



# Netra™ CT Server Service Manual

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For the Netra CT 810 Server and Netra CT 410 Server

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Part No. 816-2482-10  
October 2002, Revision A

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# Preface

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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*.

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## 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.

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# 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 810 server and Netra CT 410 server.

Chapter 10 gives instructions for removing and replacing cold-replaceable subassemblies.

## Part V “Illustrated Parts Breakdown”

Chapter 11 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.

---

# 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 <code>.login</code> file. Use <code>ls -a</code> to list all files. % You have mail.
<b>AaBbCc123</b>	What you type, when contrasted with on-screen computer output	% <b>su</b> Password:
<i>AaBbCc123</i>	Book titles, new words or terms, words to be emphasized	Read Chapter 6 in the <i>User's Guide</i> . These are called <i>class</i> options. You <i>must</i> be superuser to do this.
	Command-line variable; replace with a real name or value	To delete a file, type <code>rm filename</code> .

---

# Shell Prompts

Shell	Prompt
C shell	<i>machine_name%</i>
C shell superuser	<i>machine_name#</i>
Bourne shell and Korn shell	\$
Bourne shell and Korn shell superuser	#

---

# Related Documentation

The Netra CT server documentation is listed in the following table:

Title	Part Number
<i>Netra CT Server Start Here</i>	816-2479
<i>Netra CT Server Product Overview</i>	816-2480
<i>Netra CT Server Installation Guide</i>	816-2481
<i>Netra CT Server Service Manual</i>	816-2482
<i>Netra CT Server System Administration Guide</i>	816-2483
<i>Netra CT Server Safety and Compliance Manual</i>	816-2484
<i>Netra CT Server Product Note</i>	816-2488

You may want to refer to documentation on the following software for additional information: the Solaris™ operating environment, the ChorusOS™ environment, and the Netra High Availabilty (HA) Suite.



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Please include the part number (816-2482-10) of your document in the subject line of your email.



PART I      Preparing for Service

---

Preparing for FRU Installation and Replacement	Chapter 1
Powering the Server Off and On	Chapter 2
Handling Cards and Assemblies	Chapter 3



# 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:

- Section 1.1, “Tools Required” on page 1-1
- Section 1.2, “Attaching the Antistatic Wrist Strap” on page 1-2
- Section 1.3, “Determining If You Have a Front-Access or Rear-Access Model” on page 1-3
- Section 1.5, “FRU Categories” on page 1-7
- Section 1.6, “Device Names” on page 1-8

---

## 1.1 Tools Required

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

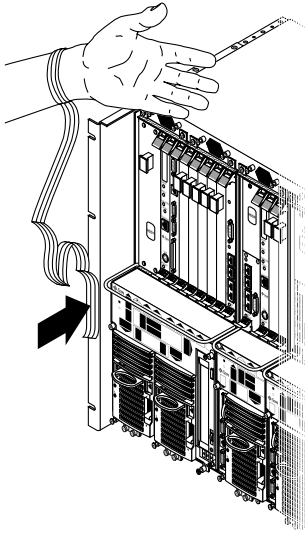
- No. 1 Phillips screwdriver
- No. 2 Phillips screwdriver

---

## 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.



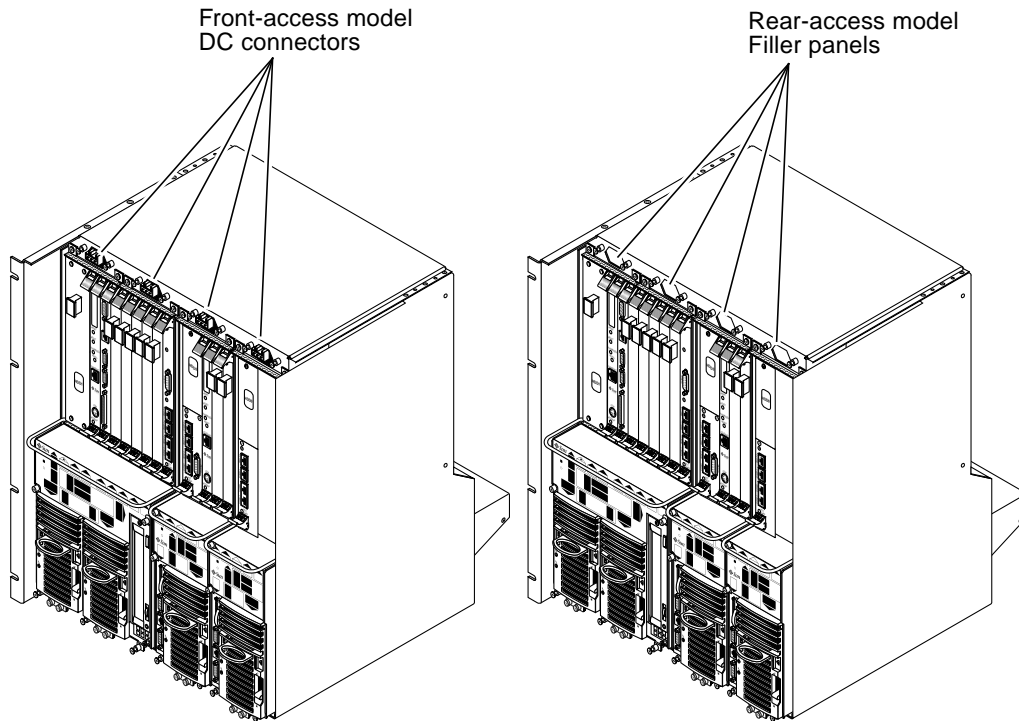
**FIGURE 1-1** Attaching the Antistatic Wrist Strap

---

## 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 or AC connectors are at the rear of the chassis for the rear-access model.



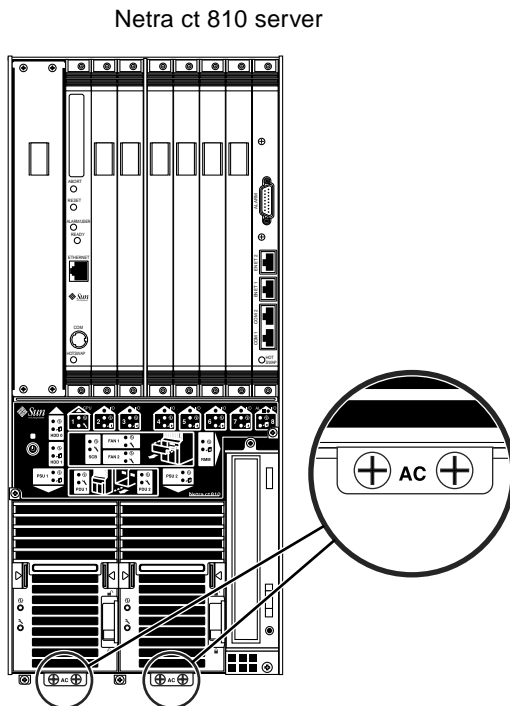
**FIGURE 1-2** Front-Access and Rear-Access Models

---

## 1.4 Determining If You Have AC- or DC-Powered Servers and Chassis

All of the Netra CT servers installed in a chassis must be either AC or DC; do not mix AC- and DC-powered servers in the same chassis. Even though there are no differences in most of the components in the AC- and DC-powered servers (such as fans, boards, and drives), the differences in the power supplies and the power connectors restrict you from mixing AC- and DC-powered servers in the same chassis.

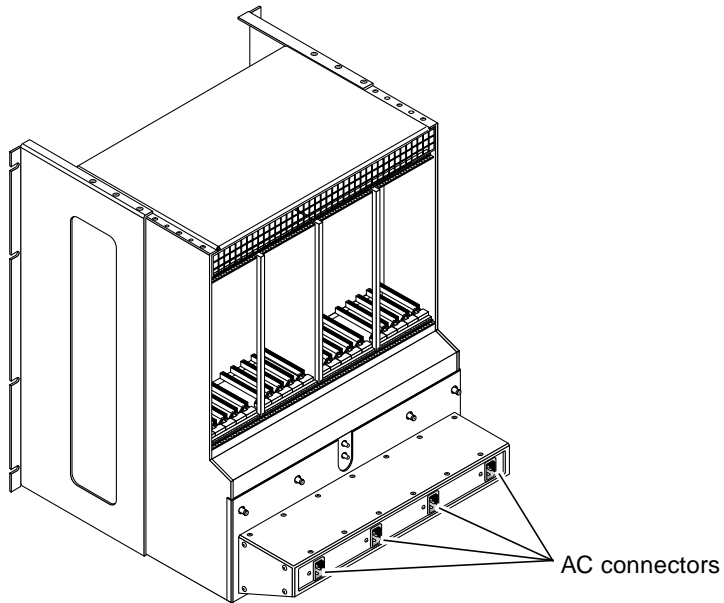
The label located between the two silver screws at the base of the each power supply unit tells you whether the servers in the chassis are all AC- or DC-powered (FIGURE 1-3).



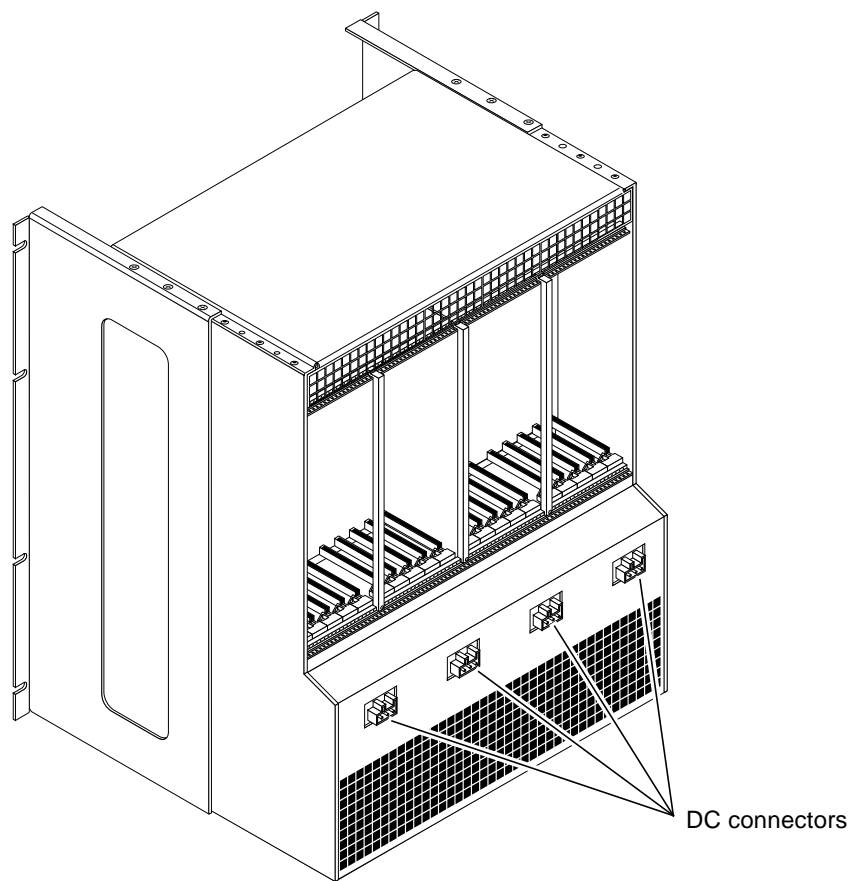
**FIGURE 1-3** Locating the Power Supply Units in the Netra CT Servers



You can also determine if a chassis is powered by AC or DC by looking at the connectors at the rear of the chassis. FIGURE 1-4 shows the connectors at the rear of an AC-powered chassis and FIGURE 1-5 shows the connectors at the rear of a DC-powered chassis.



**FIGURE 1-4** AC Connectors on a Netra CT Chassis



**FIGURE 1-5** DC Connectors on a Netra CT Chassis

---

## 1.5 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 810 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.

### 1.5.1 Hot-Swappable FRUs

The FRUs listed below are hot-swappable:

- I/O cards, both front-access and rear-access models
- Satellite CPU cards
- Alarm cards for both the Netra CT 810 server and the Netra CT 410 server<sup>1</sup>
- Alarm rear transition cards (rear-access model only)<sup>1</sup>
- Host CPU card<sup>2</sup>
- Host CPU front transition card (front-access model only)<sup>2</sup>
- Host CPU rear transition card (rear-access model only)<sup>2</sup>
- Either of the two hard disk drives in a Netra CT 810 server
- DVD or DAT drives occupying the removeable media module
- Fan trays
- System status panels
- System controller boards<sup>3</sup>
- Either of the two power supply units in a Netra CT 810 server

---

1. The alarm and alarm rear transition cards are hot-swappable only if the host CPU card and system controller board are also installed in the Netra CT server.

2. The host CPU card and the host CPU front and rear transition cards are hot-swappable only if the alarm card and system controller board are also installed in the Netra CT server.

- Power supply unit air filters
- Main air filters

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

## 1.5.2 Cold-Swappable FRUs

The FRUs listed below are cold-swappable:

- Single power supply in a Netra CT 410 server
- Single or lone remaining power supply in a Netra CT 810 server
- Single hard disk drive in a Netra CT 410 server
- Single or lone remaining hard disk drive in a Netra CT 810 server
- Power distribution units
- Powered-off or empty servers

The instructions for removing and replacing these cold-swappable FRUs are covered in Part IV, Section IV, “Replacing Cold-Swappable FRUs” on page -23.”

# 1.6 Device Names

## 1.6.1 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 810 server and TABLE 1-2 gives the device names for the I/O card slots in the Netra CT 410 server.

**TABLE 1-1** Device Names for I/O Card Slots in the Netra CT 810 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

3. The system controller board is hot-swappable only if the alarm card and host CPU card are also installed in the Netra CT server.

**TABLE 1-1** Device Names for I/O Card Slots in the Netra CT 810 Server *(Continued)*

Slot Number	Device Name
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 410 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

## 1.6.2 Device Names for Hard Disk Drives

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

- Netra CT 810 server:
  - HDD 0—c0t0d0
  - HDD 1—c1t1d0
- Netra CT 410 server:
  - HDD 0—c0t0d0



## Powering the Server Off and On

---

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

- Section 2.1, “Powering On the Server” on page 2-2
- Section 2.2, “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 full hot swap state for all I/O slots. If you want basic hot swap on an I/O slot, you must manually reset the I/O slot to basic 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 *Netra CT Server System Administration Guide* for more information.

---

## 2.1 Powering On the Server

---

**Note** – You must have the host CPU card, alarm card and system controller board installed in the Netra CT server before you can power it on; the server will not power on properly if all three of these components are not installed. Once the system is powered on and running, then you can hot-swap any of the three components as documented in this manual.

---


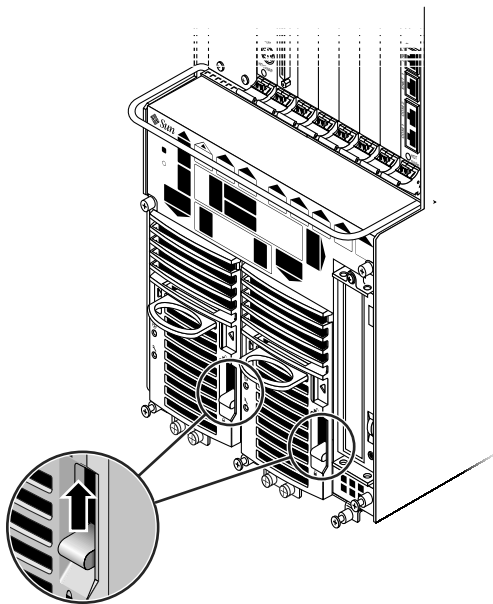
1. **Verify that the power supply locking mechanism(s) on the server you are about to power on are in the locked ( , or down, positions.**

FIGURE 2-1 shows the location of the power supply locking mechanisms on the Netra CT server. Make sure you lock *both* power supplies if you are powering on a Netra CT 810 server.



**FIGURE 2-1** Locating the Power Supply Locking Mechanism on the Netra CT 810 Server



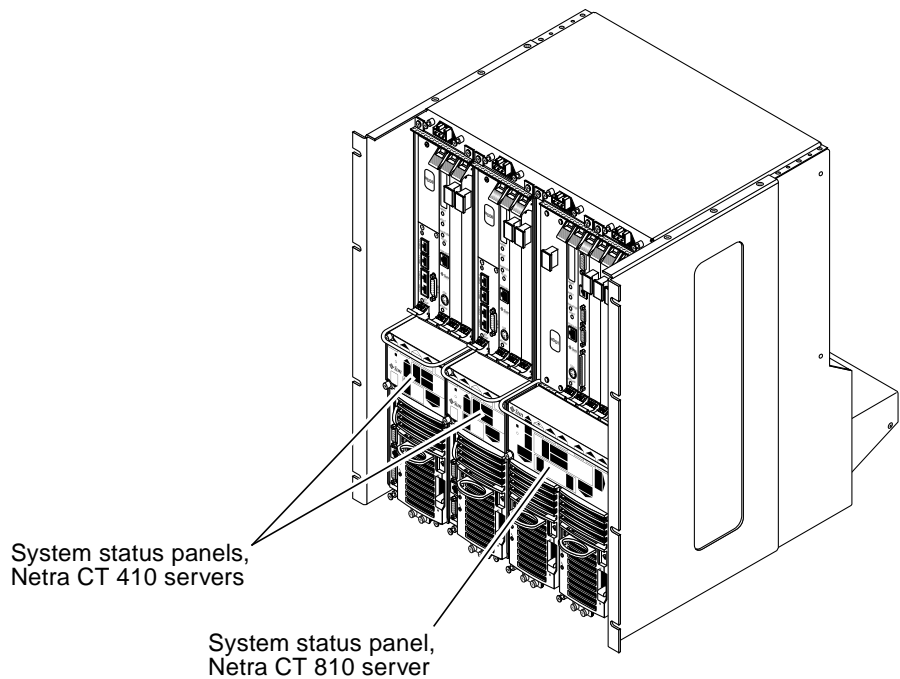
When the power supply locking mechanism is locked, the green LED on the power supplies flash, indicating that the power supplies are powered on, but the server has not been powered on yet. Also, the PDU LEDs on the system status panel should be in this state:

- Green LED (⏻) is ON
- Amber LED (⏻) is OFF

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

## 2. Locate the system status panel.

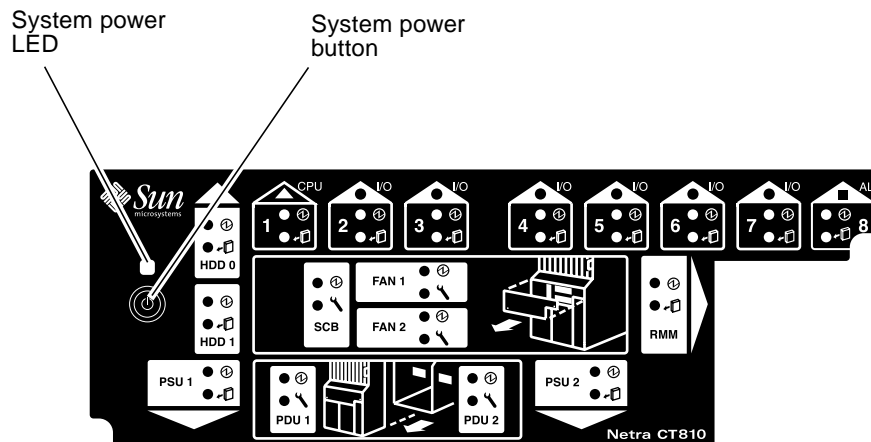
The location of the system status panel in the Netra CT 810 server and Netra CT 410 server is illustrated in FIGURE 2-2.



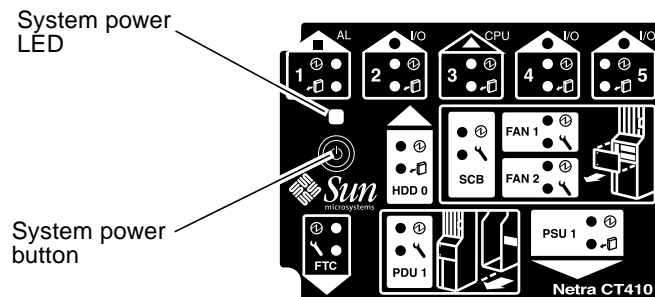
**FIGURE 2-2** System Status Panel Locations

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

FIGURE 2-3 shows the system power button location for the Netra CT 810 server, and FIGURE 2-4 shows the system power button location for the Netra CT 410 server.



**FIGURE 2-3** System Power Button and System Power LED Locations (Netra CT 810 Server)



**FIGURE 2-4** System Power Button and System Power LED Locations (Netra CT 410 Server)

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

FIGURE 2-3 shows the system power LED location for the Netra CT 810 server, and FIGURE 2-4 shows the system power LED location for the Netra CT 410 server.

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

## 6. Connect to the console and boot up the server.

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

### 2.1.1 Verifying Full Power-Up

The Netra CT server may take several minutes to completely power up and finish the configuration process, depending on the number of I/O cards you have installed in the system. Do not remove or install any cards or components in the Netra CT server until you have verified that the system is completely powered up.

To verify that the system has been completely powered up and is fully configured, as root, enter:

```
# prtpticl -c fru -v | more
```

You should see output similar to the following:

```
chassis (fru, 3d00000008)
:ChassisType    SUNW,NetraCT-810
:State          configured
:_class         fru
:name           chassis
...
```

- If the entry in the `State` field is `configured`, then the system is completely powered up and configured. You can safely remove and install boards and components at this point.
- If the entry in the `State` field is *not* `configured` (for example, `configuring` or `unconfigured`), then the system is still coming up. Do *not* remove or install any cards or components in the Netra CT server in this state. You must wait several more minutes until the state goes to `configured`.

---

## 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 Section 2.2.1, “To Perform a Hardware Power-Off” on page 2-6.
- For software power-down instructions, go to Section 2.2.2, “To Perform a Software Power Off” on page 2-7.

### 2.2.1 To Perform a Hardware Power-Off

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 810 server and Netra CT 410 server is illustrated in FIGURE 2-2.

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

FIGURE 2-3 shows the system power button location for the Netra CT 810 server, and FIGURE 2-4 shows the system power button location for the Netra CT 410 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.

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

FIGURE 2-3 shows the system power LED location for the Netra CT 810 server, and FIGURE 2-4 shows the system power LED location for the Netra CT 410 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 (FIGURE 2-1).

---

**Note** – You must unlock the locking mechanism on *both* power supply unit(s) on the Netra CT 810 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.

## 2.2.2 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. Connect to the console 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 2-2).**

The location of the system status panel in the Netra CT 810 server and Netra CT 410 server is illustrated in FIGURE 2-2.

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

FIGURE 2-3 shows the system power LED location for the Netra CT 810 server, and FIGURE 2-4 shows the system power LED location for the Netra CT 410 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 (FIGURE 2-1).**

---

**Note** – You must unlock the locking mechanism on *both* power supply unit(s) on the Netra CT 810 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

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

- Section 3.1, “Handling CompactPCI Cards” on page 3-1
- Section 3.2, “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.

---



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**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.

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PART II    Troubleshooting the System

---



# Troubleshooting the System

---

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

- Section 4.1, “Troubleshooting the System Using the System Status Panel” on page 4-2
- Section 4.2, “Troubleshooting the System Using prtdiag” on page 4-8
- Section 4.3, “Troubleshooting the System Using the SunVTS Test Suite” on page 4-12
- Section 4.4, “Troubleshooting the System Using the Power-On Self Test (POST)” on page 4-13
- Section 4.5, “Troubleshooting the System Using the Alarm Card Software” on page 4-14
- Section 4.6, “Troubleshooting a Power Supply Using the Power Supply Unit LEDs” on page 4-15
- Section 4.7, “Troubleshooting a CPU Card” on page 4-17

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

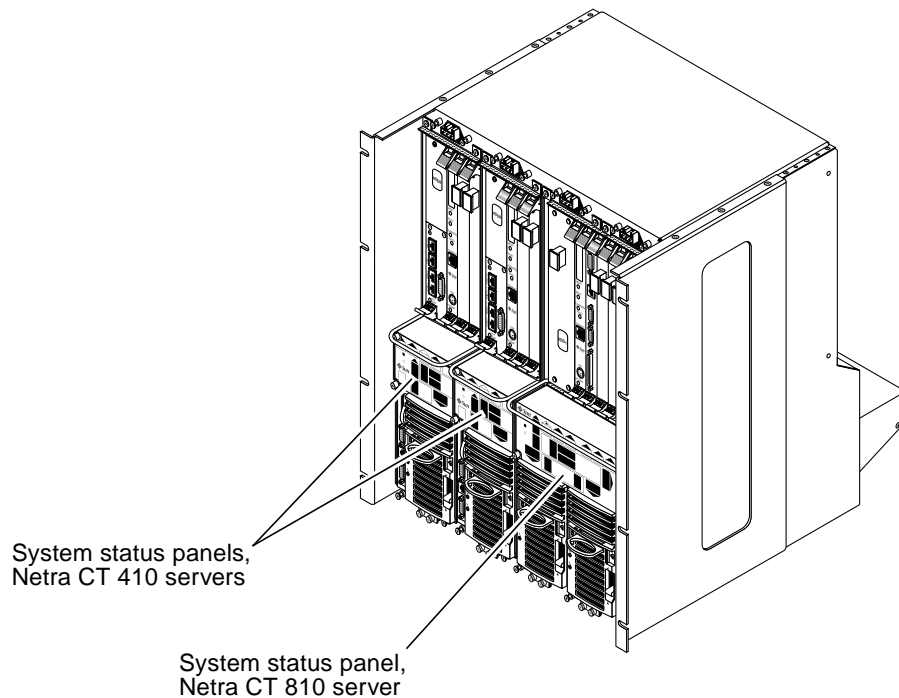
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## 4.1 Troubleshooting the System Using the System Status Panel

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 810 server, and FIGURE 4-3 shows the system status panel for the Netra CT 410 server.



**FIGURE 4-1** System Status Panel Locations

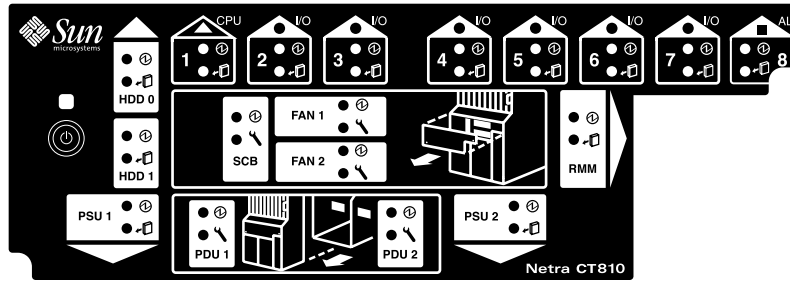


FIGURE 4-2 System Status Panel (Netra CT 810 Server)

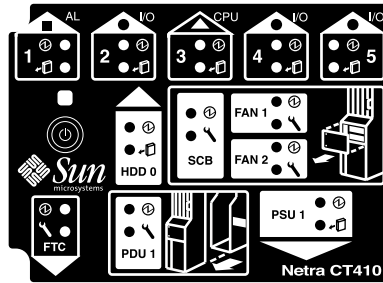


FIGURE 4-3 System Status Panel (Netra CT 410 Server)

## 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. Do not attempt to troubleshoot the system until after the LEDs have gone through their initial power-on testing.

Each major component in the Netra CT 810 server or Netra CT 410 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 810 server, and TABLE 4-2 describes which combination of LEDs is used for each component in the Netra CT 410 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 810 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 Okay to Remove	Host CPU card installed in slot 1
Slots 2 - 7	Power and Okay to Remove	I/O card or satellite CPU card (●) installed in slot 2 - 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 (DC only)	Power and Fault	Leftmost power distribution unit (behind the server)
PDU 2 (DC only)	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 410 Server

LED	LEDs Available	Component
Slot 1	Power and Okay to Remove	Alarm card(■) installed in slot 1
Slot 2	Power and Okay to Remove	I/O card or satellite CPU card (●) installed in slot 2
Slot 3	Power and Okay to Remove	Host CPU card installed in slot 3
Slot 4 and 5	Power and Okay to Remove	I/O cards or satellite CPU cards (●) installed in slot 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	Host CPU front transition card or host CPU front termination board
PDU 1 (DC only)	Power and Fault	Power distribution unit (behind the server)
PSU 1	Power and Okay to Remove	Power supply

- TABLE 4-3 gives the LED states and meanings for any *CompactPCI boards* installed in a slot in the Netra CT 810 server or Netra CT 410 server.
- TABLE 4-4 gives the LED states and meanings for any component other than a CompactPCI board that has the green Power and amber *Okay to Remove* LEDs.
- TABLE 4-5 gives the LED states and meanings for any component other than a CompactPCI board that has the green Power and amber *Fault* LEDs.



**Note** – Do not use the information in TABLE 4-4 to troubleshoot a power supply unit in a server that has only one power supply unit (a Netra CT 410 server or a Netra CT 810 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 Section 4.6, “Troubleshooting a Power Supply Using the Power Supply Unit LEDs” on page 4-15 for more information. The information given in TABLE 4-4 applies to all other components in the Netra CT 810 server or Netra CT 410 server, including the power supplies in a two power supply Netra CT 810 server.

**TABLE 4-3 CompactPCI Board LED States and Meanings**



Green Power LED state	Amber Okay to Remove LED state	Meaning	Action
Off	Off	The slot is empty or the system thinks that the slot is empty because the system didn't detect the card when it was inserted.	<p>If there is a card installed in this slot, then one of the following components is faulty:</p> <ul style="list-style-type: none"> <li>• the card installed in the slot</li> <li>• the alarm card</li> <li>• the system controller board</li> </ul> <p>Remove and replace the failed component to clear this state.</p>
Blinking	Off	The card is coming up or going down.	<i>Do not</i> remove the card in this state.
On	Off	The card is up and running.	<i>Do not</i> remove the card in this state.
Off	On	The card is powered off.	You can remove the card in this state.
Blinking	On	The card is powered on, but it is offline for some reason (for example, a fault was detected on the card).	<p>Wait several seconds to see if the green Power LED stops blinking. If it does not stop blinking after several seconds, enter <code>cfgadm</code> and verify that the card is in the <code>unconfigured</code> state, then perform the necessary action, depending on the card:</p> <ul style="list-style-type: none"> <li>• Alarm card—You can remove the alarm card in this state.</li> <li>• All other cards—Power off the slot through the alarm card software, then remove the card.</li> </ul>
On	On	The card is powered on and is in use, but a fault has been detected on the card.	<p>Deactivate the card using one of the following methods:</p> <ul style="list-style-type: none"> <li>• Use the <code>cfgadm -f -c unconfigure</code> command to deactivate the card. Note that in some cases, this may cause the system to panic, depending on the nature of the card hardware or software.</li> <li>• Halt the system and power off the slot through the alarm card software, then remove the card.</li> </ul> <p>The green Power LED will then give status information:</p> <ul style="list-style-type: none"> <li>• If the green Power LED goes off, then you can remove the card.</li> <li>• If the green Power LED remains on, then you must halt the system and power off the slot through the alarm card software.</li> </ul>



**TABLE 4-4** 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 <i>not</i> Okay to Remove. Do <i>not</i> remove the component while the system is running.

**TABLE 4-5** 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 prtdiag

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

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

If you have a Netra CT 810 server, you should get output on the console similar to the following:

CODE EXAMPLE 4-1 prtdiag Output for a Netra CT 810 Server

```
System Configuration: Sun Microsystems sun4u SPARCengine CP2000 model 140
(UltraSPARC-IIIi 648MHz)
Memory size: 512 Megabytes
platform is : SUNW,NetraCT-810
===== FRU Information =====
FRU      FRU      FRU      Green    Amber    Miscellaneous
Type     Unit#    Present  LED      LED      Information
-----
Midplane 1       Yes      on       off      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      on       off      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
```

**CODE EXAMPLE 4-1** prtdiag Output for a Netra CT 810 Server (Continued)

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 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:

**CODE EXAMPLE 4-1**    prtdiag Output for a Netra CT 810 Server *(Continued)*

					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 410 server, you should get output on the console similar to the following:

**CODE EXAMPLE 4-2** prtdiag Output for a Netra CT 410 Server

System Configuration: Sun Microsystems sun4u SPARCengine CP2000 model 140 (UltraSPARC-IIIi 648MHz)					
Memory size: 512 Megabytes					
platform is : SUNW,NetraCT-410					
===== FRU Information =====					
FRU Type	FRU Unit#	FRU Present	Green LED	Amber LED	Miscellaneous 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: 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					

### 4.3 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.

---

## 4.4 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 810 server and slot 3 in the Netra CT 410 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 Section 5.2.1, “Logging In to the Netra CT Server” on page 5-3.

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

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

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

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

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

---

## 4.5 Troubleshooting the System Using the Alarm Card Software

For information on troubleshooting using the alarm card software, refer to the *Netra CT Server System Administration Guide* (816-2483-xx).



---

## 4.6 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 410 server and two power supply units in the Netra CT 810 server, the actions to take are different.

### 4.6.1 Troubleshooting the Power Supply Unit in the Netra CT 410 Server

Following are the states of the LEDs on the power supply unit in the Netra CT 410 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 Section 10.5, “Power Supply Unit” on page 10-16 for those instructions.
- Off—One of the following conditions apply:
  - The power supply locking mechanism is in the upper, unlocked (⏏) position.
  - The accompanying cable is disconnected from the DC power distribution unit or the AC power entry unit.
  - The accompanying power distribution unit has failed.
  - The power supply unit has failed.

### 4.6.2 Troubleshooting the Power Supply Units in the Netra CT 810 Server

When both power supply units in a Netra CT 810 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; 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. 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 <i>soft-fault</i>	Replace one power supply unit at a time in order to keep the system up and running.
One power supply unit goes through a <i>soft-fault</i> and the other power supply unit goes through a <i>hard-fault</i>	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 <i>hard-fault</i>	The system is down and you should replace at least one of the power supply units to bring the system back up again.

