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 provides instructions for removing and replacing field-replaceable units (FRUs).

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

The intended reader of this document is an experienced system administrator who has experience with the Solaris OS. 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 the Netra CT server and offers examples of its use.

Chapter 2 describes the Netra CT server chassis and power distribution units.

Chapter 3 describes the Netra CT servers.

Chapter 4 describes the components inside a 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.

Refer to 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 OS
- Other software documentation that you received with your system

Typographic Conventions

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

Shell Prompts

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

Related Documentation

The documents listed as online are available at:

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

Application	Title	Part Number	Format	Location
Installation	*Netra CT Server Release Notes*	819-2739-*xx*	PDF HTML	Online
Installation	*Netra CT Server Installation Guide*	819-2740-*xx*	PDF HTML	Online
Service	*Netra CT Server Service Manual*	819-2741-*xx*	PDF HTML	Online
Introduction	*Netra CT Product Overview*	819-2742-*xx*	PDF HTML	Online
System Admin	*Netra CT Server System Administration Guide*	819-2743-*xx*	PDF HTML	Online
Safety	*Netra CT Server Safety and Compliance Manual*	819-2746-*xx*	PDF HTML	Online
Installation	*Netra CP2500 Board Release Notes*	819-1748-*xx*	PDF HTML	Online
Installation	*Netra CP2500 Board Installation and Technical Reference Manual*	819-1747-*xx*	PDF HTML	Online
Installation	*Netra CP2500 Board Programming Guide*	819-1749-*xx*	PDF HTML	Online
Safety	*Netra CP2500 Board Safety and Compliance Guide*	819-1750-*xx*	PDF HTML	Online
Installation	*Netra CP2500 RTM Release Notes*	819-1752-*xx*	PDF HTML	Online
Installation	*Netra CP2500 RTM Installation and Reference Guide*	819-1753-*xx*	PDF HTML	Online

Documentation, Support, and Training

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

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

Netra CT Server Product Overview, part number 819-2742-10

CHAPTER 1

Introduction

This chapter provides an overview of the Netra CT server's basic hardware components and illustrates the different models available. Contact Sun Microsystems to get 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 a Netra CT chassis, you can have one to two Netra CT 810 servers or one to four Netra CT 410 servers.

Note – You can 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.

The Netra CT server runs the standard Solaris OS, 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
- PICMG 2.1 R2.0 CompactPCI Hot Swap
- PICMG 2.5 R1.0 CompactPCI Computer Telephony/H.110
- PICMG 2.9 R1.0 CompactPCI IPMI
- PICMG 2.14 R1.0 CompactPCI MCNet

The hardware components for the Netra CT server are described in the following sections:

- Chassis—Chapter 2
- Servers that go into the chassis—Chapter 3
- Components that go into the servers—Chapter 4

FIGURE 1-1 shows the possible configurations of the Netra CT 810 server. FIGURE 1-2 shows the possible configurations of the Netra CT 410 server.

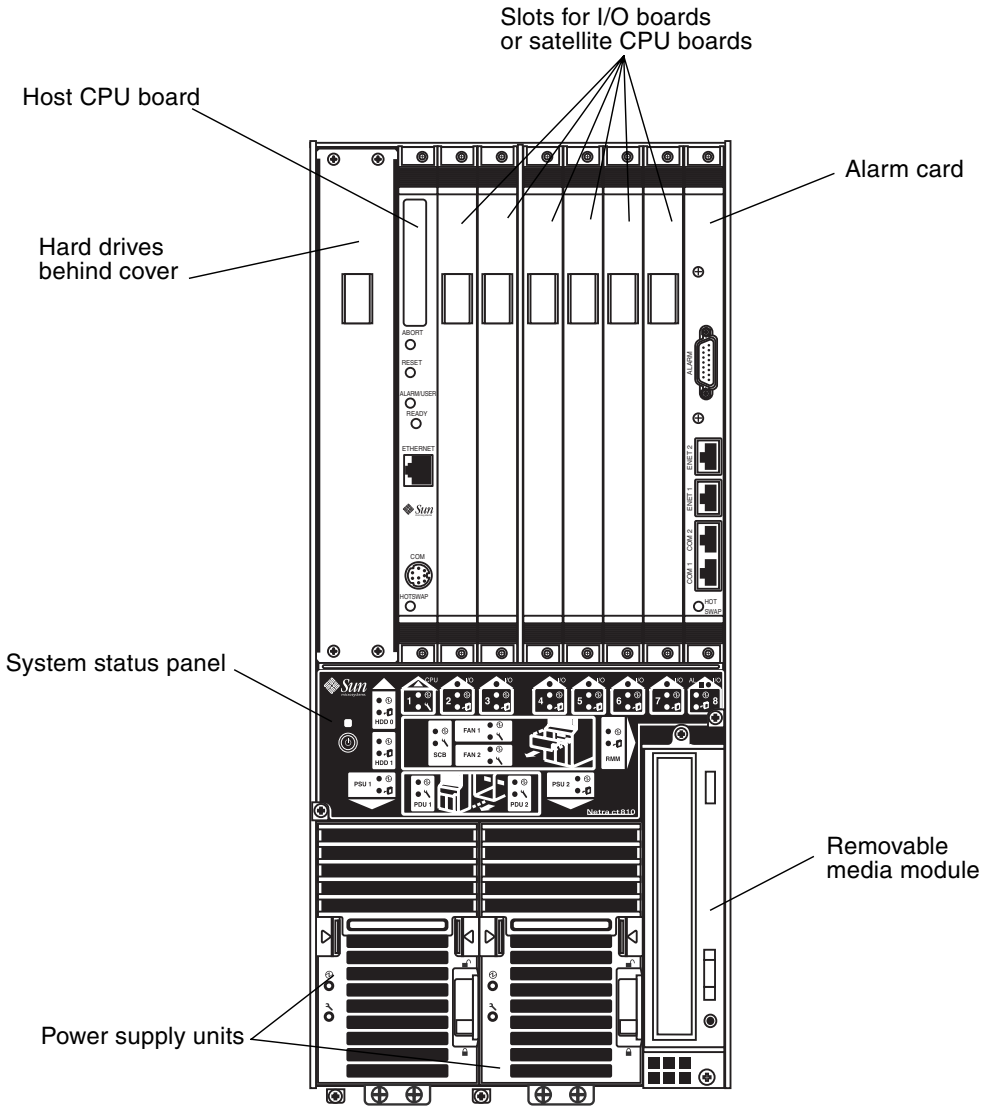

FIGURE 1-1 Components Within a Netra CT 810 Server

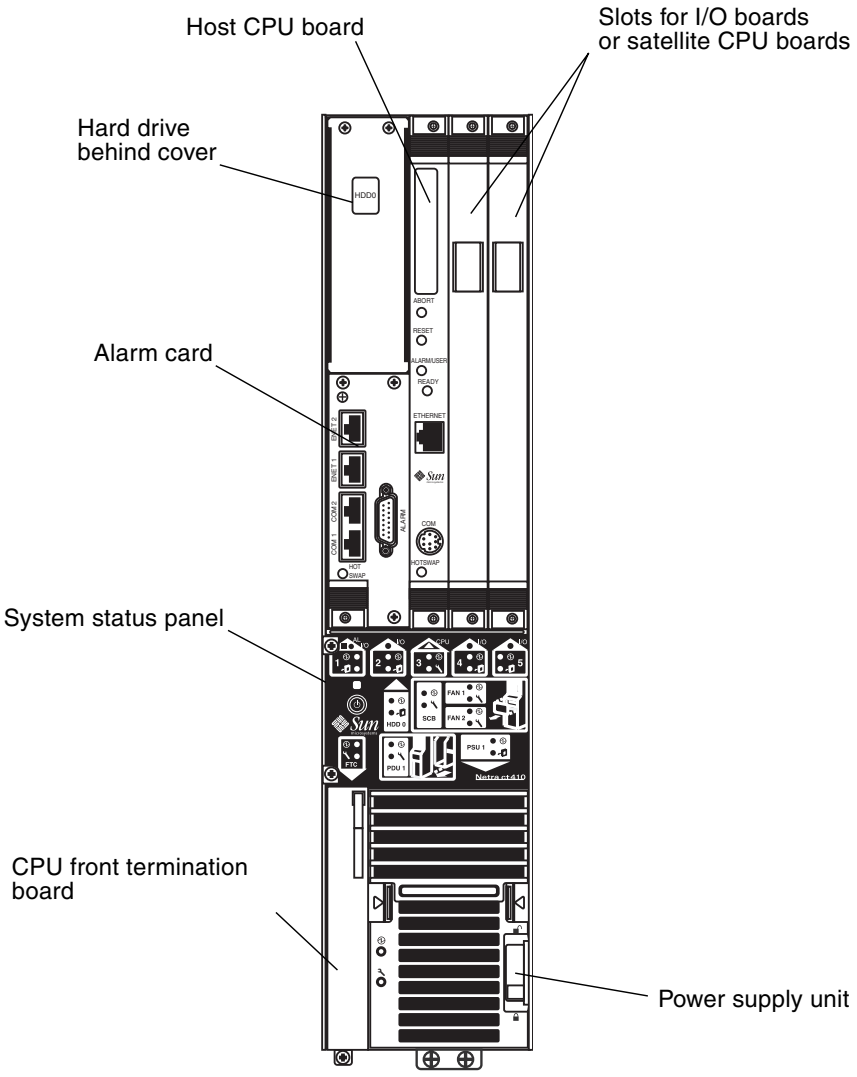

FIGURE 1-2 Components Within a Netra CT 410 Server

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.

This chapter contains the following topics:

Chassis Physical Specifications

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

- Board cages for the rear transition modules
- Four power distribution units

TABLE 2-1 gives the physical specifications for the chassis. FIGURE 2-1 shows the chassis from the front.

TABLE 2-1 Netra CT Server Chassis Physical Specifications

	U.S.	Metric
Width	17.5 inches	444.5 mm
Depth:		
• 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
Height	21 inches	533.6 mm
Weight (empty)	74 lb	33.6 kg
Weight (fully loaded)	150 lb	68 kg

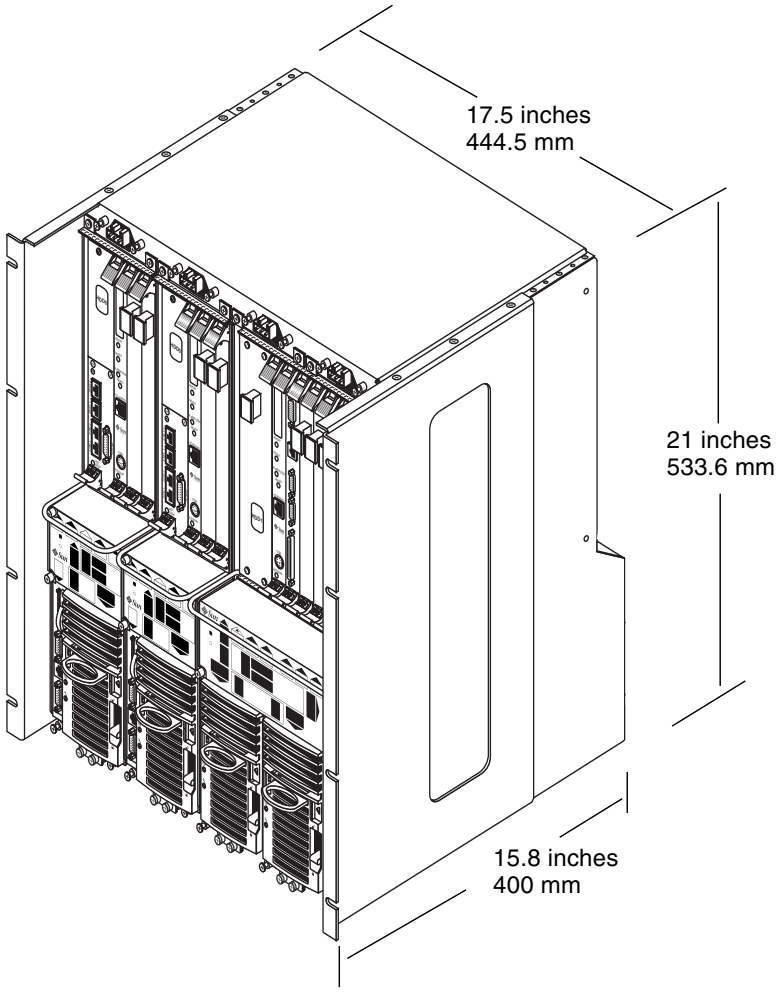

Figure showing the physical specifications for the Netra CT chassis. Same specifications are also given in TABLE 2-1.

