Netra™ CT Server Service Manual

For the Netra CT 810 Server and Netra CT 410 Server

Sun Microsystems, Inc.
www.sun.com

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Preface

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

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

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

Safety and Compliance

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

How This Book Is Organized

Part 1 "Preparing for Service"

- Chapter 1 describes the procedures you must perform before installing, removing, or replacing field-replaceable units (FRUs) in a Netra CT server.
- Chapter 2 provides hardware and software procedures for powering the Netra CT server on and off.
- Chapter 3 provides instructions for handling Compact PCI (cPCI) boards and assemblies correctly.

Part 2 "Troubleshooting the System"

- Chapter 4 provides troubleshooting procedures for the Netra CT server.

Part 3 "Replacing Hot-Swappable FRUs"

- Chapter 5 describes hot-swap software commands.
- Chapter 6 gives instructions for removing and replacing hot-swappable boards.
- Chapter 7 contains instructions for removing and replacing hard drives and removable media.
- Chapter 8 gives instructions for removing and replacing hot-swappable subassemblies.

Part 4 "Replacing Cold-Swappable FRUs"

- Chapter 9 provides instructions for removing and replacing the Netra CT 810 server and Netra CT 410 server.
- Chapter 10 gives instructions for removing and replacing cold-replaceable subassemblies.

Part 5 "Illustrated Parts List"

- Chapter 11 gives the illustrated parts list for the Netra CT server.

Part 6 "Appendixes, Glossary, and Index"

- Appendix A lists the connector pinouts for boards in the Netra CT server.
- Appendix B provides instructions for connecting a terminal console to the server.
- Appendix C gives the error messages for the Netra CT server.
- Appendix D gives the system specifications for the Netra CT server.

Using UNIX Commands

This document contains only limited information on basic UNIX® commands and procedures such as shutting down a system, booting a 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)
- AnswerBook2™ 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

You may want to refer to documentation on the following software for additional information: the Solaris OS and the Netra High Availability (HA) Suite.

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 Service Manual, part number 819-2741-10

PART 1 Preparing for Service

CHAPTER 1

Preparing for FRU Installation and Replacement

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

1.1 Tools Required

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

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

1.2 Attaching the Antistatic Wrist Strap

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

1. **Get the antistatic wrist strap and electrostatic discharge mat from the shipping kit.**
2. **Place the electrostatic discharge mat close to the system.**
3. **Unwrap the first two folds of the wrist strap and wrap the adhesive side firmly against your wrist.**
4. **Peel the liner from the copper foil at the opposite end of the wrist strap, and attach the copper end of the strap to a bare metal area on the Netra CT server or on the chassis, as shown in** FIGURE 1-1**.**

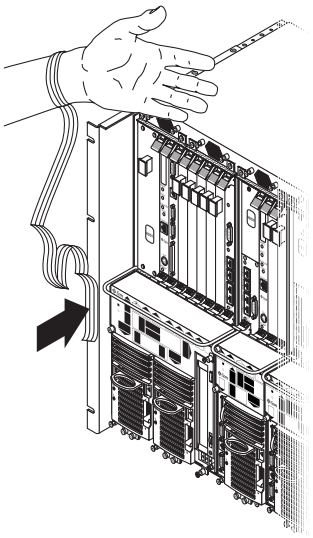

FIGURE 1-1 Attaching the Antistatic Wrist Strap

1.3 FRU Categories

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

- Hot-installable/replaceable (referred to hereafter as *hot-swappable*), meaning that you can install or remove and replace the FRU while the server is running, without interrupting the operation of the server. This category of FRU sometimes requires that you enter hot-swap software commands before and after an installation or a removal/replacement to incorporate the new FRU in the system correctly. For information on hot-swap commands, see Chapter 5.
- Non-hot-swappable, or *cold-swappable*, meaning that you must halt (and, in some cases, also power off) the server before installing or removing and replacing a FRU. Note that you must halt power only to the server where you would be removing and replacing the FRUs; any other servers installed in the same chassis can remain running.

Redundant power supplies and hard drives in a Netra CT 810 server are a variation of the hot-swappable category. You can replace a single power supply in a redundant configuration while the server is running, without having to enter any software commands, or a single hard drive after you have unmounted the drive or disengaged it if you are running a disk management software package.

1.3.1 Hot-Swappable FRUs

The FRUs listed below are hot-swappable:

- I/O boards
- Satellite CPU boards and satellite RTMs
- Alarm cards for both the Netra CT 810 server and the Netra CT 410 server[1]
- Alarm rear transition modules[1]
- Host CPU board[2]
- Host CPU rear transition module (rear-access model only)[2]
- Either of the two hard drives in a Netra CT 810 server
- DVD or DAT (digital audio tape) drives occupying the removable media module
- Fan trays
- System status panels
- System controller boards[3]
- Either of the two power supply units in a Netra CT 810 server
- Power supply unit air filters
- Main air filters

The instructions for removing and replacing these hot-swappable FRUs are covered in Part 3.

1.3.2 Cold-Swappable FRUs

The FRUs listed below are cold-swappable:

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

The instructions for removing and replacing these cold-swappable FRUs are covered in Part 4.

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

1.4 Device Names

The following sections provide information about device names for I/O slots and hard drives.

1.4.1 Device Names for I/O Board Slots in the Netra CT Servers

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

TABLE 1-1 Device Names for I/O Board Slots in the Netra CT 810 Server

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

TABLE 1-2 Device Names for I/O Board Slots in the Netra CT 410 Server

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

Note – For Netra CP2500 boards, `pcia` and `pcib` probe lists do not apply.

1.4.2 Device Names for hard drives

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

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

CHAPTER 2

Powering the Server Off and On

This chapter provides instructions on powering the Netra CT server on and off. This chapter contains the following topics:

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

Note – You can also power the Netra CT server on and off through the alarm card using the `poweroff` and `poweron` commands. Refer to the *Netra CT Server System Administration Guide* for more information.

2.1 Powering On the Server

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

Note – Do not reboot the server if the alarm card is in the process of resetting.

The system power on sequence is as follows:

1. The alarm card comes up and powers on the power supplies
2. The alarm card powers on I/O boards
3. The alarm card powers on the host CPU board, and the Solaris OS boots
4. The alarm card powers on satellite CPU boards supported by Sun Microsystems, such as the Netra CP2160 and the Netra CP2500.

The power on sequence must finish before you can use the alarm card CLI commands `poweron cpu_node` and `poweroff cpu_node`.

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

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

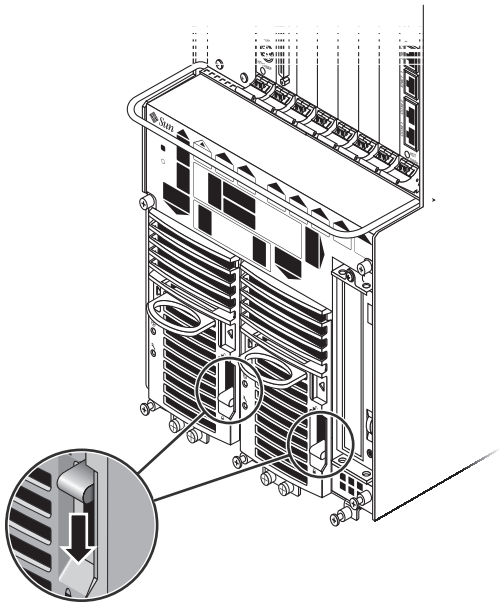

FIGURE 2-1 Locating the Power Supply Locking Mechanism on the Netra CT 810 Server

When the power supply locking mechanism is locked, the green LEDs on the power supplies flash, indicating that the power supplies are powered on, but the server has not been powered on yet. Also, the power distribution unit (PDU) LEDs on the system status panel should be in the following states:

Green LED ( ) is ON

Amber LED ( ) is OFF

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

2. **Locate the system status panel.**

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

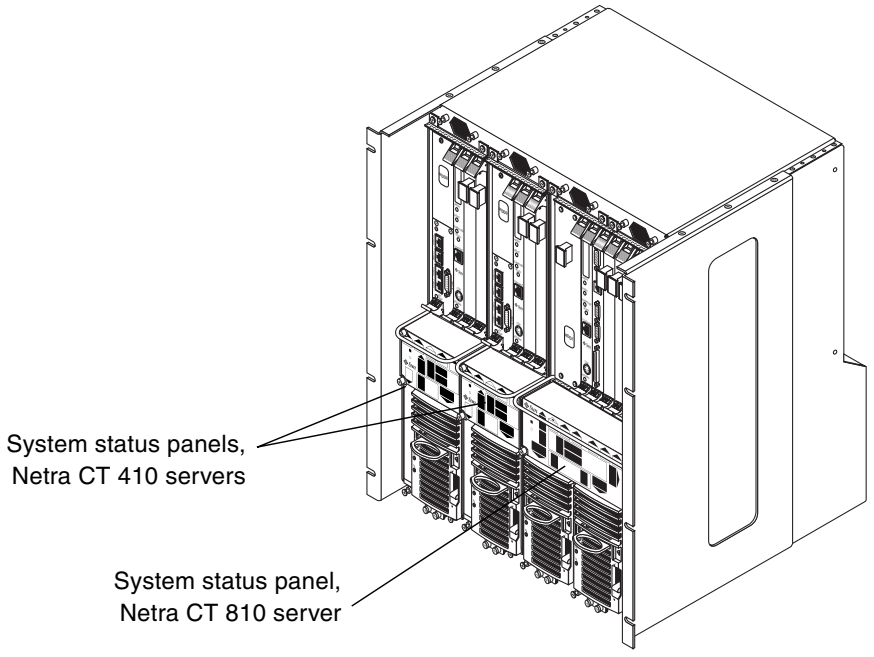

FIGURE 2-2 System Status Panel Locations

3. **Locate the system power button on the system status panel, then press the system power button to power on the server.**

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

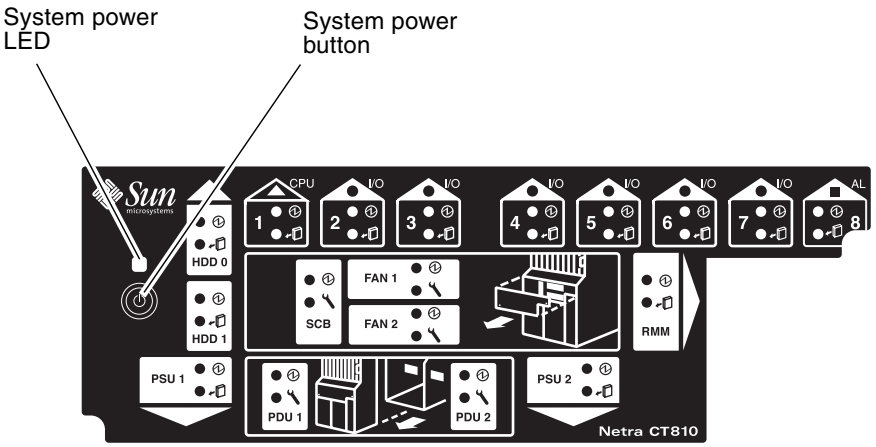

FIGURE 2-3 System Power Button and System Power LED Locations (Netra CT 810 Server)

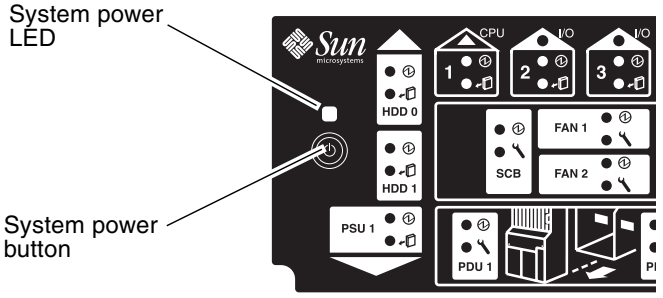

FIGURE 2-4 System Power Button and System Power LED Locations (Netra CT 410 Server)

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

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

5. **Verify that the green power (⏻) LED on the power supplies are on, not blinking, indicating that they are powered on and functioning properly.**

6. **Connect to the console and boot the server.**

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

2.2 Verifying Full Power-Up

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

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

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

Output similar to the following is displayed:

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

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

2.3 Powering Off the Server

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

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

If you do not have a terminal hookup to your server and your CPU is functioning normally, initiate a graceful hardware power-down for your server. For a graceful hardware power-down, press the system power button for *less* than four seconds. This will start the orderly power-down sequence in such a manner that no persistent OS data structures are corrupted. In the orderly power-down, applications in service are terminated and no further services are invoked by the CPU.

If you do not have a terminal hookup to your server and your CPU is *not* functioning normally, you cannot initiate a graceful hardware power-down; you must perform an ungraceful hardware power-down. For an ungraceful hardware power-down, press the system power button for *more* than four seconds. This immediately shuts the system down without making any attempts to keep the persistent OS data structures from being corrupted.

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

- For hardware power-down instructions, go to Section 2.3.1, "To Perform a Hardware Power-Down" on page 2-7.
- For software power-down instructions, go to Section 2.3.2, "To Perform a Software Power Down" on page 2-8.

2.3.1 To Perform a Hardware Power-Down

1. **In preparation for bringing down the operating system and powering off the server, ensure that all significant application activity is stopped on the server.**
2. **Go to the front of the Netra CT server and locate the system status panel.**

   The locations of the system status panels in the Netra CT 810 server and Netra CT 410 server are illustrated in FIGURE 2-2.
3. **Locate the system power button on the system status panel.**

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

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

   This action starts the orderly power-down sequence in such a manner that no persistent OS data structures are corrupted. Applications in service might be terminated and no further services are invoked by the CPU. The system power LED blinks for several seconds, then it goes off.

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

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

6. **If you want to completely power off the Netra CT server, push the purple power supply unit locking mechanisms up into the unlocked (🔓) position (FIGURE 2-1).**

Note – You must unlock the locking mechanism on *both* power supply units on the Netra CT 810 server in order to completely power off that server.

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

2.3.2 To Perform a Software Power Down

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

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

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

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

3. **Connect to the console and boot up the server.**

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

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

```
ok power-off
```

5. **Go to the front of the Netra CT server and locate the system status panel (see FIGURE 2-2).**

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

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

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

7. **If you want to completely power off the Netra CT server, push the purple power supply unit locking mechanisms up into the unlocked (🔓) position (FIGURE 2-1).**

Note – You must unlock the locking mechanism on *both* power supply units on the Netra CT 810 server to completely power off the server.

The green power (⏻) LEDs on the power supply units turn off (unlit), indicating that the system is now completely powered off.

CHAPTER 3

Handling Boards and Assemblies

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

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

3.1 Handling Boards

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

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

Caution – Do not flex the CompactPCI boards; the surface-mounted components can break.

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

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

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

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

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

3.2 Handling Assemblies

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

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

PART 2 Troubleshooting the System

CHAPTER 4

Troubleshooting the System

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

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

4.1 Troubleshooting the System Using the System Status Panel

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

4.1.1 Locating and Understanding the System Status Panel

The system status panel on the Netra CT server give the majority of troubleshooting information that you need for your server. FIGURE 4-1 shows the locations of the system status panels on the Netra CT servers. FIGURE 4-2 shows the system status panel for the Netra CT 810 server, and FIGURE 4-3 shows the system status panel for the Netra CT 410 server.

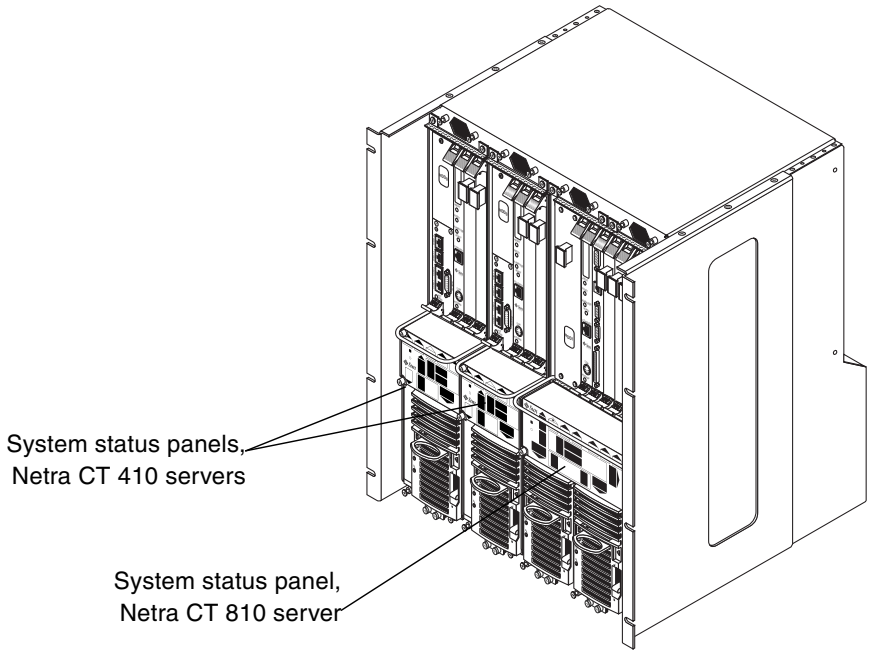

FIGURE 4-1 System Status Panel Locations

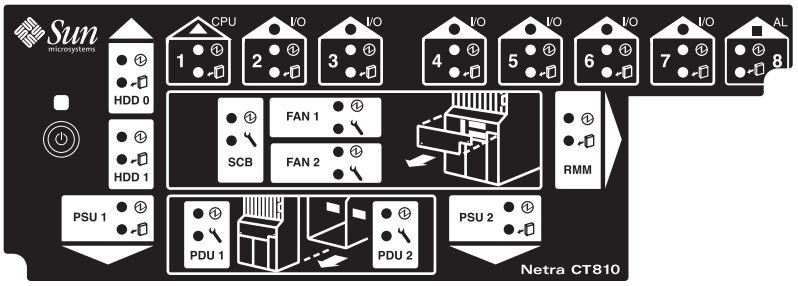

FIGURE 4-2 System Status Panel (Netra CT 810 Server)

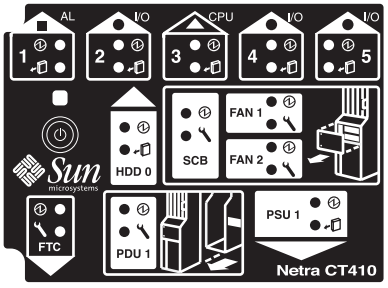

FIGURE 4-3 System Status Panel (Netra CT 410 Server)

4.1.2 Using the System Status Panel LEDs to Troubleshoot the System

When you first power-on the Netra CT server, some or all of the green Power LEDs on the system status panel flash on and off for several seconds. Do not attempt to troubleshoot the system until after the LEDs have gone through their initial power-on testing.

Each major component in the Netra CT 810 server and Netra CT 410 server has a set of LEDs on the system status panel that gives the status on that component. Each component has either green Power and amber Okay to Remove LEDs (FIGURE 4-4) or green Power and amber Fault LEDs (FIGURE 4-5).

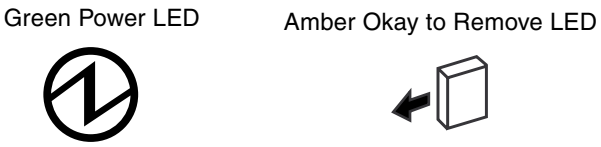

FIGURE 4-4 Power and Okay to Remove LEDs

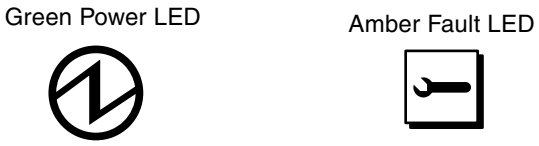

FIGURE 4-5 Power and Fault LEDs

TABLE 4-1 lists the LEDs for each component in the Netra CT 810 server, and TABLE 4-2 lists the LEDs for each component in the Netra CT 410 server. Note that the boards in the Netra CT servers all have the green Power LED, and they have either the amber Okay to Remove LED *or* the amber Fault LED, not both.

TABLE 4-1 System Status Panel LEDs for the Netra CT 810 Server

LED	LEDs Available	Component
HDD 0	Power and Okay to Remove	Upper hard 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 board or satellite CPU board (●) installed in slot 2 - 7
Slot 8	Power and Okay to Remove	Alarm card (■) installed in slot 8
SCB	Power and Fault	System controller board (behind the system status panel)
FAN 1	Power and Fault	Upper fan tray (behind the system status panel)
FAN 2	Power and Fault	Lower fan tray (behind the system status panel)
RMM	Power and Okay to Remove	Removable media module
PDU 1 (DC only)	Power and Fault	Left most power distribution unit (behind the server)
PDU 2 (DC only)	Power and Fault	Right most power distribution unit (behind the server)
PSU 1	Power and Okay to Remove	Left most power supply unit
PSU 2	Power and Okay to Remove	Right most power supply unit

TABLE 4-2 System Status Panel LEDs for the Netra CT 410 Server

LED	LEDs Available	Component
Slot 1	Power and Okay to Remove	Alarm card(■) installed in slot 1
Slot 2	Power and Okay to Remove	I/O 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 slot 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)
PDU 1 (DC only)	Power and Fault	Power distribution unit (behind the server)
PSU 1	Power and Okay to Remove	Power supply

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

Note – Do not use the information in TABLE 4-4 to troubleshoot a power supply unit in a server that has only one power supply unit (a Netra CT 410 server or a Netra CT 810 server with only one power supply). To troubleshoot the power supply in a single power supply system, use the LEDs on the power supply itself. See Section 4.6, "Troubleshooting a Power Supply Using the Power Supply Unit LEDs" on page 4-18 for more information. The information given in TABLE 4-4 applies to all other components in the Netra CT 810 server or Netra CT 410 server, including the power supplies in a two-power supply Netra CT 810 server.

TABLE 4-3 CompactPCI Board LED States and Meanings

Green Power LED state	Amber Okay to Remove LED state	Meaning	Action
Off	Off	The slot is empty or the system thinks that the slot is empty because the system didn't detect the component when it was inserted.	If there is a component installed in this slot, then one of the following boards is faulty: • the board installed in the slot • the alarm card • the system controller board Remove and replace the failed board to clear this state.
Blinking	Off	The component is coming up or going down.	*Do not* remove the component in this state.
On	Off	The component is up and running.	*Do not* remove the component in this state.

TABLE 4-3 CompactPCI Board LED States and Meanings

Green Power LED state	Amber Okay to Remove LED state	Meaning	Action
Off	On	The component is powered off.	You can remove the component in this state.
Blinking or Off	On	The component is powered on, but it is offline for some reason (for example, a fault was detected on the component).	Wait until the green Power LED stops blinking. If it does not stop blinking after several seconds, enter `cfgadm` and verify that the component is in the `unconfigured` state, then perform the necessary action, depending on the component: • Alarm card—When the green Power LED is OFF and the amber Okay to Remove LED is ON, you can remove the alarm card. • All other boards—Power off the slot through the alarm card software, then remove the component.
On	On	The component is powered on and is in use, but a fault has been detected on the component	Deactivate the component using one of the following methods: • Use the `cfgadm -f -c unconfigure` command to deactivate the component. Note that in some cases, this may cause the system to panic, depending on the nature of the component's hardware or software. • Halt the system and power off the slot through the alarm card software, then remove the component. The green Power LED will then give status information: • If the green Power LED goes off, then you can remove the component. • If the green Power LED remains on, then you must halt the system and power off the slot through the alarm card software.

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

LED State	Power LED	Okay to Remove LED
On, Solid	Component is installed and configured.	Component is Okay to Remove. You can remove the component from the system, if necessary.

