refer to "Powering On the Server" on page 2-1 for more information.

9. **If you are replacing your boot disk, reinstall the Solaris operating environment.**

   Refer to the *Netra ct Server Installation Guide* for more information.

10. **If your hard disk(s) are under the control of RAID software, perform the necessary steps to bring the disks online.**

11.2 Disk Adapter Module (Netra ct 400 Server Only)

This section describes how to remove and replace the disk adapter module in the Netra ct 400 server. There is no field-replaceable disk adapter module in the Netra ct 800 server.

11.2.1 Removing a Disk Adapter Module

1. **Remove the Netra ct 400 server from the chassis.**

   Refer to "Removing a Server" on page 9-1 for those instructions.

2. **Remove the hard disk drive from the drive bay.**

   Refer to "Removing a Hard Disk Drive" on page 11-2 for those instructions.

3. **Remove the two screws at the top of the disk adapter module that secure the module to the server.**

4. **Pull the disk adapter module out of the Netra ct 400 server** (FIGURE 11-2)**.**

Disk adapter module

Hard disk drive
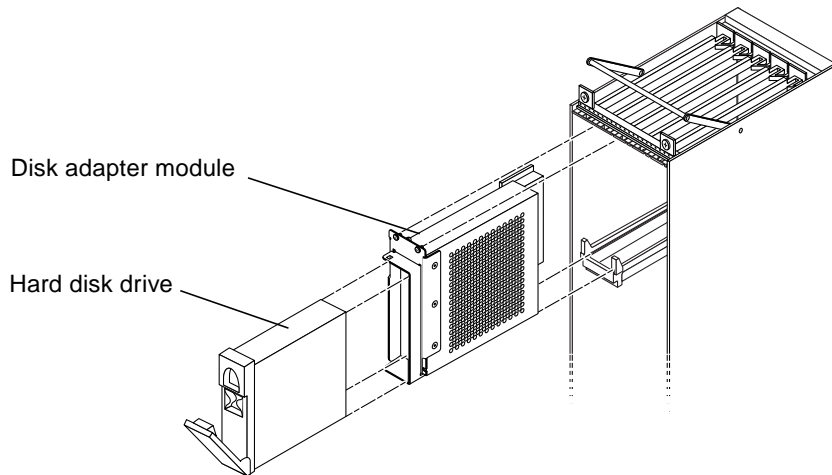
FIGURE 11-2 Removing the Disk Adapter Module

5. **Facing the left side of the Netra ct 400 server, outside the server, remove the three screws that secure the disk adapter module holder to the server** (FIGURE 11-3)**.**
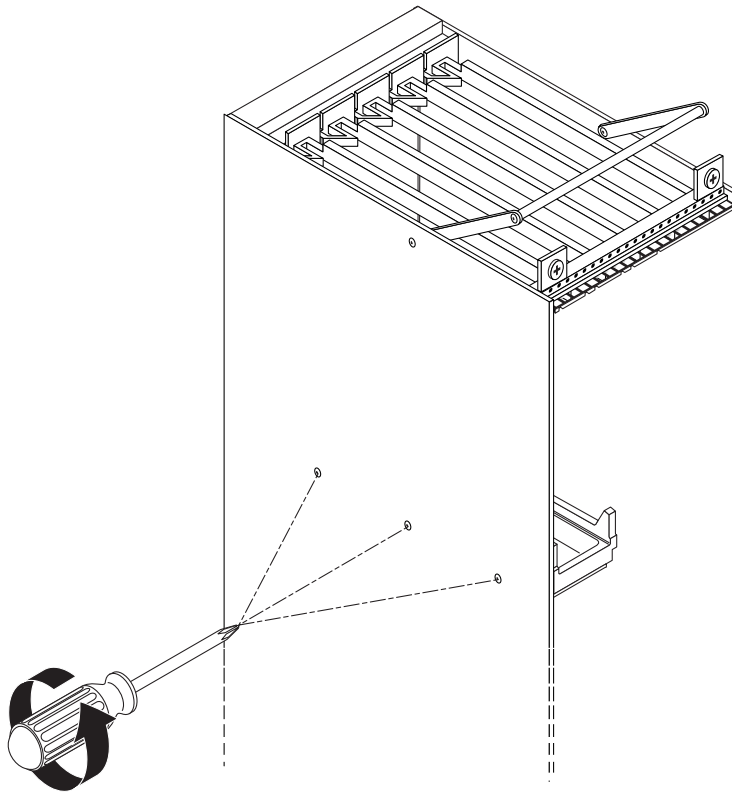
FIGURE 11-3 Removing the Disk Adapter Module Holder

6. **Remove the disk adapter module holder from the Netra ct 400 server.**

11.2.2   Replacing a Disk Adapter Module

1. **Insert the disk adapter module holder into the Netra ct 400 server, facing up.**

2. **Facing the left outside of the server, use the three screws to secure the disk adapter module holder to the server (**FIGURE 11-3**).**

3. **Insert the disk adapter module, with the connector facing the left rear side of the server (**FIGURE 11-2**).**

4. **Secure the disk adapter module to the server using the two screws at the top of the disk adapter module.**

5. **Reinsert the hard disk drive in the drive bay.**

Refer to "Replacing a Hard Disk Drive" on page 11-4 for those instructions.

11.3 SCSI Termination Board (Netra ct 800 Server Only)

This section describes you how to remove and replace a SCSI termination board from the Netra ct 800 server.

11.3.1 Removing a SCSI Termination Board

1. **Complete the power off steps.**

Refer to "Powering Off the Server" on page 2-6 for those instructions.

2. **Attach the antistatic wrist strap.**

Refer to "Attaching the Antistatic Wrist Strap" on page 1-1.

3. **Locate the SCSI termination board.**

The SCSI termination board is located directly below the removeable media module.

SCSI termination board
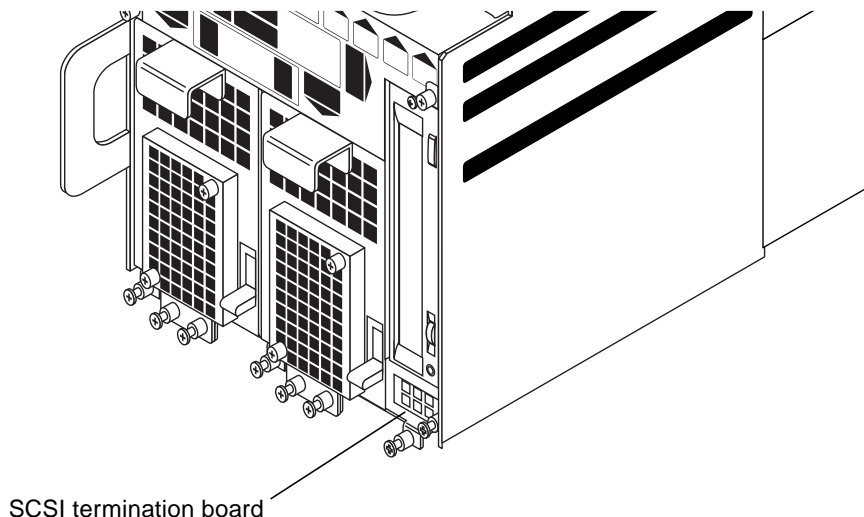
FIGURE 11-4 Locating the SCSI Termination Board

4. **Loosen the** *silver* **screw that holds the SCSI termination board in place.**

5. **Remove the SCSI termination board from the server.**

11.3.2   Replacing a SCSI Termination Board

1. **Attach the antistatic wrist strap.**

   Refer to "Attaching the Antistatic Wrist Strap" on page 1-1.

2. **Insert the SCSI termination board into the slot beneath the removeable media module.**

3. **Tighten the silver screw to secure the SCSI termination board to the server.**

4. **Complete the power on steps.**

   Refer to "Powering On the Server" on page 2-1 for more information.

11.4   Power Distribution Unit

This section tells you how to remove and replace a power distribution unit in a chassis. Keep in mind that you must remove the server in front of the failed power distribution unit in order to gain access to that power distribution unit; however, you do not have to remove any other servers except for the one directly in front of the failed power distribution unit. The power distribution unit connects directly into the midplane and is located on the chassis, not the server (FIGURE 11-5).

Power distribution units

Power supply units
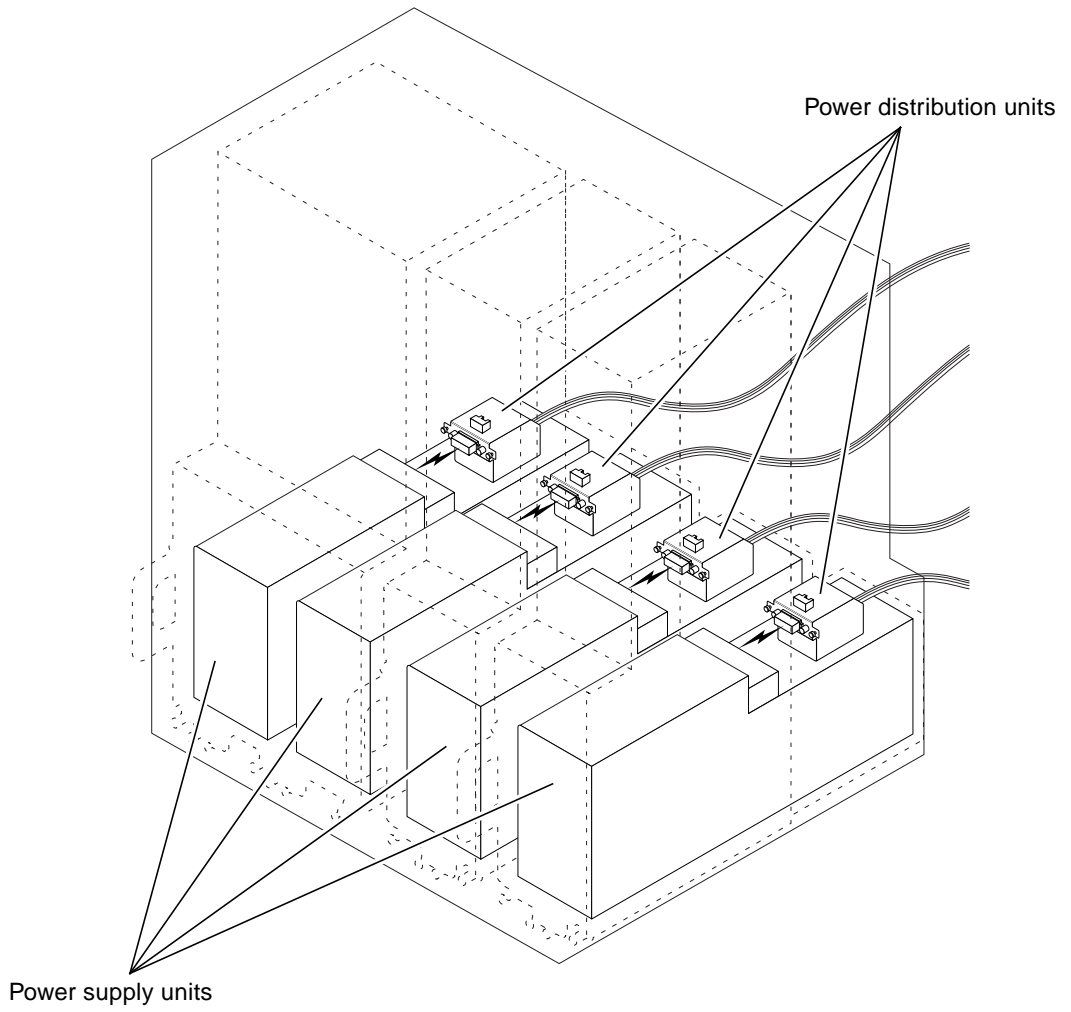
FIGURE 11-5 Locating the Power Distribution Units

11.4.1 Removing the Power Distribution Unit

1. Go to the front of the system and use the system status panel on the server to determine which power distribution unit has failed.

The system status panel on each server has power distribution unit LED(s) that shows the status of the power distribution unit(s) behind that particular server. FIGURE 11-6 shows the locations of the power distribution unit LEDs on the Netra ct 800 server and FIGURE 11-7 shows the location of the power distribution unit LEDs on the Netra ct 400 server.
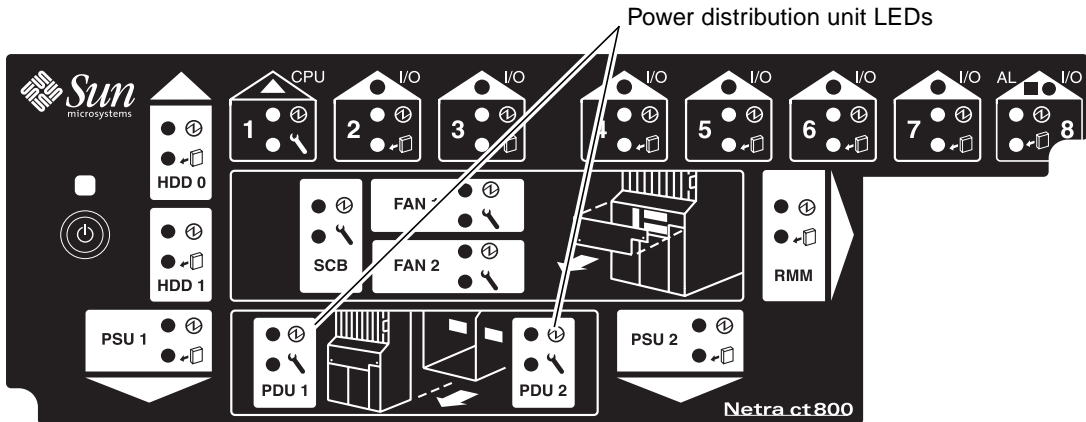
FIGURE 11-6 Locating the Power Distribution Unit LEDs on the System Status Panel (Netra ct 800 Server)
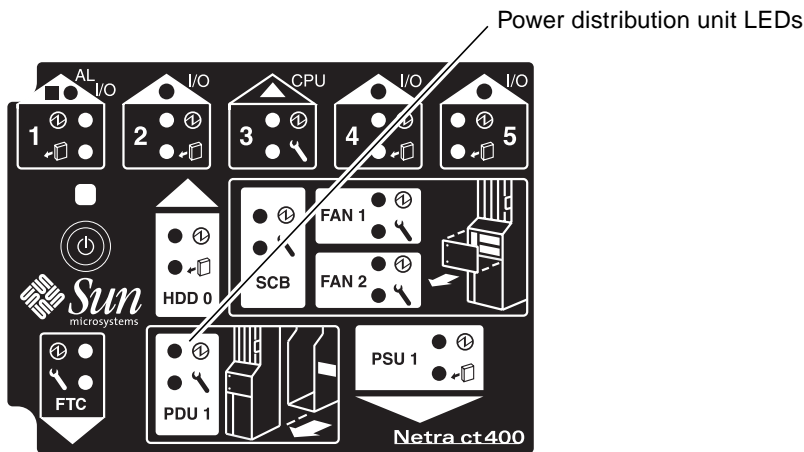
FIGURE 11-7 Locating the Power Distribution Unit LEDs on the System Status Panel (Netra ct 400 Server)

A power distribution unit may have failed if a power supply is inserted, the locking mechanism is in the locked (⊟) position, and the green Power LED (⊕) for the PDU is OFF.

Note – Verify the DC input power cable is plugged into the PDU before replacing the PDU. If the DC input power cable is unplugged, plug it in and check the PDU LEDs on the system status panel again.

---

2. **Disconnect the DC input power cable(s) from the DC connector(s) that are supplying power to the server with the failed power distribution unit.**

   FIGURE 11-8 shows how to disconnect the DC input power cables from the DC connectors on the rear-access model and FIGURE 11-9 shows how to disconnect the DC input power cables from the DC connectors on the front-access model.