FIGURE 2-1 Physical Specifications of the Netra CT Chassis

Power Distribution Units

The 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 power distribution unit is a cold-swappable field-replaceable component; however, you must remove the server before you can replace a power distribution unit.

An 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 2-2).

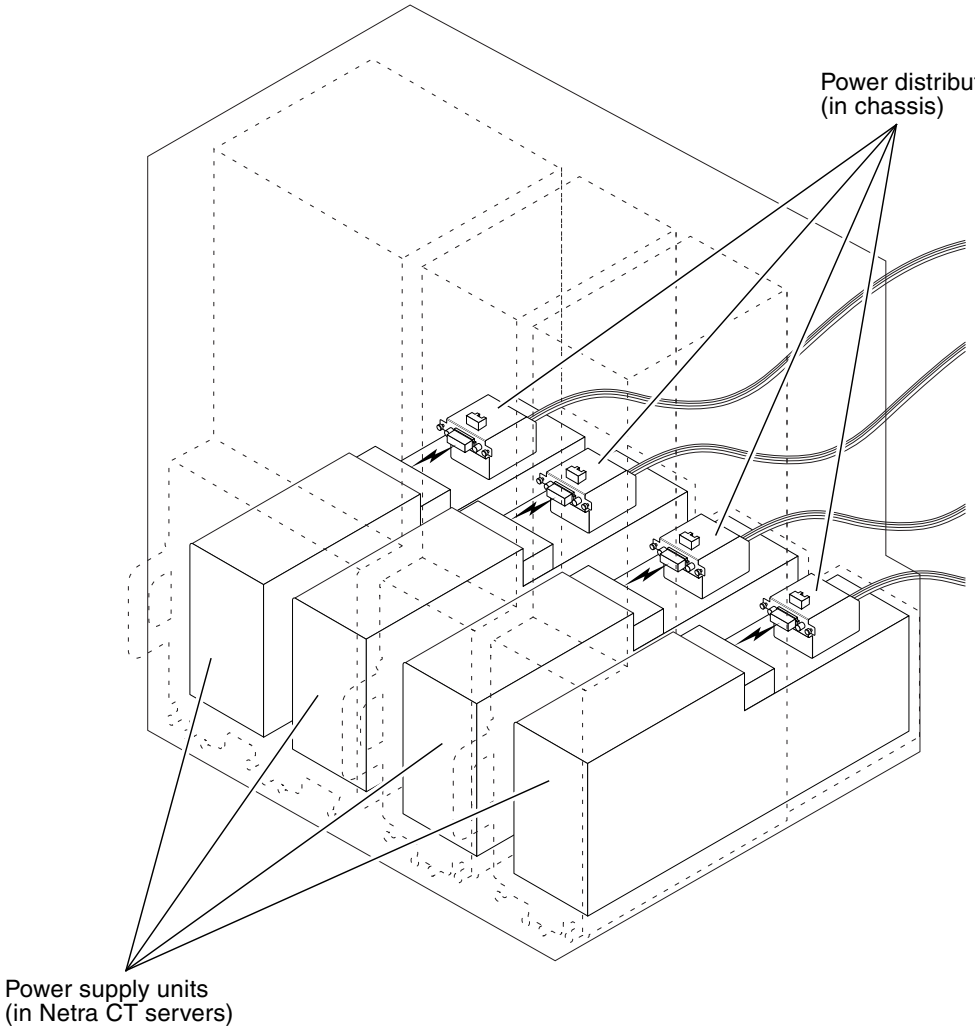

Figure showing the locations of the power supply units and power distribution units in the Netra CT servers and chassis.

FIGURE 2-2 Power Distribution Units and Power Supply Units

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 board and rear transition module (RTM), midplane, I/O slots, and, in some cases, storage devices and removable media.

Server Types

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

- Netra CT 810 server
- Netra CT 410 server

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

Netra CT 810 Server

TABLE 3-1 provides 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	15 inches	378.3 mm
Height	20.2 inches	512.7 mm
Weight, fully loaded	38 lb	17.2 kg

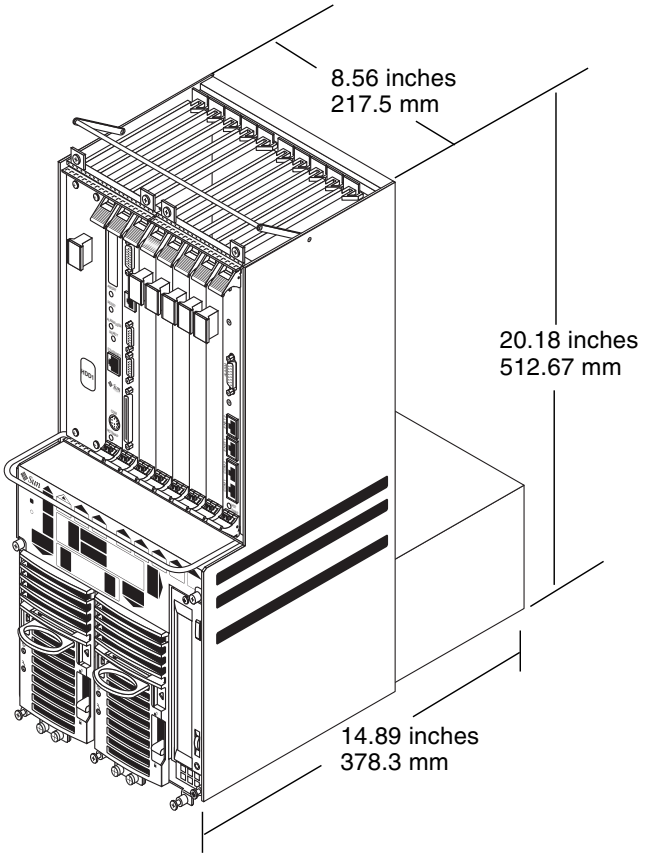

FIGURE 3-1 Netra CT 810 Server Physical Specifications

Netra CT 410 Server

TABLE 3-2 provides 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	14.9 inches	378.7 mm
Height	20.2 inches	512.7 mm
Weight, fully loaded	22 lb	10 kg

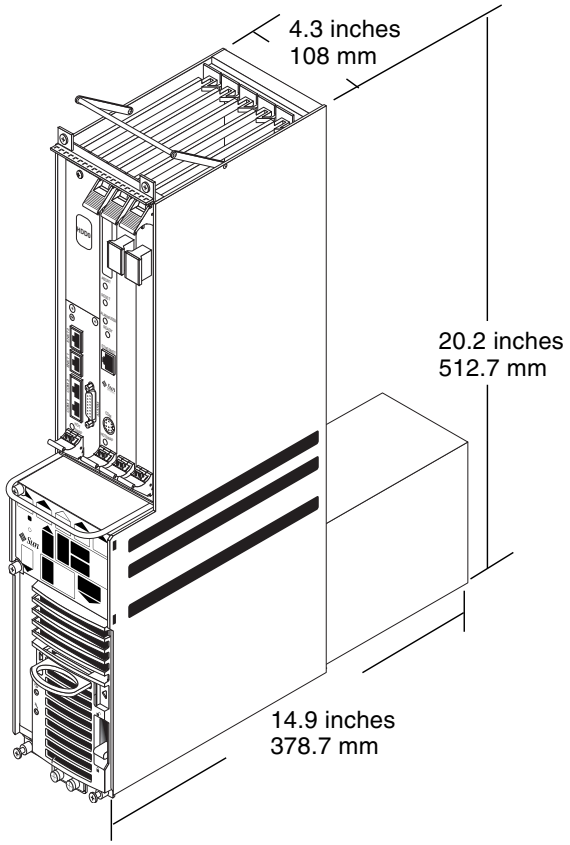

FIGURE 3-2 Netra CT 410 Server Physical Specifications

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)