---

## 4.7 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

### 4.7.1 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 slot 1 in the Netra CT 810 server and in slot 3 in the Netra CT 410 server.

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

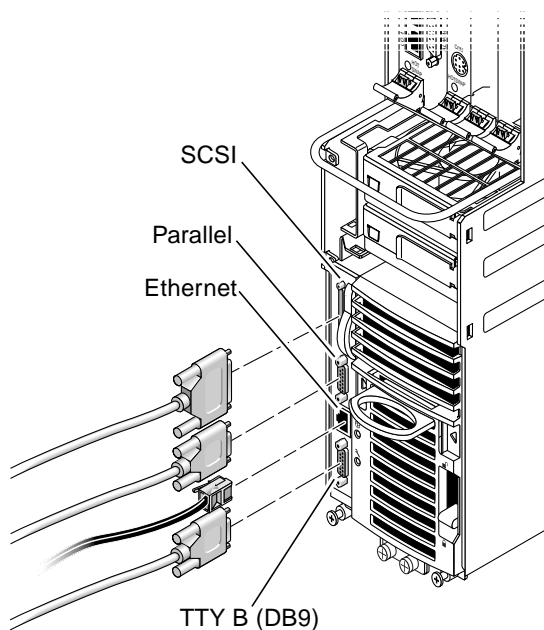
The following figures show the connectors on the different CPU transition cards:

- CPU front transition card, Netra CT 410 server—FIGURE 4-6
- CPU rear transition card, Netra CT 810 server—FIGURE 4-7
- CPU rear transition card, Netra CT 410 server—FIGURE 4-8

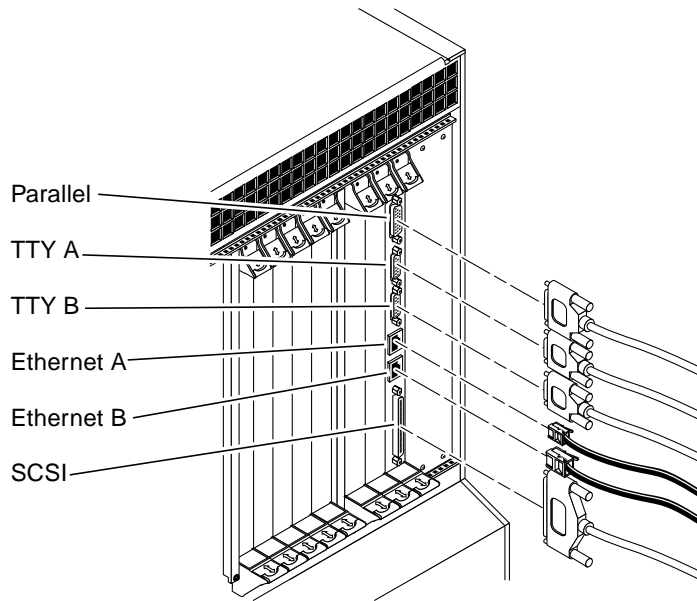
---

**Note** – The CPU rear transition card is the same for both the Netra CT 810 server and the Netra CT 410 server; only the location in the rear card cage differs.

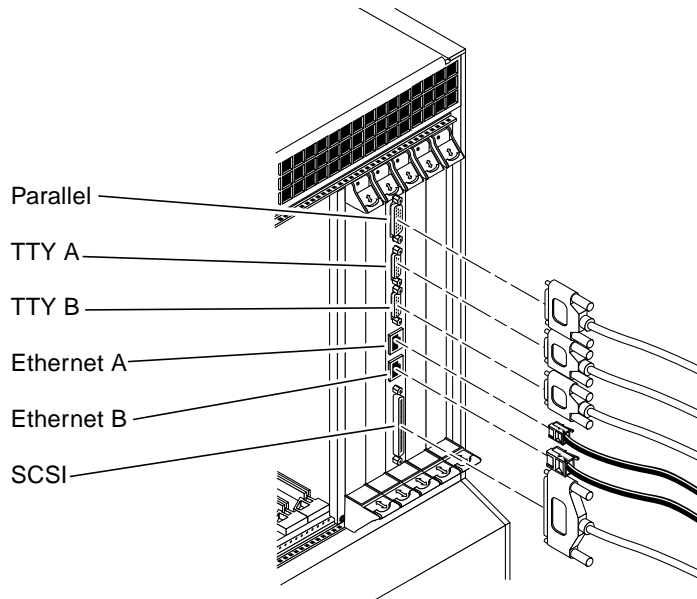
---



**FIGURE 4-6** Connectors on the CPU Front Transition Card (Netra CT 410 Server)



**FIGURE 4-7** Connectors on the CPU Rear Transition Card (Netra CT 810 Server)



**FIGURE 4-8** Connectors on the CPU Rear Transition Card (Netra CT 410 Server)

## 4.7.2 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

## 4.7.3 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.**

## 4.7.4 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.

---

## 4.7.5 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.

## 4.7.6 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.

---

### 4.7.7

## 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



### 4.7.7.1 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
```

### 4.7.7.2 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
```

### 4.7.7.3 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
```

#### 4.7.7.4 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 4-6 lists test *alias name* selections, a description of the selection, and preparation.

**TABLE 4-6** 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.
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).

## 4.7.8 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 OBDDiag menu prompt, enter a number from the menu (such as 17 to enable toggle script-debug messages).

#### CODE EXAMPLE 4-6 OBDDiag 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 obddiag, do not run any other OBP command that may change the hardware state of the board. After obddiag 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.

### 4.7.8.1 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) ==>
```

### 4.7.8.2 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) ==>
```

### 4.7.8.3 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) ==>
```

## 4.7.8.4 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) ==>
```

### 4.7.8.5 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) ==>
```

### 4.7.8.6 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) ==>
```



### 4.7.8.7 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) ==>
```

### 4.7.8.8 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

---

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Removing and Replacing Hot-Swappable Cards	Chapter 6
Removing and Replacing Hard Disk Drives and Removeable Media	Chapter 7
Removing and Replacing Hot-Swappable Subassemblies	Chapter 8



# Hot Swap Software Commands

---

---

## 5.1 Understanding Hot Swap

Certain FRUs in the Netra CT server are hot-swappable (see Section 1.5.1, “Hot-Swappable FRUs” on page 1-7). 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 Netra CT system has hot-swap modes shown in TABLE 5-1.

**TABLE 5-1** Netra CT System Hot-Swap Modes

Type of Hot Swap	Description
Basic	The hardware connection/disconnection process is performed automatically by the hardware, while the software connection process requires user assistance through the <code>cfgadm (1M)</code> command
Full	Both the hardware and the software connection process are performed automatically
High Availability	High availability hot swap provides the ability to control the hardware connection process. This provides a higher degree of control than just indicating insertion and extraction of a board. The hardware connection process is controlled by software on high availability systems, such as the Netra CT server

The Netra CT system is configured for full hot swap by default. You can change the mode of the slot for the CPU boards and I/O boards to basic or full hot swap using the `cfgadm(1M)` command. You might want to change the hot-swap state of a slot to basic, for example, if you need to insert or remove a third-party I/O board that does not have full hot-swap support.

Note that whenever you reboot or power your server on and off, the hot-swap states revert back to the default full hot-swap state for all I/O slots.

### 5.1.1 How High Availability Hot Swap Works

By default, the Netra CT server is configured to accept any cPCI FRU unless you specifically set an allowable plug-in for a specific slot (refer to the *Netra CT Server System Administration Guide* for more information.)

When a board is inserted into the Netra CT server, the alarm card checks the midplane FRU ID information for allowable FRUs for that slot, then checks the inserted board's FRU ID to make sure the board is allowed in the particular slot. If the board is allowed in the slot, the alarm card powers up the board. If the board is not allowed in the slot, the alarm card sends an SNMP trap to the MOH application.

If a host or satellite CPU board is in use, that is, has applications currently running, the alarm card CLI power commands, such as `poweron` or `poweroff`, will not work for that CPU board.

### 5.1.2 Hot Swap with Boards That Don't Support Full Hot Swap

You might want to change the hot-swap state of a slot from full to basic if you need to insert or remove a third-party I/O board that does not have full hot-swap support.

To determine the current hot-swap state of a slot, you use the `prtconf(1M)` command. To enable or disable a type of hot swap on a slot, you use the `cfgadm(1M)` command. For many `cfgadm` commands, you must know the attachment point ID for the I/O slot that you will be working on.

---

## 5.2 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

### 5.2.1 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.

### 5.2.2 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
```

For a Netra CT 810 server, you should get feedback similar to the following:

Ap_Id	Type	Receptacle	Occupant	Condition
AL-8	mcd/fhs	connected	configured	ok
CPU	bridge/fhs	connected	configured	ok
IO-2	stpcipci/fhs	connected	configured	ok
IO-3	unknown	empty	unconfigured	unknown
IO-4	stpcipci/fhs	connected	configured	ok
IO-5	unknown	disconnected	unconfigured	ok
IO-6	unknown	empty	unconfigured	unknown
IO-7	unknown	empty	unconfigured	unknown

For a Netra CT 410 server, you should get feedback similar to the following:

Ap_Id	Type	Receptacle	Occupant	Condition
AL-1	mcd/fhs	connected	configured	ok
CPU	bridge/fhs	connected	configured	ok
IO-2	unknown	disconnected	unconfigured	unknown
IO-4	stpcipci/fhs	connected	configured	ok
IO-5	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 2 in a Netra CT 810 server would be `IO-2`.

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.



## 5.2.3 Basic and Full Hot Swap `cfgadm` Commands

The Netra CT servers are set to full hot swap by default. 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.

- To determine the current hot swap state for all of the I/O slots in your Netra CT server, go to “Determining the Current Hot Swap State” on page 5-5.
- To change the default settings for one or more I/O slots in your Netra CT server to basic hot swap, go to “Enabling Basic Hot Swap on I/O Slots” on page 5-7.
- To change the settings for one or more I/O slots in your Netra CT server back to full hot swap, go to “Enabling Full Hot Swap on I/O Slots” on page 5-8.

### 5.2.3.1 Determining the Current Hot Swap State

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

```
# prtconf -v -P
```

For a Netra CT 810 server, the output is similar to the following:

```
cphsc, instance #0
  System properties:
    name='instance' type=int items=1
    value=00000000
    name='default-hotswap-mode' type=string items=1
    value='full'
  Driver properties:
    name='AL-8-autoconfig' type=string items=1 dev=none
    value='enabled'
    name='IO-7-autoconfig' type=string items=1 dev=none
    value='enabled'
    name='IO-6-autoconfig' type=string items=1 dev=none
    value='enabled'
    name='IO-5-autoconfig' type=string items=1 dev=none
    value='enabled'
    name='IO-4-autoconfig' type=string items=1 dev=none
    value='enabled'
    name='IO-3-autoconfig' type=string items=1 dev=none
    value='enabled'
    name='IO-2-autoconfig' type=string items=1 dev=none
    value='enabled'
    name='CPU-autoconfig' type=string items=1 dev=none
    value='enabled'
    name='hotswap-mode' type=string items=1 dev=none
    value='full'
```

- If you see value `'basic'` underneath the `default-hotswap-mode` line, 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 `default-hotswap-mode` line, 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.
  - If you see value `'disabled'` underneath a `<slot#-autoconfig>` line, then that slot is set to *basic* hot swap.

### 5.2.3.2 Enabling Basic Hot Swap on I/O Slots

All of the I/O slots in the Netra CT server are set to full hot swap by default. You can disable full hot swap on one or more I/O slots, bringing those slots to a basic hot swap state. That 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.

If you want to disable full hot swap on one or more I/O slots, bringing those slots to a basic hot swap state, as root, enter:

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

---

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

---

#### *Deactivating a Hot Swappable FRU*

To deactivate an I/O card in a basic hot swap state, 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 IO-4
```

#### *Reactivating a Hot Swappable FRU*

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

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

where *ap\_id* is the attachment-point ID.

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

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

where *ap\_id* is the attachment point ID.

### 5.2.3.3 Enabling Full Hot Swap on I/O Slots

If you changed the hot swap states for one or more I/O slots from the default full hot swap setting to the basic hot swap setting, you can change use the `cfgadm` utility to change the I/O slots back to the default full hot swap setting.

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 IO-4
```

You can also enable full hot swap on all slots at once by rebooting the server, which automatically reverts back to the default full hot swap setting for all I/O slots.

## Removing and Replacing Hot-Swappable Cards



**Caution** – If you are just powering on your Netra CT server, do *not* remove or install any cards in the system until you have verified that the system is completely powered up. Refer to Section 2.1.1, “Verifying Full Power-Up” on page 2-5 for more information.

---



**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** – Consult the *Netra CT Server Safety and Compliance Manual* and Chapter 3 of this document for safety and board-handling information prior before performing the procedures in this chapter.

---

There are three types of cards that are hot-swappable in the Netra CT server:

- Main cards—Following are the main cards that are available for the Netra CT servers:
  - Host CPU card<sup>1</sup>
  - Alarm card<sup>2</sup>
  - Satellite CPU cards
  - I/O cards

The procedures for removing and replacing these cards are given in Section 6.1, “Main Cards” on page 6-2.

- 
1. The host CPU card is hot-swappable only if the alarm card and system controller board are also installed in the Netra CT server.
  2. The alarm card is hot-swappable only if the host CPU card and system controller board are also installed in the Netra CT server.

- Front transition cards—Following are the cards that provide connections to standard I/O connectors on the front for front-access models:
  - Host CPU front transition card (Netra CT 410 server)

Note that the front transition cards are only hot-swappable as long as the accompanying host CPU card has been removed first.

The procedures for removing and replacing these cards are given in Section 6.2, “Front-Transition Card” on page 6-25.

- Rear transition cards—Following are the cards that extend the ports from the main cards to the rear for rear-access models:
  - Host CPU rear transition card
  - Alarm rear transition card
  - Satellite CPU rear transition cards
  - I/O rear transition cards

Note that the rear transition cards are only hot-swappable as long as the accompanying main card has been removed first.

The procedures for removing and replacing these cards are given in Section 6.3, “Rear-Transition Cards” on page 6-28.

---

## 6.1 Main Cards

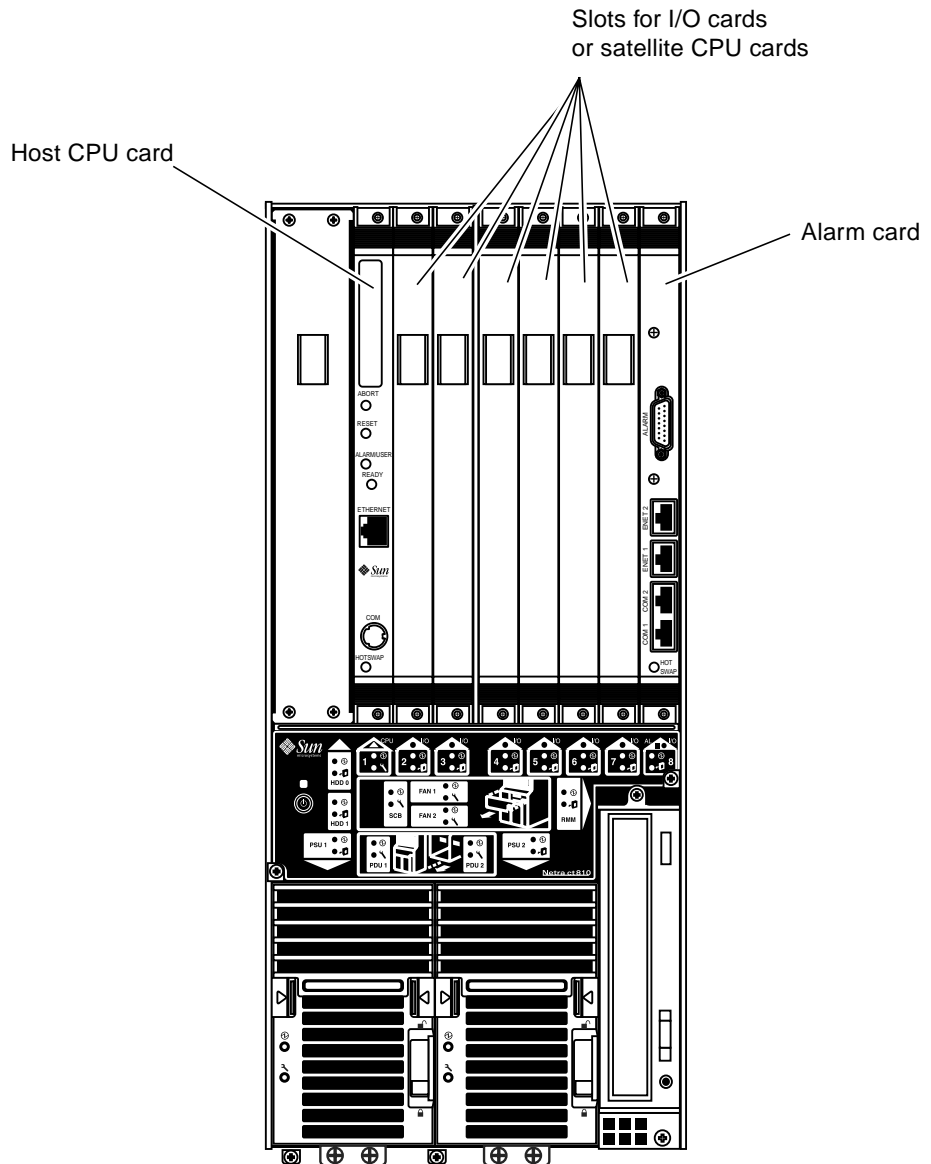
This section gives procedures for the installation, removal, and replacement of the following hot-swappable cards for the front-access models of the Netra CT 410 server and Netra CT 810 server:

- Host CPU card<sup>1</sup>
- Satellite CPU card
- Alarm card
- I/O card

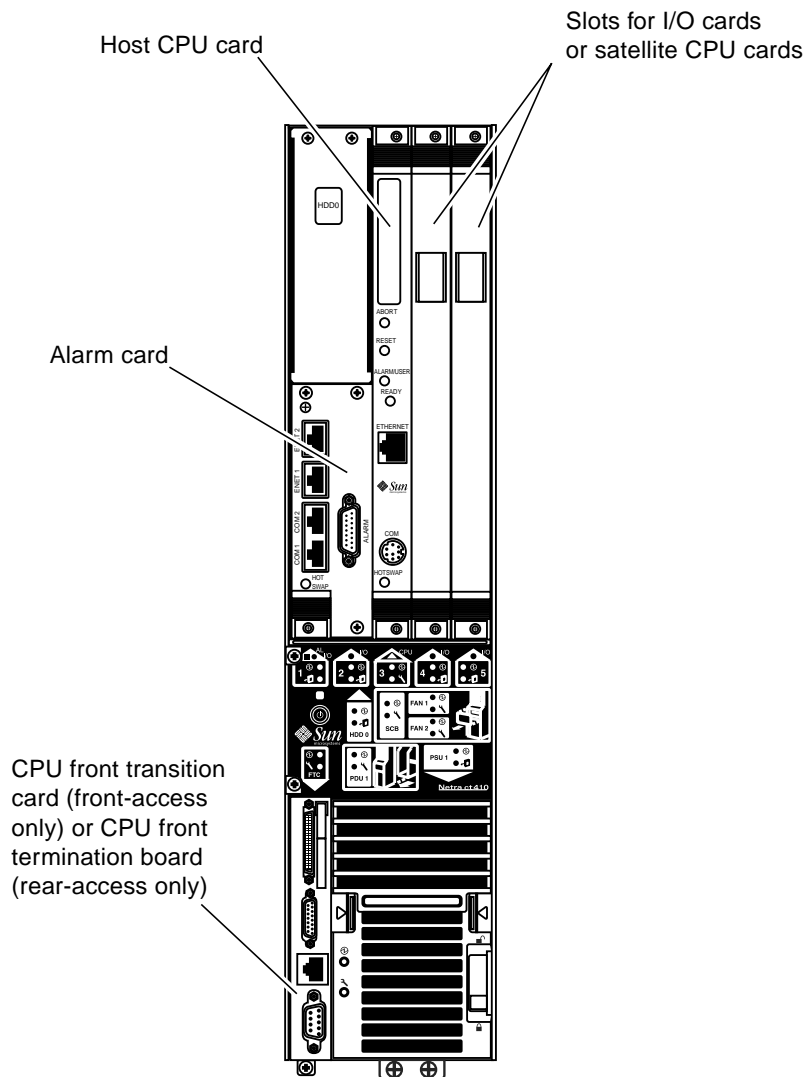
FIGURE 6-1 shows the locations of these cards in the Netra CT 810 server. FIGURE 6-2 shows the locations of these cards in the *diskfull* Netra CT 410 server, and FIGURE 6-3 shows the locations of these cards in the *diskless* Netra CT 410 server.

---

1. The host CPU card is only hot-swappable if the alarm card is also installed in the server.

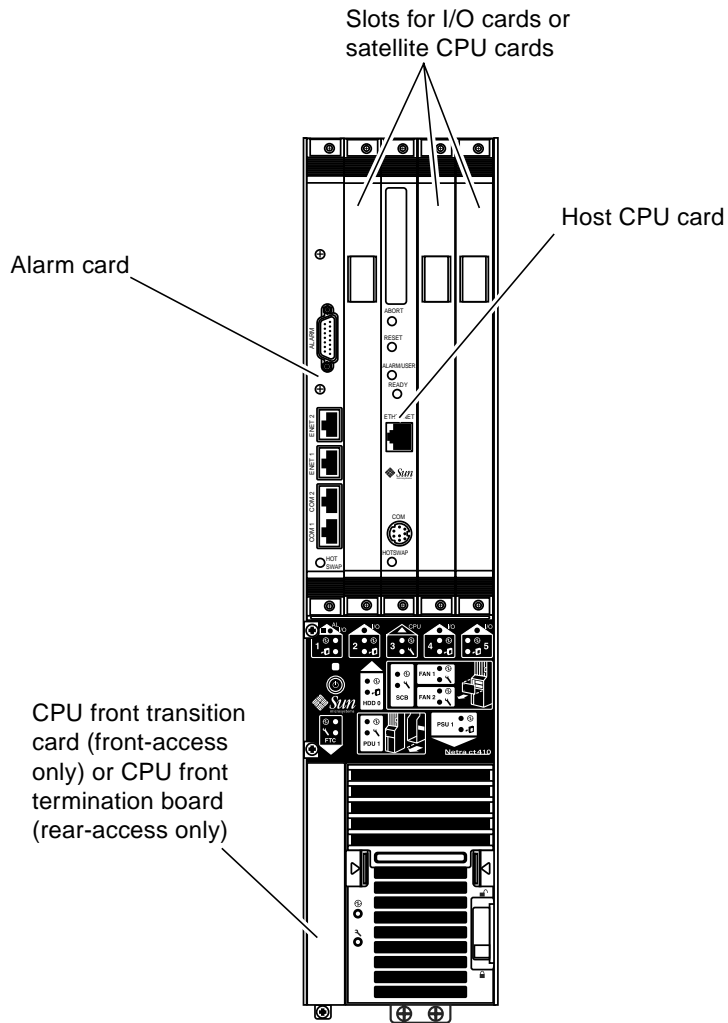


**FIGURE 6-1** Cards Within a Netra CT 810 Server



**FIGURE 6-2** Cards Within a Netra CT 410 Server, Diskfull Version





**FIGURE 6-3** Cards Within a Netra CT 410 Server, Diskless Version

## 6.1.1 Rules and Restrictions for Hot-Swapping Main Cards

Before removing and replacing any of the main cards in your server, you must first understand all rules and restrictions involved. The following sections describe the rules and restrictions for the main cards:

- Section 6.1.1.1, “General Rules and Restrictions for Hot-Swapping Cards” on page 6-6
- Section 6.1.1.2, “Rules and Restrictions for Hot-Swapping the Host CPU Card” on page 6-7
- Section 6.1.1.3, “Rules and Restrictions for Hot-Swapping the Alarm Card” on page 6-8

### 6.1.1.1 General Rules and Restrictions for Hot-Swapping Cards

Following are the rules and restrictions you must understand before hot-swapping any card in the Netra CT server:

1. You must have the host CPU card, alarm card and system controller board installed in the Netra CT server before you can hot-swap any I/O card or satellite CPU card.
2. You may not be able to perform a *full* hot-swap on any card if the card is in a failed condition; you must perform a *basic* hot-swap in this case. To determine if a card has failed, verify that these LEDs are in following states:
  - Amber Okay to Remove LED on the system status panel is *on*
  - Green Power LED on the system status panel is *on*

If the card has failed, you must manually unconfigure the card before you can hot-swap it by entering the following commands:

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

where *ap\_id* is the attachment-point ID listed in the first column.

If the LED states continue to show a failed condition for the card, then you must halt the system.

3. You can only remove a card if *all* of these LEDs are in the following states:

- Amber Okay to Remove LED on the system status panel is *on*
- Green Power LED on the system status panel is *off*
- Blue Hot Swap LED on the board is *on*

Do not remove any card from the system if any of the LEDs is not in the proper state.

### 6.1.1.2 Rules and Restrictions for Hot-Swapping the Host CPU Card

Following are the rules and restrictions you must understand before hot-swapping a host CPU card:

1. You must have the alarm card and system controller board installed in the Netra CT server before you can hot-swap the host CPU card.
2. When you remove a host CPU card from a server while the server is running, it will disable the CompactPCI bus, which means that the connection with all I/O cards installed in the server will be lost. Once the CompactPCI bus is disabled, MCNet will also become disabled in the system.

After you install the host CPU card back into the server, it will enable the CompactPCI bus and will attempt to connect to all occupied card slots.

Satellite CPU cards are unaffected by the disabling of the CompactPCI bus; they will continue to function as stand-alone processors when you hot-swap a host CPU card.

3. If the host CPU is at the OpenBoot prompt (the `ok` prompt) and you want to hot-swap the host CPU card, you must power off the the host CPU slot through the alarm card.

To power off the host CPU slot in a Netra CT server, access the alarm card and, through the alarm card command line interface, enter:

```
cli> poweroff host
```

Refer to the *Netra CT Server System Administration Manual* for more information on accessing the alarm card.

Use the `poweron` command to power on the host CPU card once you've installed the replacement host CPU card.

### 6.1.1.3 Rules and Restrictions for Hot-Swapping the Alarm Card

Following are the rules and restrictions you must understand before hot-swapping an alarm card:

1. You must have the host CPU card and the system controller board installed in the Netra CT server before you can hot-swap the alarm card.
2. You cannot hot-swap any other component in a Netra CT server while the alarm card is being hot-swapped.
3. You cannot install any new component into a Netra CT server while the alarm card is being hot-swapped.

## 6.1.2 Removing and Replacing Main Cards

The individual slots in your server will be set to *full* hot swap by default. You can also change the slots to *basic* hot swap manually. Refer to Chapter 5 for more information.

- If you are removing and replacing a card in the server, first to go Section 6.1.2.1, “Removing a Main Card” on page 6-8, then go to Section 6.1.2.2, “Inserting a Main Card” on page 6-15.
- If you are installing a card in the server, go to Section 6.1.2.2, “Inserting a Main Card” on page 6-15.

### 6.1.2.1 Removing a Main Card

---

**Note** – Do not proceed with these instructions until you have reviewed the information in Section 6.1.1, “Rules and Restrictions for Hot-Swapping Main Cards” on page 6-6. Failure to do so may result in an inadvertant system reboot or incorrect configuration information.

---

#### 1. Locate the card that you want to remove from the server.

FIGURE 6-1 shows the locations of these cards in the Netra CT 810 server. FIGURE 6-2 shows the locations of these cards in the *diskfull* Netra CT 410 server, and FIGURE 6-3 shows the locations of these cards in the *diskless* Netra CT 410 server.

#### 2. Log into the Netra CT server.

Refer to Section 5.2.1, “Logging In to the Netra CT Server” on page 5-3, then return to this procedure.

#### 3. Perform any necessary card-specific software commands.

- If you are removing an alarm card from the server, you should make a record of the settings that you have for the current alarm card so that you can use them on the replacement alarm card. Refer to the *Netra CT Server System Administration Manual* for instructions on displaying the settings that you have on the current alarm card. Make a record of those settings.
- For any other card, there may be certain card-specific software commands that you might have to perform before removing that hot-swappable card. Refer to the documentation that you received with the card for any card-specific procedures before proceeding with this procedure.

#### 4. Determine the hot swap state for the slot that holds the card you are about to remove.

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

```
# prtconf -v -P
```

The output is similar to the following (note that the following output is for a Netra CT 810 server; the output is similar for the Netra CT 410 server):

```
cphsc, instance #0
  System properties:
    name='instance' type=int items=1
    value=00000000
    name='default-hotswap-mode' type=string items=1
    value='full'
  Driver properties:
    name='AL-8-autoconfig' type=string items=1 dev=none
    value='enabled'
    name='IO-7-autoconfig' type=string items=1 dev=none
    value='enabled'
    name='IO-6-autoconfig' type=string items=1 dev=none
    value='enabled'
    name='IO-5-autoconfig' type=string items=1 dev=none
    value='enabled'
    name='IO-4-autoconfig' type=string items=1 dev=none
    value='enabled'
    name='IO-3-autoconfig' type=string items=1 dev=none
    value='enabled'
    name='IO-2-autoconfig' type=string items=1 dev=none
    value='enabled'
    name='CPU-autoconfig' type=string items=1 dev=none
    value='enabled'
    name='hotswap-mode' type=string items=1 dev=none
    value='full'
```

- If you see value 'basic' underneath the default-hotswap-mode line, then *all* of the slots in the Netra CT server have been set to *basic* hot swap. You should see value 'disabled' for every slot in the system in this situation. Go to Step 5 on page 6-10 to manually disconnect the card before removing it.
- If you see value 'full' underneath the default-hotswap-mode line, then *at least one* of the slots in the Netra CT server has been set to *full* hot swap. You must look at the entries for individual 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. Go to Step 7 on page 6-11 to remove the card.
  - If you see value 'disabled' underneath a <slot#-autoconfig> line, then that slot is set to *basic* hot swap. Go to Step 5 on page 6-10 to manually disconnect the card before removing it.

**5. Identify the attachment-point ID that corresponds to the slot where you will be removing the card.**

As root, enter:

```
# cfgadm
```

For a Netra CT 810 server, you should get feedback similar to the following:

Ap_Id	Type	Receptacle	Occupant	Condition
AL-8	mcd/fhs	connected	configured	ok
CPU	bridge/fhs	connected	configured	ok
IO-2	stpcipci/fhs	connected	configured	ok
IO-3	unknown	empty	unconfigured	unknown
IO-4	stpcipci/fhs	connected	configured	ok
IO-5	unknown	empty	unconfigured	unknown
IO-6	unknown	empty	unconfigured	unknown
IO-7	unknown	empty	unconfigured	unknown

For a Netra CT 410 server, you should get feedback similar to the following:

Ap_Id	Type	Receptacle	Occupant	Condition
AL-1	mcd/fhs	connected	configured	ok
CPU	bridge/fhs	connected	configured	ok
IO-2	unknown	empty	unconfigured	unknown
IO-4	stpcipci/fhs	connected	configured	ok
IO-5	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 slot 4 in a Netra CT 810 server would be IO-4.

**6. Disconnect the card with the `cfgadm (1m)` utility:**

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

where *ap\_id* is the attachment-point ID. For example, to deactivate the card in slot 4, as root, enter:

```
# cfgadm -c unconfigure IO-4
# cfgadm -c disconnect IO-4
```

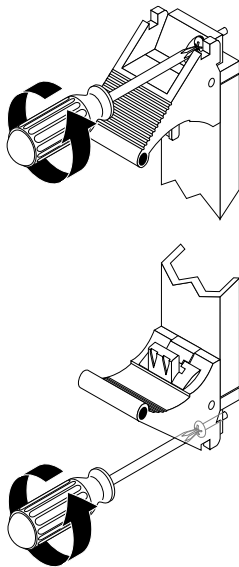
**7. If you are hot-swapping an alarm card, reset the alarm card before removing it.**

Refer to the *Netra CT Server System Administration Manual* for more information.

**8. Attach the antistatic wrist strap.**

Refer to Section 1.2, “Attaching the Antistatic Wrist Strap” on page 1-2.

**9. 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 6-4).**



**FIGURE 6-4** Loosening the Ejection Lever Captive Screws

## 10. Unlock the ejection levers.

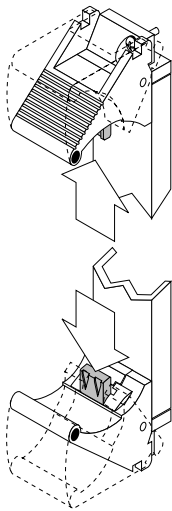


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**Caution** – Only unlock the ejection levers at this point; do *not* unseat the card until the LEDs on the system status panel are in the proper state.

---

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 6-5). Refer to the documentation that came with the card for instructions on unlocking the card.

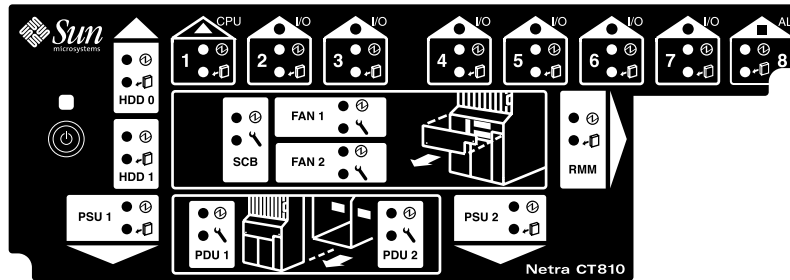


**FIGURE 6-5** Unlocking the Ejection Levers

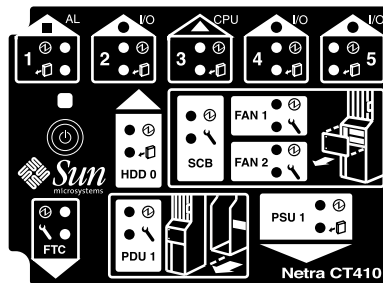


**11. Locate the LEDs on the system status panel for the card that you want to remove.**

The system status panel on each server has LEDs that show the status of the card installed in each set of the slots in that particular server. FIGURE 6-6 shows the LEDs on the Netra CT 810 server and FIGURE 6-7 shows the LEDs on the Netra CT 410 server.



**FIGURE 6-6** LEDs on the System Status Panel (Netra CT 810 Server)



**FIGURE 6-7** LEDs on the System Status Panel (Netra CT 410 Server)

**12. Determine if you can remove the card safely at this time.**

You can remove the card only if *all* of these LEDs are in the following states:

- Amber Okay to Remove LED on the system status panel is *on*
- Green Power LED on the system status panel is *off*
- Blue Hot Swap LED on the board is *on*

For more information on all the states and meanings of the system status panel LEDs, refer to “Troubleshooting the System Using the System Status Panel” on page 4-2.



**Caution** – Do *not* remove a card unless all of the LEDs are in the proper states. If you remove a card when any of the LEDs are not in the proper state, it may lead to unpredictable results. It may take several seconds or minutes for the LEDs to transition to the proper states.



---

**Caution** – Do not attempt to hot-swap any other cards until you see that the first card has been fully deactivated. Hot-swapping more than one card at the same time may lead to unpredictable results. In some situations, it could several minutes for the card to completely deactivate.

---

---

**Note** – If the server is set to the default full hot-swap mode, unlocking the ejection levers automatically starts the `cfgadm unconfigure` operation. If you decide that you do *not* want to remove the card, you must wait until the LEDs are in the correct state (as shown in Step 12), completely unseat the card, reseal it, then lock the ejection levers again in order to start the `cfgadm configure` operation. Simply locking the ejection levers after unlocking them will not start the driver attachment process.

---

13. **When it is safe to remove the card, disconnect any cables connected to the card.**
14. **Press outward on the two ejection levers on the card to unseat the card from the card cage.**
15. **Carefully slide the card out of the slot and place it on the electrostatic discharge mat.**

If you are hot-swapping an alarm card, you may notice one thing that is unique to the alarm card. If you enter the `cfgadm` command after you have removed the alarm card, you will see `disconnected` under the Receptacle column. For all other cards, after you have removed the card, you should see `empty` under the Receptacle column.

16. **Perform any additional card-specific hardware procedures, if necessary.**

For example, you may want to remove the PMC(s) from a faulty satellite CPU or I/O card and install it on the replacement card later on. Refer to the documentation that you received with your card for more information.

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

If you are not going to replace the 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.

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

- If you are removing a card from a *front-access* model of the Netra CT server, you do not have to remove any additional hardware (unless you are removing the host CPU front transition card from the Netra CT 410 server; in that case, go to Section 6.2, “Front-Transition Card” on page 6-25).
- If you are removing a card from a *rear-access* model of the Netra CT server, you must also remove the rear transition card. Go to Section 6.3.3.1, “Removing an Alarm Rear Transition Card” on page 6-38.

### 6.1.2.2

## Inserting a Main Card



---

**Caution** – When inserting a number of cards to different slots in the system, insert the cards one at a time and wait until each card is fully configured in the system. If you insert 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 Section 1.2, “Attaching the Antistatic Wrist Strap” on page 1-2.

**2. Locate the card slot where you will be installing the card.**

FIGURE 6-1 shows the locations of these cards in the Netra CT 810 server. FIGURE 6-2 shows the locations of these cards in the *diskfull* Netra CT 410 server, and FIGURE 6-3 shows the locations of these cards in the *diskless* Netra CT 410 server.

**3. Determine if you are installing a card in the *front-access* model or the *rear-access* model of the Netra CT server.**

- If you are installing a card in the *front-access* model of the Netra CT server, go to Step 4.
- If you are installing a card in the *rear-access* model of the Netra CT server, install the rear transition card first using the instructions in Section 6.3.3.2, “Installing an Alarm Rear Transition Card” on page 6-40. Once you’ve completed those instructions, return here.

**4. 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 a card for an extended period of time.

**5. Get the replacement card from the ship kit.**

6. If you are installing a new *alarm* card, remove the blue protective film from the front of the alarm card, if necessary.



---

**Caution** – You must remove the blue protective film from the front of card before installing it into the server. Failure to do so may keep the metal springfingers on the side of the alarm card from making contact with the metal panels on the server.

---

7. **Perform any card-specific hardware procedures, if necessary.**

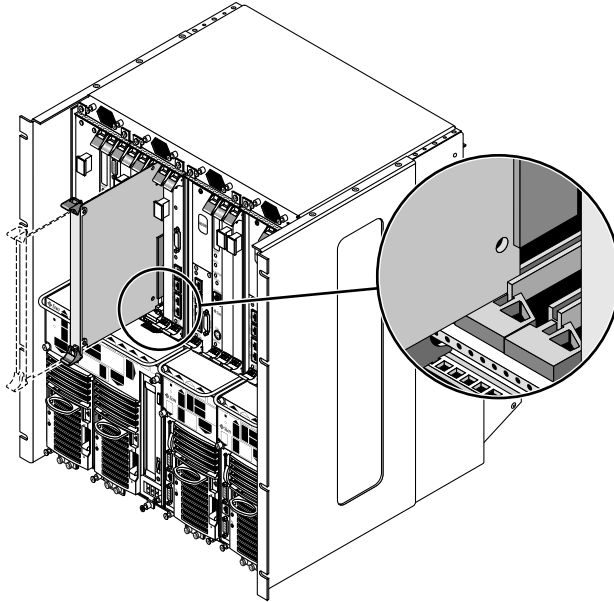
For example, if you removed a PMC from a satellite CPU or I/O card, then you will want to install the PMC into the replacement satellite CPU or I/O card at this time. Refer to the documentation that you received with your satellite CPU or I/O card for more information.

8. **Verify that the ejection levers on the card are unlocked.**

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

9. **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 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.



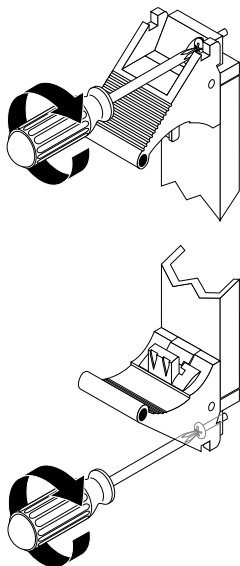
**FIGURE 6-8** Aligning the Card with the Card Cage Cutouts

**10. 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 card for instructions on locking the ejection levers.

**11. 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.**

Tighten the screws to a torque of 0.28 N.m (2.5 in.-lb).



**FIGURE 6-9** Tightening the Ejection Lever Captive Screws

---

**Note** – If you are hot-swapping an alarm card, it may take several minutes before the amber Okay to Remove LED goes off and the alarm card prompt comes up. Do not proceed with these instructions until the alarm card prompt comes up.

---

**12. Log into the Netra CT server.**

Refer to Section 5.2.1, “Logging In to the Netra CT Server” on page 5-3, then return to this procedure.

**13. Determine the hot swap state for the slot that holds the card you just installed.**

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

```
# prtconf -v -P
```

The output is similar to the following (note that the following output is for a Netra CT 810 server; the output is similar for the Netra CT 410 server):

```
cphsc, instance #0
  System properties:
    name='instance' type=int items=1
    value=00000000
    name='default-hotswap-mode' type=string items=1
    value='full'
  Driver properties:
    name='AL-8-autoconfig' type=string items=1 dev=none
    value='enabled'
    name='IO-7-autoconfig' type=string items=1 dev=none
    value='enabled'
    name='IO-6-autoconfig' type=string items=1 dev=none
    value='enabled'
    name='IO-5-autoconfig' type=string items=1 dev=none
    value='enabled'
    name='IO-4-autoconfig' type=string items=1 dev=none
    value='enabled'
    name='IO-3-autoconfig' type=string items=1 dev=none
    value='enabled'
    name='IO-2-autoconfig' type=string items=1 dev=none
    value='enabled'
    name='CPU-autoconfig' type=string items=1 dev=none
    value='enabled'
    name='hotswap-mode' type=string items=1 dev=none
    value='full'
```

- If you see value `'basic'` underneath the `default-hotswap-mode` line, then *all* of the slots in the Netra CT server have been set to *basic* hot swap. You should see value `'disabled'` for every slot in the system in this situation. Go to Step 14 on page 6-19 to manually connect the card.
- If you see value `'full'` underneath the `default-hotswap-mode` line, then *at least one* of the slots in the Netra CT server has been set to *full* hot swap. You must look at the entries for individual 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. Go to Step 17 on page 6-20 to verify that the card has been activated.
  - If you see value `'disabled'` underneath a `<slot#-autoconfig>` line, then that slot is set to *basic* hot swap. Go to Step 14 on page 6-19 to manually connect the card.

**14. Identify the attachment-point ID that corresponds to the slot where you inserted the card.**

As root, enter:

```
# cfgadm
```

For a Netra CT 810 server, you should get feedback similar to the following:

Ap_Id	Type	Receptacle	Occupant	Condition
AL-8	mcd/fhs	connected	configured	ok
CPU	bridge/fhs	connected	configured	ok
IO-2	stpcipci/fhs	connected	configured	ok
IO-3	unknown	empty	unconfigured	unknown
IO-4	unknown	disconnected	unconfigured	unknown
IO-5	unknown	empty	unconfigured	unknown
IO-6	unknown	empty	unconfigured	unknown
IO-7	unknown	empty	unconfigured	unknown

For a Netra CT 410 server, you should get feedback similar to the following:

Ap_Id	Type	Receptacle	Occupant	Condition
AL-1	mcd/fhs	connected	configured	ok
CPU	bridge/fhs	connected	configured	ok
IO-2	unknown	disconnected	unconfigured	unknown
IO-4	unknown	disconnected	unconfigured	unknown
IO-5	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 slot 4 in a Netra CT 810 server would be IO-4. Note that the information for the card installed in slot 4 in the example feedback shows it as unknown (Type), disconnected (Receptacle), unconfigured (Occupant), and unknown (Condition). This confirms that the slot has been set to basic hot swap and that the card in the slot has not yet been activated.

**15. Connect the 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 card in slot 4, as root, enter:

```
# cfgadm -c connect IO-4
```

**16. Activate the card with the `cfgadm (lm)` utility:**

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

where *ap\_id* is the attachment-point ID. For example, to activate the card in slot 4, as root, enter:

```
# cfgadm -c configure IO-4
```

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

Ap_Id	Type	Receptacle	Occupant	Condition
AL-8	mcd/fhs	connected	configured	ok
CPU	bridge/fhs	connected	configured	ok
IO-2	stpcipci/fhs	connected	configured	ok
IO-3	unknown	empty	unconfigured	unknown
IO-4	stpcipci/fhs	connected	configured	ok
IO-5	unknown	empty	unconfigured	unknown
IO-6	unknown	empty	unconfigured	unknown
IO-7	unknown	empty	unconfigured	unknown

**17. Locate the LEDs on the system status panel for the card that you just inserted.**

FIGURE 6-6 shows the LEDs on the Netra CT 810 server and FIGURE 6-7 shows the LEDs on the Netra CT 410 server.

**18. Determine if the card has been activated.**

Refer to TABLE 6-1 to determine if the card has been activated.



TABLE 6-1 CompactPCI Board Slot LED States and Meanings

Green Power LED state	Amber Okay to Remove LED state	Meaning	Action
Off	Off	The slot is empty or the system thinks that the slot is empty because the system didn't detect the card when it was inserted.	<p>If there is a card installed in this slot, then one of the following components is faulty:</p> <ul style="list-style-type: none"> <li>the card installed in the slot</li> <li>the alarm card</li> <li>the system controller board</li> </ul> <p>Remove and replace the failed component to clear this state.</p>
Blinking	Off	The card is coming up.	Wait several seconds for the card to completely come up. <i>Do not</i> remove the card in this state.
On	Off	The card is up and running.	No action necessary. <i>Do not</i> remove the card in this state.
Off	On	The card is powered off.	It is okay to remove the card in this state.
Blinking	On	The card is powered on, but it is offline for some reason (for example, a fault was detected on the card).	<p>Wait several seconds to see if the green Power LED stops blinking. If it does not stop blinking after several seconds, enter <code>cfgadm</code> and verify that the card is in the unconfigured and disconnected state, then perform the necessary action, depending on the card:</p> <ul style="list-style-type: none"> <li>Alarm card—It is okay to remove the alarm card in this state.</li> <li>All other cards—Power off the slot through the alarm card software, then it is okay to remove the card.</li> </ul>
On	On	The card is powered on and is in use, but a fault has been detected on the card.	<p>Deactivate the card using one of the following methods:</p> <ul style="list-style-type: none"> <li>Use the <code>cfgadm -f -c unconfigure</code> command to deactivate the card. Note that in some cases, this may cause the system to panic, depending on the nature of the card hardware or software.</li> <li>Halt the system and power off the slot through the alarm card software.</li> </ul> <p>The green Power LED will then give status information:</p> <ul style="list-style-type: none"> <li>If the green Power LED goes off, then it is okay to remove the card.</li> <li>If the green Power LED remains on, then you must halt the system and power off the slot through the alarm card software.</li> </ul>

**19. If the card has come up successfully, perform any card-specific software configuration procedures, if necessary.**

- For the alarm card, access the alarm card and perform any appropriate software procedures, if necessary, such as updating the alarm card flash. Refer to the *Netra CT Server System Administration Manual* for more information.
- For any other card, there may be certain card-specific software commands that you might have to perform after installing a card. Refer to the documentation that you received with the card for any card-specific procedures.

**20. Connect the cables to the card.**

Tighten the screws on the cable to a torque of 0.23 N.m (2 in.-lb).

The following figures show the connectors for the cards available for the Netra CT servers:

- Single-wide 6U alarm card<sup>1</sup>—FIGURE 6-10
- Double-wide 3U alarm card—FIGURE 6-11
- Host CPU card<sup>2</sup>—FIGURE 6-12

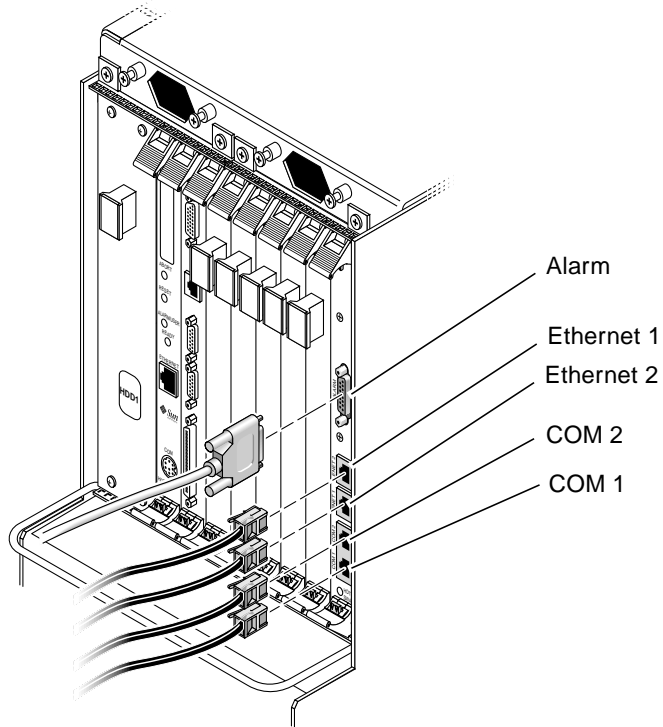
For the connectors on the satellite CPU and I/O cards, refer to the documentation that you received with those cards.

Refer to Appendix A for connector pinouts for each card, if necessary.

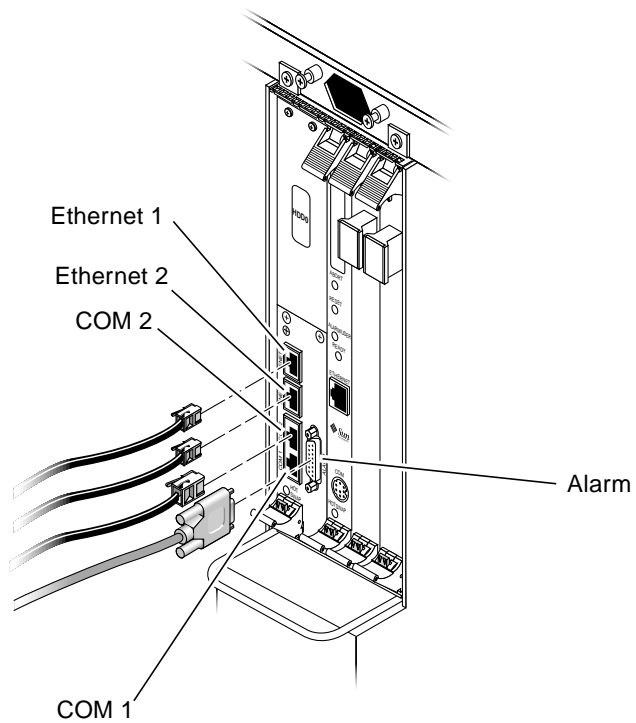
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1. FIGURE 6-10 shows the connectors for a single-wide 6U alarm card installed in a Netra CT 810 server. The location of a single-wide 6U alarm card installed in a diskless Netra CT 410 server is different, but the connectors are the same.

2. The only cables that should be connected to the host CPU card would be a cable connected to the TTY A port for the front-access model of the Netra CT 410 server and the Ethernet cable connected to the Ethernet A port only for front-access Netra CT servers. All other models of servers should use the TTY A and Ethernet A ports on the host CPU front or rear transition card.



**FIGURE 6-10** Connectors for the Single-Wide 6U Alarm Card



**FIGURE 6-11** Connectors for the Double-Wide 3U Alarm Card

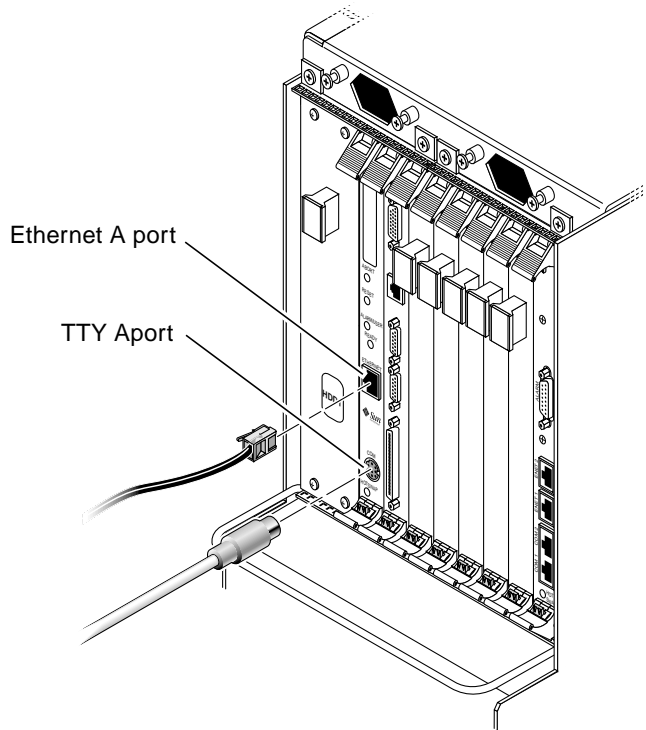


FIGURE 6-12 Connectors on the Host CPU Card

---

## 6.2 Front-Transition Card

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**Note** – The host CPU front-transition cards are only hot-swappable as long as the host CPU card has been removed first.

---

If you encounter problems with the host CPU and/or the host CPU front transition card, you may not be able to determine which card of the two is causing the problems. Because of that, you might want to replace both cards when one of them fails.

- If you are removing and replacing a *faulty* card in the server, first to go Section 6.2.1, “Removing a Host CPU Front Transition Card” on page 6-26, then go to Section 6.2.2, “Installing a Host CPU Front Transition Card” on page 6-27.
- If you are installing a *new* card in the server, go to Section 6.2.2, “Installing a Host CPU Front Transition Card” on page 6-27.

## 6.2.1 Removing a Host CPU Front Transition Card

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

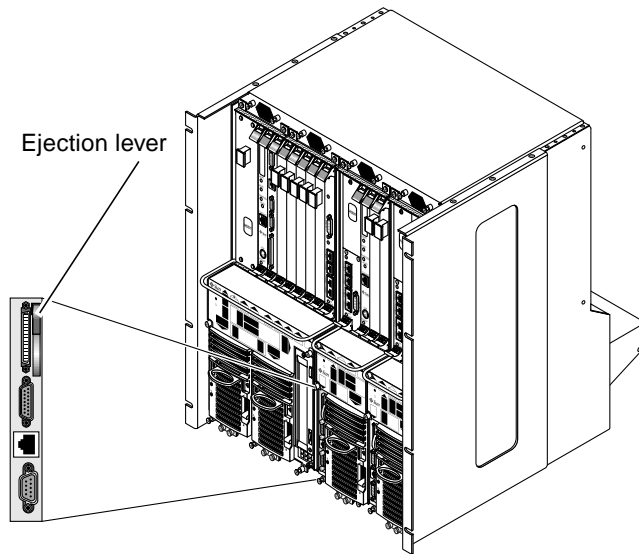
Refer to Section 1.2, “Attaching the Antistatic Wrist Strap” on page 1-2.

**2. Go to the front of the system and remove the host CPU card, if you have not done so already.**

Refer to Section 6.1.2.1, “Removing a Main Card” on page 6-8 to remove the host CPU card, then return here.

**3. Locate the host CPU front transition card.**

FIGURE 6-13 shows the location of the host CPU front transition card in a Netra CT 410 server.



**FIGURE 6-13** Host CPU Front Transition Card Location in a Netra CT 410 Server

**4. Disconnect any cables attached to the host CPU front transition card.**

**5. Using a No. 2 Phillips screwdriver, loosen the captive screw inside the card's ejection lever.**

**6. Flip up on the ejector lever to unseat the card from the card cage (FIGURE 6-13).**

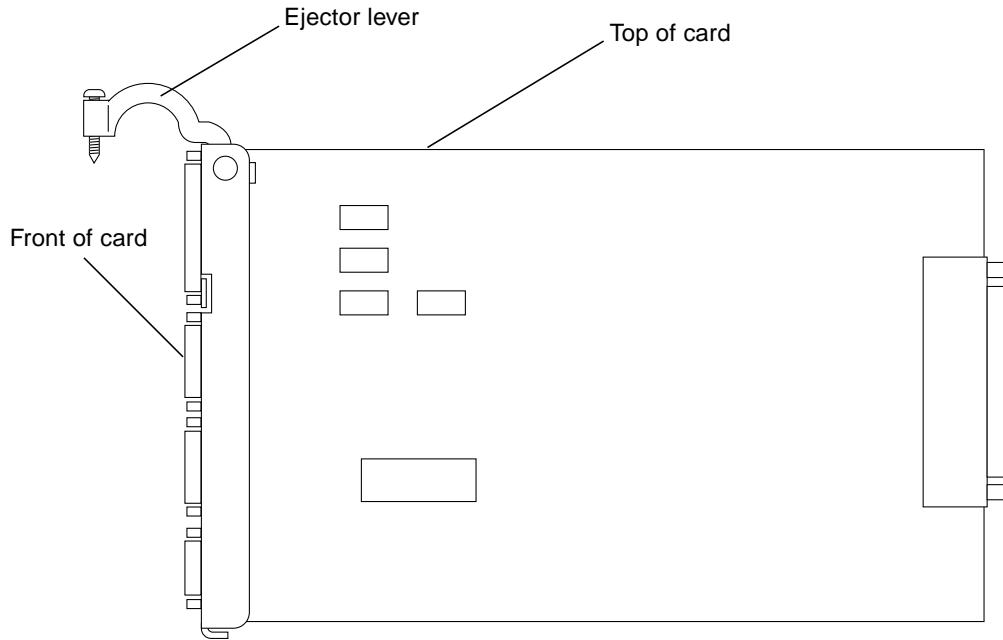
**7. Slide the card out of the slot and place it on the electrostatic discharge mat.**

## 6.2.2 Installing a Host CPU Front Transition Card

### 1. Attach the antistatic wrist strap.

Refer to Section 1.2, “Attaching the Antistatic Wrist Strap” on page 1-2.

### 2. Flip the ejector lever up to a 90-degree angle (FIGURE 6-14).



**FIGURE 6-14** Proper Orientation for the Ejector Lever for Netra CT 410 Server Host CPU Front Transition Card

### 3. Keeping the card vertical, slide the card into the slot.

### 4. Press down on the ejector lever to seat the card into the card cage (FIGURE 6-13).

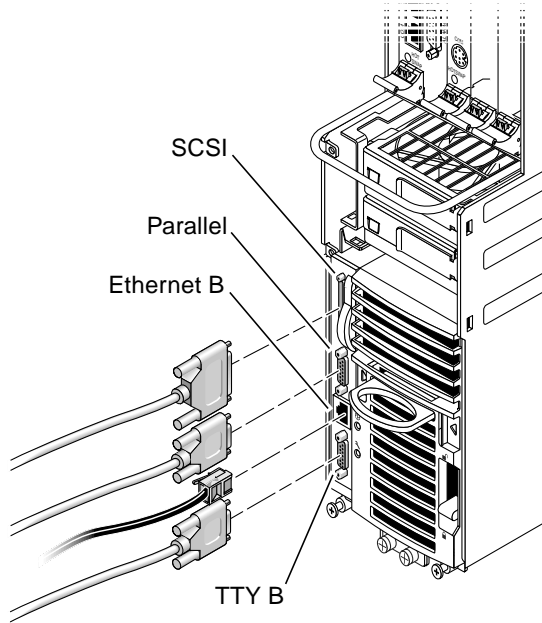
### 5. Using a No. 2 Phillips screwdriver, tighten the captive screw inside the card's ejector lever.

Tighten the screw to a torque of 0.28 N.m (2.5 in.-lb).

### 6. Make the necessary cable connections to the host CPU front transition card.

Tighten the screws on the cable to a torque of 0.23 N.m (2 in.-lb).

FIGURE 6-15 shows the connectors on the host CPU front transition card for the Netra CT 410 server. Note that the TTY A port is located on the host CPU card itself (COM port) for the Netra CT 410 server.



**FIGURE 6-15** Connectors on the Host CPU Front Transition Card (Netra CT 410 Server)

**7. After you have replaced the host CPU front transition card, get the replacement host CPU card from the ship kit.**

**8. Go to the front of the server and install the host CPU card.**

Refer to Section 6.1.2.2, “Inserting a Main Card” on page 6-15 for those instructions.

---

## 6.3 Rear-Transition Cards

---

**Note** – The rear-transition cards are only hot-swappable as long as the accompanying main card has been removed first.

---

This section gives procedures for the installation, removal, and replacement of the following hot-swappable cards for rear-access models of the Netra CT 410 server and Netra CT 810 server:

- Section 6.3.1, “Host CPU Rear Transition Card” on page 6-29
- Section 6.3.2, “Satellite CPU or I/O Rear Transition Card” on page 6-33
- Section 6.3.3, “Alarm Rear Transition Card” on page 6-38



## 6.3.1 Host CPU Rear Transition Card

This section tells how to remove and replace a host 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.

---

- If you are removing and replacing a *faulty* card in the server, first to go Section 6.3.1.1, “Removing a Host CPU Rear Transition Card” on page 6-29, then go to Section 6.3.1.2, “Installing a Host CPU Rear Transition Card” on page 6-31.
- If you are installing a *new* card in the server, go to Section 6.3.1.2, “Installing a Host CPU Rear Transition Card” on page 6-31.

### 6.3.1.1 Removing a Host CPU Rear Transition Card

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

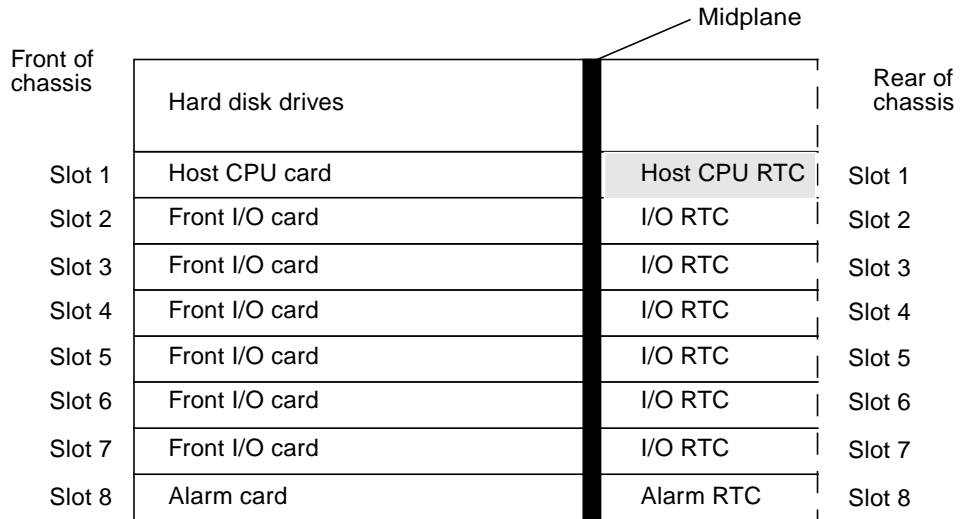
Refer to Section 1.2, “Attaching the Antistatic Wrist Strap” on page 1-2.

**2. Go to the front of the system and remove the host CPU card, if you have not done so already.**

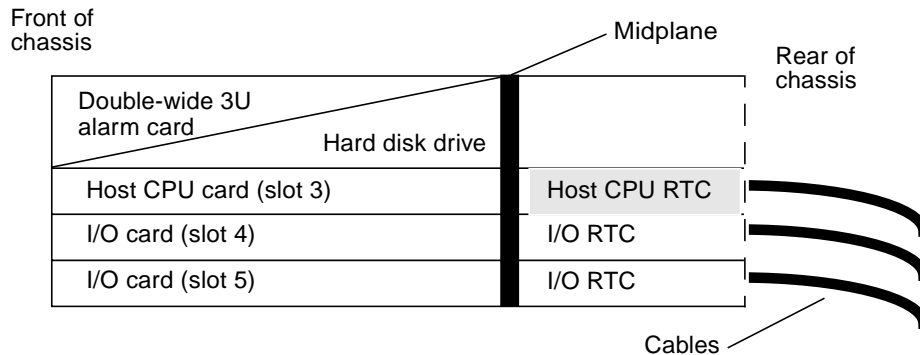
Refer to Section 6.1.2.1, “Removing a Main Card” on page 6-8 to remove the host CPU card, then return here.

**3. Go to the rear of the system and locate the host CPU rear transition card.**

FIGURE 6-16 shows the location of the host CPU rear transition card on the Netra CT 810 server, and FIGURE 6-17 shows the location of the host CPU rear transition card on the Netra CT 410 server.



**FIGURE 6-16** Locating the Host CPU Rear Transition Card in the Rear-Access Model of a Netra CT 810 Server (Top View)



**FIGURE 6-17** Locating the Host CPU Rear Transition Card in the Rear-Access Model of a Netra CT 410 Server (Top View)

4. Unplug any cables attached to the host CPU rear transition 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 6-4).
6. Press out on the ejection levers to unseat the card.
7. Slide the card out of the slot and place it on the electrostatic discharge mat.

### 6.3.1.2 Installing a Host CPU Rear Transition Card

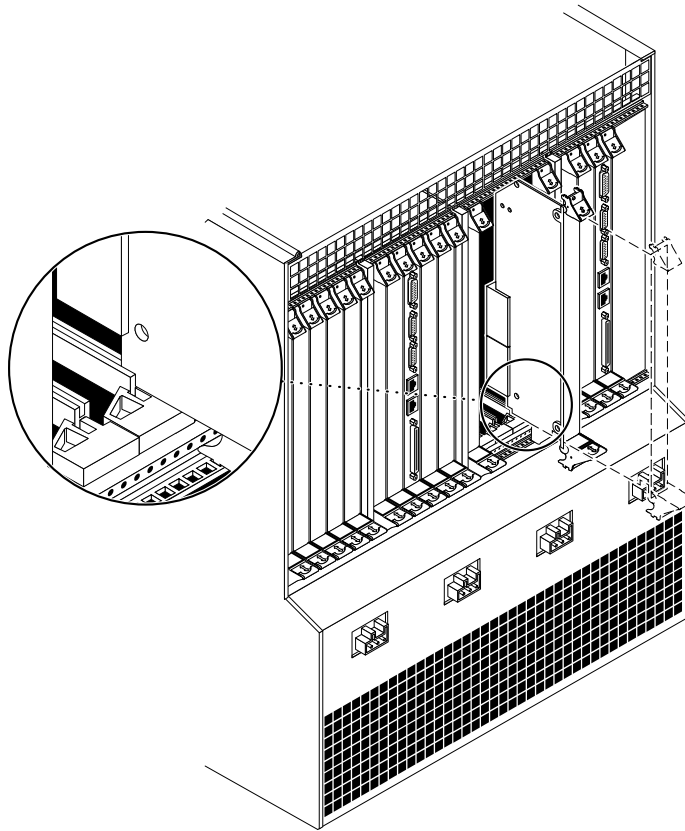
**1. Attach the antistatic wrist strap.**

Refer to Section 1.2, “Attaching the Antistatic Wrist Strap” on page 1-2.

**2. Get the replacement host CPU rear transition card from the ship kit.**

**3. Keeping the host CPU rear transition card vertical, slide the card into the slot in between the two guides (FIGURE 6-18).**

The teeth in the handle of the card must align with the square cutouts in the 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 6-18 shows how to insert an I/O card into a slot; the same principal applies to a host CPU rear transition card.



**FIGURE 6-18** Aligning the Card with the Rear Card Cage Cutouts

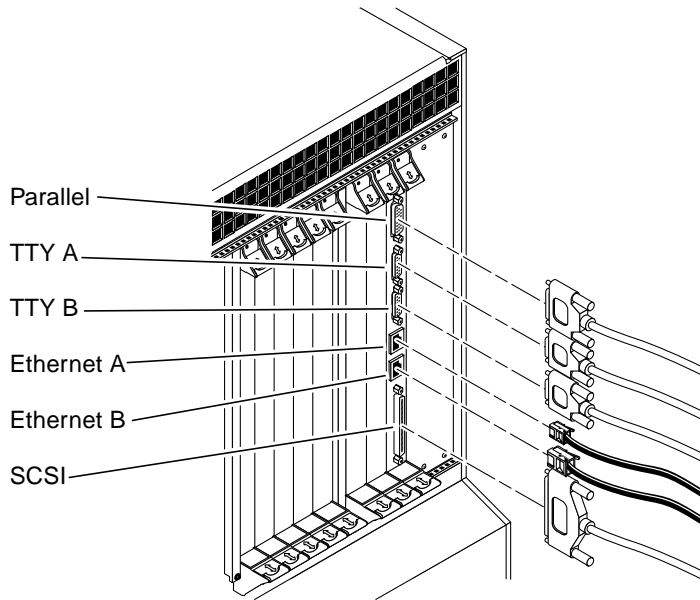
4. Using a No. 2 Phillips screwdriver, tighten the two captive screws inside the card's ejection levers, one on top and one on the bottom (FIGURE 6-9).

Tighten the screws to a torque of 0.28 N.m (2.5 in.-lb).

5. Make the necessary cable connections to the host CPU rear transition card.

Tighten the screws on the cable to a torque of 0.23 N.m (2 in.-lb).

FIGURE 6-19 shows the connectors on the host CPU rear transition card.



**FIGURE 6-19** Connectors on the Host CPU Rear Transition Card (Netra CT 810 Server)

6. After you have replaced the host CPU rear transition card, get the replacement host CPU card from the ship kit.
7. Go to the front of the server and install the replacement host CPU card.  
Refer to Section 6.1.2.2, "Inserting a Main Card" on page 6-15 for those instructions.

## 6.3.2 Satellite CPU or I/O Rear Transition Card

### 6.3.2.1 Satellite CPU Rear Transition Card Set

The satellite CPU rear transition card set consists of two separate cards:

- The satellite CPU card (front)
- The satellite CPU rear transition card (rear)

The satellite CPU card is installed from the front of the Netra CT server; however, no cables are connected to the satellite CPU card. It is the same satellite CPU card that is used in the front-access model of the Netra CT server.

The rear transition card extends the ports from the PMCs installed in the satellite CPU card to the PIMs installed in the satellite CPU rear transition card. The satellite CPU card must be installed in the same slot at the front of the server in order for the satellite CPU rear transition card to work. For example, if you install a satellite CPU rear transition card in I/O slot 3 at the rear of a Netra CT 810 server, you must also install the accompanying satellite CPU card in I/O slot 3 at the front of the server.

When one of the two cards fails, you may not be able to determine which of the two cards has failed. Because of this, you may want to replace both the satellite CPU card *and* the satellite CPU rear transition card. FIGURE 6-20 and FIGURE 6-21 give graphical representations of how the satellite CPU cards should align with the satellite CPU rear transition cards (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.

Front of chassis		Midplane	Rear of chassis	
	Hard disk drives			
Slot 1	Host CPU card	Host CPU RTC	Slot 1	
Slot 2	Satellite CPU or I/O card	CPU or I/O RTC	Slot 2	
Slot 3	Satellite CPU or I/O card	CPU or I/O RTC	Slot 3	
Slot 4	Satellite CPU or I/O card	CPU or I/O RTC	Slot 4	
Slot 5	Satellite CPU or I/O card	CPU or I/O RTC	Slot 5	
Slot 6	Satellite CPU or I/O card	CPU or I/O RTC	Slot 6	
Slot 7	Satellite CPU or I/O card	CPU or I/O RTC	Slot 7	
Slot 8	Single-wide 6U alarm card	Alarm RTC	Slot 8	

**FIGURE 6-20** Supported Locations for Satellite CPU or I/O Rear Transition Card Sets in a Netra CT 810 Server (Top View)

Front of chassis		Midplane	Rear of chassis	
Slot 1	Single-wide 6U alarm card	Alarm RTC		
Slot 2	Satellite CPU or I/O card	CPU or I/O RTC		
Slot 3	Host CPU card	Host CPU RTC		
Slot 4	Satellite CPU or I/O card	CPU or I/O RTC		
Slot 5	Satellite CPU or I/O card	CPU or I/O RTC		

**FIGURE 6-21** Supported Locations for Satellite CPU or I/O Rear Transition Card Sets in a Netra CT 410 Server (Top View)

### 6.3.2.2 I/O Rear Transition Card Set

The I/O rear transition card set consists of two separate cards:

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

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 at the front of the server 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 810 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 may not be able to determine which of the two cards has failed. Because of this, you may want to replace both the front I/O card *and* the I/O rear transition card. FIGURE 6-20 and FIGURE 6-21 give graphical representations of how the front I/O cards should align with the I/O rear transition cards (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.

### 6.3.2.3 Removing and Installing Satellite CPU or I/O Rear Transition Card Sets

- If you are removing and replacing *faulty* cards in the server, first to go “Removing a Satellite CPU or I/O Rear Transition Card” on page 6-35, then go to “Installing a Satellite CPU or I/O Rear Transition Card” on page 6-37.
- If you are installing *new* cards in the server, go to “Installing a Satellite CPU or I/O Rear Transition Card” on page 6-37.

#### *Removing a Satellite CPU or I/O Rear Transition Card*

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

Refer to Section 1.2, “Attaching the Antistatic Wrist Strap” on page 1-2.

##### **2. Locate the card slot that holds the satellite CPU or I/O card.**

- FIGURE 6-20 shows the satellite CPU or I/O card slots in a Netra CT 810 server.
- FIGURE 6-21 shows the satellite CPU or I/O card slots in a Netra CT 410 server.

**3. Remove the satellite CPU or I/O card from the front of the Netra CT server.**

Refer to Section 6.1.2.1, “Removing a Main Card” on page 6-8 for those instructions, then return here.



---

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

---

**4. After you have removed the satellite CPU or I/O card from the front of the Netra CT server, go to the rear of the server and locate the rear transition card.**

FIGURE 6-20 shows the slots available for the rear transition cards in a Netra CT 810 server and FIGURE 6-21 shows the slots available for the rear transition cards in a Netra CT 410 server.

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

**6. Using a No. 2 Phillips screwdriver, loosen the two captive screws inside the rear transition card's ejection levers, one on top and one on the bottom (FIGURE 6-4).**

**7. Unlock the ejection levers.**

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

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

**10. Perform any additional card-specific hardware procedures, if necessary.**

For example, you may want to remove the PIM(s) from a faulty satellite CPU or I/O card and install it on the replacement card later on. Refer to the documentation that you received with your card for more information.

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

If you are not going to replace the 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.



## *Installing a Satellite CPU or I/O Rear Transition Card*

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

Refer to Section 1.2, “Attaching the Antistatic Wrist Strap” on page 1-2.

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

FIGURE 6-20 shows the slots available for the rear transition cards in a Netra CT 810 server and FIGURE 6-21 shows the slots available for the rear transition cards in a Netra CT 410 server.

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 rear transition card from the ship kit.**

### **4. Perform any card-specific hardware procedures, if necessary.**

For example, if you removed the PIM(s) from a faulty satellite CPU or I/O card, then you will want to install the PIM(s) into the replacement satellite CPU or I/O card at this time. Refer to the documentation that you received with your satellite CPU or I/O card for more information.

### **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 rear transition card in between the two guides into the slot (FIGURE 6-18).**

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.

### **7. Lock the ejection levers.**

The method you use to lock the ejection levers varies 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.

### **8. 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.**

Tighten the screws to a torque of 0.28 N.m (2.5 in.-lb).

### **9. Plug all appropriate cables into the rear transition card.**

Tighten the screws on the cable to a torque of 0.23 N.m (2 in.-lb). Refer to the documentation that you received with the card for more information.

### **10. Go to the front of the server and install the satellite CPU or I/O card in the Netra CT server.**

Refer to Section 6.1.2.2, “Inserting a Main Card” on page 6-15 for those instructions.

## 6.3.3 Alarm Rear Transition Card

The alarm rear transition card for the Netra CT 810 server consists of two separate cards:

- The alarm card
- The alarm rear transition card

When one of the two cards fails, you may not be able to determine which of the two cards has failed. Because of this, you may want to replace both the alarm card *and* the alarm rear transition card.

The alarm card is installed from the front of the Netra CT server. It is the same alarm card that is used in the front-access model of the Netra CT 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 Section 6.3.3.1, “Removing an Alarm Rear Transition Card” on page 6-38, then go to Section 6.3.3.2, “Installing an Alarm Rear Transition Card” on page 6-40.
- If you are installing *new* cards in the server, go to Section 6.3.3.2, “Installing an Alarm Rear Transition Card” on page 6-40.

### 6.3.3.1 Removing an Alarm Rear Transition Card

#### 1. Attach the antistatic wrist strap.

Refer to Section 1.2, “Attaching the Antistatic Wrist Strap” on page 1-2.

#### 2. Remove the alarm card from the front of the Netra CT server.

Refer to “Removing a Main Card” on page 6-8 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 server, go to the rear of the server and locate the alarm rear transition card.

FIGURE 6-22 shows the slot available for the alarm rear transition card in a Netra CT 810 server and FIGURE 6-23 shows the slot available for the alarm rear transition card in a Netra CT 410 server.

Front of chassis		Midplane	Rear of chassis
	Hard disk drives	Hard disk drives	
Slot 1	Host CPU card	Host CPU RTC	Slot 1
Slot 2	I/O card	I/O RTC	Slot 2
Slot 3	I/O card	I/O RTC	Slot 3
Slot 4	I/O card	I/O RTC	Slot 4
Slot 5	I/O card	I/O RTC	Slot 5
Slot 6	I/O card	I/O RTC	Slot 6
Slot 7	I/O card	I/O RTC	Slot 7
Slot 8	Alarm card	Alarm RTC	Slot 8

**FIGURE 6-22** Supported Location for the Alarm Rear Transition Card in a Netra CT 810 Server (Top View)

Front of chassis		Midplane	Rear of chassis
Slot 1	6U or 3U alarm card	Alarm RTC	
Slot 2	I/O card	I/O RTC	
Slot 3	Host CPU card	Host CPU RTC	
Slot 4	I/O card	I/O RTC	
Slot 5	I/O card	I/O RTC	

**FIGURE 6-23** Supported Location for the Alarm Rear Transition Card in a Netra CT 410 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.

### 6.3.3.2 Installing an Alarm Rear Transition Card

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

Refer to Section 1.2, "Attaching the Antistatic Wrist Strap" on page 1-2.

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

FIGURE 6-22 shows the slot available for the alarm rear transition card in a Netra CT 810 server and FIGURE 6-23 shows the slot available for the alarm rear transition card in a Netra CT 410 server.

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. **Remove the blue protective film from the front of the alarm rear transition card.**



---

**Caution** – You must remove the blue protective film from the front of card before installing it into the server. Failure to do so may keep the metal springfingers on the side of the alarm card from making contact with the metal panels on the server.

---

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 (FIGURE 6-18).**

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 6-8 shows how to insert an I/O card into a slot; the same principal applies to an alarm rear transition card.

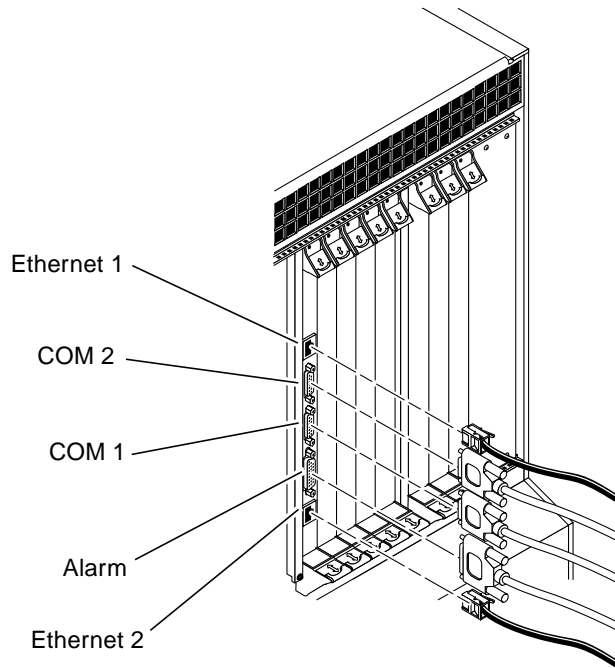
- 7. Using a No. 2 Phillips screwdriver, tighten the two captive screws inside the card's ejection levers, one on top and one on the bottom.**

Tighten the screws to a torque of 0.28 N.m (2.5 in.-lb).

- 8. Lock the ejection levers on the card.**

- 9. Plug all appropriate cables into the alarm rear transition card.**

Tighten the screws on the cable to a torque of 0.23 N.m (2 in.-lb).



**FIGURE 6-24** Connectors on the Alarm Rear Transition Card

- 10. Get the replacement alarm card from the ship kit.**

- 11. Verify that the ejection levers are unlocked.**

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

- 12. Go to the front of the server and install the replacement alarm card in the Netra CT server.**

Refer to “Inserting a Main Card” on page 6-15 for those instructions.

## Removing and Replacing Hard Disk Drives and Removeable Media



---

**Caution** – If you are just powering on your Netra CT server, do *not* remove or install any components in the system until you have verified that the system is completely powered up. Refer to Section 2.1.1, “Verifying Full Power-Up” on page 2-5 for more information.

---

---

**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:

- Section 7.1, “Hard Disk Drive” on page 7-2
- Section 7.2, “DVD or DAT Drive (Netra CT 810 Server Only)” on page 7-9

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.

---

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## 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 410 server is a hot-swappable disk drive only if the Netra CT 410 server is running on the Solaris operating environment over the network, and not off of the hard disk drive.

In addition, there are two separate SCSI chains in the Netra CT 810 server for the SCSI devices:

- The upper hard disk drive (HDD 0) and the removeable media device are both on the first SCSI chain (c0). Any external SCSI devices attached to the SCSI port on the CPU front or rear transition card would also be on the first SCSI chain.
- The lower hard disk drive (HDD 1) is the only SCSI device on the second SCSI chain (c1), and should be used as the boot 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 10 in the section Section 10.1, “Hard Disk Drive” on page 10-1.

- If you are removing and replacing a *faulty* hard disk drive in the server, first to go Section 7.1.1, “Removing a Hard Disk Drive” on page 7-3, then go to Section 7.1.2, “Installing a Hard Disk Drive” on page 7-8.
- If you are installing a *new* hard disk drive in the server, go to Section 7.1.2, “Installing a Hard Disk Drive” on page 7-8.



## 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. **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 c#
```

