# Netra™ CT Server Product Overview

## For the Netra CT 810 Server and Netra CT 410 Server

Sun Microsystems, Inc.
www.sun.com

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# Contents

# Figures

# Tables

# Preface

The *Netra CT Server Product Overview* describes the basic hardware components of the Netra CT server. It is a companion to the *Netra CT Server Installation Guide*, which describes how to install the Netra CT server, and the *Netra CT Server Service Manual*, which describes the removing and replacing of the server's field-replaceable units (FRUs).

The procedures described in the *Netra CT Server Product Overview* are limited mostly to the use of the Solaris™ operating environment. These detailed instructions are a supplement to the Solaris documentation (printed or online) that accompanies the Netra CT server.

The intended reader of this manual is an experienced system administrator who has experience with the Solaris operating environment. The reader should be comfortable with LAN fundamentals and with networking in general.

## Safety and Compliance

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

## How This Book Is Organized

Chapter 1 introduces you to the Netra CT server and offers examples of its use.

Chapter 2 describes the Netra ct chassis and the power distribution units.

Chapter 3 describes the Netra CT servers (Netra CT 810 server and Netra CT 410 server).

Chapter 4 describes the components inside the Netra CT server.

Glossary is a list of words, phrases, and acronyms and their definitions.

# 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 AnswerBook™ form, available in printed form as an at-cost option.)
- AnswerBook online documentation for the Solaris™ software environment
- Other software documentation that you received with your system

# Typographic Conventions

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

# Shell Prompts

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

# Related Documentation

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

| Title | Part Number |
|---|---|
| *Netra CT Server Start Here* | 816-2479 |
| *Netra CT Server Product Overview* | 816-2480 |
| *Netra CT Server Installation Guide* | 816-2481 |
| *Netra CT Server Service Manual* | 816-2482 |
| *Netra CT Server System Administration Guide* | 816-2483 |
| *Netra CT Server Safety and Compliance Manual* | 816-2484 |
| *Netra CT Server Product Note* | 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 Availability (HA) Suite.

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CHAPTER 1

# Introduction

This chapter provides an overview of the Netra CT server's basic hardware components and describes the different models available for the server. Contact Sun Microsystems to get the NEBS testing information for the Netra CT server.

The Netra CT server is a *CompactPCI*-based, *NEBS* (level 3)-certified, ETSI compliant, rack mountable server. The Netra CT server is highly configurable. Within the Netra CT chassis, you can have one to two Netra CT 810 servers or one to four Netra CT 410 servers.

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**Note –** You can also have a mix of Netra ct 800 servers and Netra ct 400 servers. Refer to the documentation that came with those systems for more information.

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The Netra CT server runs the standard Solaris operating environment, so that your Solaris applications can run on the server with no modifications.

The Netra CT server complies to the following specifications:

- PICMG 2.0 R3.0 CompactPCI specifications
- PICMG 2.1 R2.0 CompactPCI Hot Swap specifications
- PICMG 2.5 R1.0 CompactPCI Computer Telephony/H.110 specifications
- PICMG 2.9 R1.0 CompactPCI IPMI specifications
- PICMG 2.14 R1.0 CompactPCI MCNet specifications

The hardware components for the Netra CT server can be broken down into three sections:

- The chassis—Chapter 2
- The servers that go into the chassis—Chapter 3
- The components that go into the servers—Chapter 4

FIGURE 1-1 shows the possible configurations for the Netra CT 810 server. FIGURE 1-2 shows the possible configurations for the *diskfull* Netra CT 410 server and FIGURE 1-3 shows the possible configurations for the *diskless* Netra CT 410 server.

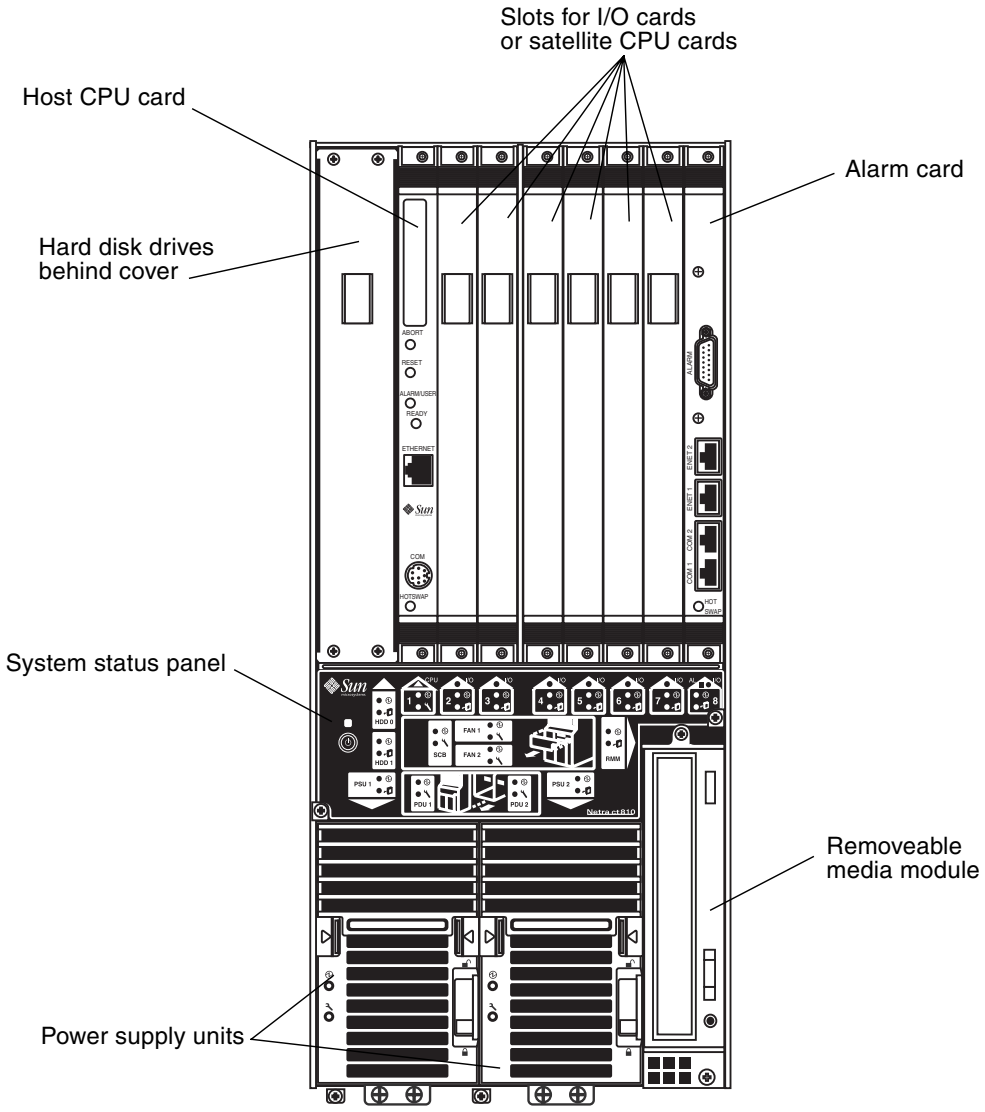


**FIGURE 1-1** Components Within a Netra CT 810 Server

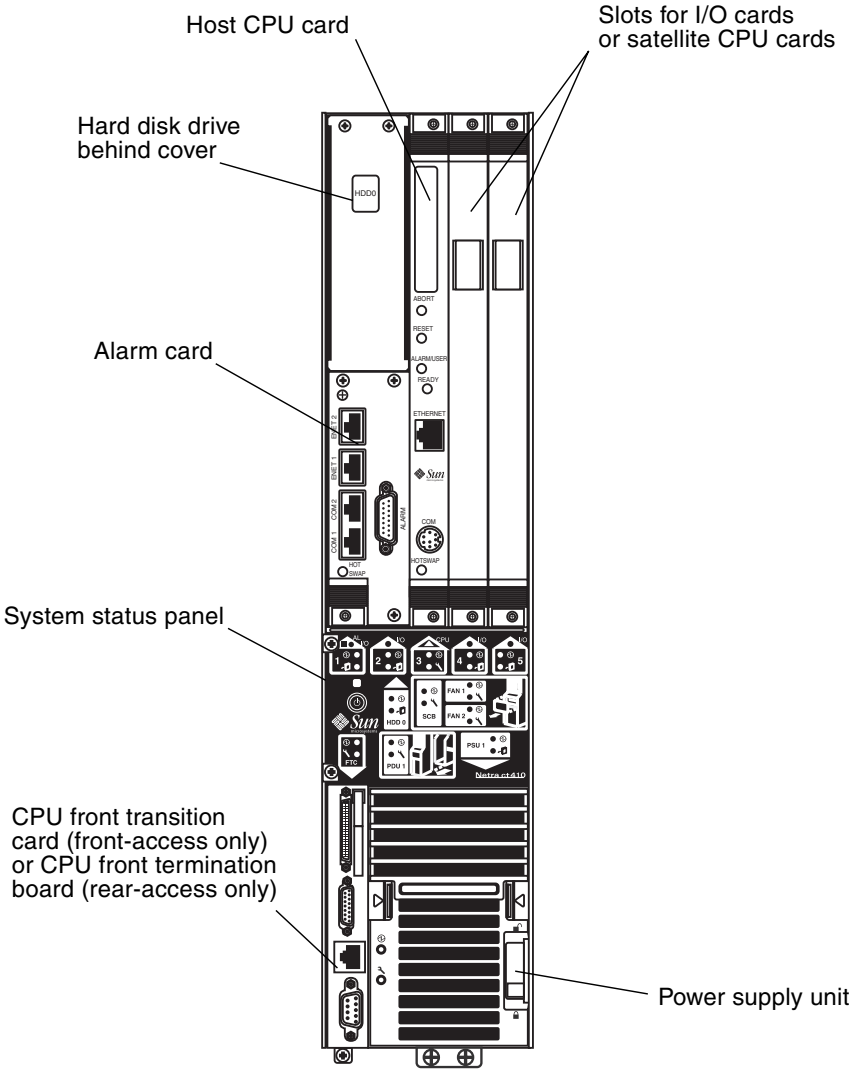


**FIGURE 1-2** Components Within a Netra CT 410 Server, Diskfull Version

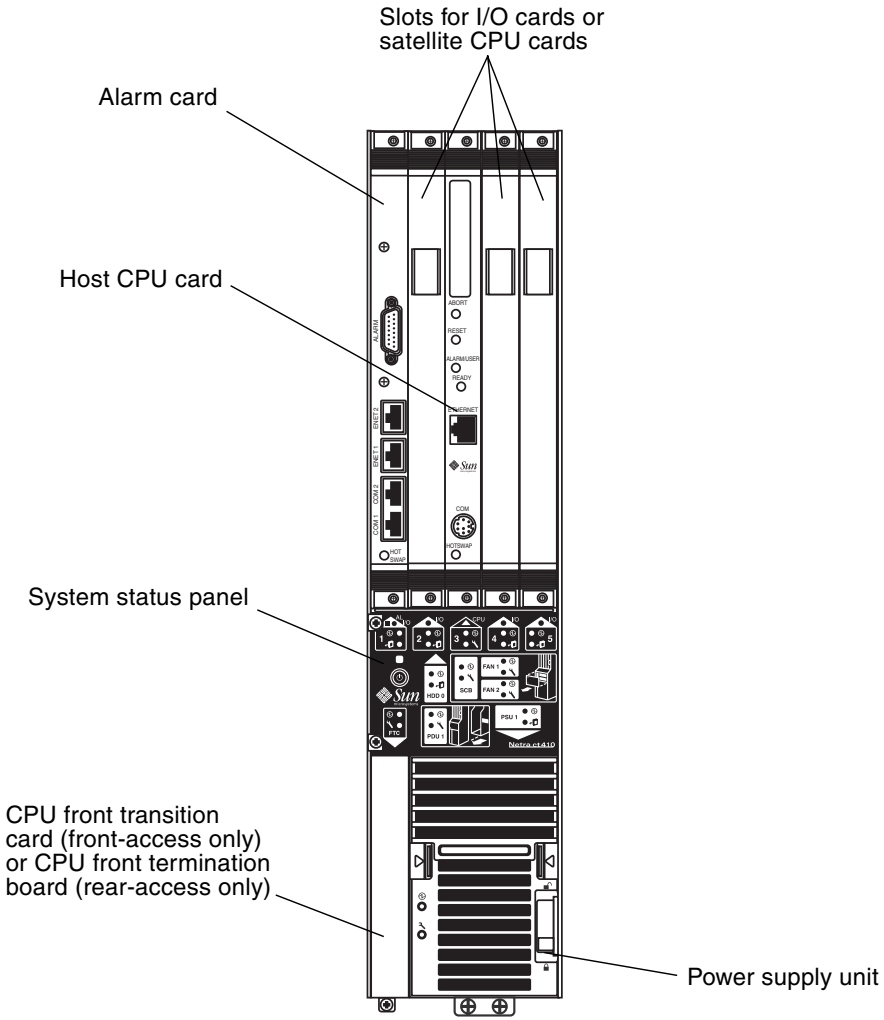


**FIGURE 1-3** Components Within a Netra CT 410 Server, Diskless Version

CHAPTER 2

# Chassis Description

The Netra CT chassis is designed to be mounted in a 19-inch rack. You can purchase optional adaptors that enable you to mount the chassis in a 21-inch, 23-inch, or 600-mm rack.

The Netra CT chassis is rugged enough to withstand environmental hazards—such as excessive heat, earthquakes, and smoke—to which a server in a telco central office might be subjected. It houses the following Netra CT server components:

- Card cage for the rear transition cards
- Front-access cable (only for front-access DC models)
- Four DC power distribution units or one AC power entry module

TABLE 2-1 gives the physical specifications for the DC- and AC-powered chassis. FIGURE 2-1 shows the DC chassis from the front, and FIGURE 2-2 shows the AC chassis from the front.

# Chassis Physical Specifications

**TABLE 2-1** 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 as shown in FIGURE 2-1 | 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 as shown in FIGURE 2-2 | 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 |

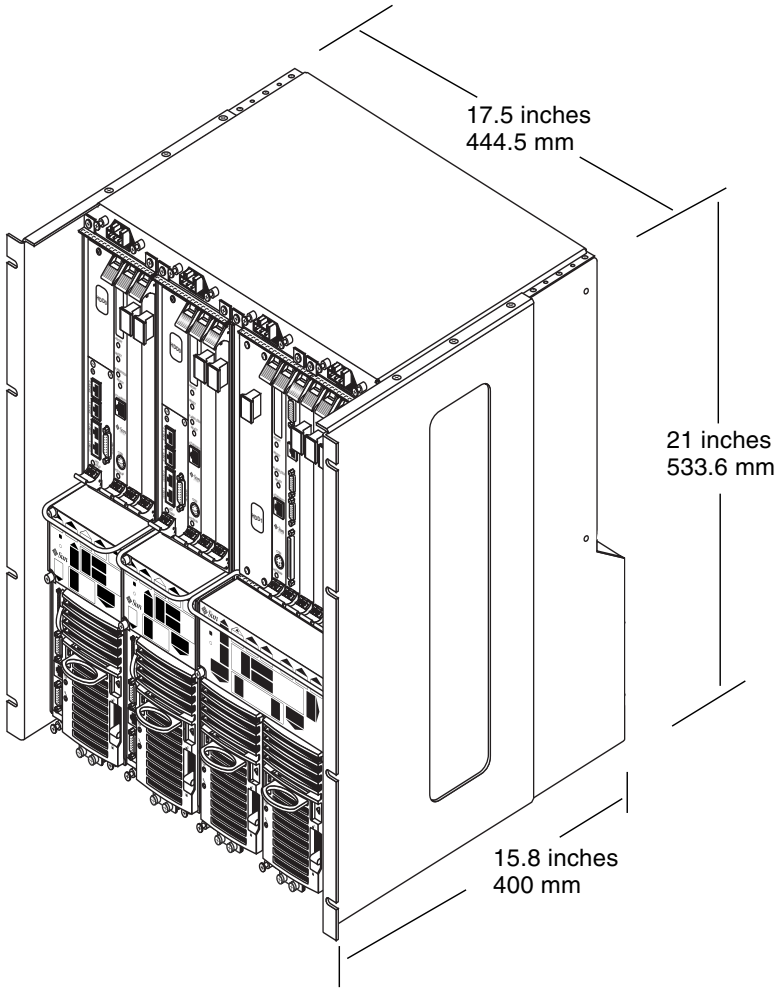


**FIGURE 2-1** Physical Specifications for the Netra CT Chassis, DC model

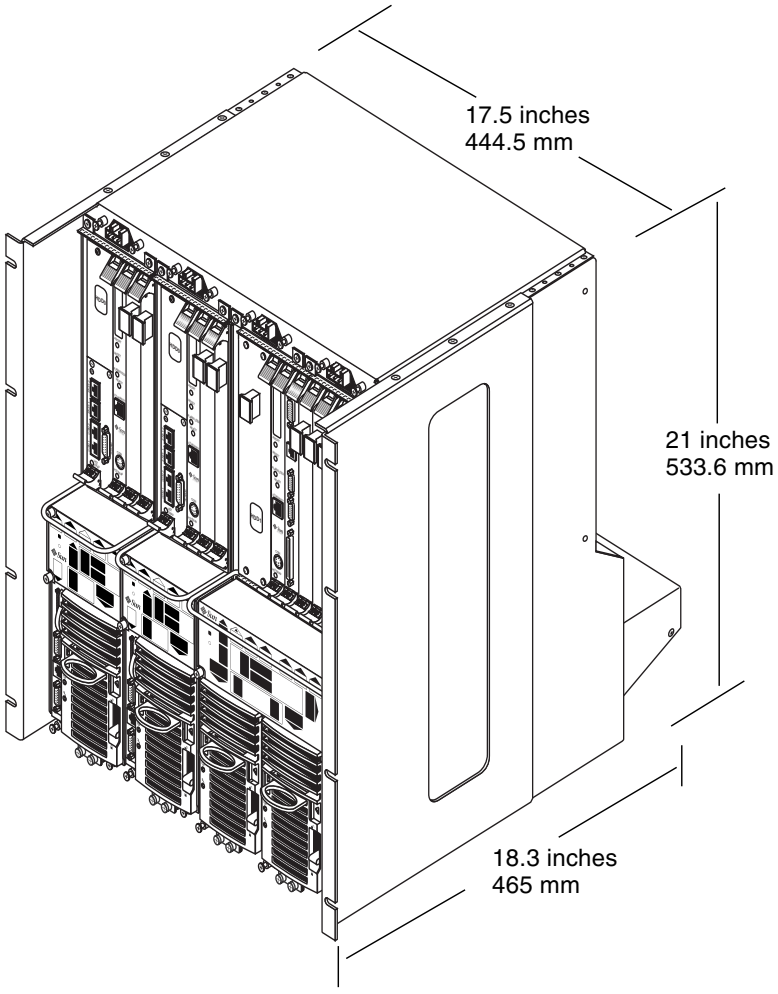


**FIGURE 2-2** Physical Specifications for the Netra CT Chassis, AC model

Power is supplied to the servers installed in the chassis differently, depending on whether the servers are AC- or DC-powered.