Caution – An energy hazard is present if you do not unplug the DC input power cable from the DC connector that supplies power to the power distribution unit that you are replacing.
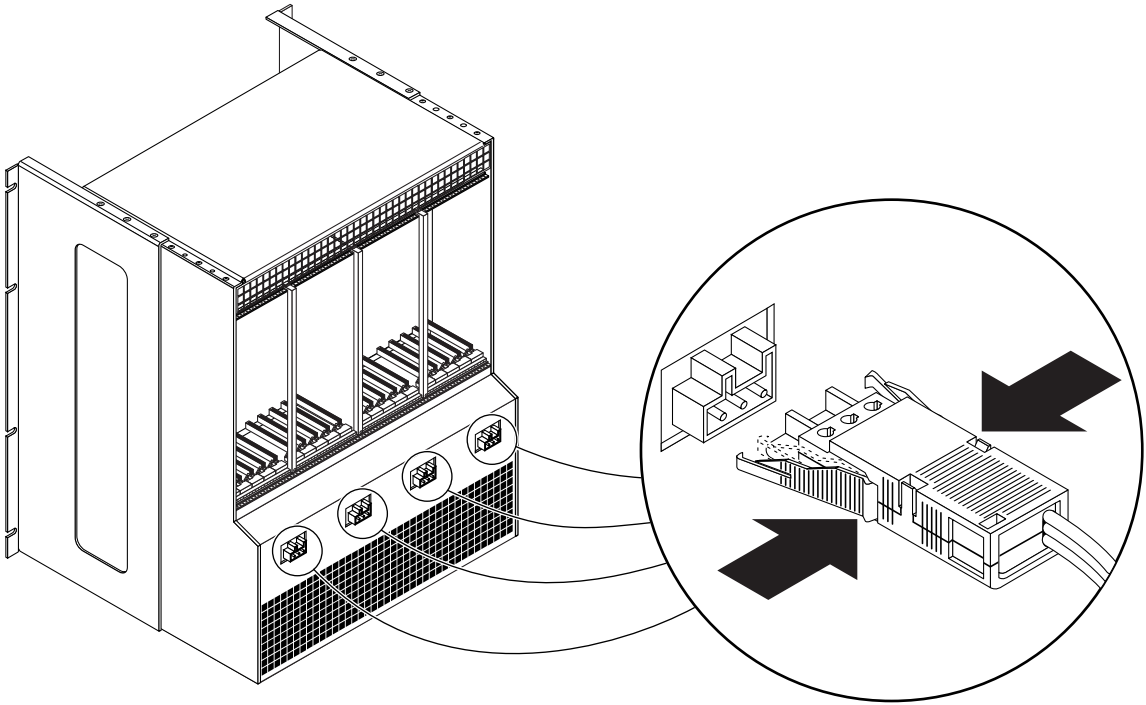
FIGURE 11-8 Unplugging the DC Input Power Cable From the DC Connector, Rear-Access
Model
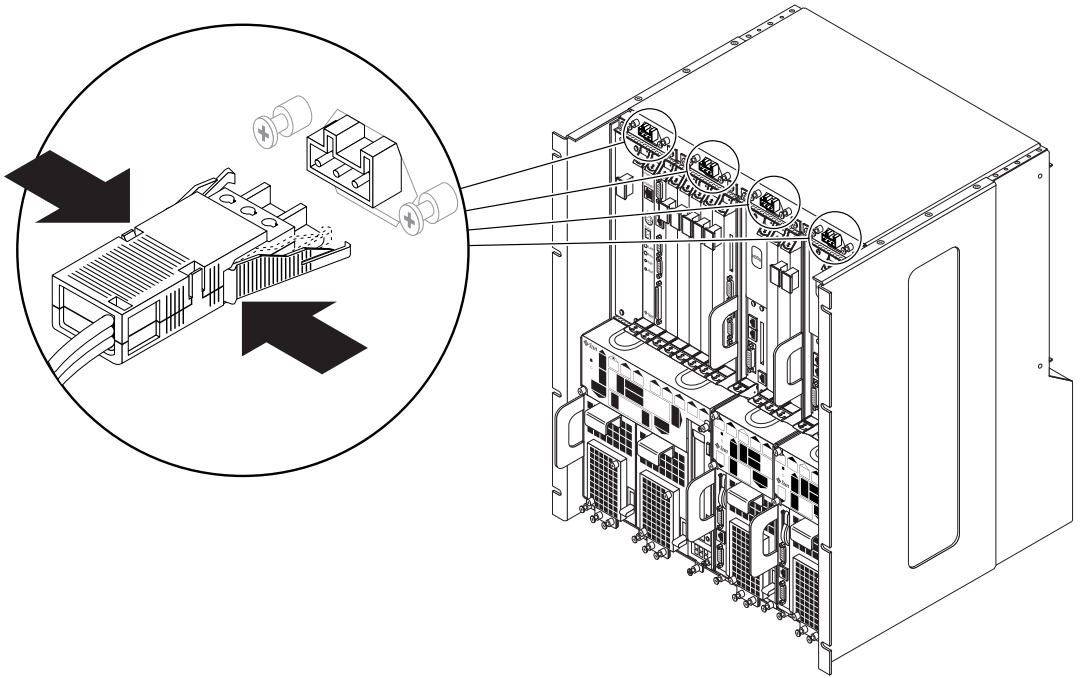
FIGURE 11-9 Unplugging the DC Input Power Cable From the DC Connector, Front-Access Model

3. **Perform all the necessary procedures to remove the server in front of the failed power distribution unit, including all software power-off procedures.**

   You must completely remove the server directly in front of the failed power distribution unit in order to gain access to that power distribution unit. Follow the instructions in "Removing a Server" on page 9-1 to safely remove the server.

4. **Locate the power distribution unit that you want to replace.**

   FIGURE 11-10 shows the location of the power distribution units looking at an empty chassis from the front.

Power distribution units
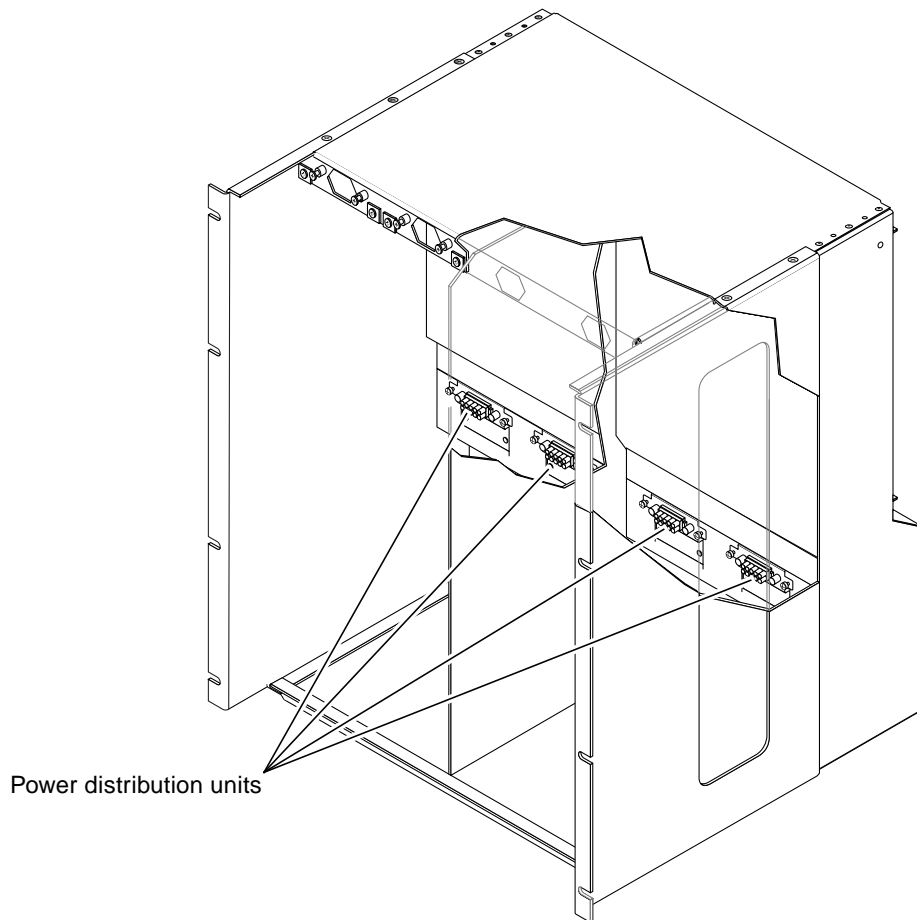
FIGURE 11-10 Locating the Power Distribution Units

5. **For front-access models, carefully reach into the chassis from the front and unplug the front-access cable connected to the top of the power distribution unit inside the chassis.**

6. **Carefully reach into the chassis from the front and unscrew the two captive screws that secure the power distribution unit to the chassis (**FIGURE 11-11**).**
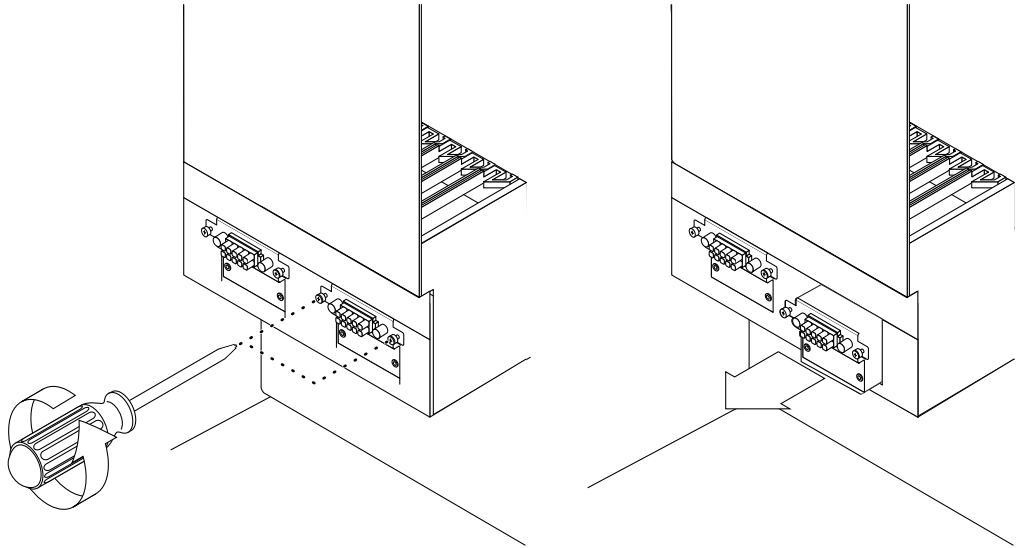
FIGURE 11-11 Removing the Power Distribution Unit

7. Remove the power distribution unit from the chassis.

11.4.2   Replacing the Power Distribution Unit

1. Insert the power distribution unit into the slot in the chassis.

2. Tighten the two captive screws to secure the power distribution unit to the chassis (FIGURE 11-11**).**

3. Plug the DC input power cable(s) into the appropriate DC connector(s).

FIGURE 11-8 on page 11-12 shows how to plug the DC input power cables into the DC connectors on the rear-access model and FIGURE 11-9 on page 11-13 shows how to plug the DC input power cables into the DC connectors on the front-access model.

4. Perform all the necessary procedures to reinsert the server that you removed to access the failed power distribution unit, including all system power-up procedures.

Refer to "Replacing a Server" on page 9-9 for those instructions.

5. Once the system is powered up, go to the system status panel and verify that the power distribution unit LEDs are in the appropriate states.

FIGURE 11-6 shows the locations of the power distribution unit LEDs on the Netra ct 800 server and FIGURE 11-7 shows the locations of the power distribution unit LEDs on the Netra ct 400 server. A power distribution unit is functioning properly if a power supply is inserted and the green Power LED (⏻) for the PDU is ON.

11.5 Front-Access Cable (Front-Access Models Only)

The front-access cable is used to connect the power distribution unit to the power connector at the front of the front-access models of the Netra ct 800 server and the Netra ct 400 server.

11.5.1 Removing the Front-Access Cable

1. **Perform all the necessary procedures to remove the server directly in front of the failed front-access cable, including all software power-off procedures.**

   You must completely remove the server directly in front of the failed front-access cable in order to gain access to that cable. Follow the instructions in "Removing a Server" on page 9-1 to safely remove the server.

2. **Unplug the DC input power cable from the DC connector at the front of the chassis (**FIGURE 11-12**).**
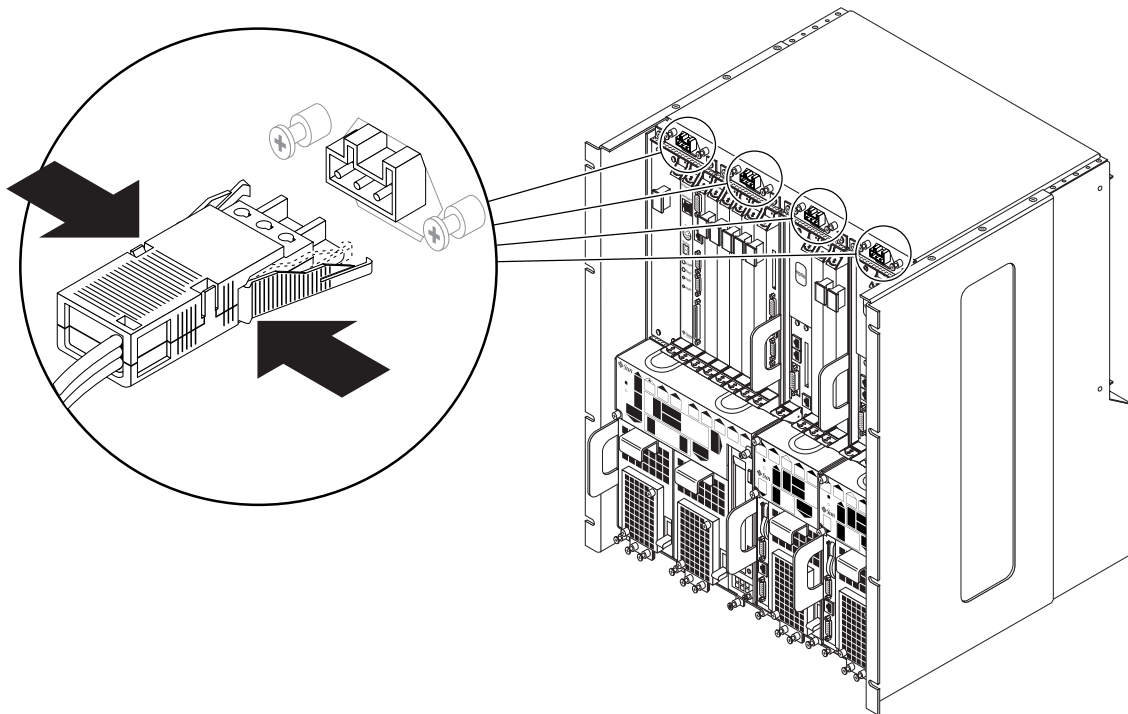
FIGURE 11-12 Unplugging the DC Input Power Cable From the DC Connector, Front-Access Model

Caution – An energy hazard is present if you do not unplug the DC input power cable from the DC connector.