where *c#* is the SCSI controller number for the drive that you want to remove. For example, to list the attachment-point IDs for the first SCSI chain in the 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/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 DVD drive is *c0::dsk/c0t6d0*.

## 2. 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 upper hard disk drive (HDD 0), as root, enter:

```
# cfgadm -c unconfigure c0::dsk/c0t0d0
```

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/c0t0d0s7	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 5 on page 7-5.

---

## 3. Unmount the mounted partition(s).

For every filesystem that was listed in the previous step, as root, enter:

```
# umount filesystem
```

For example, using the feedback from the previous step, you would enter:

```
# umount /mnt
```

#### 4. 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 upper hard disk drive (HDD 0), as root, enter:

```
# cfgadm -c unconfigure c0::dsk/c0t0d0
```

#### 5. Determine if you are trying to remove the boot drive or a normal data drive from the system.

- If you are trying to remove the boot drive, go to Step 6.
- If you are trying to remove a normal data drive, as root, enter:

```
# cfgadm -x remove_device ap_id
```

where *ap\_id* is the attachment-point ID for the hard disk drive that you want to remove. For example, for the upper hard disk drive (HDD 0), as root, enter:

```
# cfgadm -x remove_device c0::dsk/c0t0d0
```

#### 6. Verify that the hard disk drive has been deactivated.

As root, enter:

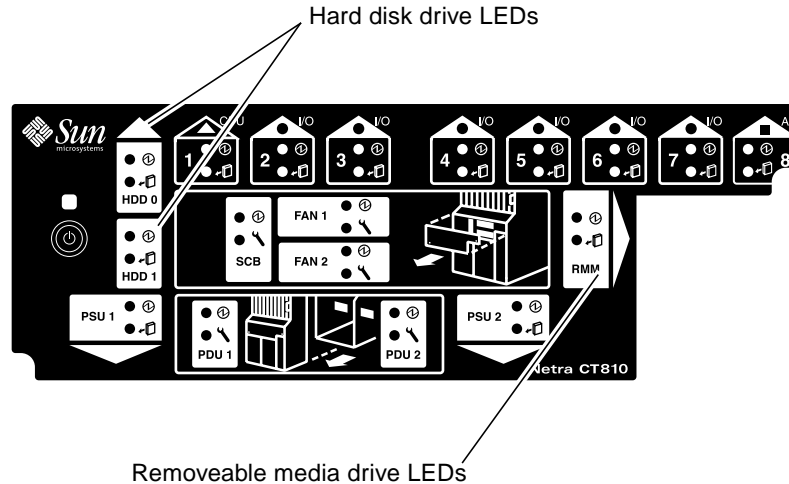
```
# cfgadm -a c0
```

You should get feedback similar to the following:

Ap_Id	Type	Receptacle	Occupant	Condition
c0	scsi-bus	connected	configured	unknown
c0::dsk/c0t0d0	unavailable	connected	unconfigured	unknown
c0::dsk/c0t6d0	CD-ROM	connected	configured	unknown

Note that in the sample feedback above, the Type column for the upper hard disk drive (c0::disk/c0t0d0) 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 7-1). 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.



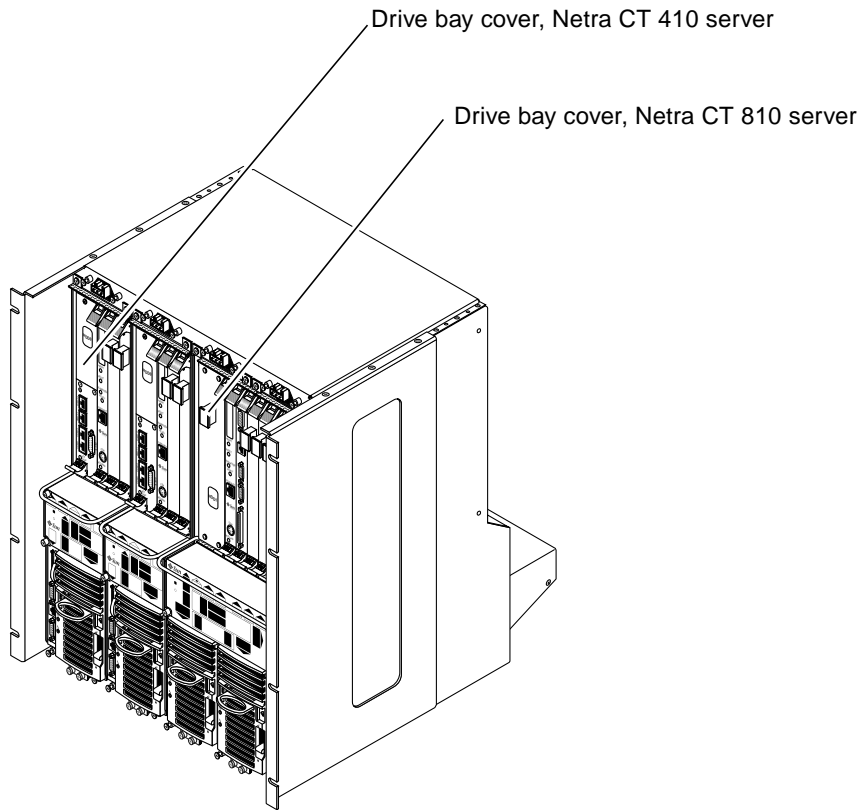
**FIGURE 7-1** Locating the Hard Disk Drive LEDs on the System Status Panel (Netra CT 810 Server)

## 7. Attach the antistatic wrist strap.

Refer to Section 1.2, “Attaching the Antistatic Wrist Strap” on page 1-2.

## 8. 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 810 server and one behind the drive bay cover in a Netra CT 410 server.



**FIGURE 7-2** Drive Bay Cover Locations

**9. Loosen the captive screws that hold the drive bay cover in place.**

- For the Netra CT 810 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 410 server, use a No. 2 Phillips screwdriver to loosen the one captive screw on top.

**10. Remove the drive bay cover.**

**11. Locate the hard disk drive that you want to replace.**

In a Netra CT 810 server, HDD0 is the upper hard disk drive and HDD1 is the lower hard disk drive.

**12. Unlatch the disk drive handle to release it.**

Push down in the direction of the arrow to release the bracket handle latch.

**13. Pull the bracket handle out and swing it open.**

14. Continue to pivot the disk drive bracket handle against the chassis, applying mild pressure until the drive disconnects.
15. Slide the drive out of the chassis and place it on the electrostatic discharge mat.
16. Secure the drive bay cover over the drive bays (FIGURE 7-1).  
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 Section 1.2, “Attaching the Antistatic Wrist Strap” on page 1-2.
2. Remove the drive bay cover (FIGURE 7-2).
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 upper hard disk drive (HDD 0), as root, enter:

```
# cfgadm -c configure c0::dsk/c0t0d0
```

## 9. Verify that the hard disk drive has been activated.


As root, enter:

```
# cfigadm -a c0
```

You should get feedback similar to the following:

Ap_Id	Type	Receptacle	Occupant	Condition
c0	scsi-bus	connected	configured	unknown
c0::disk/c0t0d0	disk	connected	configured	unknown
c0::disk/c0t6d0	CD-ROM	connected	configured	unknown

Note that in the sample feedback above, the Type column for the upper hard disk drive (c0::disk/c0t0d0) 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 7-1). 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 DVD or DAT Drive (Netra CT 810 Server Only)

This section tells you how to replace a DVD or Digital Audio Tape (DAT) drive in a Netra CT 810 server. 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 410 server.

Following are the SCSI IDs for the devices used in the removeable media module:

- 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 Section 7.2.1, “Removing a DVD or DAT Drive” on page 7-10, then go to Section 7.2.2, “Installing a DVD or DAT Drive” on page 7-13.
- If you are installing a *new* removeable media drive in the server, go to Section 7.2.2, “Installing a DVD or DAT Drive” on page 7-13.

## 7.2.1 Removing a DVD or DAT Drive

### 1. Log in to the server and kill the Volume Manager daemon.

As root, enter:

```
# /etc/init.d/volmgt stop
```

### 2. If you are removing a DAT drive, enter the following command to rebuild the device tree:

```
# devfsadm -i st
```

This command is not necessary if you are removing a DVD drive.

### 3. Get the attachment-point ID for the removeable media drive installed in your server.

As root, enter:

```
# cfgadm -a c0
```

- If you have a *DVD* drive installed in your server, 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/c0t6d0	CD-ROM	connected	configured	unknown
c0::rmt/0	unavailable	connected	unconfigured	unknown

In the sample feedback above, the attachment-point ID for the DVD drive is `c0::dsk/c0t6d0`, shown as CD-ROM under the Type column.



- If you have a *DAT* drive installed in your server, 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/c0t6d0	unavailable	connected	unconfigured	unknown
c0::rmt/0	tape	connected	configured	unknown

In the sample feedback above, the attachment-point ID for the DAT drive is `c0::rmt/0`, shown as `tape` under the `Type` column.

#### 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 DVD drive using the feedback given above, as root, enter:

```
# cfgadm -c unconfigure c0::dsk/c0t6d0
```

Note that the attachment-point ID would be different for the DAT drive.

#### 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/c0t6d0	unavailable	connected	unconfigured	unknown
c0::rmt/0	unavailable	connected	unconfigured	unknown

The entry under the Type column for the drive you removed should be unavailable, and the entry under the Occupant column should be unconfigured.

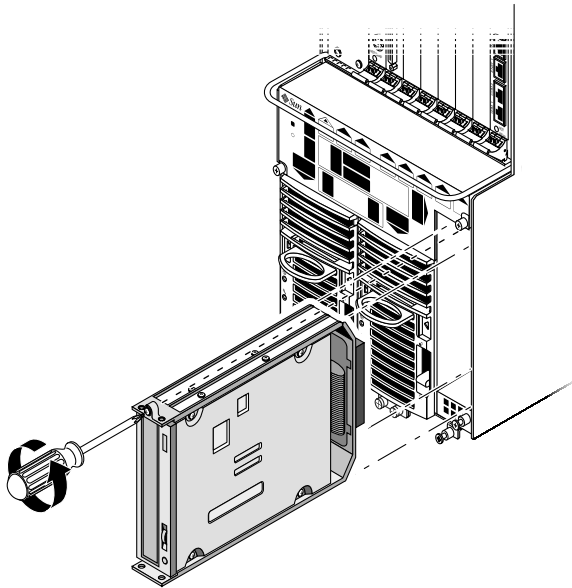
You can also use the removeable media module (RMM) LEDs on the system status panel to verify that the removeable media drive has been deactivated. The Okay to Remove LED (  ) on the system status panel for the removeable media module should go ON, indicating that you can remove the removeable media drive from the slot.

**6. Attach the antistatic wrist strap.**

Refer to Section 1.2, “Attaching the Antistatic Wrist Strap” on page 1-2.

**7. Using a No. 2 Phillips screwdriver, loosen the captive screw that holds the removeable media module in place.**

**8. 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 810 Server

## 7.2.2 Installing a DVD or DAT Drive

### 1. Attach the antistatic wrist strap.

Refer to Section 1.2, “Attaching the Antistatic Wrist Strap” on page 1-2.

### 2. Insert the removeable media module into the server.

The Okay to Remove LED (  ) and the Power LED (  ) on the system status panel for the removeable media module should go ON.

### 3. Using a No. 2 Phillips screwdriver, tighten the screw on the removeable media module to secure it to the server.

### 4. Remove the antistatic wrist strap.

### 5. Log in to the server and, as root, activate the replacement removeable media drive:

```
# cfgadm -c configure c0
```

### 6. If you installed a DAT drive into your server, enter the following command to rebuild the device tree:

```
# devfsadm -i st
```

This command is not necessary if you installed a DVD drive into your server.

### 7. Verify that the removeable media drive has been activated.

As root, enter:

```
# cfgadm -a c0
```

- If you installed a *DVD* drive in your server, 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/c0t6d0	CD-ROM	connected	configured	unknown
c0::rmt/0	unavailable	connected	unconfigured	unknown

Locate the line with the attachment point `c0::dsk/c0t6d0` listed in the `Ap_Id` column. Verify that the following entries appear for the DVD drive that you just installed:

<code>c0::dsk/c0t6d0</code>	CD-ROM	connected	configured	unknown
-----------------------------	--------	-----------	------------	---------

- If you see `CD-ROM` in the `Type` column and `configured` in the `Occupant` column, then the DVD drive was activated. Go to Step 8.
- If you see *unavailable* instead of `CD-ROM` in the `Type` column and *unconfigured* instead of `configured` in the `Occupant` column, then the DVD drive was not activated. Enter the following command to activate the DVD drive:

```
# cfgadm -c configure c0::dsk/c0t6d0
```

Enter the `cfgadm -a c0` command a second time to verify that the DVD drive was activated. 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. 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. Go to Step 8.

- If you installed a *DAT* drive in your server, you should get feedback similar to the following:

Ap_Id	Type	Receptacle	Occupant	Condition
<code>c0</code>	<code>scsi-bus</code>	<code>connected</code>	<code>configured</code>	<code>unknown</code>
<code>c0::dsk/c0t0d0</code>	<code>disk</code>	<code>connected</code>	<code>configured</code>	<code>unknown</code>
<code>c0::dsk/c0t6d0</code>	<code>unavailable</code>	<code>connected</code>	<code>unconfigured</code>	<code>unknown</code>
<code>c0::rmt/0</code>	<code>tape</code>	<code>connected</code>	<code>configured</code>	<code>unknown</code>

Locate the line with the attachment point `c0::rmt/0` listed in the `Ap_Id` column. Verify that the following entries appear for the DAT drive that you just installed:


<code>c0::rmt/0</code>	tape	connected	configured	unknown
------------------------	------	-----------	------------	---------

- If you see `tape` in the `Type` column and `configured` in the `Occupant` column, then the DAT drive was activated. Go to Step 8.

- If you see *unavailable* instead of *tape* in the Type column and *unconfigured* instead of *configured* in the Occupant column, then the DAT drive was not activated. Enter the following command to activate the DAT drive:

```
# cfgadm -c configure c0::rmt/0
```

Enter the `cfgadm -a c0` command a second time to verify that the DAT drive was activated.

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. 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.

## 8. Start the Volume Manager daemon.

As root, enter:

```
# /etc/init.d/volmgt start
```



## Removing and Replacing Hot-Swappable Subassemblies

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**Caution** – If you are just powering on your Netra CT server, do *not* remove or install any components in the system until you have verified that the system is completely powered up. Refer to Section 2.1.1, “Verifying Full Power-Up” on page 2-5 for more information.

---

---

**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:

- Section 8.1, “System Status Panel” on page 8-2
- Section 8.2, “System Controller Board” on page 8-6
- Section 8.3, “Air Filters” on page 8-10
- Section 8.4, “Power Supply Unit (AC or DC)” on page 8-13
- Section 8.5, “Fan Tray” on page 8-17

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 410 server and a Netra CT 810 server.

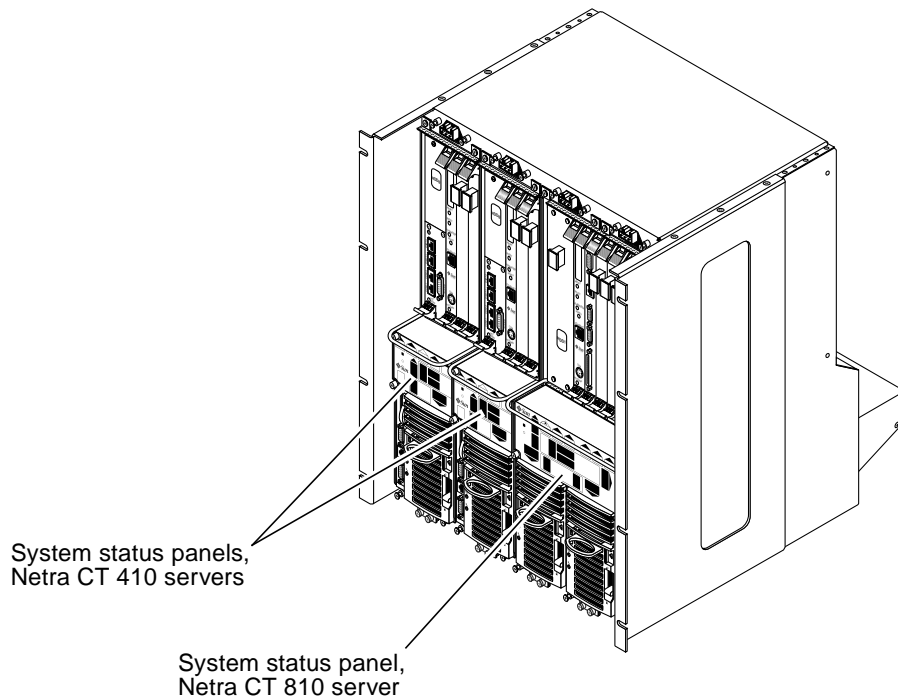
### 8.1.1 Removing the System Status Panel

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

Refer to Section 1.2, “Attaching the Antistatic Wrist Strap” on page 1-2.

**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 810 server and Netra CT 410 server is illustrated in FIGURE 8-1.

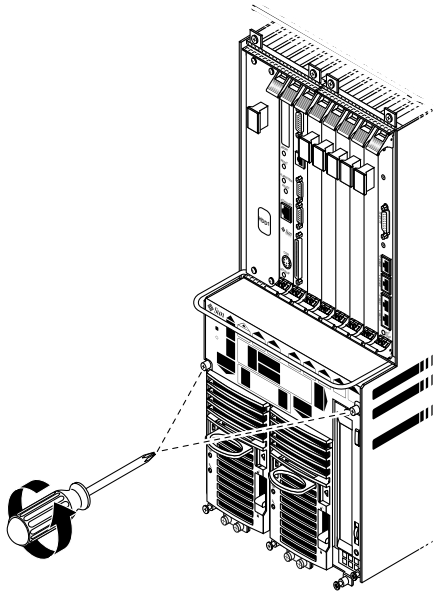


**FIGURE 8-1** System Status Panel Locations

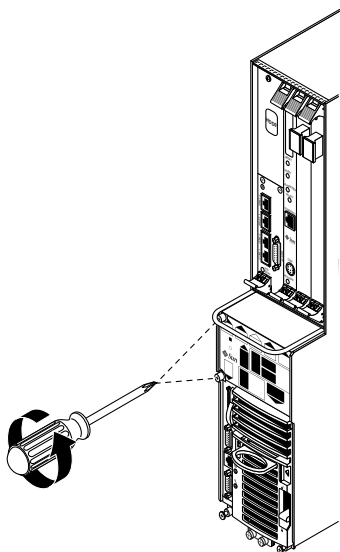


3. Using a No. 2 Phillips screwdriver, loosen the two captive screws that hold the system status panel in place.

FIGURE 8-2 shows the location of the captive screws on the Netra CT 810 server, and FIGURE 8-3 shows the location of the captive screws on the Netra CT 410 server.