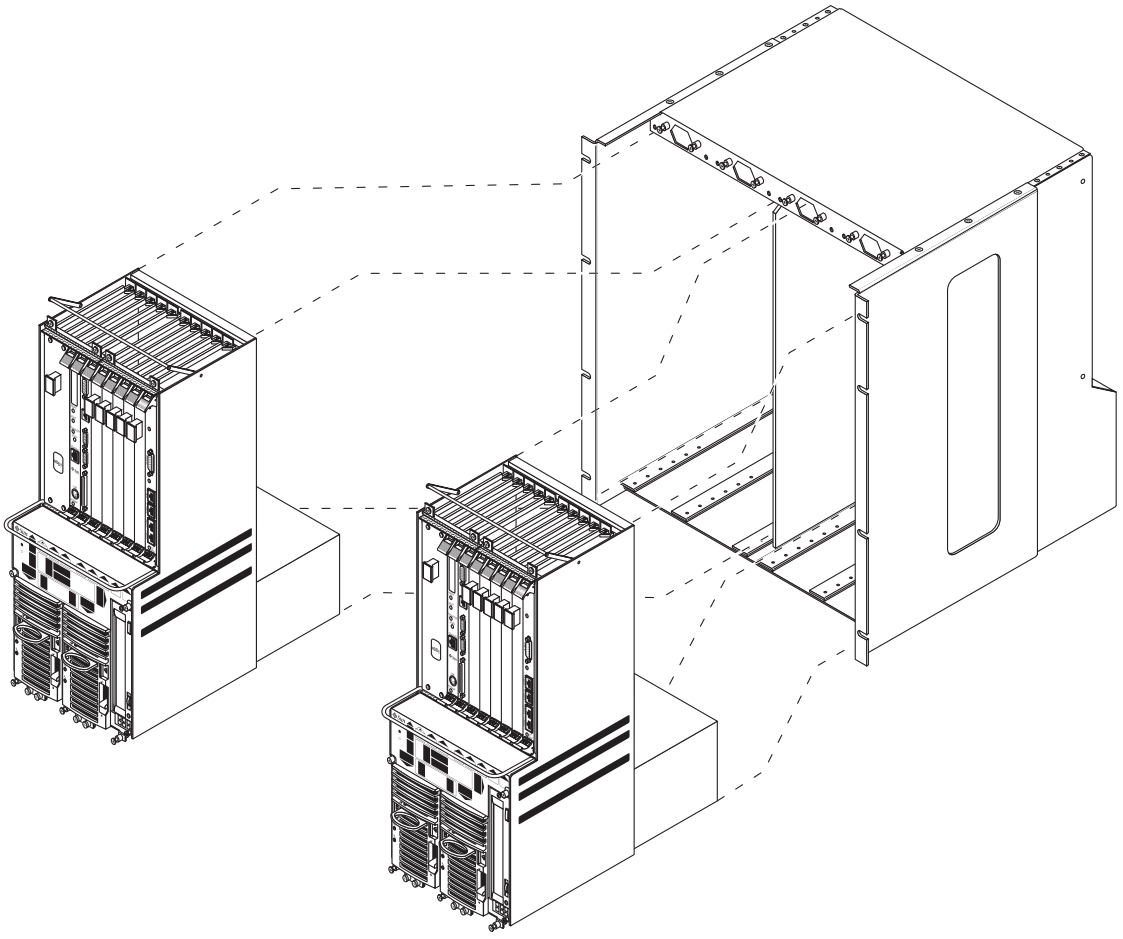

FIGURE 3-3 Two Netra CT 810 Servers in a Chassis

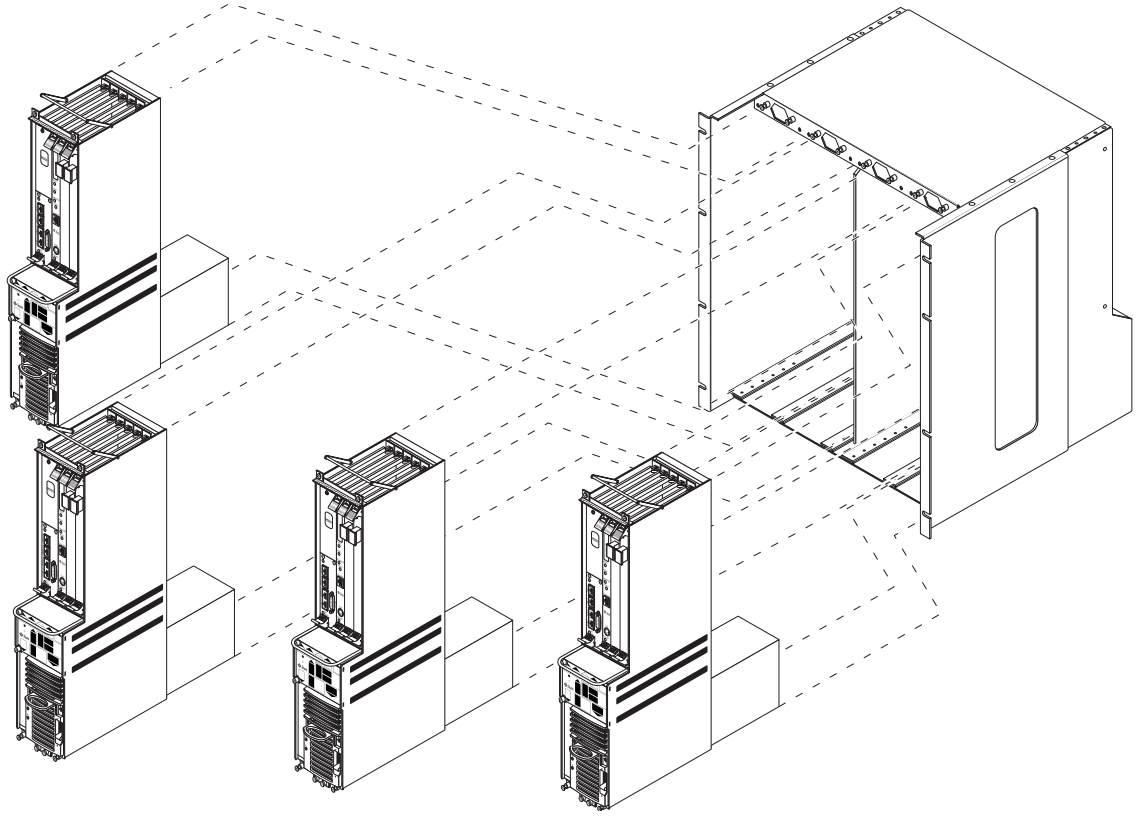

FIGURE 3-4 Four Netra CT 410 Servers in a Chassis

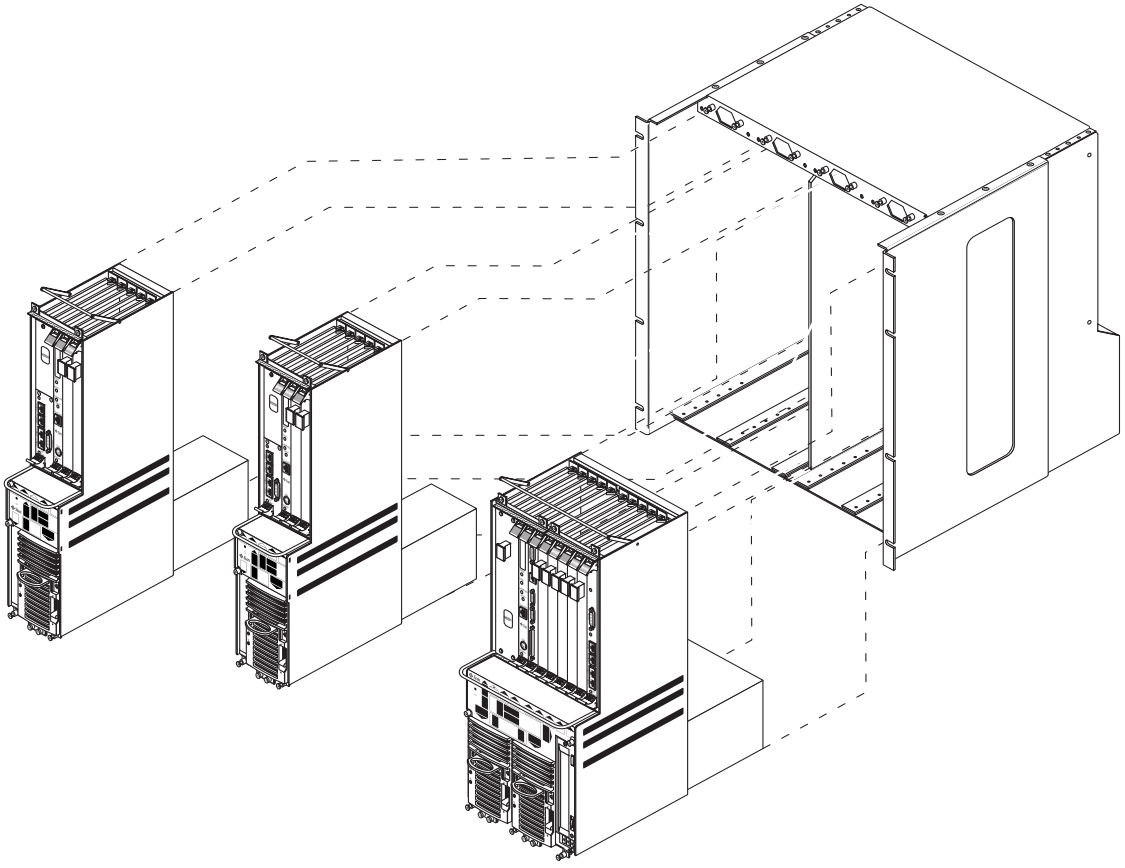

FIGURE 3-5 One Netra CT 810 Server and Two Netra CT 410 Servers in a Chassis

Determining Which Server You Have

If you are uncertain whether you have a Netra CT 810 server or a Netra CT 410 server in a chassis, locate the system status panel (FIGURE 3-6) on the front of the chassis.

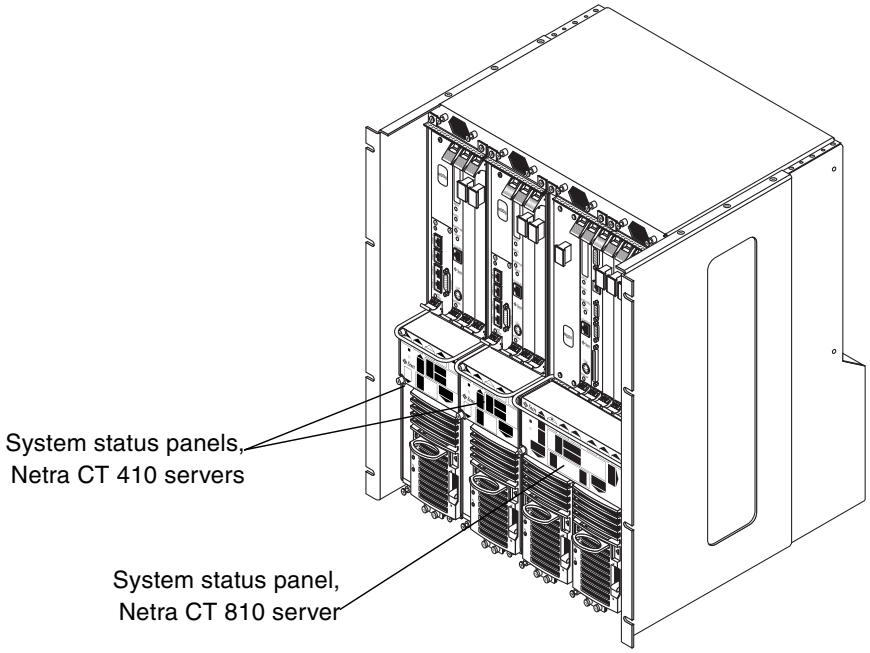

FIGURE 3-6 System Status Panel Locations

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

Note – Also, you can 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.

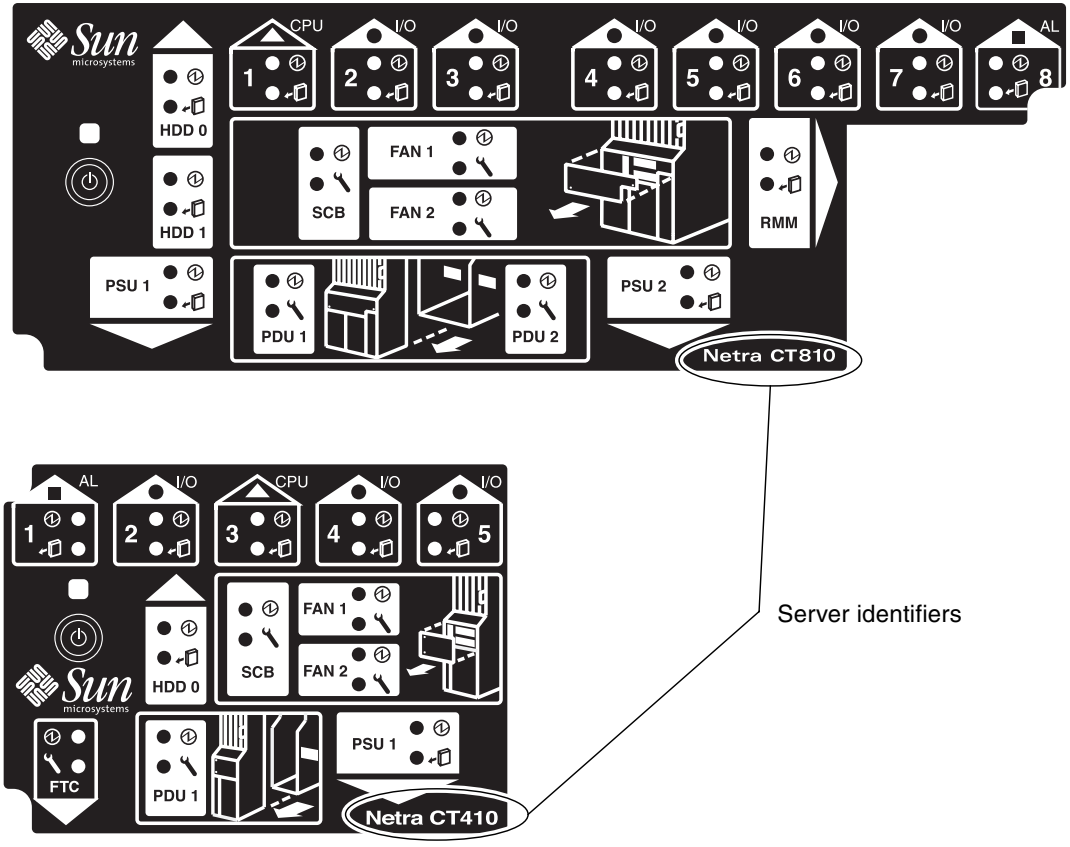

FIGURE 3-7 Locating the Server Identifiers

Midplanes

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

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

- Slots 1 and 8 in a Netra CT 810 server
- Slots 1 and 3 in a 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 board. 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.