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

LED State	Power LED	Okay to Remove LED
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 4-5 Meanings of Power and Fault LEDs

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

4.2 Troubleshooting the System Using `prtdiag`

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

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

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

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

```
System Configuration: Sun Microsystems  sun4u SPARCengine CP2000 model 140
(UltraSPARC-IIi 648MHz)
Memory size: 512 Megabytes
platform is : SUNW,NetraCT-810
============================== FRU Information ==============================
FRU          FRU      FRU         Green     Amber     Miscellaneous
Type         Unit#    Present     LED       LED       Information
----------  -----    -------     -----     -----     --------------------------
Midplane     1        Yes                             Netra ct800
                                                      Properties:
                                                        Version=0
                                                        Maximum Slots=8
SCB          1        Yes         on        off       System Controller Board
                                                       Properties:
                                                         Version=2
                                                         hotswap-mode=basic
SSB          1        Yes                             System Status Panel
CPU          1        Yes         on        off       CPU board
                                                        temperature(celsius):38
I/O          2        Yes         on        off       CompactPCI IO Slot
                                                      Properties:
                                                        auto-config=disabled
                                                      Board Type:Unknown
                                                      Devices:
                                                        pci
                                                          pci108e,1000
                                                          SUNW,hme
                                                          SUNW,isptwo
I/O          3        Yes         on        off       CompactPCI IO Slot
                                                      Properties:
                                                        auto-config=disabled
```

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

```
                                                    Board Type:Unknown
                                                      Devices:
                                                        pci
                                                          pci108e,1000
                                                          SUNW,hme
                                                          SUNW,isptwo
I/O         4         Yes         on         off      CompactPCI IO Slot
                                                    Properties:
                                                      auto-config=disabled
                                                      Board Type:Unknown
                                                    Devices:
                                                      pci
                                                        pci108e,1000
                                                        SUNW,hme
                                                        SUNW,isptwo
I/O         5         Yes         on         off      CompactPCI IO Slot
                                                    Properties:
                                                      auto-config=disabled
                                                      Board Type:Unknown
                                                     Devices:
                                                       pci
                                                         pci108e,1000
                                                         SUNW,hme
                                                         SUNW,isptwo
I/O         6         Yes         on         off      CompactPCI IO Slot
                                                    Properties:
                                                      auto-config=disabled
I/O         7         Yes         on         off      CompactPCI IO Slot
                                                    Properties:
                                                      auto-config=disabled
                                                    Board Type:Unknown
                                                    Devices:
                                                      pci
                                                        pci108e,1000
                                                        SUNW,qfe
                                                        pci108e,1000
                                                        SUNW,qfe
                                                        pci108e,1000
                                                        SUNW,qfe
                                                        pci108e,1000
                                                        SUNW,qfe
                                                        pci1176,608
I/O         8         Yes         on         off      CompactPCI IO Slot
                                                    Properties:
                                                      auto-config=disabled
                                                    Board Type:Alarm Card
                                                    Devices:
```

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

```
                                                        pci
                                                          ebus
                                                          ethernet
PDU          1        Yes        on         off        Power Distribution Unit
PDU          2        Yes        on         off        Power Distribution Unit
PSU          1        Yes        on         on         Power Supply Unit
                                                          condition:ok
                                                          temperature:ok
                                                        ps fan:ok
                                                          supply:on
PSU          2        Yes        on         on         Power Supply Unit
                                                          condition:ok
                                                          temperature:ok
                                                          ps fan:ok
                                                          supply:on
FAN          1        Yes        on         off        Fan Tray
                                                          condition:ok
                                                          fan speed:low
FAN          2        Yes        on         off        Fan Tray
                                                          condition:ok
                                                          fan speed:low
HDD          0        Yes        on         off        hard drive
                                                          condition:ok
HDD          1        Yes        on         off        hard drive
                                                          condition:ok
RMM                   Yes        on         on        Removable Media Module
                                                          condition:Unknown

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

If you have a Netra CT 410 server, the output on the console is similar to the following:

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

```
System Configuration: Sun Microsystems  sun4u SPARCengine CP2000 model 140
(UltraSPARC-IIi 648MHz)
Memory size: 512 Megabytes
platform is : SUNW,NetraCT-410
================================ FRU Information ================================
FRU          FRU      FRU        Green     Amber     Miscellaneous
Type         Unit#    Present    LED       LED       Information
-----------  -----    -------    -----      -----    --------------------------
Midplane     1        Yes        Netra ct400
                                                     Properties:
                                                       Version=0
                                                       Maximum Slots=5
SCB          1        Yes        on        off       System Controller Board
                                                       Properties:
                                                       Version=2
                                                       hotswap-mode=basic
SSB          1        Yes                            System Status Panel
I/O          1        Yes        on        off       CompactPCI IO Slot
                                                     Properties:
                                                       auto-config=disabled
                                                     Board Type:Alarm Card
                                                     Devices:
                                                       pci
                                                         ebus
                                                         ethernet
I/O          2        Yes        off        off      CompactPCI IO Slot
                                                     Properties:
                                                       auto-config=disabled
CPU          3        Yes        on        off       CPU board
                                                       temperature(celsius):38
I/O          4        Yes        on        off       CompactPCI IO Slot
                                                     Properties:
                                                       auto-config=disabled
                                                     Board Type:Unknown
                                                     Devices:
                                                       pci
                                                         pci108e,1000
                                                         SUNW,hme
                                                         SUNW,isptwo
I/O          5        Yes        on        off       CompactPCI IO Slot
                                                     Properties:
                                                       auto-config=disabled
                                                     Board Type:Unknown
                                                     Devices:
```

CODE EXAMPLE 4-2 `prtdiag` Output for a Netra CT 410 Server *(Continued)*

```
                                                        pci
                                                          pci108e,1000
                                                          SUNW,qfe
                                                          pci108e,1000
                                                          SUNW,qfe
                                                          pci108e,1000
                                                          SUNW,qfe
                                                          pci108e,1000
                                                          SUNW,qfe
PDU          1        Yes        on         off        Power Distribution Unit
PSU          1        Yes        on         off        Power Supply Unit
                                                          condition:ok
                                                          temperature:ok
                                                          ps fan:ok
                                                          supply:on
FAN          1        Yes        on         off        Fan Tray
                                                          condition:ok
                                                          fan speed:low
FAN          2        Yes        on         off        Fan Tray
                                                          condition:ok
                                                          fan speed:low
HDD          0        Yes        on         off        hard drive
                                                          condition:ok

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

4.3 Troubleshooting the System Using Diagnostic Software

Software packages, such as Sun VTS, allow you to run diagnostic tests on your system. SunVTS is a validation test suite that is provided as a supplement to the Solaris operating environment. The individual tests can stress a device, system, or resource so as to detect and pinpoint hardware and software failures and to provide users with informational messages for resolving problems. SunVTS runs at the operating system level.

The following tests are useful when troubleshooting a Netra CT server:

- `alarm2test`—is part of SunVTS, but it is used to test the alarm card installed in the Netra CT server by invoking the `alarmdiag` test on the alarm card. `alarm2test` runs at the operating system level.
- `obdiag`—is similar to the `alarm2test`, in that it invokes the `alarmdiag` test on the alarm card; however, `obdiag` is run from the firmware level, not the operating system level.
- `Apost`—is part of the embedded firmware image on the alarm card. It runs a basic test on the alarm card to verify that the alarm card is operating properly before bringing up Chorus on the alarm card.

A new utility called `diagconf`, which is part of the embedded firmware image on the alarm card, is now available. You can use `diagconf` to set or display the configuration settings for `Apost`, allowing you to make the tests run on the alarm card more or less thoroughly before the embedded firmware is brought up on the alarm card.

To display the values currently set for `Apost`, access the alarm card command line interface (CLI) and enter the following command:

```
hostname cli> diagconf -d
```

Output similar to the following is displayed, giving you the values currently set for the `Apost` test on the alarm card:

```
diag-switch         False
verb-mode           True
stop-on-error       False
diag-level          Max
mfg-mode            Off
hdr-checksum        0xaa
time-stamp          0
record-format-ver   49
post-version        02
reset-status        0xd0000000
post-status         ...
post-msg            Watchdog Reset-------- POST Passed-------------------
```

Some values are hard-set and cannot be changed by a user, while others can be changed to make the test more or less thorough. To change the value for a test, enter the following command:

hostname `cli>` **`diagconf -s`** *command value*

where *command* is the name of the command that you want to change, and *value* is the value you want to change.

The following table lists the `Apost` tests that can be changed by a user and the allowable values for each. Any tests not listed in TABLE 4-6 are either hard-set and cannot be changed, or should not be changed by a user.

TABLE 4-6 `Apost` Tests and Values through `diagconf`

Command	Value
diag-switch	• True—Turns the `diag-switch` test on. • False—Turns the `diag-switch` test off.
verb-mode	• True—Turns the `verb-mode` test on. • False—Turns the `verb-mode` test off.
stop-on-error	• True—Stops the Apost testing when the first error is encountered. • False—Continues Apost testing, regardless of the number of errors encountered.
diag-level	• Off—Turns the `diag-level` test off. • Min—Sets the `diag-level` test to the minimum level of testing. • Max—Sets the `diag-level` test to the maximum level of testing.

For more information on these and other tests in the SunVTS test suite, refer to the Computer Systems Release Notes Supplement for Sun Hardware document or the SunVTS documentation on the Solaris on Sun Hardware Answerbook, both included with your Solaris operating environment.

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

When you first power-up the Netra CT server, some or all of the green Power LEDs on the system status panel flash on and off for several seconds. The green Power LED for the I/O slot holding the host board (slot 1 in the Netra CT 810 server and slot 3 in the Netra CT 410 server) lights solid green while the green Power LEDs for the remaining components are flashing on and off; this status is an indication that the CPU board passed the power-on self test (POST).

Before any processing occurs on a system, the system must successfully complete the POST. Messages are displayed for each step in the POST process. If there is a critical failure, the system does not complete POST and does not boot. To monitor this process, you must be connected to the TTY A port on the CPU board or rear transition module. See Section 5.2.1, "Logging In to the Netra CT Server" on page 5-5.

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

To see the console *output* device, enter:

```
ok printenv output-device
```

The screen displays output similar to the following:

```
output-device            ttya
```

The possible settings for this variable are as follows:

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

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

To see the console *input* device, enter:

```
ok printenv input-device
```

The screen displays output similar to the following:

```
input-device             ttya
```

The possible settings for this variable are:

- ttya (default)
- ttyb
- keyboard
- rsc

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

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

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

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

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

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

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

4.5 Troubleshooting the System Using the Alarm Card Software

For information on troubleshooting using the alarm card software, refer to the *Netra CT Server System Administration Guide* (819-2743-xx).

4.6 Troubleshooting a Power Supply Using the Power Supply Unit LEDs

Two LEDs are on each power supply unit: a green ( ) LED and an amber ( ) LED. Use the LEDs on the power supply unit to troubleshoot each power supply unit. Because there is one power supply unit in the Netra CT 410 server and two power supply units in the Netra CT 810 server, the actions to take are different. The following sections provide guidelines for each server.

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

Following are the states of the LEDs on the power supply unit in the Netra CT 410 server:

- Green, flashing—The power supply unit is in the standby mode; the power supply unit is powered on, yet it is not supplying power to the server.
- Green, solid—Both the server and the power supply unit are powered on and functioning properly.
- Amber—A fault was found in the power supply unit. Replace the power supply unit. See Section 10.2, "Cold-Swappable Power Supply Unit" on page 10-5 for those instructions.
- Off—One of the following conditions apply:
  - The power supply locking mechanism is in the upper, unlocked position.
  - The accompanying cable is disconnected from the power distribution unit.
  - The accompanying power distribution unit failed.
  - The power supply unit failed.

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

When both power supply units in a Netra CT 810 server are up and running properly, the green ( )LEDs on both power supply units is ON (note that these are the LEDs on the power supply units themselves, *not* the LEDs on the system status panel).

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

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

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

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

4.7 Troubleshooting a Host CPU Board

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

The following topics are covered:

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

Also, the following diagnostic procedures are described:

- OpenBoot PROM on-board diagnostics
- OpenBoot diagnostics

4.7.1 General Troubleshooting Tips

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

The following general troubleshooting tips are useful in isolating issues related to a host board:

1. **Make sure the host board is installed properly in the correct slot in the Netra CT server.**

   The CPU board is installed in slot 1 in the Netra CT 810 server and in slot 3 in the Netra CT 410 server.

2. **Make sure all the necessary cables are attached properly to the host rear transition module.**

   The following are possible board and rear transition module combinations:

   - Netra CP2140 and Netra CT CPU transition card (CTC, hereafter referred to as rear transition module)
   - Netra CP2500 and Netra CP2500 RTM-H (rear transition module for host)

   FIGURE 4-6 shows the connectors on the CTC. FIGURE 4-7 shows connectors on the RTM-H.

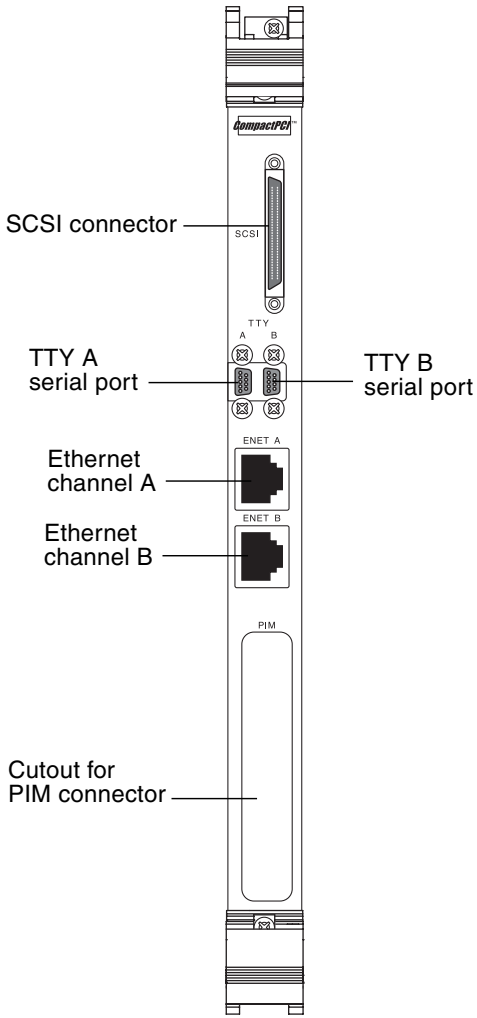

FIGURE 4-6 Connectors on the Netra CP2140 Host Rear Transition Module

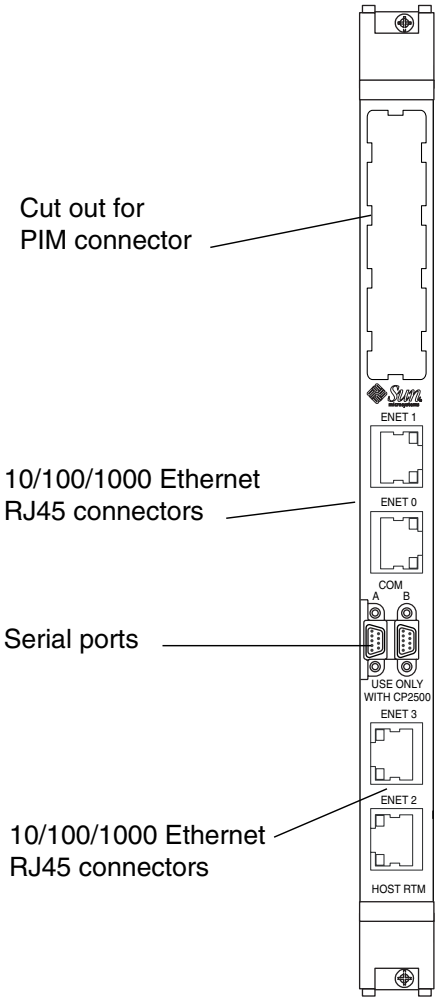

FIGURE 4-7 Connectors on the Netra CP2500 Rear Transition Module Host (RTM-H) Board

4.7.2 Warning, Critical, and Shutdown Temperatures

The following temperatures apply to the Netra CP2500 board:

- Warning: 221˚F (105˚C)
- Critical: 230˚F (110˚C)
- Shutdown: 239˚F (115˚C)

4.7.3 General Troubleshooting Requirements

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

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

4.7.4 Mechanical Failures

Symptom

Unable to insert the CPU board into the backplane.

Action

1. **Verify that no mechanical and physical obstructions exist in the slot where the CPU board is going to be installed.**
2. **Make sure no pins on the board connectors or the CompactPCI backplane connectors are bent or damaged.**
3. **Verify that the front panel screws are seated and not preventing the board from seating properly.**

4.7.5 Power-On Failures

This section provides examples of power-on failure symptoms and suggests actions.

- **Make sure the CPU board is installed properly.**
  - If the CPU board is a host Netra CP2140 or satellite Netra CP2160 and both the Ready and Alarm LEDs on the CPU board are green, the board is partially functional and capable of running POST (power on self-test). However, if none of the LEDs is green, the board is not functional. In this case, contact your Sun supplier or field service engineer.

- If the CPU board is a host or satellite Netra CP2500 and the Ready LED is green and the Alarm LEDs is either off or amber, the board is partially functional and capable of running POST (power on self-test). If the LEDs are not green and either off or amber, the board is not functional. In this case, contact your Sun supplier or field service engineer.

4.7.6 Failures Subsequent to Power-On

Symptom

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

Action

1. **Check the TTY cable for proper setup.**
2. **If you do not see any output after connecting the TTY terminal to the rear transition module, remove the terminal, then connect it to the COM port of the CPU board and try again.**

4.7.7 Troubleshooting During POST/OpenBoot PROM and During Boot Process

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

Symptom

POST error message displays:

```
cannot establish network service
```

Action

This might be a hardware address problem.

- **Add or check the media access control (MAC) address to the server and the IP address at the server.**

Symptom

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

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

Action

This might be a mounting issue with the CPU Mylar film, socket, or heatsink, which could have occurred during transportation or due to severe vibration.

- **Contact Sun's Customer Care Center.**

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

4.7.8 OpenBoot PROM On-Board Diagnostics

Note – For Netra CP2500 boards, `pcia-probe-list` does not apply.

The following OBP variables are specific to the Netra CT server:

- `pcia-probe-list`—Probes the bus that runs the first ethernet port (front connection) and standard I/O devices (by default: 1, 2)
- `pcib-probe-list`—Probes the bus that runs the second ethernet port (rear connection) (by default: 1, 2, 3)
- `cpci-probe-list`—Probes the bus that runs connections to all cPCI slots in the ct400 or ct800 (by default: 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, a, b, c, d, e, f)

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

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

4.7.8.1 `watch-clock`

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

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

4.7.8.2 watch-net and watch-net-all

The watch-net and watch-net-all commands monitor Ethernet packets on the Ethernet interfaces connected to the system. Good packets received by the system are indicated by a period (.). Errors such as the framing error and the cyclic redundancy check (CRC) error are indicated with an X and an associated error description. CODE EXAMPLE 4-3 identifies the watch-net output message and CODE EXAMPLE 4-4 identifies the watch-net-all output message.

CODE EXAMPLE 4-3 watch-net Output Message

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

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

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

4.7.8.3 probe-scsi

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

CODE EXAMPLE 4-5 probe-scsi Output Message

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

4.7.8.4 test *alias name*, device path, -all

The test command, combined with a device alias name or device path, enables a device self-test program. If a device has no self-test program, the message: No selftest method for *device name* is displayed. To enable the self-test program for a device, type the test command followed by the device alias or device path name. TABLE 4-7 lists test *alias name* selections, a description of the selection, and preparation.

TABLE 4-7 Selected OpenBoot PROM On-Board Diagnostic Tests

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

TABLE 4-7 Selected OpenBoot PROM On-Board Diagnostic Tests *(Continued)*

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

4.7.9 OpenBoot Diagnostics

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

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

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

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

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

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

CODE EXAMPLE 4-6 OBDiag Menu

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

You can type the relevant numbers to run all or some of the tests. If an error is detected, an error message is displayed on the screen. For example, if an error is detected while testing the floppy disk drive, a message similar to the following is displayed on the screen:

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

Some of the OBDiag menu options are described in detail in the following paragraphs.

4.7.9.1 PCI/PCIO

The PCI/PCIO diagnostic performs the following:

- `vendor_ID_test`: Verifies that the PCIO ASIC vendor ID is 108e.
- `device_ID_test`: Verifies that the PCIO ASIC device ID is 1000.
- `mixmode_read`: Verifies that the PCI configuration space is accessible as half-word bytes by reading the EBus2 vendor ID address.
- `2_class_test`: Verifies the address class code. Address class codes include bridge device (0 x B, 0 x 6), other bridge device (0 x A and 0 x 80), and programmable interface (0 x 9 and 0 x 0).
- `status_reg_walk1`: Performs walk1 test on status register with mask 0 x 280 (PCIO ASIC is accepting fast back-to-back transactions, DEVSEL timing is 0 x 1).
- `line_size_walk1`: Performs tests “a” through “e.”
- `latency_walk1`: Performs walk1 test on latency timer.
- `line_walk1`: Performs walk1 test on interrupt line.
- `pin_test`: Verifies that the interrupt pin is logic-level high (1) after reset.

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

CODE EXAMPLE 4-7 PCI/PCIO Output Message

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

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

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

4.7.9.2 EBus DMA/TCR Registers

The diagnostic EBus DMA/TCR registers performs the following:

- The `dma_reg_test`: Performs a walk1 bit test for control status register, address register, and byte count register of each channel. Verifies that the control status register is set properly.
- The `dma_func_test`: Validates the direct memory access (DMA) capabilities and first in, first out (FIFO). The test is executed in a DMA diagnostic loopback mode. It initializes the data of transmitting memory with its address, performs a DMA read and write, and verifies that the data received is correct. This diagnostic is repeated for four channels.

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

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

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

TEST= all_dma/ebus_test
SUBTEST= dma_reg_test
SUBTEST= dma_func_test

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

4.7.9.3 Ethernet

The Ethernet diagnostic performs the following:

- `my_channel_reset`: Resets the Ethernet channel.
- `hme_reg_test`: Performs walk1 on the following registers set: global register 1, global register 2, bmac xif register, bmac tx register, and the mif register.
- `MAC_internal_loopback_test`: Performs Ethernet channel engine internal loopback.
- `10_mb_xcvr_loopback_test`: Enables the 10Base-T data present at the transmit MII data inputs to be routed back to the receive MII data outputs.
- `100_mb_phy_loopback_test`: Enables MII transmit data to be routed to the MII receive data path.
- `100_mb_twister_loopback_test`: Forces the twisted-pair transceiver into loopback mode.

CODE EXAMPLE 4-9 shows the Ethernet output message.

CODE EXAMPLE 4-9 Ethernet Output Message

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

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

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

4.7.9.4 Parallel Port

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

CODE EXAMPLE 4-10 Parallel Port Output Message

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

TEST= parallel_port_test
SUBTEST= dma_read

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

Note – The Netra CP2500 board has no parallel port.

4.7.9.5 Serial Port A

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

CODE EXAMPLE 4-11 Serial Port A Output Message

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

TEST= uarta_test

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

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

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

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

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

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

4.7.9.6 Serial Port B

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

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

CODE EXAMPLE 4-13 Serial Port B Output Message

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

TEST= uartb_test

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

4.7.9.7 NVRAM

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

CODE EXAMPLE 4-14 NVRAM Output Message

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

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

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

4.7.9.8 All Above

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

CODE EXAMPLE 4-15 All Above Output Message

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

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

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

PART 3 Replacing Hot-Swappable FRUs

CHAPTER 5

Hot-Swap Software Commands

This chapter provides information about hot-swap and the `cfgadm` utility. This chapter contains the following topics:

5.1 Understanding Hot-Swap

Certain FRUs in the Netra CT server are hot-swappable (see Section 1.3.1, "Hot-Swappable FRUs" on page 1-4). Hot-swap, a key feature of the PICMG standard, means that a CompactPCI board that meets the PICMG standard can be reliably inserted into or extracted from a powered and operating CompactPCI platform without affecting the other functions of the platform.

The Netra CT system hot-swap modes are listed in TABLE 5-1.

TABLE 5-1 Netra CT System Hot-Swap Modes

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

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

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

5.1.1 How High-Availability Hot-Swap Works

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

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

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

5.1.2 Hot-swap with Boards That Do Not Have Full Hot-swap

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

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

5.1.3 System Status Panel LED States and Meanings

The LEDs on the system status panel give you information to determine what state a board is in and if it is safe to remove the board from the system. See TABLE 5-1 for more information.

TABLE 5-2 CompactPCI Board LED States and Meanings on the System Status Panel

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 board when it was inserted.	If there is a board installed in this slot, then one of the following is faulty: • the board installed in the slot • the alarm card • the system controller board Remove and replace the failed component to clear this state.
Blinking	Off	The board is coming up or going down.	*Do not* remove the board in this state.
On	Off	The board is up and running.	*Do not* remove the board in this state.
Off	On	The board is powered off.	You can remove the board in this state.
Blinking	On	The board is powered on, but it is offline for some reason (for example, a fault was detected on the board).	Wait several seconds to see if the green Power LED stops blinking. If it does not stop blinking after several seconds, enter `cfgadm` and verify that the board is in the `unconfigured` state, then perform the necessary action, depending on the board: • Alarm card—You can remove the alarm card in this state. • All other boards—Power off the slot through the alarm card software, then remove the board.
On	On	The board is powered on and is in use, but a fault has been detected on the board.	Deactivate the board using one of the following methods: • Use the `cfgadm -f -c unconfigure` command to deactivate the board. In some cases, this might cause the system to panic, depending on the nature of the board hardware or software. • Halt the system and power off the slot through the alarm card software, then remove the board. The green Power LED gives status information: • If the green Power LED goes off, remove the board. • If the green Power LED remains on, halt the system and power off the slot through the alarm card software.

5.2 Using the `cfgadm` Utility

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

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

5.2.1 Logging In to the Netra CT Server

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

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

5.2.2 Running the `cfgadm` Utility

For all `cfgadm` commands, you must know the attachment-point ID for the I/O slot that you are changing state. To list the attachment-point IDs for the slots in a server, log in to the server and, as superuser, enter the following command:

```
# cfgadm
```

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

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

For a Netra CT 410 server, output similar to the following is displayed:

```
Ap_Id              Type           Receptacle      Occupant        Condition
AL-1               mcd/fhs        connected       configured      ok
CPU                bridge/fhs     connected       configured      ok
IO-2               unknown        disconnected    unconfigured    unknown
IO-4               stpcipci/fhs   connected       configured      ok
IO-5               stpcipci/fhs   connected       configured      ok
```

The attachment-point ID is shown in the first column of the readout; for example, the attachment-point ID for I/O slot 2 in a Netra CT 810 server is `IO-2`.