- "Determining If You Have AC- or DC-Powered Servers and Chassis" on page 9
- "DC-Powered Chassis and Servers" on page 11
- "AC-Powered Chassis and Servers" on page 12

# 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 2-3).

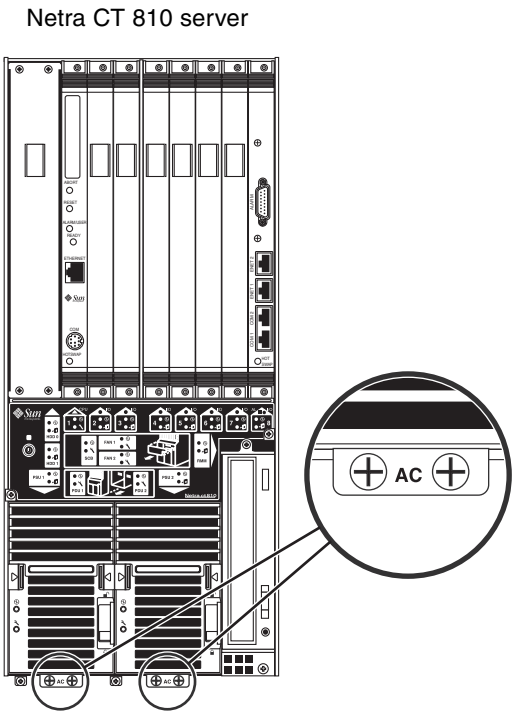


**FIGURE 2-3** Locating the Power Supply Unit Label in the Netra CT Servers

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 2-4 shows the connectors at the rear of an AC-powered chassis and FIGURE 2-5 shows the connectors at the rear of a DC-powered chassis.

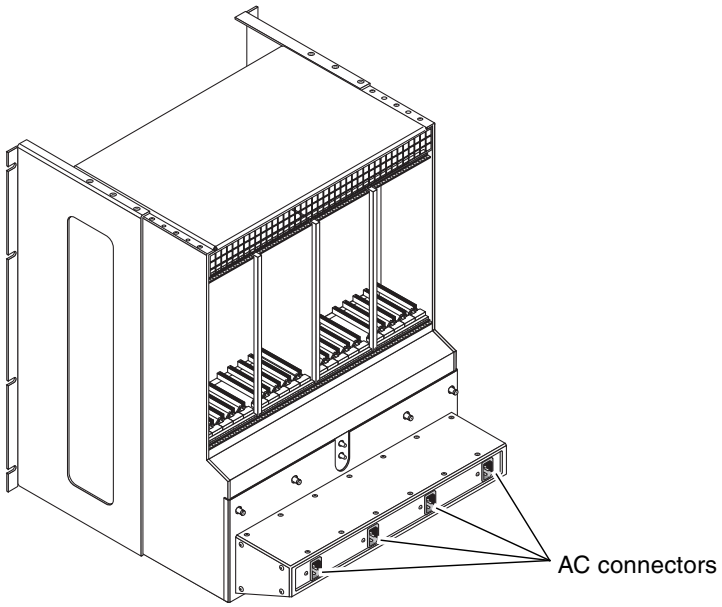


**FIGURE 2-4** AC Connectors on a Netra CT Chassis

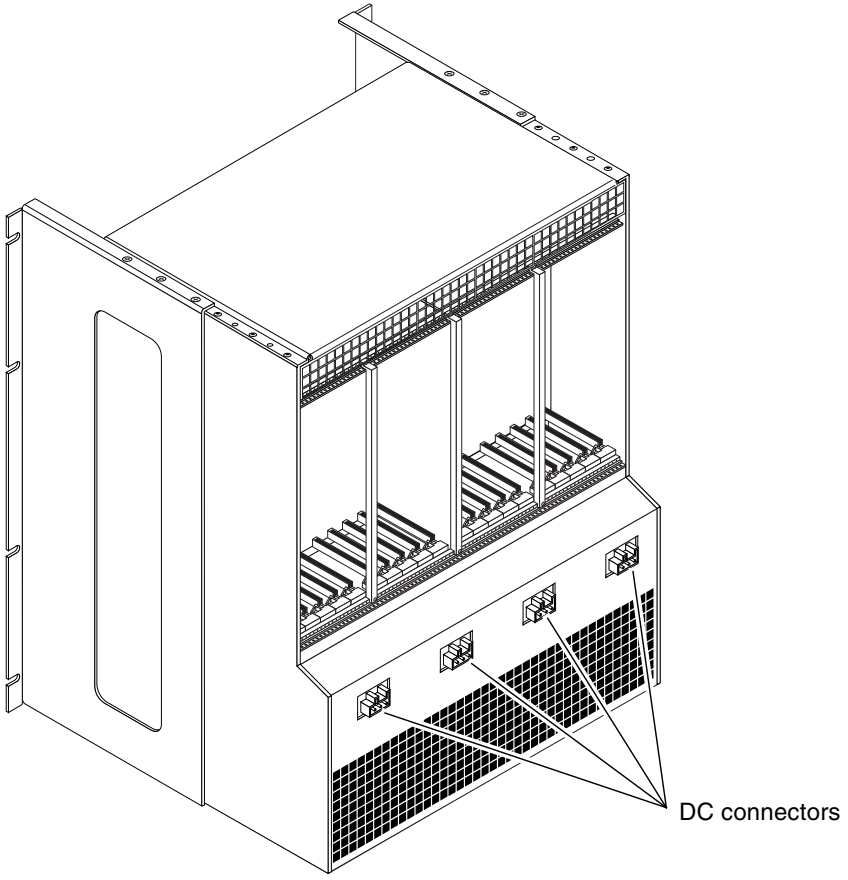


**FIGURE 2-5** DC Connectors on a Netra CT Chassis

# DC-Powered Chassis and Servers

The DC power distribution units are located on the chassis and connect directly to the server's midplane when the server is installed in the chassis. Each DC power distribution unit is a cold-swappable field-replaceable component; however, you must remove the server before you can replace a power distribution unit. A DC input power cable is plugged into the power distribution unit, then the power distribution unit provides power to the accompanying power supply unit in the Netra CT server (see FIGURE 2-6).

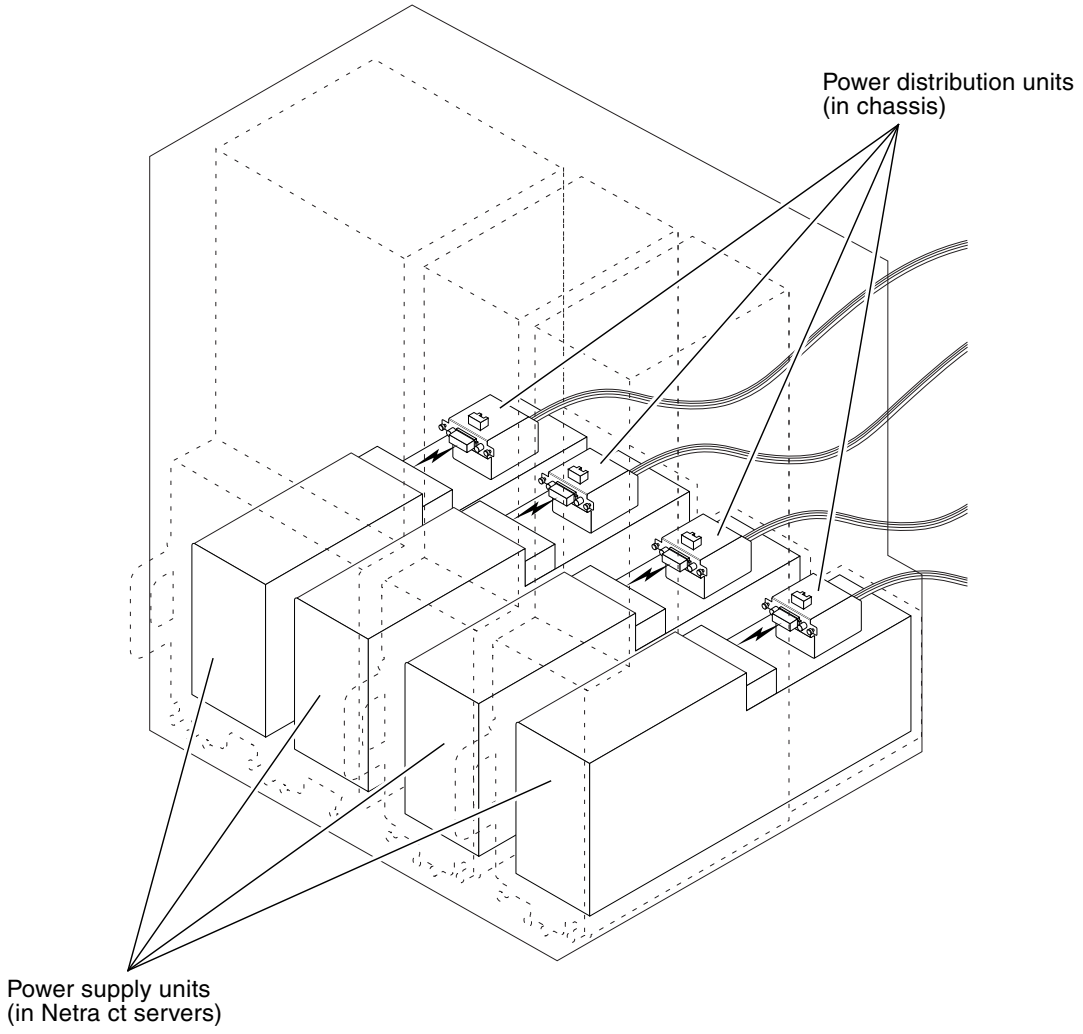


**FIGURE 2-6** Power Distribution Units and Power Supply Units

# AC-Powered Chassis and Servers

The AC power entry unit is located on the chassis, and provides power directly to the AC power supply units in the servers, without going through the midplane. An AC power cable is plugged into each AC connector on the AC power entry unit,

then the AC power entry unit distributes power to the accompanying power supply unit in the Netra CT server (see FIGURE 2-7). The AC power entry unit is a cold-swappable field-replaceable component.

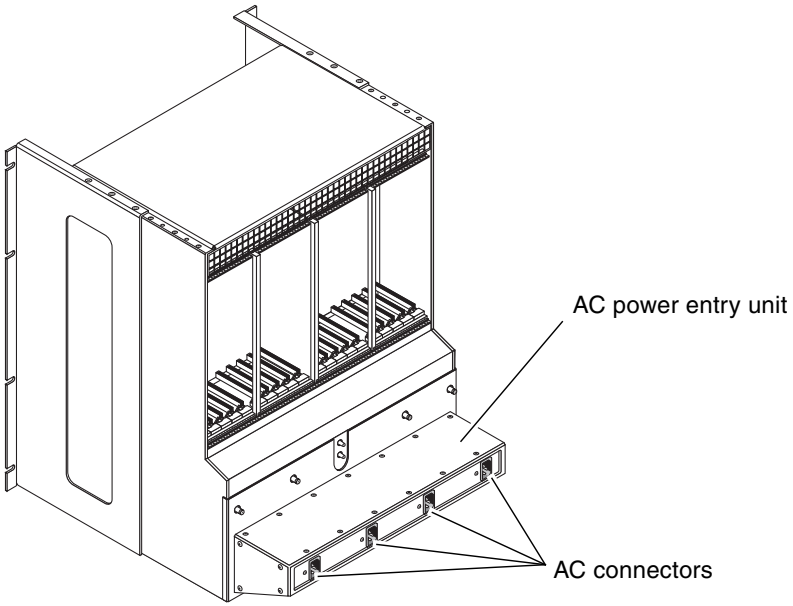


**FIGURE 2-7** AC Connectors on a Netra CT Server Chassis

CHAPTER 3

# Server Description

The Netra CT servers slide into the chassis and are secured to the chassis using captive screws at the top and base of the server. Each Netra CT server is an independent computer, with its own host CPU card, midplane, I/O slots, and, in some cases, storage devices and removeable media.

## Server Types

The Netra CT chassis supports two types of Netra CT server:

- Netra CT 810 server
- Netra CT 410 server

**Note –** The Netra CT chassis also supports the Netra ct 800 server and the Netra ct 400 server. For more information on those servers, refer to the documentation that you received with those servers.

# Netra CT 810 Server

TABLE 3-1 gives the physical specifications for the Netra CT 810 server, and FIGURE 3-1 shows the Netra CT 810 server.

**TABLE 3-1** 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 |

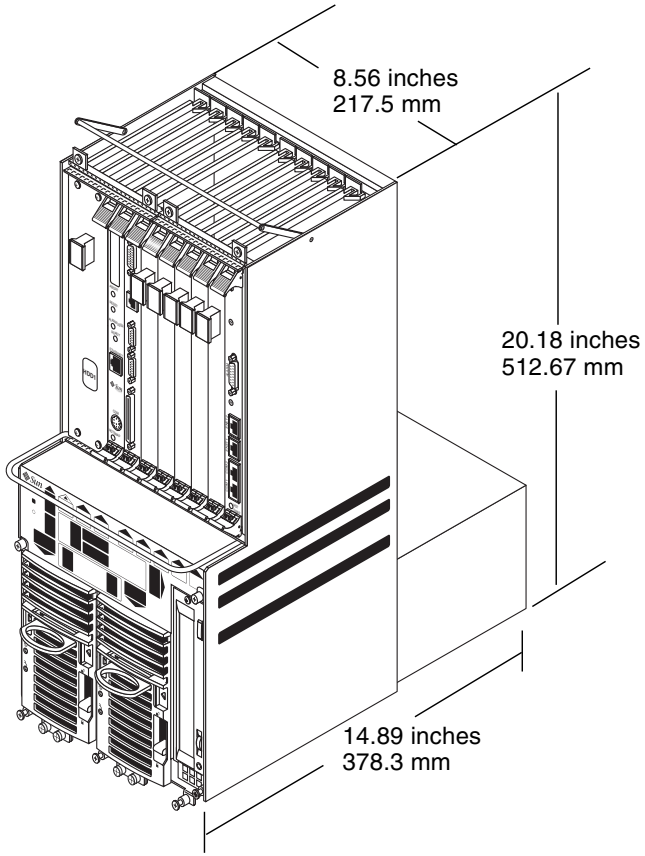


**FIGURE 3-1** Netra CT 810 Server Physical Specifications

# Netra CT 410 Server

TABLE 3-2 gives the physical specifications for the Netra CT 410 server, and FIGURE 3-2 shows the Netra CT 410 server.