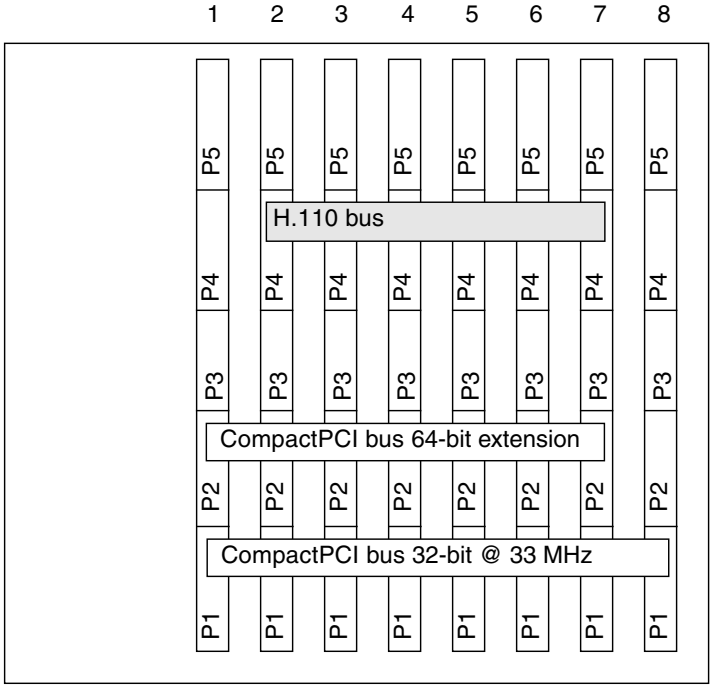

FIGURE 3-8 Buses in a Netra CT 810 Server (Front View)

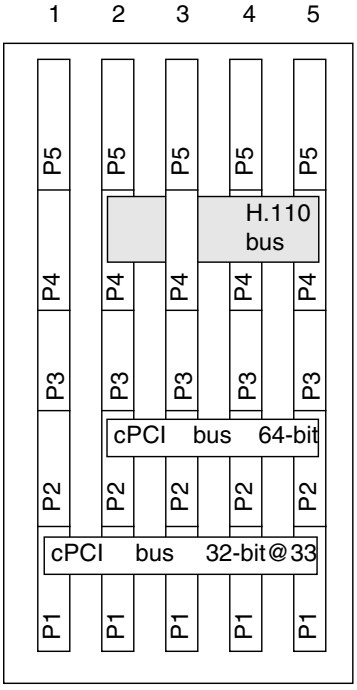

FIGURE 3-9 Buses in a Netra CT 410 Server (Front View)

Server Access

Both Netra CT 410 servers and Netra CT 810 servers are rear-access models. A *rear-access* model is designed so that all the cables to the CompactPCI boards are connected from the rear of the chassis.

For both the Netra CT 810 server and the Netra CT 410 server, all the cables are connected to *rear transition modules* installed at the rear of the Netra CT server. The rear transition modules, in effect, extend the CompactPCI boards installed in each slot from the midplane to the rear of the chassis.

Each rear transition module installed must have an accompanying board installed in the front board cage of the server; however, the type of board installed in the front board cage varies:

- Host CPU board—A host CPU board must be installed in the front board 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 corresponding host CPU rear transition module must be installed in the *rear* board cage for the same slot number, viewed from the rear. The host CPU rear transition module provides connections from the host CPU board to standard I/O connectors at the rear of the system.
- I/O board or satellite CPU board—An I/O board or satellite CPU board must be installed in the front board cage in one of the I/O slots. It contains the hot-swap LED that tells you when an I/O board or satellite CPU board is ready for removal. In addition, the corresponding rear transition module must be installed in the *rear* board cage in the same slot number, viewed from the rear. The rear transition module provides connections from the I/O board or satellite CPU board to standard connectors at the rear of the system.
- Alarm card—An alarm card must be installed in the front board 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 module must be installed in the rear board cage in the same slot number, viewed from the rear.

FIGURE 3-10 shows the top view of a Netra CT 810 server with an alarm card installed, and FIGURE 3-11 shows the top view of a Netra CT 410 server.

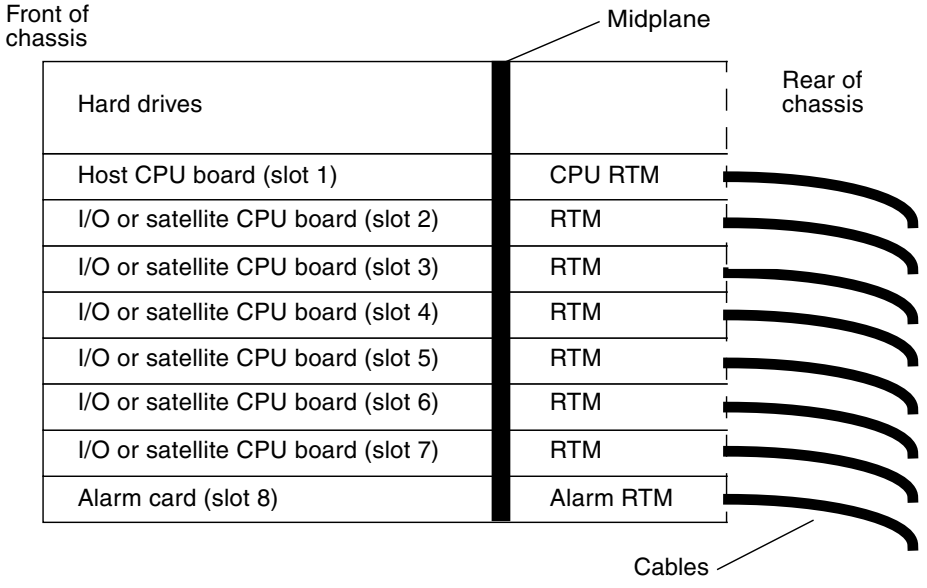

FIGURE 3-10 Netra CT 810 Server (Top View)

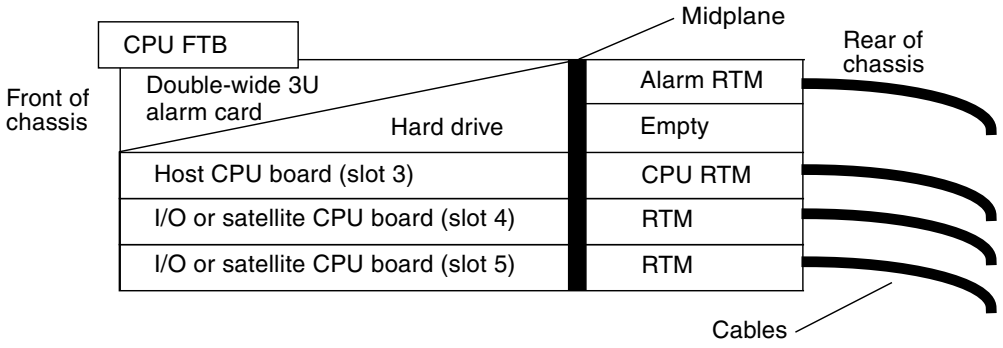

FIGURE 3-11 Netra CT 410 Server (Top View)

The slot to the left of the power supply in a Netra CT 410 server is reserved for the host CPU front termination board (see "Host CPU Front Termination Boards (FTB)" on page 31 for more information).

CHAPTER 4

Component Descriptions

This chapter describes the components of the Netra CT 810 and Netra CT 410 servers. Some components are available only for the Netra CT 810 server, while others are available only for the Netra CT 410 server.

This chapter contains the following topics:

Component Quick Reference

Components are either hot-swappable or cold-swappable:

- 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 might 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 *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.

TABLE 4-1 lists components available for Netra CT servers. 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 a Netra CT Server

Component	Description and Comments
Air filters	A *hot-swappable* component. See "Air Filters" on page 42.
Alarm cards	A *hot-swappable* component. Must be installed with alarm rear transition module. See "Alarm Cards" on page 49 and "Alarm Rear Transition Modules" on page 51.
Alarm rear transition modules	A *hot-swappable* component. Must be installed with alarm card. See "Alarm Cards" on page 49 and "Alarm Rear Transition Modules" on page 51.
Fans and fan trays	A *hot-swappable* component. See "Fan Trays and Fans" on page 44.
Hard drives	A *hot-swappable* component. See "Hard Drives" on page 46.
Host CPU boards	A *hot-swappable* component. Must be installed with a corresponding host rear transition module. See "Host CPU Boards" on page 27 and "Host CPU Rear Transition Modules" on page 30.
Host CPU front termination boards	• Netra CT 810 server: Not applicable. • Netra CT 410 server: A *hot-swappable* component. See "Host CPU Front Termination Boards (FTB)" on page 31.
Host rear transition modules	A *hot-swappable* component. Must be installed with a host CPU board. See "Host CPU Boards" on page 27 and "Host CPU Rear Transition Modules" on page 30.
I/O boards	*Hot-swappable* components. Both the I/O board and the I/O rear transition module must be installed. See "Satellite CPU Boards" on page 34.

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

Component	Description and Comments
Power supply units	• Netra CT 810 server: A *hot-swappable* component, as long as it is not the only power supply unit. See "Power Supply Units" on page 36. • Netra CT 410 server: A *cold-swappable* component. See "Power Supply Units" on page 36.
Removable media modules	• Netra CT 810 server: A *hot-swappable* component. See "Removable Media Modules" on page 48. • Netra CT 410 server: Not applicable.
Satellite CPU boards	*Hot-swappable* components. Both the satellite CPU board and the corresponding satellite CPU rear transition module must be installed. See "Satellite CPU Boards" on page 34.
Satellite CPU rear transition modules	A *hot-swappable* component. Both the satellite CPU board and the corresponding satellite CPU rear transition module must be installed. See "Satellite CPU Boards" on page 34.
System controller boards	A *hot-swappable* component. See "System Controller Boards" on page 31.
System status panels	A *hot-swappable* component. See "System Status Panels" on page 39.

Host CPU Boards

This section provides general information about host CPU boards in Netra CT servers. For detailed information about host CPU boards, refer to the following:

- Netra CP2140 host CPU board: *Netra CP2140 Technical Reference and Installation Manual* (816-4908-xx) and the *Netra CP2140 CompactPCI Board Product Note* (816-4870-xx).
- Netra CP 2500 host CPU board: *Netra CP2500 Board Installation and Technical Reference Manual* (819-1747-xx) and the *Netra CP2500 Board Release Note*s (819-1748-xx).

In addition, there are restrictions for each of these host CPU boards. Refer to the documentation for information.

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

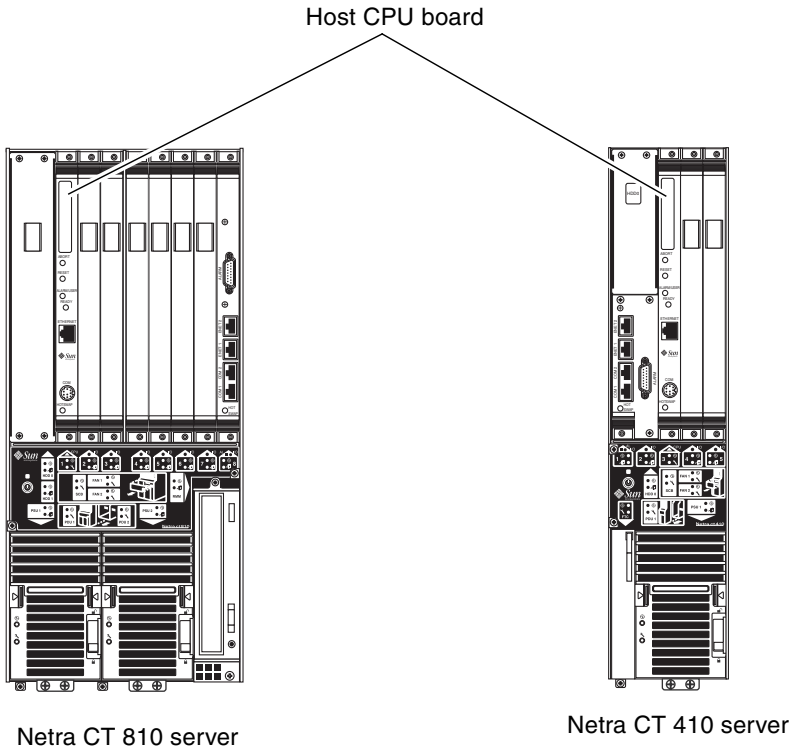

FIGURE 4-1 Host CPU Board Required Locations

On-Board Components

FIGURE 4-2 shows the ports on a Netra CP2140 host CPU board. FIGURE 4-3 shows the ports on a Netra CP2500 host CPU board. Do *not* use the TTY A port on a host CPU board for the Netra CT 810 server or Netra CT 410 server because the rear transition modules for those models all have a TTY A port.