To view the online help for `cfgadm`, as superuser, enter:

```
# cfgadm -h pci
```

Output similar to the following is displayed:

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

To view the man page for the `cfgadm` utility, enter `man cfgadm` at the prompt.

5.2.3 Basic and Full Hot-Swap `cfgadm` Commands

The Netra CT servers are set to full hot-swap by default. Full hot-swap on an I/O slot means that you do not need to manually deactivate or activate the I/O board when replacing it in the server; those processes are handled automatically.

- To determine the current hot-swap state for all of the I/O slots in your Netra CT server, go to "Determining the Current Hot-Swap State" on page 7.
- To change default settings for one or more I/O slots in your Netra CT server to basic hot-swap, go to "Enabling Basic Hot-Swap on I/O Slots" on page 8.
- To change settings for one or more I/O slots in your Netra CT server back to full hot-swap, go to "Enabling Full Hot-Swap on I/O Slots" on page 9.

5.2.3.1 Determining the Current Hot-Swap State

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

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

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

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

- If you see `value 'basic'` underneath the `default-hotswap-mode` line, then *all* of the I/O slots in the Netra CT server are set to *basic* hot-swap. The entry `value 'disabled'` is shown for every I/O slot in the system in this state.

- If you see `value 'full'` underneath the `default-hotswap-mode` line, then *at least one* of the I/O slots in the Netra CT server is set to *full* hot-swap. You must look at the entries for individual I/O slots to determine if they are set to basic or full hot-swap mode:
  - If you see `value 'enabled'` underneath a `<slot#-autoconfig>` line, then that slot is set to *full* hot-swap.
  - If you see `value 'disabled'` underneath a `<slot#-autoconfig>` line, then that slot is set to *basic* hot-swap.

5.2.3.2 Enabling Basic Hot-Swap on I/O Slots

All of the I/O slots in the Netra CT server are set to full hot-swap by default. You can disable full hot-swap on one or more I/O slots, bringing those slots to a basic hot-swap state. That means that if an I/O board becomes faulty and needs replacing, you must manually deactivate the I/O slot using the `cfgadm` utility before you can remove the board, then you must manually reactivate the I/O slot after replacing the board.

To disable full hot-swap on one or more I/O slots, changing those slots to a basic hot-swap state, as superuser, by enter:

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

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

Deactivating a Hot-Swappable FRU

To deactivate an I/O board in a basic hot-swap state, as superuser, enter:

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

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

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

Reactivating a Hot-Swappable FRU

To connect an I/O board, as superuser, enter:

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

where *ap_id* is the attachment-point ID.

To activate an I/O board, as superuser, enter:

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

where *ap_id* is the attachment-point ID.

5.2.3.3 Enabling Full Hot-Swap on I/O Slots

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

To enable full hot-swap for an I/O slot in a Netra CT server, as superuser, enter:

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

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

```
# cfgadm -x enable_autoconfig IO-4
```

To enable full hot-swap on all slots at once, reboot the server, which automatically reverts settings back to the default full hot-swap for all I/O slots.

CHAPTER 6

Removing and Replacing Hot-Swappable Boards

This chapter provides instructions for removing and replacing hot-swappable boards. This chapter contains the following topics:

Caution – If you are just powering on your Netra CT server, do *not* remove or install any boards in the system until you have verified that the system is completely powered up. See Section 2.2, "Verifying Full Power-Up" on page 2-6 for more information.

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

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

6.1 Boards

This section contains procedures for the installation, removal, and replacement of the following hot-swappable boards for the Netra CT 410 server and Netra CT 810 server:

- Host board[1]
- Satellite board
- Alarm card[2]
- I/O board

FIGURE 6-1 shows the locations of these boards in the Netra CT 810 server. FIGURE 6-2 shows the locations of these boards in the Netra CT 410 server.

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

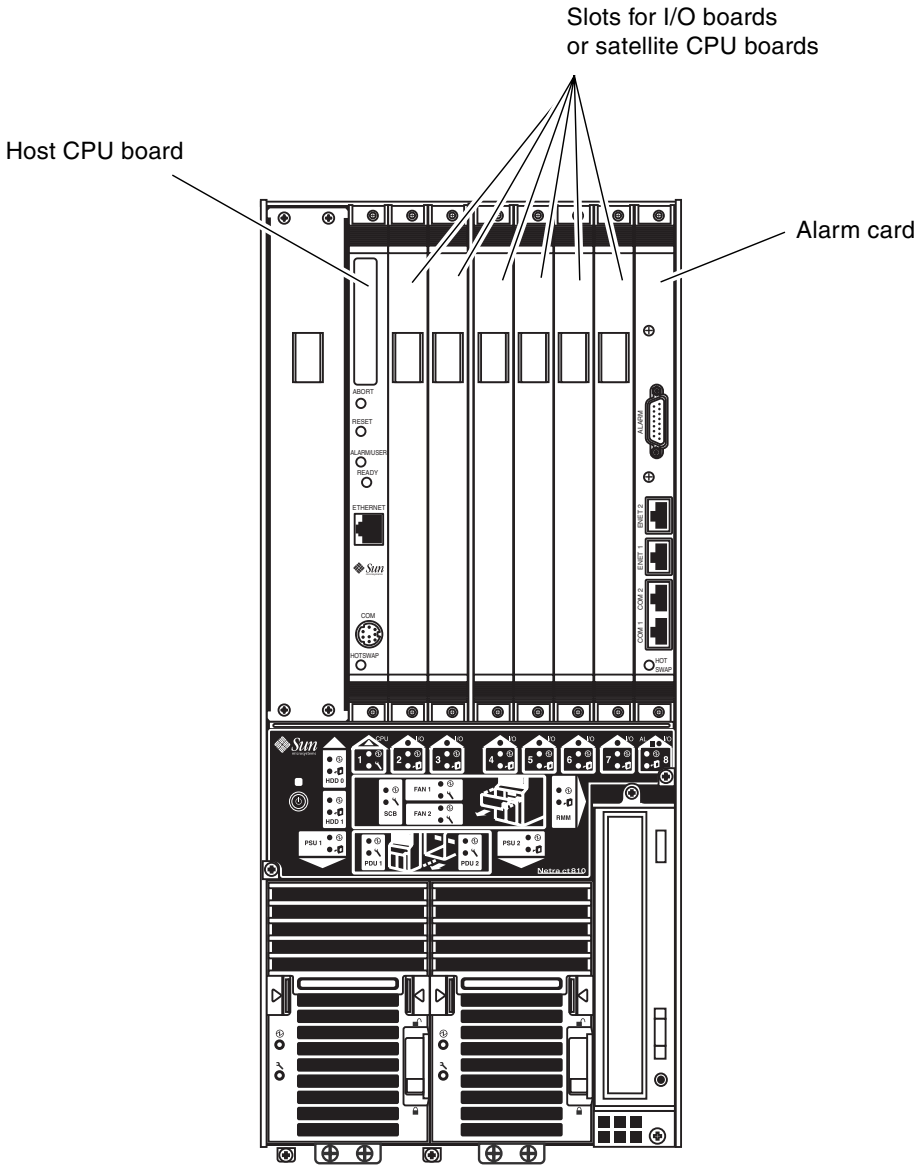

FIGURE 6-1 Boards Within a Netra CT 810 Server

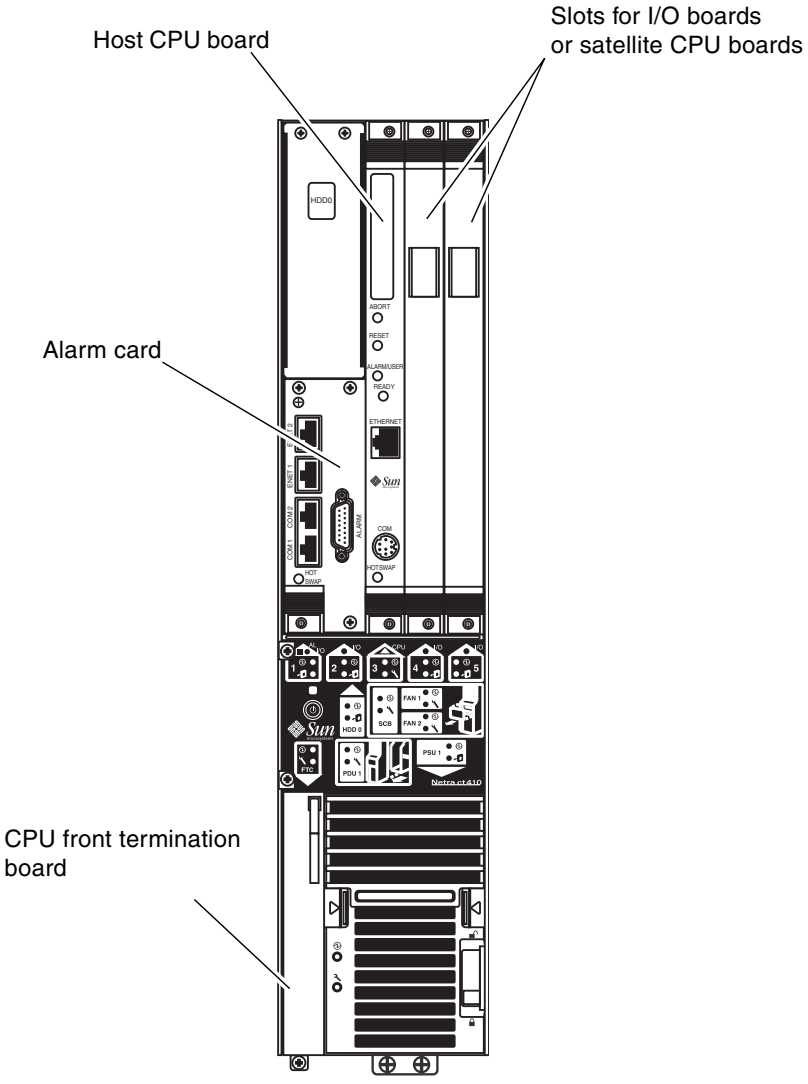

FIGURE 6-2 Boards Within a Netra CT 410 Server

6.1.1 Rules and Restrictions for Hot-Swapping Boards

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

- Section 6.1.1.1, "General Rules and Restrictions for Hot-Swapping Boards" on page 6-5
- Section 6.1.1.2, "Rules and Restrictions for Hot-Swapping the Host Board" on page 6-6
- Section 6.1.1.3, "Rules and Restrictions for Hot-Swapping the Alarm Card" on page 6-9

6.1.1.1 General Rules and Restrictions for Hot-Swapping Boards

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

1. You must have the host board and alarm card installed in the Netra CT server before you can hot-swap any I/O board or satellite CPU board.
2. If a component is in a failed condition; you must perform a *basic* hot-swap. To determine if a board has failed, verify that the LEDs are in following states:
   - Amber Okay to Remove LED on the system status panel is *on*
   - Green Power LED on the system status panel is *on*

   See Chapter 4 for detailed tables listing the meanings of LED states. If the board has failed, you must manually unconfigure the board by entering the following commands before you can hot-swap it:

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

   where *ap_id* is the attachment-point ID listed in the first column.

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

3. You can only remove a board if *all* of the LEDs are in the following states:
   - Amber Okay to Remove LED on the system status panel is *on*
   - Green Power LED on the system status panel is *off*
   - Blue Hot-swap LED on the board is *on*

   Do not remove any board from the system if any of the LEDs are in a different state from those listed here.

6.1.1.2 Rules and Restrictions for Hot-Swapping the Host Board

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

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

   After you install the host CPU board back into the server, CompactPCI bus is enabled and attempts to connect to all occupied board slots.

   Satellite CPU boards are unaffected by the disabling of the CompactPCI bus; they continue to function as stand-alone processors when you hot-swap a host CPU board.
3. If a host CPU is at the OpenBoot prompt (the `ok` prompt) and you want to hot-swap the host CPU board, you must power off the host CPU slot through the alarm card.

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

```
cli> poweroff host
```

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

   Use the `poweron` command to power on the host CPU board after you install the replacement host CPU board.

4. If you are installing a Netra CP2140 host CPU board into a Netra CT server, ensure that the switch settings on the SW0501 switches are set for the *default, non-high-availability* settings. 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 on the Netra CP2140 host CPU board must be set in the default, non-high-availability settings.

Following are the correct settings for the SMC module switch SW0501 for the Netra CT server (see FIGURE 6-3 and FIGURE 6-4):

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

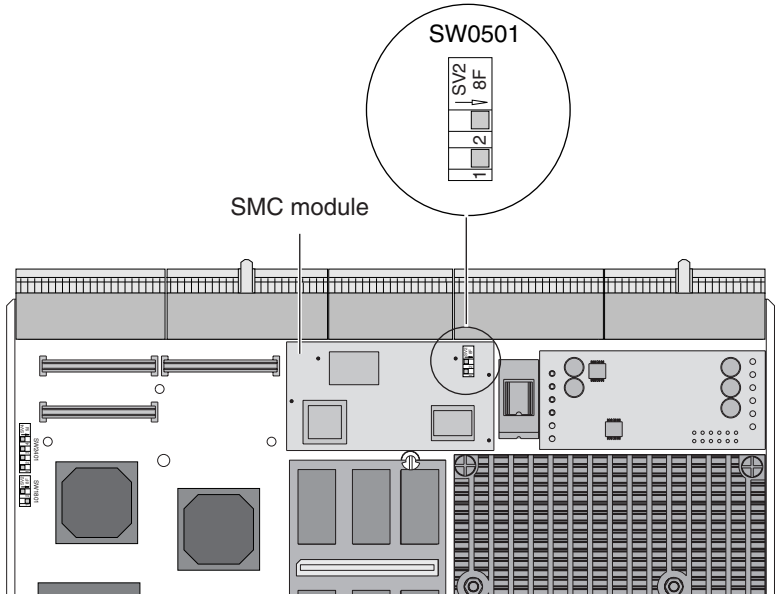

FIGURE 6-3 Location of SW0501 on SMC Module

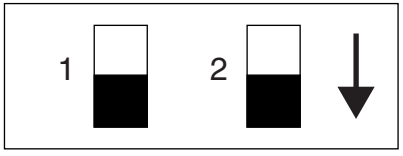

FIGURE 6-4 Switch SW0501 in Closed Position (Default) for the Netra CT Server

5. If you want to reconfigure a Netra CP2500 board from another server or slot where the board was used as a CompactPCI switched backplane (cPSB) board, change the SW3301 dip switch settings to reconfigure the board as a cPCI satellite board. See FIGURE 6-5 for an illustration of the correct settings for use as a cPCI board.

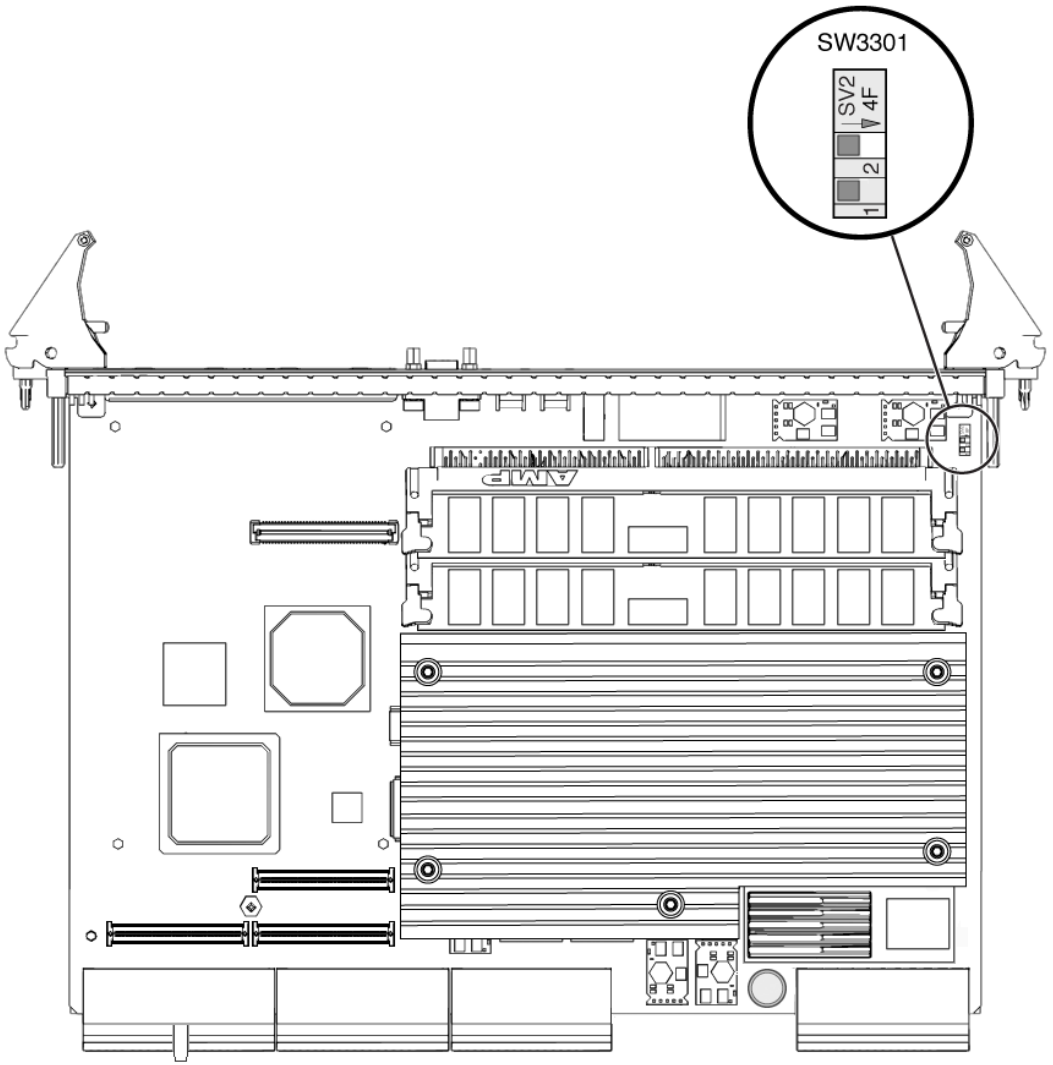

FIGURE 6-5 Reconfiguring a Netra CP2500 cPSB Board for Use as a cPCI Board

6.1.1.3 Rules and Restrictions for Hot-Swapping the Alarm Card

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

1. You must have the host CPU board and the system controller board installed in the Netra CT server before you can hot-swap an alarm card.
2. You cannot hot-swap any other component in a Netra CT server unless the alarm card is installed and fully booted.

6.1.2 Removing and Replacing Boards

The individual slots in your server are set to *full* hot-swap by default. You can change the slots to *basic* hot-swap manually. See Chapter 5 for more information.

- If you are removing and replacing a board in the server, first go to Section 6.1.2.1, "Removing a Board" on page 6-9, then go to Section 6.1.2.2, "Inserting a Board" on page 6-15.
- If you are installing a board in the server, go to Section 6.1.2.2, "Inserting a Board" on page 6-15.

6.1.2.1 Removing a Board

Note – Do not proceed with the following instructions until you review the information in Section 6.1.1, "Rules and Restrictions for Hot-Swapping Boards" on page 6-5. Failure to do so might result in an inadvertent system reboot or incorrect configuration.

---

1. **Locate the board that you want to remove from the server.**

   FIGURE 6-1 shows the locations of the boards in a Netra CT 810 server. FIGURE 6-2 shows the locations of the boards in a Netra CT 410 server.

2. **Log in to the Netra CT server.**

   See Section 5.2.1, "Logging In to the Netra CT Server" on page 5-5, then go to the next step.

3. **Perform any board-specific software commands.**

   - If you are removing an alarm card from the server, record the settings that you have for the current alarm card so that you can use them on the replacement alarm card. Refer to the *Netra CT Server System Administration Manual* for instructions on displaying the settings.
   - For any other board, there could be board-specific software commands that you must perform before removing the hot-swappable board. Refer to the documentation that you received with the board for any board-specific procedures before proceeding.

4. **Determine the hot-swap state for the slot that holds the board you want to remove.**

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

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

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

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

- If you see `value 'basic'` underneath the `default-hotswap-mode` line, then *all* of the slots in the Netra CT server are set to *basic* hot-swap. The entry `value 'disabled'` is shown for every slot in the system in this situation. Go to Step 5 to manually disconnect the board before removing it.
- If you see `value 'full'` underneath the `default-hotswap-mode` line, then *at least one* of the slots in the Netra CT server is set to *full* hot-swap. Look at the entries for individual slots to determine if they are set to basic or full hot-swap mode in this situation:
  - If you see `value 'enabled'` underneath a `<slot#-autoconfig>` line, then that slot is set to *full* hot-swap. Go to Step 7 on page 6-12 to remove the board.
  - If you see `value 'disabled'` underneath a `<slot#-autoconfig>` line, then that slot is set to *basic* hot-swap. Go to Step 5 on page 6-11 to manually disconnect the board before removing it.

5. **Identify the attachment-point ID that corresponds to the slot that contains the board you want to remove.**

   As superuser, enter:

```
# cfgadm
```

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

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

For a Netra CT 410 server, output similar to the following is displayed:

```
Ap_Id              Type           Receptacle      Occupant          Condition
AL-1               mcd/fhs        connected       configured        ok
CPU                bridge/fhs     connected       configured        ok
IO-2               unknown        empty           unconfigured      unknown
IO-4               stpcipci/fhs   connected       configured        ok
IO-5               stpcipci/fhs   connected       configured        ok
```

The attachment-point ID is shown in the first column of the readout; for example, the attachment-point ID for slot 4 in a Netra CT 810 server is `IO-4`.

6. **Disconnect the board with the `cfgadm (1M)` utility:**

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

where *ap_id* is the attachment-point ID. For example, to deactivate the board in slot 4, as superuser, enter:

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

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

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

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

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

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

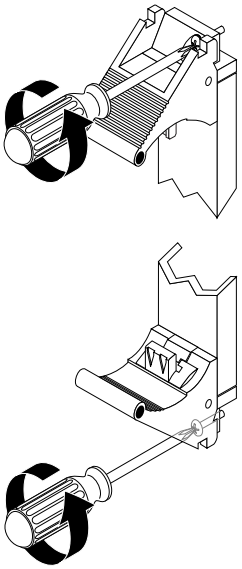

FIGURE 6-6 Loosening the Ejection Lever Captive Screws

10. **Unlock the ejection levers.**

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

The method you use to unlock the ejection levers varies depending on the model of the ejection lever used on the board; for example, one model uses red tabs at the top and bottom to unlock the board (FIGURE 6-7). Refer to the documentation that came with the board for instructions on unlocking the board.

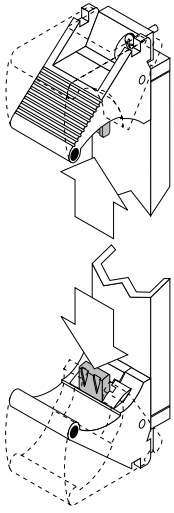

FIGURE 6-7 Unlocking the Ejection Levers

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

The system status panel on each server has LEDs that show the status of the board installed in each set of the slots in that server. FIGURE 6-8 shows the LEDs on the Netra CT 810 server and FIGURE 6-9 shows the LEDs on the Netra CT 410 server.

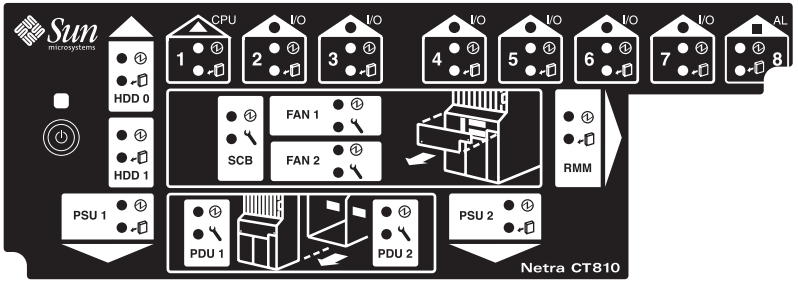

FIGURE 6-8 LEDs on the System Status Panel (Netra CT 810 Server)

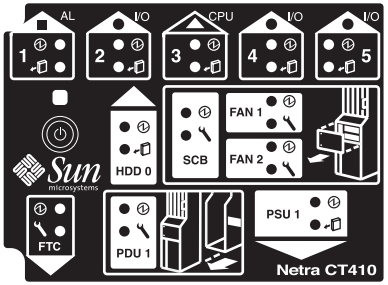

FIGURE 6-9 LEDs on the System Status Panel (Netra CT 410 Server)

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

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

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

    It might take several seconds or minutes for the LEDs to transition to the proper states.

    For detailed information on states of the system status panel LEDs, see Section 4.1, "Troubleshooting the System Using the System Status Panel" on page 4-2. Do *not* remove a board unless all of the LEDs are in the proper states. If you remove a board when any of the LEDs are not in the proper state, the action might cause unpredictable results.

    Caution – Do not attempt to hot-swap any other boards or rear transition modules until you see that the first board is fully deactivated. Hot-swapping more than one board at the same time might lead to unpredictable results.