**TABLE 3-2** 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 |

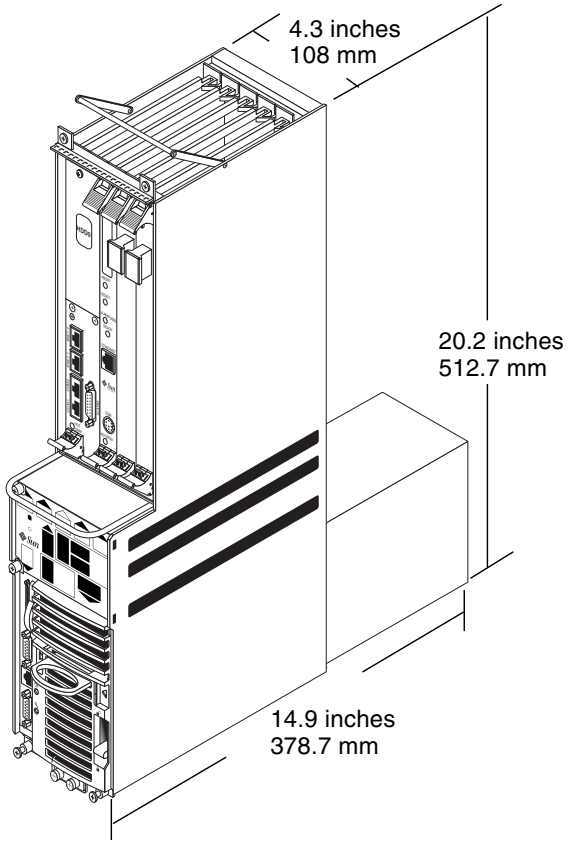


**FIGURE 3-2** Netra CT 410 Server Physical Specifications

The following combinations of the two server types are supported in a Netra CT chassis:

- One or two Netra CT 810 servers (FIGURE 3-3)
- One to four Netra CT 410 servers (FIGURE 3-4)
- One Netra CT 810 server and one or two Netra CT 410 servers (FIGURE 3-5)

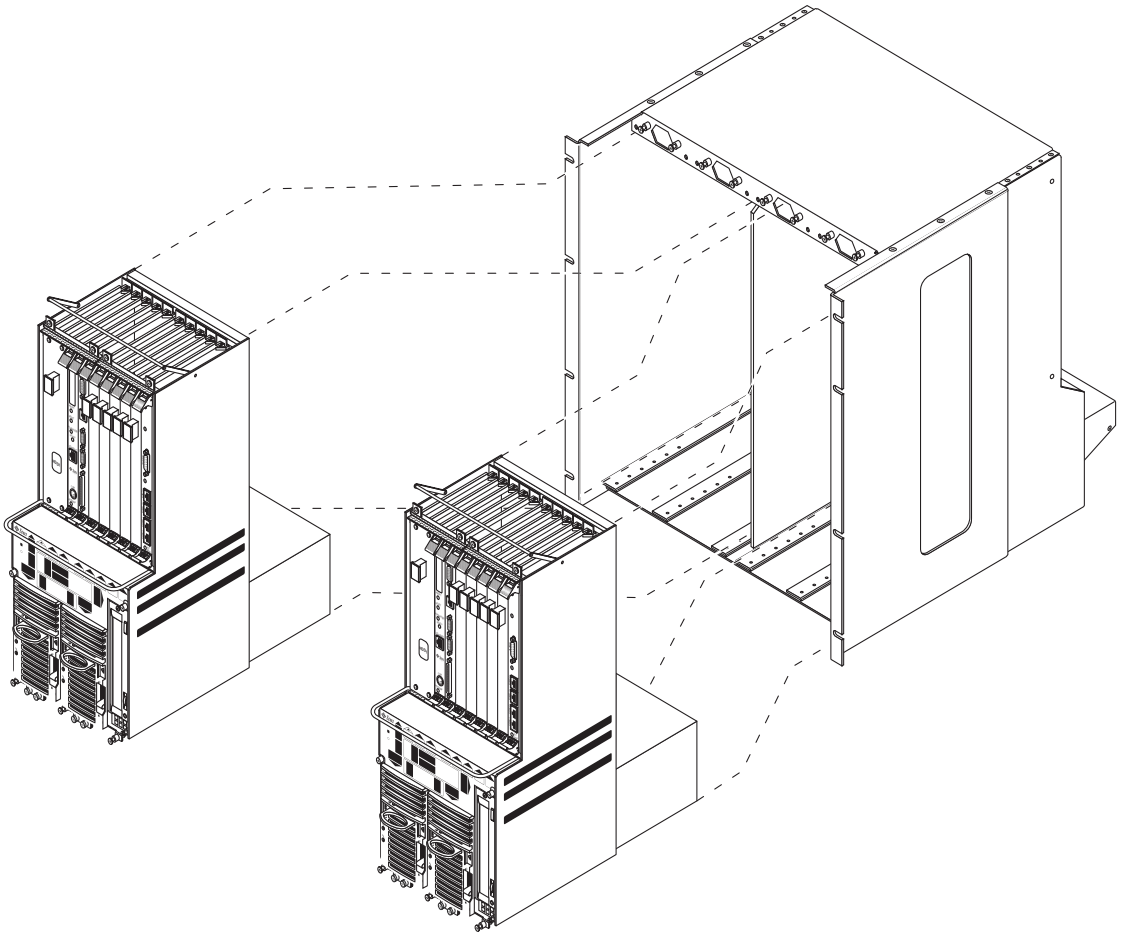

**FIGURE 3-3** Two Netra CT 810 Servers in a Chassis

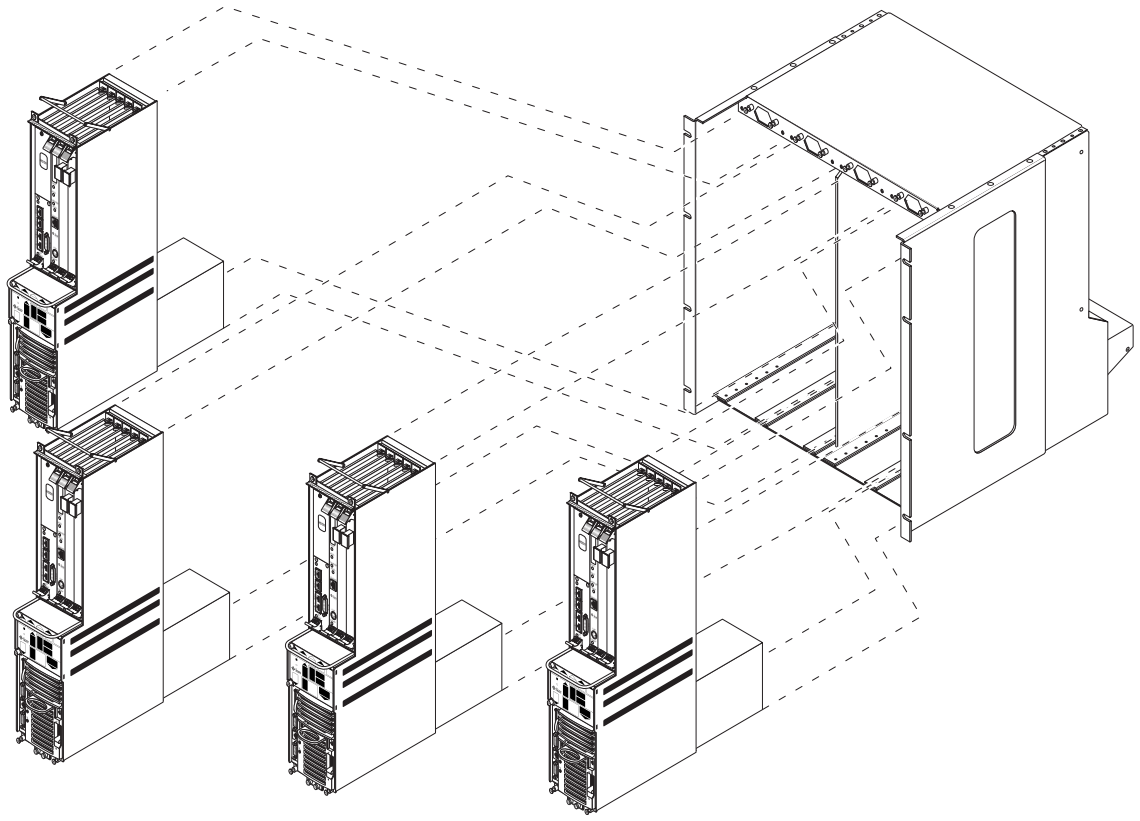

**FIGURE 3-4** Four Netra CT 410 Servers in a Chassis

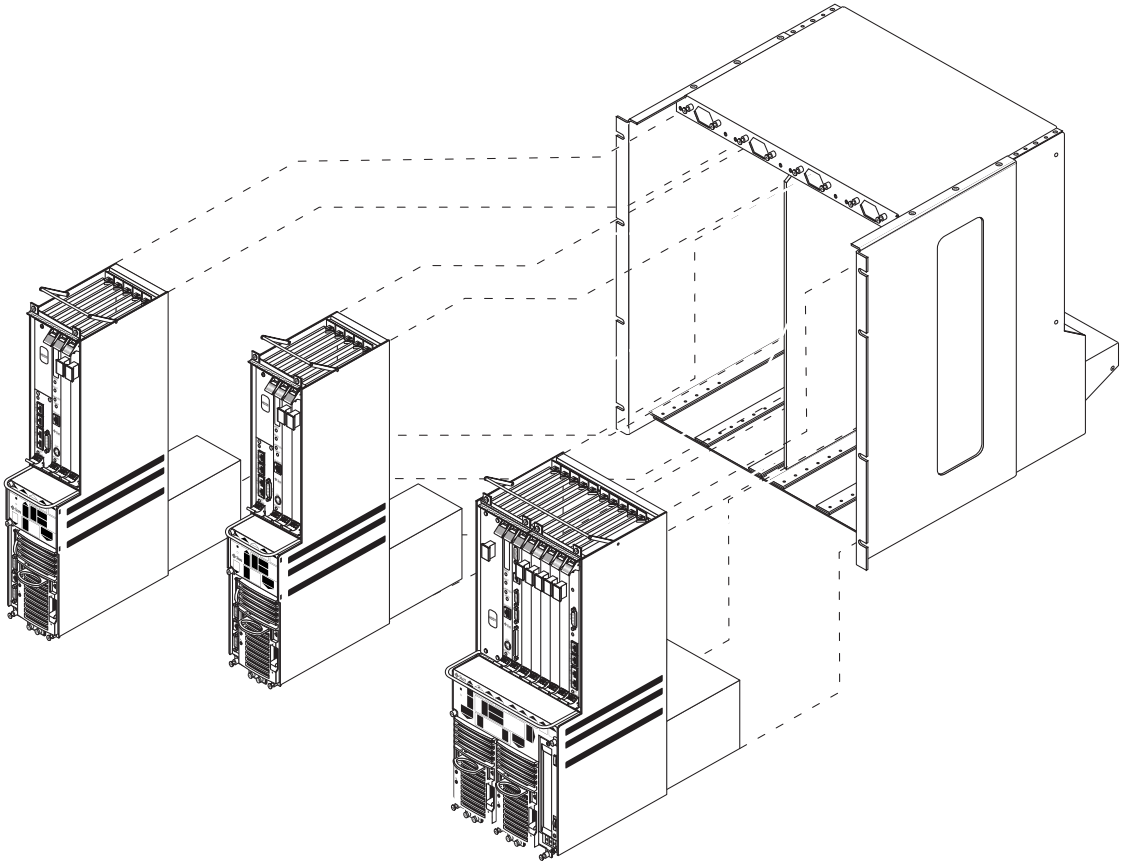

**FIGURE 3-5** One Netra CT 810 Server, Two Netra CT 410 Servers in a Chassis

# Determining If You Have a Netra CT 810 Server or Netra CT 410 Server

If you are not sure whether you have a Netra CT 810 server or a Netra CT 410 server, go to the front of the chassis and locate the system status panel (FIGURE 3-6).

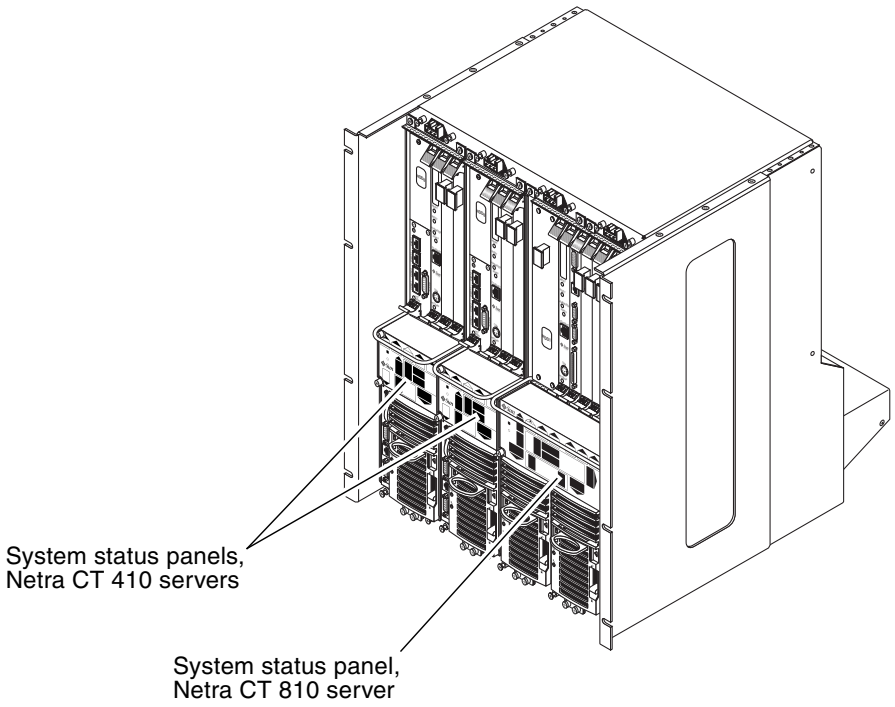


**FIGURE 3-6** System Status Panel Locations

The server identifier at the bottom right corner of the system status panel tells you if you have a Netra CT 810 server or a Netra CT 410 server (FIGURE 3-7).

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**Note –** You can also use the server identifiers on the system status panel to determine if you have a Netra ct 800 or a Netra ct 400 server. Refer to the documentation that you received with those servers for more information.

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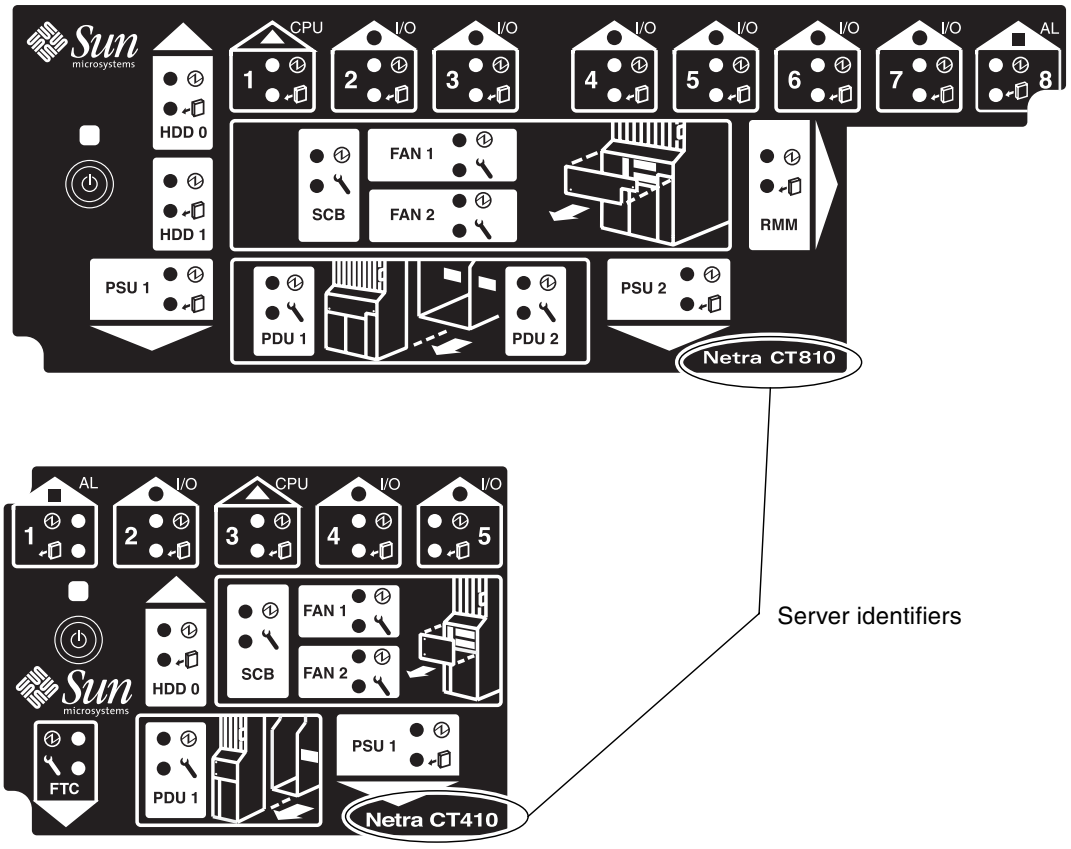


**FIGURE 3-7** Locating the Server Identifiers

# Midplanes

Each Netra CT server has a *midplane*. A midplane is the functional equivalent of a backplane. The CPU card, storage devices, and I/O cards all plug into the midplane from the front of the chassis, and the rear transition cards plug into the midplane from the rear. The midplane for each server is secured to the back of the server unit.