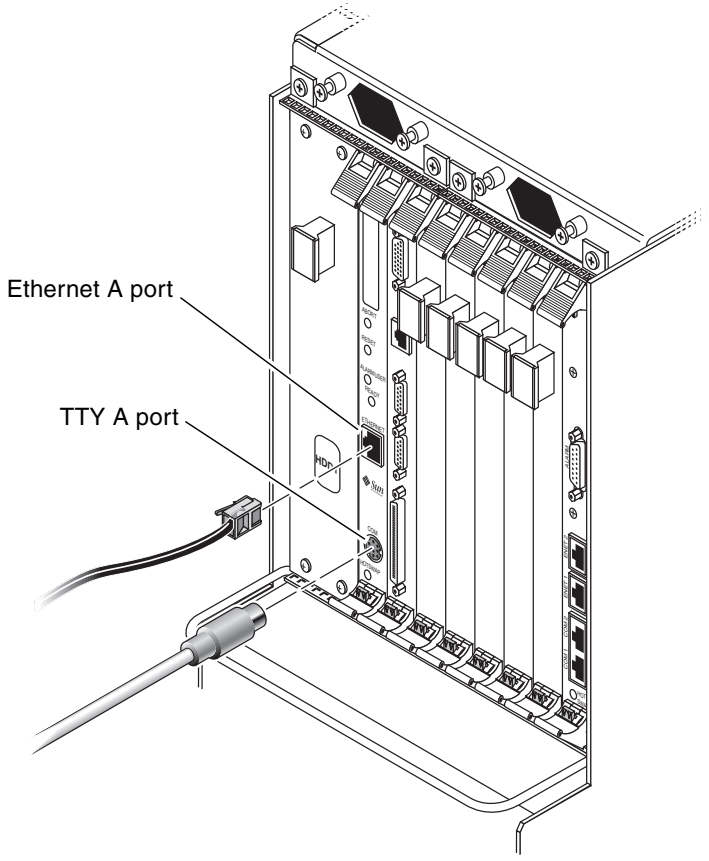

FIGURE 4-2 Netra CP2140 Host CPU Board

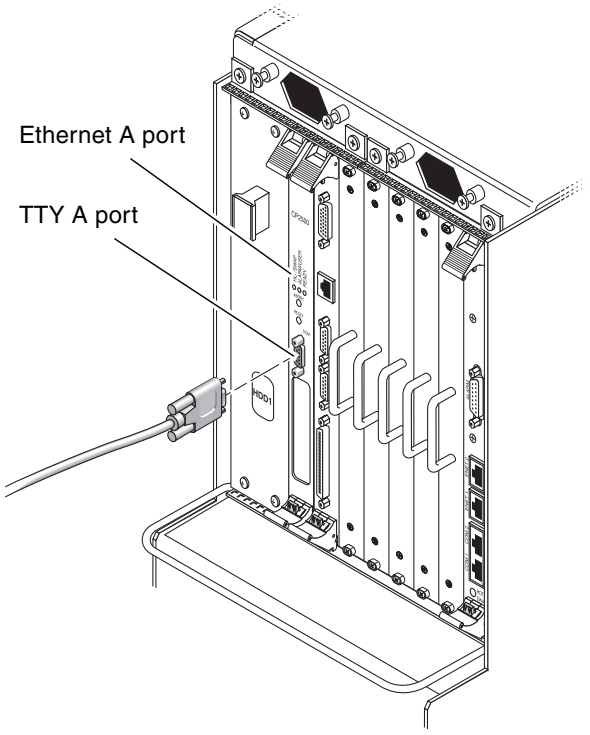

FIGURE 4-3 Netra CP2500 Host CPU Board

Host CPU Rear Transition Modules

The host rear transition module (RTM) is required to provide connections from the host CPU board to standard I/O connectors. In addition, the host RTM provides two media independent interfaces (MIIs) to two 10/100 twisted-pair Ethernet connections. The host CPU board must be installed in the front of the server for the host RTM to work. The same host RTM is used by both the Netra CT 810 server and the Netra CT 410 server. Use only Netra CT-supported host RTMs in a Netra CT server.

Host CPU Front Termination Boards (FTB)

The host CPU front termination board (FTB) terminates the SCSI chain for the Netra CT 410 server only.

System Controller Boards

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 a Netra CT 810 server is illustrated in FIGURE 4-4, and the location of the system controller board in a Netra CT 410 server is illustrated in FIGURE 4-5.

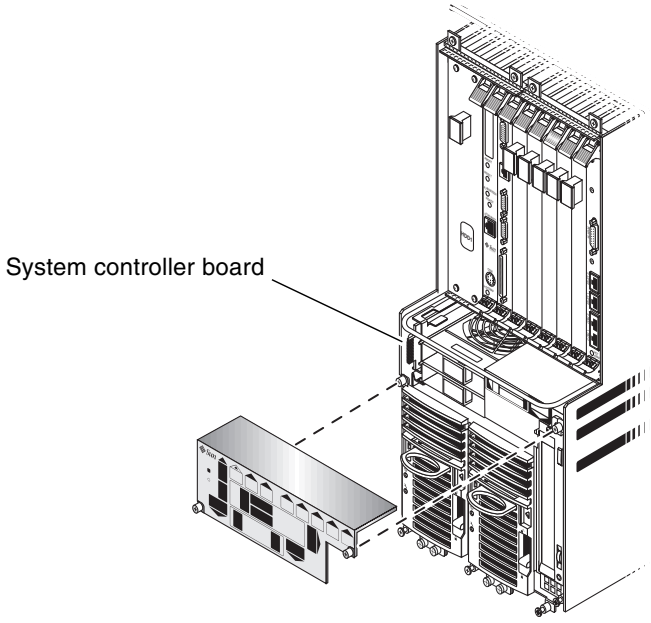

FIGURE 4-4 System Controller Board Location on Netra CT 810 Server

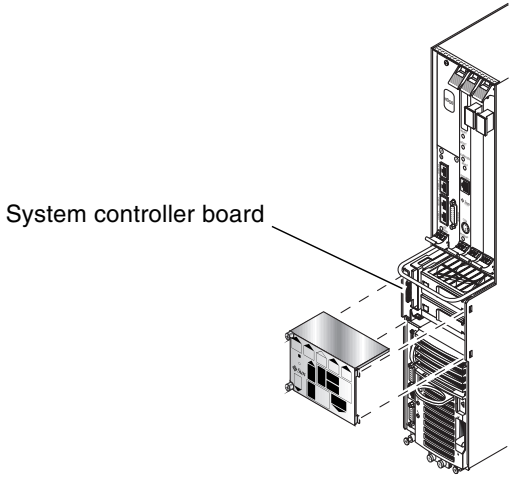

FIGURE 4-5 System Controller Board Location on Netra CT 410 Server

FIGURE 4-6 shows the location of the host rear transition module on a Netra CT 810 server, and FIGURE 4-7 shows the location of the host rear transition module on a Netra CT 410 server.

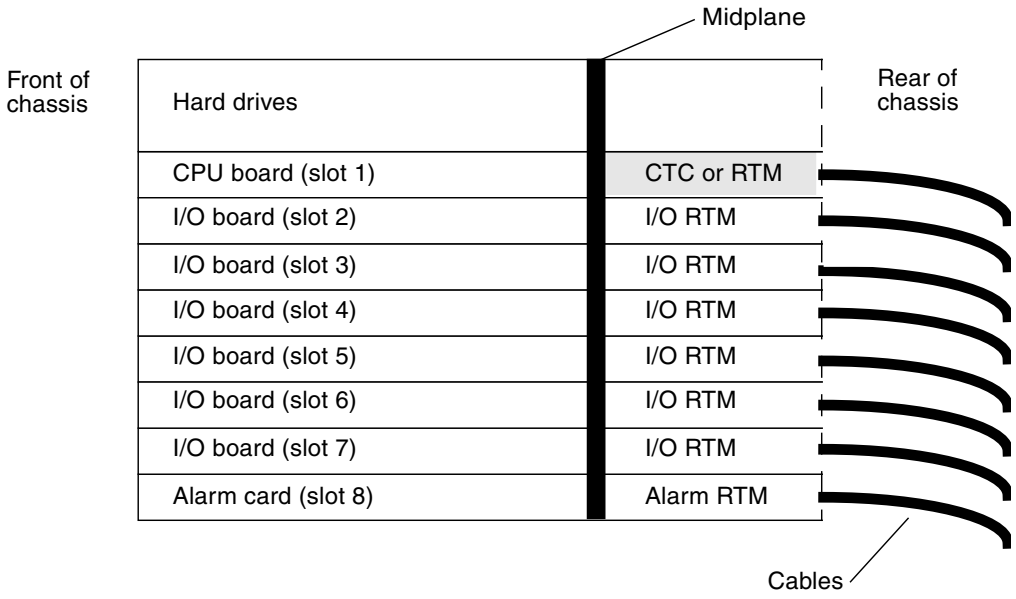

FIGURE 4-6 Locating the Rear Transition Module in a Netra CT 810 Server (Top View)

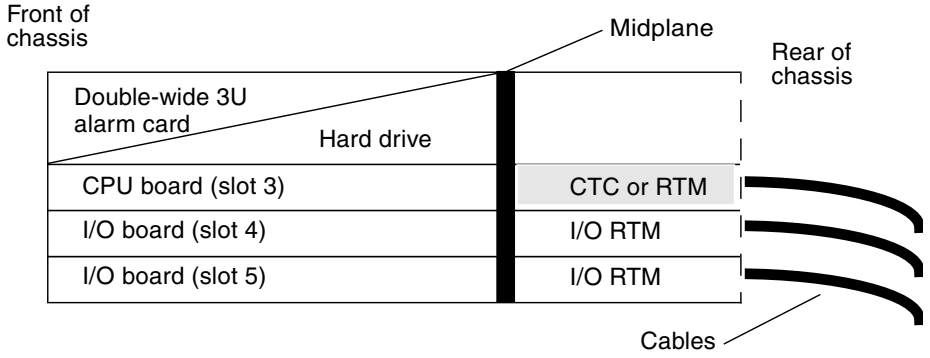

FIGURE 4-7 Locating the Rear Transition Module in a Netra CT 410 Server (Top View)

Satellite CPU Boards

The satellite CPU board and rear transition module set consists of two separate boards:

- Satellite CPU board (front)
- Satellite RTM (rear)

The satellite CPU board is installed from the front of the Netra CT server; however, no cables are connected to the satellite CPU board.

The RTM extends the ports from the PCI mezzanine cards (PMCs) installed in the satellite CPU board to the PMC I/O modules (PIMs) installed in the satellite RTM. The satellite CPU board must be installed in the same slot at the front of the server for the satellite RTM to work. For example, if you install a satellite RTM in I/O slot 3 at the rear of a Netra CT 810 server, you must install the corresponding satellite CPU board in I/O slot 3 at the front of the server.

FIGURE 4-8 and FIGURE 4-9 are graphical representations of how satellite CPU boards align with the satellite RTMs. 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.