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

13. **When it is safe to remove the board, disconnect any cables connected to the board.**

14. **Press outward on the two ejection levers on the board to unseat the board from the board cage.**

15. **Carefully slide the board out of the slot and place it on an electrostatic discharge mat.**

    If you enter the `cfgadm` command after you remove the alarm card, you see `disconnected` under the Receptacle column. For all other boards, after you remove the board, you see `empty` under the Receptacle column.

16. **Perform any necessary board-specific hardware procedures.**

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

17. **If necessary, secure a blank filler panel over any empty I/O slots.**

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

18. **Remove the rear transition module.**

    For instructions, see Section 6.2, "Rear Transition Modules" on page 6-24.

6.1.2.2 Inserting a Board

Caution – When inserting multiple boards in different slots of the system, insert the boards one at a time and wait until each board is fully configured in the system. If you insert multiple boards at the same time, you might panic or hang the system.

Note – If you are installing a Netra CP2140 host CPU board into a Netra CT server, do *not* change the default SMC module switch settings on the SW0501 switches. 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 on the Netra CP2140 host CPU board should be set in the *default, non-high availability* settings. Refer to the *Netra CT Server Product Overview* for more information.

---

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

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

2. **Locate the board slot where you are installing the board.**

   FIGURE 6-1 shows the locations of these boards in the Netra CT 810 server. FIGURE 6-2 shows the locations of these boards in the Netra CT 410 server.

Caution – If you are installing a Netra CP2500 boad in a Netra CT 810 server, do not install the board in slots 6 and 7.

3. **Install the rear transition module first, using the instructions in Section 6.2, "Rear Transition Modules" on page 6-24.**

   After you've completed the rear transition module removal and installation instructions, continue with the next step.

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

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

5. **Obtain the replacement board from the shipping kit.**

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

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

7. **Perform any necessary board-specific hardware procedures.**

   a. **If you removed a PMC from a satellite CPU or I/O board, install the PMC into the replacement satellite CPU or I/O board at this time.**

      Refer to the documentation that you received with your satellite CPU or I/O board for more information.

   b. **If you want to reconfigure a Netra CP2500 board from another server or slot where the board was used as a cPSB, change the SW3301 dip switch settings to reconfigure the board as a cPCI satellite board.**

      FIGURE 6-5 shows the dip switch settings required for the Netra CP2500 board to be used as a cPCI board.

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

   You cannot install the board properly if the ejection levers are locked.

9. **Keeping the board vertical, slide the board into the slot between the two guides.**

   The cuts in the handle of the board must align with the square cutouts in the slot. When the board is completely seated in the board cage, the two ejection levers flip inward, and the notches in the ejection levers fit smoothly in the rectangular cutouts in the bottom and top plates.

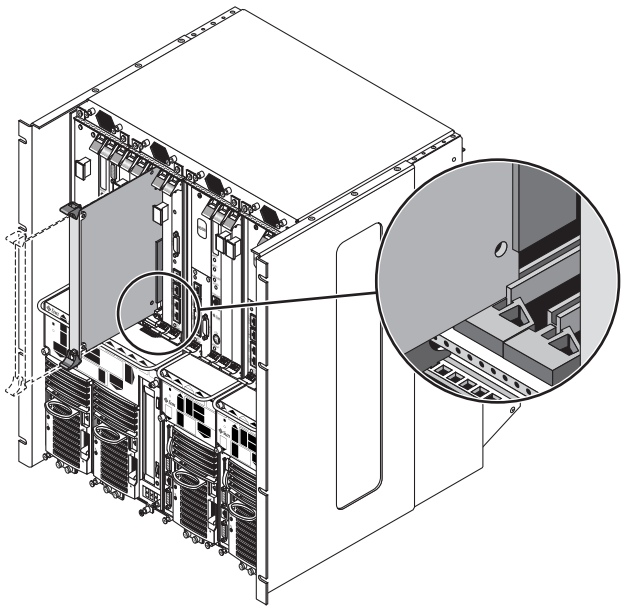

FIGURE 6-10 Aligning the Board with the Board Cage Cutouts

10. **Lock the ejection levers.**

    The method you use to lock the ejection levers varies depending on the model of the ejection lever used on the board. Refer to the documentation that came with the board for instructions on locking the ejection levers.

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

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

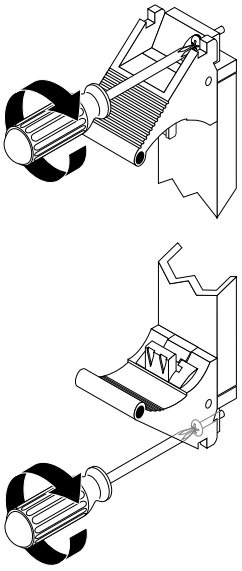

FIGURE 6-11 Tightening the Ejection Lever Captive Screws

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

---

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

    See Section 5.2.1, "Logging In to the Netra CT Server" on page 5-5.

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

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

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

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

    As superuser, enter:

```
# cfgadm
```

15. **Connect the board with the `cfgadm` dynamic reconfiguration software:**

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

where *ap_id* is the attachment-point ID. For example, to connect the board in slot 4, as superuser, enter:

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

16. **Activate the board with the `cfgadm (1m)` utility:**

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

where *ap_id* is the attachment-point ID. For example, to activate the board in slot 4, as superuser, enter:

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

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

FIGURE 6-8 shows the LEDs on the Netra CT 810 server and FIGURE 6-9 shows the LEDs on the Netra CT 410 server.

18. **Determine if the board is activated.**

For detailed information on states of the system status panel LEDs, see Section 4.1, "Troubleshooting the System Using the System Status Panel" on page 4-2.

19. **If the board activates successfully, perform any necessary board-specific software configuration.**

- For the alarm card, access the alarm card and perform any appropriate software procedures, such as updating the alarm card flash. Refer to the *Netra CT Server System Administration Manual* for information.
- For any other board, perform any necessary board-specific software commands. Refer to the documentation that you received with the board for any board-specific procedures.

20. **Connect the cables to the board.**

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

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

- Single-wide 6U alarm card[1]—FIGURE 6-12
- Double-wide 3U alarm card—FIGURE 6-13
- Host CPU board[2]—FIGURE 6-14

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

See Appendix A for connector pinouts for each board, if necessary.

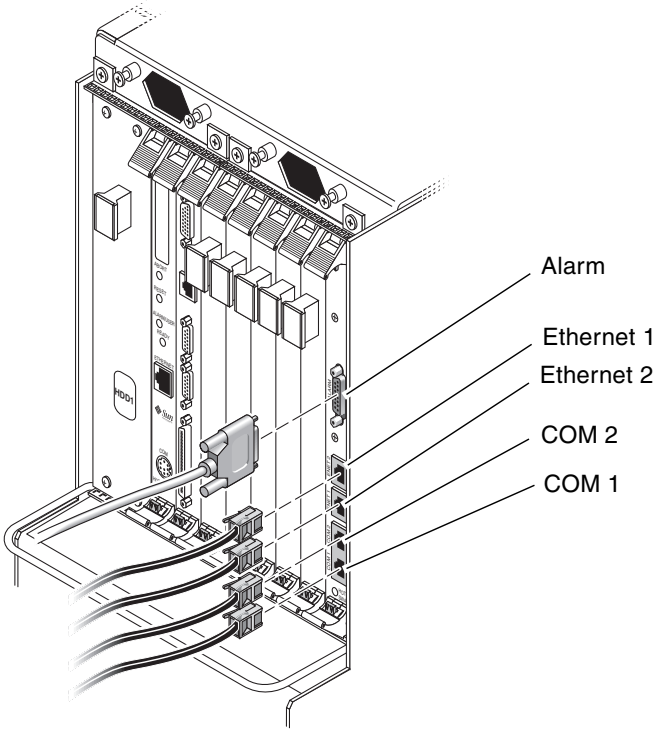

FIGURE 6-12 Connectors for the Single-Wide 6U Alarm Card

1. FIGURE 6-12 shows the connectors for a single-wide 6U alarm card installed in a Netra CT 810 server. The location of a single-wide 6U alarm card installed in a diskless Netra CT 410 server is different, but the connectors are the same.
2. All models of servers should use the TTY A and Ethernet A ports on the host CPU rear transition module.

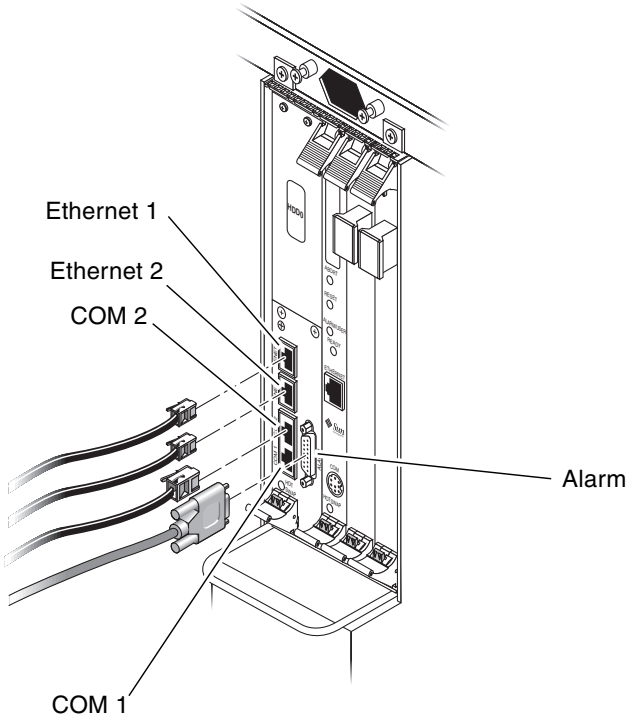

FIGURE 6-13 Connectors for the Double-Wide 3U Alarm Card

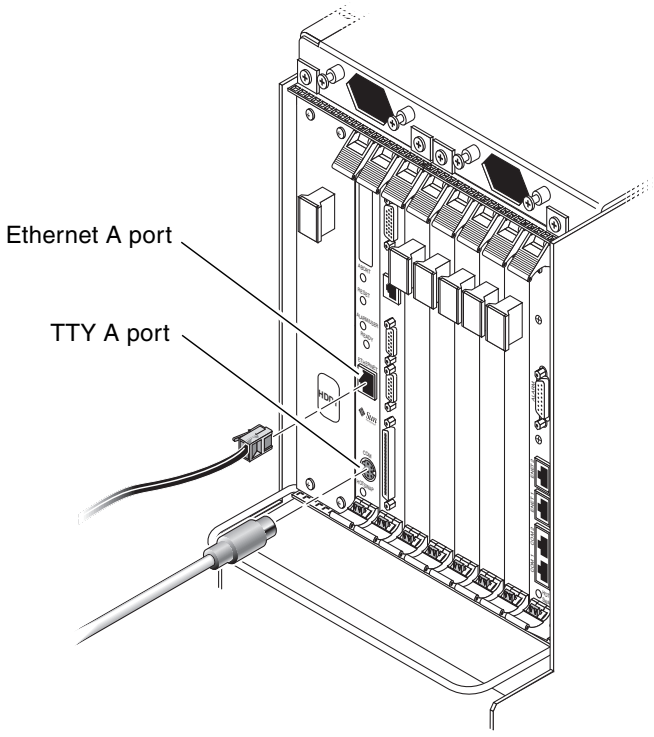

FIGURE 6-14 Connectors on the Netra CP2140 Host CPU Board

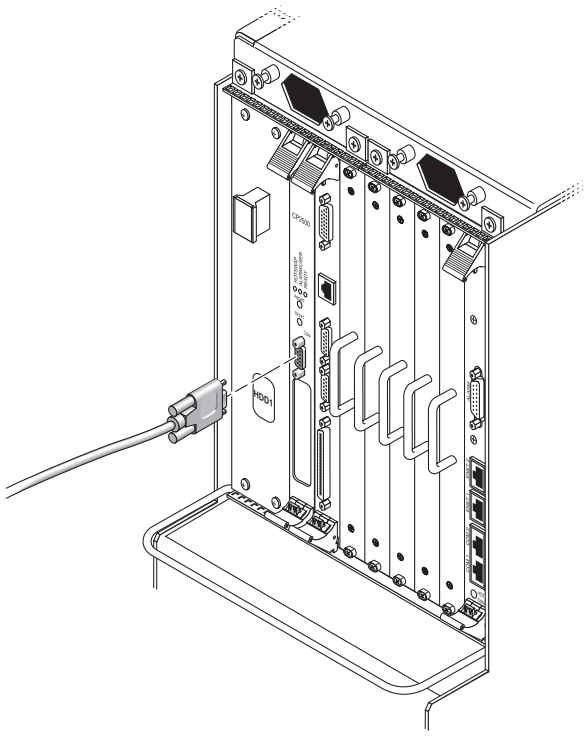

FIGURE 6-15 Connectors on the Netra CP2500 Host CPU Board

6.2 Rear Transition Modules

Note – The rear-transition modules are only hot-swappable as long as the accompanying host or satellite board is removed *first*.

The following rear transition modules extend the ports from the host and satellite boards to the rear:

- Host rear transition modules
- Satellite rear transition modules
- Alarm rear transition modules
- I/O rear transition modules

This section contains procedures for the installation, removal, and replacement of the following hot-swappable modules for the Netra CT 410 server and Netra CT 810 server:

- Section 6.2.1, "Host Rear Transition Modules" on page 6-24
- Section 6.2.2, "Satellite and I/O Rear Transition Modules" on page 6-30
- Section 6.2.3, "Alarm Rear Transition Module" on page 6-35

6.2.1 Host Rear Transition Modules

This section explains how to remove and replace host rear transition modules.

The following are the possible pairings of host boards with rear transition modules:

- Netra CP2140 host board and Netra CT CPU transition card. With the Netra CP2140, use *only* the Netra CT CPU transition card (CTC, hereafter referred to as rear transition module) in the Netra CT server; do not use the XCP2040-TRN I/O transition module that is available with the Netra CP2140 board. See FIGURE 6-16 to determine if the module you have is supported or unsupported on a Netra CT server.
- Netra CP2500 host board and Netra CP2500 RTM-H (rear transition module-host).

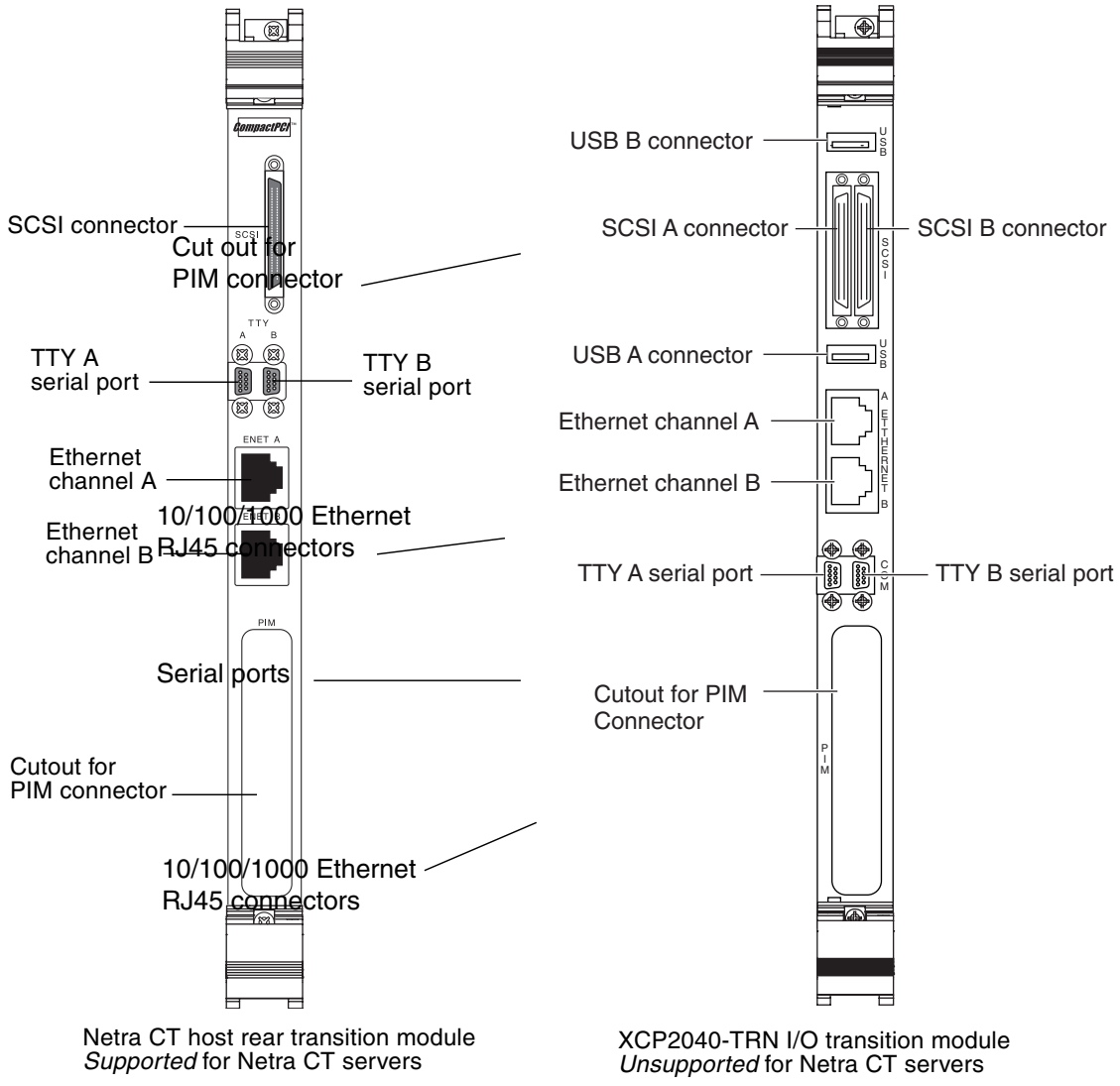

FIGURE 6-16 Supported and Unsupported Netra CP2140 Host Rear Transition Module for a Netra CT Server

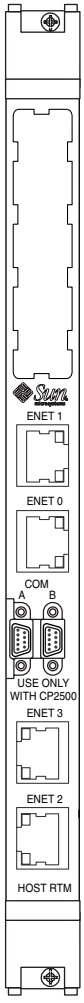

FIGURE 6-17 Netra CP2500 Rear Transition Module-Host (RTM-H)

- If you are removing and replacing a *faulty* module in the server, first go to Section 6.2.1.1, "Removing a Host Rear Transition Module" on page 6-27, then go to "Installing a Host Rear Transition Module" on page 28.
- If you are installing a *new* module in the server, go to Section 6.2.1.2, "Installing a Host Rear Transition Module" on page 6-28.

6.2.1.1 Removing a Host Rear Transition Module

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

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

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

   See Section 6.1.2.1, "Removing a Board" on page 6-9 to remove the host CPU board.

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

   FIGURE 6-18 shows the location of the host rear transition module on the Netra CT 810 server, and FIGURE 6-19 shows the location of the host CPU rear transition module on the Netra CT 410 server.

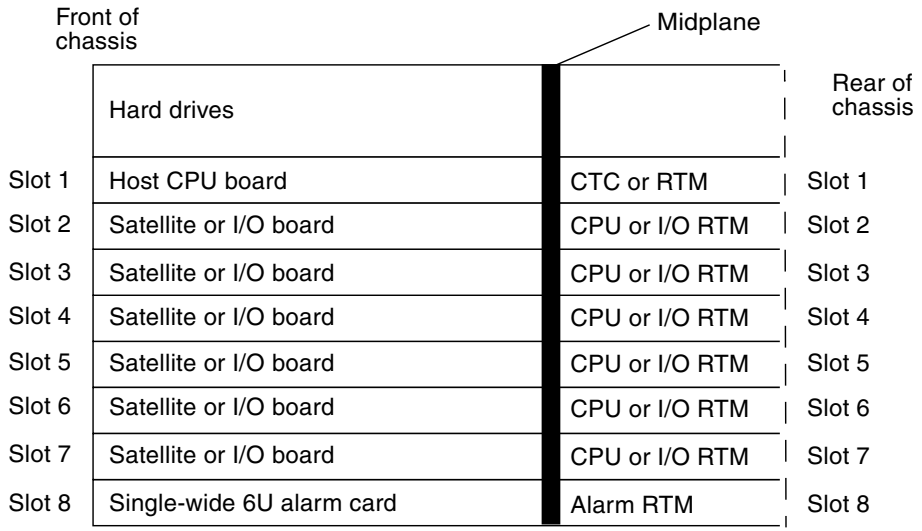

FIGURE 6-18 Locating the Host Rear Transition Module in a Netra CT 810 Server (Top View)

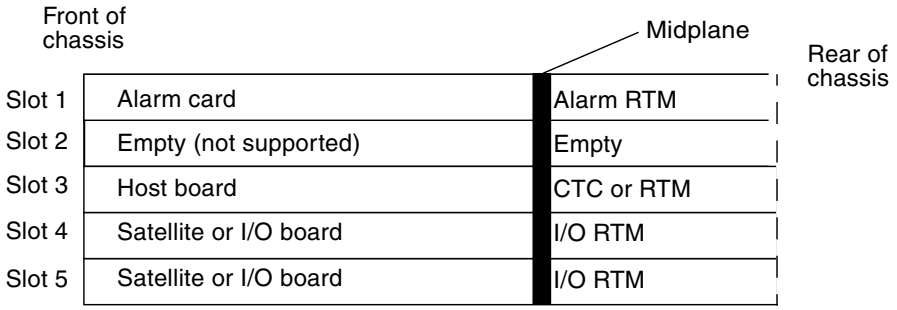

FIGURE 6-19 Locating the Host Rear Transition Module in a Netra CT 410 Server (Top View)

4. **Unplug any cables attached to the host rear transition module.**
5. **Using a No. 2 Phillips screwdriver, loosen the two captive screws inside the module's ejection levers, one on top and one on the bottom (**FIGURE 6-6**).**
6. **Press out on the ejection levers to unseat the module.**
7. **Slide the module out of the slot, and place it on an electrostatic discharge mat.**

6.2.1.2 Installing a Host Rear Transition Module

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

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

2. **Get the replacement host rear transition module from the shipping kit.**
3. **Keeping the host rear transition module vertical, slide the module into the slot in between the two guides (**FIGURE 6-20**).**

   The teeth in the handle of the module must align with the square cutouts in the slot. When the module is completely seated in the cage, the two ejection levers flip inward, and the teeth in the ejection levers fit smoothly in the rectangular cutouts in the bottom and top plates. FIGURE 6-20 shows how to insert an I/O board into a slot; the same method applies to a host rear transition module.

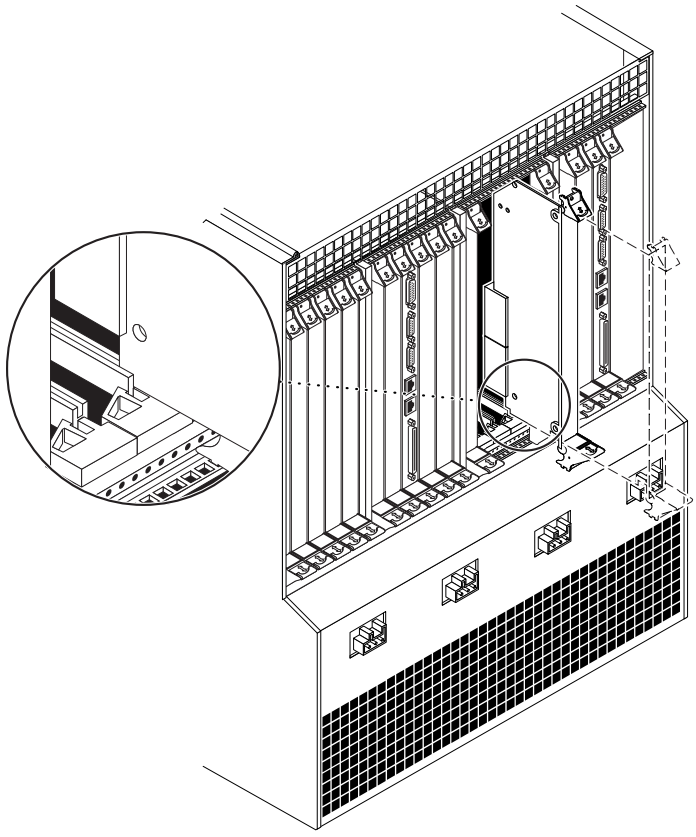

FIGURE 6-20 Aligning the Module with the Rear Cage Cutouts

4. **Using a No. 2 Phillips screwdriver, tighten the two captive screws inside the module's ejection levers, one on top and one on the bottom (**FIGURE 6-11**).**

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

5. **Make the necessary cable connections to the host rear transition module.**

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

   FIGURE 6-16 and FIGURE 6-17 show the connectors on host rear transition modules.

6. **After you replace the host CPU rear transition module, get the replacement host CPU board from the shipping kit.**

7. **Go to the front of the server and install the replacement host CPU board.**

   See Section 6.1.2.2, "Inserting a Board" on page 6-15 for instructions.