They support the 5V-V10 CompactPCI bus. Although the CPU card will only support the 32-bit CompactPCI bus, the midplanes in both Netra CT servers will allow 64-bit peer-to-peer transactions. The midplanes will also support the H.110 telephony bus on all *but* these slots:

- Slots 1 and 8 in the Netra CT 810 server
- Slots 1 and 3 in the Netra CT 410 server

Slot 1 in the Netra CT 810 server and slot 3 in the Netra CT 410 server are reserved for the host CPU card. Slot 8 in the Netra CT 810 server and slot 1 in the Netra CT 410 server are proprietary I/O slots, intended solely for alarm cards. All CompactPCI slots support basic, full and high availability hot swap on every CompactPCI slot.

FIGURE 3-8 shows the different buses on the Netra CT 810 server and FIGURE 3-9 shows the different buses on the Netra CT 410 server.

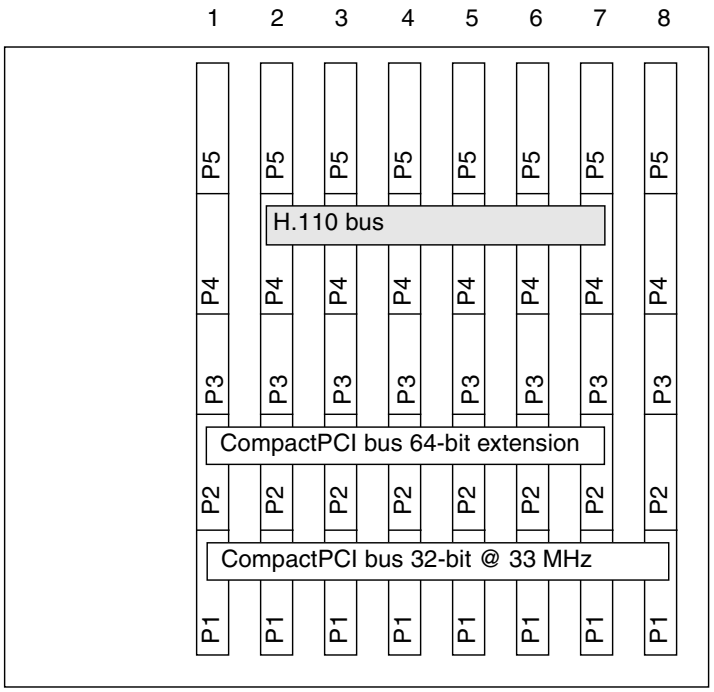


**FIGURE 3-8** Buses in a Netra CT 810 Server (Front View)

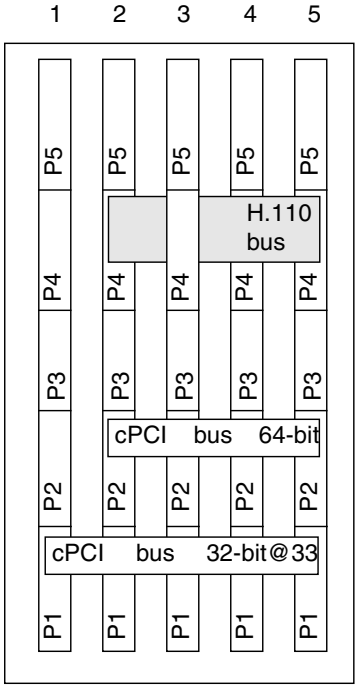


**FIGURE 3-9** Buses in a Netra CT 410 Server (Front View)

# Front-Access and Rear-Access Models

Both Netra CT 410 servers and Netra CT 810 servers can be either front-access or rear-access models. A *front-access* model is a server that is designed so that all the cables to the CompactPCI cards are connected from the front of the chassis, and a *rear-access* model is designed so that all the cables to the CompactPCI cards are connected from the rear of the chassis. The front and rear-access models are mechanically different from one another. All models of servers in a chassis—whether it is a Netra CT 410 server or a Netra CT 810 server—must have the same type of cable access, all front or all rear; you cannot have both front and rear-access model servers in the same chassis.

**Note –** The internal wiring and mechanical layout differ greatly between the rear-access and front-access models of the Netra CT server. Because of this, you *cannot* change a rear-access model of a Netra CT server to a front-access model (or vice versa) after the Netra CT server and chassis have been shipped from the factory.

# Front-Access Models

For the front-access model of the Netra CT 410 server, all of the CompactPCI cards installed in the servers are installed from the front of the server and the cables are connected from the front. There are no cards installed or cabling from the rear of the server, so the back of the Netra CT server chassis is closed for front-access models. FIGURE 3-10 shows the top view of the front-access model of a *diskfull* Netra CT 410 server, and FIGURE 3-11 shows the top view of the front-access model of a *diskless* Netra CT 410 server.

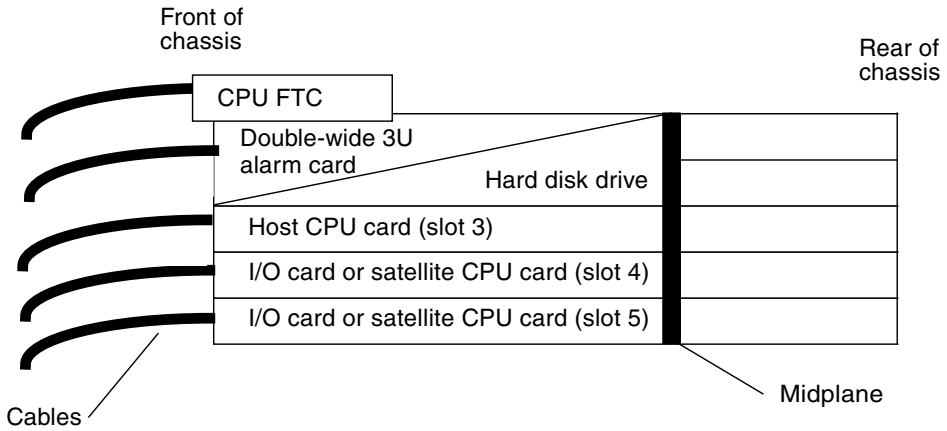


**FIGURE 3-10** Front-Access Model of a Netra CT 410 Server, Diskfull Version (Top View)

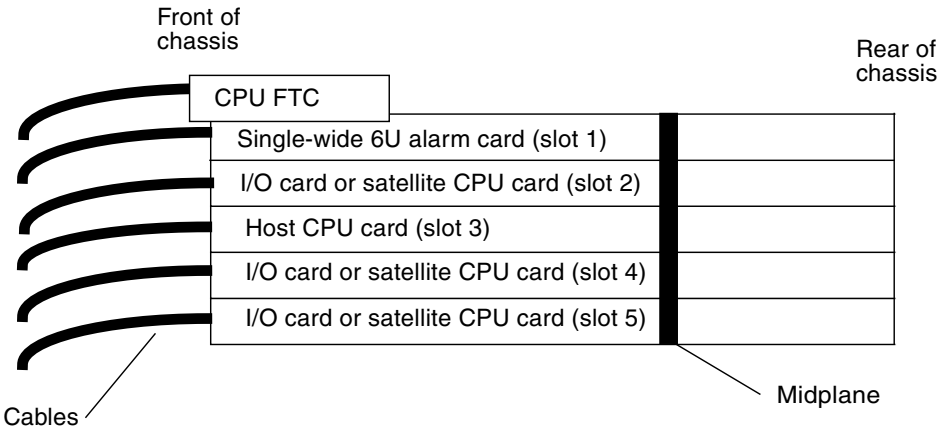


**FIGURE 3-11** Front-Access Model of a Netra CT 410 Server, Diskless Version (Top View)

# Rear-Access Models

For the rear-access models of both the Netra CT 810 server and the Netra CT 410 server, all the cables are connected to *rear transition cards* installed at the rear of the Netra CT server. The rear transition cards, in effect, extend the CompactPCI cards installed in each slot from the midplane to the rear of the chassis. The rear-panel transition cards are "in-line" with the front CompactPCI cards.

Each rear transition card installed in a rear-access model must have an accompanying card installed in the front card cage of the server; however, the type of card installed in the front card cage varies:

- Host CPU card—A host CPU card must be installed in the *front* card cage in the appropriate slot (slot 1 in the Netra CT 810 server and slot 3 in the Netra CT 410 server). In addition, a host CPU rear transition card must be installed in the *rear* card cage in the same slot, viewed from the rear. The host CPU rear transition card provides connections from the host CPU card to standard I/O connectors at the rear of the system.
- I/O card or satellite CPU card—A front I/O card or satellite CPU card must be installed in the *front* card cage in one of the I/O slots. It contains the hot swap LED that tells you when an I/O card or satellite CPU card is ready for removal. In addition, the accompanying rear transition card must be installed in the *rear* card cage in the same slot, viewed from the rear. The rear transition card provides connections from the front I/O card or satellite CPU card to standard connectors at the rear of the system.

- Alarm card—An alarm card must be installed in the *front* card cage in the appropriate slot (slot 8 in the Netra CT 810 server and slot 1 in the Netra CT 410 server). In addition, an alarm rear transition card must be installed in the *rear* card cage in the same slot, viewed from the rear. The alarm card installed in the front card cage is the same alarm card installed in a front-access model; however, when a Netra CT server system detects an alarm rear transition card, it automatically reroutes the signals directly to the alarm rear transition card, so cabling is done to the alarm rear transition card, not the alarm card installed in the front card cage.

FIGURE 3-12 shows the top view of the rear-access model of a Netra CT 810 server with an alarm card installed, and FIGURE 3-13 shows the top view of the rear-access model of a Netra CT 410 server.

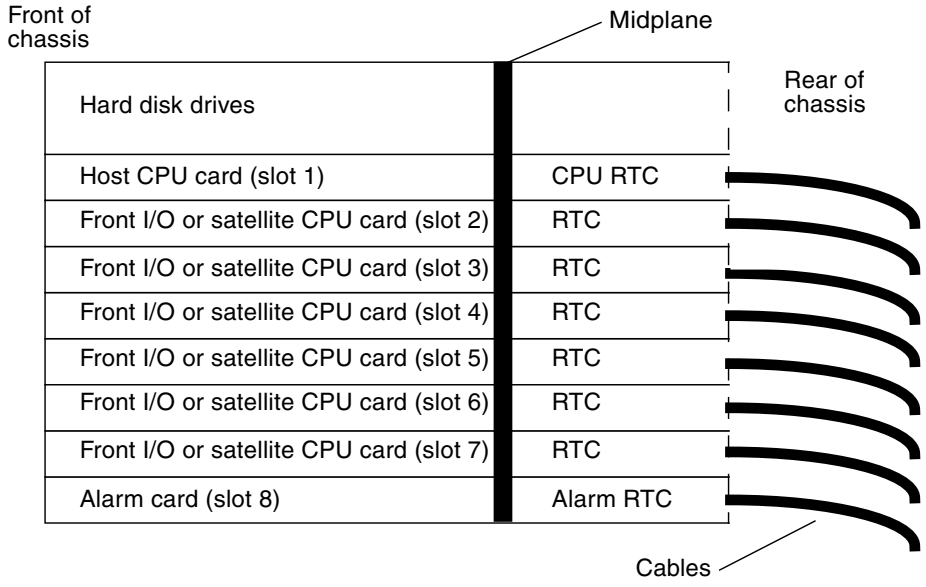


**FIGURE 3-12** Rear-Access Model of an Netra CT 810 Server (Top View)

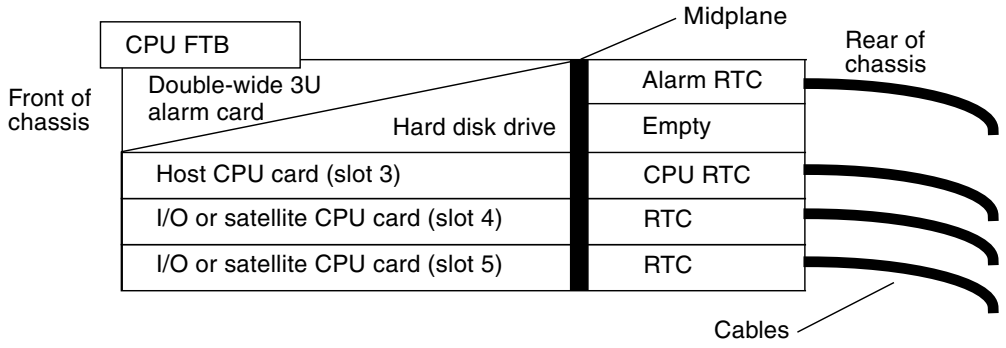


**FIGURE 3-13** Rear-Access Model of a Netra CT 410 Server, *Diskfull* Version (Top View)

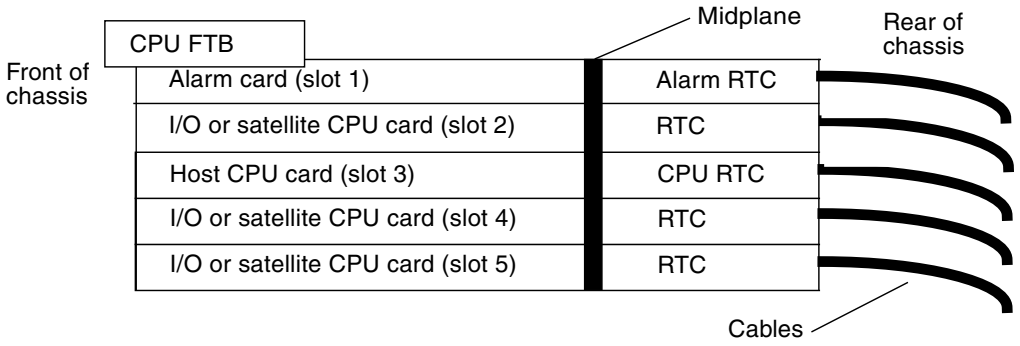


**FIGURE 3-14** Rear-Access Model of a Netra CT 410 Server, *Diskless* Version (Top View)

The slot to the left of the power supply in the Netra CT 410 server is reserved for the host CPU front transition card (FTC). The host CPU front transition card is not needed for the rear-access model of the Netra CT 410 server, so a host CPU front termination board is installed in this slot for the rear-access model (see "Host CPU Front Termination Board (Netra CT 410 Server Only)" on page 61 for more information).

# 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 3-15).
- 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 3-15). The DC connectors are at the rear of the chassis for the rear-access model.

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**Note –** AC-powered servers are only available in rear-access models.

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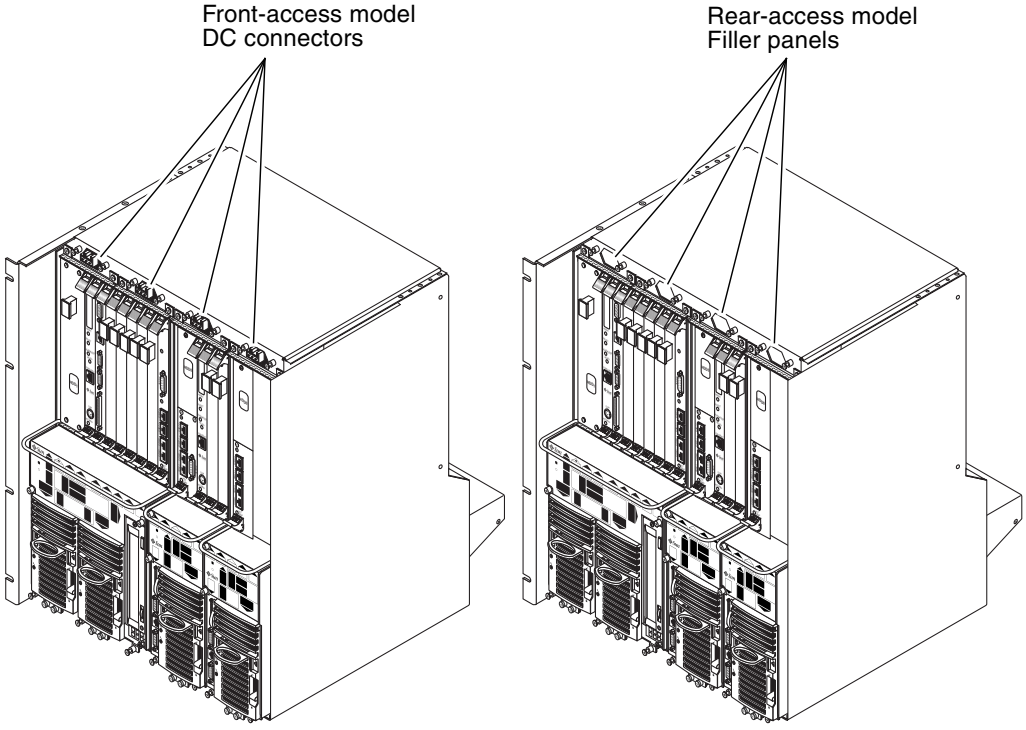


**FIGURE 3-15** Front-Access and Rear-Access Models

CHAPTER 4

# Components Descriptions

Components within the Netra CT servers can be broken down into three categories:

- Components available for both front and rear-access model servers
- Components available only for the front-access model servers
- Components available only for the rear-access model servers

In addition, some components are available only for the Netra CT 810 server, some are available only for the Netra CT 410 server, and some are available for both types of servers.

Finally, components can be further broken down into either hot-swappable or cold-swappable components:

- A *hot-swappable* component is a component that you can install or remove and replace while the server is running, without interrupting the operation of the server. You may have to enter software commands before and after an installation or a removal/replacement of a hot-swappable component to incorporate the new component in the system correctly.
- A non-hot swappable or *cold-swappable* component is a component that requires that you halt (and, in some cases, also power down) the server before installing or removing and replacing the component.