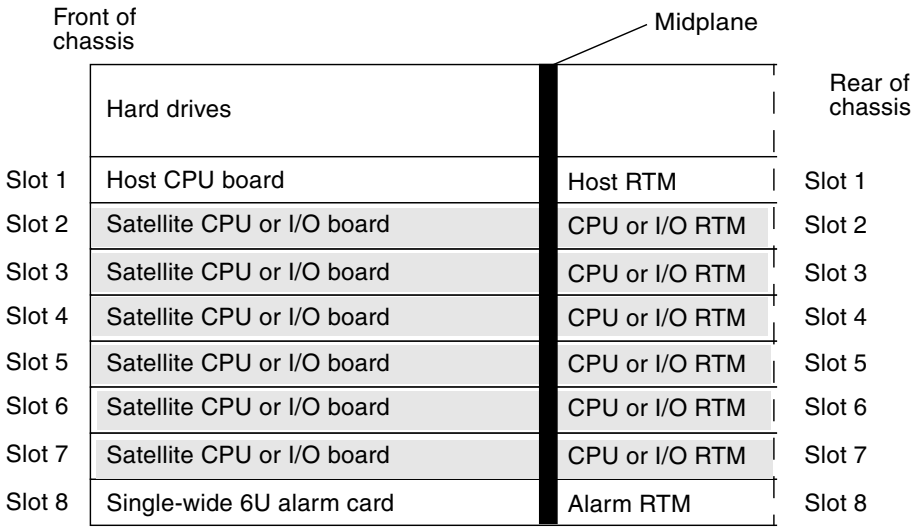

FIGURE 4-8 Supported Locations for Satellite CPU or I/O Rear Transition Module Sets in a Netra CT 810 Server (Top View)

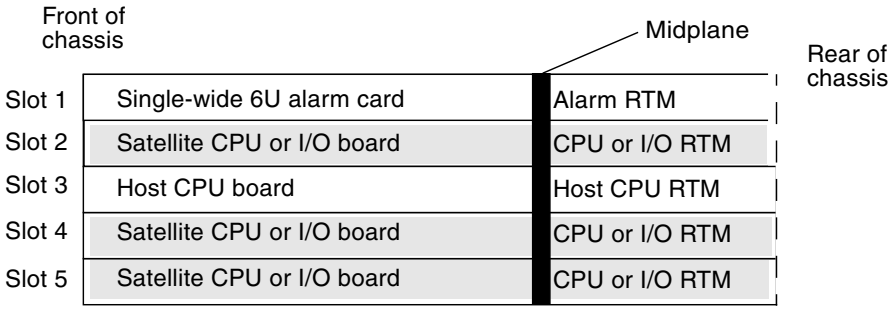

FIGURE 4-9 Supported Locations for Satellite CPU or I/O Rear Transition Module Sets in a Netra CT 410 Server (Top View)

I/O Board and Rear Transition Module Sets

An I/O board and rear transition module set consists of two separate boards:

- The I/O board
- The I/O RTM

The I/O board contains the application-specific integrated cicuits (ASICs) for the associated I/O board and is installed from the front of the server; however, no cables are connected to the I/O board.

The I/O RTM extends the ports for a particular I/O board to the rear of the server. The I/O RTM and the I/O board must be installed in the same slot number for the I/O RTM to work. For example, if you install an I/O RTM in I/O slot 3 at the rear of a Netra CT 810 server, you must install the accompanying I/O board in I/O slot 3 at the front of the server.

If one of the two boards fails, replace *both* the I/O board *and* the I/O RTM. FIGURE 4-8 and FIGURE 4-9 show graphical representations of how the I/O boards align with the I/O RTMs. 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.

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. Feeds are supplied to each of the power supply units through the power distribution units (see Chapter 2 for 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 continues 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 4-10, and the location of the power supply unit in the Netra CT 410 server is illustrated in FIGURE 4-11.

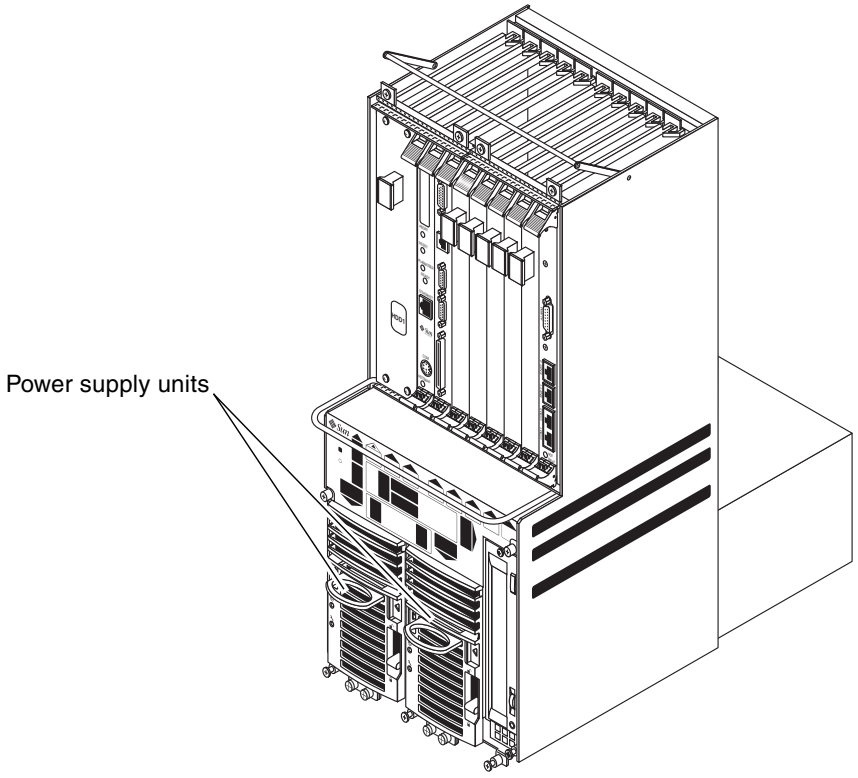

FIGURE 4-10 Power Supply Unit Locations on Netra CT 810 Server

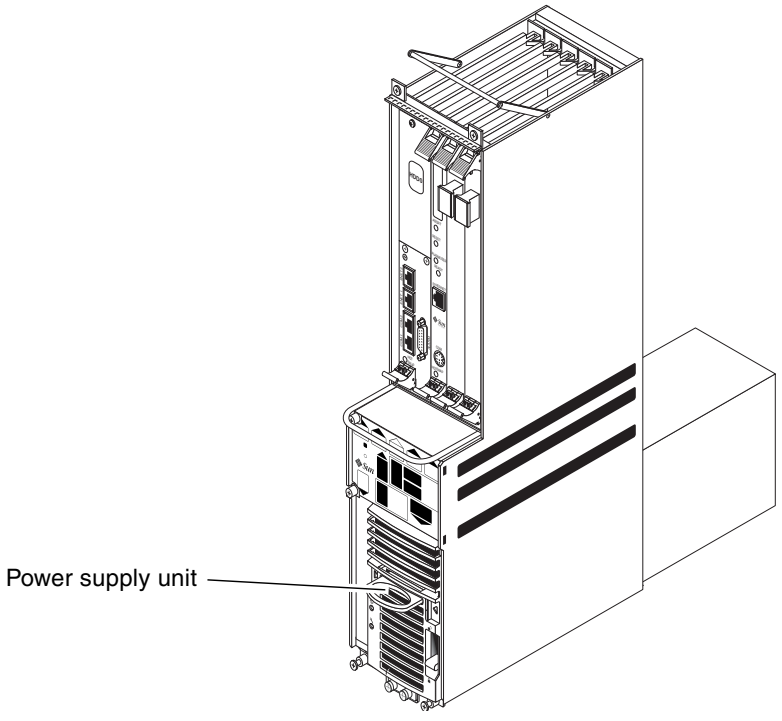

FIGURE 4-11 Power Supply Unit Location on Netra CT 410 Server

System Status Panels

System status panels give feedback on the status of key components within Netra CT servers. The locations of system status panels in Netra CT 810 servers and Netra CT 410 servers are illustrated in FIGURE 4-12.

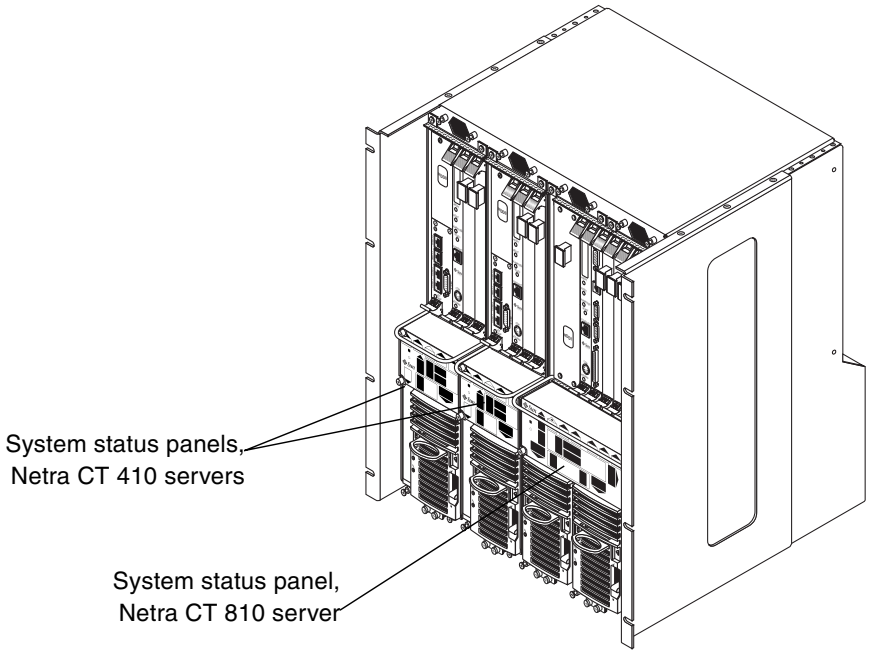

FIGURE 4-12 System Status Panel Locations

The system status panel has one set of LEDs for each component within that server. FIGURE 4-13 shows the LEDs on the system status panel for the Netra CT 810 server, and FIGURE 4-14 shows the LEDs on the system status panel for the Netra CT 410 server.

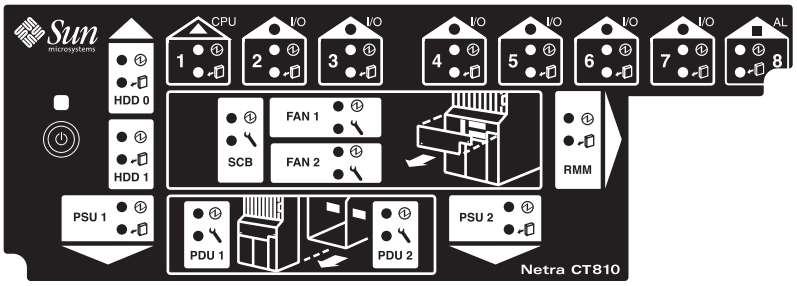

FIGURE 4-13 System Status Panel (Netra CT 810 Server)

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 drive
HDD 1	Power and Okay to Remove	Lower hard drive
Slot 1	Power and Okay to Remove	Host CPU board installed in slot 1
Slots 2–7	Power and Okay to Remove	I/O boards or satellite CPU boards (●) 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

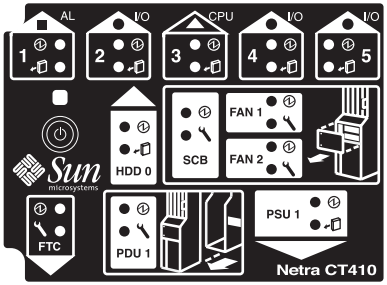

FIGURE 4-14 System Status Panel (Netra CT 410 Server)

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 board or satellite CPU board (●) installed in slot 2
Slot 3	Power and Okay to Remove	Host CPU board installed in slot 3
Slot 4 and 5	Power and Okay to Remove	I/O boards or satellite CPU boards (●) installed in slots 4 and 5
HDD 0	Power and Okay to Remove	Hard 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 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 has either green Power and amber Okay to Remove LEDs (FIGURE 4-15) or green Power and amber Fault LEDs (FIGURE 4-16). Note that the components in the Netra CT servers all have the green Power LED. They have either the amber Okay to Remove LED *or* the amber Fault LED, not both.