6.2.2 Satellite and I/O Rear Transition Modules

This section describes the pairings of satellite boards and rear transition modules, and it explains how to remove and replace satellite rear transition modules (RTMs).

6.2.2.1 Satellite Rear Transition Module Sets

A satellite rear transition module set consists of two separate boards:

- The satellite board
- The satellite rear transition module

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

The following are possible satellite board and rear transition module combinations:

- Netra CP2160 and XCP2060-TRN I/O rear transition module
- Netra CP2500 and Netra CP2500 RTM-S (rear transition module-satellite)

The rear transition module extends the ports from the PMCs installed in the satellite CPU board to the PMC I/O module (PIM) installed in the satellite CPU rear transition module. The satellite CPU board must be installed in the same slot at the front of the server for the satellite CPU rear transition module to work. For example, if you install a satellite CPU rear transition module in I/O slot 3 at the rear of a Netra CT 810 server, you must install the accompanying satellite CPU board in I/O slot 3 at the front of the server.

When one of the two components fails, you might not be able to determine which of the components failed. Because of this, you might want to replace both the satellite CPU board *and* the satellite CPU rear transition module. FIGURE 6-21 and FIGURE 6-22 show graphical representations of how the satellite CPU boards align with the satellite CPU rear transition modules. If you are facing the *front* of the server, the I/O slots read from *left to right*, whereas they read from *right to left* if you are facing the *rear* of the server.

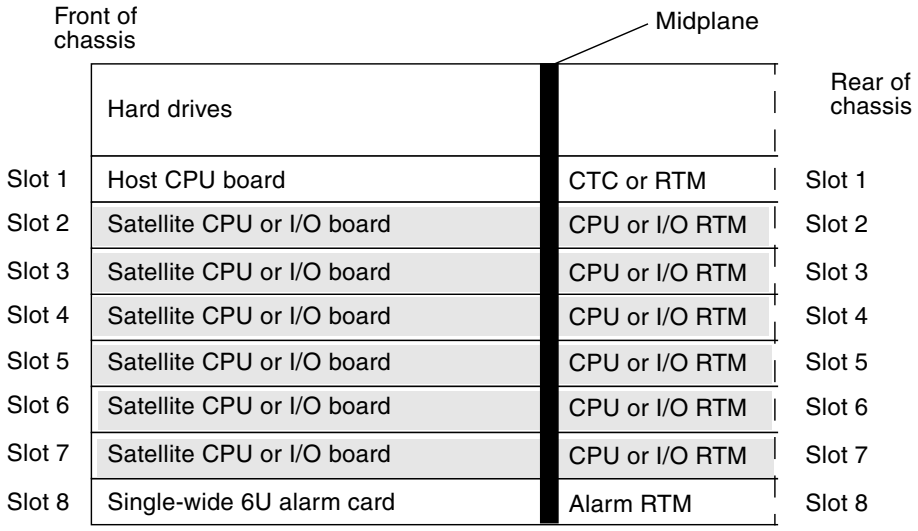

FIGURE 6-21 Supported Locations for Satellite CPU or I/O Rear Transition Module Sets in a Netra CT 810 Server (Top View)

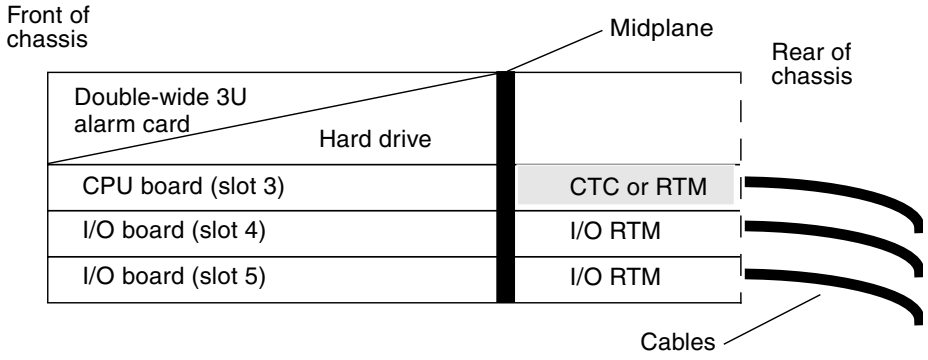

FIGURE 6-22 Supported Locations for Satellite CPU or I/O Rear Transition Module Sets in a Netra CT 410 Server (Top View)

6.2.2.2 I/O Rear Transition Module Sets

The I/O rear transition module set consists of two separate boards:

- The I/O board
- The I/O rear transition module

The I/O board contains the application-specific integrated circuit (ASIC) 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 rear transition module extends the ports for a particular I/O board to the rear of the server. The I/O rear transition module and the I/O board must be installed in the same slot at the front of the server for the I/O rear transition module to work. For example, if you install an I/O rear transition module 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.

When one of the two components fails, you might not be able to determine which of the components failed. Because of this, you might want to replace both the I/O board *and* the I/O rear transition module. FIGURE 6-21 and FIGURE 6-22 show graphical representations of how the I/O boards align with the I/O rear transition modules. Note that, if you are facing the *front* of the server, the I/O slots read from *left to right*, whereas they read from *right to left* if you are facing the *rear* of the server.

6.2.2.3 Removing and Installing Satellite CPU or I/O Rear Transition Module Sets

- If you are removing and replacing *faulty* boards in the server, first to go "Removing a Satellite CPU or I/O Rear Transition Module" on page 32, then go to "Installing a Satellite CPU or I/O Rear Transition Module" on page 34.
- If you are installing *new* boards in the server, go to "Installing a Satellite CPU or I/O Rear Transition Module" on page 34.

Removing a Satellite CPU or I/O Rear Transition Module

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

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

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

   - FIGURE 6-21 shows the satellite CPU or I/O board slots in a Netra CT 810 server.
   - FIGURE 6-22 shows the satellite CPU or I/O board slots in a Netra CT 410 server.

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

   See Section 6.1.2.1, "Removing a Board" on page 6-9.

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

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

   FIGURE 6-21 shows the slots available for the rear transition modules in a Netra CT 810 server, and FIGURE 6-22 shows the slots available for the rear transition modules in a Netra CT 410 server.

5. **Unplug any cables attached to the rear transition module.**

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

7. **Unlock the ejection levers.**

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

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

10. **Perform any necessary board-specific hardware procedures.**

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

11. **If necessary, secure blank filler panels over the empty I/O slots.**

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

Installing a Satellite CPU or I/O Rear Transition Module

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

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

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

   FIGURE 6-21 shows the slots available for the rear transition modules in a Netra CT 810 server, and FIGURE 6-22 shows the slots available for the rear transition modules in a Netra CT 410 server.

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

3. **Get the replacement rear transition module from the shipping kit.**

4. **Perform any necessary board-specific hardware procedures.**

   a. **If you removed a PIM from a satellite CPU or I/O board, install the PIM into the replacement satellite CPU or I/O board.**

      Refer to the documentation that you received with your satellite CPU or I/O board for more information.

   b. **If you want to reconfigure a Netra CP2500 RTM-S from another server or slot where the board was used as a cPSB satellite transition module, change the SW3301 dip switch settings to reconfigure the board as a cPCI board.**

      FIGURE 6-5 shows the dip switch settings required for the Netra CP2500 RTM-S to be used as a cPCI board.

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

   You cannot install the board properly if the ejection levers are locked.

6. **Keeping the board vertical, slide the rear transition module in between the two guides into the slot (**FIGURE 6-20**).**

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

7. **Lock the ejection levers.**

   The method you use to lock the ejection levers varies depending on the model of the ejection lever used on the board. Refer to the documentation that came with the I/O board for instructions on locking the ejection levers.

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

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

9. **Plug all appropriate cables into the rear transition module.**

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

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

    See Section 6.1.2.2, "Inserting a Board" on page 6-15 for instructions.

6.2.3 Alarm Rear Transition Module

The alarm rear transition module for the Netra CT 810 server consists of two separate components:

- The alarm card
- The alarm rear transition module

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

The alarm card is installed in the front of the Netra CT server.

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

- If you are removing and replacing *faulty* components in the server, first go to Section 6.2.3.1, "Removing an Alarm Rear Transition Module" on page 6-36, then go to Section 6.2.3.2, "Installing an Alarm Rear Transition Module" on page 6-38.
- If you are installing *new* components in a server, go to Section 6.2.3.2, "Installing an Alarm Rear Transition Module" on page 6-38.

6.2.3.1 Removing an Alarm Rear Transition Module

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

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

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

   See Section 6.1.2.1, "Removing a Board" on page 6-9 for instructions.

Caution – Do not proceed unless you removed the alarm card from the front of the server. If the I/O slot holding the alarm card is set to basic hot-swap, you must manually deactivate the I/O slot that holds the alarm card.

3. **After you remove the alarm card from the front of the Netra CT server, go to the rear of the server and locate the alarm rear transition module.**

   FIGURE 6-23 shows the slot available for the alarm rear transition module in a Netra CT 810 server, and FIGURE 6-24 shows the slot available for the alarm rear transition module in a Netra CT 410 server.

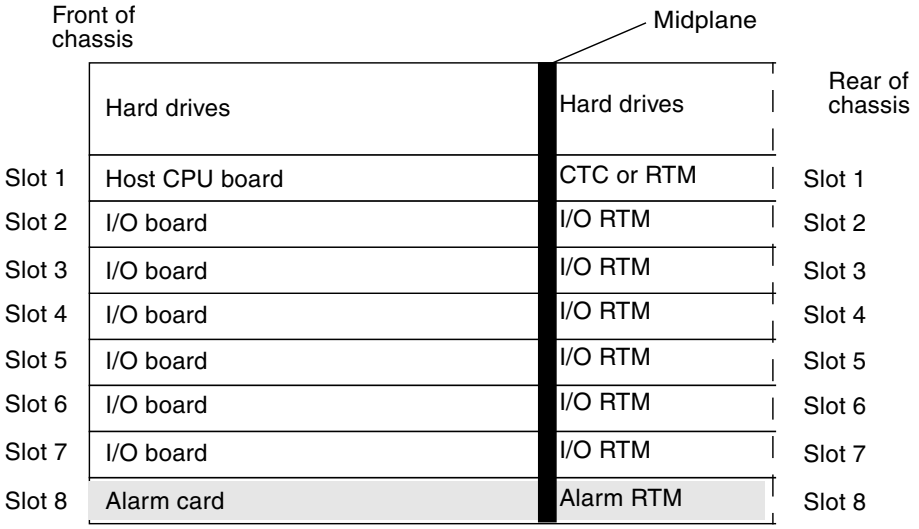

FIGURE 6-23 Supported Location for the Alarm Rear Transition Module in a Netra CT 810 Server (Top View)

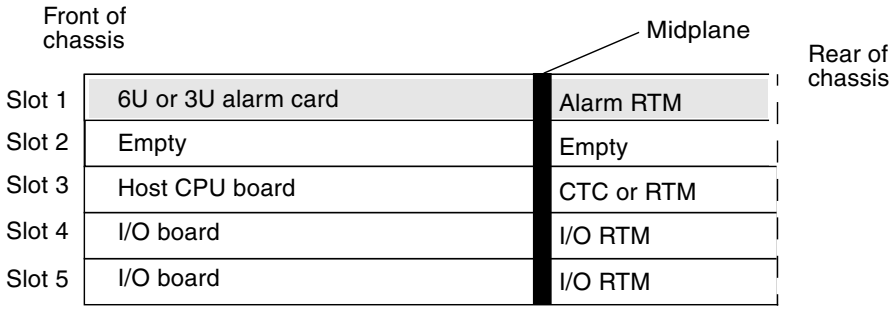

FIGURE 6-24 Supported Location for the Alarm Rear Transition Module in a Netra CT 410 Server (Top View)

4. **Unplug any cables attached to the alarm rear transition module.**
5. **Using a No. 2 Phillips screwdriver, loosen the two captive screws inside the card's ejection levers, one on top and one on the bottom.**
6. **Unlock the ejection levers on the card.**
7. **Press outward on the two ejection levers on the card to unseat the card from the card cage.**
8. **Slide the card out of the slot and place it on the electrostatic discharge mat.**
9. **If necessary, secure blank filler panels over the empty I/O slot.**

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

6.2.3.2 Installing an Alarm Rear Transition Module

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

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

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

   FIGURE 6-23 shows the slot available for the alarm rear transition module in a Netra CT 810 server, and FIGURE 6-24 shows the slot available for the alarm rear transition module in a Netra CT 410 server.

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

3. **Get the replacement alarm rear transition module from the shipping kit.**

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

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

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

   You cannot install the module properly if the ejection levers are locked.

6. **Keeping the module vertical, slide the module into the slot between the two guides (FIGURE 6-20).**

   The teeth in the handle of the module must align with the square cutouts in the I/O slot. When the module is completely seated in the board cage, the two ejection levers flip inward, and the teeth in the ejection levers fit smoothly in the rectangular cutouts in the bottom and top plates. FIGURE 6-10 shows how to insert an I/O board into a slot; the same method applies to an alarm rear transition module.

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

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

8. **Lock the ejection levers on the module.**

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

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

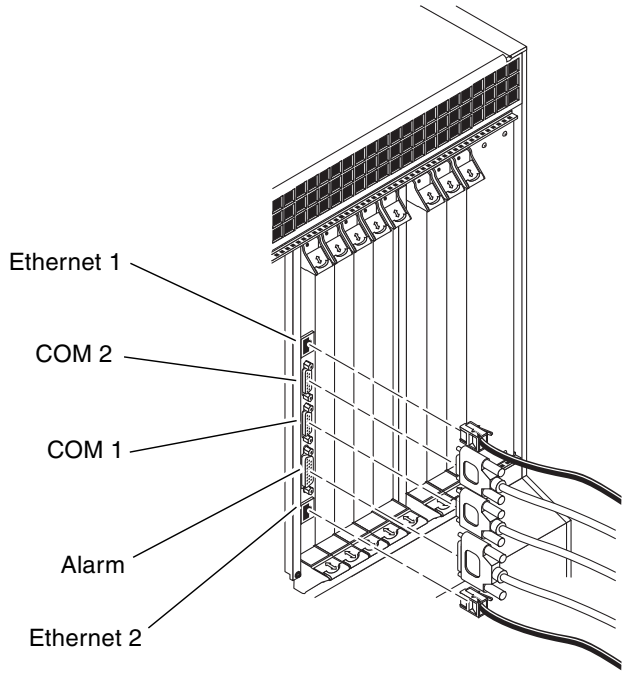

FIGURE 6-25 Connectors on the Alarm Rear Transition Module

10. **Get the replacement alarm card from the shipping kit.**
11. **Verify that the ejection levers are unlocked.**

    You cannot install the alarm card properly if the ejection levers are locked.
12. **Go to the front of the server, then install the replacement alarm card in the Netra CT server.**

    See "Inserting a Board" on page 15 for instructions.

CHAPTER 7

Removing and Replacing Hard Drives and Removeable Media

This chapter contains procedures for the installation, removal, and replacement of hard drives and removable media. This chapter contains the following topics:

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

Note – Read Chapter 3 before performing the procedures in this chapter.

Caution – If you are powering on your Netra CT server, do *not* remove or install any components in the system until you have verified that the system is completely powered up. See Section 2.2, "Verifying Full Power-Up" on page 2-6 for more information.

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

7.1 Hard Drive

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

A hard drive is a hot-swappable component only if the hard drive is not being used by the server. For example, if a hard drive is being used as the primary boot drive, then that hard drive is not hot-swappable unless disk management software is used to mirror the boot drive to another device. A hard drive in a Netra CT 410 server is a hot-swappable drive only if the Netra CT 410 server is running on the Solaris OS over the network, and not off of the Netra CT 410 server's hard drive.

In addition, two separate SCSI chains exist 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 (c0). Any external SCSI devices attached to the SCSI port on the rear transition module are on the first SCSI chain.
- The lower hard drive (HDD 1) is the only SCSI device on the second SCSI chain (c1) and is used as the boot drive.

The remove-and-replace instructions for hot-swappable drives are covered in this chapter; the remove-and-replace instructions for cold-swappable drives are covered in Chapter 10 in the section Section 10.1, "Cold Swappable Hard dDrives" on page 10-2.

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

7.1.1 Removing a Hard Drive

Note – The instructions in this section do *not* cover unconfiguration procedures that might be necessary if you are removing a hard drive that is under the control of any disk management software, such as Solaris™ Volume Manager or Solstice DiskSuite™. If you are running disk management software on your system, refer to the documentation that came with the disk management software for instructions on releasing a hard drive from the control of the software before proceeding with the following instructions.

1. **Log in to the server and obtain the attachment-point IDs for the hard drives installed in your server.**

   As superuser, enter:

```
# cfgadm -a c#
```

   where *c#* is the SCSI controller number for the drive that you want to remove. For example, to list the attachment-point IDs for the first SCSI chain in the server, as superuser, enter:

```
# cfgadm -a c0
```

   Output similar to the following is displayed:

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

   In the sample output, the attachment-point ID for the upper hard drive (HDD 0) is `c0::dsk/c0t0d0` and the attachment-point ID for the DVD drive is `c0::dsk/c0t6d0`.

2. **List all mounted partitions on the disk that you want to remove.**

   As superuser, enter:

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

   where *ap_id* is the attachment-point ID for the hard drive that you want to remove. For example, to list the mounted partitions on the upper hard drive (HDD 0), as superuser, enter:

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

   Output similar to the following is displayed:

```
cfgadm: Component system is busy, try again: failed to offline:
/devices/pci@1f,0/pci@1,1/scsi@2/sd@1,0

     Resource                Information
------------------  --------------------------
/dev/dsk/c0t0d0s7   mounted filesystem "/mnt"
```

Note – If you did not get any output after entering the command, then you do not have any partitions mounted, and the hard drive was successfully deactivated. Go to Step 5 on page 7-5.

3. **Unmount the mounted partitions.**

   For every file system that was listed in the previous step, as superuser, enter:

```
# unmount filesystem
```

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

```
# unmount /mnt
```

4. **Deactivate the hard drive.**

   As superuser, enter:

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

   where *ap_id* is the attachment-point ID for the hard drive that you want to remove. For example, to deactivate the upper hard drive (HDD 0), as superuser, enter:

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

5. **Determine the next action:**

   - If you are removing the boot drive, go to Step 6.
   - If you are removing a normal data drive, as superuser, enter:

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

   where *ap_id* is the attachment-point ID for the boot drive that you want to remove. For example, for the upper hard drive (HDD 0), as superuser, you would enter:

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

6. **Verify that the hard drive is deactivated.**

   As superuser, enter:

```
# cfgadm -a c0
```

   Output similar to the following is displayed:

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

Note that in the sample output, the Type column for the upper hard drive (`c0::dsk/c0t0d0`) is now `unavailable`, and the Occupant column now shows it as `unconfigured`.

Also, you can use the hard drive (HDD) LEDs on the system status panel to verify that the hard drive is deactivated (FIGURE 7-1). When the Okay to Remove LED ( ) on the system status panel for the hard drive is ON, you can remove the hard drive from the slot.

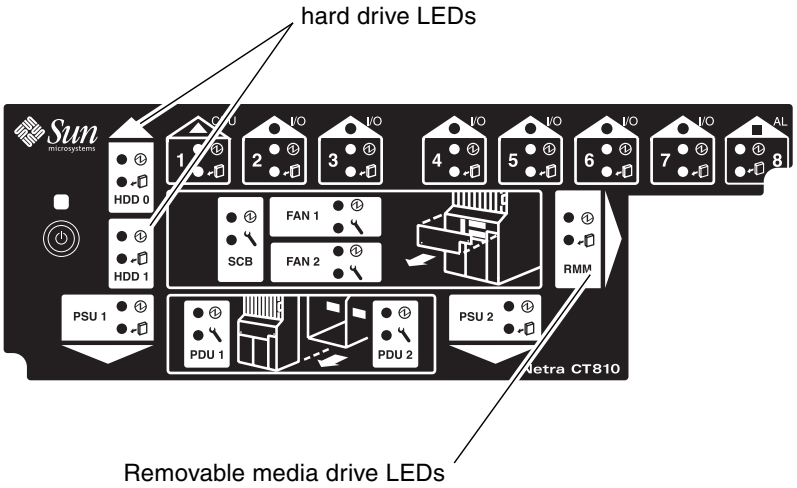

FIGURE 7-1 Locating the Hard Drive LEDs on the System Status Panel (Netra CT 810 Server)

7. **Attach the antistatic wrist strap.**

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

8. **Locate the drive bay cover on the system.**

   The hard drives are behind the drive bay cover on your system. A maximum of two hard drives are behind the drive bay cover in a Netra CT 810 server and only one behind the drive bay cover in a Netra CT 410 server.

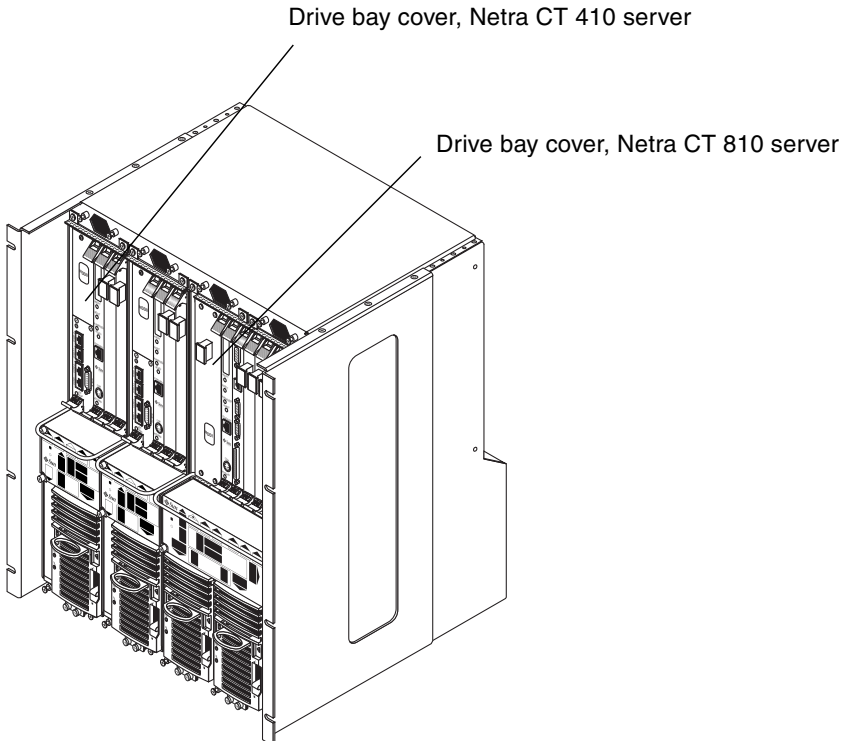

FIGURE 7-2 Drive Bay Cover Locations

9. **Loosen the captive screws that hold the drive bay cover in place.**
   - For the Netra CT 810 server, use a No. 1 Phillips screwdriver to loosen the four captive screws (two on top and two on the bottom).
   - For the Netra CT 410 server, use a No. 2 Phillips screwdriver to loosen the one captive screw on top.
10. **Remove the drive bay cover.**
11. **Locate the hard drive that you want to replace.**

    In a Netra CT 810 server, HDD0 is the upper hard drive and HDD1 is the lower hard drive.
12. **Unlatch the disk drive handle to release it.**

    Push down in the direction of the arrow to release the bracket handle latch.
13. **Pull the bracket handle out and swing it open.**

14. **Continue to pivot the disk drive bracket handle against the chassis, applying mild pressure until the drive disconnects.**
15. **Slide the drive out of the chassis, and place it on an electrostatic discharge mat.**
16. **Secure the drive bay cover over the drive bays (**FIGURE 7-1**).**

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

7.1.2 Installing a Hard Drive

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

   See Section 1.2, "Attaching the Antistatic Wrist Strap" on page 1-2.
2. **Remove the drive bay cover (**FIGURE 7-2**).**
3. **Hold the bracket handle on the disk drive open.**
4. **Slide the replacement disk drive into the drive slot.**
5. **Gently push the drive until the locking handle engages.**
6. **Close the locking handle completely, using gentle downward pressure.**
7. **Replace the drive bay cover.**
8. **Log in to the server and, as superuser, activate the replacement hard drive:**

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

where *ap_id* is the attachment-point ID for the hard drive that you just installed. For example, to activate the upper hard drive (HDD 0), you would enter:

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

9. **Verify that the hard drive is activated.**

   As superuser, enter:

```
# cfgadm -a c0
```

   Output similar to the following is displayed:

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

   Note that in the output, the Type column for the upper hard drive (`c0::dsk/c0t0d0`) is now `disk`, and the Occupant column shows it as `configured`.

   Also, you can use the hard drive (HDD) LEDs on the system status panel to verify that the hard drive is activated (FIGURE 7-1). When the Okay to Remove LED () on the system status panel for the hard drive is OFF, the hard drive is activate.

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

11. **Perform any other necessary software procedures on the hard drive to bring it online, including mounting the partitions and creating file systems.**

7.2 DVD or DAT Drive

This section explains how to replace a DVD or Digital Audio Tape (DAT) drive in a Netra CT 810 server. DVD and DAT drives are referred to as *removable media* drives. The removable media drives are hot-swappable components. Internal removable media drives are not available for the Netra CT 410 server.