Refer to TABLE 4-1 for a list of components available for the different models of the Netra CT server. All information applies to both the Netra CT 810 server and the Netra CT 410 server unless otherwise noted.

**TABLE 4-1** Components Available for the Netra CT Server

| | Front-Access Models | Rear-Access Models |
|---|---|---|
| **Air filters** | A *hot-swappable* component. Refer to "Air Filters" on page 47. | A *hot-swappable* component. Refer to "Air Filters" on page 47. |
| **Alarm card** | A *hot-swappable* component. Refer to "Alarm Card" on page 53. | A *hot-swappable* component. Must be installed along with alarm rear transition card. Refer to "Alarm Card" on page 53 and "Alarm Rear Transition Card" on page 62. |
| **Alarm rear transition card** | Not applicable. | A *hot-swappable* component. Must be installed along with alarm card. Refer to "Alarm Card" on page 53 and "Alarm Rear Transition Card" on page 62. |
| **Fans and fan tray** | A *hot-swappable* component. Refer to "Fan Tray and Fans" on page 49. | A *hot-swappable* component. Refer to "Fan Tray and Fans" on page 49. |
| **Hard disk drive** | A *hot-swappable* component. Refer to "Hard Disk Drive" on page 51. | A *hot-swappable* component. Refer to "Hard Disk Drive" on page 51. |
| **Host CPU card** | A *hot-swappable* component. Must be installed along with a host CPU front transition card. Refer to "Host CPU Card" on page 34 and "Host CPU Front Transition Card" on page 56.[1] | A *hot-swappable* component. Must be installed along with a host CPU rear transition card. Refer to "Host CPU Card" on page 34 and "Host CPU Rear Transition Card" on page 59.[1] |
| **Host CPU front termination board** | Not applicable. | • Netra CT 810 server: Not applicable.<br>• Netra CT 410 server: A *hot-swappable* component. Refer to "Host CPU Front Termination Board (Netra CT 410 Server Only)" on page 61. |
| **Host CPU front transition card** | A *hot-swappable* component. Must be installed along with a host CPU card. Refer to "Host CPU Card" on page 34 and "Host CPU Front Transition Card" on page 56.[1] | Not applicable. |
| **Host CPU rear transition card** | Not applicable. | A *hot-swappable* component. Must be installed along with a host CPU card. Refer to "Host CPU Card" on page 34 and "Host CPU Rear Transition Card" on page 59.[1] |
| **I/O card** | A *hot-swappable* component. Refer to "Front-Access Model Satellite CPU or I/O Cards" on page 56. | *Hot-swappable* components. Both the front I/O card and the I/O rear transition card must be installed. Refer to "Rear-Access Model Satellite CPU or I/O Cards" on page 64. |

**TABLE 4-1** Components Available for the Netra CT Server *(Continued)*

| | Front-Access Models | Rear-Access Models |
|---|---|---|
| **Power supply unit** | • Netra CT 810 server: A *hot-swappable* component, as long as it is not the lone power supply unit. Refer to "Power Supply Units" on page 38.<br>• Netra CT 410 server: A *cold-swappable* component. Refer to "Power Supply Units" on page 38. | • Netra CT 810 server: A *hot-swappable* component, as long as it is not the lone power supply unit. Refer to "Power Supply Units" on page 38.<br>• Netra CT 410 server: A *cold-swappable* component. Refer to "Power Supply Units" on page 38. |
| **Removeable media module** | • Netra CT 810 server: A *hot-swappable* component. Refer to "Removeable Media Module" on page 52.<br>• Netra CT 410 server: Not applicable. | • Netra CT 810 server: A *hot-swappable* component. Refer to "Removeable Media Module" on page 52.<br>• Netra CT 410 server: Not applicable. |
| **Satellite CPU card** | A *hot-swappable* component. Refer to "Front-Access Model Satellite CPU or I/O Cards" on page 56. | *Hot-swappable* components. Both the front satellite CPU card and the satellite CPU rear transition card must be installed. Refer to "Rear-Access Model Satellite CPU or I/O Cards" on page 64. |
| **Satellite CPU rear transition card** | Not applicable. | A *hot-swappable* component. Both the front satellite CPU card and the satellite CPU rear transition card must be installed. Refer to "Rear-Access Model Satellite CPU or I/O Cards" on page 64. |
| **System controller board** | A *hot-swappable* component. Refer to "System Controller Board" on page 46. | A *hot-swappable* component. Refer to "System Controller Board" on page 46. |
| **System status panel** | A *hot-swappable* component. Refer to "System Status Panel" on page 39. | A *hot-swappable* component. Refer to "System Status Panel" on page 39. |

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

# Components Available for Both the Front-Access and Rear-Access Models

Following are components that are available for both front and rear-access model servers:

# Host CPU Card

---

**Note –** This section gives general information about the host CPU in the Netra CT server. For more specific information about the Netra CP2140 host CPU card, refer to the *Netra CP2140 Technical Reference and Installation Manual* (816-4908-xx) and the *Netra CP2140 CompactPCI Board Product Note* (816-4870-xx). In addition, there are restrictions for the Netra CP2140 host CPU card that are specific to the Netra CT server; refer to "Restrictions for the Netra CT Server" on page 36 for more information.

---

Every Netra CT server contains one host CPU card. The Netra CT 810 servers and the Netra CT 410 servers use the same host CPU card. A specific slot is reserved for the host CPU card in both the Netra CT 810 server (slot 1) and the Netra CT 410 server (slot 3), indicated by a red card cage guide. FIGURE 4-1 shows where the host CPU card must be installed in both types of servers.

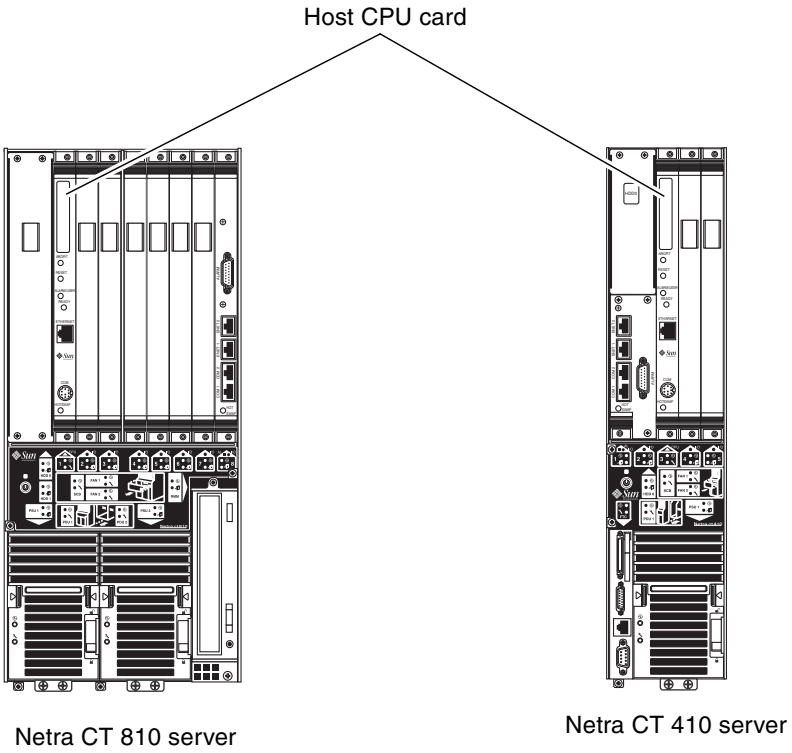


**FIGURE 4-1** Host CPU Card Locations

## On-Board Components

FIGURE 4-2 shows the ports on a host CPU card. The TTY A port is available on the host CPU card for the front-access model of the Netra CT 410 server because the CPU front transition card for the Netra CT 410 server does not have a TTY A port (see "Host CPU Front Transition Card" on page 56 for more information on the CPU front transition card for the Netra CT 410 server). Do *not* use the TTY A port on the host CPU card for the rear-access models of the Netra CT 810 server or Netra CT 410 server because the CPU transition cards for those models all have a TTY A port.

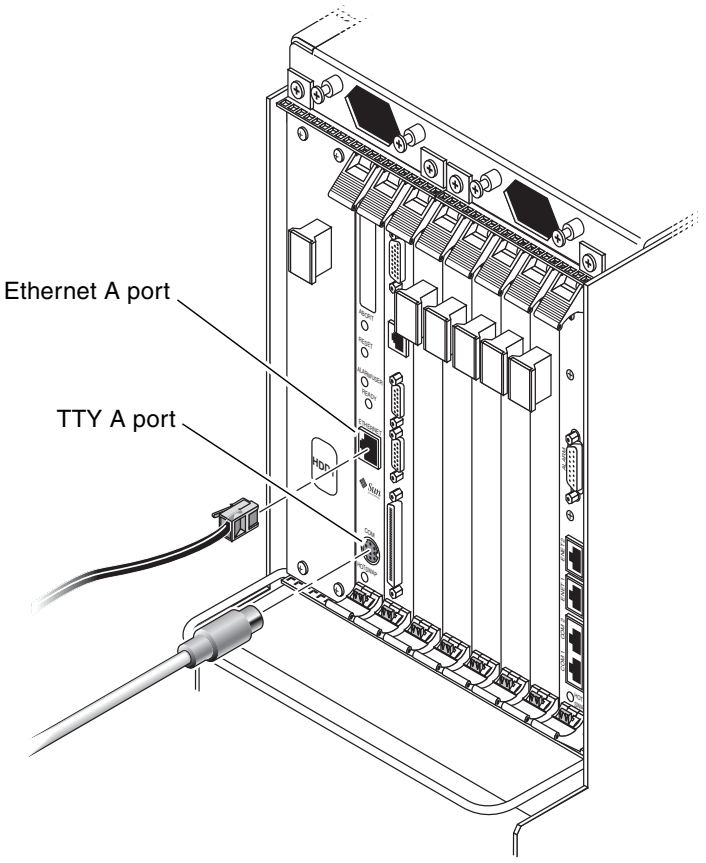


**FIGURE 4-2** Host CPU Card

## Restrictions for the Netra CT Server

The documentation that comes with the Netra CP2140 host CPU card explains how to set the SMC module settings on the SW0501 switches when installing a Netra CP2140 host CPU card into high availability chassis or a non-high availability chassis. The Netra CT server supports high availability hot swap; however, because the alarm card controls the high availability on the Netra CT server, the settings on the SW0501 switches should actually be set in the *default, non-high availability* settings.

Following are the correct (default) settings for the SMC module switch SW0501 for the Netra CT server (see FIGURE 4-3 and FIGURE 4-4):

- Switch 1—Closed (switch is set in direction of arrow)
- Switch 2—Closed (switch is set in direction of arrow)

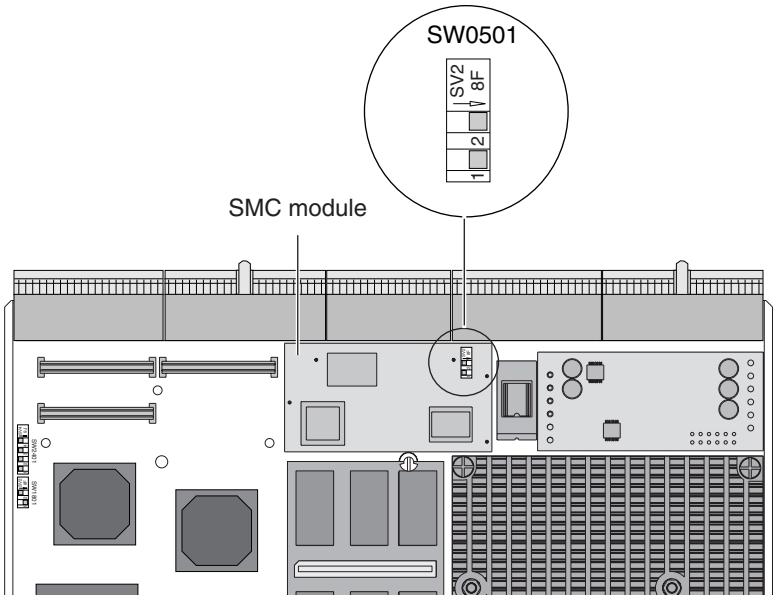


**FIGURE 4-3** Location of SW0501 on SMC Module

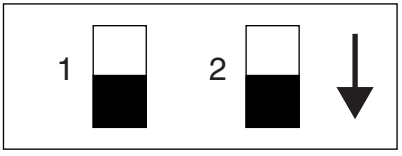


**FIGURE 4-4** Switch SW0501 in Closed Position (Default) for the Netra CT Server

# Power Supply Units

Every Netra CT 810 server contains two power supply units, and every Netra CT 410 server contains one power supply unit. The Netra CT 810 servers and Netra CT 410 servers use the same power supply units.

For the Netra CT 810 server, one power supply unit is redundant of the other. Feeds are supplied to each of the power supply units through the DC power distribution units or AC power entry unit (see Chapter 2 for more information). Because each Netra CT 810 server has two power supply units, the server receives power from two power sources. If one power source or one power supply unit fails, the server will continue normal operation using the remaining power supply. Note that this is not the case for the Netra CT 410 server because it has only one power supply unit.

The locations of the power supply units in the Netra CT 810 server are illustrated in FIGURE 4-5 and the location of the power supply unit in the Netra CT 410 server is illustrated in FIGURE 4-6.

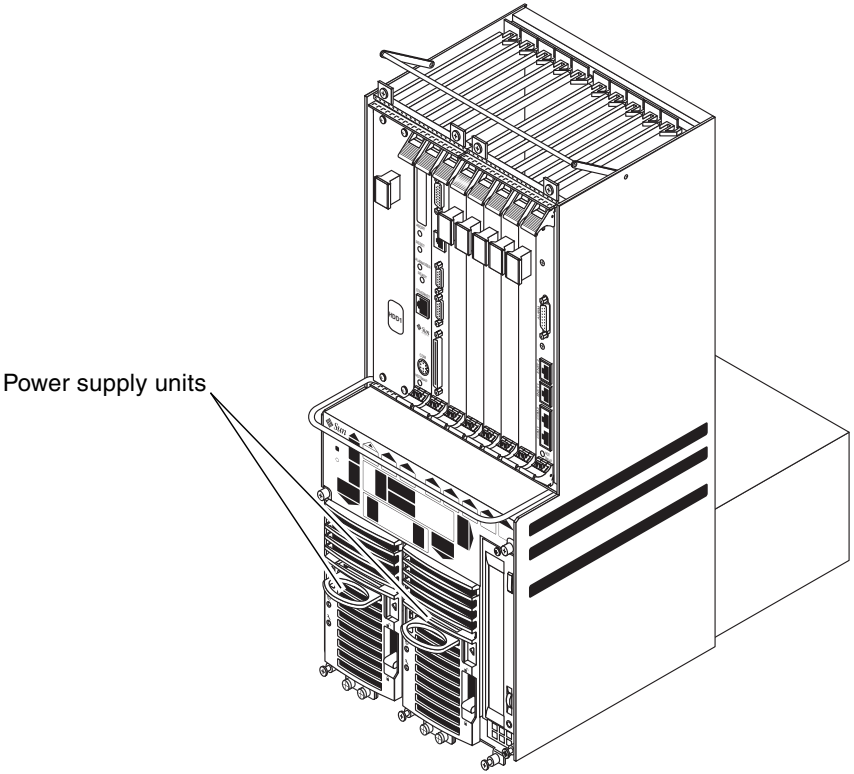


**FIGURE 4-5** Power Supply Unit Locations (Netra CT 810 Server)

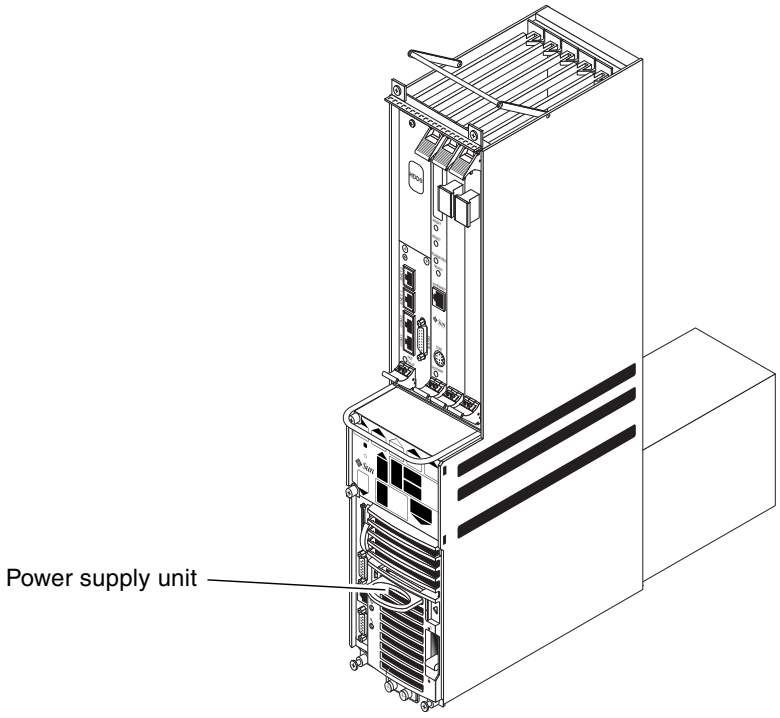


**FIGURE 4-6** Power Supply Unit Location (Netra CT 410 Server)

# System Status Panel

The system status panel is a module designed to give feedback on the status of the key components within the Netra CT servers. The location of the system status panel in the Netra CT 810 servers and Netra CT 410 servers is illustrated in FIGURE 4-7.