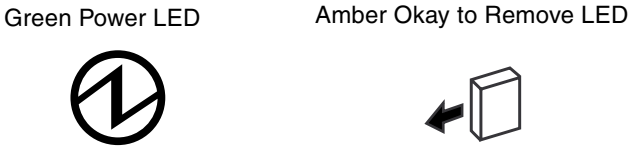

FIGURE 4-15 Power and Okay to Remove LEDs

FIGURE 4-16 Power and Fault LEDs

A green system power LED and power on/off button is located on the system status panel. When the system is off, the system power LED is unlit. Pressing the system power button when the system is off starts the power-up sequence. Once the system is completely powered up, the system power LED remains on.

For detailed information about the states and meanings of the LEDs, refer to the *Netra CT Server Service Manual*.

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 might have to replace them more frequently. The power supply unit air filter must be in place for safe operation. FIGURE 4-17

shows the locations of the air filters in a Netra CT 810 server power supply unit, and FIGURE 4-18 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.

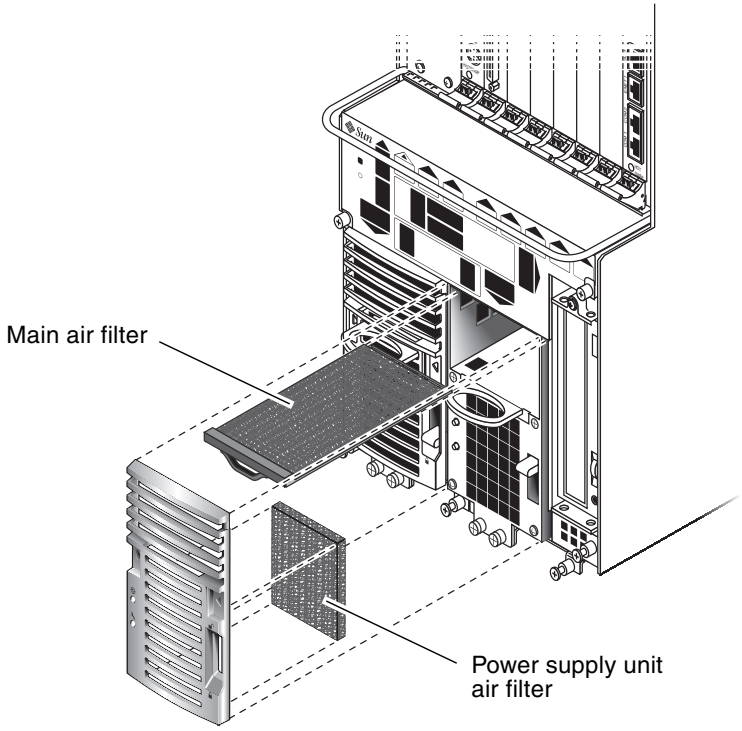

FIGURE 4-17 Power Supply Unit Air Filter and Main Air Filter (Netra CT 810 Server)

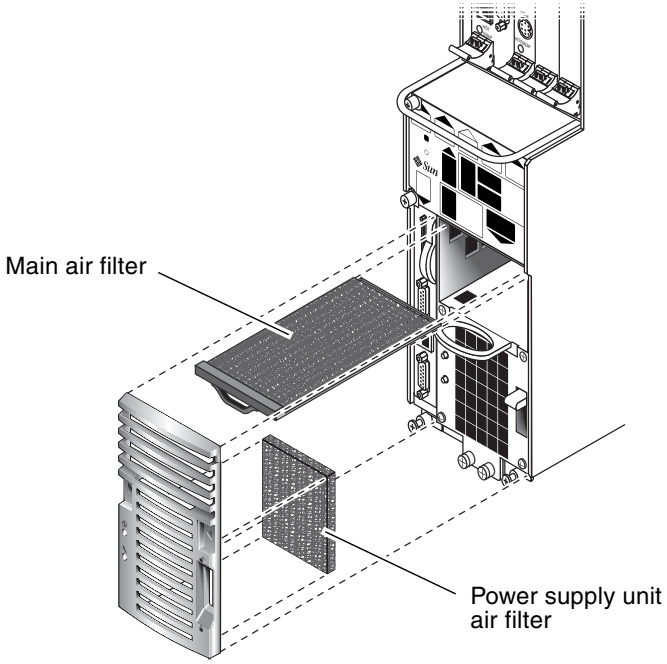

FIGURE 4-18 Power Supply Unit Air Filter and Main Air Filter (Netra CT 410 Server)

Fan Trays 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. High-speed fans are required to support Netra CP2500 boards.

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

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 might not be able to cool the system properly.

The fans are located underneath the board cage behind the system status panel (see "System Status Panels" on page 39 for the location of the system status panel). They are recessed into the operations board cage to maximize the air flow across the CompactPCI boards. FIGURE 4-19 shows the locations of the fan trays in a Netra CT 810 server, and FIGURE 4-20 shows the locations of the fan trays in a Netra CT 410 server. Note that the system status panel is removed in both figures.

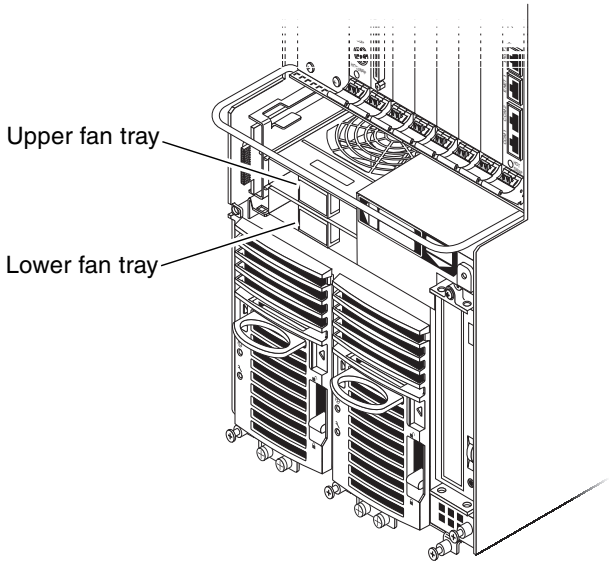

FIGURE 4-19 Fan Trays (Netra CT 810 Server)

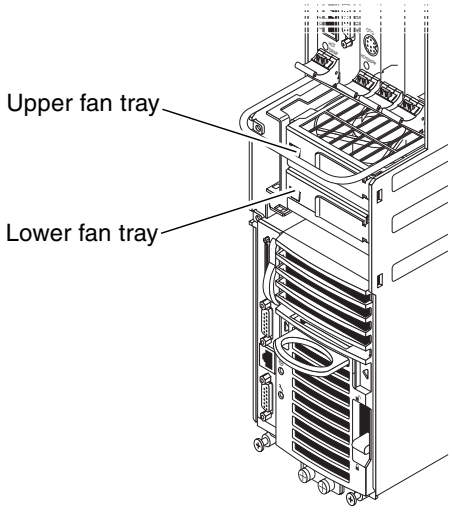

FIGURE 4-20 Fan Trays (Netra CT 410 Server)

Hard Drives

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

A specific slot is reserved for hard drives in both Netra CT 810 servers and Netra CT 410 servers. The hard drives are behind the drive bay cover.

Following are the SCSI IDs for the hard drives:

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

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

- The upper hard drive (HDD 0) and the removable media device are both on the first SCSI chain. Any external SCSI devices attached to the SCSI port on the rear transition module would be on the first SCSI chain.

- The lower hard drive (HDD 1) is the only SCSI device on the second SCSI chain, and is used as the boot drive.

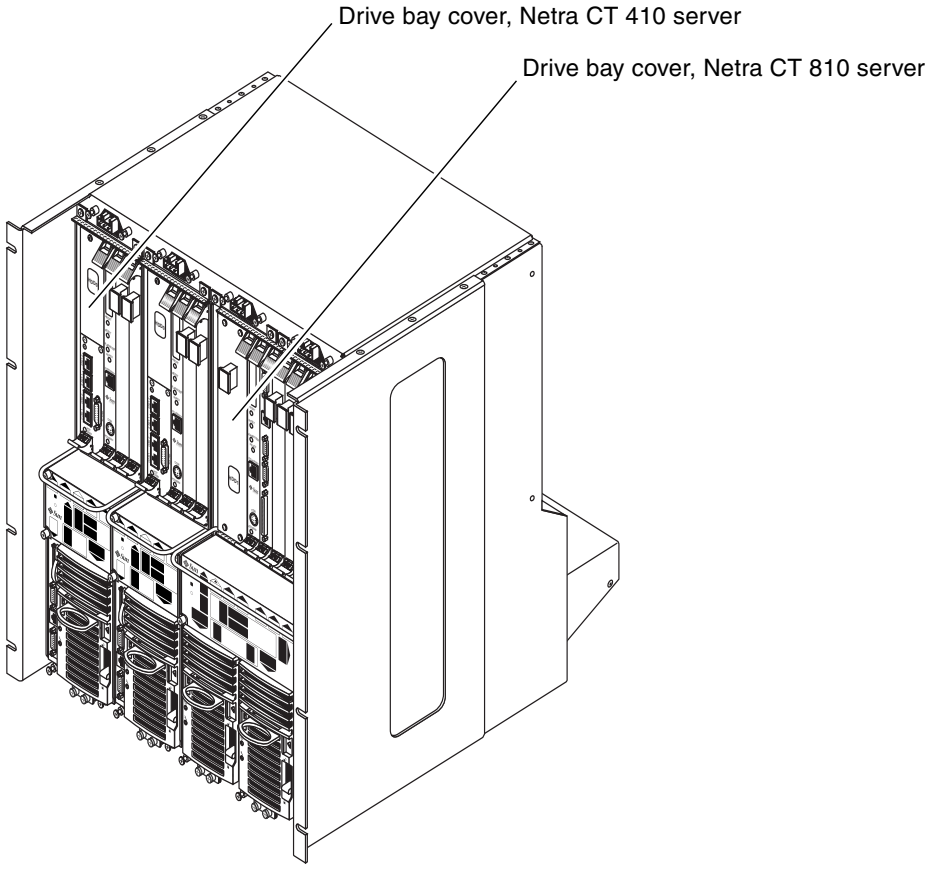

FIGURE 4-21 Drive Bay Cover Locations

Removable Media Modules

A removable media module consists of either a DVD or a 4-mm digital audio tape (DAT) drive, either of which is placed in the system from the front. The removable 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, two separate SCSI chains are in the Netra CT 810 server for the SCSI devices. The removable media device and the upper hard drive (HDD 0) are both on the first SCSI chain; the lower hard drive (HDD 1) is alone on the second SCSI chain.

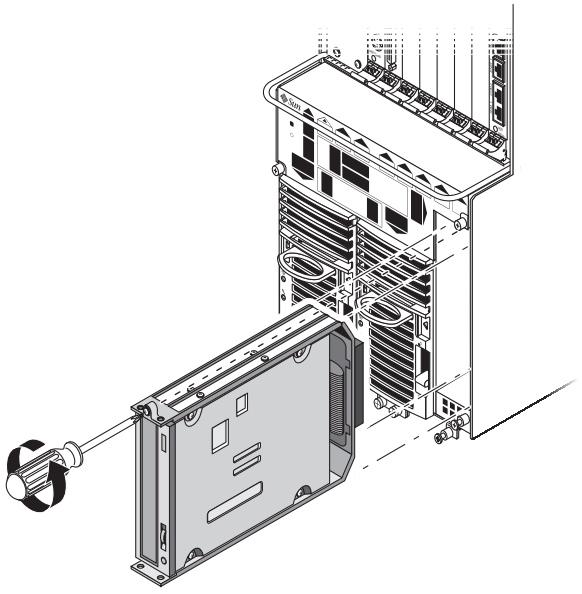

FIGURE 4-22 Removable Media Module Location

Alarm Cards

An alarm card is a standard component for both the Netra CT 410 servers and Netra CT 810 servers. Two different types of alarm cards are used in the 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.
- The double-wide 3U alarm card. This alarm card is used in the Netra CT 410 server.