**FIGURE 8-2** Removing the System Status Panel (Netra CT 810 Server)



**FIGURE 8-3** Removing the System Status Panel (Netra CT 410 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.

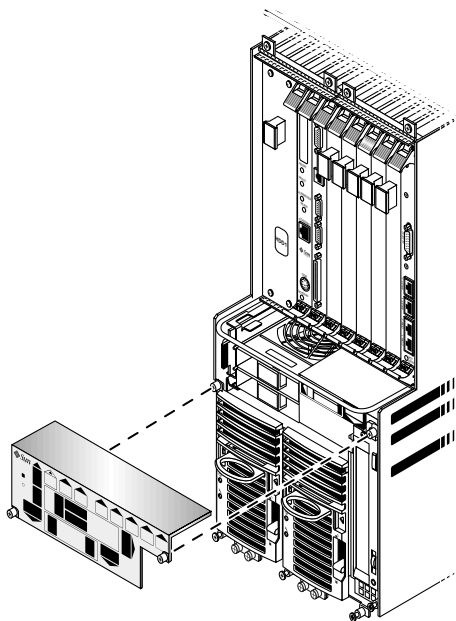
## 8.1.2 Replacing the System Status Panel

- 1. Attach the antistatic wrist strap.**

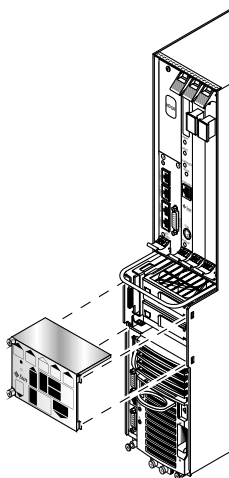
Refer to Section 1.2, “Attaching the Antistatic Wrist Strap” on page 1-2.

- 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 810 server and FIGURE 8-5 shows how to position the panel into place on the Netra CT 410 server.



**FIGURE 8-4** Positioning the System Status Panel (Netra CT 810 Server)



**FIGURE 8-5** Positioning the System Status Panel (Netra CT 410 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 810 server, and FIGURE 8-3 shows the location of the captive screws on the Netra CT 410 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.

---

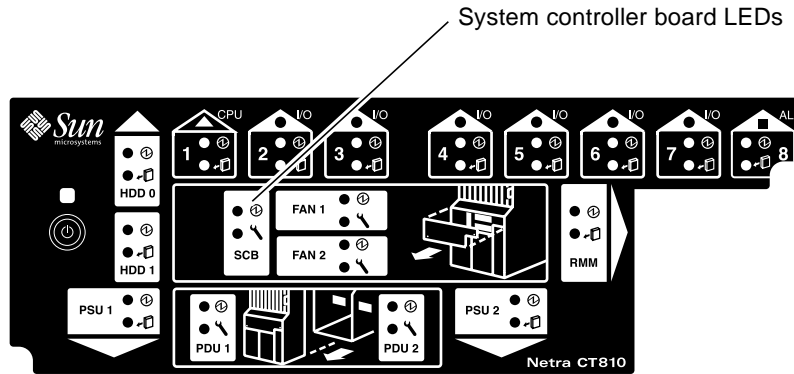
**Note** – You must have the alarm card and host CPU card installed in the server before you can hot-swap the system controller board.

---

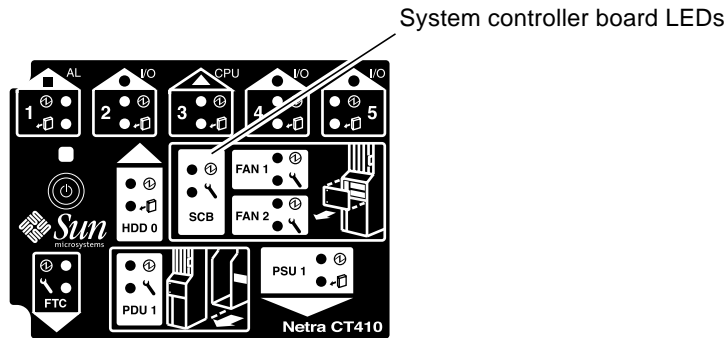
### 8.2.1 Removing the System Controller Board

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 810 server, and FIGURE 8-7 shows the locations of the system controller board LEDs on the Netra CT 410 server.

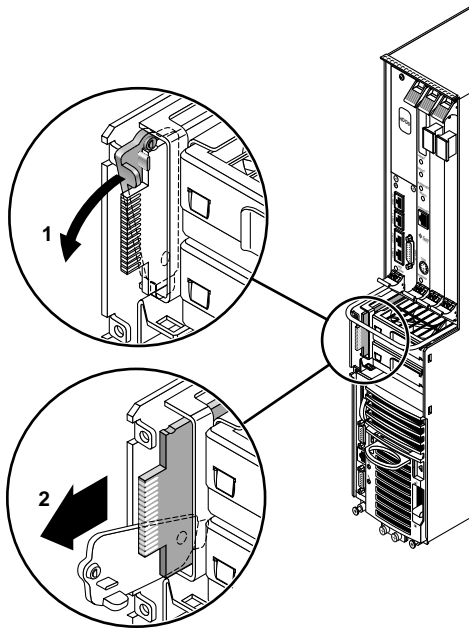


**FIGURE 8-6** Locating the System Controller Board LEDs on the System Status Panel (Netra CT 810 Server)



**FIGURE 8-7** Locating the System Controller Board LEDs on the System Status Panel (Netra CT 410 Server)

2. 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.
3. Pull down on the ejection lever to unseat the system controller board (FIGURE 8-8).



**FIGURE 8-8** Removing a System Controller Board

- 4. Slide the board out and place it on the electrostatic discharge mat.**

## 8.2.2 Replacing the System Controller Board

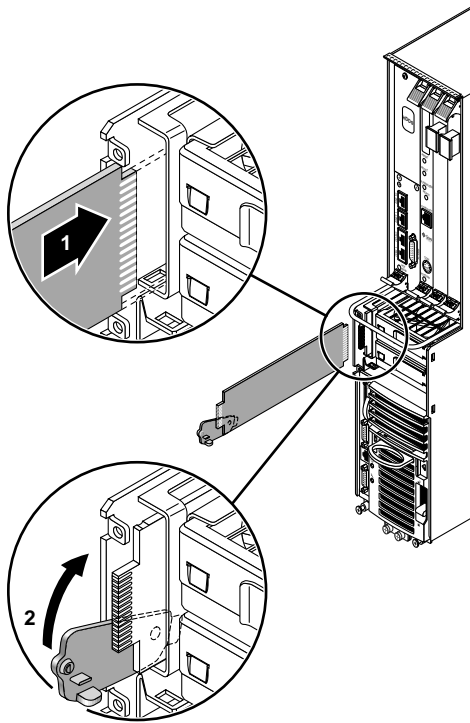
- 1. Attach the antistatic wrist strap.**

Refer to Section 1.2, “Attaching the Antistatic Wrist Strap” on page 1-2.

- 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 ejector lever up as you slide the board into the slot to completely seat it in the card cage.**

The notch on the ejector 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 8-4.

---

## 8.3 Air Filters

Both the Netra CT 810 servers and the Netra CT 410 servers have two types of air filters: a power supply unit air filter, which filters the air going into the power supply, and a main air filter, which filters the air going into the server. Both air filters are located in the power supply unit. The power supply unit air filter is located at the front of the power supply unit and the main air filter is located in a tray at the top of the power supply unit.

Both sets of air filters should be replaced every three to six months. If your server environment is especially dirty, you may have to replace them more frequently. The power supply unit air filter must be in place for safe operation. Note that you do not have to power off the power supply unit or the system when removing or installing any of the air filters.

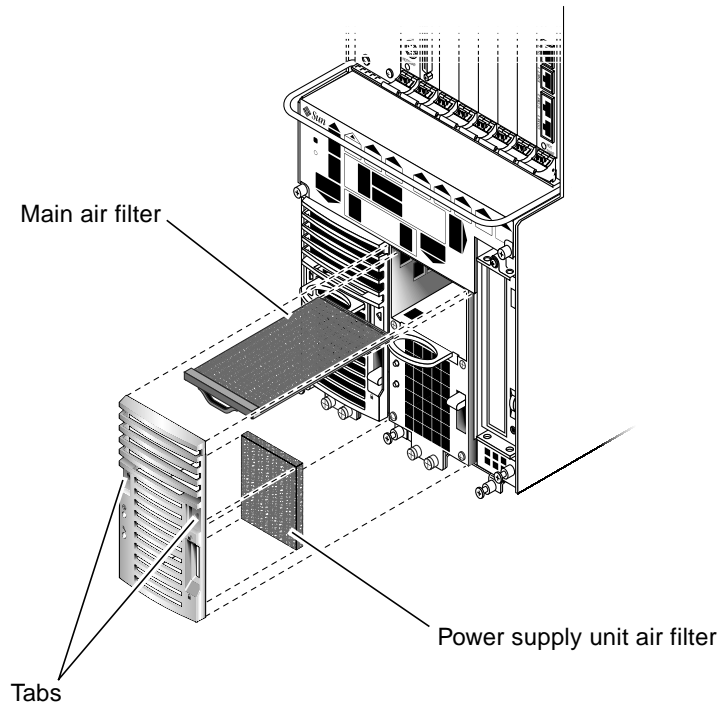
There is a single part number for the kit that contains both the main air filter and the power supply unit air filter for the Netra CT servers. The part number for the air filter kit is X7221A.

### 8.3.1 Removing the Air Filters

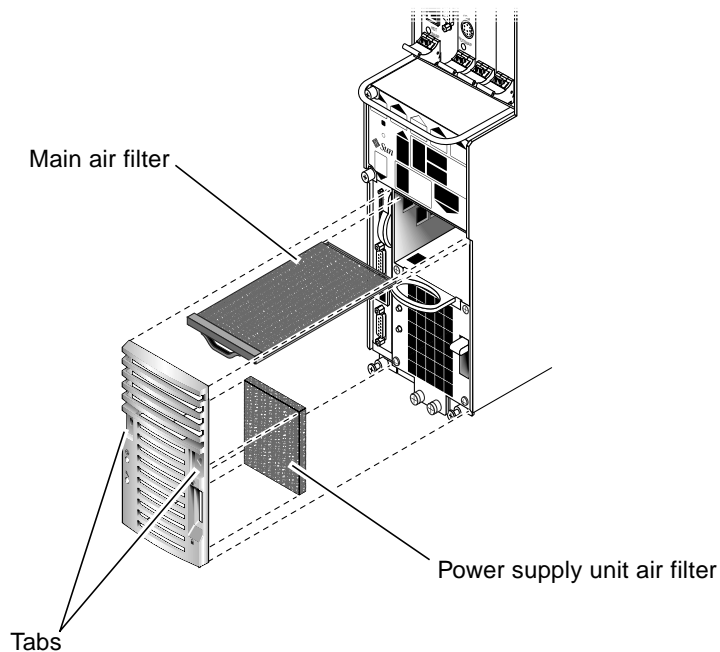
1. **Squeeze in on the tabs at the sides of the power supply unit cover and remove the cover.**

FIGURE 8-10 shows the location of the power supply unit cover for the Netra CT 810 server and FIGURE 8-11 shows the location of the power supply unit cover for the Netra CT 410 server.





**FIGURE 8-10** Locating the Air Filters (Netra CT 810 Server)



**FIGURE 8-11** Locating the Air Filters (Netra CT 410 Server)

- 2. Remove the power supply unit air filter.**  
Refer to FIGURE 8-10 and FIGURE 8-11.
- 3. Slide the main air filter tray out of the power supply unit.**  
Refer to FIGURE 8-10 and FIGURE 8-11.
- 4. Remove the main air filter from the tray.**

## 8.3.2 Replacing the Air Filters

- 1. Insert the main air filter in the air filter tray.**  
Refer to FIGURE 8-10 and FIGURE 8-11.
- 2. Slide the air filter tray into the power supply unit.**
- 3. Insert the power supply unit air filter into the power supply unit cover.**
- 4. Replace the power supply unit cover on the power supply unit until it clicks into place.**

---

## 8.4 Power Supply Unit (AC or DC)

The second power supply unit in a Netra CT 810 server is hot-swappable, as described in Section 1.5, “FRU Categories” on page 1-7. The remaining power supply unit in a Netra CT 810 server and the lone power supply unit in a Netra CT 410 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 Section 10.5, “Power Supply Unit” on page 10-16.

Note that your Netra CT 810 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.

The instructions for removing and replacing power supply unit is the same, regardless of whether they are AC or DC power supply units.

The part number for the AC power supply unit is F300-1543. The part number for the DC power supply unit is F300-1535.

### 8.4.1 Removing a Hot-Swappable Power Supply Unit

- 1. Attach the antistatic wrist strap.**


Refer to Section 1.2, “Attaching the Antistatic Wrist Strap” on page 1-2.

- 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 Section 4.6, “Troubleshooting a Power Supply Using the Power Supply Unit LEDs” on page 4-15 for more information.

- 3. Verify that the power supply unit that you want to remove is hot-swappable.**

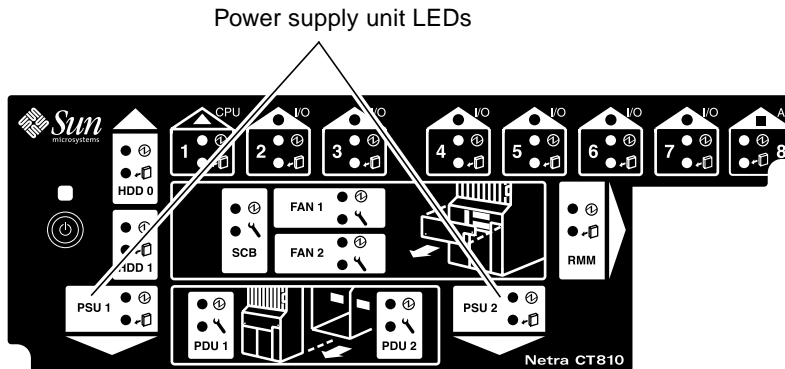
Use the power supply unit (PSU) LEDs on the *system status panel* to locate the power supply unit that can be removed. FIGURE 8-12 shows the location of the power supply unit LEDs on the Netra CT 810 server system status panel.

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.

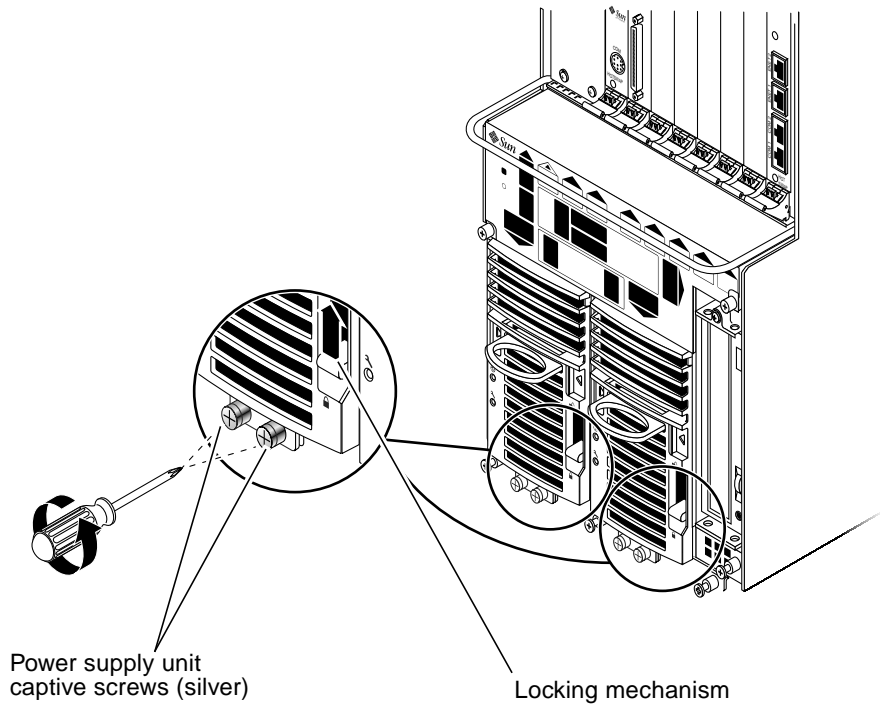
---



**FIGURE 8-12** Locating the Power Supply Unit LEDs on the System Status Panel (Netra CT 810 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 810 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 810 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.



**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.

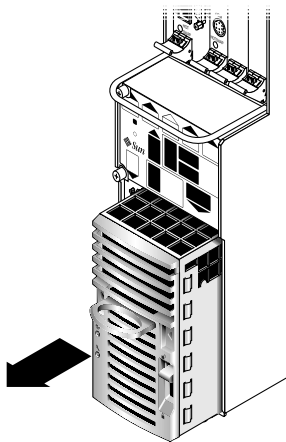
FIGURE 8-13 shows the location of the captive screws for a power supply unit on a Netra CT 810 server.

---

**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 Section 1.2, “Attaching the Antistatic Wrist Strap” on page 1-2.

### 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 810 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 810 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 810 server.

The amber LEDs (  ) on the system status panel for both power supply units in the Netra CT 810 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 Fan Tray

This section describes you how to remove and replace a fan tray in both the Netra CT 810 server and the Netra CT 410 server.

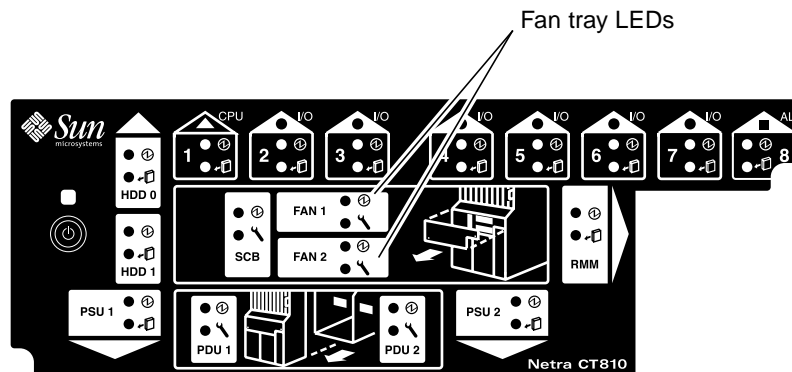
If the temperature rises above 158°F (70°C), the CPU card sends out a warning that the system is overheating. If the temperature rises above 167°F (75°C), then the system shuts down automatically. Note that the temperatures above are not ambient air temperatures, but rather the CPU temperatures that are monitored by a thermistor located under the heatsink on the host CPU card.

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.

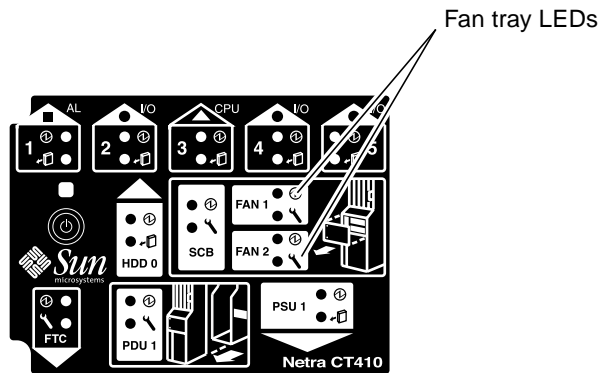
### 8.5.1 Removing a Fan Tray

1. Go to the front of the system and use the system status panel to determine if a fan tray has failed.

FIGURE 8-15 shows the locations of the fan tray LEDs on the Netra CT 810 server and FIGURE 8-16 shows the locations of the fan tray LEDs on the Netra CT 410 server.



**FIGURE 8-15** Locating the Fan Tray LEDs on the System Status Panel (Netra CT 810 Server)



**FIGURE 8-16** Locating the Fan Tray LEDs on the System Status Panel (Netra CT 410 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.**

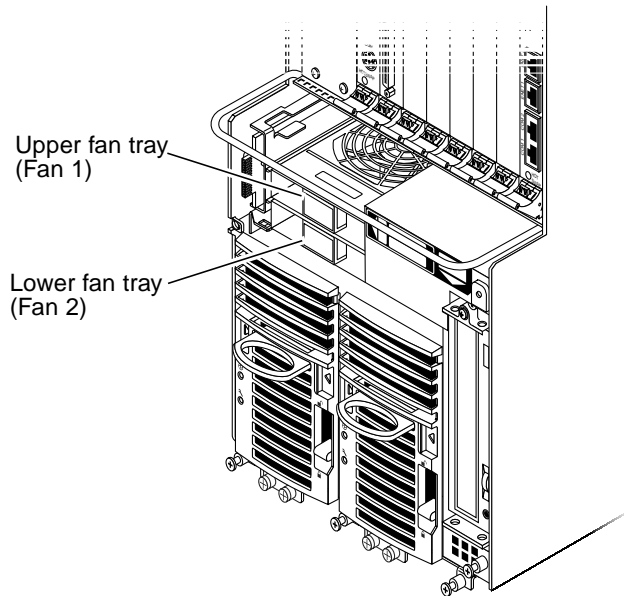
Refer to Section 8.1.1, "Removing the System Status Panel" on page 8-2 for those instructions.

**4. Locate the fan tray that has failed.**

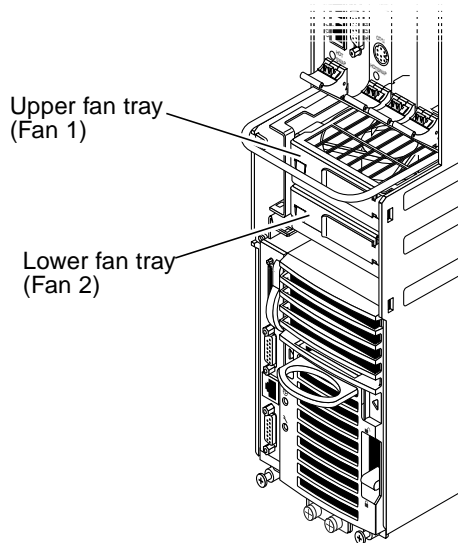
- If the *Fan 1* LEDs were in a failed state on the system status panel, the *upper* fan tray has failed.
- If the *Fan 2* LEDs were in a failed state on the system status panel, the *lower* fan tray has failed.

FIGURE 8-17 shows the locations of the fan trays in a Netra CT 810 server and FIGURE 8-18 shows the locations of the fan trays in a Netra CT 410 server.





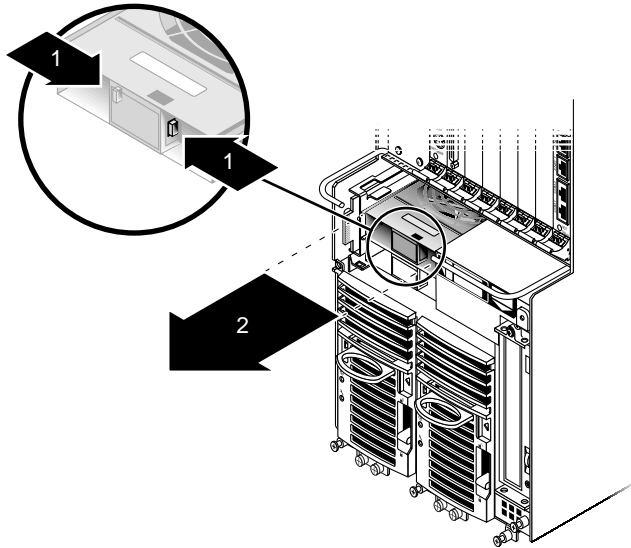
**FIGURE 8-17** Locating the Fan Trays in a Netra CT 810 Server



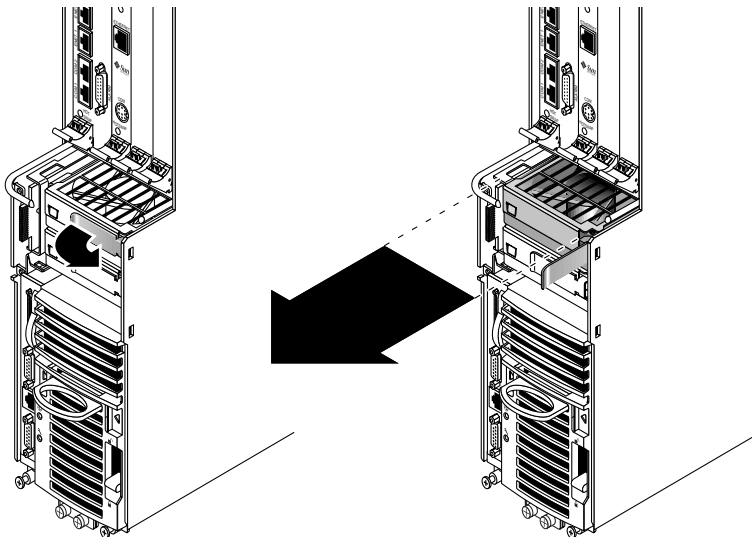
**FIGURE 8-18** Locating the Fan Trays in a Netra CT 410 Server

## 5. Remove the fan tray from the system.

- If you are removing a fan tray from a Netra CT 810 server, squeeze on the tabs on the sides of the fan tray handle to disengage it from the server (FIGURE 8-19).
- If you are removing a fan tray from a Netra CT 410 server, pull on the fan tray handle to disengage it from the server (FIGURE 8-20).



**FIGURE 8-19** Removing a Fan Tray from a Netra CT 810 Server



**FIGURE 8-20** Removing a Fan Tray from a Netra CT 410 Server

## 8.5.2 Replacing a Fan Tray

### 1. Insert the fan tray into the system:

- If you are installing a fan tray into a Netra CT 810 server, press the fan tray into place until the fan tray clicks into place (FIGURE 8-19).
- If you are installing a fan tray into a Netra CT 410 server, make 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 8-20).

### 2. Install the system status panel on the system.

Refer to Section 8.1.2, “Replacing the System Status Panel” on page 8-4 for those instructions.

### 3. Verify that the fan tray LEDs are lit properly.

FIGURE 8-15 shows the locations of the fan tray LEDs on the Netra CT 810 server and FIGURE 8-16 shows the locations of the fan tray LEDs on the Netra CT 410 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

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Removing and Replacing the Servers	Chapter 9
Removing and Replacing Cold-Swappable Subassemblies	Chapter 10



# Removing and Replacing the Servers

---

This chapter specifies procedures for the installation, removal, and replacement of the Netra CT 810 server and Netra CT 410 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 before performing the procedures in this chapter.

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## 9.1 Servers

You can power down and remove one server without affecting the other servers in the chassis.

- Section 9.1.1, “Removing a Server” on page 9-2
- Section 9.1.2, “Installing a Server” on page 9-9

## 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 Section 2.2, “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.

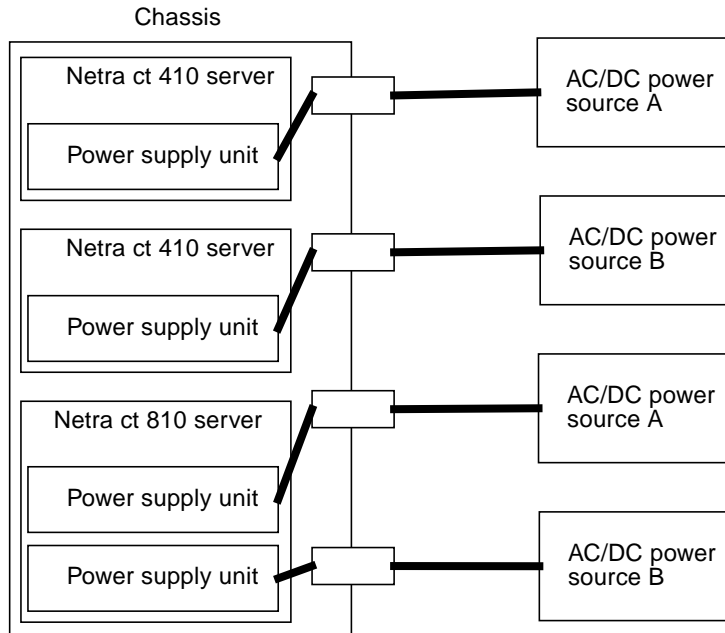
### 2. Disconnect the power cable(s) from the appropriate connectors.

For rear-access models, disconnect the power cable(s) from the connectors at the rear of the chassis; for front-access models, disconnect the power cable(s) from the connectors at the front of the chassis. Keep the following in mind when disconnecting power cables:

- A Netra CT 810 server has *two* power supply units, so you must disconnect two power cables when removing a Netra CT 810 server
- A Netra CT 410 server has *one* power supply unit, so you must disconnect one power cable when removing a Netra CT 810 server

FIGURE 9-1 shows sample server configurations. You do not have to disconnect the power cables from any connectors other than the ones supplying power to the server that you want to remove; doing so will power off other servers in the chassis.





**FIGURE 9-1** Power Supply Units and Power Sources



**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 810 server or Netra CT 410 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 810 server or Netra CT 410 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 *front* of the server.**

You will be disconnecting the cables from the *front* of 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. Note that you do not have to unplug any cables connected to cards installed in the rear of the chassis.

**6. Unplug all cables from the cards installed in the *front* of the server.**

**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:

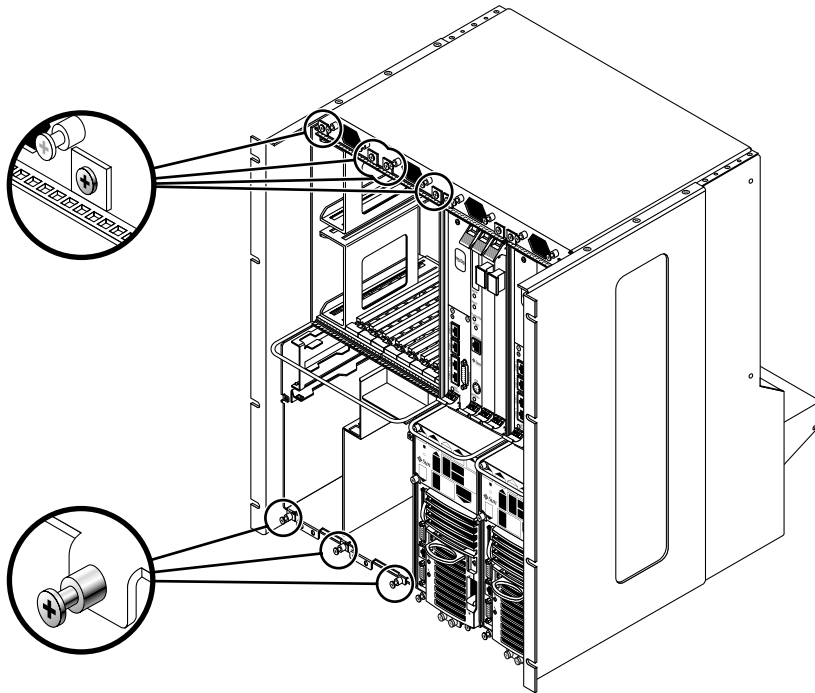
- Section 7.2.1, "Removing a DVD or DAT Drive" on page 7-10 (Netra CT 810 server)
- Section 8.1.1, "Removing the System Status Panel" on page 8-2
- Section 8.2.1, "Removing the System Controller Board" on page 8-6
- Section 8.3.1, "Removing the Air Filters" on page 8-10
- Section 8.5.1, "Removing a Fan Tray" on page 8-17
- Section 6.1.2.1, "Removing a Main Card" on page 6-8
- Section 10.1.1, "Removing a Hard Disk Drive" on page 10-2
- Section 10.5.1, "Removing a Cold-Swappable Power Supply Unit" on page 10-16

Remove the following additional components if you have a *front-access* model:

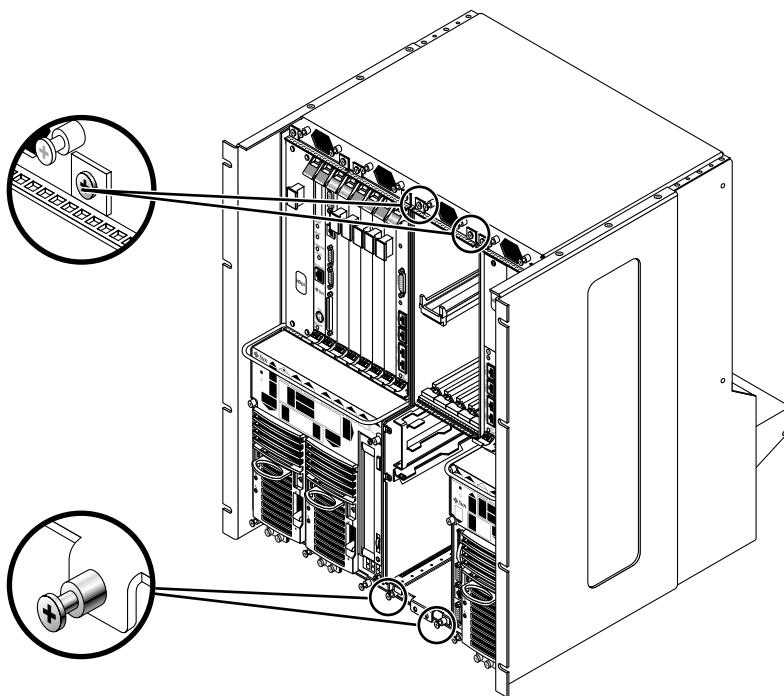
- Section 10.4.1, "Removing the Front-Access DC Cable" on page 10-13
- Section 6.2.1, "Removing a Host CPU Front Transition Card" on page 6-26 (front-access models)

**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 810 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 410 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 810 Server

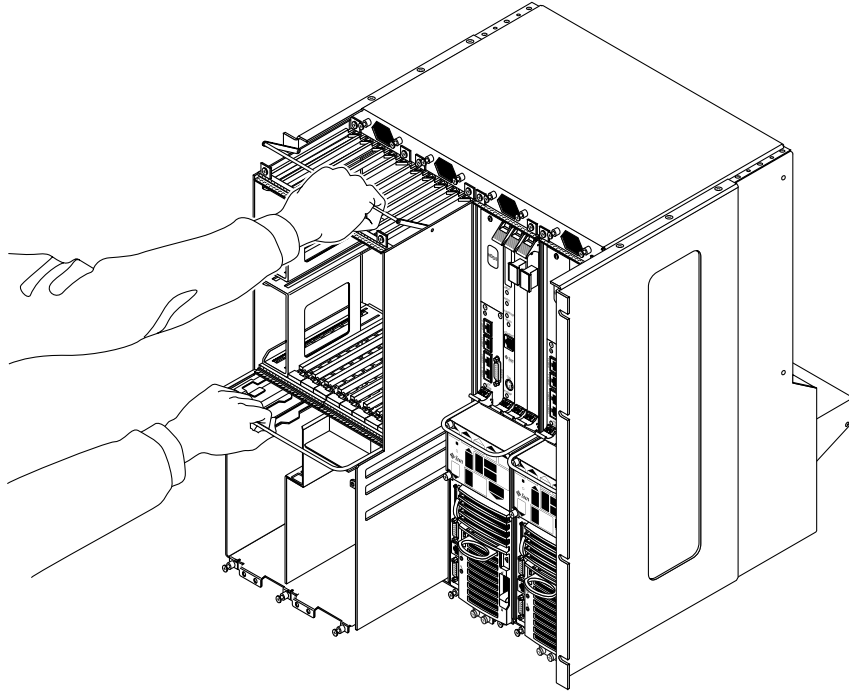


**FIGURE 9-3** Loosening the Screws at the Top and Bottom of a Netra CT 410 Server

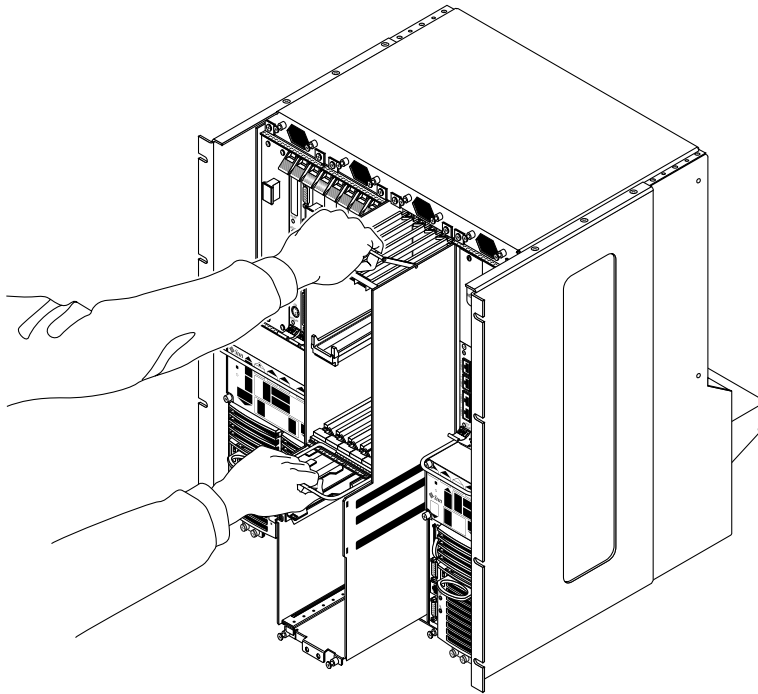
- 9. Grasp the server handle and slowly pull the server out of the chassis until the purple server bar at the top of the server is visible.**

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 server handle and the bar.