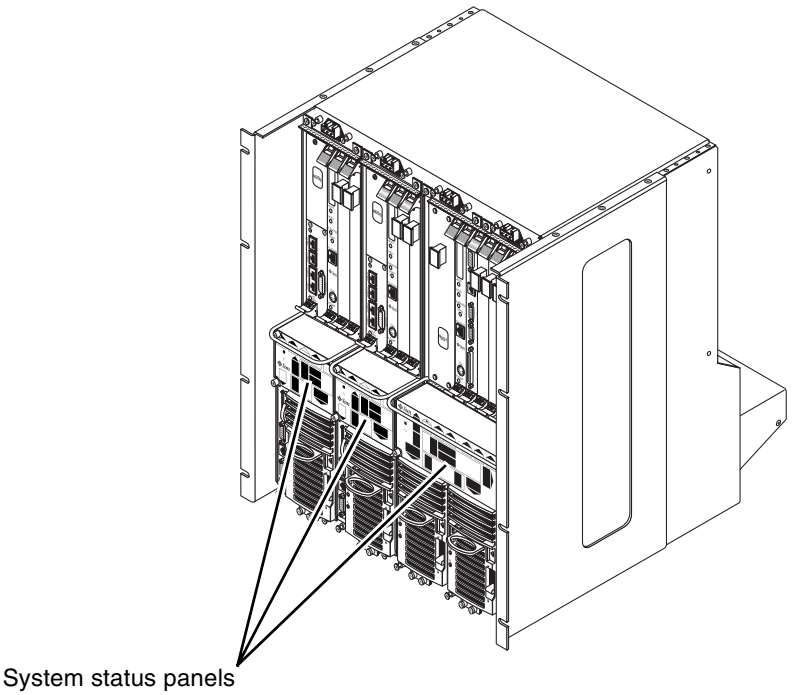


**FIGURE 4-7** System Status Panel Locations

The system status panel has one set of LEDs for each component within that particular server. FIGURE 4-8 shows the LEDs on the system status panel for the Netra CT 810 server, and FIGURE 4-9 shows the LEDs on the system status panel for the Netra CT 410 server.

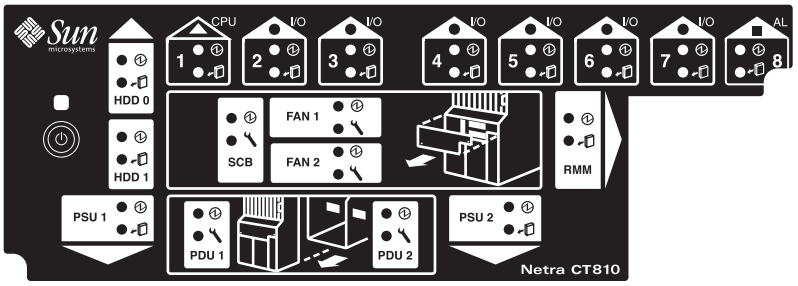


**FIGURE 4-8** System Status Panel (Netra CT 810 Server)

**TABLE 4-2** 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 cards or satellite CPU cards (●) installed in slots 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 |

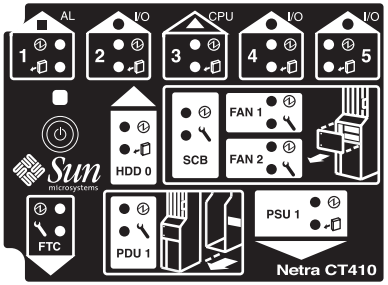


**FIGURE 4-9** System Status Panel (Netra CT 410 Server)

**TABLE 4-3** 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 |

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 4-10) or the green Power and amber Fault LEDs (FIGURE 4-11). 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.

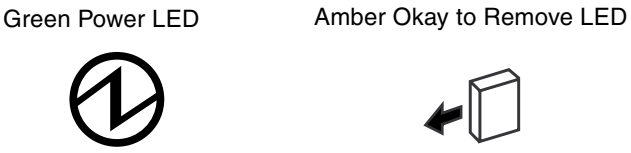


**FIGURE 4-10** Power and Okay to Remove LEDs


**FIGURE 4-11** Power and Fault LEDs

- TABLE 4-4 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 4-5 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 4-6 gives the LED states and meanings for any component other than a CompactPCI board that has the green Power and amber *Fault* LEDs.

**TABLE 4-4** 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. | If there is a card installed in this slot, then one of the following components is faulty:<br>• the card installed in the slot<br>• the alarm card<br>• the system controller board<br>Remove and replace the failed component to clear this state. |
| Blinking | Off | The card is coming up or going down. | *Do not* remove the card in this state. |
| On | Off | The card is up and running. | *Do not* 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). | Wait several seconds to see if the green Power LED stops blinking. If it does not stop blinking after several seconds, enter `cfgadm -al` and verify that the card is in the `unconfigured` state, then perform the necessary action, depending on the card:<br>• Alarm card—You can remove the alarm card in this state.<br>• All other cards—Power off the slot through the alarm card software, then remove the card. |
| On | On | The card is powered on and is in use, but a fault has been detected on the card. | Deactivate the card using one of the following methods:<br>• Use the `cfgadm -f -c unconfigure` 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.<br>• Halt the system and power off the slot through the alarm card software, then remove the card.<br>The green Power LED will then give status information:<br>• If the green Power LED goes off, then you can remove the card.<br>• If the green Power LED remains on, then you must halt the system and power off the slot through the alarm card software. |

**TABLE 4-5** Meanings of Power and Okay to Remove LEDs

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

**TABLE 4-6** 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. |

There is also a green system power LED and power on/off button located on the system status panel. When the system is off, the system power LED will be unlit. Pressing the system power button when the system is off will start the power-up sequence. Once the system is completely powered up, the system power LED remains on.

When the system is powered on, pressing the system power button for less than 4 seconds will start the orderly power-down sequence—in a manner that no persistent operating system data structures are corrupted—indicated by a blinking LED. In the orderly power-down, applications in service may be abnormally terminated and no

further services will be invoked by the CPU. Once the CPU has reached a quiescent state (run level-0, as if `init 0` had been invoked), then the power suppl(ies) will turn off, indicated by the LED changing from a blinking state to the off state.

If the button is held down for 4 seconds or longer, the power suppl(ies) are turned off without any intervention of the CPU; that is, the “emergency” power-down sequence occurs.

# System Controller Board

The system controller board is a hot-swappable component located behind the system status panel; you must remove the system status panel to access the system controller board. The system controller board 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.

The location of the system controller board in the Netra CT 810 server is illustrated in FIGURE 4-12 and the location of the system controller board in the Netra CT 410 server is illustrated in FIGURE 4-13.

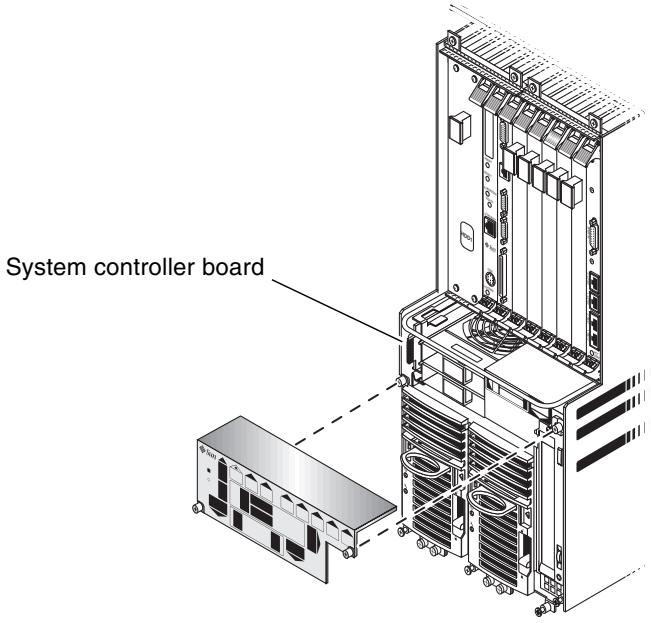


**FIGURE 4-12** System Controller Board Location (Netra CT 810 Server)

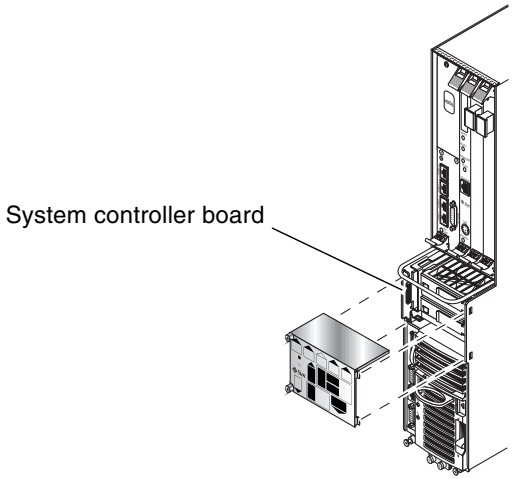


**FIGURE 4-13** System Controller Board Location (Netra CT 410 Server)

# 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. FIGURE 4-14 shows the locations of the air filters in a Netra CT 810 server power supply unit, and FIGURE 4-15 shows the locations of the air filters in a Netra CT 410 server power supply unit.

**Caution –** There is an energy hazard present if the power supply unit air filter is not installed. If you remove the power supply unit air filter, you must replace the filter immediately and replace the outer cover for the safe operation of your system. Refer to the instructions in the *Netra CT Server Service Manual* for more information.

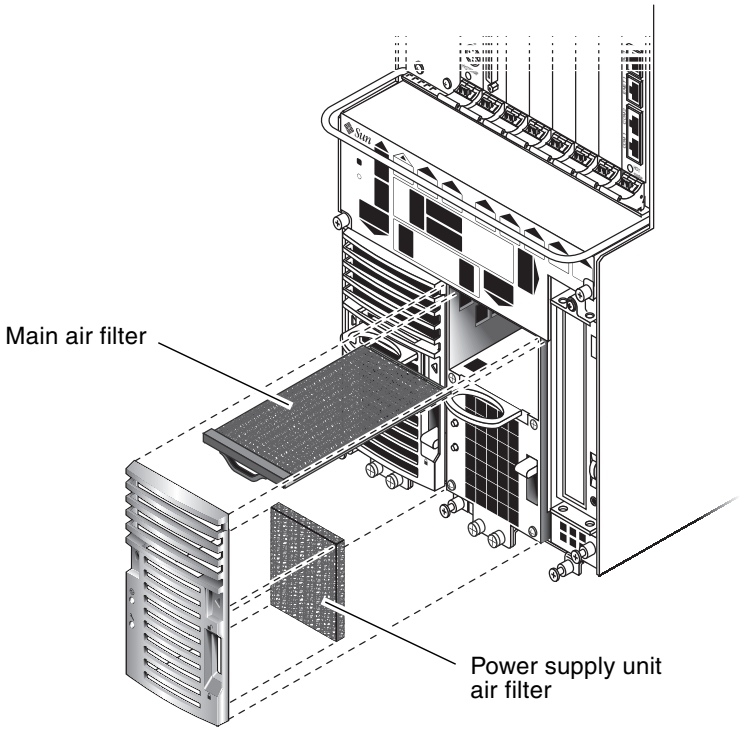


**FIGURE 4-14** Power Supply Unit Air Filter and Main Air Filter (Netra CT 810 Server)

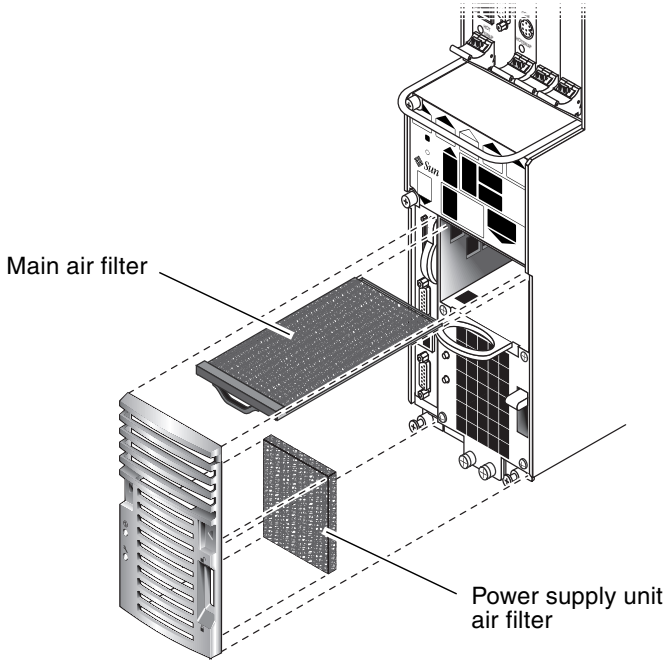


**FIGURE 4-15** Power Supply Unit Air Filter and Main Air Filter (Netra CT 410 Server)

# Fan Tray and Fans

Both the Netra CT 810 servers and the Netra CT 410 servers have two fan trays. The fan tray for the Netra CT 810 server has a single large fan in each tray, while the fan tray for the Netra CT 410 server has two smaller fans in each tray. The fan tray is designed to be hot-swappable.

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.

The fans are located underneath the card cage behind the system status panel (see "System Status Panel" on page 39 for the location of the system status panel). They are recessed into the operations card cage to maximize the air flow across the

CompactPCI cards. FIGURE 4-16 shows the locations of the fan trays in a Netra CT 810 server and FIGURE 4-17 shows the locations of the fan trays in a Netra CT 410 server. Note that the system status panel has been removed in both figures.

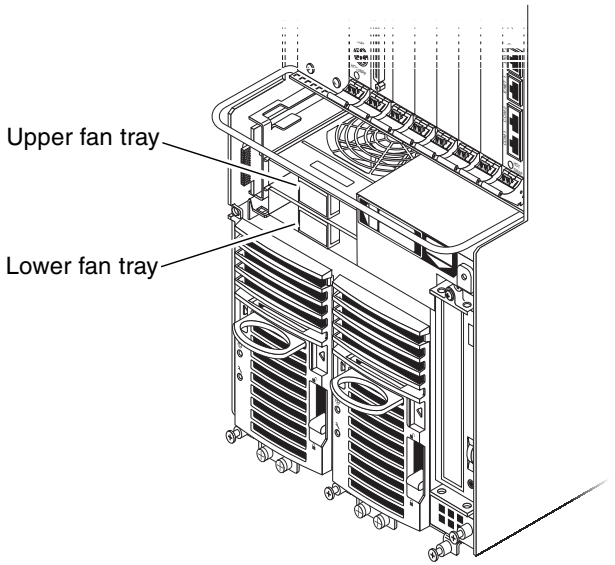


**FIGURE 4-16** Fan Trays (Netra CT 810 Server)

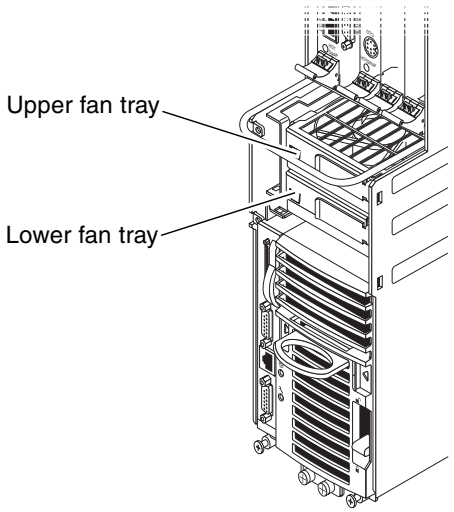


**FIGURE 4-17** Fan Trays (Netra CT 410 Server)

# Hard Disk Drive

Hard disk drives are fully hot-swappable. Each hard disk drive has its own latching mechanism to ensure a positive lock with the chassis. You can have a maximum of two hard disk drives in the Netra CT 810 server and one hard disk drive in the Netra CT 410 server. The Netra CT 810 servers and the Netra CT 410 servers both use the same hard disk drives.

A specific slot is reserved for the hard disk drives in both the Netra CT 810 servers and the Netra CT 410 servers. 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.

Following are the SCSI IDs for the hard disk drives:

- Netra CT 810 server
  - Upper hard disk drive (HDD 0)—SCSI ID 0 on first SCSI chain (c0t0d0)
  - Lower hard disk drive (HDD 1)—SCSI ID 1 on second SCSI chain (c1t1d0)
- Netra CT 410 server
  - Hard disk drive (HDD 0)—SCSI ID 0 on only SCSI chain (c0t0d0)

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. 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, and should be used as the boot drive.