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

- DVD—SCSI ID 6
- DAT—SCSI ID 5

Determine the procedure to use:

- If you are removing and replacing a *faulty* removable media drive in a server, first go to Section 7.2.1, "Removing a DVD or DAT Drive" on page 7-10, then go to Section 7.2.2, "Installing a DVD or DAT Drive" on page 7-13.
- If you are installing a *new* removable media drive in the server, go to Section 7.2.2, "Installing a DVD or DAT Drive" on page 7-13.

7.2.1 Removing a DVD or DAT Drive

1. **Log in to the server and stop the Volume Manager daemon.**

   As superuser, enter:

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

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

```
# devfsadm -i st
```

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

3. **Obtain the attachment-point ID for the removable media drive installed in your server.**

   As superuser, enter:

```
# cfgadm -a c0
```

- If you have a *DVD* drive installed in your server, output similar to the following is displayed:

```
Ap_Id                          Type         Receptacle   Occupant     Condition
c0                              scsi-bus     connected    configured   unknown
c0::dsk/c0t0d0                  disk         connected    configured   unknown
c0::dsk/c0t6d0                  CD-ROM       connected    configured   unknown
c0::rmt/0                       unavailable  connected    unconfigured unknown
```

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

- If you have a *DAT* drive installed in your server, output similar to the following is displayed:

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

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

4. **Deactivate the removeable media drive.**

As superuser, enter:

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

where *ap_id* is the attachment-point ID for the removable media drive that you want to remove. For example, to deactivate the DVD drive using the sample output, you would enter:

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

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

5. **Verify that the removable media drive is deactivated.**

   As superuser, enter:

```
# cfgadm -a c0
```

   Output similar to the following is displayed:

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

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

   Also, you can use the removable media module (RMM) LEDs on the system status panel to verify that the removable media drive is deactivated. When the Okay to Remove LED () on the system status panel for the removable media module is ON, you can remove the removable media drive from the slot.

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

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

7. **If there is media in the drive, remove it.**

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

9. **Pull the module from the system and place it on an electrostatic discharge mat.**

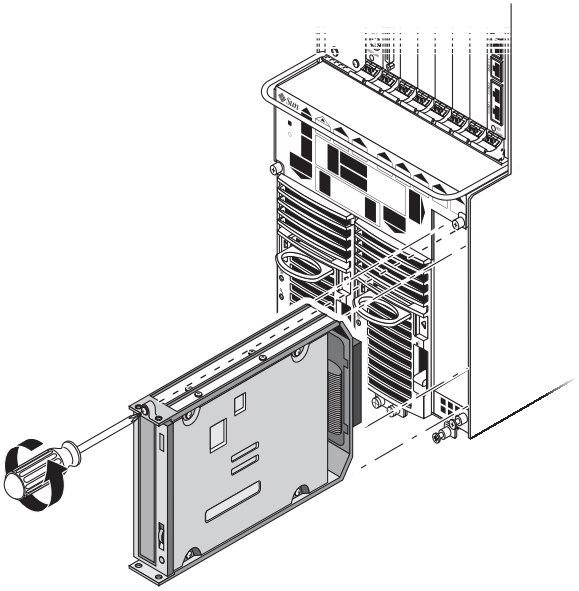

FIGURE 7-3 Removing the Removable Media Module from a Netra CT 810 Server

7.2.2 Installing a DVD or DAT Drive

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

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

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

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

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

4. **Remove the antistatic wrist strap.**

5. **Log in to the server as superuser, and activate the replacement removable media drive:**

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

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

```
# devfsadm -i st
```

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

7. **Verify that the removable media drive is activated.**

As superuser, enter:

```
# cfgadm -a c0
```

- If you installed a *DVD* drive in your server, output similar to the following is displayed:

```
Ap_Id                          Type         Receptacle   Occupant     Condition
c0                              scsi-bus     connected    configured   unknown
c0::dsk/c0t0d0                 disk         connected    configured   unknown
c0::dsk/c0t6d0                 CD-ROM       connected    configured   unknown
c0::rmt/0                      unavailable  connected    unconfigured unknown
```

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

```
c0::dsk/c0t6d0                 CD-ROM       connected    configured   unknown
```

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

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

Enter the `cfgadm -a c0` command a second time to verify that the DVD drive is activate. Also, you can use the removable media module (RMM) LEDs on the system status panel to verify that the removable media drive is activate. When the Okay to Remove LED ( ) on the system status panel for the removable media drive is OFF, the removable media drive is activate. Continue with Step 8.

- If you installed a *DAT* drive in your server, output similar to the following is displayed:

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

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

```
c0::rmt/0                       tape         connected    configured   unknown
```

- If you see `tape` in the Type column and `configured` in the Occupant column, then the DAT drive is activate. Skip to Step 8.
- If you see *unavailable* instead of `tape` in the Type column and *unconfigured* instead of `configured` in the Occupant column, then the DAT drive is not activate. Enter the following command to activate the DAT drive:

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

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

Also, you can use the removable media module (RMM) LEDs on the system status panel to verify that the removable media drive is activate. When the Okay to Remove LED ( ) on the system status panel for the removable media drive is OFF, the removable media drive is activate.

8. Start the Volume Manager daemon.

As superuser, enter:

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

CHAPTER 8

Removing and Replacing Hot-Swappable Subassemblies

This chapter contains procedures for the installation, removal, and replacement of hot-swappable Netra CT server subassemblies. This chapter contains the following topics:

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

Caution – If you are powering on your Netra CT server, do *not* remove or install any components in the system until you verify that the system is completely powered up. See Section 2.2, "Verifying Full Power-Up" on page 2-6 for more information.

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

Note – Read Chapter 3 before performing the procedures in this chapter.

8.1 System Status Panel

This section describes how to remove and replace a system status panel. The instructions provided here apply to the removal and replacement of the system status panel in a Netra CT 810 server or a Netra CT 410 server.

8.1.1 Removing the System Status Panel

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

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

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

   The locations of the system status panel in the Netra CT 810 server and Netra CT 410 server are illustrated in FIGURE 8-1.

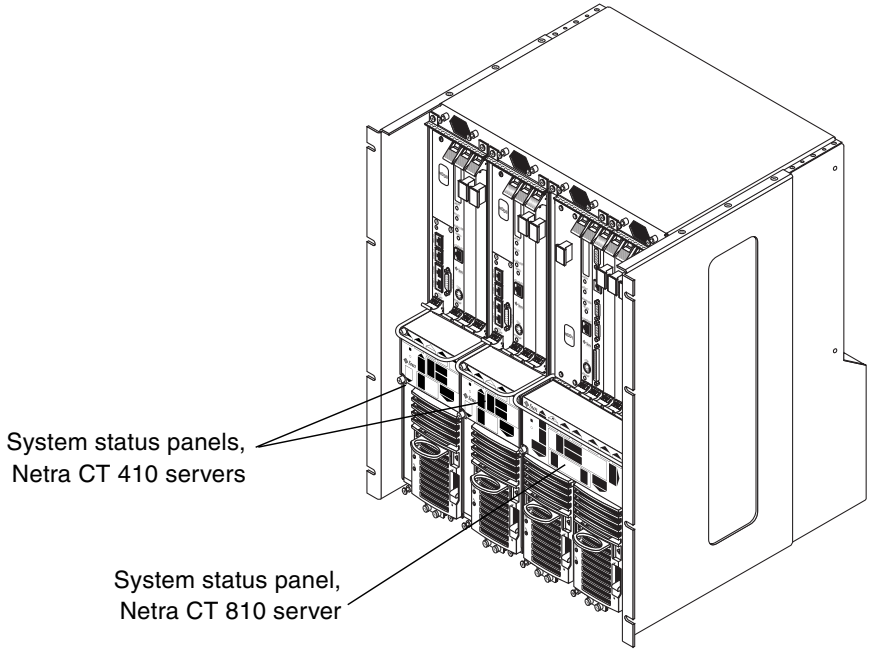

FIGURE 8-1 System Status Panel Locations

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

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

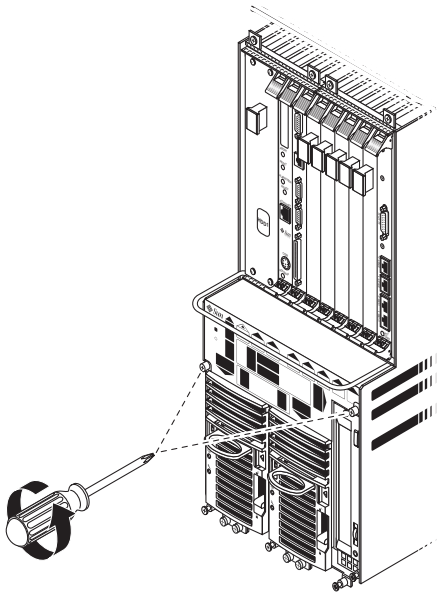

FIGURE 8-2 Removing the System Status Panel (Netra CT 810 Server)

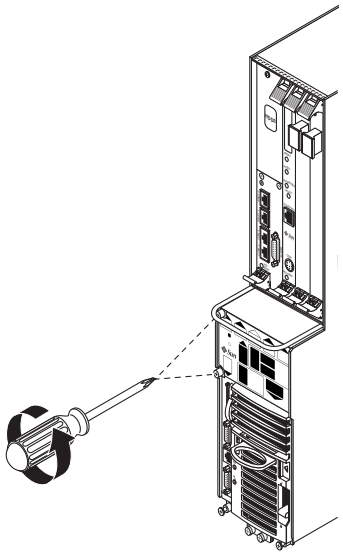

FIGURE 8-3 Removing the System Status Panel (Netra CT 410 Server)

4. **Pull the system status panel away from the Netra CT server, and place it on an electrostatic discharge mat.**

   You might have to pull on the screws to remove the system status panel from the server.

8.1.2 Replacing the System Status Panel

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

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

2. **Carefully position the system status panel into place on the system.**

   FIGURE 8-4 shows how to position the panel into place on the Netra CT 810 server, and FIGURE 8-5 shows how to position the panel into place on the Netra CT 410 server.

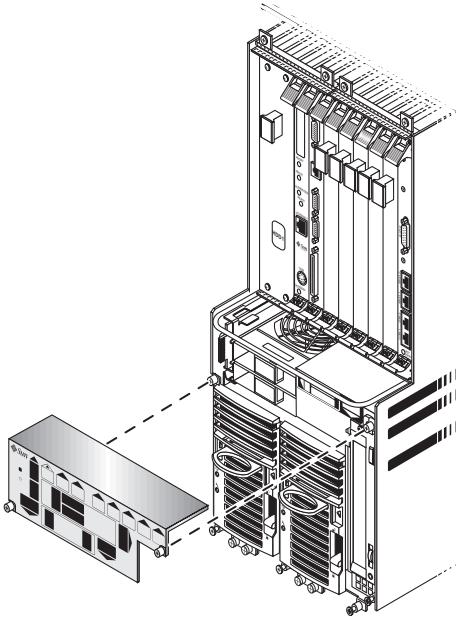

FIGURE 8-4 Positioning the System Status Panel (Netra CT 810 Server)

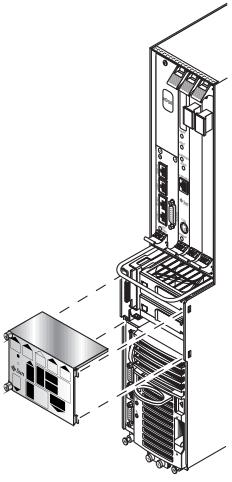

FIGURE 8-5 Positioning the System Status Panel (Netra CT 410 Server)

3. **Push the system status panel into place against the server, paying special attention to the connector on the left side of the panel, making sure that the connector on the left rear of the system status panel mates fully with the system controller board.**

Note – Be careful not to press the power switch when you are pressing the left side of the system status panel into place.

---

4. **Using a No. 2 Phillips screwdriver, tighten the two captive screws to secure the system status panel to the system.**

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

8.2 System Controller Board

This section describes how to remove and replace a system controller board. Each server has a single system controller board.

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

8.2.1 Removing the System Controller Board

1. **Go to the front of the system and use the system status panel to determine if the system controller board failed.**

FIGURE 8-6 shows the locations of the system controller board LEDs on the Netra CT 810 server, and FIGURE 8-7 shows the locations of the system controller board LEDs on the Netra CT 410 server.

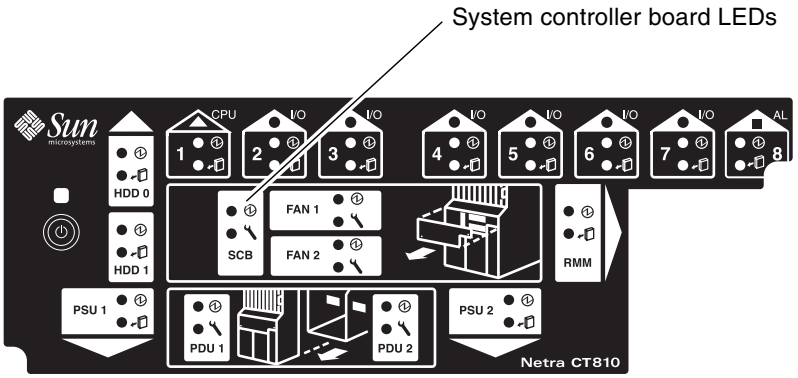

FIGURE 8-6 Locating the System Controller Board LEDs on the System Status Panel (Netra CT 810 Server)

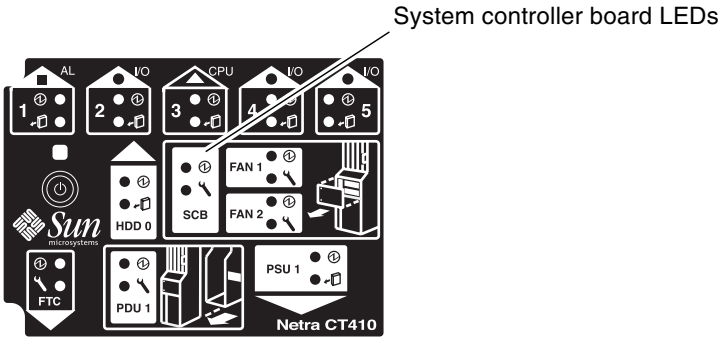

FIGURE 8-7 Locating the System Controller Board LEDs on the System Status Panel (Netra CT 410 Server)

2. **Remove the system status panel as described in Section 8.1.1, "Removing the System Status Panel" on page 8-2.**

   Do not remove the antistatic wrist strap after you remove the system status panel.

Caution – You must remove the system status panel *before* you access and hot-swap the system controller board. (This process allows the hot-swap to occur without causing the host CPU board to go offline and require a reset.)

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

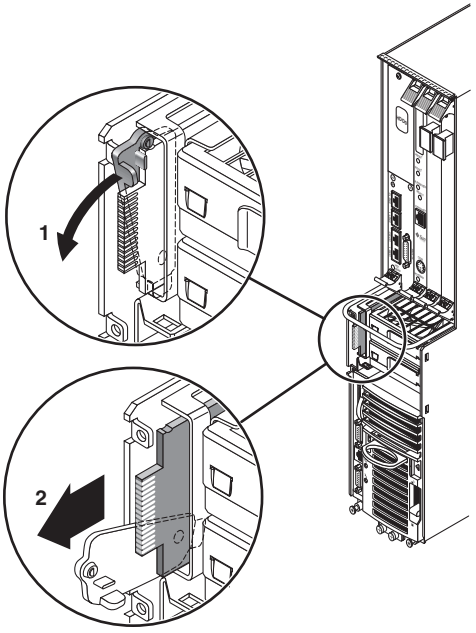

FIGURE 8-8 Removing a System Controller Board

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

8.2.2 Replacing the System Controller Board

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

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

2. **Push the ejection lever all the way down.**

3. **Line up the system controller board with its slot using the upper and lower rails, making sure that the component side of the board faces the left of the server.**

   Insert the wide connector first, as shown in FIGURE 8-9.

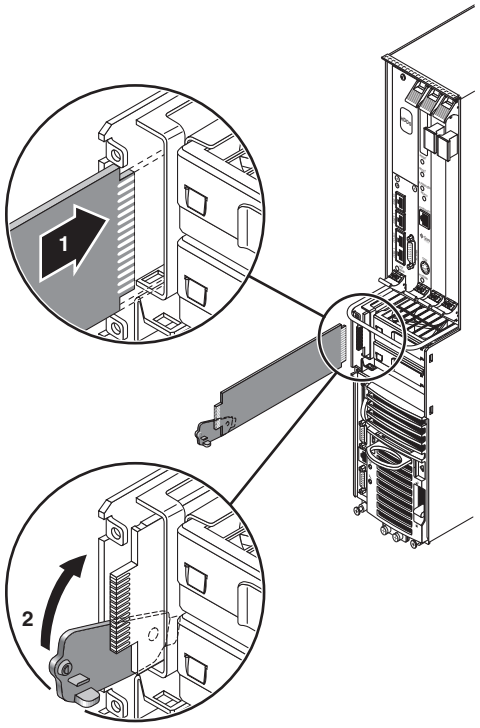

FIGURE 8-9 Inserting a System Controller Board

4. **Slide the board into the slot (**FIGURE 8-9**).**

5. **Flip the ejection lever up as you slide the board into the slot to completely seat it in the board cage.**

   The notch on the ejection lever should fit into the cutout.

Caution – Do not force any board into a slot; this can cause damage to the board and system. The board should insert and seat smoothly. If it binds, remove the board and inspect the board cage slot for any obvious obstructions.

When the board is completely seated, a brief flash of light displays behind the board.

- If the light flashes on and off, then remains off, the board is seated and functioning properly.
- If the light flashes on and remains on, then the board is either not seated properly or is faulty. Try reseating the board. If the light continues to stay on after repeated attempts, then the board is faulty.

6. **Replace the system status panel, as described in Section 8.1.2, "Replacing the System Status Panel" on page 8-4.**

8.3 Air Filters

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

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

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

8.3.1 Removing the Air Filters

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

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

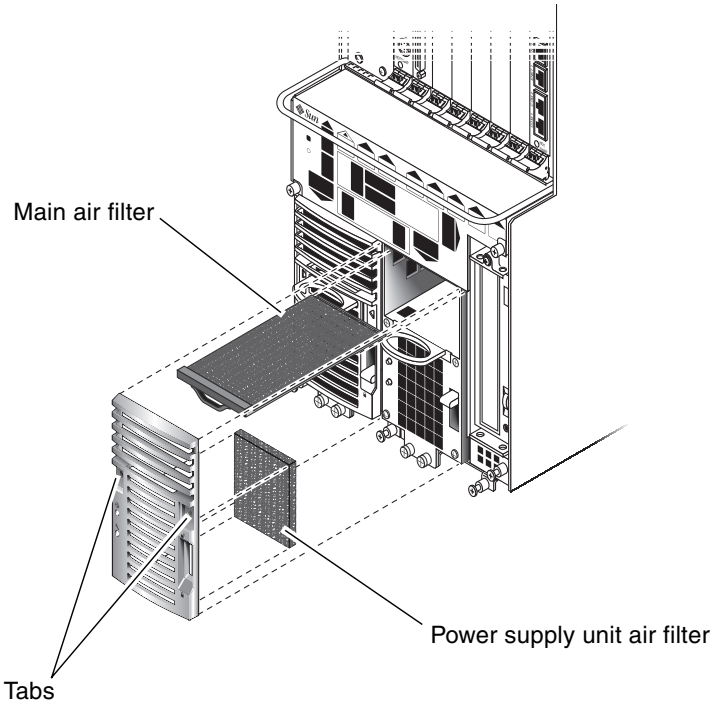

FIGURE 8-10 Locating the Air Filters (Netra CT 810 Server)

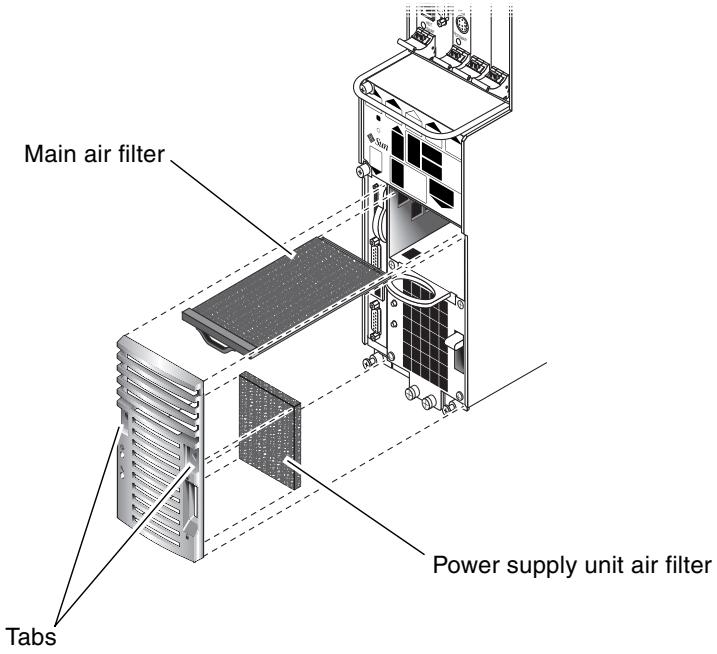

FIGURE 8-11 Locating the Air Filters (Netra CT 410 Server)

2. **Remove the power supply unit air filter.**

   See FIGURE 8-10 and FIGURE 8-11.

3. **Slide the main air filter tray out of the power supply unit.**

   See FIGURE 8-10 and FIGURE 8-11.

4. **Remove the main air filter from the tray.**

8.3.2 Replacing the Air Filters

1. **Insert the main air filter in the air filter tray.**

   See FIGURE 8-10 and FIGURE 8-11.

2. **Slide the air filter tray into the power supply unit.**

3. **Insert the power supply unit air filter into the power supply unit cover.**

4. **Replace the power supply unit cover on the power supply unit until it clicks into place.**

8.4 Power Supply Unit

The second power supply unit in a Netra CT 810 server is hot-swappable, as described in Section 1.3, "FRU Categories" on page 1-3. The remaining power supply unit in a Netra CT 810 server and the lone power supply unit in a Netra CT 410 server are cold-swappable. If you are replacing a *hot-swappable* power supply unit, then follow the instructions in this section; if you are replacing a *cold-swappable* power supply unit, then go to Section 10.2, "Cold-Swappable Power Supply Unit" on page 10-5.

Note that your Netra CT 810 server continues to operate normally with only one power supply unit; however, you do not have complete redundancy for the power supplies until you replace the failed power supply unit.

The newest part number for the power supply unit is F300-1767. Older power supply units with part numbers F300-1535 can be used.

8.4.1 Removing a Hot-Swappable Power Supply Unit

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

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

2. **Determine the state of the power supply unit that you want to remove.**

   You might have to get troubleshooting information from the LEDs on the power supply unit to determine the state. See Section 4.6, "Troubleshooting a Power Supply Using the Power Supply Unit LEDs" on page 4-18 for information.

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

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

   In a redundant system, a power supply unit is hot-swappable and can be removed if the amber Okay to Remove LED ( ) on the *system status panel* is ON.

Note – Do *not* remove a power supply unit if the amber Okay to Remove LED ( ) on the system status panel is OFF; that means that the power supply unit is *not* hot-swappable, and your server power would turn off if you removed it.

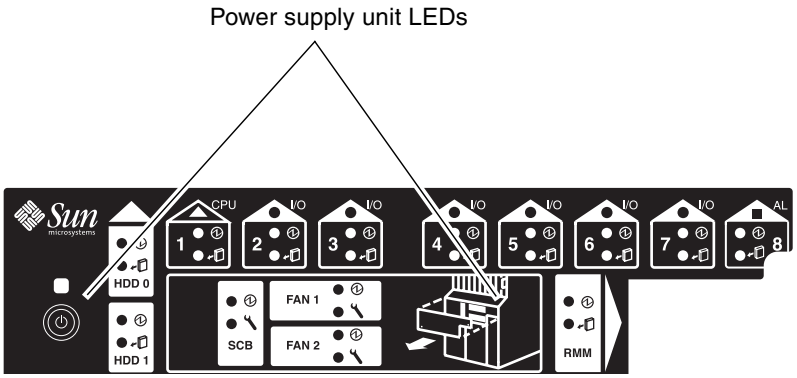

FIGURE 8-12 Locating the Power Supply Unit LEDs on the System Status Panel (Netra CT 810 Server)

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

   FIGURE 8-13 shows the location of the locking mechanism for a power supply unit in a Netra CT 810 server. The two LEDs on the power supply unit should go off. In addition, after several seconds, the amber Okay to Remove LED ( ) on the system status panel for the remaining power supply unit in the Netra CT 810 server should go to OFF. This state tells you that the remaining power supply unit is no longer hot-swappable as long as you have the first power supply unit disabled.