FIGURE 9-4 shows how to remove a Netra CT 810 server from the chassis and FIGURE 9-5 shows how to remove a Netra CT 410 server from the chassis.



**FIGURE 9-4** Removing or Inserting a Netra CT 810 Server



**FIGURE 9-5** Removing or Inserting a Netra CT 410 Server

- 11. Set the server aside on a flat surface.**
- 12. Secure a blank filler panel over the empty server slot, if necessary.**

If you are not going to replace the server right away, you must install a blank filler panel over the opening to ensure proper airflow in the system. The filler panel is secured to the chassis using four screws, two at the top of the filler panel and two at the bottom.

## 9.1.2 Installing a Server

See the *Netra CT Server Product Overview* for combinations of Netra CT 410 server and Netra CT 810 server supported within a chassis.



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**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.

---

**1. Remove the blank filler panel, if necessary.**

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

**2. With your left hand, grasp the server handle.**

**3. 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 server handle and the server bar.**

FIGURE 9-4 shows how to insert a Netra CT 810 server into the chassis and FIGURE 9-5 shows how to insert a Netra CT 410 server into the chassis.

**4. Push the purple server bar at the top of the server down and gently push the server the remaining distance into the chassis.**

**5. Using a No. 2 Phillips screwdriver, tighten the captive screws that secure the server to the chassis.**

Tighten the screws on the server to a torque of 0.45 - 0.68 N.m (4 - 6 in.-lb).

- If you are installing a Netra CT 810 server, tighten the *four* black captive 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 410 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).

**6. If you have a *rear-access* model, reseal all the rear transition cards into the server that you just replaced.**

**7. 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 810 server or Netra CT 410 server, you must connect all the cables and reinstall all the components that you removed from the faulty server. Go to Step 8.
- If you are installing a *functioning* Netra CT 810 server or Netra CT 410 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 10.

**8. 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:

- Section 7.2.2, “Installing a DVD or DAT Drive” on page 7-13 (Netra CT 810 server)
- Section 8.1.2, “Replacing the System Status Panel” on page 8-4
- Section 8.2.2, “Replacing the System Controller Board” on page 8-8
- Section 8.3.2, “Replacing the Air Filters” on page 8-12
- Section 8.5.2, “Replacing a Fan Tray” on page 8-21
- Section 6.1.2.2, “Inserting a Main Card” on page 6-15
- Section 10.1.2, “Replacing a Hard Disk Drive” on page 10-4
- Section 10.5.2, “Replacing a Cold-Swappable Power Supply Unit” on page 10-19

Replace the following components if you have a *front-access* model:

- Section 10.4.2, “Replacing a Front-Access DC Cable” on page 10-15
- Section 6.2.2, “Installing a Host CPU Front Transition Card” on page 6-27 (front-access models)

**9. Plug all the cables into the server.**

**10. Connect the DC input power cable(s) to the DC connector(s) for the server you just replaced.**

**11. Power on the server.**

Refer to Section 2.1, “Powering On the Server” on page 2-2 for those instructions.



## Removing and Replacing Cold-Swappable Subassemblies

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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:

- Section 10.1, “Hard Disk Drive” on page 10-1
- Section 10.2, “Power Distribution Unit (DC Models Only)” on page 10-4
- Section 10.3, “AC Power Entry Unit (AC Models Only)” on page 10-11
- Section 10.4, “Front-Access DC Cable (Front-Access DC Models Only)” on page 10-13
- Section 10.5, “Power Supply Unit” on page 10-16

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.

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### 10.1 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 410 server has one disk bay and the Netra CT 810 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 410 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 Section 7.1, “Hard Disk Drive” on page 7-2.

## 10.1.1 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.

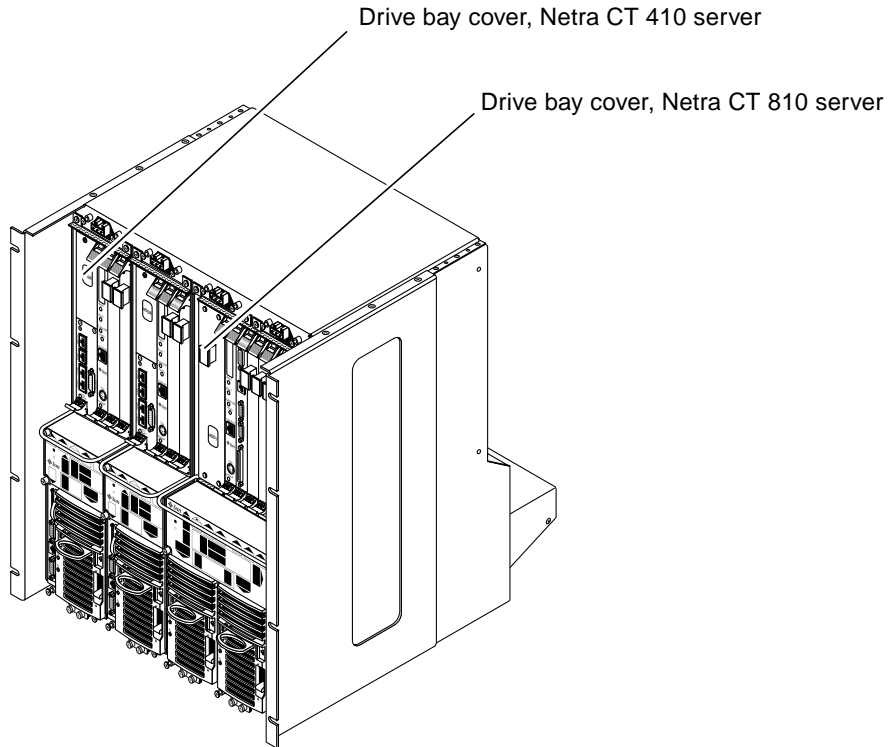
Refer to Section 2.2, “Powering Off the Server” on page 2-6 for those instructions.

### 2. Attach the antistatic wrist strap.

Refer to Section 1.2, “Attaching the Antistatic Wrist Strap” on page 1-2.

### 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 810 server and one behind the drive bay cover in a Netra CT 410 server.



**FIGURE 10-1** Drive Bay Cover Locations

**4. Loosen the captive screws that hold the drive bay cover in place.**

- For the Netra CT 810 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 410 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 10-1).**

You must install the drive bay cover over the drive bays to ensure proper airflow in the system.

## **10.1.2 Replacing a Hard Disk Drive**

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

Refer to Section 1.2, “Attaching the Antistatic Wrist Strap” on page 1-2.

**2. Remove the drive bay cover (FIGURE 10-1).**

**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 Section 2.1, “Powering On the Server” on page 2-2 for more information.

**9. If you are replacing your boot disk, reinstall the Solaris operating environment.**

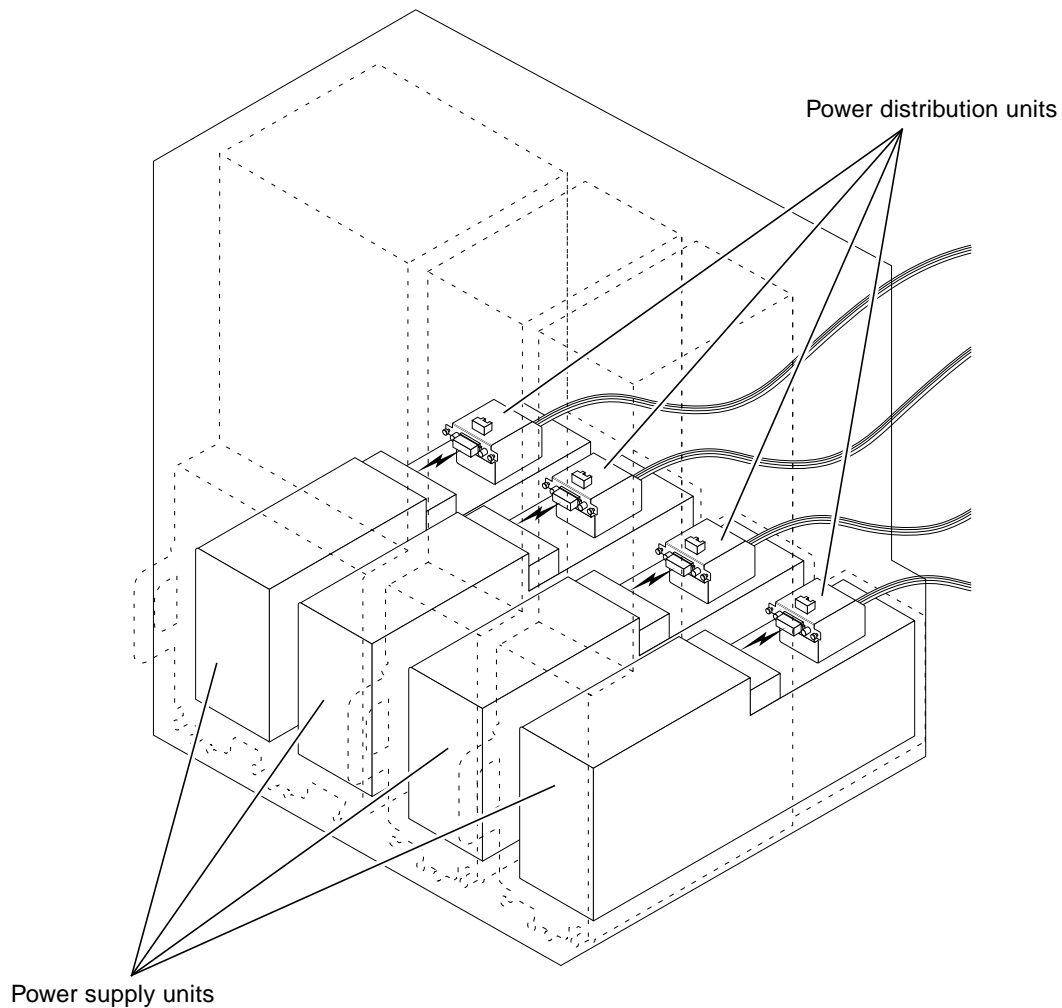
Refer to the *Netra CT Server Installation Guide* for more information.

**10. If your hard disk(s) are under the control of RAID software, perform the necessary steps to bring the disks online.**

---

## **10.2 Power Distribution Unit (DC Models Only)**

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 10-2).

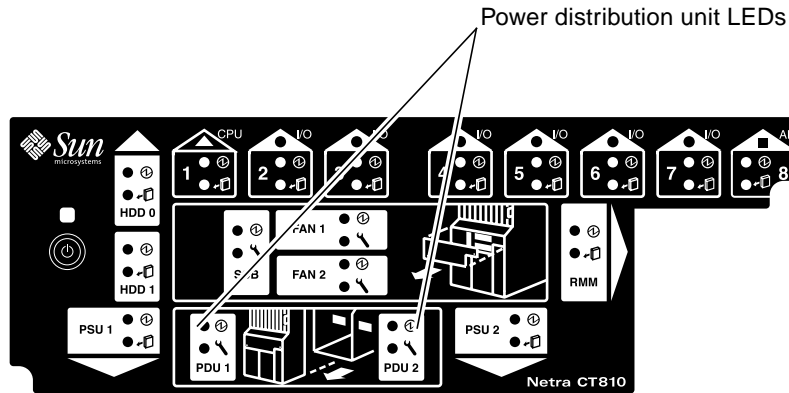


**FIGURE 10-2** Locating the Power Distribution Units

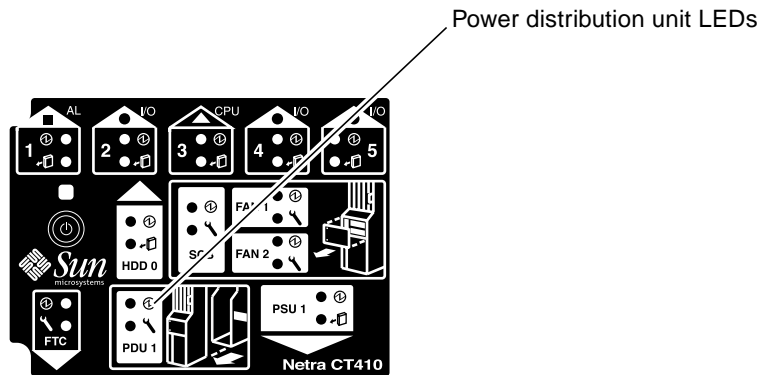
## 10.2.1 Removing the Power Distribution Unit

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 10-3 shows the locations of the power distribution unit LEDs on the Netra CT 810 server and FIGURE 10-4 shows the location of the power distribution unit LEDs on the Netra CT 410 server.



**FIGURE 10-3** Locating the Power Distribution Unit LEDs on the System Status Panel (Netra CT 810 Server)



**FIGURE 10-4** Locating the Power Distribution Unit LEDs on the System Status Panel (Netra CT 410 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.

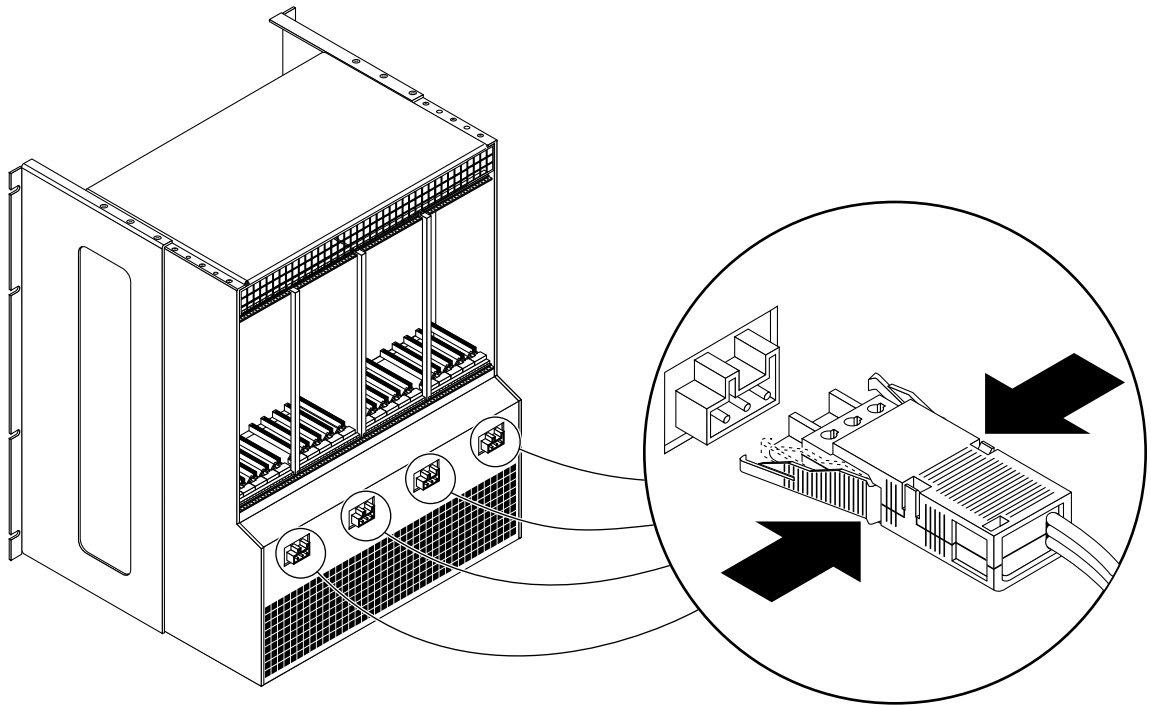
FIGURE 10-5 shows how to disconnect the DC input power cables from the DC connectors on the rear-access model and FIGURE 10-6 shows how to disconnect the DC input power cables from the DC connectors on the front-access model.



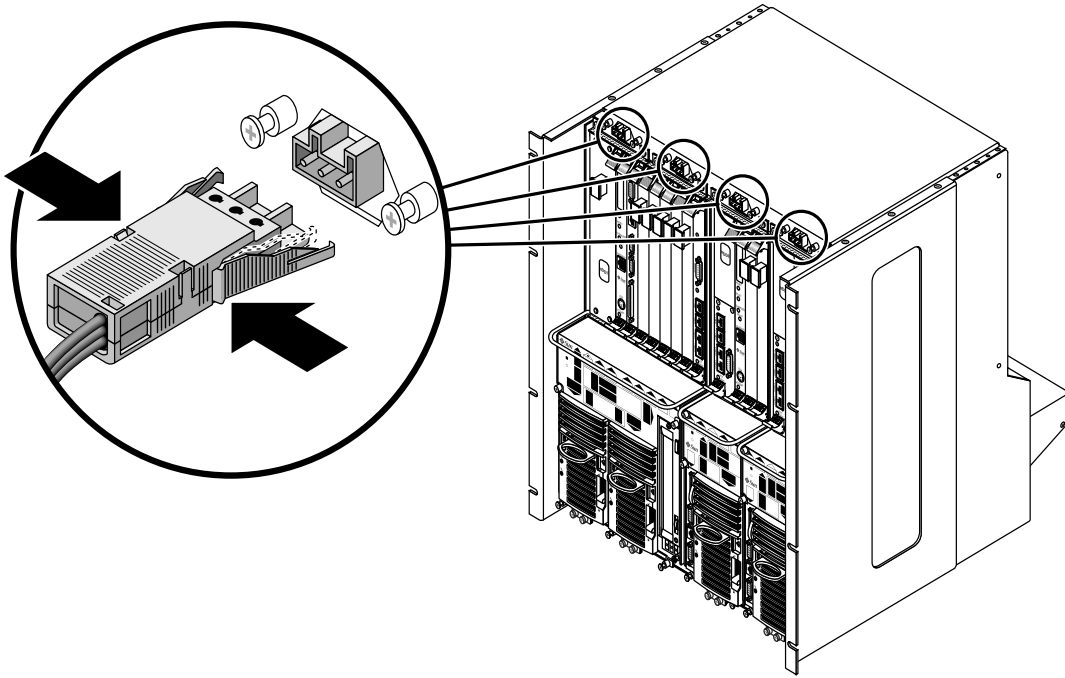
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**Caution** – An energy hazard is present if you do not unplug the DC input power cable from the DC connector that supplies power to the power distribution unit that you are replacing.

---



**FIGURE 10-5** Unplugging the DC Input Power Cable From the DC Connector, Rear-Access Model



**FIGURE 10-6** Unplugging the DC Input Power Cable From the DC Connector, Front-Access Model

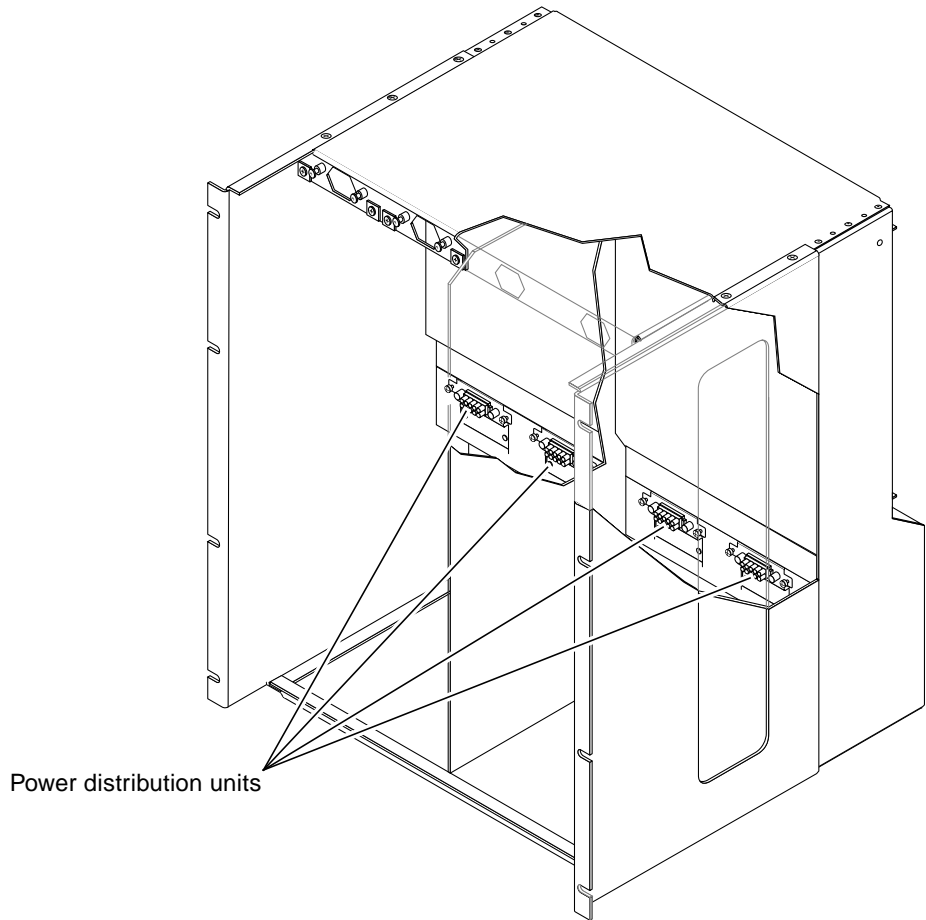
**3. Perform all the necessary procedures to remove the server in front of the failed power distribution unit, including all software power-off procedures.**

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 Section 9.1.1, “Removing a Server” on page 9-2 to safely remove the server.

**4. Locate the power distribution unit that you want to replace.**

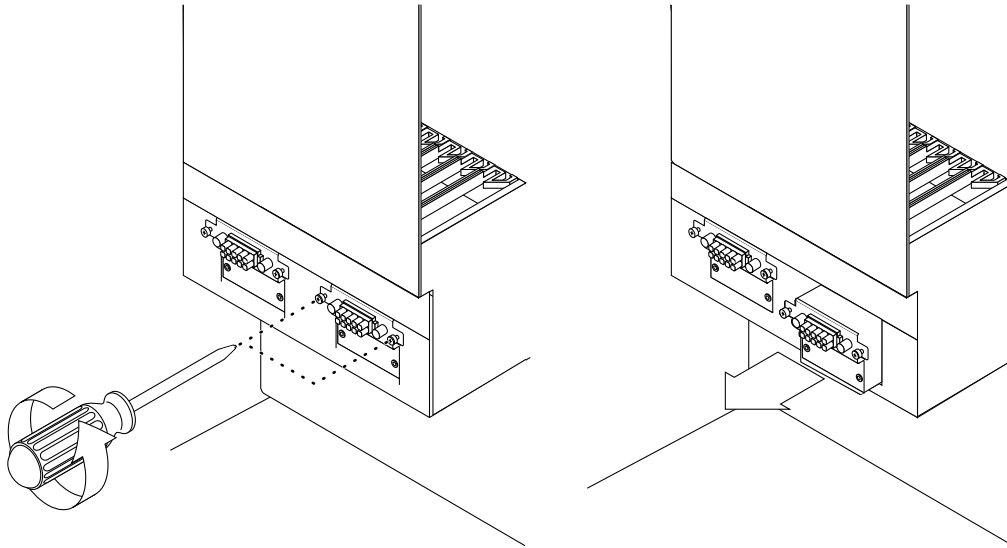
FIGURE 10-7 shows the location of the power distribution units looking at an empty chassis from the front.





**FIGURE 10-7** Locating the Power Distribution Units

- 5. For front-access models, carefully reach into the chassis from the front and unplug the front-access DC 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 10-8).**



**FIGURE 10-8** Removing the Power Distribution Unit

- 7. Remove the power distribution unit from the chassis.**

## 10.2.2 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 10-8).**
- 3. Plug the DC input power cable(s) into the appropriate DC connector(s).**

FIGURE 10-5 shows how to plug the DC input power cables into the DC connectors on the rear-access model and FIGURE 10-6 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 Section 9.1.2, “Installing 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 10-3 shows the locations of the power distribution unit LEDs on the Netra CT 810 server and FIGURE 10-4 shows the locations of the power distribution unit LEDs on the Netra CT 410 server. A power distribution unit is functioning properly if a power supply is inserted and the green Power LED (🔌) for the PDU is ON.

---

## 10.3 AC Power Entry Unit (AC Models Only)

The AC power entry unit provides power to all of the servers in the chassis, so you have to power off all of the servers in the chassis in order to remove or install an AC power entry unit. Note that you do not have to remove any of the AC power supply units to remove or install the AC power entry unit.

The part number for the AC power entry unit is F510-5148.

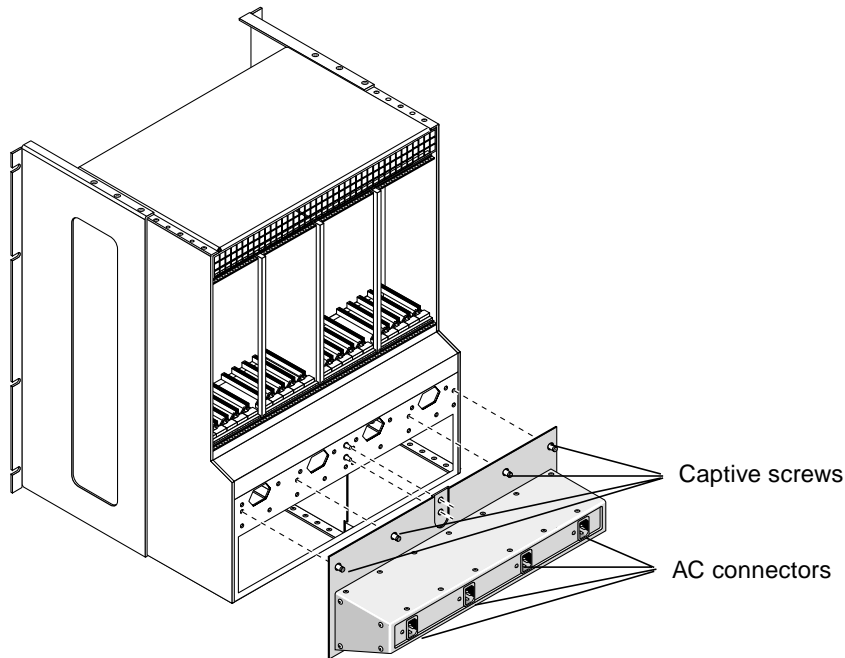
### 10.3.1 Removing the AC Power Entry Unit

- 1. Power off all of the Netra CT servers in the chassis.**

Refer to Section 2.2, “Powering Off the Server” on page 2-6 for those instructions.

- 2. Unplug all AC cables from the AC connectors at the rear of the chassis.**

FIGURE 10-9 shows the locations of the AC connectors at the rear of the chassis.



**FIGURE 10-9** AC Connectors on a Netra CT Chassis

3. Using a No. 2 Phillips screwdriver, loosen the four captive screws that secure the AC power entry unit to the rear of the chassis.

FIGURE 10-9 shows the locations of the four captive screws at the rear of the chassis.

4. Tilt the top of the AC power entry unit away from the chassis, then lift the AC power entry unit up and away from the chassis.

## 10.3.2 Installing the AC Power Entry Unit

1. Go to the rear of the chassis and insert the lower lip of the AC power entry unit into the opening at the rear of the chassis.
2. Press the top of the AC power entry unit against the chassis.
3. Tighten the four captive screws to secure the AC power entry unit to the chassis (FIGURE 10-9).

Tighten the screws to between 4 and 6 in/lbs torque.

4. Plug all the AC cables into the AC connectors at the rear of the chassis (FIGURE 10-9).

**5. Power on all of the Netra CT servers in the chassis.**

Refer to Section 2.1, “Powering On the Server” on page 2-2 for those instructions.

**6. Verify that all power supplies are functioning properly.**

The green power LED (🔌) on the power supply unit should go ON.

---

## 10.4 Front-Access DC Cable (Front-Access DC Models Only)

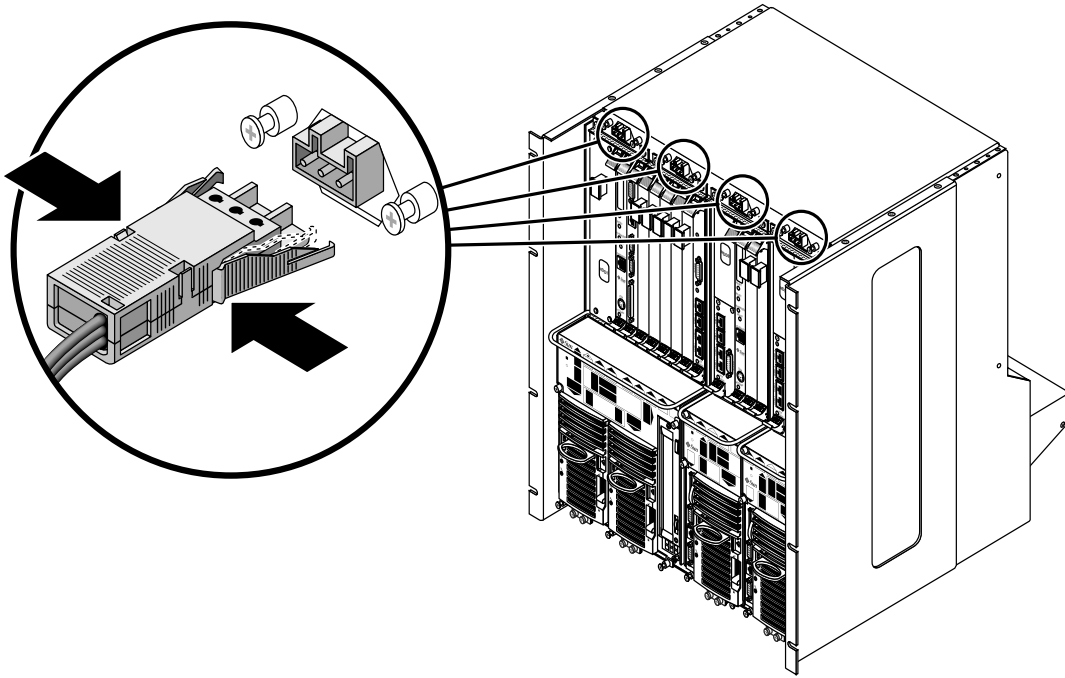
The front-access DC cable is used to connect the power distribution unit to the power connector at the front of the front-access DC models of the Netra CT 810 server and the Netra CT 410 server.

### 10.4.1 Removing the Front-Access DC Cable

**1. Perform all the necessary procedures to remove the server directly in front of the failed front-access DC cable, including all software power-off procedures.**

You must completely remove the server directly in front of the failed front-access DC cable in order to gain access to that cable. Follow the instructions in Section 9.1.1, “Removing a Server” on page 9-2 to safely remove the server.