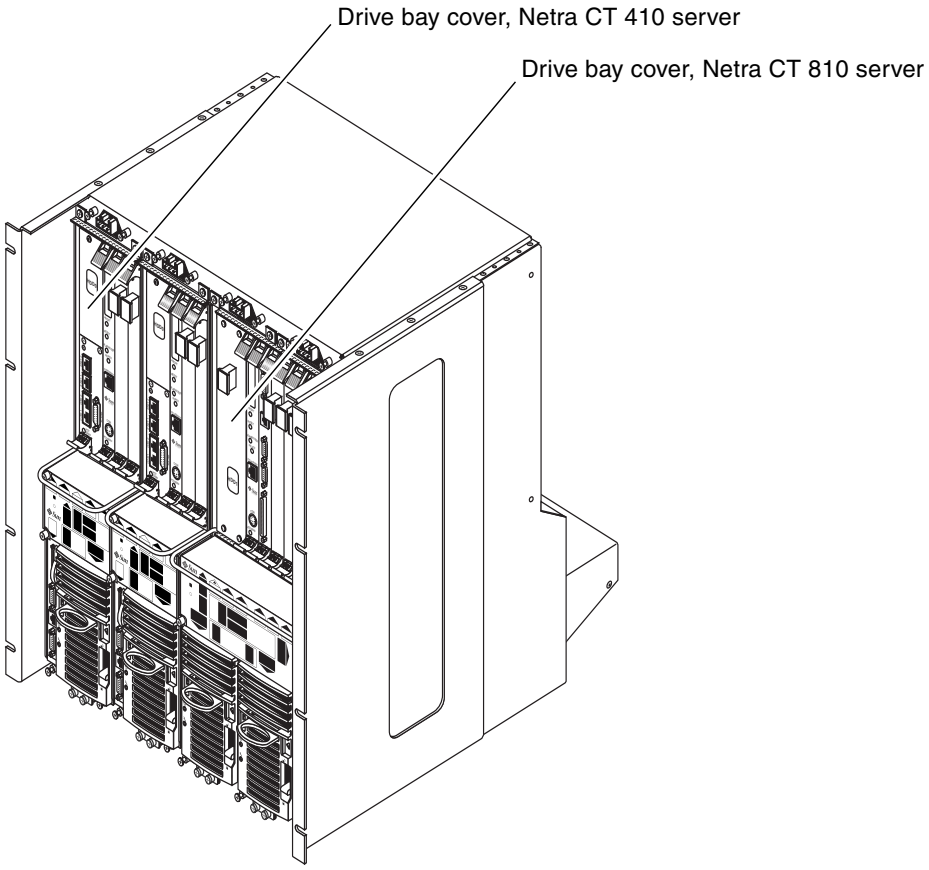


**FIGURE 4-18** Drive Bay Cover Locations

# Removeable Media Module

The removeable media module consists of either a DVD or a 4-mm digital audio tape (DAT) drive, either of which is placed into the system from the front. The removeable media module is available only for the Netra CT 810 server.

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

- DVD—SCSI ID 6
- DAT—SCSI ID 5

In addition, there are two separate SCSI chains in the Netra CT 810 server for the SCSI devices. The removeable media device and the upper hard disk drive (HDD 0) are both on the first SCSI chain; the lower hard disk drive (HDD 1) is alone on the second SCSI chain.

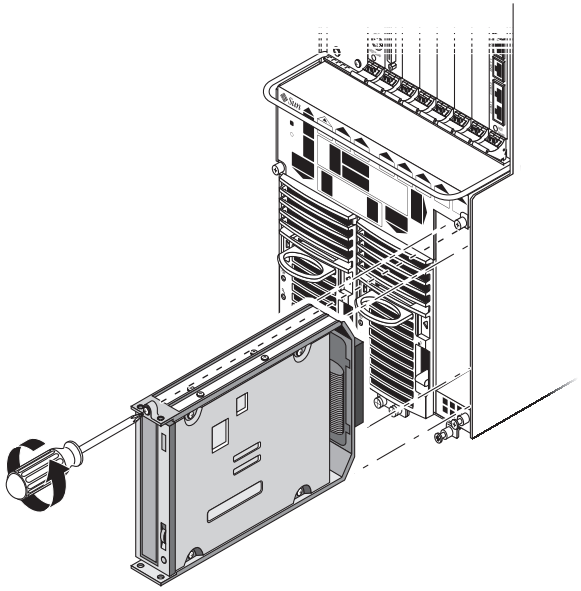

**FIGURE 4-19** Removeable Media Module Location

# Alarm Card

The alarm card is a standard component for both the Netra CT 410 servers and Netra CT 810 servers. There are two different types of alarm cards used in the two servers:

- The single-wide 6U alarm card (a *U* is a unit of measure equal to 1.75 inches or 44.45 mm). This alarm card is used in the Netra CT 810 server, and in the diskless version of the Netra CT 410 server.
- The double-wide 3U alarm card. This alarm card is used only in the diskfull version of the Netra CT 410 server.

Significant *Reliability, Availability, Serviceability (RAS)* functions are provided by the *alarm card*. The alarm card has its own CPU, a Motorola MPC850 processor, plus its own real-time operating system and application software.

The alarm card and its accompanying software perform the following functions on the Netra CT server:

- Enables you to power on and off the Netra CT server from a remote console
- Notifies an administrator in the event of a component failure
- Gives a hard or soft reset of the CPU board
- Interacts with the network management software on the server to indicate changes in system state

The alarm card has the following remote interfaces:

- Two RJ-45 connectors—one 10 Mbps (Ethernet port 1) and one 10/100 Mbps (Ethernet port 2)
- Two RS-232 serial ports
- One DB-15 alarm port

A specific slot is reserved for the alarm card in both the Netra CT 810 server and the Netra CT 410 server. FIGURE 4-20 shows the single-wide 6U alarm card used in the Netra CT 810 server and the diskless Netra CT 410 server. FIGURE 4-21 shows the double-wide 3U alarm card used in the diskfull Netra CT 410 server.

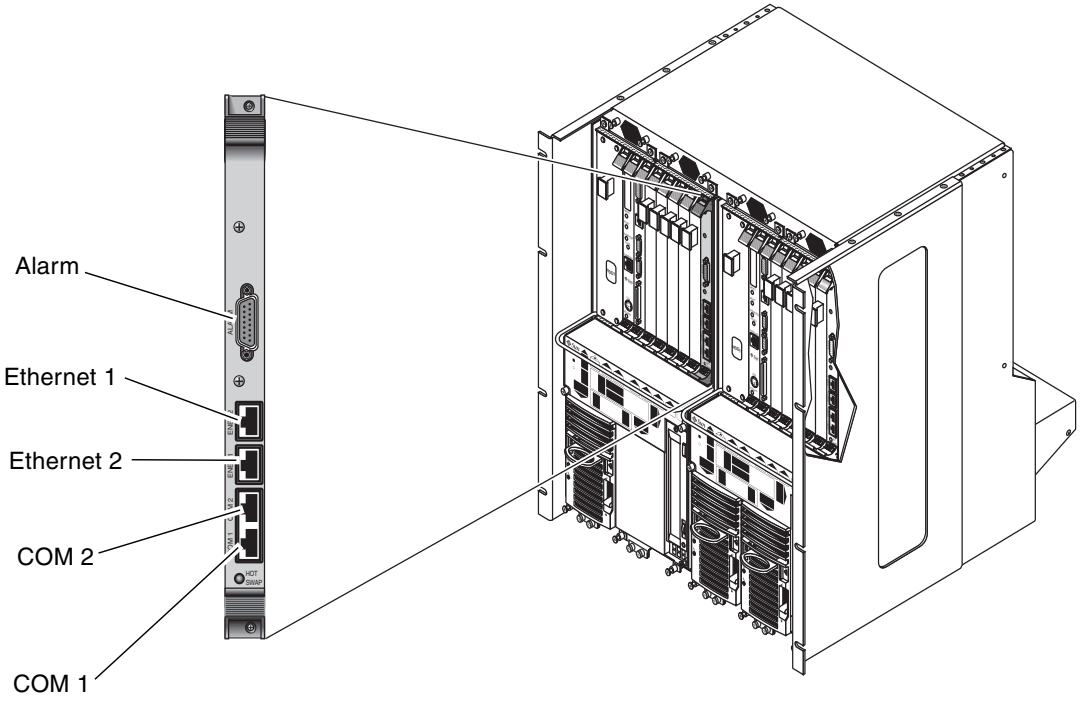


**FIGURE 4-20** Single-Wide 6U Alarm Card

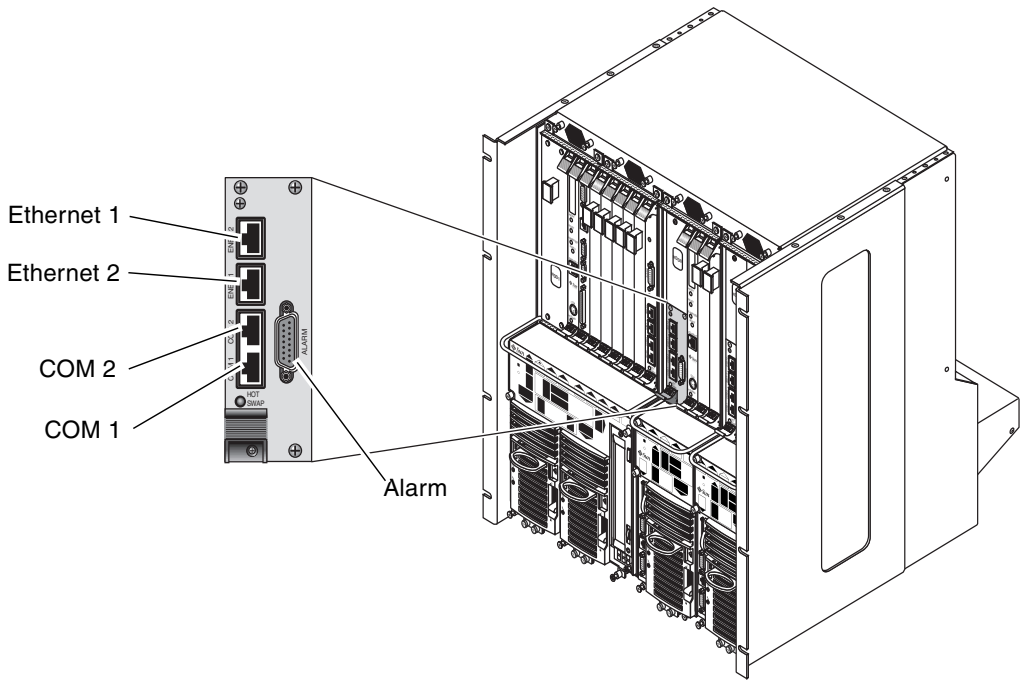


**FIGURE 4-21** Double-Wide 3U Alarm Card

There is also an alarm rear transition card available for the rear-access models of the Netra CT 810 server and Netra CT 410 server. Either the single-wide 6U alarm card or the double-wide 3U alarm card can be used in conjunction with the alarm rear transition card. The alarm rear transition card must be installed in the same slot, at the rear of the server, as the alarm card. Refer to "Alarm Rear Transition Card" on page 62 for more information.

# Components Available Only for the Front-Access Models

Following are components that are available only for front-access model servers:

- "Host CPU Front Transition Card" on page 56
- "Front-Access Model Satellite CPU or I/O Cards" on page 56

# Host CPU Front Transition Card

The host CPU front transition card is required to provide connections from the host CPU card to standard I/O connectors on the front. The host CPU front transition card for the Netra CT 410 server is 3U and is installed in the slot next to the power supply.

FIGURE 4-22 shows the location of the host CPU front transition card in a Netra CT 410 server. Note that the host CPU front transition card for the Netra CT 410 server does not have a TTY A port, so you must use the COM port on the host CPU card as the TTY A port for the front-access model of the Netra CT 410 server (see "Host CPU Card" on page 34 for more information on the COM port on the host CPU card).

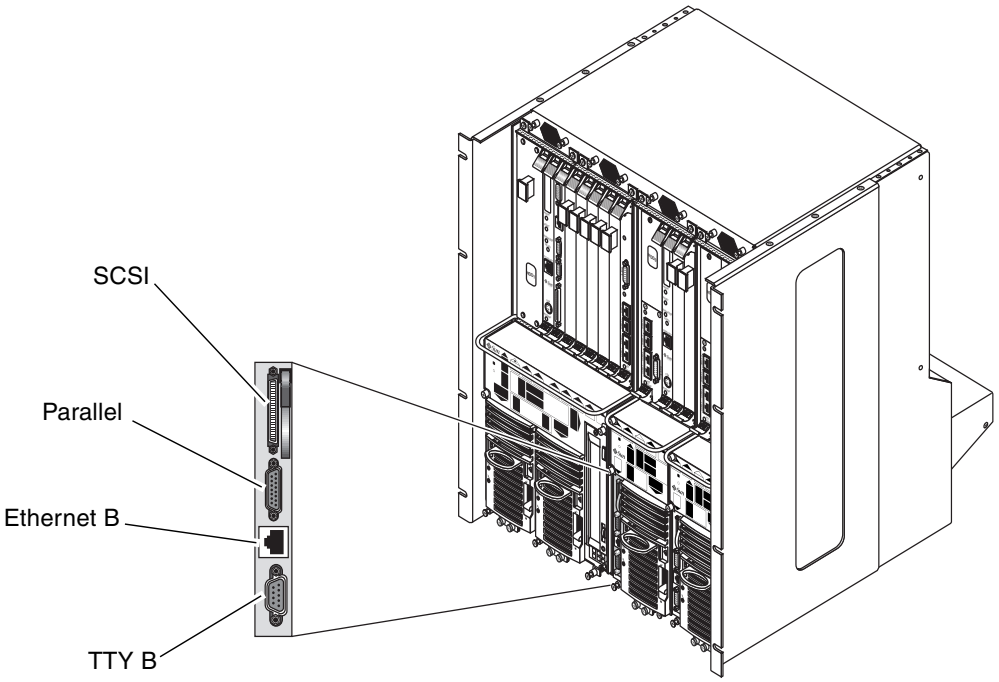


**FIGURE 4-22** Host CPU Front Transition Card Location in a Netra CT 410 Server

# Front-Access Model Satellite CPU or I/O Cards

Visit the `www.sun.com` site for more information on satellite CPU and I/O cards that are supported on the Netra CT server.

Card slots designated for satellite CPU, I/O cards and alarm cards have black rails; card slots with red rails are reserved for the host CPU card. There are also labels at the front of the servers and the rear of the chassis that show the I/O slot numbers for

front-access and rear-access models, as well as the cards that are supported in each slot. For front-access models, you can also determine the I/O slot numbers for your servers by using the I/O slot numbers shown on the system status panels. A satellite CPU or I/O card *cannot* be installed in the slots meant for the host CPU card or alarm card. All the slots for satellite CPU or I/O cards in the Netra CT server support hot swap.

The following figures show the slots available for satellite CPU or I/O cards in the Netra CT servers:

- Netra CT 810 server—FIGURE 4-23
- Netra CT 410 server—FIGURE 4-24

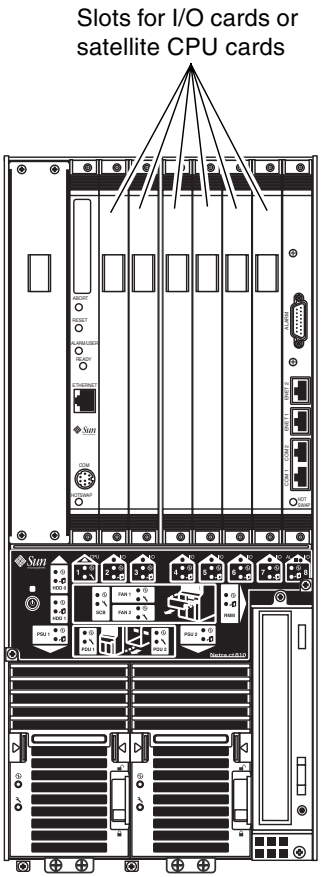


**FIGURE 4-23** Supported Locations for Satellite CPU or I/O Cards in a Front-Access Netra CT 810 Server

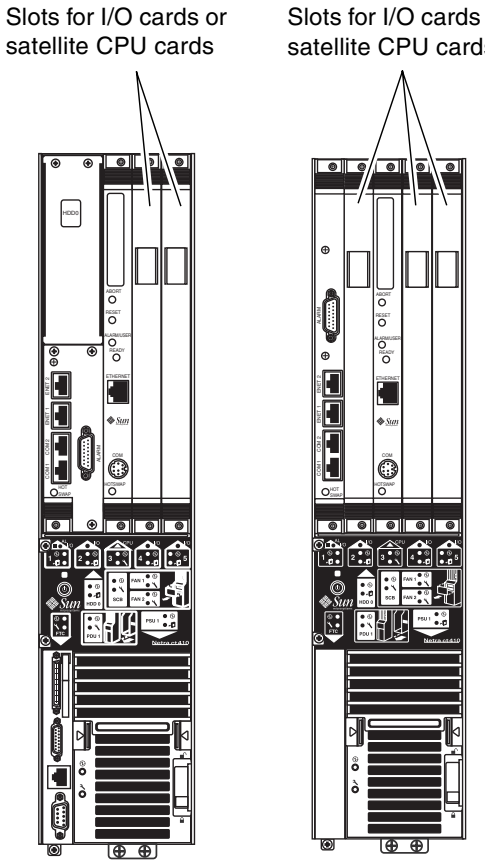


**FIGURE 4-24** Supported Locations for Satellite CPU or I/O Cards in a Front-Access Netra CT 410 Server

# Components Available Only for the Rear-Access Models

Following are components that are available only for rear-access model servers:

- "Host CPU Rear Transition Card" on page 59
- "Host CPU Front Termination Board (Netra CT 410 Server Only)" on page 61
- "Alarm Rear Transition Card" on page 62
- "Rear-Access Model Satellite CPU or I/O Cards" on page 64

# Host CPU Rear Transition Card

The host CPU rear transition card is required to provide connections from the host CPU card to standard I/O connectors on the rear. In addition, the host CPU rear transition card provides two MIIs to two 10/100 twisted-pair Ethernet connections. The host CPU card must be installed in the front of the server in order for the host CPU rear transition card to work (refer to "Rear-Access Models" on page 26 for more information). The same host CPU rear transition card is used by both the Netra CT 810 server and the Netra CT 410 server.