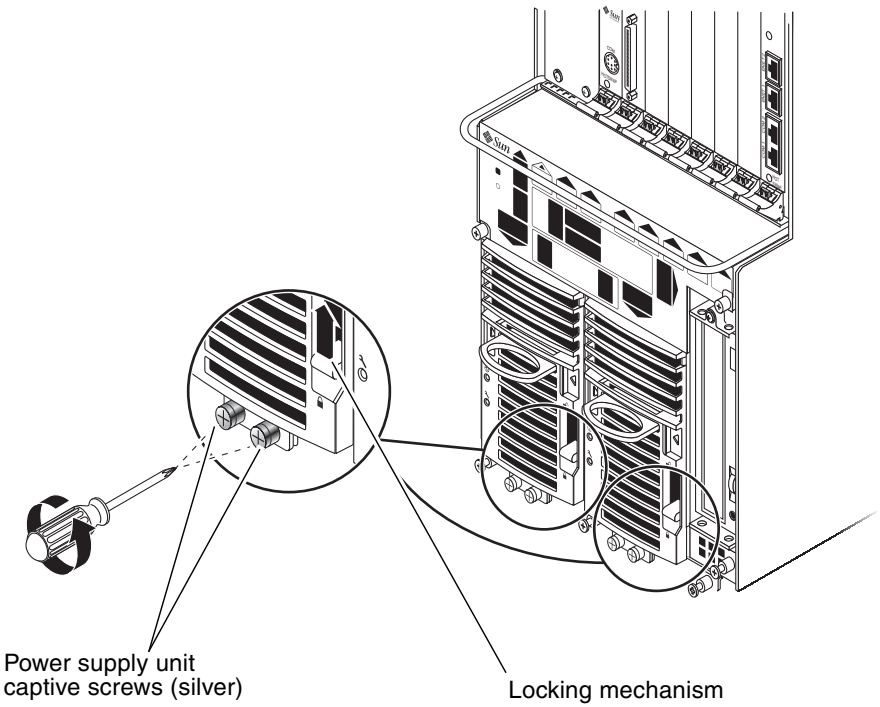

FIGURE 8-13 Unlocking a Power Supply Unit

5. **Using a No. 2 Phillips screwdriver, loosen the two *silver* captive screws at the base of the power supply unit.**

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

Note – Do not loosen the *black* captive screws at the base of the system; those screws hold the server in place.

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6. **Grasp the handle on the power supply unit, slide it out of the server, and place it on an electrostatic discharge mat.**

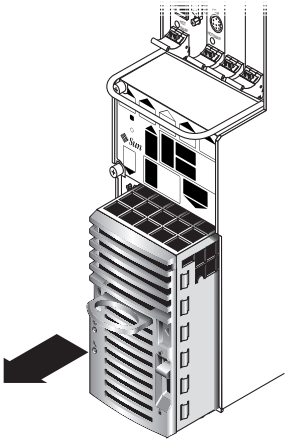

FIGURE 8-14 Removing a Power Supply Unit

8.4.2 Replacing a Hot-Swappable Power Supply Unit

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

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

2. **Slide the power supply unit into the slot.**

3. **Using a No. 2 Phillips screwdriver, tighten the two silver captive screws beneath the power supply unit to secure the power supply unit to the server.**

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

4. **Push the locking mechanism down into the locked ( ) position.**

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

5. **Verify that the power supply unit you just installed is functioning properly.**

   FIGURE 8-12 shows the location of the power supply unit (PSU) LEDs on the system status panel on the Netra CT 810 server.

   The amber LEDs ( ) on the system status panel for both power supply units in the Netra CT 810 server should go ON. This state tells you that you have two functioning, redundant power supply units in the server, and either of them is now hot-swappable.

8.5 Fan Trays

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

Depending upon which host board you have, when the temperature rises above a certain level, the CPU board sends out a warning that the system is overheating. If the temperature rises too high, then the system shuts down automatically. Note that these temperatures 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.

The following temperatures apply to the Netra CP2140 board:

- Warning: 158˚F (70˚C)
- Shutdown: 167˚F (75˚C)

The following temperatures apply to the Netra CP2500 board:

- Warning: 221˚F (105˚C)
- Critical: 230˚F (110˚C)
- Shutdown: 239˚F (115˚C)

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 too high, a single fan tray might not be able to cool the system properly.

High-speed fan trays designed especially for the Netra CP2500 board are required when you install a Netra CP2500 board in a Netra CT 810 server or a Netra CT 410 server.

8.5.1 Removing a Fan Tray

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

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

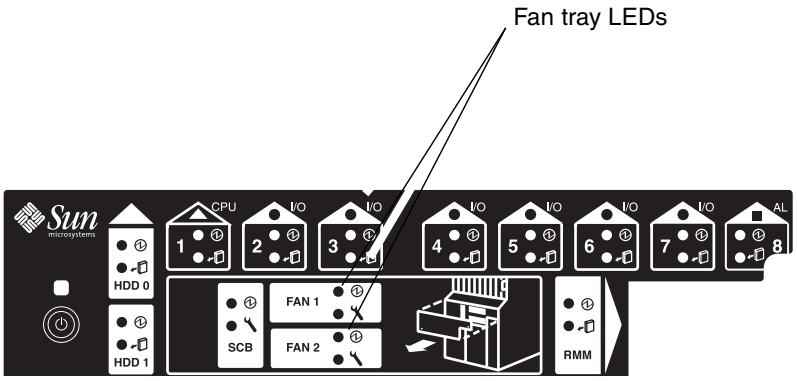

FIGURE 8-15 Locating the Fan Tray LEDs on the System Status Panel (Netra CT 810 Server)

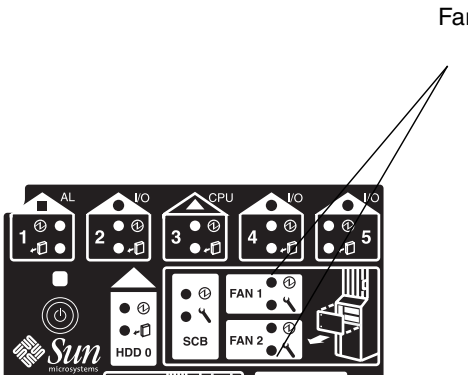

FIGURE 8-16 Locating the Fan Tray LEDs on the System Status Panel (Netra CT 410 Server)

A fan tray has failed if the amber Fault LED (🔧) on the system status panel is ON.

2. **Make a note of which fan tray has failed.**

   You must remove the system status panel to access the fan trays.

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

3. **Remove the system status panel from the system.**

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

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

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

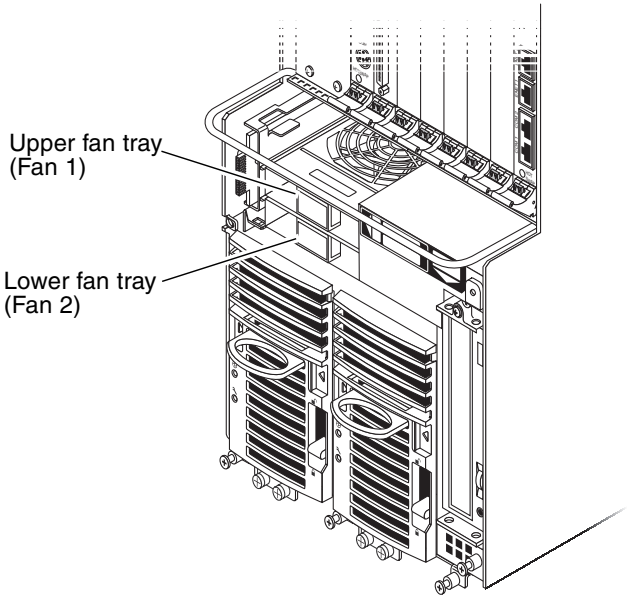

FIGURE 8-17 Locating the Fan Trays in a Netra CT 810 Server

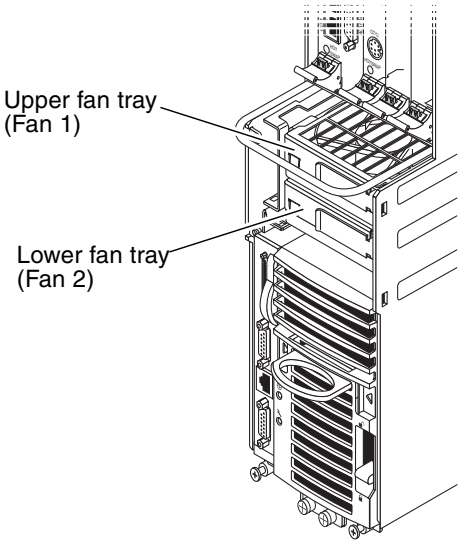

FIGURE 8-18 Locating the Fan Trays in a Netra CT 410 Server

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

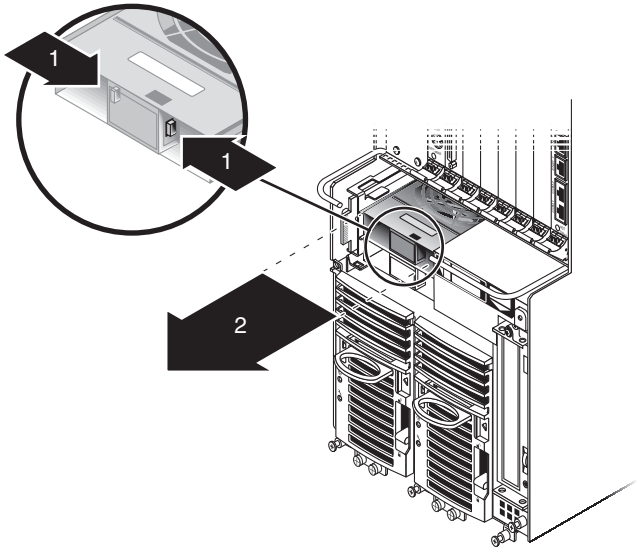

FIGURE 8-19 Removing a Fan Tray from a Netra CT 810 Server

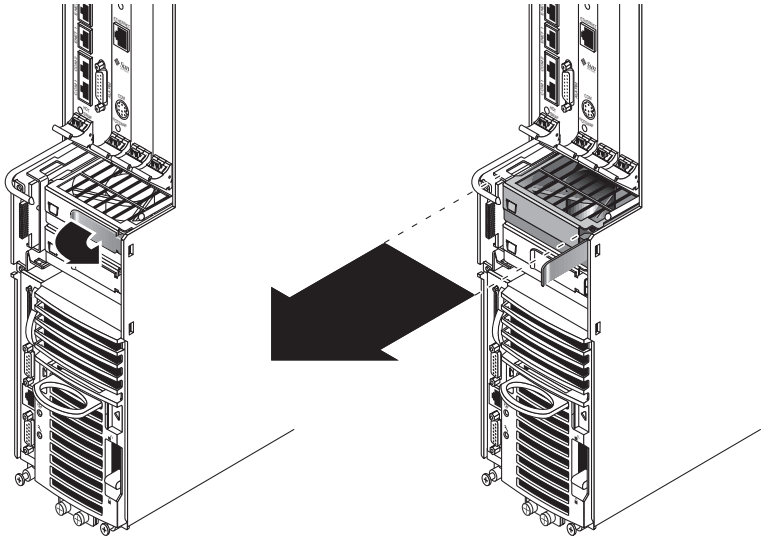

FIGURE 8-20 Removing a Fan Tray from a Netra CT 410 Server

8.5.2 Replacing a Fan Tray

1. **Insert the fan tray into the system:**
   - If you are installing a fan tray into a Netra CT 810 server, press the fan tray into place until the fan tray clicks into place (FIGURE 8-19).
   - If you are installing a fan tray into a Netra CT 410 server, make sure the handle on the fan tray is on the right, then press the fan tray handle to lock the fan tray into place (FIGURE 8-20).
2. **Install the system status panel on the system.**

   See Section 8.1.2, "Replacing the System Status Panel" on page 8-4 for those instructions.
3. **Verify that the fan tray LEDs are lit properly.**

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

   A fan tray is functioning properly if the amber Fault LED ( ) on the system status panel is OFF, and the green Power LED ( ) is ON.

PART 4 Replacing Cold-Swappable FRUs

CHAPTER 9

Removing and Replacing the Servers

This chapter contains procedures for the installation, removal, and replacement of the Netra CT 810 server and Netra CT 410 server. This chapter contains the following topics:

The server and the midplane are considered a single FRU. You can power down and remove one server without affecting the other servers in a chassis.

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

Note – Read Chapter 3 before performing the procedures in this chapter.

9.1 Removing a Server

The instructions in this section cover the following situations:

- Removing a failed server
- Removing a functioning server so that you can access a component behind the server, such as a power distribution unit or cable

1. **Completely power off the Netra CT server.**

   See Section 2.3, "Powering Off the Server" on page 2-7 for instructions. You must push the purple power supply unit locking mechanism into the unlocked position before you can remove the server.

2. **Disconnect the power cables from the appropriate connectors.**

   A Netra CT 810 server has *two* power supply units; you must disconnect two power cables when removing a Netra CT 810 server.

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

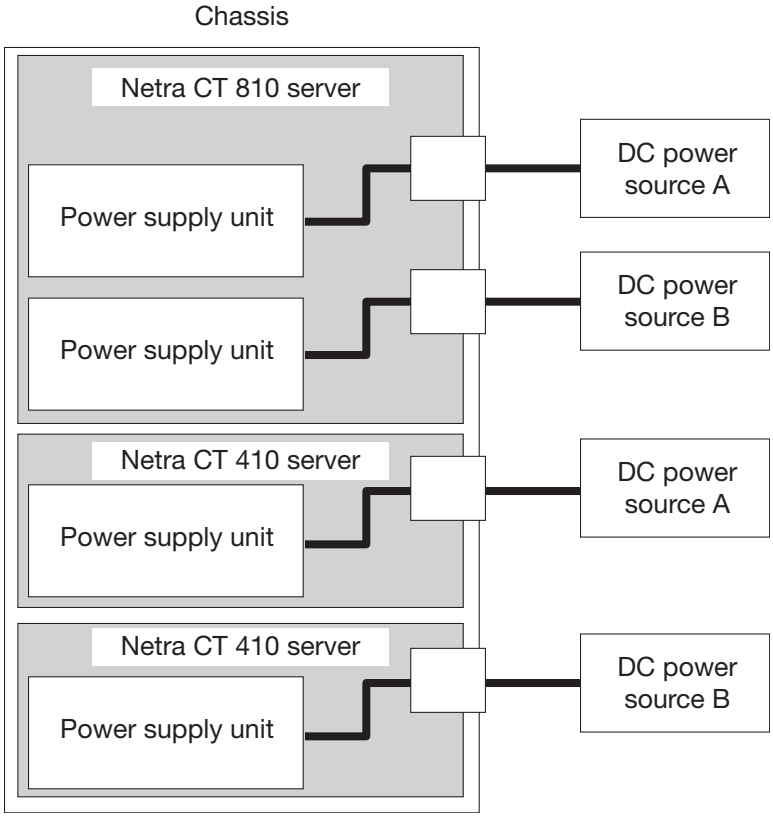

FIGURE 9-1 Power Supply Units and Power Sources

Caution – Do *not* attempt to remove the server from a chassis without first performing the next step, or you might damage major system components.

3. **Unseat all rear transition modules from the server that you are going to remove.**

   You do not need to completely remove the rear transition modules from the chassis; you only need to pull them out an inch or two so that they are disengaged from the rear of the server.

4. **Determine if you need to unplug the cables connected to the server and remove all the components from the server:**

   - If you are removing a *faulty* Netra CT 810 server or Netra CT 410 server, you must unplug all the cables and remove all the components from the faulty server so that you can reinstall them in the replacement server. Continue with Step 5.

- If you are removing a *functioning* Netra CT 810 server or Netra CT 410 server to access a component behind the server, you do *not* have to unplug all the cables and remove all the components from the server. Skip to Step 8.

5. **Label all the cables connected to the *front* of the server.**

   Note that you do not have to unplug any cables connected to boards installed in the rear of the chassis.

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

7. **Remove all the components from the server.**

   Later, you will reinstall them in the replacement server.

   Remove the components using the instructions in the following sections:

   - Section 7.2.1, "Removing a DVD or DAT Drive" on page 7-10 (Netra CT 810 server)
   - Section 8.1.1, "Removing the System Status Panel" on page 8-2
   - Section 8.2.1, "Removing the System Controller Board" on page 8-6
   - Section 8.5.1, "Removing a Fan Tray" on page 8-17
   - Section 6.1.2.1, "Removing a Board" on page 6-9
   - Section 10.1.1, "Removing a Cold-Swappable Hard Drive" on page 10-2
   - Section 10.2.1, "Removing a Cold-Swappable Power Supply Unit" on page 10-5

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

   - If you are removing a Netra CT 810 server, loosen the *four* black captives screws at the top of the server and the *three* black captive screws at the bottom of the server (FIGURE 9-2).
   - If you are removing a Netra CT 410 server, loosen the *two* black captive screws at the top of the server and the *two* black captive screws at the bottom of the server (FIGURE 9-3).

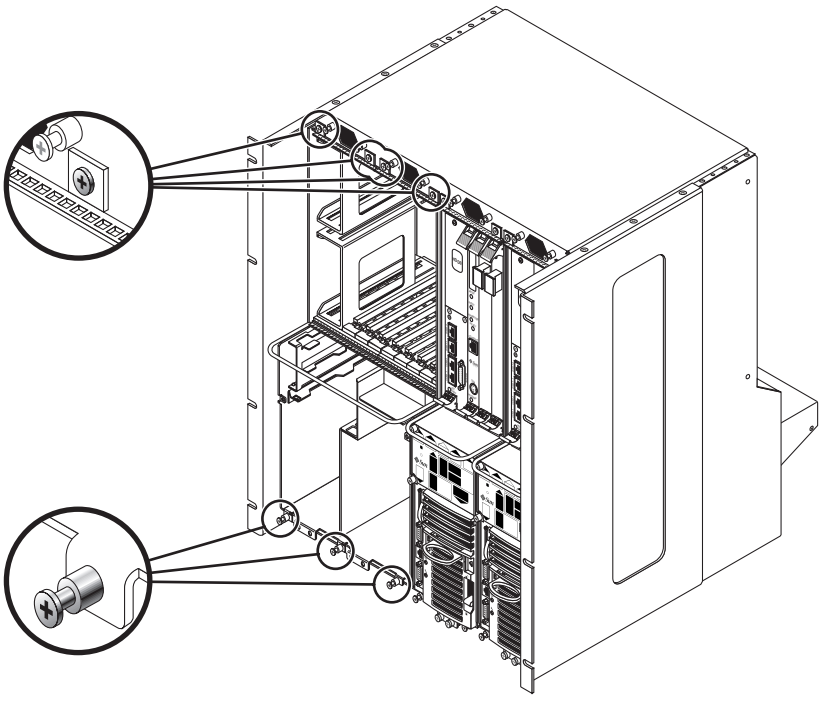

FIGURE 9-2 Loosening the Screws at the Top and Bottom of a Netra CT 810 Server

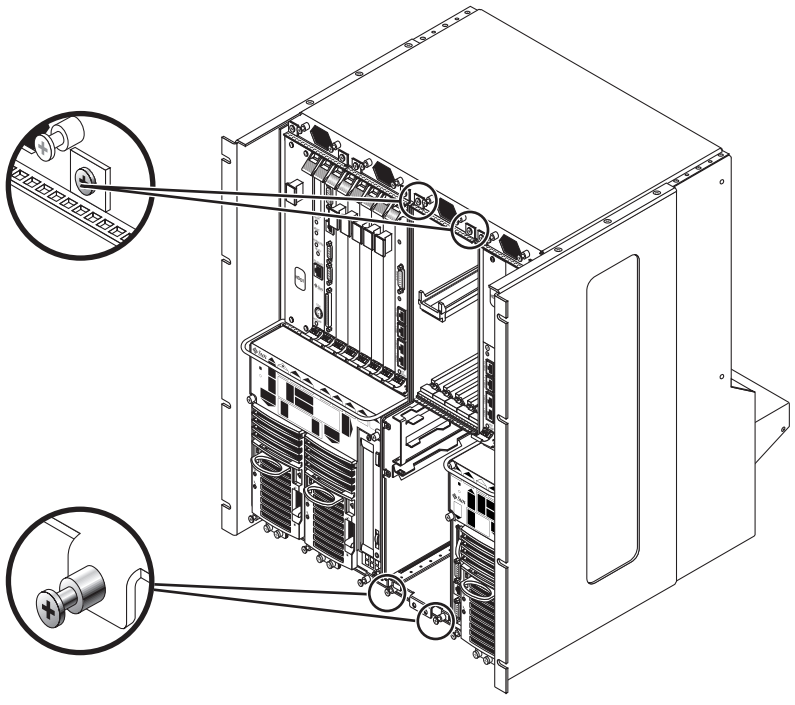

FIGURE 9-3 Loosening the Screws at the Top and Bottom of a Netra CT 410 Server

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

10. **With your right hand, grasp the purple bar at the top of the server and completely pull the server out of the chassis using the server handle and the bar.**

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

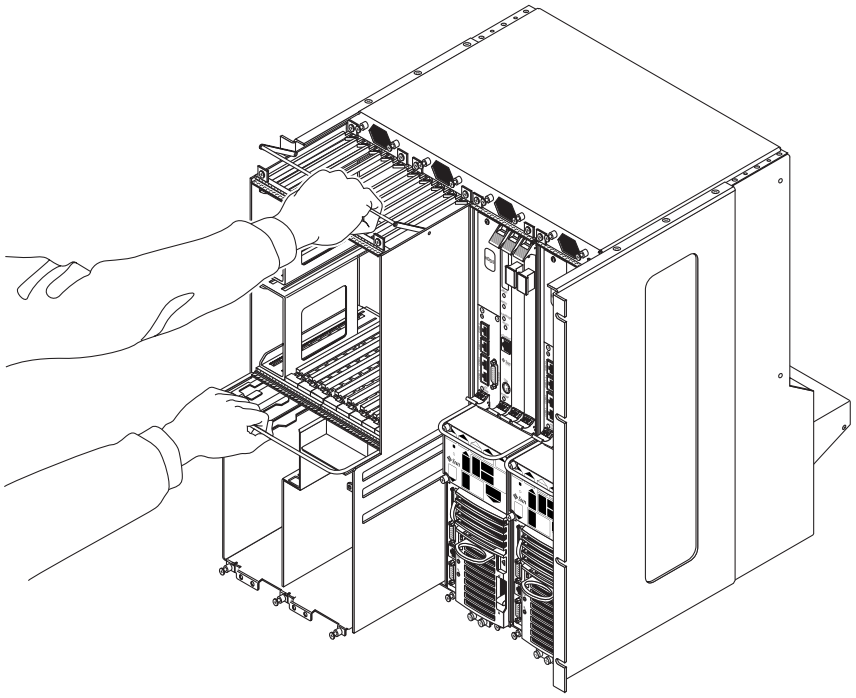

FIGURE 9-4 Removing or Inserting a Netra CT 810 Server

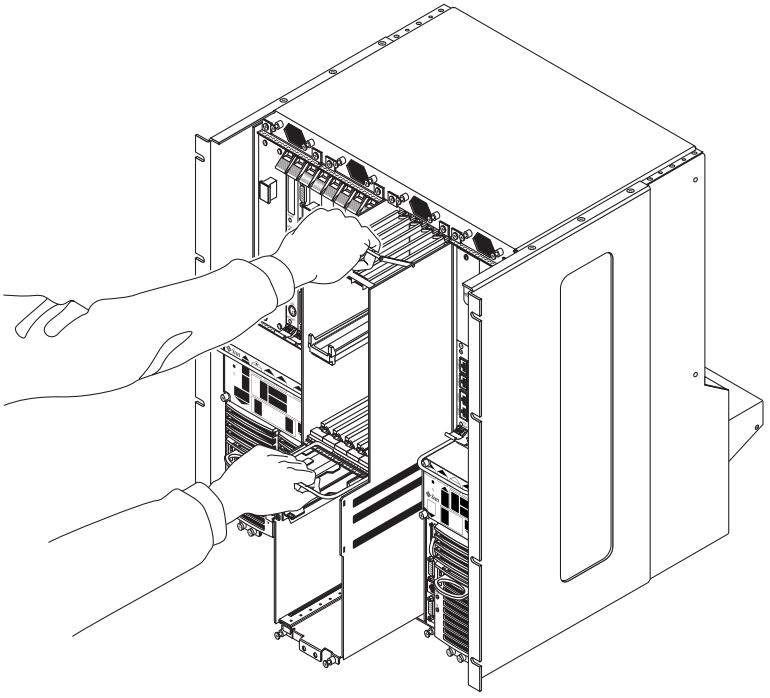

FIGURE 9-5 Removing or Inserting a Netra CT 410 Server

11. **Set the server aside on a flat surface.**

12. **If necessary, secure a blank filler panel over any empty server slot.**

    If you are not going to replace the server right away, you must install a blank filler panel over the opening. For a Netra CT 410, one filler panel is required. For a Netra CT810, two filler panels are required. The filler panel is secured to the chassis using four screws, two at the top of the filler panel and two at the bottom.

9.2 Installing a Server

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

Caution – Verify that all RTMs are completely unseated before proceeding with these procedures. If you attempt to insert a server without unseating the RTMs, you might damage the connector pins on the midplane when you insert the server.

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

   Store the slot filler panel in a safe place; you might need to use it again if you need to remove a server for an extended period of time.