**2. Unplug the DC input power cable from the DC connector at the front of the chassis (FIGURE 10-10).**



**FIGURE 10-10** Unplugging the DC Input Power Cable From the DC Connector, Front-Access Model

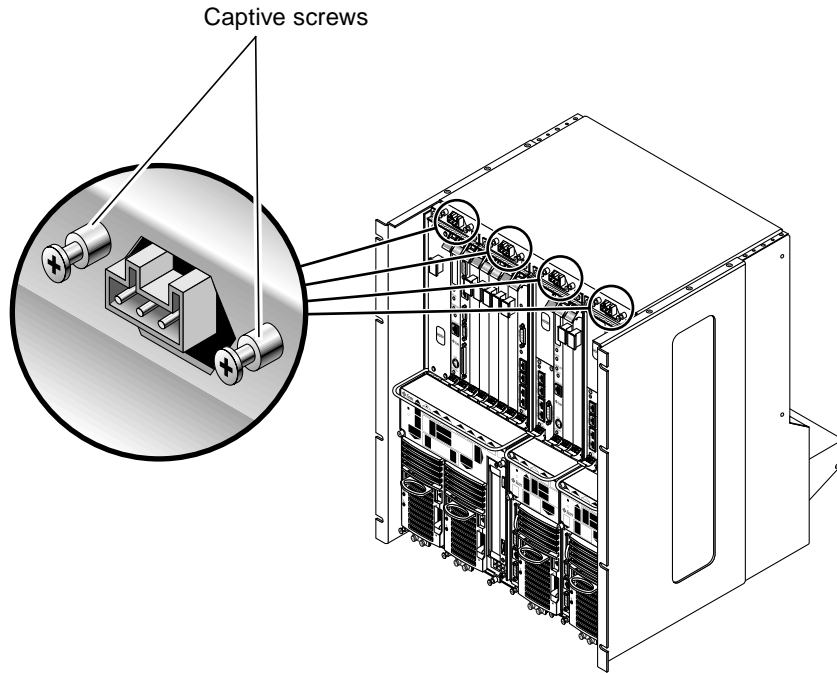


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**Caution** – An energy hazard is present if you do not unplug the DC input power cable from the DC connector.

---

3. At the front of the chassis, loosen the two captive screws that secure the front-access DC cable to the chassis.



**FIGURE 10-11** Loosening the Front-Access DC Cable Screws

- 4. Reach into the chassis and gently pull the front-access DC 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 DC cable from the cable clips along the top inside the chassis.**

## **10.4.2 Replacing a Front-Access DC 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 DC cable through the holes at the top of the chassis (FIGURE 10-11).**
- 3. Hook the front-access DC cable to the cable clips along the top inside of the chassis.**
- 4. Tighten the two captive screws to secure the cable to the chassis (FIGURE 10-11).**

5. **Perform all the necessary procedures to reinsert the server that you removed to access the failed front-access DC cable, including all system power-up procedures.**  
Refer to Section 9.1.2, “Installing a Server” on page 9-9 for those instructions.
6. **Connect the DC input power cable to the DC connectors at the front of the chassis (FIGURE 10-10).**

---

## 10.5 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 810 server or the only power supply unit in the Netra CT 410 server.

---

**Note** – If you are replacing one power supply unit in a Netra CT 810 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.

---

### 10.5.1 Removing a Cold-Swappable Power Supply Unit

1. **Power off the server.**

Refer to Section 2.2, “Powering Off the Server” on page 2-6 for those instructions.

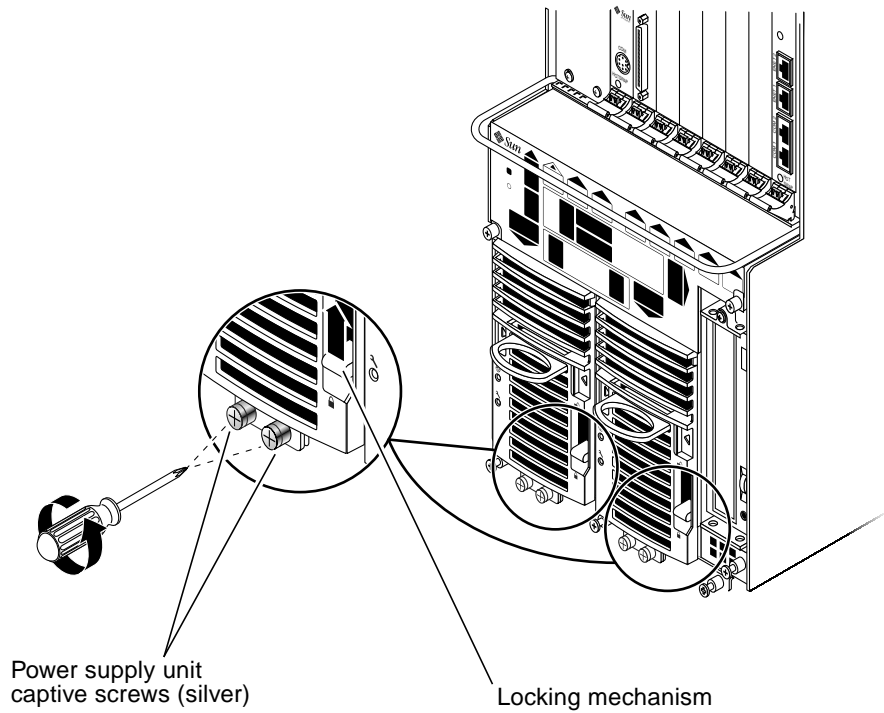
2. **Attach the antistatic wrist strap.**

Refer to Section 1.2, “Attaching the Antistatic Wrist Strap” on page 1-2.

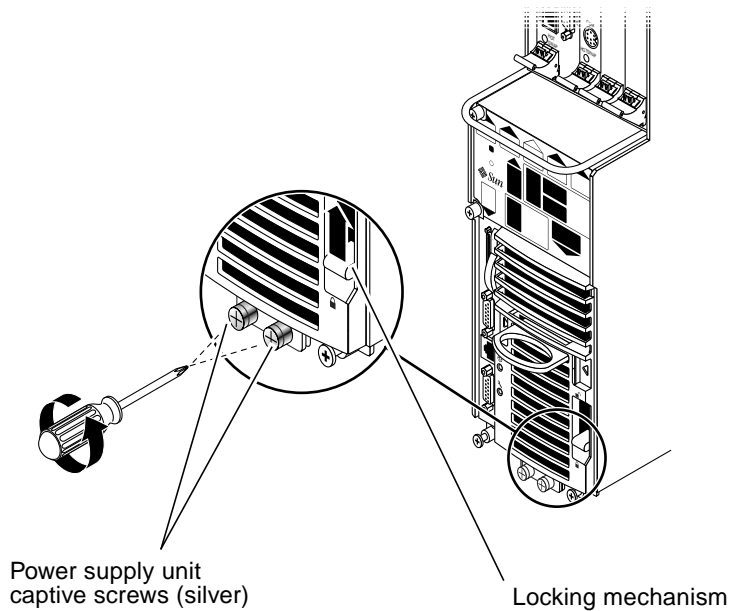
3. **Push the purple locking mechanism up into the unlocked (  ) position.**

FIGURE 10-12 shows the location of the locking mechanism for the power supply unit on a Netra CT 810 server, and FIGURE 10-13 shows the location of the locking mechanism for the power supply unit on a Netra CT 410 server. The two LEDs on the power supply unit should go OFF.





**FIGURE 10-12** Removing or Replacing a Power Supply Unit From a Netra CT 810 Server



**FIGURE 10-13** Removing or Replacing a Power Supply Unit From a Netra CT 410 Server

4. Using a No. 2 Phillips screwdriver, loosen the two *silver* captive screws at the base of the system.

FIGURE 10-12 shows the location of the captive screws for the power supply unit on a Netra CT 810 server, and FIGURE 10-13 shows the location of the captive screws for the power supply unit on a Netra CT 410 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 10-14), slide it out of the server and place it on the electrostatic discharge mat.

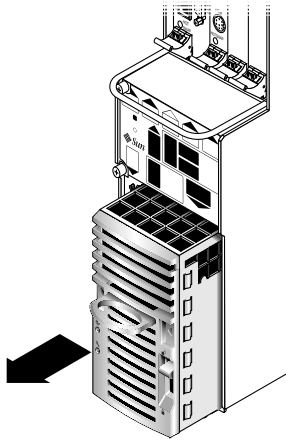


FIGURE 10-14 Removing a Power Supply Unit From a Netra CT 410 Server

## 10.5.2 Replacing a Cold-Swappable Power Supply Unit

### 1. Attach the antistatic wrist strap.

Refer to Section 1.2, “Attaching the Antistatic Wrist Strap” on page 1-2.

### 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 10-12 shows the location of the captive screws for the power supply unit on a Netra CT 810 server, and FIGURE 10-13 shows the location of the captive screws for the power supply unit on a Netra CT 410 server.


### 4. Push the power supply unit locking mechanism(s) down into the locked ( ) position.

FIGURE 10-12 shows the location of the locking mechanisms for the power supply unit on a Netra CT 810 server, and FIGURE 10-13 shows the location of the locking mechanisms for the power supply unit on a Netra CT 410 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 Section 2.1, “Powering On the Server” on page 2-2 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**

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Illustrated Parts Breakdown

Chapter 11

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## Illustrated Parts Breakdown

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This chapter contains the illustrated parts breakdown and the part numbers for each field-replaceable unit (FRU) in the Netra CT server.

- Section 11.1, “DC Chassis Components” on page 11-2
- Section 11.2, “AC Chassis Components” on page 11-4
- Section 11.3, “Netra CT 810 Server” on page 11-6
- Section 11.4, “Netra CT 410 Server, Diskfull” on page 11-8
- Section 11.5, “Netra CT 410 Server, Diskless” on page 11-10

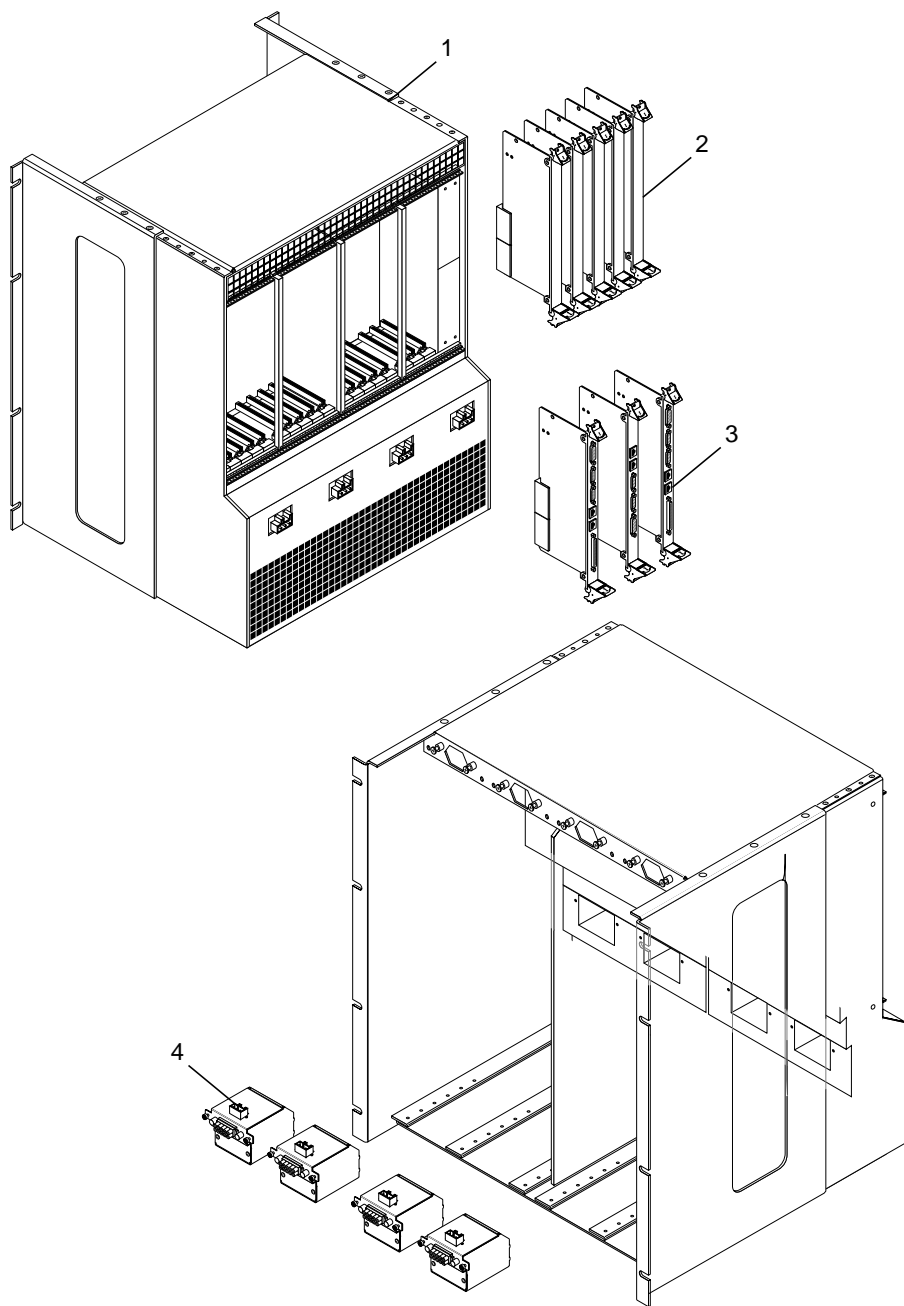
# 11.1 DC Chassis Components

TABLE 11-1 lists the FRUs for the DC chassis.

TABLE 11-1 FRUs for the DC Chassis

	FRU	Part Number
1	Chassis, front-access model	X7190A
1	Chassis, rear-access model	X7191A
2	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.
3	Alarm rear transition card (rear-access models only)	F501-6124, X7227A
3	Host CPU rear transition card (rear-access models only)	F501-5945
3	Satellite CPU rear transition card (rear-access models only)	F595-5949, XCP2060-TRN
4	Power distribution unit	F540-4397
	Front-access DC cable (front-access models only)	F530-2895





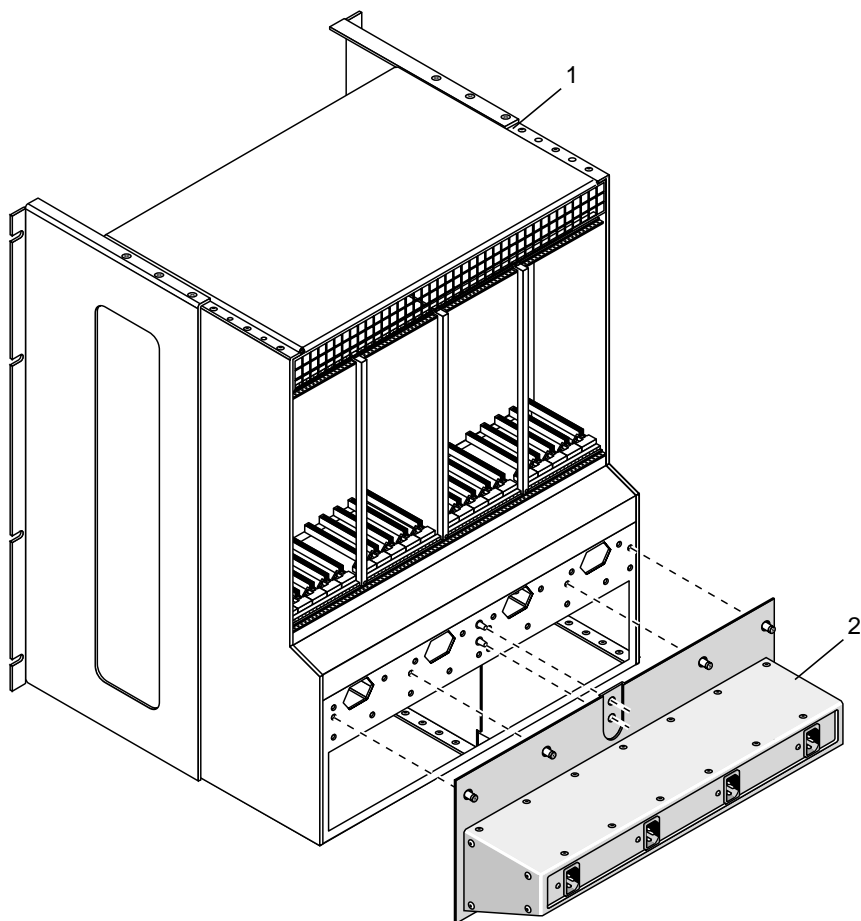
**FIGURE 11-1** Illustrated Parts Breakdown, DC Chassis and Rear-Access Model Components

# 11.2 AC Chassis Components

TABLE 11-1 lists the FRUs for the AC chassis.

TABLE 11-2 FRUs for the AC Chassis

	FRU	Part Number
1	Chassis, rear-access model	X7191A
2	AC power entry unit	F540-5148
	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.
	Alarm rear transition card (rear-access models only)	F501-6124, X7227A
	Host CPU rear transition card (rear-access models only)	F501-5945
	Satellite CPU rear transition card (rear-access models only)	F595-5949, XCP2060-TRN



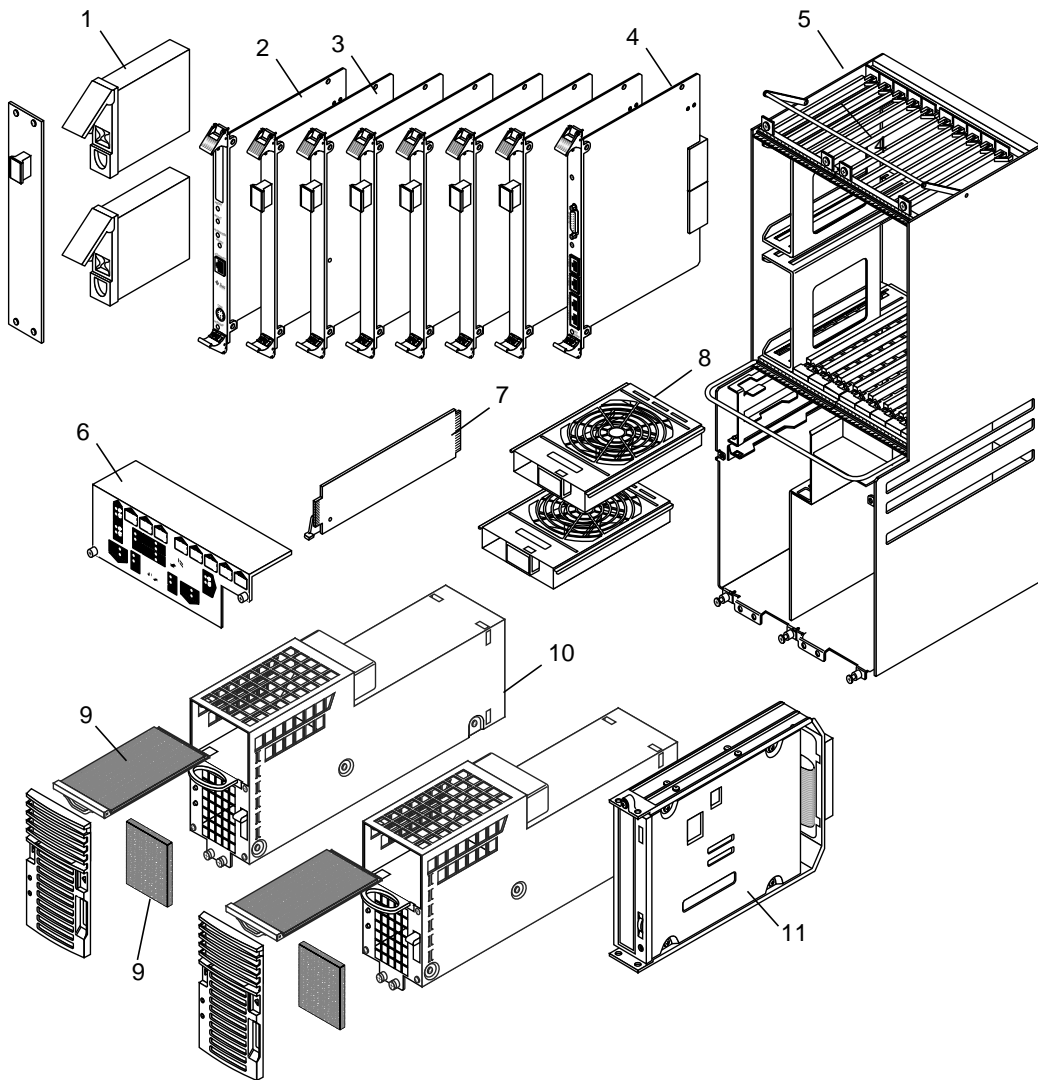
**FIGURE 11-2** Illustrated Parts Breakdown, AC Chassis and Rear-Access Model Components

## 11.3 Netra CT 810 Server

TABLE 11-3 lists the FRUs for the Netra CT 810 server.

**TABLE 11-3** FRUs for the Netra CT 810 Server

	FRU	Part Number
1	Hard disk drive, 36GB	F540-4689, X5244A
2	Host CPU card, 650 MHz, 1GB RAM	F501-6403
2	Host CPU card, 650 MHz, 2GB RAM	F501-6416
3	6U I/O cards	Varies depending on the I/O card. Contact your local Sun service representative for more information.
3	6U satellite CPU cards	Varies depending on the satellite CPU card. Contact your local Sun service representative for more information
4	Alarm card, 6U single-wide	F501-6171, X7226A
5	Netra CT 810 server and midplane	F540-5025
6	System status panel, Netra CT 810 server	F540-5010, X7231A
7	System controller board	F501-6118, X7232A
8	Fan trays, Netra CT 810 server	F540-4928, X7229A
9	Main and power supply unit air filters	X7221A
10	DC power supply unit	F300-1535, X7193A
10	AC power supply unit	F300-1543, X7194A
11	Removable media module, DVD	F540-4684
11	Removable media module, DAT	F540-4409



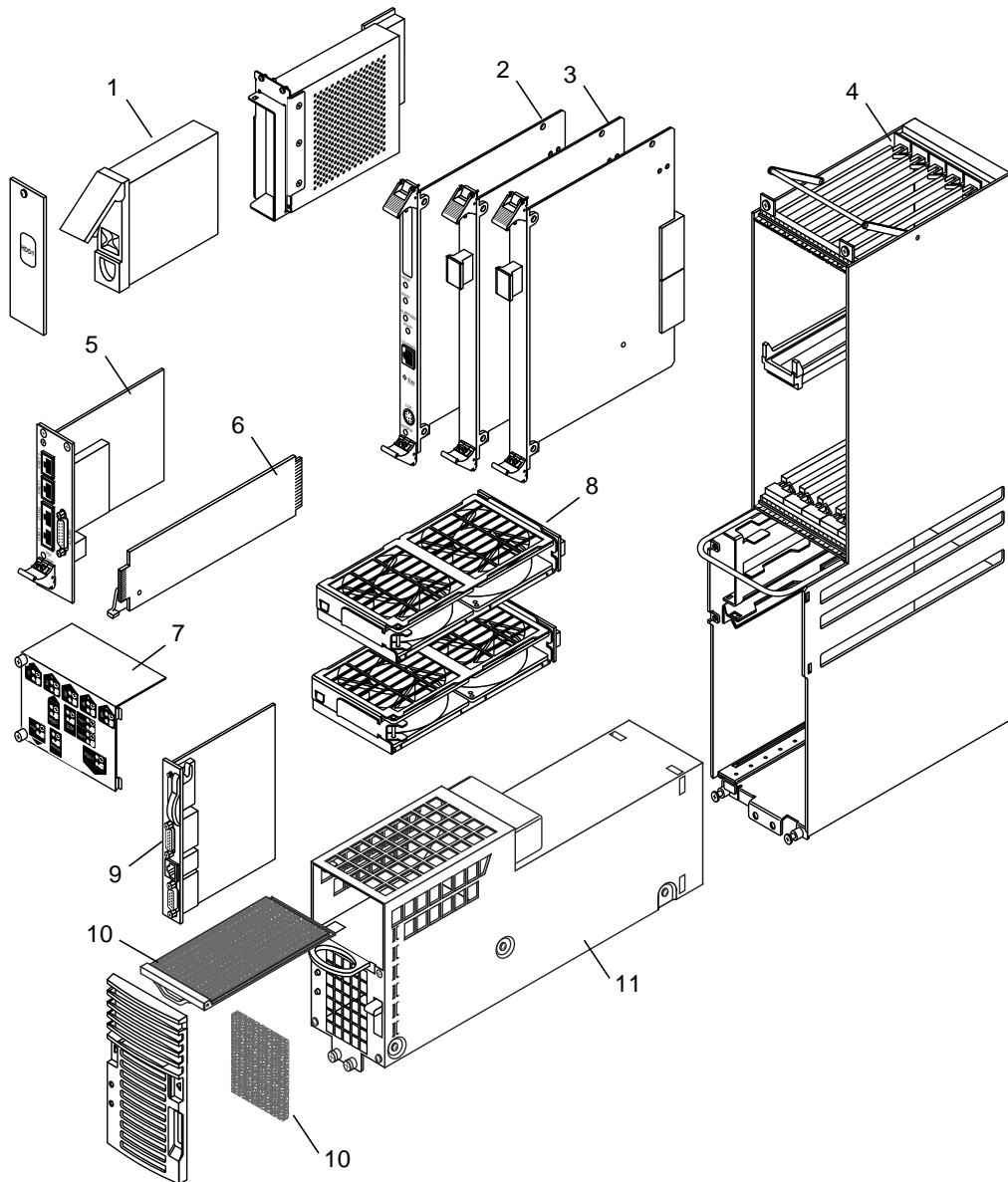
**FIGURE 11-3** Illustrated Parts Breakdown, Netra CT 810 Server

# 11.4 Netra CT 410 Server, Diskfull

TABLE 11-4 lists the FRUs for the diskfull Netra CT 410 server.

TABLE 11-4 FRUs for the Netra CT 410 Server, Diskfull

	FRU	Part Number
1	Hard disk drive, 36GB	F540-4689, X5244A
2	Host CPU card, 650 MHz, 1GB RAM	F501-6403
2	Host CPU card, 650 MHz, 2GB RAM	F501-6416
3	6U I/O cards	Varies depending on the I/O card. Contact your local Sun service representative for more information.
3	6U satellite CPU cards	Varies depending on the satellite CPU card. Contact your local Sun service representative for more information
4	Netra CT 410 server and midplane, diskfull	F540-5026
5	Alarm card, 3U double-wide	F501-6123, X7225A
6	System controller board	F501-6118, X7232A
7	System status panel, Netra CT 410 server	F540-5011, X7230A
8	Fan trays, Netra CT 410 server	F540-4931, X7228A
9	Host CPU front transition card, Netra CT 410 server (front-access models only)	F501-5624
10	Main and power supply air filters	X7221A
11	DC power supply unit	F300-1535, X7193A
11	AC power supply unit	F300-1543, X7194A
	Host CPU front termination board (rear-access models only)	F501-5619



**FIGURE 11-4** Illustrated Parts Breakdown, Diskfull Netra CT 410 Server

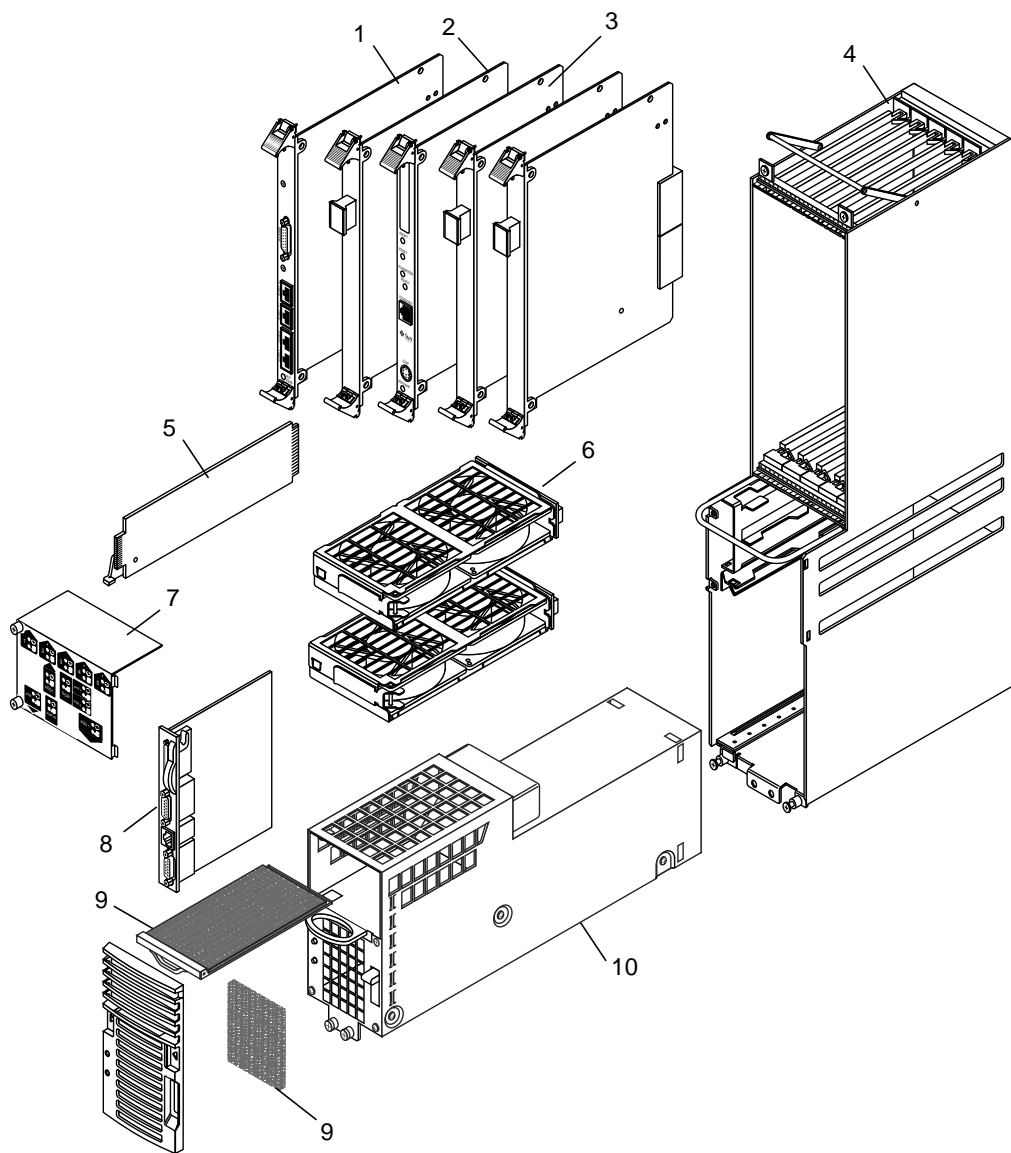
## 11.5 Netra CT 410 Server, Diskless

TABLE 11-4 lists the FRUs for the diskless Netra CT 410 server.

**TABLE 11-5** FRUs for the Netra CT 410 Server, Diskless

	FRU	Part Number
1	Alarm card, 6U single-wide	F501-6171, X7226A
2	6U I/O cards	Varies depending on the I/O card. Contact your local Sun service representative for more information.
2	6U satellite CPU cards	Varies depending on the satellite CPU card. Contact your local Sun service representative for more information
3	Host CPU card, 650 MHz, 1GB RAM	F501-6403
3	Host CPU card, 650 MHz, 2GB RAM	F501-6416
4	Netra CT 410 server and midplane, diskless	F540-5390
5	System controller board	F501-6118, X7232A
6	Fan trays, Netra CT 410 server	F540-4931, X7228A
7	System status panel, Netra CT 410 server	F540-5011, X7230A
8	Host CPU front transition card, Netra CT 410 server (front-access models only)	F501-5624
9	Main and power supply air filters	X7221A
10	DC power supply unit	F300-1535, X7193A
10	AC power supply unit	F300-1543, X7194A
	Host CPU front termination board (rear-access models only)	F501-5619





**FIGURE 11-5** Illustrated Parts Breakdown, Diskless Netra CT 410 Server



PART VI    **Appendixes, Glossary, and Index**

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Connector Pinouts	Appendix A
Connecting a Terminal Console to the Server	Appendix B
Error Messages	Appendix C
System Specifications	Appendix D

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## Connector Pinouts

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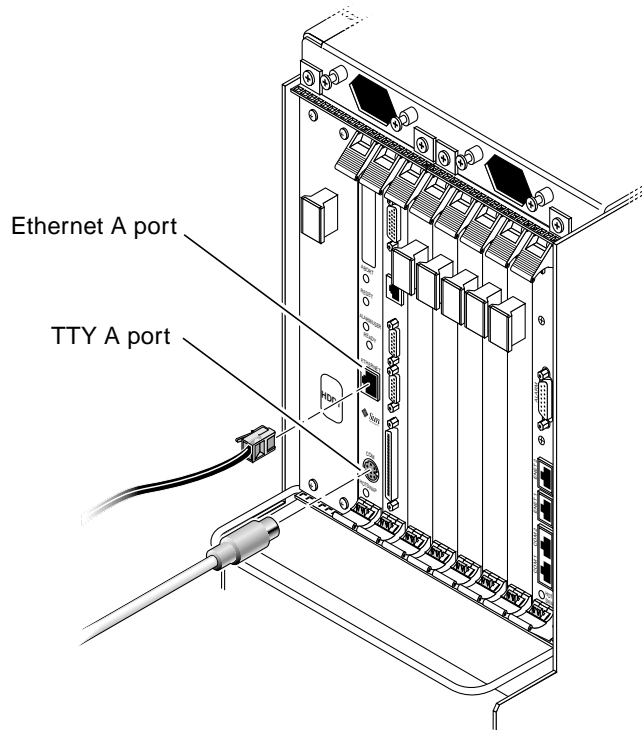
This appendix gives the connector pinouts for the following Netra CT server cards:

- Section A.1, “CPU Card” on page A-2
- Section A.2, “CPU Front Transition Card, Netra CT 410 Server” on page A-5
- Section A.3, “CPU Rear Transition Card” on page A-10
- Section A.4, “Alarm Card, 6U Single-Wide” on page A-15
- Section A.5, “Alarm Card, 3U Double-Wide” on page A-19
- Section A.6, “Alarm Rear Transition Card” on page A-23

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## A.1 CPU Card

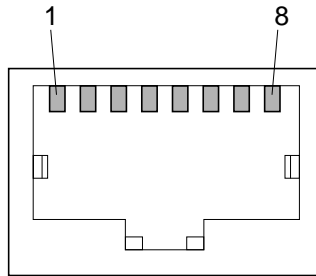
FIGURE A-1 shows the locations of the connectors on the CPU card.