3. At the front of the chassis, loosen the two captive screws that secure the front-access cable to the chassis.
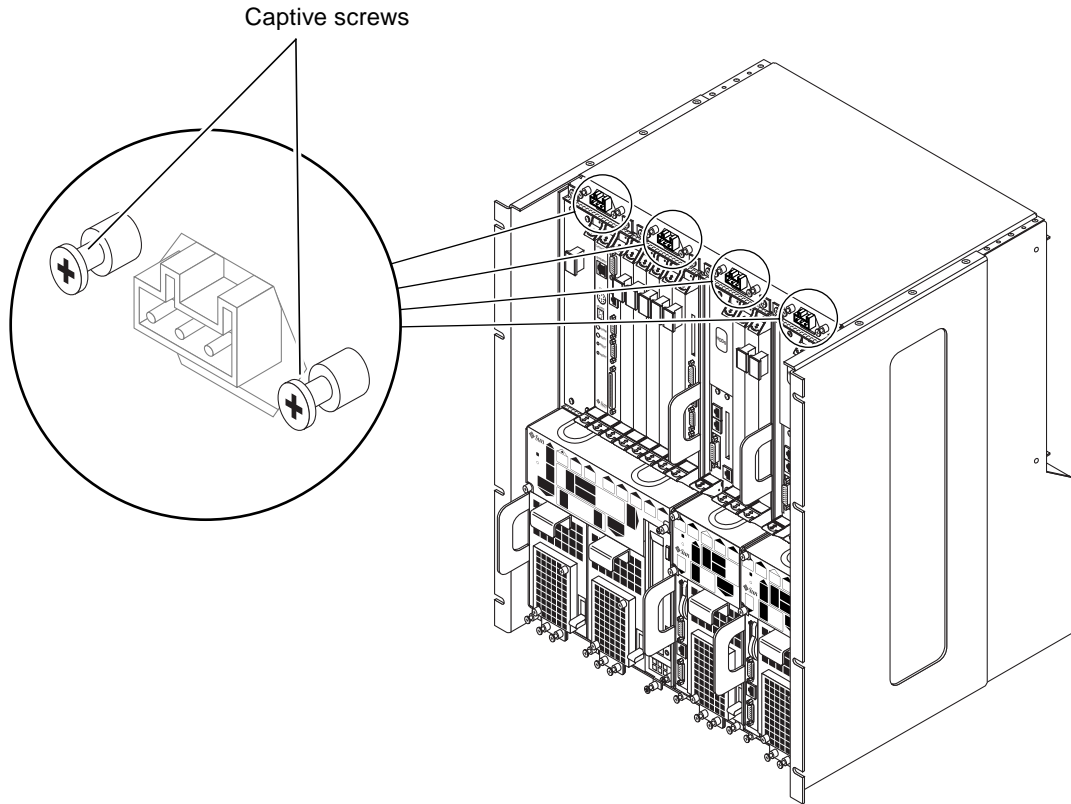
Captive screws

FIGURE 11-13 Loosening the Front-Access Cable Screws

4. Reach into the chassis and gently pull the front-access cable free from the front of the chassis.

5. Carefully reach into the chassis from the front and unplug the front access cable connected to the top of the power distribution unit inside the chassis.

6. Unhook the front-access cable from the cable clips along the top inside the chassis.

11.5.2   Replacing a Front-Access Cable

1. **Carefully reach into the chassis from the front and plug one end of the front access cable to the top of the power distribution unit inside the chassis.**

2. **Insert the other end of the front-access cable through the holes at the top of the chassis (**FIGURE 11-13**).**

3. **Tighten the two captive screws to secure the cable to the chassis (**FIGURE 11-13**).**

4. **Hook the front-access cable to the cable clips along the top inside of the chassis.**

5. **Connect the DC input power cable to the DC connectors at the front of the chassis (**FIGURE 11-12**).**

6. **Perform all the necessary procedures to reinsert the server that you removed to access the failed front-access cable, including all system power-up procedures.**

   Refer to "Replacing a Server" on page 9-9 for those instructions.

11.6   Power Supply Unit

This section describes how to remove and replace a cold-swappable power supply unit. A cold-swappable power supply unit would be either a single remaining power supply unit in the Netra ct 800 server or the only power supply unit in the Netra ct 400 server.

Note – If you are replacing one power supply unit in a Netra ct 800 server and the second power supply unit is still up and running, you can replace the failed power supply unit without powering off the server. Refer to Chapter 8 for more information.

11.6.1   Removing a Cold-Swappable Power Supply Unit

1. **Power off the server.**

   Refer to "Powering Off the Server" on page 2-6 for those instructions.

2. **Attach the antistatic wrist strap.**

   Refer to "Attaching the Antistatic Wrist Strap" on page 1-1.

3. Push the purple locking mechanism up into the unlocked (⌐) position.

FIGURE 11-14 shows the location of the locking mechanism for the power supply unit on a Netra ct 800 server, and FIGURE 11-15 shows the location of the locking mechanism for the power supply unit on a Netra ct 400 server. The two LEDs on the power supply unit should go OFF.
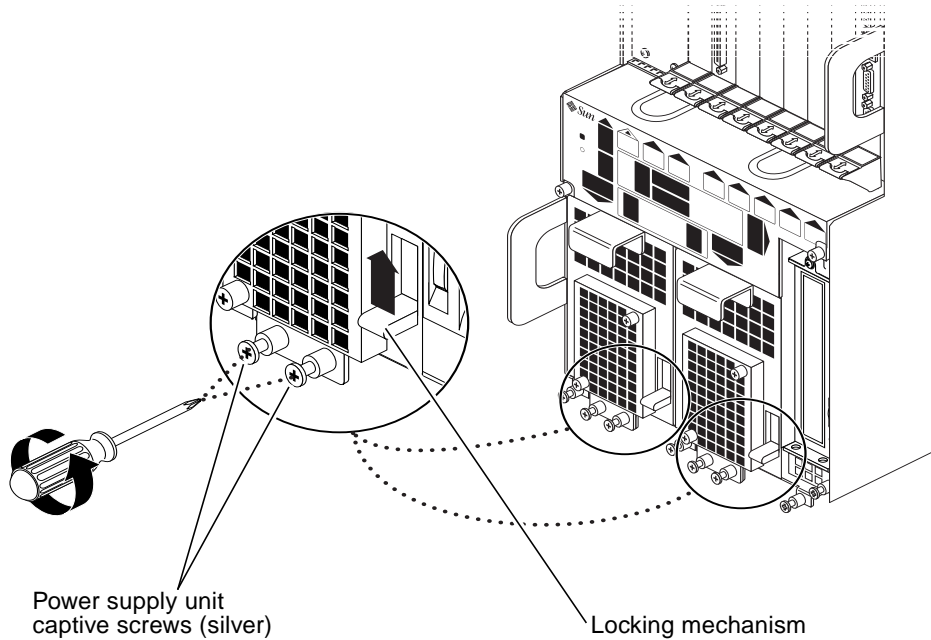

Power supply unit
captive screws (silver)

Locking mechanism

FIGURE 11-14 Removing or Replacing a Power Supply Unit From a Netra ct 800 Server

Power supply unit
captive screws (silver)

Locking mechanism
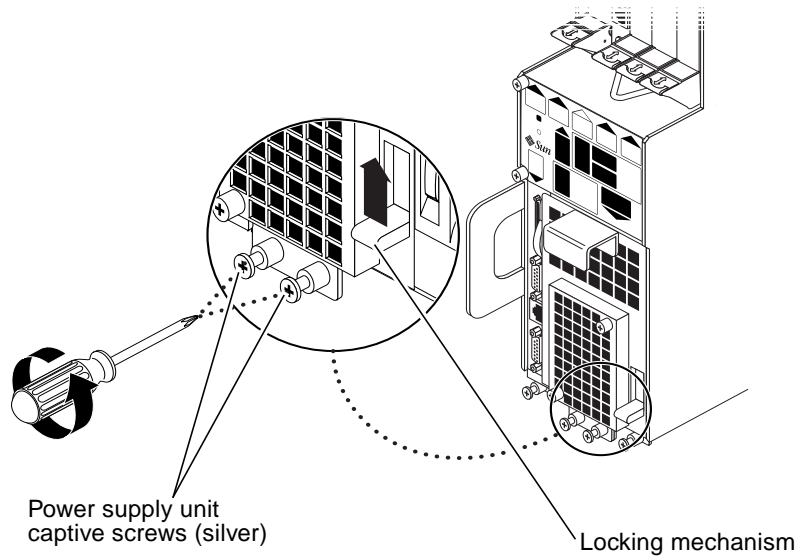
FIGURE 11-15 Removing or Replacing a Power Supply Unit From a Netra ct 400 Server

4. **Using a No. 2 Phillips screwdriver, loosen the two** *silver* **captive screws at the base of the system.**

   FIGURE 11-14 shows the location of the captive screws for the power supply unit on a Netra ct 800 server, and FIGURE 11-15 shows the location of the captive screws for the power supply unit on a Netra ct 400 server.

   ___

   Note – Do not loosen the *black* captive screws at the base of the system; those screws hold the server in place.

   ___

5. **Grasp the handle on the power supply unit (**FIGURE 11-16**), slide it out of the server and place it on the electrostatic discharge mat.**
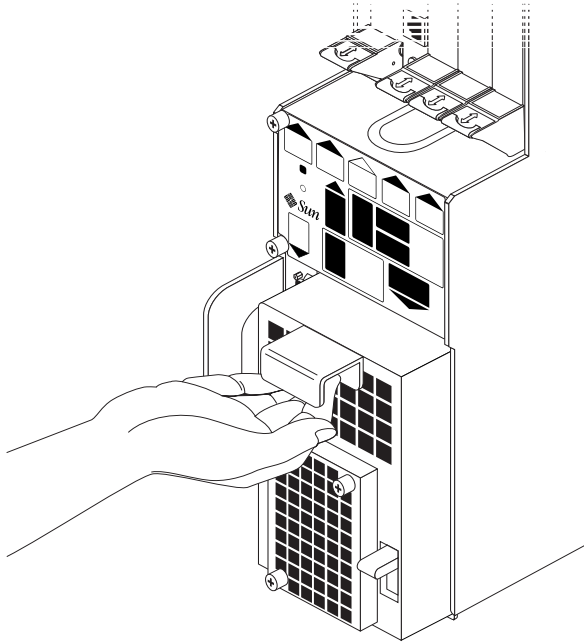
FIGURE 11-16 Removing a Power Supply Unit From a Netra ct 800 Server

11.6.2 Replacing a Cold-Swappable Power Supply Unit

1. **Attach the antistatic wrist strap.**

   Refer to "Attaching the Antistatic Wrist Strap" on page 1-1.

2. **Slide the power supply unit into the slot.**

3. **Using a No. 2 Phillips screwdriver, tighten the two black captive screws to secure the power supply unit to the server.**

   FIGURE 11-14 shows the location of the captive screws for the power supply unit on a Netra ct 800 server, and FIGURE 11-15 shows the location of the captive screws for the power supply unit on a Netra ct 400 server.

4. **Push the power supply unit locking mechanism(s) down into the locked (⌷) position.**

   FIGURE 11-14 shows the location of the locking mechanisms for the power supply unit on a Netra ct 800 server, and FIGURE 11-15 shows the location of the locking mechanisms for the power supply unit on a Netra ct 400 server. The green LED on

the power supply unit should start flashing at this point, indicating that the power supply unit is powered on and functioning properly, but the server has not been powered on yet.

5. **Power on the server.**

   Refer to "Powering On the Server" on page 2-1 for more information.

6. **Verify that the power supply unit you just installed is functioning properly.**

   The green Power LED (⏻) on the power supply unit should go ON and the system should boot.

PART **V**   Illustrated Parts Breakdown

Illustrated Parts Breakdown   Chapter 12

CHAPTER **12**

Illustrated Parts Breakdown

This chapter contains the illustrated parts breakdown and the part numbers for each field-replaceable unit (FRU) in the Netra ct server.

12.1 Chassis Components

TABLE 12-1 lists the FRUs for the chassis.

TABLE 12-1 FRUs for the Chassis

	FRU	Part Number
1	Power distribution unit	#540-4397, X7177A
	Front-access cable (front-access models only)	#530-2895, X7186A
2	Alarm rear transition card, Netra ct 800 server (rear-access models only)	#501-5611, X7176A
3	CPU rear transition card (rear-access models only)	#501-5609, X7169A
4	I/O rear transition cards (rear-access models only)	Varies depending on the I/O card. Contact your local Sun service representative for more information.
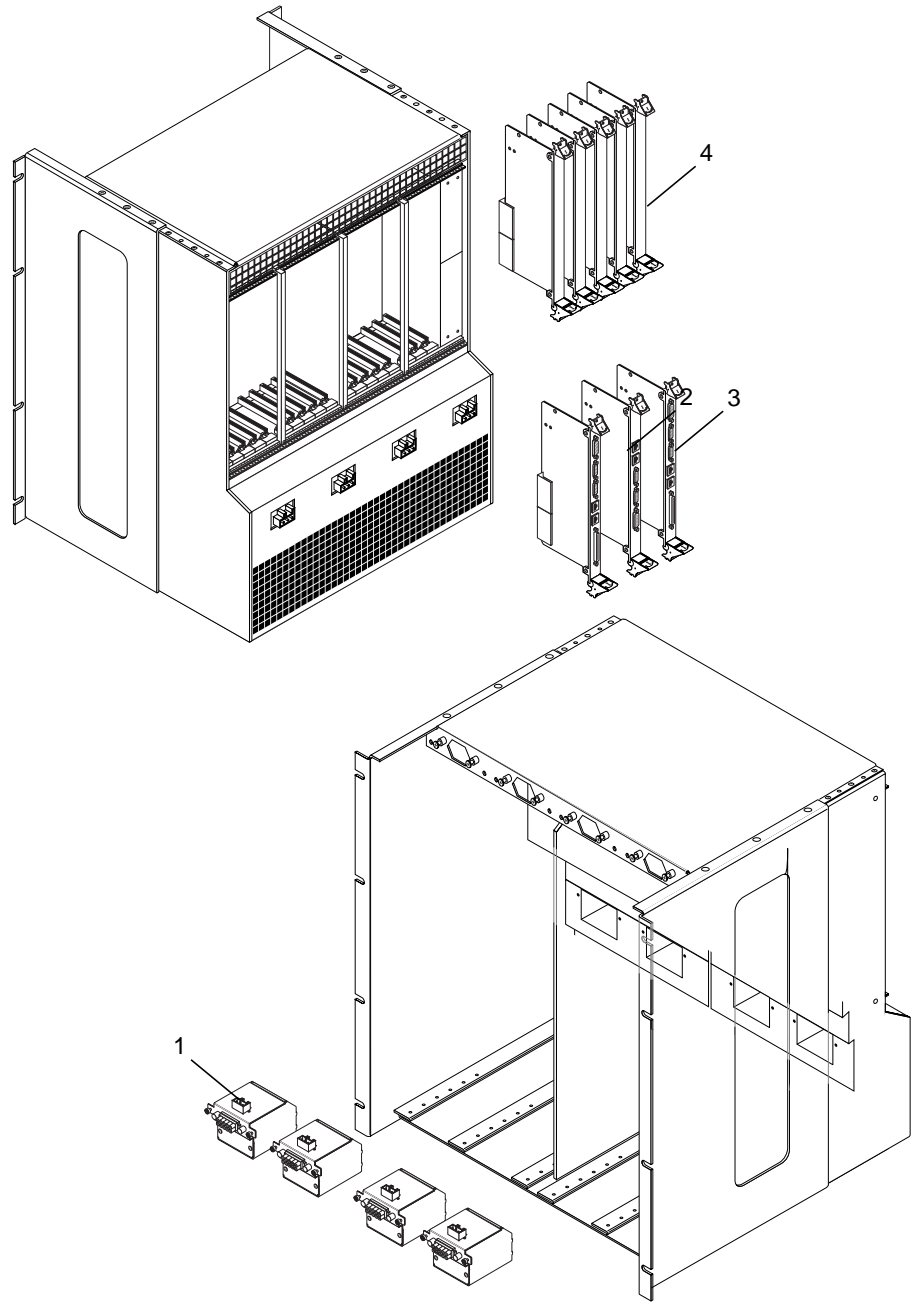
FIGURE 12-1 Illustrated Parts Breakdown, Chassis and Rear-Access Model Components

12.2 Netra ct 800 Server

TABLE 12-2 lists the FRUs for the Netra ct 800 server.