Use only the Netra CT-supported host CPU rear transition card in the Netra CT server; do not use the XCP2040-TRN I/O transition card that is available with the Netra CP2140 board. Refer to FIGURE 4-25 to determine if the host CPU rear transition card you have is supported or unsupported on a Netra CT server.

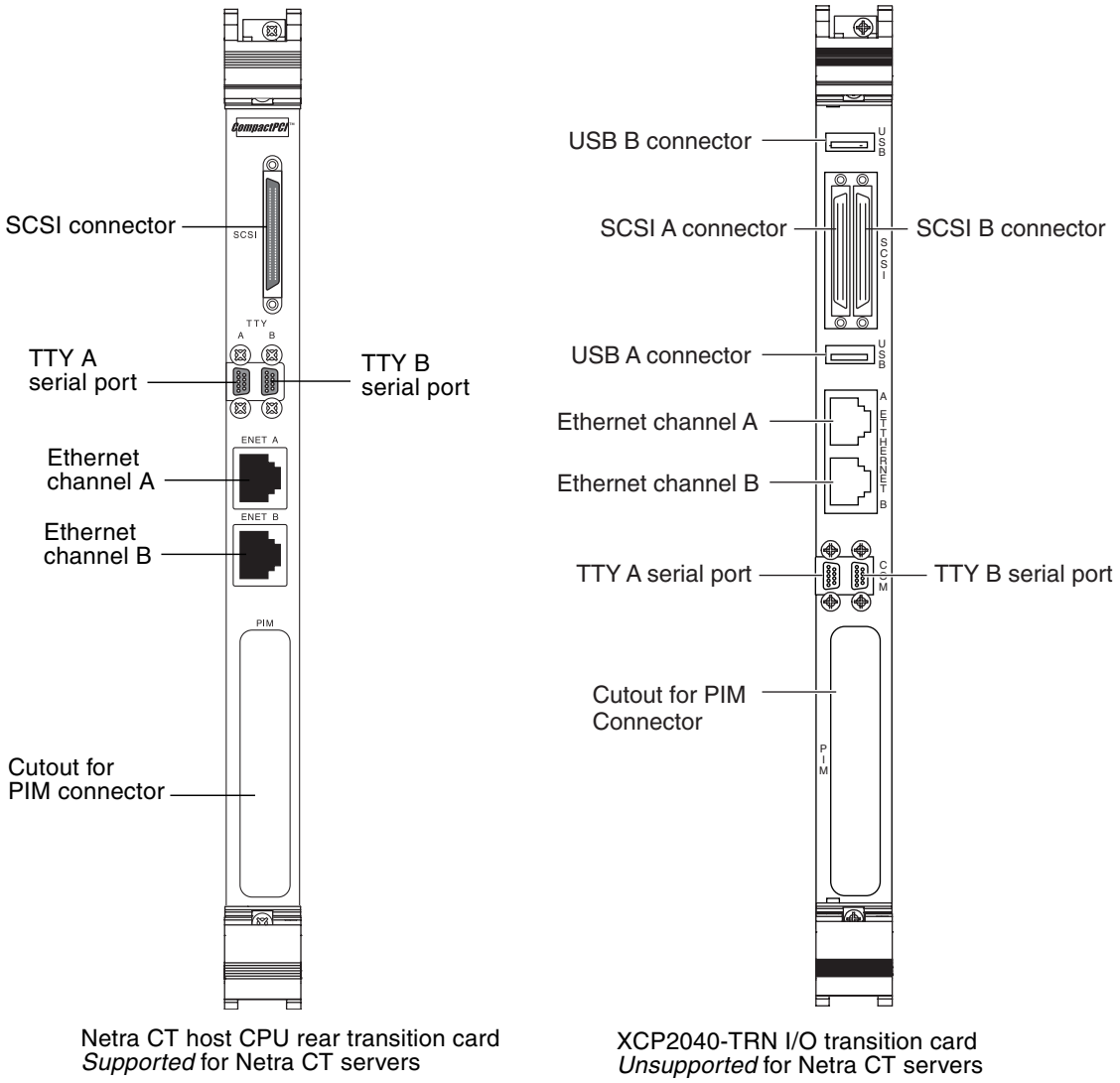


**FIGURE 4-25** Supported and Unsupported Host CPU Rear Transition Card for a Netra CT Server

FIGURE 4-26 shows the location of the host CPU rear transition card on the Netra CT 810 server, and FIGURE 4-27 shows the location of the host CPU rear transition card on the Netra CT 410 server.

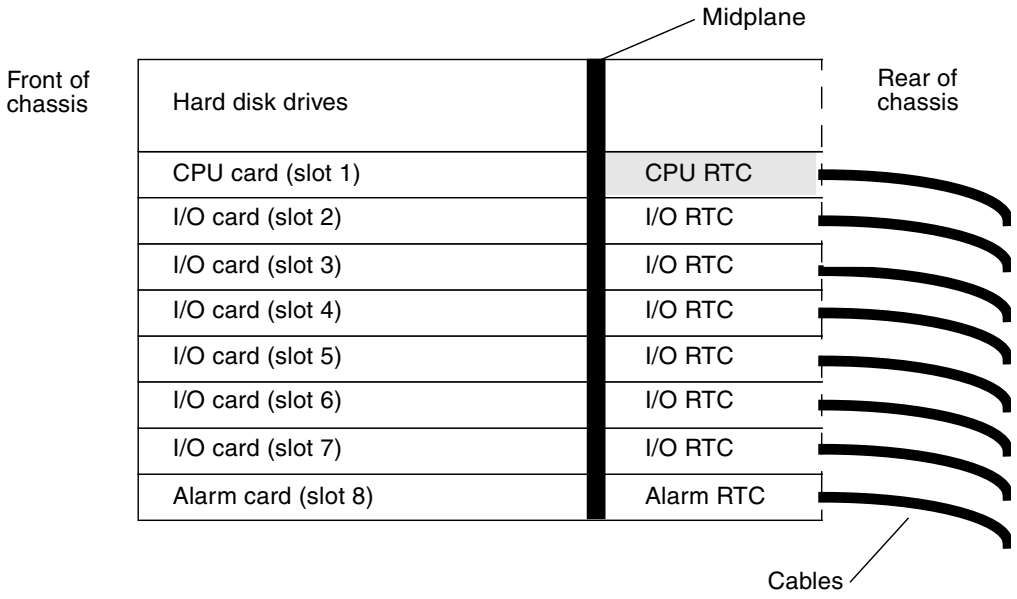


**FIGURE 4-26** Locating the CPU Rear Transition Card in a Netra CT 810 Server (Top View)

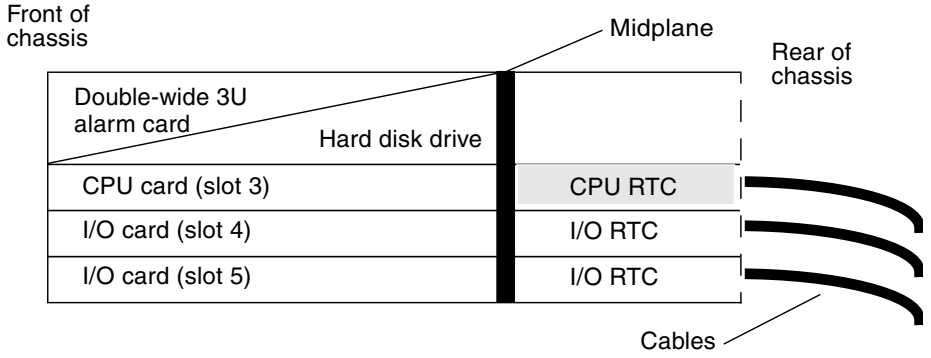


**FIGURE 4-27** Locating the CPU Rear Transition Card in a Netra CT 410 Server (Top View)

# Host CPU Front Termination Board (Netra CT 410 Server Only)

The host CPU front termination board is installed in the slot that would normally be occupied by the host CPU front transition card in a front-access model of the Netra CT 410 server. The host CPU front termination board terminates the SCSI chain for the rear-access Netra CT 410 server.

# Alarm Rear Transition Card

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 same alarm rear transition card is used by both the Netra CT 810 server or the Netra CT 410 server. The alarm card must be installed in the front of the server in order for the alarm rear transition card to work (refer to "Rear-Access Models" on page 26 for more information). Ethernet port 1 is a 10Mbps Ethernet port, and Ethernet port 2 is a 10/100 Mbps Ethernet port. FIGURE 4-28 shows the ports for the alarm rear transition card. FIGURE 4-29 shows the location of the alarm rear transition card in a Netra CT 810 server, and FIGURE 4-30 shows the location of the alarm rear transition card in a Netra CT 410 server.

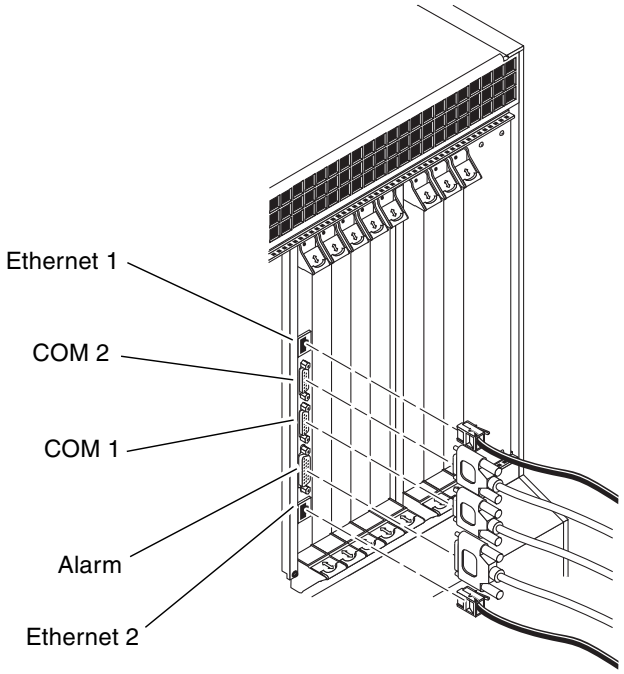


**FIGURE 4-28** Alarm Rear Transition Card

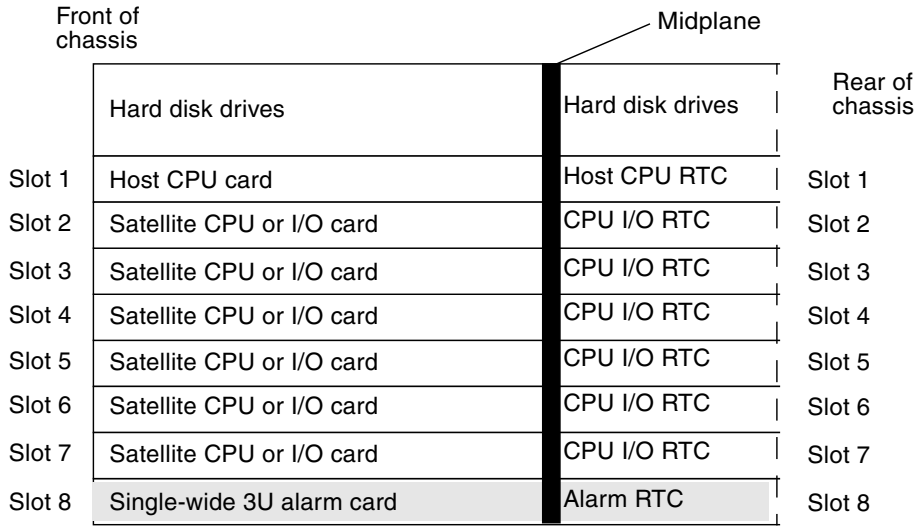


**FIGURE 4-29** Supported Location for the Alarm Rear Transition Card in a Netra CT 810 Server (Top View)

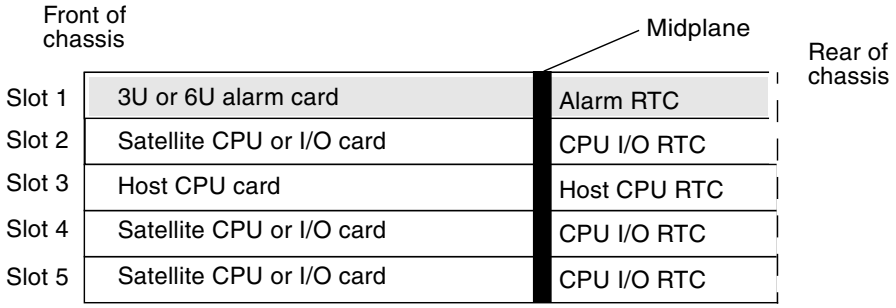


**FIGURE 4-30** Supported Location for the Alarm Rear Transition Card in a Netra CT 410 Server (Top View)

# Rear-Access Model Satellite CPU or I/O Cards

## 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.

FIGURE 4-31 and FIGURE 4-32 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.

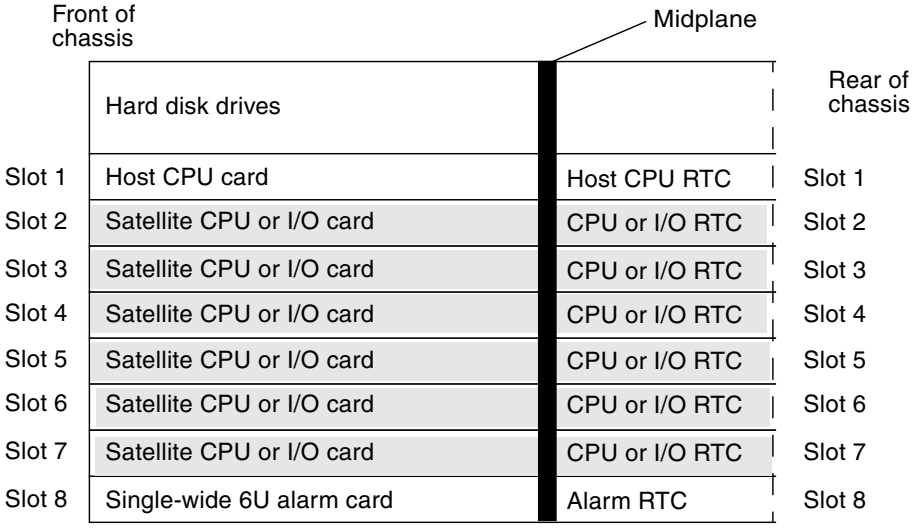


**FIGURE 4-31** Supported Locations for Satellite CPU or I/O Rear Transition Card Sets in a Netra CT 810 Server (Top View)

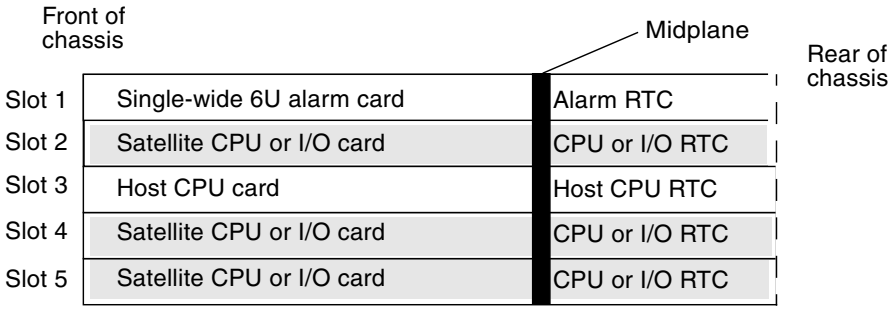


**FIGURE 4-32** Supported Locations for Satellite CPU or I/O Rear Transition Card Sets in a Netra CT 410 Server (Top View)

## 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 should replace *both* the front I/O card *and* the I/O rear transition card. FIGURE 4-31 and FIGURE 4-32 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.

# Glossary

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 Inductrial Computer Manufacturers Group. (PCI stands for Peripheral Component Interconnect.) PICMG is the group that promulgates the CompactPCI standard.

See *CompactPCI*.

# R

**rear-access** The model of the Netra CT server that is configured so that all of the cables come out from the rear of the chassis.

**rear transition card** Used only on the rear access models of the Netra CT server. The rear transition cards extend the connectors 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.

# Index

## P



## R



## S