**FIGURE A-1** Connectors on the CPU Card

## A.1.1 Ethernet A Port

The twisted pair Ethernet connector is an R-J45 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	4T_D3P
5	4T_D3P
6	RXD-
7	4T_D4P
8	4T_D4P

# A.1.2 TTY A 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.

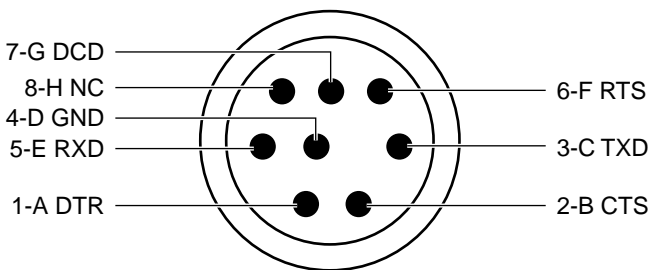


FIGURE A-3 TTY A Connector

TABLE A-2 shows the TTY A connector pinouts.

TABLE A-2 TTY A Connector Pinouts

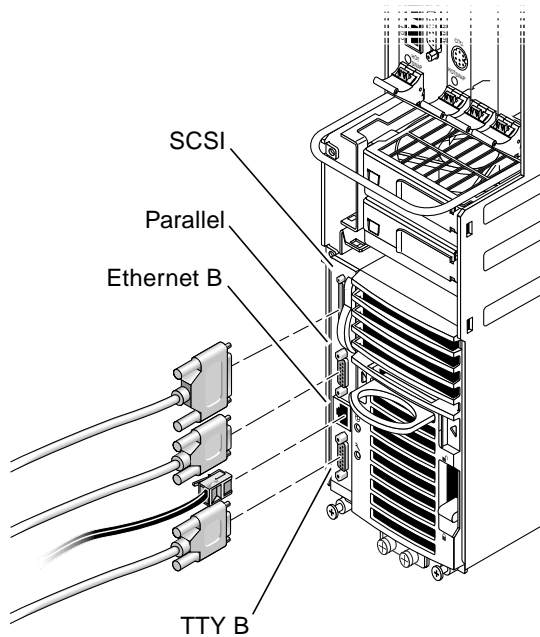
Pin	Signal Name	Pin	Signal Name
1	FP_SER_A_DTR	5	FP_SER_A_RXD
2	FP_SER_A_CTS	6	FP_SER_A_RTS
3	FP_SER_A_TXD	7	FP_SER_A_DCD
4	FP_SER_A_GND	8	GND



---

## A.2 CPU Front Transition Card, Netra CT 410 Server

FIGURE A-4 shows the locations of the connectors on the CPU front transition card (CPU FTC) for the Netra CT 410 server.



**FIGURE A-4** Connectors on the CPU Front Transition Card (Netra CT 410 Server)

## A.2.1 SCSI (VHDC)

The SCSI port on the CPU FTC for the Netra CT 410 server is a 68-pin CHAMP very high-density connector (VHDC). A VHDC-to-SCSI 3 cable is available through Sun, if necessary (part number 530-2453-xx, X3832A).

**TABLE A-3** SCSI Port Pinouts, CPU FTC for the Netra CT 410 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.2.2 Parallel Port

The parallel port on the CPU FTC for the Netra CT 410 server is an AMPLIMITE SLIMLINE female receptacle.

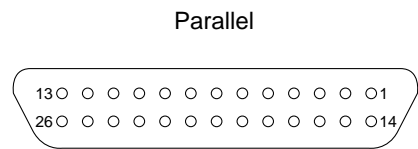


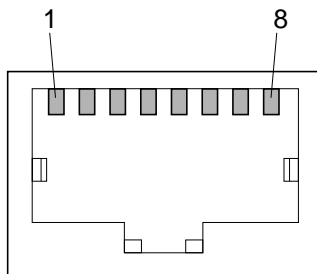
FIGURE A-5 Parallel Connector

TABLE A-4 Parallel Port Pinouts, CPU FTC for the Netra CT 410 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.2.3 Ethernet B Port

The Ethernet B port on the CPU FTC for the Netra CT 410 server is an RJ-45 connector for 10/100.



**FIGURE A-6** RJ-45 Ethernet Connector Diagram

**TABLE A-5** Ethernet B Connector Pinouts, CPU FTC for the Netra CT 410 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.2.4 TTY B

The TTY B port on the CPU FTC for the Netra CT 410 server is a DB-9 male connector.

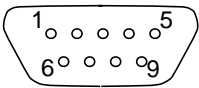


FIGURE A-7 TTY B Connector

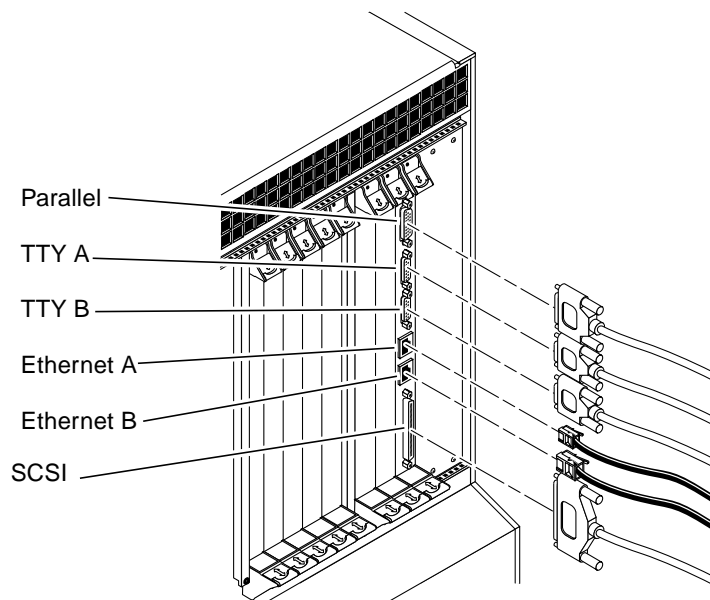
TABLE A-6 TTY B Port Pinouts, CPU FTC for the Netra CT 410 Server

Pin No.	Signal Name
1	DCD
2	RXD
3	TXD
4	DTR
5	GND
6	DSR
7	RTS
8	CTS
9	RI

---

## A.3 CPU Rear Transition Card

FIGURE A-8 shows the locations of the connectors on the CPU rear transition card (CPU RTC). The CPU rear transition card is the same for both the Netra CT 810 server and the Netra CT 410 server; only the location in the rear card cage differs.



**FIGURE A-8** Connectors on the CPU Rear Transition Card

# A.3.1 Parallel Port

The parallel port on the CPU RTC is an AMPLIMITE SLIMLINE female DB-25 receptacle.

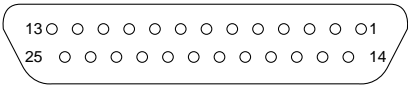


FIGURE A-9 Parallel Connector

TABLE A-7 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.3.2 TTY A and B Ports

The TTY A and B ports on the CPU RTC are DB-9 male connectors.

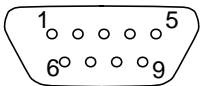


FIGURE A-10 TTY A and B Connectors

TABLE A-8 TTY A and 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.3.3 Ethernet A and B Ports

The Ethernet A and B ports on the CPU RTC are RJ-45 connectors for 10/100.

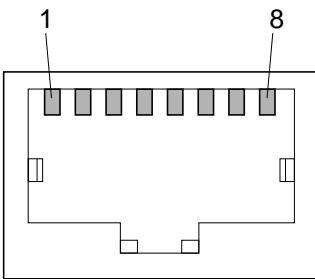


FIGURE A-11 RJ-45 Ethernet Connector Diagram

TABLE A-9 Ethernet A and B 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.3.4 SCSI (VHDC)

The SCSI port on the CPU RTC is a 68-pin CHAMP very high-density connector (VHDC). A VHDC-to-SCSI 3 cable is available through Sun, if necessary (part number 530-2453-xx, X3832A).

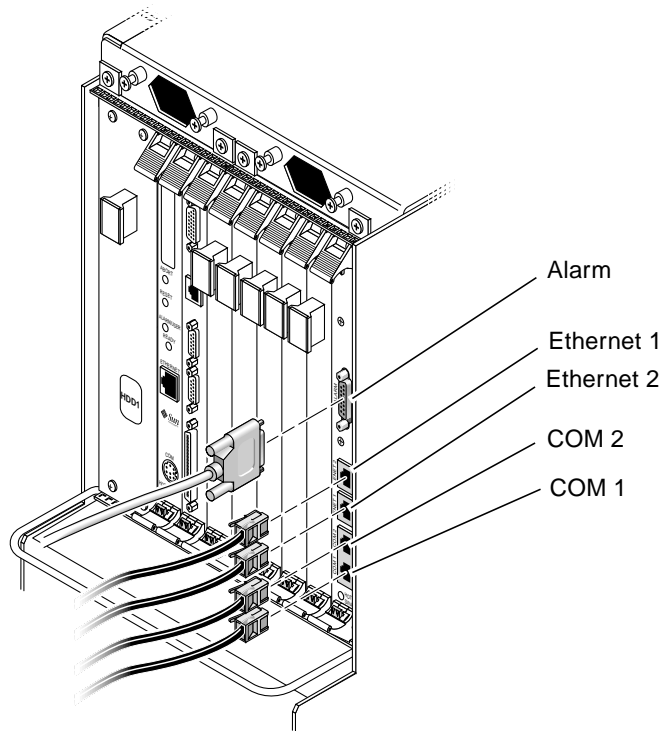
**TABLE A-10** SCSI Port Pinouts, CPU RTC

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.4 Alarm Card, 6U Single-Wide

FIGURE A-12 shows the locations of the connectors on the 6U single-wide alarm card. Note that the figure shows the 6U single-wide alarm card installed in a Netra CT 810 server; the 6U single-wide alarm card will be installed in a different slot in a Netra CT 410 server, but the ports are exactly the same.



**FIGURE A-12** Connector Ports in the 6U Single-Wide Alarm Card

# A.4.1 Alarm Port

I/O connections are available through the male DB-15 alarm port.

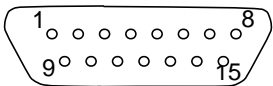


FIGURE A-13 Alarm Port

TABLE A-11 Alarm Port Pinouts

Pin No.	Signal	Pin No.	Signal	Pin No.	Signal
1	RESET0 +	6	ALARM0_NC	11	ALARM2_NO
2	RESET0 -	7	ALARM0_COM	12	ALARM2_NC
3	RESET1 +	8	ALARM1_NO	13	ALARM2_COM
4	RESET1 -	9	ALARM1_NC	14	ALARM3_NO
5	ALARM0_NO	10	ALARM1_COM	15	ALARM3_COM

# A.4.2 Ethernet Ports 1 and 2

Ethernet ports 1 and 2 on the alarm cards use standard RJ-45 connectors. Ethernet port 1 is a 10Mbps Ethernet port, and Ethernet port 2 is a 10/100 Mbps Ethernet port.

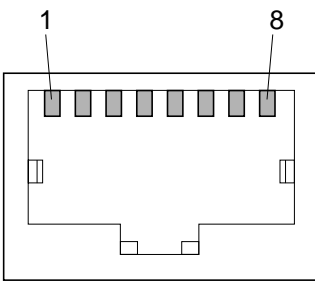


FIGURE A-14 RJ-45 Ethernet Connector Diagram

TABLE A-12 Ethernet Ports 1 and 2 Pinouts

Pin No.	Description	Pin No.	Description
1	TX+	5	Not used
2	TX-	6	RX-
3	RX+	7	Not used
4	Not used	8	Not used

## A.4.3 COM Ports 1 and 2

COM ports 1 and 2 on the alarm cards use standard RJ-45 connectors.

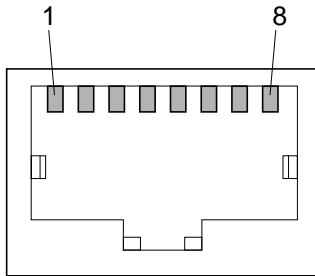


FIGURE A-15 RJ-45 Ethernet Connector Diagram

TABLE A-13 COM Port 1 Pinouts

Pin No.	Description	Pin No.	Description
1	RTS1	5	DCD1
2	DTR1	6	RXD1
3	TXD1	7	DSR1
4	GND	8	CTS1

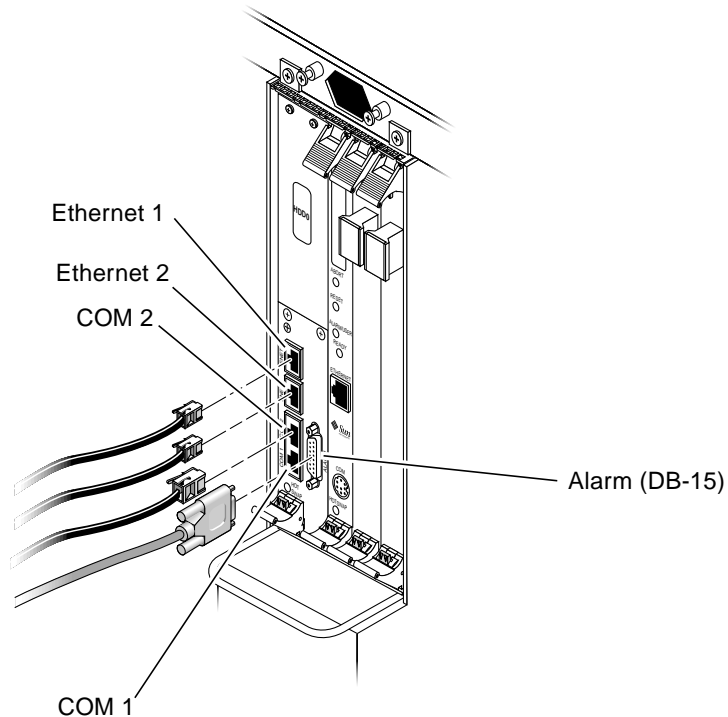
TABLE A-14 COM Port 2 Pinouts

Pin No.	Description	Pin No.	Description
1	RTS2	5	DCD2
2	DTR2	6	RXD2
3	TXD2	7	DSR2
4	GND	8	CTS2

---

## A.5 Alarm Card, 3U Double-Wide

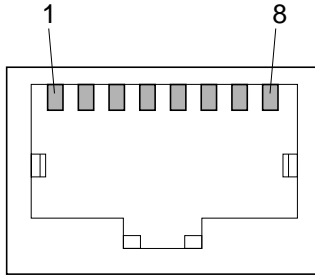
FIGURE A-16 shows the locations of the connectors on the 3U double-wide alarm card for the Netra CT 410 server.



**FIGURE A-16** Connectors on the Alarm Card (Netra CT 410 Server)

## A.5.1 Ethernet Ports 1 and 2

Ethernet ports 1 and 2 on the alarm cards use standard RJ-45 connectors. Ethernet port 1 is a 10Mbps Ethernet port, and Ethernet port 2 is a 10/100 Mbps Ethernet port.



**FIGURE A-17** RJ-45 Ethernet Connector Diagram

**TABLE A-15** Ethernet Ports 1 and 2 Pinouts

Pin No.	Description	Pin No.	Description
1	TX+	5	Not used
2	TX-	6	RX-
3	RX+	7	Not used
4	Not used	8	Not used



# A.5.2 COM Ports 1 and 2

COM ports 1 and 2 on the alarm cards use standard RJ-45 connectors.

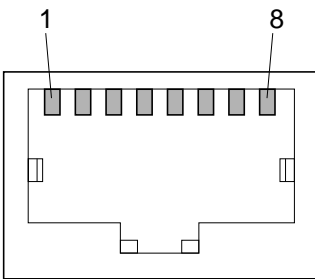


FIGURE A-18 RJ-45 Ethernet Connector Diagram

TABLE A-16 COM Port 1 Pinouts

Pin No.	Description	Pin No.	Description
1	RTS1	5	DCD1
2	DTR1	6	RXD1
3	TXD1	7	DSR1
4	GND	8	CTS1

TABLE A-17 COM Port 2 Pinouts

Pin No.	Description	Pin No.	Description
1	RTS2	5	DCD2
2	DTR2	6	RXD2
3	TXD2	7	DSR2
4	GND	8	CTS2

# A.5.3 Alarm Port

I/O connections are available through the male DB-15 alarm port.

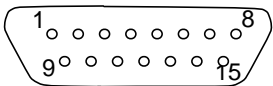


FIGURE A-19 Alarm Port

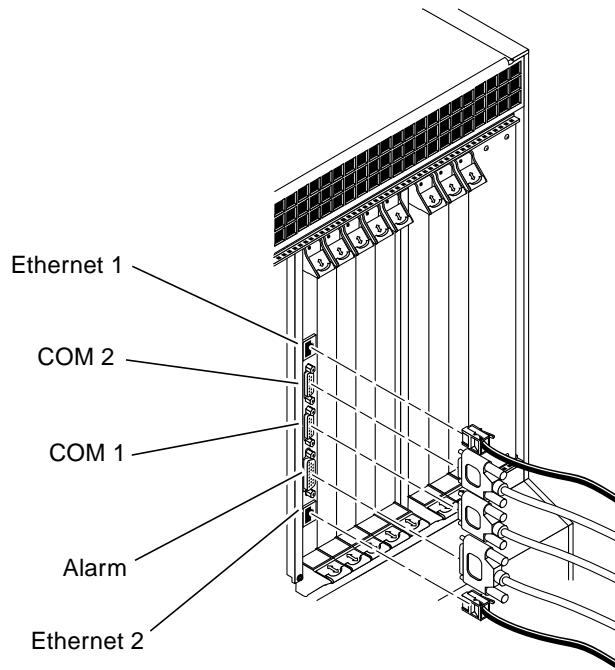
TABLE A-18 Alarm Port Pinouts

Pin No.	Signal	Pin No.	Signal	Pin No.	Signal
1	RESET0 +	6	ALARM0_NC	11	ALARM2_NO
2	RESET0 -	7	ALARM0_COM	12	ALARM2_NC
3	RESET1 +	8	ALARM1_NO	13	ALARM2_COM
4	RESET1 -	9	ALARM1_NC	14	ALARM3_NO
5	ALARM0_NO	10	ALARM1_COM	15	ALARM3_COM

---

## A.6 Alarm Rear Transition Card

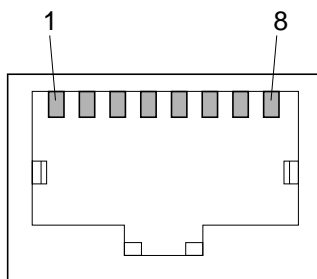
FIGURE A-12 shows the locations of the connectors on the alarm rear transition card (alarm RTC).



**FIGURE A-20** Connectors on the Alarm Rear Transition Card

## A.6.1 Ethernet Ports 1 and 2

Ethernet ports 1 and 2 on the alarm rear transition card use standard RJ-45 connectors. Ethernet port 1 is a 10Mbps Ethernet port, and Ethernet port 2 is a 10/100 Mbps Ethernet port.



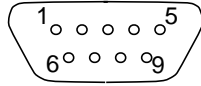
**FIGURE A-21** RJ-45 Ethernet Connector Diagram

**TABLE A-19** Ethernet Ports 1 and 2 Pinouts

Pin No.	Description	Pin No.	Description
1	TX+	5	Not used
2	TX-	6	RX-
3	RX+	7	Not used
4	Not used	8	Not used

## A.6.2 COM Ports 1 and 2

COM ports 1 and 2 on the alarm rear transition card use standard DB-9 male connectors.



**FIGURE A-22** COM Ports 1 and 2

**TABLE A-20** COM Ports 1 and 2 Connector Pinouts, Alarm Rear Transition Card

Pin No.	Description
1	DCD
2	RXD
3	TXD
4	DTR
5	GND
6	DSR
7	RTS
8	CTS
9	RI

# A.6.3 Alarm Port

The alarm port on the alarm rear transition card uses a standard male DB-15 connector.

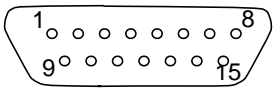


FIGURE A-23 Alarm Port

TABLE A-21 Alarm Port Pinouts

Pin No.	Signal	Pin No.	Signal	Pin No.	Signal
1	RESET0 +	6	ALARM0_NC	11	ALARM2_NO
2	RESET0 -	7	ALARM0_COM	12	ALARM2_NC
3	RESET1 +	8	ALARM1_NO	13	ALARM2_COM
4	RESET1 -	9	ALARM1_NC	14	ALARM3_NO
5	ALARM0_NO	10	ALARM1_COM	15	ALARM3_COM

## 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 Section B.1, “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 Section B.2, “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 Section B.3, “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
<b>Netra CT 810 server</b>	<ul style="list-style-type: none"> <li>• <i>Rear-access</i> model: DB-9 male on the CPU rear transition card. See Section A.3, “CPU Rear Transition Card” on page A-10.</li> </ul>	Not needed.	DB-9 female-to-DB-25 male straight-through	DB-25 female-to-DB-25 female gender changer	DB-25 male
<b>Netra CT 410 server</b>	<ul style="list-style-type: none"> <li>• <i>Front-access</i> model: DIN-8 female on the CPU card. See Section A.1, “CPU Card” on page A-2.</li> <li>• <i>Rear-access</i> model: DB-9 male on the CPU rear transition card. See Section A.3, “CPU Rear Transition Card” on page A-10.</li> </ul>	Not needed.	<ul style="list-style-type: none"> <li>• <i>Front-access</i> model: DIN-8 male-to-DB-25 male</li> <li>• <i>Rear-access</i> model: DB-9 female-to-DB-25 male straight-through</li> </ul>	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
<b>Netra CT 810 server</b>	<ul style="list-style-type: none"> <li>• <i>Front-access</i> model: RJ-45 on the alarm card. See Section A.4, “Alarm Card, 6U Single-Wide” on page A-15.</li> <li>• <i>Rear-access</i> model: DB-9 male on the alarm rear transition card. See Section A.6, “Alarm Rear Transition Card” on page A-23.</li> </ul>	<ul style="list-style-type: none"> <li>• <i>Front-access</i> model: RJ-45-to-DB-9 male</li> <li>• <i>Rear-access</i> model: Not needed</li> </ul>	DB-9 female-to-DB-25 male straight-through	DB-25 female-to-DB-25 female gender changer	DB-25 male
<b>Netra CT 410 server</b>	<ul style="list-style-type: none"> <li>• <i>Front-access</i> model: RJ-45 on the alarm card. See Section A.4, “Alarm Card, 6U Single-Wide” on page A-15 or Section A.5, “Alarm Card, 3U Double-Wide” on page A-19.</li> <li>• <i>Rear-access</i> model: DB-9 male on the alarm rear transition card. See Section A.6, “Alarm Rear Transition Card” on page A-23.</li> </ul>	<ul style="list-style-type: none"> <li>• <i>Front-access</i> model: RJ-45-to-DB-9 male</li> <li>• <i>Rear-access</i> model: Not needed</li> </ul>	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 810 server	<ul style="list-style-type: none"><li>• <i>Rear-access</i> model: DB-9 male on the CPU rear transition card. See Section A.3, “CPU Rear Transition Card” on page A-10.</li></ul>	Not needed.	DB-9 female-to-DB-25 male null modem	Not needed.	DB-25 female
Netra CT 410 server	<ul style="list-style-type: none"><li>• <i>Front-access</i> model: DIN-8 female on the CPU card. See Section A.1, “CPU Card” on page A-2.</li><li>• <i>Rear-access</i> model: DB-9 male on the CPU rear transition card. See Section A.3, “CPU Rear Transition Card” on page A-10.</li></ul>	Not needed.	<ul style="list-style-type: none"><li>• <i>Front-access</i> model: DIN-8 male-to-DB-25 male</li><li>• <i>Rear-access</i> model: DB-9 female-to-DB-25 male null modem</li></ul>	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 810 server	<ul style="list-style-type: none"><li>• <i>Front-access</i> model: RJ-45 on the alarm card. See Section A.4, “Alarm Card, 6U Single-Wide” on page A-15.</li><li>• <i>Rear-access</i> model: DB-9 male on the alarm rear transition card. See Section A.6, “Alarm Rear Transition Card” on page A-23.</li></ul>	<ul style="list-style-type: none"><li>• <i>Front-access</i> model: RJ-45-to-DB-9 male</li><li>• <i>Rear-access</i> model: Not needed</li></ul>	DB-9 female-to-DB-25 male null modem	Not needed.	DB-25 female
Netra CT 410 server	<ul style="list-style-type: none"><li>• <i>Front-access</i> model: RJ-45 on the alarm card. See Section A.4, “Alarm Card, 6U Single-Wide” on page A-15 or Section A.5, “Alarm Card, 3U Double-Wide” on page A-19.</li><li>• <i>Rear-access</i> model: DB-9 male on the alarm rear transition card. See Section A.6, “Alarm Rear Transition Card” on page A-23.</li></ul>	<ul style="list-style-type: none"><li>• <i>Front-access</i> model: RJ-45-to-DB-9 male</li><li>• <i>Rear-access</i> model: Not needed</li></ul>	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 hardware` 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 810 server	<ul style="list-style-type: none"><li>• <i>Rear-access</i> model: DB-9 male on the CPU rear transition card. See Section A.3, “CPU Rear Transition Card” on page A-10.</li></ul>	Not needed.	DB-9 female-to-DB-9 female null modem	Not needed.	DB-9 male
Netra CT 410 server	<ul style="list-style-type: none"><li>• <i>Front-access</i> model: DIN-8 female on the CPU card. See Section A.1, “CPU Card” on page A-2.</li><li>• <i>Rear-access</i> model: DB-9 male on the CPU rear transition card. See Section A.3, “CPU Rear Transition Card” on page A-10.</li></ul>	Not needed.	<ul style="list-style-type: none"><li>• <i>Front-access</i> model: DIN-8 male-to-DB-25 male</li><li>• <i>Rear-access</i> model: DB-9 female-to-DB-9 female null modem</li></ul>	<ul style="list-style-type: none"><li>• <i>Front-access</i> model: DB-25 female-to-DB-9 female</li><li>• <i>Rear-access</i> model: Adapter not needed.</li></ul>	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
<b>Netra CT 810 server</b>	<ul style="list-style-type: none"> <li>• <i>Front-access</i> model: RJ-45 on the alarm card. See Section A.4, “Alarm Card, 6U Single-Wide” on page A-15.</li> <li>• <i>Rear-access</i> model: DB-9 male on the alarm rear transition card. See Section A.6, “Alarm Rear Transition Card” on page A-23.</li> </ul>	<ul style="list-style-type: none"> <li>• <i>Front-access</i> model: RJ-45-to-DB-9 male</li> <li>• <i>Rear-access</i> model: Not needed</li> </ul>	DB-9 female-to-DB-9 female null modem	Not needed.	DB-9 male
<b>Netra CT 410 server</b>	<ul style="list-style-type: none"> <li>• <i>Front-access</i> model: RJ-45 on the alarm card. See Section A.4, “Alarm Card, 6U Single-Wide” on page A-15 or Section A.5, “Alarm Card, 3U Double-Wide” on page A-19.</li> <li>• <i>Rear-access</i> model: DB-9 male on the alarm rear transition card. See Section A.6, “Alarm Rear Transition Card” on page A-23.</li> </ul>	<ul style="list-style-type: none"> <li>• <i>Front-access</i> model: RJ-45-to-DB-9 male</li> <li>• <i>Rear-access</i> model: Not needed</li> </ul>	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.

TABLE C-1 Netra CT Server Error Messages

Error Message	Page Number
<b>scsb Error Messages</b>	
Alarm and Slot presence state bits do not match!	page C-3
SCSB: Should NOT remove SCB(#) while cPCI Slot # is in RESET with a possible bad board. scsb#0: Slot # Now out of Reset!	page C-3
scsb#0: ALERT! Lost HEALTHY# on Slot #, Occupant Offline scsb#0: ALERT! Lost HEALTHY# on Slot #, Occupant Online!!!	page C-3
scsb#0: Bad (non friendly ?) Board in Slot # ? Taking it Offline.	page C-4
scsb#0: Could not Update %s LEDs. scsb#0: Could not Blink %s LEDs.	page C-4
scsb#0: hsc_board_healthy: No Slot Info.	page C-5
scsb#0: hsc_enum_intr: No Last Board Insertion Info.	page C-5
scsb#0: hsc_restore: Cannot reset disconnected slot #	page C-6
scsb0: I2C TRANSFER Failed scsb0: Error Reading Healthy# Registers scsb#0: scsb_reset_slot: error reading Reset regs	page C-6
scsb#0: no HEALTHY# signal on slot#	page C-7
scsb#0: Reset Not Asserted on Healthy# Failed slot#	page C-7
scsb#0: slot # Occupant configured, Regained HEALTHY#! scsb#0: slot # Occupant Unconfigured, Regained HEALTHY#!	page C-8

TABLE C-1 Netra CT Server Error Messages (Continued)

Error Message	Page Number
scsb#0: Successfully Downgraded to Basic Hotswap Mode	page C-8
scsb#0: Successfully Upgraded to Full Hotswap Mode	page C-8
<b>Anticipated Hardware Failure</b>	
Interrupt Level 4--Not serviced	page C-9
Interrupt Level 4--Not serviced	page C-10
<b>I2C Complaints</b>	
NO ADDERSS ACK 80	page C-11
<b>Bus Busy Complaints</b>	
Bus busy, cleared after initiallizing	page C-12

## C.1 Generic Error Messages

This program must be run on the same chassis.

### Action

You must restart mcnet. Change directories to the `rsc` directory.

- If you are performing a procedure on the Netra CT 810 server, go here:

```
# cd /usr/platform/SUNW,NetraCT-810/mcn
```

- If you are performing a procedure on the Netra CT 410 server, go here:

```
# cd /usr/platform/SUNW,NetraCT-410/mcn
```

Then, enter this command:

```
# ./mcnet start
```

---

## C.2 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. 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.

```
scsb#0: Could not Update %s LEDs.  
scsb#0: Could not Blink %s LEDs.
```



### *Cause*

An I<sup>2</sup>C 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 Section 8.2, “System Controller Board” on page 8-6 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 Section 5.2.3.2, “Enabling Basic Hot Swap on I/O Slots” on page 5-7.

```
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 Section , "scsb#0: Bad (non friendly ?) Board in Slot # ? Taking it Offline." on page C-4.

## *Action*

Remove the I/O card from the server using the instructions in Chapter 6. If the error message repeats, the system controller board may have failed. Try replacing the system controller board using the instructions in Section 8.2, "System Controller Board" on page 8-6.

```
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. 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 occurred 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 Section 8.2, “System Controller Board” on page 8-6 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.

```
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.

```
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.

```
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.3 Anticipated Hardware Failure

### C.3.1 Transient Interrupts

#### *Message*

Interrupt Level 4--Not serviced

#### *Cause*

Such a message occurring 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.3.2 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.4 I<sup>2</sup>C Complaints

### *Message*

NO ADDRESS ACK 80

### *Cause*

This message indicates a problem with I<sup>2</sup>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 message occurs during normal operation, it may indicate a problem with the I<sup>2</sup>C device.

---

## C.5 Bus Busy Complaints

### *Message*

Bus busy, cleared after initiallizing

### *Cause*

This is a transient 1<sup>2</sup>C error message.

### *Action*

Usually no action is necessary because the system should recover from most transient 1<sup>2</sup>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** Netra CT Server Chassis Physical Specifications

	U.S.	Metric
Width	17.5 inches	444.5 mm
Depth—DC model:		
Default configuration, with rackmount brackets extended	15.8 inches	400 mm
With rackmount brackets flush against the bottom of the chassis	13.8 inches	350 mm
Depth—AC model:		
Default configuration, with rackmount brackets extended	18.3 inches	465 mm
With rackmount brackets flush against the bottom of the chassis	16.3 inches	415 mm
Height	21 inches	533.6 mm
Weight (empty)	74 lbs	33.6 kg
Weight (fully-loaded)	150 lbs	68 kg

**TABLE D-2** Physical Specifications, Netra CT 810 Server

Measure	U.S.	Metric
Width	8.6 inches	217.5 mm
Depth—DC model	15 inches	378.3 mm
Depth—AC model	15.4 inches	391.3 mm
Height	20.2 inches	512.7 mm
Weight, fully-loaded	38 lbs	17.2 kg

**TABLE D-3** Physical Specifications, Netra CT 410 Server

Measure	English	Metric
Width	4.3 inches	108 mm
Depth—DC model	14.9 inches	378.7 mm
Depth—AC model	15.4 inches	391.7 mm
Height	20.2 inches	512.7 mm
Weight, fully-loaded	22 lbs	10 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 810 servers		Sound power LWAd Operating 6.7 B (1B = 10 dB)  Idle 6.7 B
Chassis w/four Netra CT 410 servers		Sound power LWAd Operating 7.1 B (1B = 10 dB)  Idle 7.1 B



# Glossary

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Knowledge of the following terms and acronyms is useful in the administration of the Netra CT server.

---

## A

**alarm card** A 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.

---

## B

**basic hot swap** One of the hot swap methods. 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 card** Used only for the CPU in the front access model of the Netra CT 410 server. The CPU front transition card allows for CPU cabling from the front of the chassis.

**full hot swap** One of the hot swap methods. 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 server. 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 various vibration stresses, 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 Industrial 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 to the rear of the chassis.

**Reliability, Availability,  
Serviceability (RAS)**

Refers to hardware and software features that implement or improve the reliability, availability and serviceability of a server.

---

## S

- system status panel** A module that uses LEDs to indicate the status of 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.



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