TABLE 12-2 FRUs for the Netra ct 800 Server

	FRU	Part Number
1	Hard disk drive cover panel	N/A
2	Hard disk drive	Varies depending on the hard disk drive. Contact your local Sun service representative for more information.
3	6U I/O cards	Varies depending on the I/O card. Contact your local Sun service representative for more information.
3	CPU card	#501-5389
3	CPU front transition card, Netra ct 800 server, front-access model	#501-5618
3	Alarm card, Netra ct 800 server	#501-5610, X7161A
4	Netra ct 800 server and midplane	#540-4799, X7179A
5	Main air filter, Netra ct 800 server	#370-4076, X7163A
6	System status panel, Netra ct 800 server	#540-4450, X7175A
7	System controller board	#501-5612, X7168A
8	Fan tray	#540-4394, X7166A
9	Removable media module	#540-4399, X7164A
10	Power supply	#300-1445, X7167A
11	Power supply air filter	X7182A
	CPU shunt card, Netra ct 800 server, front-access model	#501-5619
	SCSI termination board	#501-5616
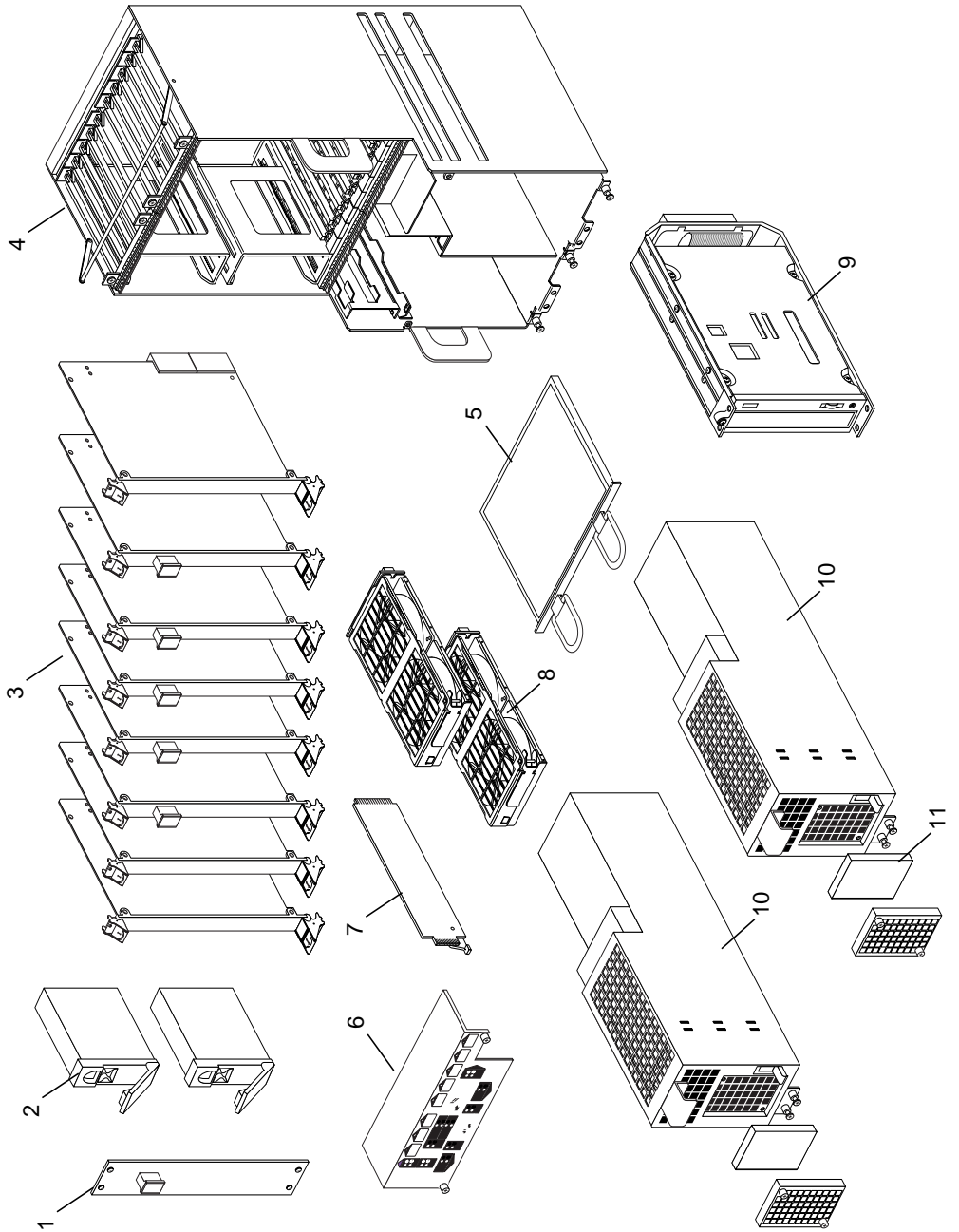
FIGURE 12-2 Illustrated Parts Breakdown, Netra ct 800 Server

12.3 Netra ct 400 Server

TABLE 12-3 lists the FRUs for the Netra ct 400 server.

TABLE 12-3   FRUs for the Netra ct 400 Server

	FRU	Part Number
1	Hard disk drive cover panel	N/A
2	Hard disk drive adapter bracket	#540-4398
3	Hard disk drive	Varies depending on the hard disk drive. Contact your local Sun service representative for more information.
4	6U I/O cards	Varies depending on the I/O card. Contact your local Sun service representative for more information.
4	CPU card	#501-5389
5	Netra ct 400 server and midplane	#540-4800, X7178A
6	Main air filter, Netra ct 400 server	#370-4080, X7162A
7	Alarm card, Netra ct 400 server	#540-4406, X7160A
8	System controller board	#501-5612, X7168A
9	System status panel, Netra ct 400 server	#540-4451, X7174A
10	Fan tray	#540-4394, X7166A
11	Power supply unit	#300-1445, X7167A
12	CPU front transition card, Netra ct 400 server	#501-5624, X7172A
13	Power supply air filter	X7182A
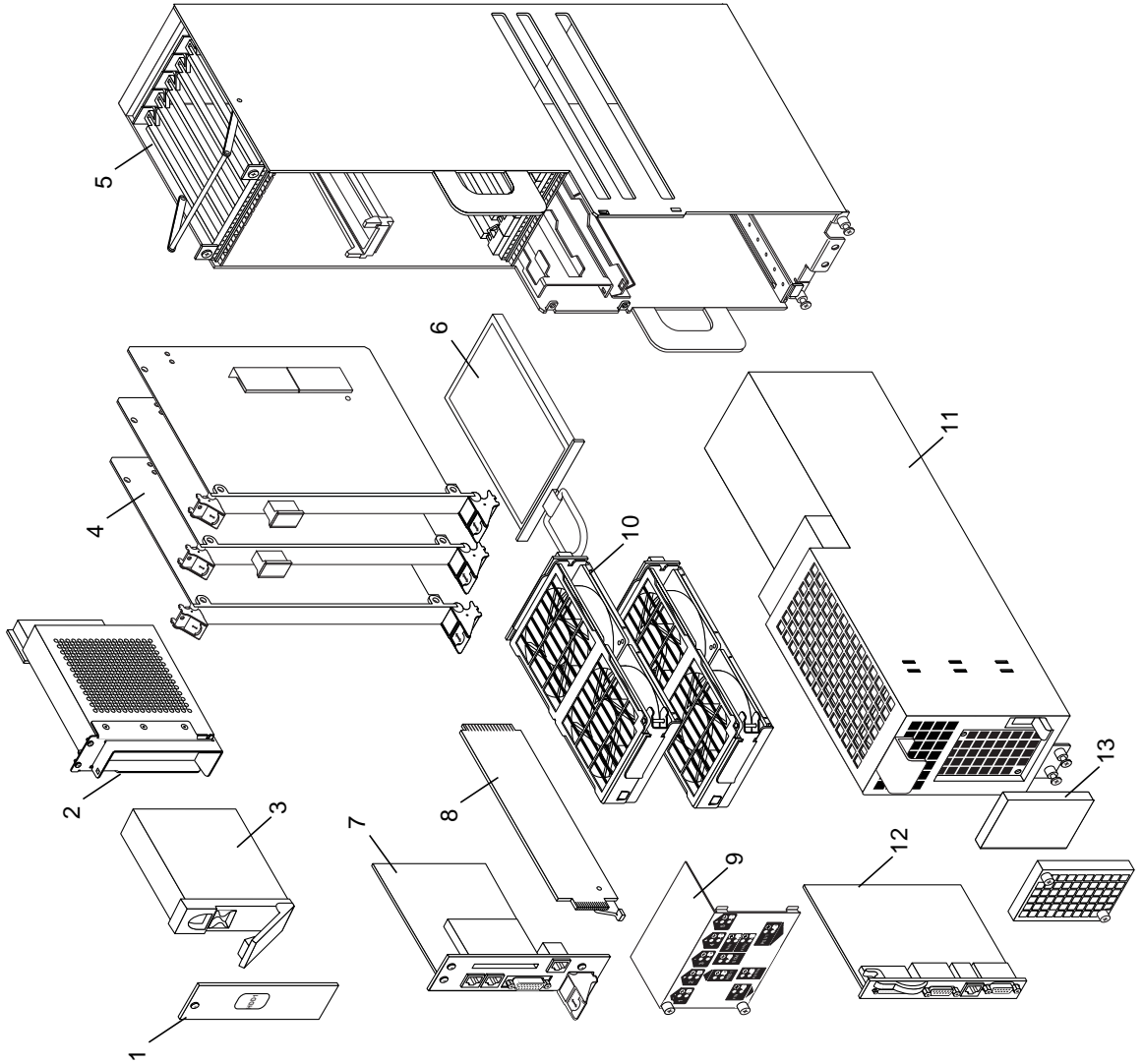
FIGURE 12-3 Illustrated Parts Breakdown, Netra ct 400 Server

PART **VI**   Appendixes, Glossary, and Index

Connector Pinouts

This appendix gives the connector pinouts for the following Netra ct server cards:

A.1 CPU Card

FIGURE A-1 shows the locations of the connectors on the CPU card.
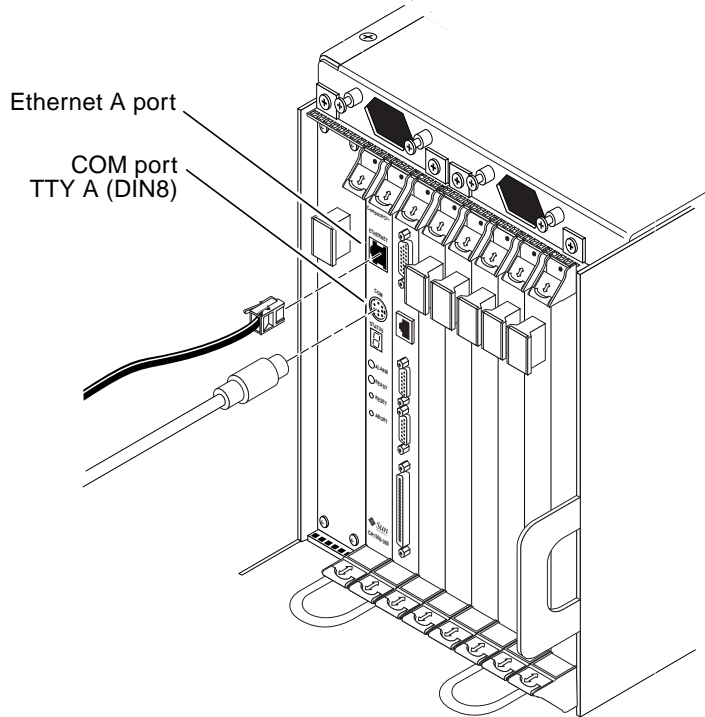

Ethernet A port

COM port
TTY A (DIN8)

FIGURE A-1   Connectors on the CPU Card

A.1.1 Ethernet Port

The twisted pair Ethernet connector is an RJ-45 connector. The controller auto-negotiates to either 10BASE-T or 100 BASE-T.
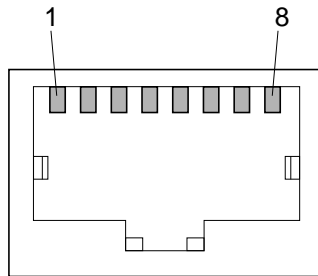
FIGURE A-2 RJ-45 Ethernet Connector Diagram

TABLE A-1 Ethernet Connector Pinouts, CPU Card (J2301)

Pin No.	Description
1	TXD+
2	TXD-
3	RXD+
4	Not used
5	Not used
6	RXD-
7	Not used
8	Not used

A.1.2   COM Port

This port is connected logically to serial port A. It is intended to be used only for serial output to a terminal.

Caution – Serial port A is also connected through the rear cPCI connectors. No mechanism is provided to disable simultaneous input from the front panel and the rear cPCI connectors. Attempts to input data from both ports will place the board in an unknown state.
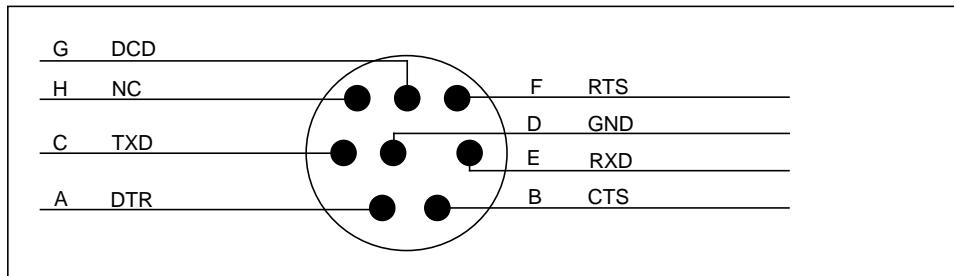
FIGURE A-3   CPU Card Front Panel TTYA Diagram

A.2 CPU Front Transition Card, Netra ct 800 Server

FIGURE A-4 shows the locations of the connectors on the CPU front transition card (CPU FTC) for the Netra ct 800 server.
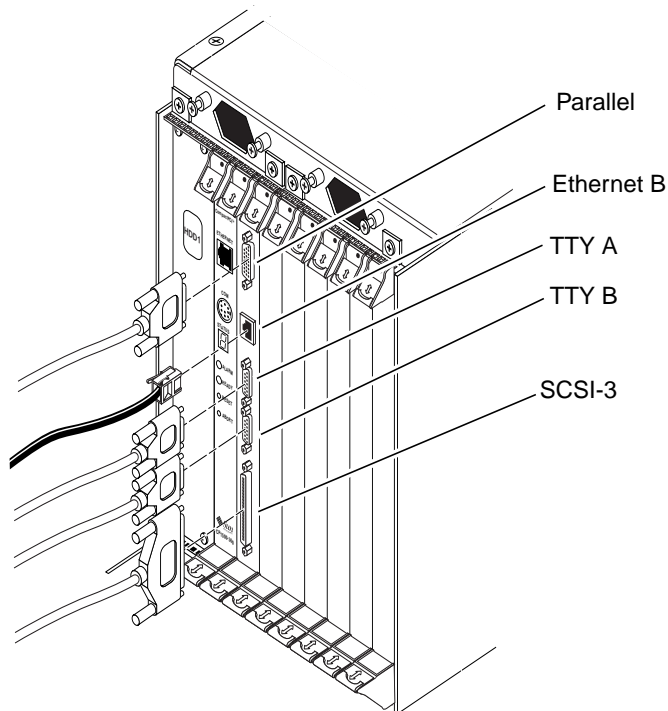
FIGURE A-4 Connectors on the CPU Front Transition Card (Netra ct 800 Server)

A.2.1 Parallel Port

The parallel port on the CPU front transition card for the Netra ct 800 server is a DB-25 female receptacle.
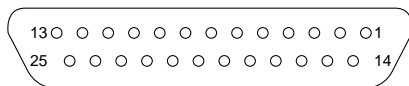
FIGURE A-5 Parallel Connector

TABLE A-2 Parallel Port Pinouts, CPU FTC for the Netra ct 800 Server

Pin No.	Signal	Pin No.	Signal
1	STB	14	AFD
2	PD0	15	ERR
3	PD1	16	INIT
4	PD2	17	SLIN
5	PD3	18	DGND
6	PD4	19	DGND
7	PD5	20	DGND
8	PD6	21	DGND
9	PD7	22	DGND
10	ACK	23	DGND
11	BUSY	24	DGND
12	PE	25	DGND
13	SLCT		