Significant reliability, availability, and serviceability (RAS) functions are provided by the alarm card. The alarm card has its own CPU, a Motorola MPC850 processor, and its own real-time operating system and application software.

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

- Enable you to power on and off the Netra CT server from a remote console
- Notify an administrator in the event of a component failure
- Give a hard or soft reset of the CPU board
- Interact with 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 4-23 shows the single-wide 6U alarm card used in the Netra CT 810 server. FIGURE 4-24 shows the double-wide 3U alarm card used in the Netra CT 410 server.

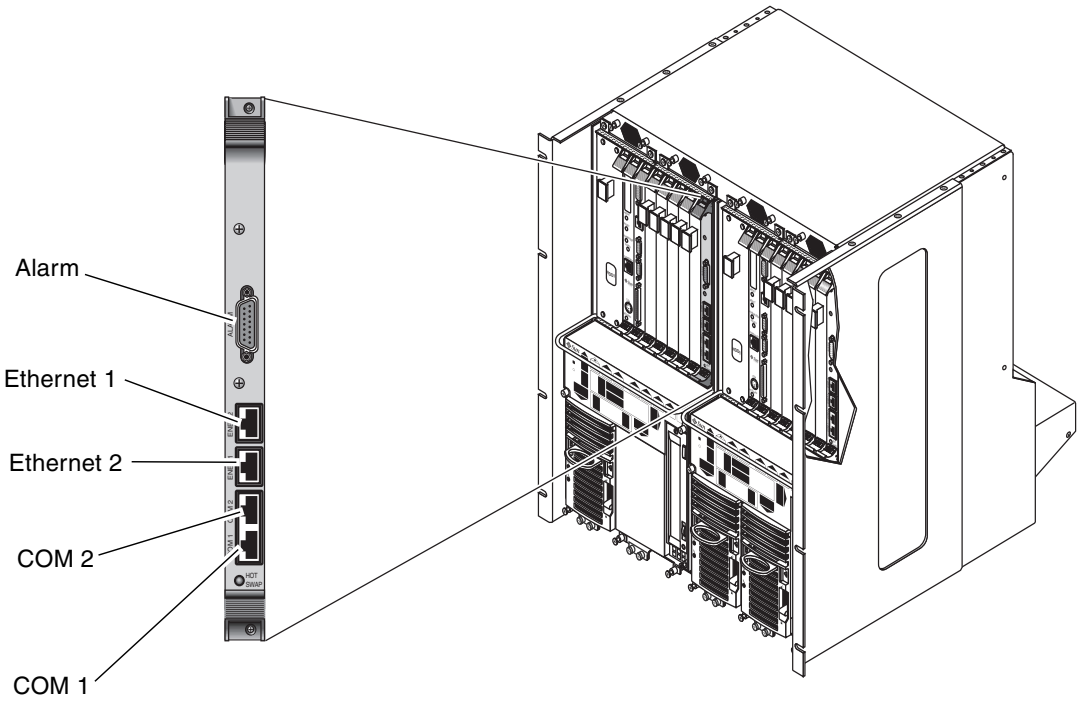

FIGURE 4-23 Single-Wide 6U Alarm Card (Netra CT 810 Server)

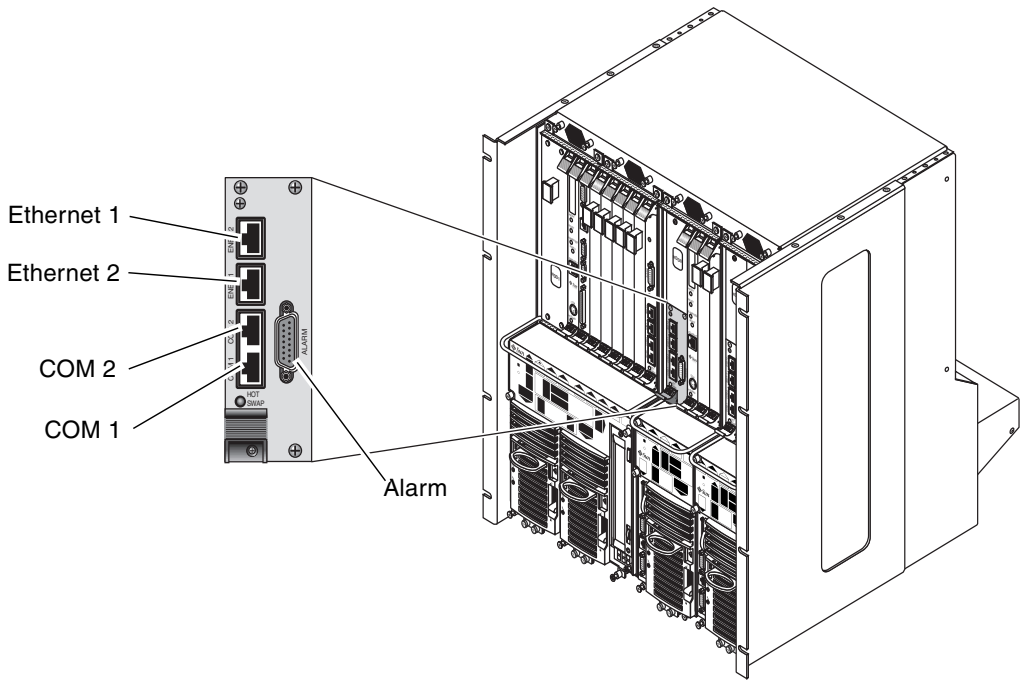

FIGURE 4-24 Double-Wide 3U Alarm Card (Netra CT 410 Server)

Alarm Rear Transition Modules

An alarm rear transition module (RTM) is paired with the alarm card in both the Netra CT 810 server and the Netra CT 410 server. Either the single-wide 6U alarm card or the double-wide 3U alarm card can be used with the alarm rear transition module. The alarm rear transition module must be installed in the same slot number, at the rear of the server, as the alarm card.

The alarm rear transition module extends the ports on the alarm card installed at the front of the server to the alarm rear transition module installed at the rear of the server. Ethernet port 1 is a 10-Mbps Ethernet port, and Ethernet port 2 is a 10/100 Mbps Ethernet port. FIGURE 4-25 shows the ports for the alarm rear transition module. FIGURE 4-26 shows the location of the alarm rear transition module in a Netra CT 810 server, and FIGURE 4-27 shows the location of the alarm rear transition module in a Netra CT 410 server.

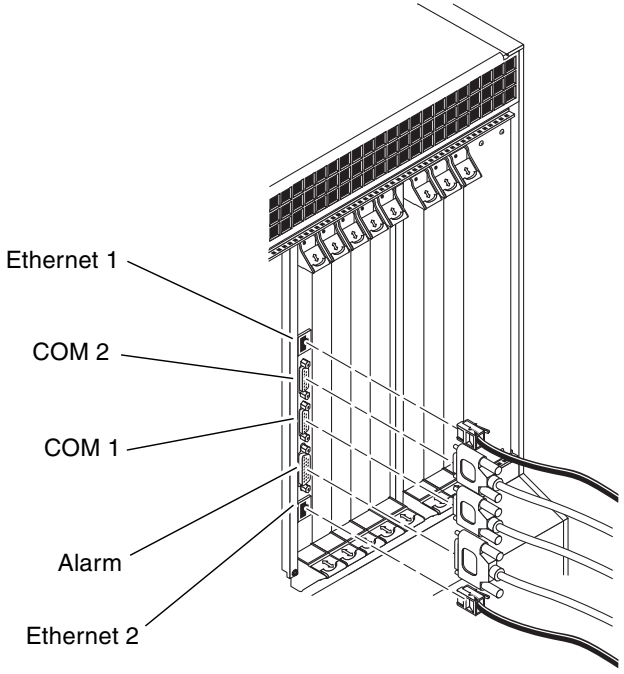

FIGURE 4-25 Alarm Rear Transition Module

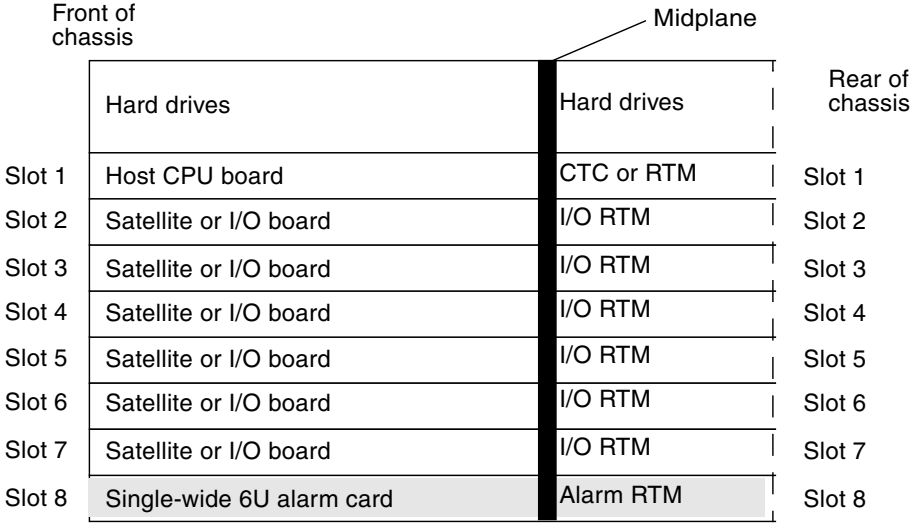

FIGURE 4-26 Supported Location for the Alarm Rear Transition Module in a Netra CT 810 Server (Top View)

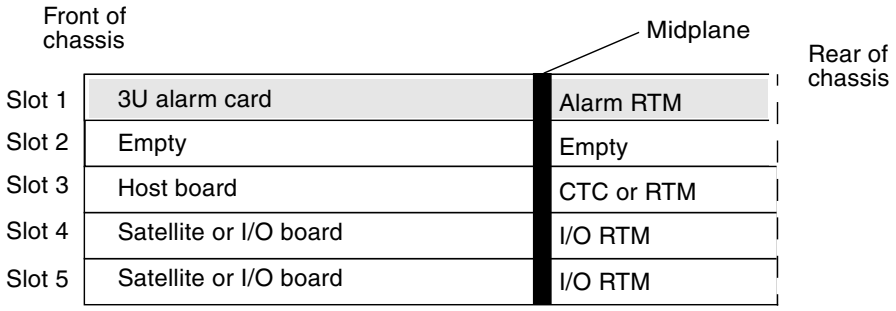

FIGURE 4-27 Supported Location for the Alarm Rear Transition Module in a Netra CT 410 Server (Top View)

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.

alarm rear transition module A module that extends the ports on the alarm card installed at the front of the server to the alarm rear transition module installed at the rear of the server.

ASIC Accronym for application-specific integrated cicuit.

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 (cPCI) 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.

D

DAT Accronym for digital auido tape.

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 drives, I/O boards, and power supplies. Note that a server, with all of its boards and other components, is not a FRU. However, an empty server is.

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 boards from and replace boards 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 rear of the server. The CPU board, I/O boards, and storage devices plug into the midplane from the front, and the rear transition modules plug into the midplane from the rear.

MII Acronym for media independent interface.

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

PCI Acronym for the Peripheral Component Interconnect. See *CompactPCI (cPCI)*.

PICMG Acronym for the PCI Industrial Computer Manufacturers Group. PICMG is the group that promulgates the CompactPCI standard. See *CompactPCI (cPCI)*.

PIM Acronym for the PCI mezzanine card (PMC) I/O module (PIM).

PMC Acronym for the PCI mezzanine card (PMC).

R

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

rear transition modules The rear transition modules 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