A.2.2   Ethernet B Port

The Ethernet B port on the CPU FTC for the Netra ct 800 server is an RJ-45 connector for 10/100.
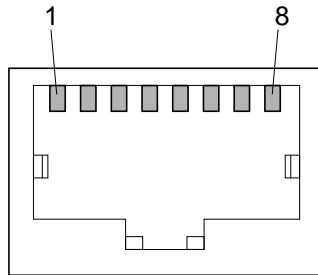
FIGURE A-6   RJ-45 Ethernet Connector Diagram

TABLE A-3   Ethernet B Connector Pinouts, CPU FTC for the Netra ct 800 Server

Pin No.	Description
1	TXD+
2	TXD-
3	RXD+
4	Not used
5	Not used
6	RXD-
7	Not used
8	Not used

A.2.3   TTY A

The TTY A port on the CPU FTC for the Netra ct 800 server is a DB-9 male
connector.
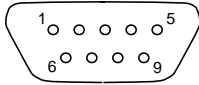
FIGURE A-7   TTY A Connector

TABLE A-4   TTY A Port Pinouts, CPU FTC for the Netra ct 800 Server

Pin No.	Signal Name
1	DCD
2	RXD
3	TXD
4	DTR
5	GND
6	DSR
7	RTS
8	CTS
9	RI

A.2.4   TTY B

The TTY B port on the CPU FTC for the Netra ct 800 server is a DB9 male connector.
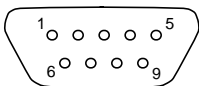
FIGURE A-8   TTY B Connector

TABLE A-5   TTY B Port Pinouts, CPU FTC for Netra ct 800 Server

Pin No.	Signal Name
1	DCD
2	RXD
3	TXD
4	DTR
5	GND
6	DSR
7	RTS
8	CTS
9	RI

A.2.5   SCSI-3

The SCSI port on the CPU FTC for the Netra ct 800 server is a 68-pin SCSI-3 AMPLIMITE connector.
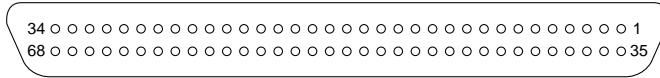
FIGURE A-9   SCSI-3 Connector

TABLE A-6   SCSI Port Pinouts, CPU FTC for Netra ct 800 Server

Pin No.	Signal	Pin No.	Signal
1	GND	35	DATA 12
2	PRES_L	36	DATA 13
3	GND	37	DATA 14
4	GND	38	DATA 15
5	GND	39	PH_L
6	GND	40	DATA 0
7	GND	41	DATA 1
8	GND	42	DATA 2
9	GND	43	DATA 3
10	GND	44	DATA 4
11	GND	45	DATA 5
12	GND	46	DATA 6
13	GND	47	DATA 7
14	GND	48	PL_L
15	GND	49	PRES_L
16	GND	50	GND
17	TERM PWR	51	TERM PWR
18	TERM PWR	52	TERM PWR
19	GND	53	GND

TABLE A-6   SCSI Port Pinouts, CPU FTC for Netra ct 800 Server *(Continued)*

Pin No.	Signal	Pin No.	Signal
20	GND	54	GND
21	GND	55	ATN_L
22	GND	56	GND
23	GND	57	BSY_L
24	GND	58	ACK_L
25	GND	59	RST_L
26	GND	60	MSG_L
27	GND	61	DEL_L
28	GND	62	CD_L
29	GND	63	REQ_L
30	GND	64	IO_L
31	GND	65	DATA 8
32	GND	66	DATA 9
33	GND	67	DATA 10
34	GND	68	DATA 11

A.3 CPU Front Transition Card, Netra ct 400 Server

FIGURE A-10 shows the locations of the connectors on the CPU front transition card (CPU FTC) for the Netra ct 400 server.
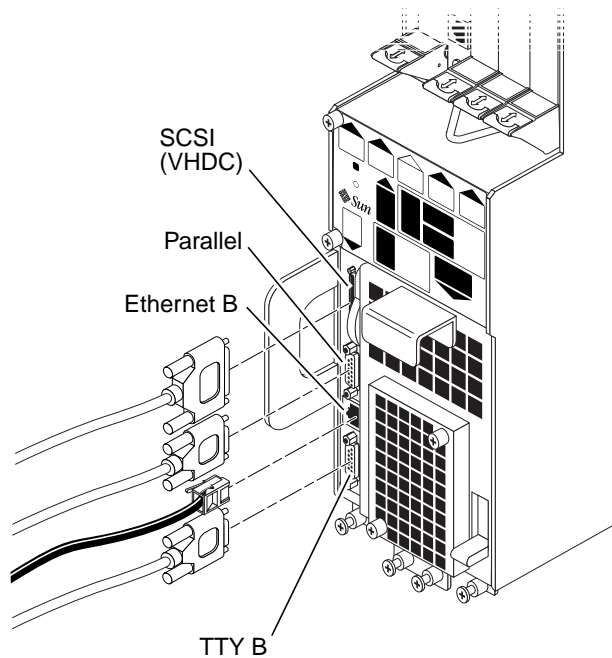
FIGURE A-10 Connectors on the CPU Front Transition Card (Netra ct 400 Server)

A.3.1 SCSI (VHDC)

The SCSI port on the CPU FTC for the Netra ct 400 server is a 68-pin CHAMP very high-density connector (VHDC). Note that a VHDC-to-SCSI 3 cable is included with the Netra ct server (part number 530-2454-01).

TABLE A-7 SCSI Port Pinouts, CPU FTC for the Netra ct 400 Server

Pin No.	Signal	Pin No.	Signal	Pin No.	Signal
1	GND	24	GND	47	DATA 7
2	PRES_L	25	GND	48	PL_L
3	GND	26	GND	49	PRES_L
4	GND	27	GND	50	GND
5	GND	28	GND	51	TERM PWR
6	GND	29	GND	52	TERM PWR
7	GND	30	GND	53	GND
8	GND	31	GND	54	GND
9	GND	32	GND	55	ATN_L
10	GND	33	GND	56	GND
11	GND	34	GND	57	BSY_L
12	GND	35	DATA 12	58	ACK_L
13	GND	36	DATA 13	59	RST_L
14	GND	37	DATA 14	60	MSG_L
15	GND	38	DATA 15	61	SEL_L
16	GND	39	PH_L	62	CD_L
17	TERM PWR	40	DATA 0	63	REQ_L
18	TERM PWR	41	DATA 1	64	IO_L
19	GND	42	DATA 2	65	DATA 8
20	GND	43	DATA 3	66	DATA 9
21	GND	44	DATA 4	67	DATA 10
22	GND	45	DATA 5	68	DATA 11
23	GND	46	DATA 6		

A.3.2 Parallel Port

The parallel port on the CPU FTC for the Netra ct 400 server is an AMPLIMITE SLIMLINE female receptacle.

```
13○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○1
26○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○14
```
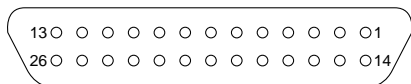
FIGURE A-11 Parallel Connector

TABLE A-8   Parallel Port Pinouts, CPU FTC for the Netra ct 400 Server

Pin No.	Signal	Pin No.	Signal
1	STB	14	AFD
2	PD0	15	ERR
3	PD1	16	INIT
4	PD2	17	SLIN
5	PD3	18	DGND
6	PD4	19	DGND
7	PD5	20	DGND
8	PD6	21	DGND
9	PD7	22	DGND
10	ACK	23	DGND
11	BUSY	24	DGND
12	PE	25	DGND
13	SLCT	26	DGND

A.3.3 Ethernet B Port

The Ethernet B port on the CPU FTC for the Netra ct 400 server is an RJ-45 connector for 10/100.
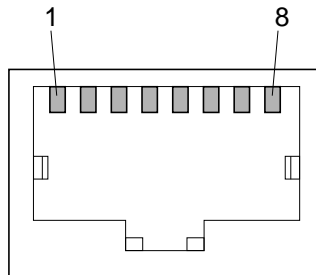
FIGURE A-12 RJ-45 Ethernet Connector Diagram

TABLE A-9   Ethernet B Connector Pinouts, CPU FTC for the Netra ct 400 Server

Pin No.	Description
1	TXD+
2	TXD-
3	RXD+
4	Not used
5	Not used
6	RXD-
7	Not used
8	Not used

A.3.4 TTY B

The TTY B port on the CPU FTC for the Netra ct 400 server is a DB-9 male connector.
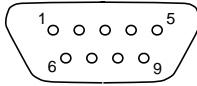
FIGURE A-13 TTY B Connector

TABLE A-10 TTY B Port Pinouts, CPU FTC for the Netra ct 400 Server

Pin No.	Signal Name
1	DCD
2	RXD
3	TXD
4	DTR
5	GND
6	DSR
7	RTS
8	CTS
9	RI

A.4 CPU Rear Transition Card

FIGURE A-14 shows the locations of the connectors on the CPU rear transition card (CPU RTC) for the Netra ct 800 server and FIGURE A-15 shows the locations of the connectors on the CPU RTC for the Netra ct 400 server. The CPU rear transition card is the same for both the Netra ct 800 server and the Netra ct 400 server; only the location in the rear card cage differs.

Parallel
TTY A
TTY B
Ethernet A
Ethernet B
SCSI (VHDC)
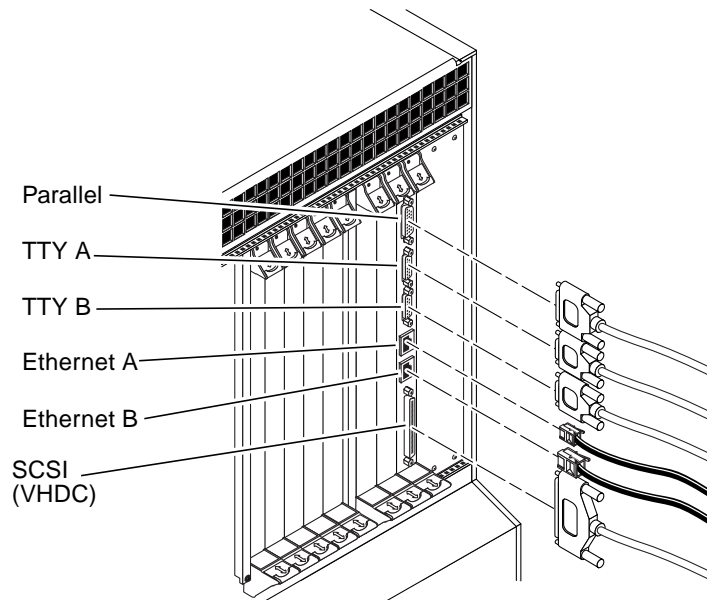
FIGURE A-14 Connectors on the CPU Rear Transition Card (Netra ct 800 Server)
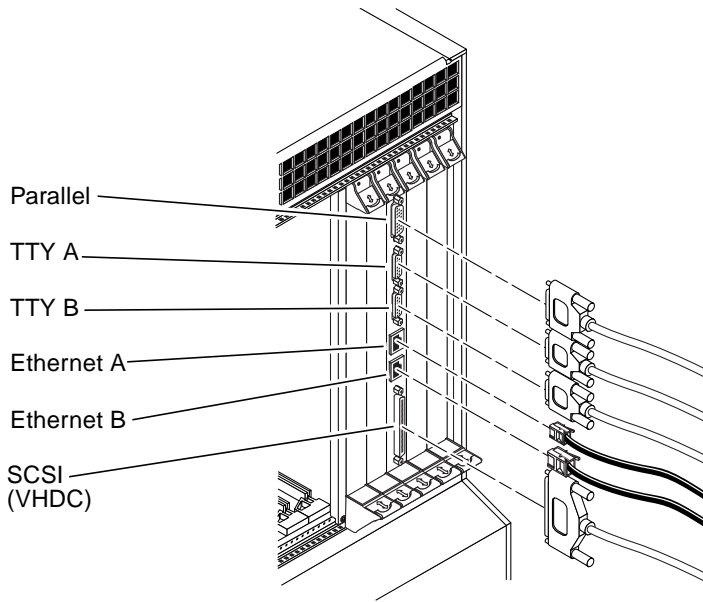
FIGURE A-15 Connectors on the CPU Rear Transition Card (Netra ct 400 Server)

A.4.1 Parallel Port

The parallel port on the CPU RTC is an AMPLIMITE SLIMLINE female DB-25 receptacle.
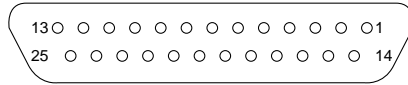
FIGURE A-16 Parallel Connector

TABLE A-11 Parallel Port Pinouts, CPU RTC

Pin No.	Signal	Pin No.	Signal
1	STB	14	AFD
2	PD0	15	ERR
3	PD1	16	INIT
4	PD2	17	SLIN
5	PD3	18	DGND
6	PD4	19	DGND
7	PD5	20	DGND
8	PD6	21	DGND
9	PD7	22	DGND
10	ACK	23	DGND
11	BUSY	24	DGND
12	PE	25	DGND
13	SLCT		

A.4.2　TTY A

The TTY A port on the CPU RTC is a DB-9 male connector.
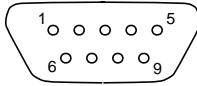
FIGURE A-17 TTY A Connector

TABLE A-12 TTY A Port Pinouts, CPU RTC

Pin No.	Signal Name
1	DCD
2	RXD
3	TXD
4	DTR
5	GND
6	DSR
7	RTS
8	CTS
9	RI

A.4.3 TTY B

The TTY B port on the CPU RTC is a DB9 male connector.
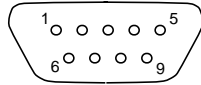
FIGURE A-18 TTY B Connector

TABLE A-13 TTY B Port Pinouts, CPU RTC

Pin No.	Signal Name
1	DCD
2	RXD
3	TXD
4	DTR
5	GND
6	DSR
7	RTS
8	CTS
9	RI

A.4.4　Ethernet A Port

The Ethernet A port on the CPU RTC is an RJ-45 connector for 10/100.
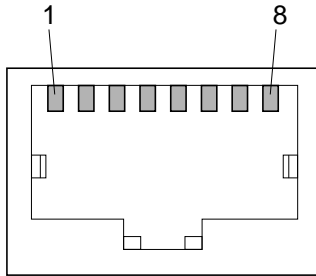
FIGURE A-19 RJ-45 Ethernet Connector Diagram

TABLE A-14　Ethernet Connector Pinouts, CPU RTC

Pin No.	Description
1	TXD+
2	TXD-
3	RXD+
4	Not used
5	Not used
6	RXD-
7	Not used
8	Not used

A.4.5 Ethernet B Port

The Ethernet B port on the CPU RTC is an RJ-45 connector for 10/100.
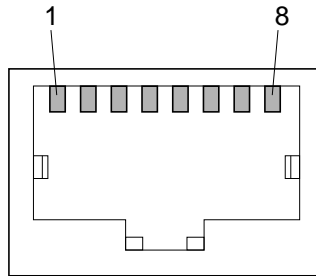
FIGURE A-20 RJ-45 Ethernet Connector Diagram

TABLE A-15 Ethernet Connector Pinouts, CPU RTC

Pin No.	Description
1	TXD+
2	TXD-
3	RXD+
4	Not used
5	Not used
6	RXD-
7	Not used
8	Not used

A.4.6   SCSI (VHDC)

The SCSI port on the CPU RTC is a 68-pin CHAMP very high-density connector (VHDC). Note that a VHDC-to-SCSI 3 cable is included with the Netra ct server (part number 530-2454-01).

TABLE A-16   SCSI Port Pinouts, CPU RTC

Pin No.	Signal	Pin No.	Signal	Pin No.	Signal
1	GND	24	GND	47	DATA 7
2	PRES_L	25	GND	48	PL_L
3	GND	26	GND	49	PRES_L
4	GND	27	GND	50	GND
5	GND	28	GND	51	TERM PWR
6	GND	29	GND	52	TERM PWR
7	GND	30	GND	53	GND
8	GND	31	GND	54	GND
9	GND	32	GND	55	ATN_L
10	GND	33	GND	56	GND
11	GND	34	GND	57	BSY_L
12	GND	35	DATA 12	58	ACK_L
13	GND	36	DATA 13	59	RST_L
14	GND	37	DATA 14	60	MSG_L
15	GND	38	DATA 15	61	DEL_L
16	GND	39	PH_L	62	CD_L
17	TERM PWR	40	DATA 0	63	REQ_L
18	TERM PWR	41	DATA 1	64	IO_L
19	GND	42	DATA 2	65	DATA 8
20	GND	43	DATA 3	66	DATA 9
21	GND	44	DATA 4	67	DATA 10
22	GND	45	DATA 5	68	DATA 11
23	GND	46	DATA 6		

A.5   Alarm Card, Netra ct 800 Server

FIGURE A-21 shows the locations of the connectors on the alarm card for the Netra ct 800 server.
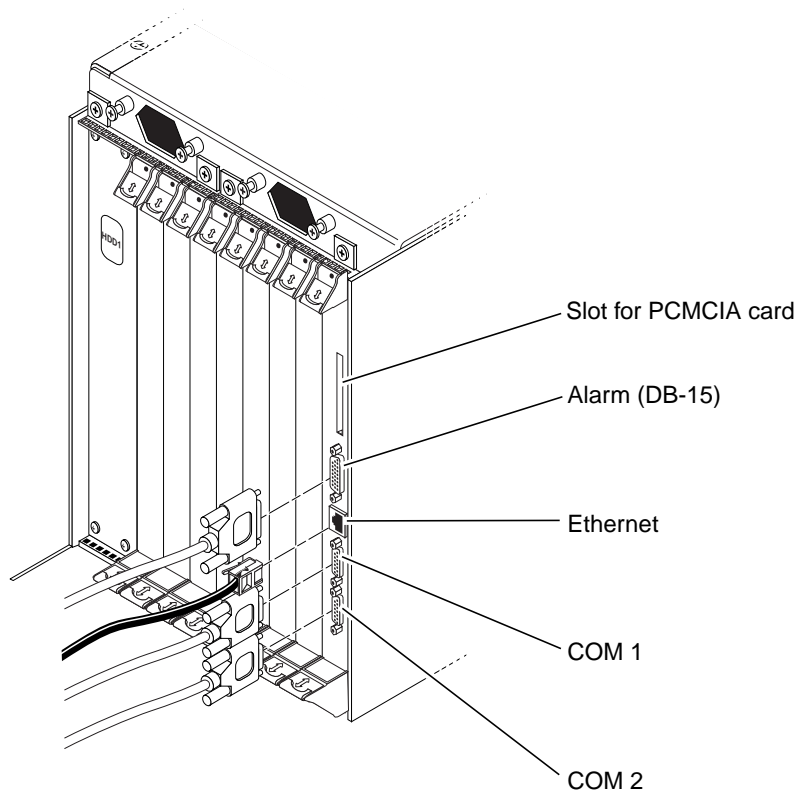
FIGURE A-21 Connector Ports in the Alarm Card in Netra ct 800 Server

A.5.1 Alarm Port

I/O connections are available through the male DB-15 alarm port.
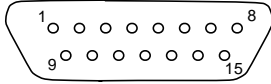
FIGURE A-22 Alarm Port

TABLE A-17 Alarm Port Pinouts, Alarm RTC for the Netra ct 800 Server

Pin No.	Signal
1	RESET0 +
2	RESET0 -
3	RESET1 +
4	RESET1 -
5	ALARM0_NO
6	ALARM0_NC
7	ALARM0_COM
8	ALARM1_NO
9	ALARM1_NC
10	ALARM1_COM
11	ALARM2_NO
12	ALARM2_NC
13	ALARM2_COM
14	ALARM3_NO
15	ALARM3_COM

A.5.2 Ethernet Port

The Ethernet port on the alarm card for the Netra ct 800 server is an RJ-45 connector for 10BASE-T.
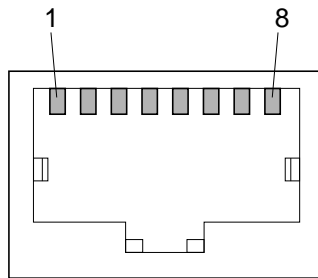
FIGURE A-23 RJ-45 Ethernet Connector Diagram

TABLE A-18 Ethernet Connector Pinouts, Alarm Card for the Netra ct 800 Server

Pin No.	Description	Pin No.	Description
1	TXD+	5	Not used
2	TXD-	6	RXD-
3	RXD+	7	Not used
4	Not used	8	Not used

A.5.3 COM 1

The COM 1 port on the alarm card for the Netra ct 800 server is a DB-9 male connector.
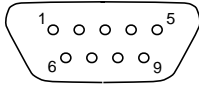
FIGURE A-24 COM 1 Connector

TABLE A-19 COM 1 Connector Pinouts, Alarm Card for the Netra ct 800 Server

Pin No.	Description
1	NC
2	RXD
3	TXD
4	NC
5	Isolated GND 1
6	NC
7	RTS
8	CTS
9	NC

A.5.4 COM 2

The COM 2 port on the alarm card for the Netra ct 800 server is a DB-9 male connector.
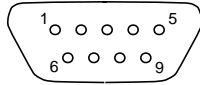
FIGURE A-25 COM 2 Connector

TABLE A-20   COM 2 Connector Pinouts, Alarm Card for the Netra ct 800 Server

Pin No.	Description
1	DCD
2	RXD
3	TXD
4	DTR
5	Isolated GND 2
6	DSR
7	RTS
8	CTS
9	NC

A.6   Alarm Card, Netra ct 400 Server

FIGURE A-26 shows the locations of the connectors on the alarm card for the Netra ct 400 server.
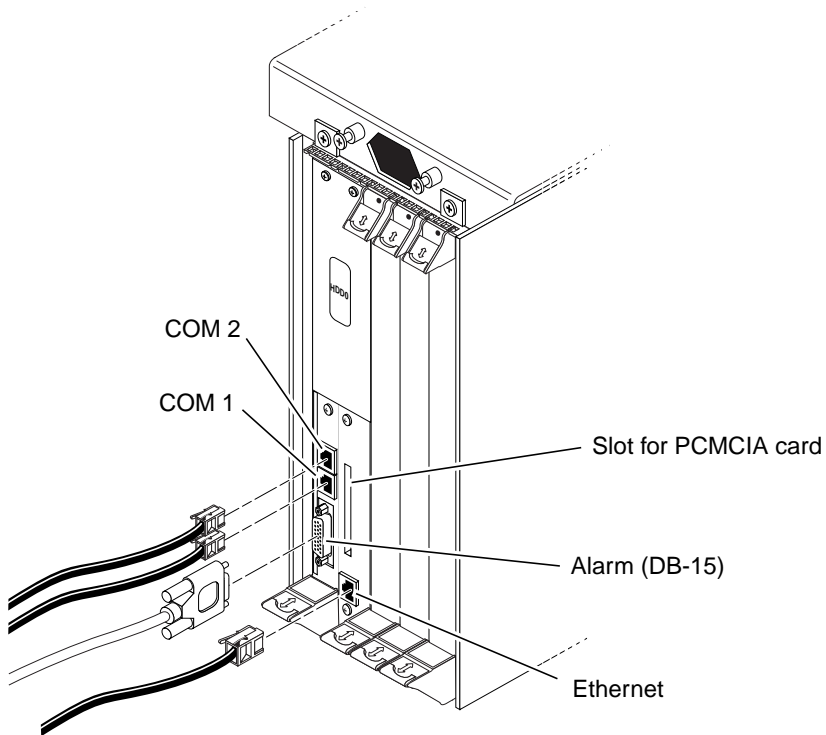
FIGURE A-26 Connectors on the Alarm Card (Netra ct 400 Server)

A.6.1 COM 2

The COM 2 port on the alarm card for the Netra ct 400 server is an RJ-45 connector.
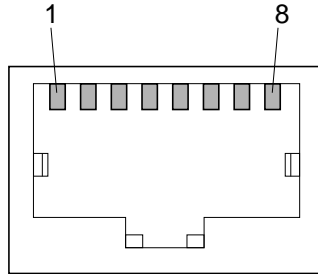
FIGURE A-27 RJ-45 COM Connector Diagram

TABLE A-21 COM 2 Connector Pinouts, Alarm Card for the Netra ct 400 Server

Pin No.	Description
1	RTS
2	DTR
3	TXD
4	Isolated GND 2
5	Isolated GND 2
6	RXD
7	DSR
8	CTS

A.6.2   COM 1

The COM 1 port on the alarm card for the Netra ct 400 server is an RJ-45 connector.
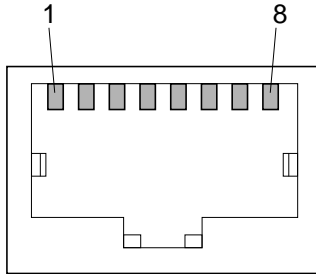
FIGURE A-28 RJ-45 COM Connector Diagram

TABLE A-22   COM 1 Connector Pinouts, Alarm Card for the Netra ct 400 Server

Pin No.	Description
1	RTS
2	NC
3	TXD
4	Isolated GND 1
5	Isolated GND 1
6	RXD
7	NC
8	CTS

A.6.3 Alarm Port

I/O connections are available through the male DB-15 alarm port.
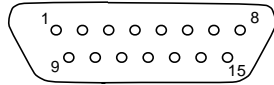
TABLE A-23 Alarm Port Pinouts, Alarm Card for the Netra ct 400 Server

Pin No.	Signal
1	RESET0 +
2	RESET0 -
3	RESET1 +
4	RESET1 -
5	ALARM0_NO
6	ALARM0_NC
7	ALARM0_COM
8	ALARM1_NO
9	ALARM1_NC
10	ALARM1_COM
11	ALARM2_NO
12	ALARM2_NC
13	ALARM2_COM
14	ALARM3_NO
15	ALARM3_COM

FIGURE A-29 Alarm Port

A.6.4 Ethernet Port

The Ethernet port on the alarm card for the Netra ct 400 server is an RJ-45 connector for 10BASE-T.
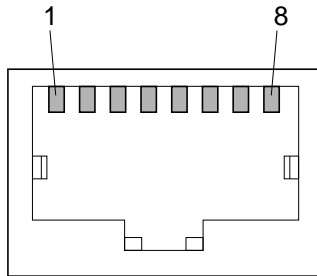
FIGURE A-30 RJ-45 Ethernet Connector Diagram

TABLE A-24 Ethernet Connector Pinouts, Alarm Card for Netra ct 400 Server

Pin No.	Description
1	TXD+
2	TXD-
3	RXD+
4	Not used
5	Not used
6	RXD-
7	Not used
8	Not used

A.7 Alarm Rear Transition Card, Netra ct 800 Server

FIGURE A-21 shows the locations of the connectors on the alarm rear transition card (alarm RTC) for the Netra ct 800 server.

Ethernet

COM 2

COM 1
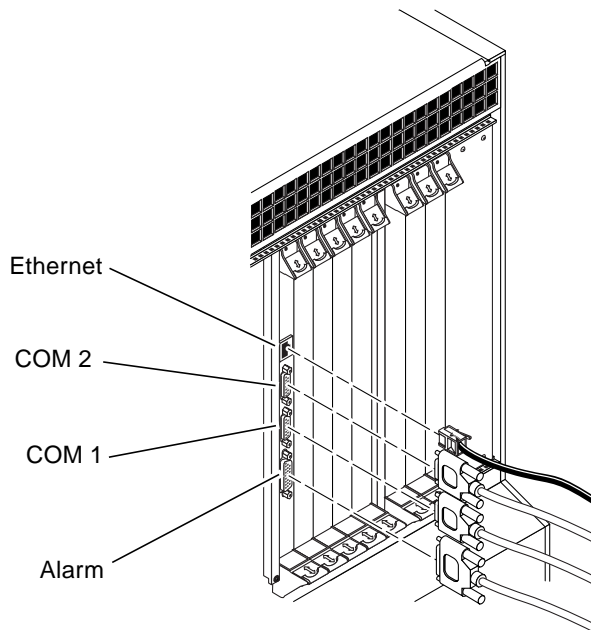
Alarm

FIGURE A-31 Connectors on the Alarm Rear Transition Card

A.7.1 Ethernet Port

The Ethernet port on the alarm RTC for the Netra ct 800 server is an RJ-45 connector for 10BASE-T.
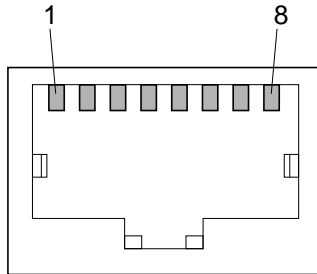
FIGURE A-32 RJ45 Ethernet Connector Diagram

TABLE A-25 Ethernet Connector Pinout, Alarm RTC for the Netra ct 800 Server

Pin No.	Description
1	TXD+
2	TXD-
3	RXD+
4	Not used
5	Not used
6	RXD-
7	Not used
8	Not used

A.7.2   COM 2

The COM 2 port on the alarm RTC for the Netra ct 800 server is a DB-9 male connector.

FIGURE A-33 COM 2 Connector

TABLE A-26   COM 2 Connector Pinouts, Alarm RTC for the Netra ct 800 Server

Pin No.	Description
1	DCD
2	RXD
3	TXD
4	DTR
5	Isolated GND 2
6	DSR
7	RTS
8	CTS
9	NC

A.7.3　COM 1

The COM 1 port on the alarm RTC for the Netra ct 800 server is a DB-9 male connector.
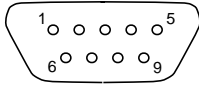
FIGURE A-34　COM 1 Connector

TABLE A-27　COM 1 Connector Pinouts, Alarm RTC for the Netra ct 800 Server

Pin No.	Description
1	NC
2	RXD
3	TXD
4	NC
5	Isolated GND 1
6	NC
7	RTS
8	CTS
9	NC

A.7.4 Alarm Port

I/O connections are available through the male DB-15 alarm port.
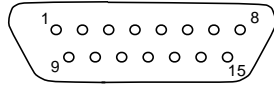
TABLE A-28 Alarm Port Pinouts, Alarm RTC for the Netra ct 800 Server

Pin No.	Signal
1	RESET0 +
2	RESET0 -
3	RESET1 +
4	RESET1 -
5	ALARM0_NO
6	ALARM0_NC
7	ALARM0_COM
8	ALARM1_NO
9	ALARM1_NC
10	ALARM1_COM
11	ALARM2_NO
12	ALARM2_NC
13	ALARM2_COM
14	ALARM3_NO
15	ALARM3_COM

FIGURE A-35 Alarm Port

Connecting a Terminal Console to the Server

One way to power on and off your server is to log in to the server either remotely, where you would log in to the Netra ct server as root through another server on the network, or directly, where you would connect a terminal console directly to your Netra ct server. A terminal console can be an ASCII terminal, workstation, or PC laptop.

For a direct login, the connection you use varies depending on the Netra ct server model you have, the type of terminal console you are using, and the card that you are connecting to:

- If you are using an ASCII terminal to power on and off the Netra ct server, go to "To Use an ASCII Terminal" on page B-1.

- If you are using a Solaris workstation to power on and off the Netra ct server, go to "To Use a Solaris Workstation" on page B-3.

- If you are using a PC laptop to power on and off the Netra ct server, go to "To Use a PC Laptop" on page B-5.

B.1 To Use an ASCII Terminal

1. **Get the appropriate cable(s) and adapter(s) and make the necessary connections.**

   You may need one or more cables and adapters in order to connect the ASCII terminal to the server. The cables and adapters you need varies, depending on the model server you have and the card that you are connecting to.

   - If you are connecting an ASCII terminal to a *CPU or CPU transition card*, use the information in TABLE B-1 to make the necessary connections.

   - If you are connecting an ASCII terminal to an *alarm card or alarm rear transition card*, use the information in TABLE B-2 to make the necessary connections.

TABLE B-1   Connecting an ASCII Terminal to a CPU or CPU Transition Card

Server Type	TTY A Port on Netra ct Server	Adapter	Cable	Adapter	Serial Port on Terminal
Netra ct 800 server	• *Front-access* model: DB-9 male on the CPU front transition card. See "CPU Front Transition Card, Netra ct 800 Server" on page A-5. • *Rear-access* model: DB-9 male on the CPU rear transition card. See "CPU Rear Transition Card" on page A-17.	Not needed.	DB-9 female-to-DB-25 male straight-through	DB-25 female-to-DB-25 female gender changer	DB-25 male
Netra ct 400 server	• *Front-access* model: DIN-8 female on the CPU card. See "CPU Card" on page A-2. • *Rear-access* model: DB-9 male on the CPU rear transition card. See "CPU Rear Transition Card" on page A-17.	Not needed.	• *Front-access* model: DIN-8 male-to-DB-25 male • *Rear-access* model: DB-9 female-to-DB-25 male straight-through	DB-25 female-to-DB-25 female gender changer	DB-25 male

TABLE B-2   Connecting an ASCII Terminal to an Alarm or Alarm Rear Transition Card

Server Type	COM 1 Port on Netra ct Server	Adapter	Cable	Adapter	Serial Port on Terminal
Netra ct 800 server	• *Front-access* model: DB-9 male on the alarm card. See "Alarm Card, Netra ct 800 Server" on page A-25. • *Rear-access* model: DB-9 male on the alarm rear transition card. See "Alarm Rear Transition Card, Netra ct 800 Server" on page A-35.	Not needed.	DB-9 female-to-DB-25 male straight-through	DB-25 female-to-DB-25 female gender changer	DB-25 male
Netra ct 400 server	• *Front-access* model: RJ-45 on the alarm card. See "Alarm Card, Netra ct 400 Server" on page A-30. • *Rear-access* model: Not available.	RJ-45-to-DB-9 male	DB-9 female-to-DB-25 male straight-through	DB-25 female-to-DB-25 female gender changer	DB-25 male

2. **Access the "Set Up Menu" of the ASCII terminal and bring up the Serial Communications section.**

3. **Set up the serial port communications parameters.**

   The default settings should match the values reported on the host serial port.

   - Hardwired modem connection
   - No parity
   - 9600 baud
   - 1 stop bit
   - 8 bit data

4. **Test the connection.**

   Verify that communication has been established to the server and the keyboard/display of the ASCII terminal.

B.2   To Use a Solaris Workstation

1. **Get the appropriate cable(s) and adapter(s) and make the necessary connections.**

   You may need one or more cables and adapters in order to connect a Solaris workstation to the server. The cables and adapters you need varies, depending on the model server you have and the card that you are connecting to.

   - If you are connecting a Solaris workstation to a *CPU or CPU transition card*, use the information in TABLE B-3 to make the necessary connections.

   - If you are connecting a Solaris workstation to an *alarm card or alarm rear transition card*, use the information in TABLE B-4 to make the necessary connections.

TABLE B-3 Connecting a Solaris Workstation to a CPU or CPU Transition Card

Server Type	TTY A Port on Netra ct Server	Adapter	Cable	Adapter	Serial Port on Workstation
Netra ct 800 server	• *Front-access* model: DB-9 male on the CPU front transition card. See "CPU Front Transition Card, Netra ct 800 Server" on page A-5. • *Rear-access* model: DB-9 male on the CPU rear transition card. See "CPU Rear Transition Card" on page A-17.	Not needed.	DB-9 female-to-DB-25 male null modem	Not needed.	DB-25 female
Netra ct 400 server	• *Front-access* model: DIN-8 female on the CPU card. See "CPU Card" on page A-2. • *Rear-access* model: DB-9 male on the CPU rear transition card. See "CPU Rear Transition Card" on page A-17.	Not needed.	• *Front-access* model: DIN-8 male-to-DB-25 male • *Rear-access* model: DB-9 female-to-DB-25 male null modem	Not needed.	DB-25 female

TABLE B-4 Connecting a Solaris Workstation to an Alarm or Alarm Rear Transition Card

Server Type	COM 1 Port on Netra ct Server	Adapter	Cable	Adapter	Serial Port on Workstation
Netra ct 800 server	• *Front-access* model: DB-9 male on the alarm card. See "Alarm Card, Netra ct 800 Server" on page A-25. • *Rear-access* model: DB-9 male on the alarm rear transition card. See "Alarm Rear Transition Card, Netra ct 800 Server" on page A-35.	Not needed.	DB-9 female-to-DB-25 male null modem	Not needed.	DB-25 female
Netra ct 400 server	• *Front-access* model: RJ-45 on the alarm card. See "Alarm Card, Netra ct 400 Server" on page A-30. • *Rear-access* model: Not available.	RJ-45-to-DB-9 male	DB-9 female-to-DB-25 male null modem	Not needed.	DB-25 female

2. **Check the** `/etc/remote` **file for the appropriate line.**

   To connect to the *TTY A or COM 1* port on the workstation, check for this line:

   ```
   tip -9600 /dev/ttya
   ```

3. **Type** `tip hardwire` **at the prompt.**

You should see the word `connected` as the response.

To disconnect the tip window, type `~.` (tilde period) at the prompt.

B.3 To Use a PC Laptop

1. **Get the appropriate cable(s) and adapter(s) and make the necessary connections.**

You may need one or more cables and adapters in order to connect a PC laptop to the server. The cables and adapters you need varies, depending on the model server you have and the card that you are connecting to.

- If you are connecting a PC laptop to a *CPU or CPU transition card*, use the information in TABLE B-5 to make the necessary connections.

- If you are connecting a PC laptop to an *alarm card or alarm rear transition card*, use the information in TABLE B-6 to make the necessary connections.

TABLE B-5 Connecting a PC Laptop to a CPU or CPU Transition Card

Server Type	TTY A Port on Netra ct Server	Adapter	Cable	Adapter	Serial Port on PC Laptop
Netra ct 800 server	• *Front-access* model: DB-9 male on the CPU front transition card. See "CPU Front Transition Card, Netra ct 800 Server" on page A-5. • *Rear-access* model: DB-9 male on the CPU rear transition card. See "CPU Rear Transition Card" on page A-17.	Not needed.	DB-9 female-to-DB-9 female null modem	Not needed.	DB-9 male
Netra ct 400 server	• *Front-access* model: DIN-8 female on the CPU card. See "CPU Card" on page A-2. • *Rear-access* model: DB-9 male on the CPU rear transition card. See "CPU Rear Transition Card" on page A-17.	Not needed.	• *Front-access* model: DIN-8 male-to-DB-25 male • *Rear-access* model: DB-9 female-to-DB-9 female null modem	• *Front-access* model: DB-25 female-to-DB-9 female • *Rear-access* model: Adapter not needed.	DB-9 male

TABLE B-6   Connecting a PC Laptop to an Alarm or Alarm Rear Transition Card

Server Type	COM 1 Port on Netra ct Server	Adapter	Cable	Adapter	Serial Port on PC Laptop
Netra ct 800 server	• *Front-access* model: DB-9 male on the alarm card. See "Alarm Card, Netra ct 800 Server" on page A-25. • *Rear-access* model: DB-9 male on the alarm rear transition card. See "Alarm Rear Transition Card, Netra ct 800 Server" on page A-35.	Not needed.	DB-9 female-to-DB-9 female null modem	Not needed.	DB-9 male
Netra ct 400 server	• *Front-access* model: RJ-45 on the alarm card. See "Alarm Card, Netra ct 400 Server" on page A-30. • *Rear-access* model: Not available.	RJ-45-to-DB-9 male	DB-9 female-to-DB-9 female null modem	Not needed.	DB-9 male

2. Set the following connection parameters:

- No parity
- 9600 baud
- 1 stop bit
- 8 bit data

Error Messages

This appendix gives several error messages that you might see while operating or servicing your Netra ct server, their meanings, and the actions necessary for each. All error messages in this appendix are written to the `/var/adm/messages` file on your system.

scsb Error Messages

C.1   `scsb` Error Messages

```
Alarm and Slot presence state bits do not match!
```

Cause

A problem was encountered when a hot swap alarm card was installed into the server.

Action

Run `prtdiag` to determine the state of the I/O slot. If the alarm card is not listed when you run `prtdiag`, reinsert the alarm card into the slot.

```
SCSB: Should NOT remove SCB(#) while cPCI Slot # is in RESET
with a possible bad board. scsb#0: Slot # Now out of Reset!
```

Cause

The system controller board was removed from the server while the amber Okay to
Remove LED was ON for an I/O slot.

Action

Enable *basic* hot swap on all the I/O slots in the server using the instructions in
Chapter 5 "Hot Swap Software Commands." Once basic hot swap is enabled on all
I/O slots, it is safe to remove the system controller board from the server.

```
scsb#0: ALERT! Lost HEALTHY# on Slot #, Occupant Offline
scsb#0: ALERT! Lost HEALTHY# on Slot #, Occupant Online!!!
```

Cause

The CompactPCI card has lost its HEALTHY report.

Action

The CompactPCI card has failed or is damaged. Configure the card, and then
unconfigure it using the instructions in Chapter 6. If the error messages repeat, then
the card has failed. Replace the I/O card using the instructions in Chapter 6.

If the system has already taken the card offline because the card stopped sending a
HEALTHY signal, the following message is displayed:

```
scsb#0: Slot # successfully taken offline
```

```
scsb#0: Bad (non friendly ?) Board in Slot # ? Taking it
Offline.
```

Cause

The system has identified an I/O card that is sending repeated interrupts and has taken it offline.

Action

Replace the I/O card using the instructions in Chapter 6 "Removing and Replacing Hot-Swappable Cards."

```
scsb#0: Could not Update %s LEDs.
scsb#0: Could not Blink %s LEDs.
```

Cause

An I^2C error has resulted in an LED change failure. The LEDs on the system status panel may give incorrect information as a result.

Action

Use the `prtdiag` tool to print the correct LED states. Remove and reinstall the system controller board to correct the problem. Refer to "System Controller Board" on page 8-7 for those instructions.

```
scsb#0: hsc_board_healthy: No Slot Info.
```

Cause

A disabled slot that is no longer being monitored by the system (due to errors or user request) is having HEALTHY state changes and sending full hot swap style interrupts to the CPU.

Action

Remove the I/O card from that slot. If the error messages repeat, set the I/O slot to basic hot swap using the instructions in "Enabling Basic Hot Swap on I/O Slots" on page 5-5.

```
scsb#0: hsc_enum_intr:   No Last Board Insertion Info.
```

Cause

A CompactPCI card that is probably damaged was installed into an I/O slot in the
system. The card has some sort of error causing it to continually interrupt the CPU
with hot swap service events when there is no change to the board's state. The card
continually reports itself 'inserted' after it has already been acknowledged. Since no
board is 'claiming' the event, no slot # can be given. Also see "scsb#0: Bad (non
friendly ?) Board in Slot # ? Taking it Offline." on page C-3.

Action

Remove the I/O card from the server using the instructions in Chapter 6 "Removing
and Replacing Hot-Swappable Cards." If the error message repeats, the system
controller board may have failed. Try replacing the system controller board using the
instructions in "System Controller Board" on page 8-7.

```
scsb#0: hsc_restore:   Cannot reset disconnected slot #
```

Cause

The system controller board was installed in the server while the amber Okay to
Remove LED was ON for an I/O slot.

Action

Enable *basic* hot swap on all the I/O slots in the server using the instructions in
Chapter 5 "Hot Swap Software Commands." Once basic hot swap is enabled on all
I/O slots, remove the system controller board from the server.

```
scsb0: I2C TRANSFER Failed
scsb0: Error Reading Healthy# Registers
scsb#0: scsb_reset_slot: error reading Reset regs
```

Cause

An error occured when the `scsb` driver received the `retry` command from the system controller board.

Action

Retry. If the error persists, the system controller board is damaged and should be replaced. Refer to "System Controller Board" on page 8-7 for those instructions.

```
scsb#0: no HEALTHY# signal on slot#
```

Cause

You tried to connect or configure a hot-swappable I/O card that was not reporting itself HEALTHY. The card has failed or was not inserted properly.

Action

Remove the I/O card from the server and reinsert it, making sure the card is completely and properly inserted into the server. If the error message repeats, then the card has failed. Replace the I/O card using the instructions in Chapter 6 "Removing and Replacing Hot-Swappable Cards."

```
scsb#0: Reset Not Asserted on Healthy# Failed slot#
```

Cause

You rebooted the system with a failed board. While the board is not reporting itself HEALTHY, the OpenBoot PROM has taken it out of reset and probed it anyway.

Action

The board is probably damaged and should not be used. Unconfigure the board manually and remove the board from the system using the instructions in Chapter 6 "Removing and Replacing Hot-Swappable Cards."

```
scsb#0: slot # Occupant configured, Regained HEALTHY#!
scsb#0: slot # Occupant Unconfigured, Regained HEALTHY#!
```

Cause

A CompactPCI card is sending conflicting HEALTHY and UNHEALTHY signals.

Action

The card has failed. Replace the I/O card using the instructions in Chapter 6 "Removing and Replacing Hot-Swappable Cards."

```
scsb#0: Successfully Downgraded to Basic Hotswap Mode
```

Cause

Basic hot swap was enabled on the system.

Action

No action is necessary.

```
scsb#0: Successfully Upgraded to Full Hotswap Mode
```

Cause

Full hot swap was enabled on the system.

Action

No action is necessary.

C.2 Anticipated Hardware Failure

C.2.1 Transient Interrupts

Message

```
Interrupt Level 4--Not serviced
```

Cause

Such a message occuring intermittently is always a result of the underlying hardware doing something unpredictable.

Transient interrupts occur when, for example, a fan is starting to fail, and it fails long enough to generate an interrupt and then resumes operation. By the time the fan driver is queried, it denies the interruption because now it is functioning normally.

Action

The condition is a result of the architecture of interrupt generation and response. As long as the generating hardware has resumed normal operation, no further action is required.

C.2.2 Soft Hang

Message

```
Interrupt Level 4--Not serviced
```

Cause

This message, occurring continuously, signals a soft hang of the system. The presenting symptom is the system is noticeably sluggish because it is busy processing interrupts.

A soft hang occurs when a component such as a power supply sends a level high interrupt and keeps it high. The kernel notices and polls the devices. Each device answers negative, including the culprit power supply. Meanwhile, the CPU continues with minimal work before returning to the querying process. This is a serious problem because the failing component remains unidentified.

Action

Completely power the server off and then on again using the instructions in Chapter 2. When the system boots, it always boots interrupts low (masked), and attaches the drivers one by one. You can also use OpenBoot PROM commands to probe the components and determine which one has failed.

C.3   I^{2}C Complaints

Message

```
NO ADDERSS ACK 80
```

Cause

This message indicates a problem with I^{2}C, and often it's the pcf8584 driver that complains, followed by the address it was trying to access (for example, `NO ADDRESS ACK 80.` indicates a problem with address 80, which is the fixed address of the system controller board.

Most of the Sun drivers print a secondary error message, but the principal error message comes from pcf8584. The interface to this is through an ioctl, so its done through software. This message indicates a problem, but not the severity. Sometimes such a message is normal.

For example when a power supply is removed, the Present line goes low and the SCB sets the bit high (interrupt. The kernel pcf8584 goes down the device line querying for interrupts in the order in which the devices boot, each one answering. The message 8584 NO ADDR ACK 0x9E   occurs when the device is removed. Because it happened after the driver tried to query the hardware, this spurious error message occurs. This happens with fans and power supplies.

Action

If the error message occurs during a hot swap operation, it is erroneous and should be ignored. If the error messge occurs during normal operation, it may indicate a problem with the I^{2}C device. Use `envmond` to troubleshoot the system using the instructions in "Troubleshooting the System Using envmond" on page 4-7.

C.4 Bus Busy Complaints

Message

```
Bus busy, cleared after initiallizing
```

Cause

This is a transcient 1^{2}C error message.

Action

Usually no action is necessary because the system should recover from most transcient 1^{2}C errors. If the system becomes unresponsive, completely power the server off and then power it back on. Watch the Power-On Self-Test messages to determine the cause for the error.

System Specifications

This appendix gives the system specifications for the Netra ct server.

D.1 Physical Specifications

TABLE D-1   Physical Specifications, Netra ct Chassis

	English	Metric
Width	17.5 inches	444.5 mm
Depth (default configuration, with rack mount brackets extended)	15.75 inches	400 mm
Depth (with rack mount brackets flush against the bottom of the chassis)	13.78 inches	350 mm
Height	20.97 inches	533.64 mm
Weight, empty	74 lbs	33.56 kg
Weight, fully-loaded	150 lbs	68.04 kg

TABLE D-2   Physical Specifications, Netra ct 800 Server

	English	Metric
Width	8.56 inches	217.5 mm
Depth	14.89 inches	378.3 mm
Height	20.18 inches	512.67 mm
Weight, fully-loaded	38 lbs	17.24 kg

TABLE D-3   Physical Specifications, Netra ct 400 Server

	English	Metric
Width	4.25 inches	108 mm
Depth	14.91 inches	378.68 mm
Height	20.18 inches	512.67 mm
Weight, fully-loaded	22 lbs	9.98 kg

D.2   Electrical Specifications

TABLE D-4   DC Power Requirements

Electrical Element	Requirement
Voltage (nominal)	-48 VDC, -60VDC
Input current (maximum)	14 A
Max. input surge current	17 A

D.3 Environmental Specifications

TABLE D-5 Environmental Specifications

Type	Location	Minimum to Maximum Range
Temperature	Operating	-5˚C to 45˚C (23˚F to 113˚F)
	Nonoperating	-40˚C to 70˚C (-38˚F to 158˚F)
Short term (less than 96 consecutive hrs)	Operating	-5˚C to 55˚C (23˚F to 131˚F)
Relative humidity (noncondensing)	Operating	5% to 93% RH
	Nonoperating	93% RH max
Altitude	Operating	0 ft to 13,123 ft (0m to 4000m)
	Nonoperating	0 ft to 39,370 ft (0m to 12,000m)
Declared noise emissions in accordance with ISO 9296		
Chassis w/two Netra ct 800 servers		Sound power LWAd Operating 6.7 B (1B = 10 dB)
		Idle 6.7 B
Chassis w/four Netra ct 400 servers		Sound power LWAd Operating 7.1 B (1B = 10 dB)
		Idle 7.1 B

Upgrading CPU Memory

This appendix gives the instructions for upgrading the CPU memory for the CPU card in the Netra ct server.

E.1 Memory Installation

This section describes the memory configuration and installation procedure for the CPU card.

E.1.1 Memory Configurations

TABLE E-1 shows the permissible memory configurations for the CPU card.

TABLE E-1   Permissible Memory Configurations on the CPU Card

Maximum Memory Available	No. of Memory Modules Supported	Memory Module Size Options (MBytes)
1 GByte (1024 MByte)	Maximum 2	The memory board to be installed first (memory board A position) should be the one with the larger amount of memory, for example, 512 MByte. Memory board B should be the one with equivalent or smaller memory, for example, 64 MByte, 128 MByte, or 256 MByte. See FIGURE 6-2 for details.

TABLE E-2 shows the available memory sizes and part numbers.

TABLE E-2 Memory Sizes and Part Numbers

Memory Size	Memory Board Part Number	Marketing Part Number
64 MByte	501-5210	XCP1500-64
128 MBytes	501-5209	XCP-1500-128
256 MByte	501-5388	XCPMEM-256
512 MByte	501-5289	XCPMEM-512

E.1.2 Memory Installation Procedure

It is recommended that you read these instructions and familiarize yourself with the memory installation procedure and rules before installing the memory. The procedure itself is quite simple.

Memory modules are not included in the CPU card package and must be ordered separately. Before installing a CPU card into the OEM equipment you need to install at least one memory module on the CPU card. This procedure requires that you remove the CPU card from the OEM equipment and place the board on a clean and flat surface before you can begin to install the memory cards.

The CPU card supports up to two mezzanine memory modules, also referred to as memory boards or memory cards. The first memory board (memory board A) is installed directly onto the CPU card. The second memory board (memory board B) is installed on top of memory board A in a piggy-back style. FIGURE E-1 illustrates the installation procedure and the appropriate hardware for installing the memory boards on the CPU card. The CPU card with both memory boards takes only one CompactPCI slot.

If you have an existing memory card (memory board A) that has less memory than the memory board that you wish to add, you need to unscrew and remove the existing memory card because it will require reinstallation of the memory boards in a particular order. If the boards consist of different memory sizes, the board with greater memory must be installed first. If your CPU card has an existing memory card that has equal or more memory, simply remove the mounting hardware and install another memory board following the necessary steps described below.

This procedure assumes that no memory are present on the CPU card and that you wish to install two memory boards.

If you are installing only one memory board, the nylon spacers are not needed. In that case you can simply install the board, tighten the appropriate mounting screws and washers directly into the metal posts (which also work as spacers). In any event

you need to carefully align the memory boards, press on the connectors (specially the middle one) to make sure the memory cards are properly seated and secured with the appropriate screws, spacers, and washers.

Follow the safety rules and the relevant steps shown below to install the memory boards.

Caution – Follow all the safety rules set forth by the OEM equipment manufacturer before performing this procedure. The components on the CPU card and on the memory cards are quite sensitive to static electricity. Wear anti-static wrist strap when handling the memory cards and during the installation. Failure to comply may result in physical injury as well as damage to the board and equipment.

Depending on the presence of any existing memory, you may or may not have to take all the steps.

1. **Determine the size of the memory card that you wish to install or that of any existing memory card(s) by looking at the part number printed near the middle connector on the memory card.**

    Refer to TABLE E-2 for the memory size and part number. See FIGURE E-1 for the location of the part number on the memory card that specifies the amount of memory on a board.

2. **Select screws, washers and spacers of appropriate sizes for installing the memory card from a bag that came with the memory kit.**

    If you are adding two memory boards, you need to use longer screws to secure both boards. Be careful not to let the washers, spacers, and screws fall into the chassis or under some other components of the CPU card.

3. **Position the memory board A connectors above the memory board connector sockets on the CPU card, align them properly (making sure all the mounting holes are concentric), and press down the connectors using your fingers until they are seated (**FIGURE E-2**).**

    Make sure the middle connector is also properly seated.

4. **If you wish to install a second memory board, skip to Step 6.**

5. **If you do not wish to install another memory board, tighten all four screws of appropriate size and washers and spring washers.**

    Carefully hold the washers in place while installing the screws in the mounting holes so that the washers do not come out.

6. **Place the round nylon spacers on top of the mounting holes on the memory board A so that they are aligned with the mounting holes.**

7. **Position the memory board B connectors on top of the memory board A sockets, align them properly (making sure all the mounting holes are concentric) and the nylon spacers are aligned.**

8. **Press down the connectors using your fingers until they are seated.**

9. **Install the mounting screws and washers (**FIGURE E-2**).**

   If you notice the nylon spacers have shifted from their respective places, move them to their proper places before installing and tightening the screws.

10. **Press down the middle connector of the memory board to make sure it has not popped out.**

    Tightening of all the mounting screws does not necessarily mean that the connectors are seated properly. It is important to perform this step.
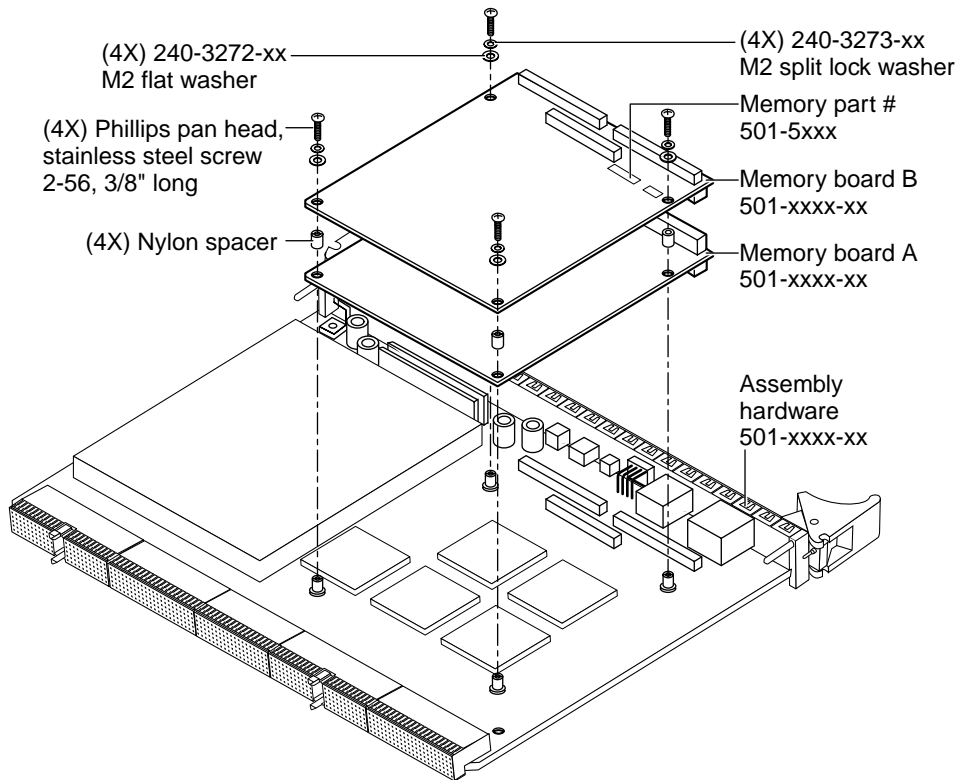
FIGURE E-1   Installing a Memory Module on the CPU Card
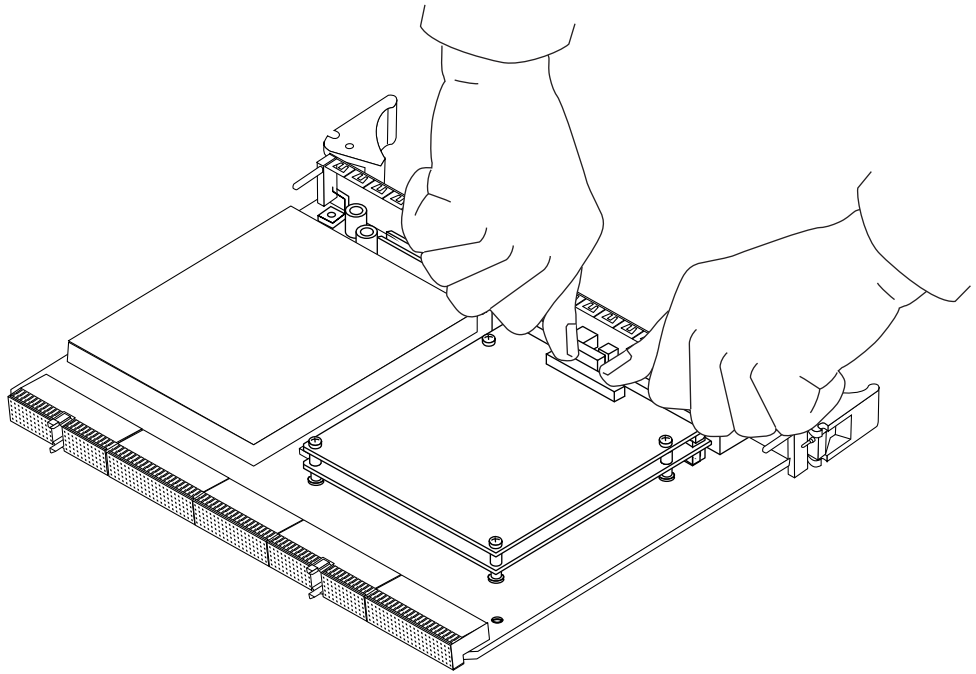
FIGURE E-2 Seating the Memory Module

Caution – Do not apply excessive pressure on any of the connectors. Applying excessive pressure on any of the connectors may result in micro-fractures on the CPU card and severely damage the board.

Glossary

Knowledge of the following terms and acronyms is useful in the administration of the Netra ct server.

A

alarm card An optional card that occupies a slot in the Netra ct server. The alarm card responds to events, such as I/O card failures or excessive heat. Software that resides on the card can take action in response to such events.

alarms feature A set of features implemented in software and hardware that provide the operator of the Netra ct server with notifications when hardware and/or software failures occur (or when failure thresholds are being approached).

B

basic hot swap One of the hot swap states. In the basic hot swap model, the hardware connection process can be performed automatically by the hardware, while the software connection process requires operator assistance. See *hot swap, full hot swap*

C

CompactPCI A standard for computer boards and buses. CompactPCI is adapted from the *Peripheral Component Interconnect (PCI) Specification* for industrial and/or embedded applications requiring a more robust mechanical form factor than desktop PCI. CompactPCI is supported by the PCI Industrial Computer Manufacturers Group (PICMG), a consortium that uses PCI for embedded applications.

F

field replaceable unit (FRU) From a service point of view, the smallest irreducible elements of a server, such as the Netra ct server. Examples of FRUs are disk drives, I/O cards, and power supplies. Note that a server, with all of its cards and other components, is not a FRU. However, an empty server is.

front-access The model of the Netra ct server that is configured so that all of the cables come out from the front of the chassis.

front transition module Used only for the CPU in the front access models of the Netra ct server. The CPU front transition module allows for CPU cabling from the front of the chassis.

full hot swap One of the hot swap states. In the full hot swap model, both the hardware and the software connection process are performed automatically.

See *hot swap*, *basic hot swap*

H

hot swap Implies the ability to remove and replace cards from and in a running computer. See *full hot swap*, *basic hot swap*

M

midplane   The functional equivalent of a backplane. The midplane is secured to the back of the server. The CPU card, I/O cards and storage devices plug into the midplane from the front, and the rear transition cards plug into the midplane from the rear.

N

NEBS   An acronym for Network Equipment/Building System. A set of requirements for equipment installed in telco offices. These requirements cover personnel safety, protection of property, and operational continuity. "NEBS testing" involves subjecting equipment to shaking (for earthquakes), fire, and other environmental insults. There are three levels of NEBS compliance, each a superset of the preceding. NEBS level 3, the highest level, certifies that a piece of equipment can be safely deployed in an "extreme environment." A telco Central Office is considered an extreme environment.

The NEBS standards are maintained by Telcordia Technologies, Inc., formerly Bellcore.

P

PICMG   Acronym for the PCI Inductrial Computer Manufacturers Group. (PCI stands for Peripheral Component Interconnect.) PICMG is the group that promulgates the CompactPCI standard.

See *CompactPCI*.

R

rear-access   The model of the Netra ct server that is configured so that all of the cables come out from the rear of the chassis.

rear transition card   Used only on the rear access models of the Netra ct server. The rear transition cards extend the connectors from the midplane to the rear of the chassis.

**Reliability, Availability,
Serviceability (RAS)**   Refers to hardware or software features that implement or improve the reliability, availability and serviceability of a server. For example, the Netra ct server has a watchdog reset that prevents endless operating system "hangs". If the operating system enters a hung state, the watchdog reset initiates a system reset upon the expiration of a timer. This feature is said to increase the server's availability. Much of the Netra ct server's RAS functions are provided by the *alarm card* and the firmware that resides on that card.

S

system status panel   A module designed to give feedback on the status of the key components within the Netra ct servers. The system status panel has one set of LEDs for each component within that particular server.

**system controller
board**   A hot-swappable component located behind the system status panel. It feeds system status information to the system status panel, where LEDs give feedback on the status of the key components within the Netra ct servers.

U

U   A unit of measure equal to 1.75 inches.

Index