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

3. **With your right hand, grasp the purple server bar at the top of the server and insert the server into the chassis using the flat server handle and the server bar.**

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

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

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

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

   - If you are installing a Netra CT 810 server, tighten the *four* black captives screws at the top of the server and the *three* black captive screws at the bottom of the server (FIGURE 9-2).
   - If you are installing a Netra CT 410 server, tighten the *two* black captive screws at the top of the server and the *two* black captive screws at the bottom of the server (FIGURE 9-3).

6. **Reseat all the rear transition modules into the replacement server.**

7. **Determine if you need to connect the cables to the boards in the server and reinstall all the components from the server.**
   - If you are installing a *replacement* Netra CT 810 server or Netra CT 410 server, you must connect all the cables and reinstall all the components that you removed from the faulty server. Continue with Step 8.
   - If you are installing a *functioning* Netra CT 810 server or Netra CT 410 server that you had to remove to access a component behind the server, you do *not* have to connect the cables and reinstall the components. Skip to Step 10.
8. **Reinstall all the components that you removed from the faulty server.**

   Replace the following components:
   - Section 7.2.2, "Installing a DVD or DAT Drive" on page 7-13 (Netra CT 810 server)
   - Section 8.1.2, "Replacing the System Status Panel" on page 8-4
   - Section 8.2.2, "Replacing the System Controller Board" on page 8-8
   - Section 8.5.2, "Replacing a Fan Tray" on page 8-21
   - Section 6.1.2.2, "Inserting a Board" on page 6-15
   - Section 10.1.2, "Replacing a Cold-Swappable Hard Drive" on page 10-4
   - Section 10.2.2, "Replacing a Cold-Swappable Power Supply Unit" on page 10-8
9. **Plug all the cables into the server.**
10. **Connect the input power cables to the connectors for the replacement server.**
11. **Power on the server.**

    See Section 2.1, "Powering On the Server" on page 2-2 for instructions.

CHAPTER 10

Removing and Replacing Cold-Swappable Subassemblies

This chapter contains procedures for the initial installation, removal, and replacement of cold-swappable Netra CT server subassemblies. This chapter contains the following topics:

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

Note – Read Chapter 3 before performing the procedures in this chapter.

10.1 Cold Swappable Hard dDrives

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

Though the Netra CT 410 server has one disk bay and the Netra CT 810 server has two, the procedures for removal and replacement of a disk are the same for both types of servers.

A hard drive is a cold-swappable component if it is being used by the server. For example, if a hard drive is being used as the primary boot drive, then that hard drive is a cold-swappable component unless disk management software is used to mirror the boot drive to a second hard drive installed in the server. For that reason, a hard drive in a Netra CT 410 server is a cold-swappable disk drive, unless it is running on the Solaris OS over the network and not off of the hard drive, in which case it becomes a hot-swappable component.

Instructions for removing and replacing a cold-swappable hard drive are covered here; instructions for removing and replacing a hot-swappable hard drive are covered in Section 7.1, “Hard Drive” on page 7-2.

10.1.1 Removing a Cold-Swappable Hard Drive

Note – The instructions in this section do *not* cover unconfiguration procedures that might be necessary if you are removing a hard drive that is under the control of any disk management software, such as Solaris Volume Manager or Solstice DiskSuite. If you are running disk management software on your system, refer to the documentation that came with the disk management software for instructions on releasing a hard drive from the control of the software before proceeding with these instructions.

---

1. **Complete the power off steps.**

   See Section 2.3, “Powering Off the Server” on page 2-7 for those instructions.

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

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

3. **Locate the drive bay cover on your system.**

   The hard drives are behind the drive bay cover on your system. A maximum of two hard drives are behind the drive bay cover in a Netra CT 810 server, and only one is behind the drive bay cover in a Netra CT 410 server.

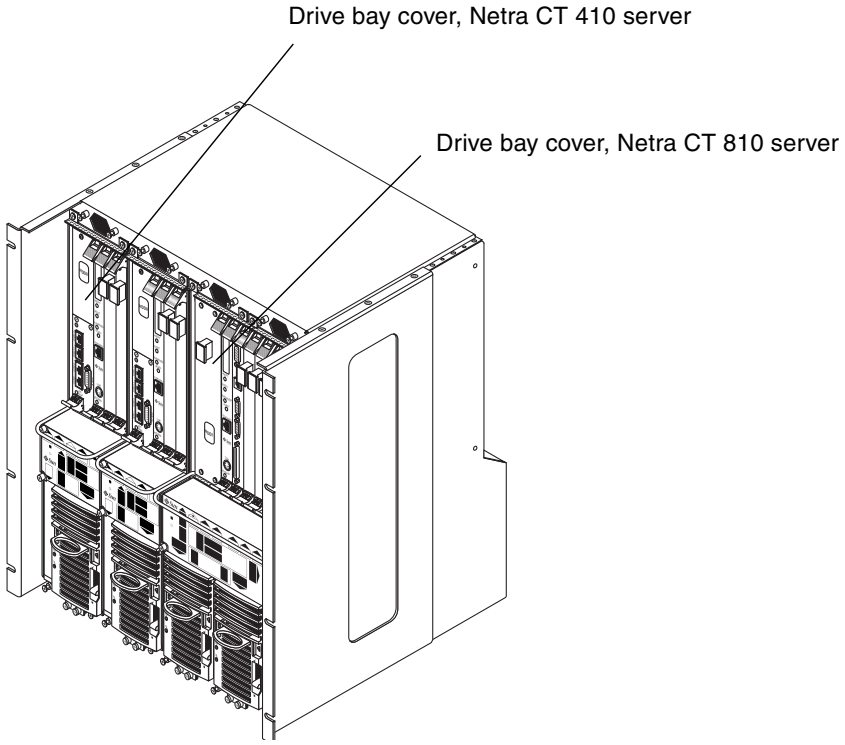

FIGURE 10-1 Drive Bay Cover Locations

4. **Loosen the captive screws that hold the drive bay cover in place.**
   - For the Netra CT 810 server, use a No. 1 Phillips screwdriver to loosen the four captive screws (two on top and two on the bottom).
   - For the Netra CT 410 server, use a No. 2 Phillips screwdriver to loosen the one captive screw on top.
5. **Remove the drive bay cover.**
6. **Determine which disk drive you want to remove.**

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

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

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

9. **Continue to pivot the disk drive bracket handle against the chassis, applying mild pressure until the drive disconnects.**

10. **Slide the drive out of the chassis and place it on the electrostatic discharge mat.**

11. **Secure the drive bay cover over the drive bays**FIGURE 10-1 **(**FIGURE 10-2**).**

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

10.1.2 Replacing a Cold-Swappable Hard Drive

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

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

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

3. **Hold the bracket handle on the disk drive open.**

4. **Slide the replacement disk drive into the drive slot.**

5. **Gently push the drive until the locking handle engages.**

6. **Close the locking handle completely, using gentle downward pressure.**

7. **Replace the drive bay cover.**

8. **Complete the power-on steps.**

   See Section 2.1, "Powering On the Server" on page 2-2 for more information.

9. **If you replaced the boot drive, reinstall the Solaris OS.**

   See the *Netra CT Server Installation Guide* for more information.

10. **If the hard drive is under the control of RAID software, perform the necessary steps to bring the disk online.**

10.2 Cold-Swappable Power Supply Unit

This section describes how to remove and replace a cold-swappable power supply unit. A cold-swappable power supply unit would be either a single remaining power supply unit in the Netra CT 810 server or the only power supply unit in the Netra CT 410 server.

Note – If you are replacing one power supply unit in a Netra CT 810 server and the second power supply unit is still up and running, you can replace the failed power supply unit without powering off the server. See Chapter 8 for more information.

10.2.1 Removing a Cold-Swappable Power Supply Unit

1. **Power off the server.**

   See Section 2.3, "Powering Off the Server" on page 2-7 for those instructions.

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

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

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

   FIGURE 10-2 shows the location of the locking mechanism for the power supply unit on a Netra CT 810 server, and FIGURE 10-3 shows the location of the locking mechanism for the power supply unit on a Netra CT 410 server. The two LEDs on the power supply unit should go OFF.

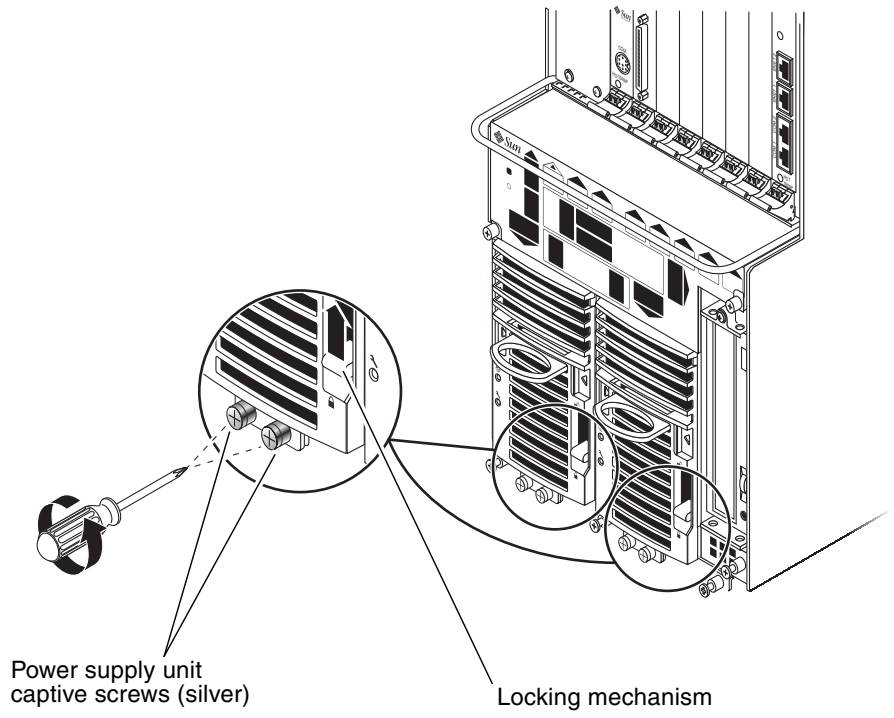

FIGURE 10-2 Removing or Replacing a Cold-Swappable Power Supply Unit From a Netra CT 810 Server

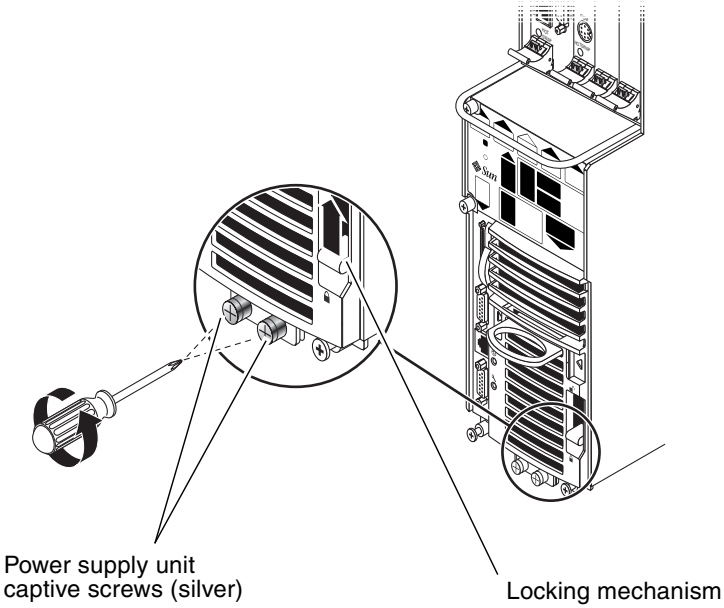

FIGURE 10-3 Removing or Replacing a Cold-Swappable Power Supply Unit From a Netra CT 410 Server

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

   FIGURE 10-2 shows the location of the captive screws for the power supply unit on a Netra CT 810 server, and FIGURE 10-3 shows the location of the captive screws for the power supply unit on a Netra CT 410 server.

Note – Do not loosen the *black* captive screws at the base of the system; those screws hold the server in place.

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5. **Grasp the handle on the power supply unit (FIGURE 10-4), slide it out of the server and place it on an electrostatic discharge mat.**

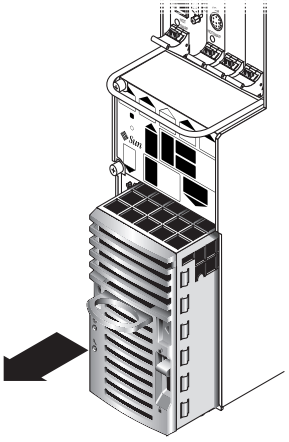

FIGURE 10-4 Removing a Cold-Swappable Power Supply Unit From a Netra CT 410 Server

10.2.2 Replacing a Cold-Swappable Power Supply Unit

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

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

2. **Slide the power supply unit into the slot.**

3. **Using a No. 2 Phillips screwdriver, tighten the two black captive screws to secure the power supply unit to the server.**

   FIGURE 10-2 shows the location of the captive screws for the power supply unit on a Netra CT 810 server, and FIGURE 10-3 shows the location of the captive screws for the power supply unit on a Netra CT 410 server.

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

   FIGURE 10-2 shows the location of the locking mechanisms for the power supply unit on a Netra CT 810 server, and FIGURE 10-3 shows the location of the locking mechanisms for the power supply unit on a Netra CT 410 server. The green LED on the power supply unit should start flashing at this point, indicating that the power supply unit is powered on and functioning properly, but the server is still powered off.

5. **Power on the server.**

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

6. **Verify that the power supply unit you installed is functioning properly.**

   The green Power LED (⏻) on the power supply unit should go ON and the system should boot.

PART 5 Illustrated Parts List

CHAPTER 11

Illustrated Parts List

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

11.1 Chassis Components

TABLE 11-1 lists the FRUs for the chassis.

TABLE 11-1 FRUs for the Chassis

	FRU	Part Number
1	Chassis	X7191A
2	I/O rear transition modules	Varies depending on the I/O board. Contact your local Sun service representative for information.
3	Alarm rear transition card	F501-6124, X7227A
3	Host Netra CT CPU transition card (CTC, rear transition module for Netra CP2140 host board)	F501-5945
3	Host Netra CP2500 CPU rear transition module	F501-7032
3	Satellite Netra CP2160 rear transition module	F595-5949, XCP2060-TRN
3	Satellite Netra CP2500 CPU rear transition module	F501-7064, XCP2500-TRN-S-4
4	Power distribution unit	F540-4397

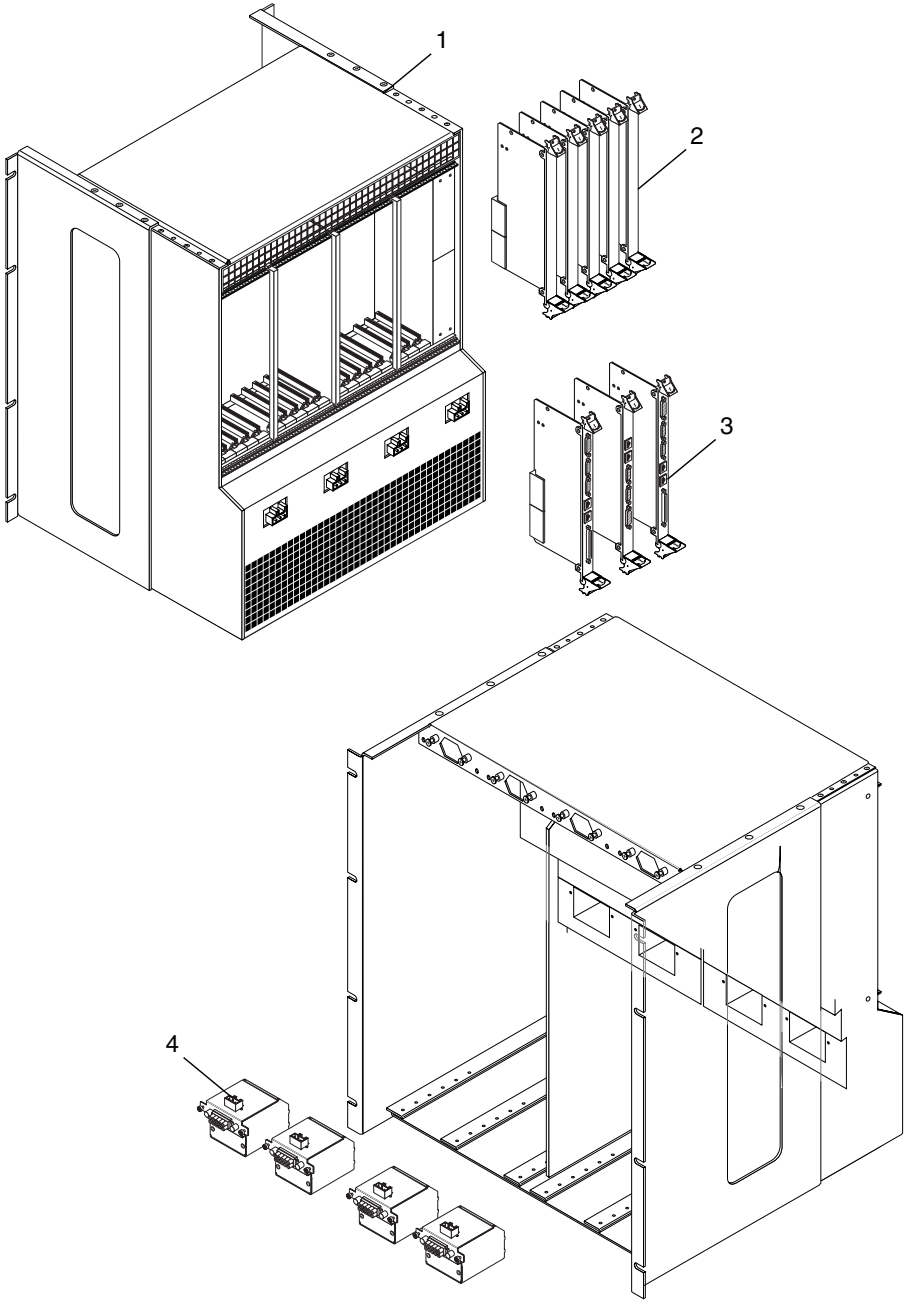

FIGURE 11-1 Illustrated Parts of Chassis and Components

11.2 Netra CT 810 Server

TABLE 11-2 lists the FRUs for the Netra CT 810 server.

TABLE 11-2 FRUs for the Netra CT 810 Server

	FRU	Part Number
1	Hard disk, 73 GB	F540-4689, X5244A
2	Host Netra CP2140 CPU board, 650 MHz, 1 GB RAM	F501-6403
2	Host Netra CP2140 CPU board, 650 MHz, 2 GB RAM	F501-6416
2	Netra CP2500 CPU board, 2 GB RAM (host and satellite)	F501-7062, XCP2500S-960-2GB-4
3	Host Netra CP2500 upgrade kit: • Netra CP2500 SPARC processor board with 2 GB SDRAM • Netra CP2500 host rear transition module • High-speed fans and trays	(X)8206A-4
3	6U I/O boards	Varies depending on the I/O board. Contact your local Sun service representative for more information.
3	6U satellite CPU boards	Varies depending on the satellite CPU board. Contact your local Sun service representative for more information
4	Alarm card, 6U single-wide	F501-6171, X7226A
5	Netra CT 810 server and midplane	F540-5025
6	System status panel, Netra CT 810 server	F540-5010, X7231A
7	System controller board	F501-6118, X7232A
8	Fan trays, Netra CT 810 server	F540-4928, X7229A
8	High-speed fan trays for Netra CP2500 boards	F540-6419, X8203A-4
9	Filler panel for empty Netra CP2500 slot	370-7791-01, X8204A-4
9	Main and power supply unit air filters	X7221A

TABLE 11-2 FRUs for the Netra CT 810 Server

	FRU	Part Number
10	Power supply unit	F300-1535, X7193A
11	Removable media module, DVD	F540-4684
11	Removable media module, DAT	F540-4409

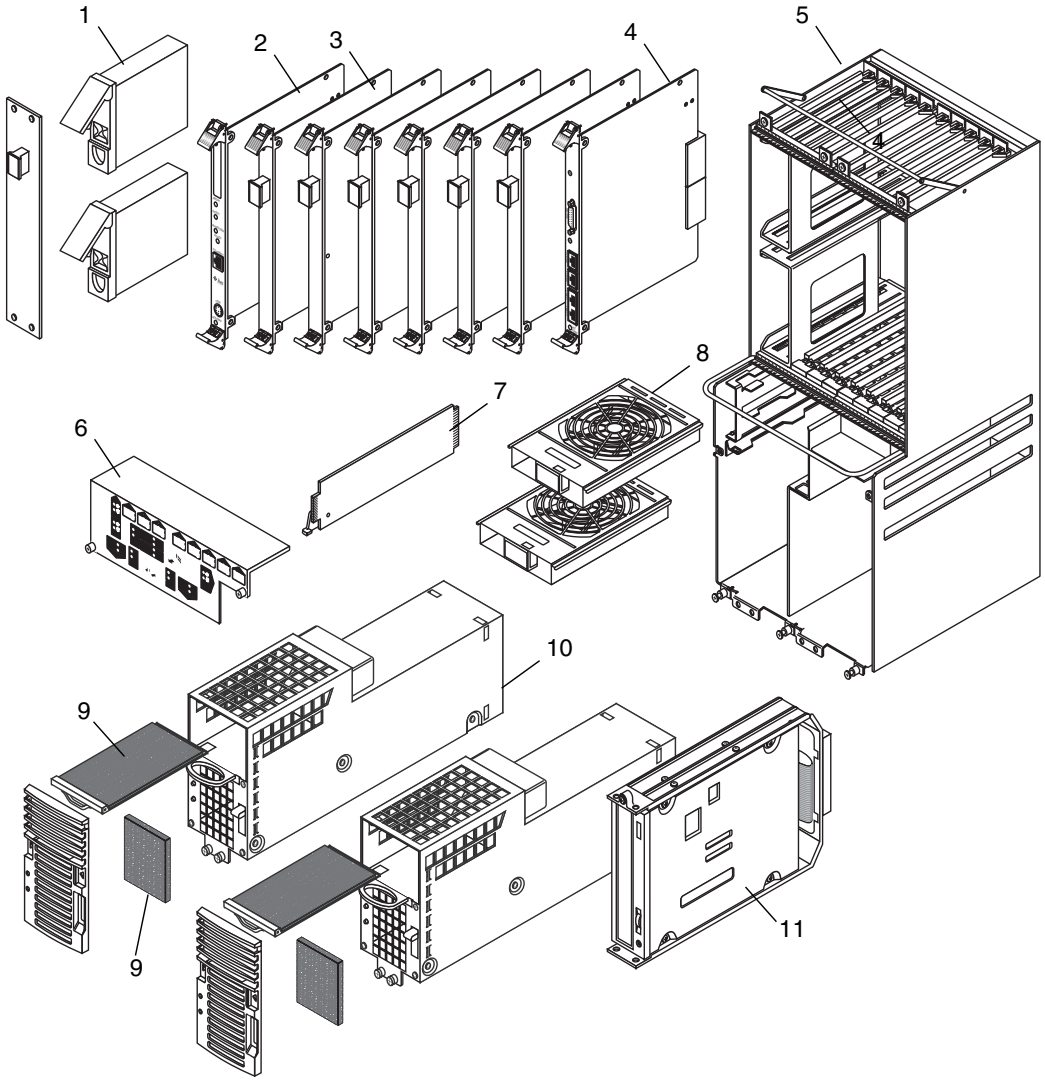

FIGURE 11-2 Illustrated Parts Breakdown, Netra CT 810 Server

11.3 Netra CT 410 Server

TABLE 11-3 lists the FRUs for the Netra CT 410 server.

TABLE 11-3 FRUs for the Netra CT 410 Server

	FRU	Part Number
1	Hard disk, 73 GB	F540-4689, X5244A
2	Host Netra CP2140 CPU board, 650 MHz, 1 GB RAM	F501-6403
2	Host Netra CP2140 CPU board, 650 MHz, 2 GB RAM	F501-6416
2	Netra CP2500 CPU board, 2 GB RAM (host and satellite)	F501-7062, XCP2500S-960-2GB-4
3	Host Netra CP2500 upgrade kit: • Netra CP2500 SPARC processor board with 2 GB SDRAM • Netra CP2500 host rear transition module • High-speed fans and trays	(X)8205A-4
3	6U I/O boards	Varies depending on the I/O board. Contact your local Sun service representative for more information.
3	6U satellite CPU boards	Varies depending on the satellite CPU board. Contact your local Sun service representative for more information
4	Netra CT 410 server and midplane	F540-5026
5	Alarm card, 3U double-wide	F501-6123, X7225A
6	System controller board	F501-6118, X7232A
7	System status panel, Netra CT 410 server	F540-5011, X7230A
8	Fan trays for Netra CP2140 and Netra CP2160 boards	F540-4931, X7228A
8	High-speed fan trays for Netra CP2500 boards	F540-6418, X8202A-4
9	Host CPU front termination board	F501-5619
10	Main and power supply air filters	X7221A
11	Power supply unit	F300-1535, X7193A

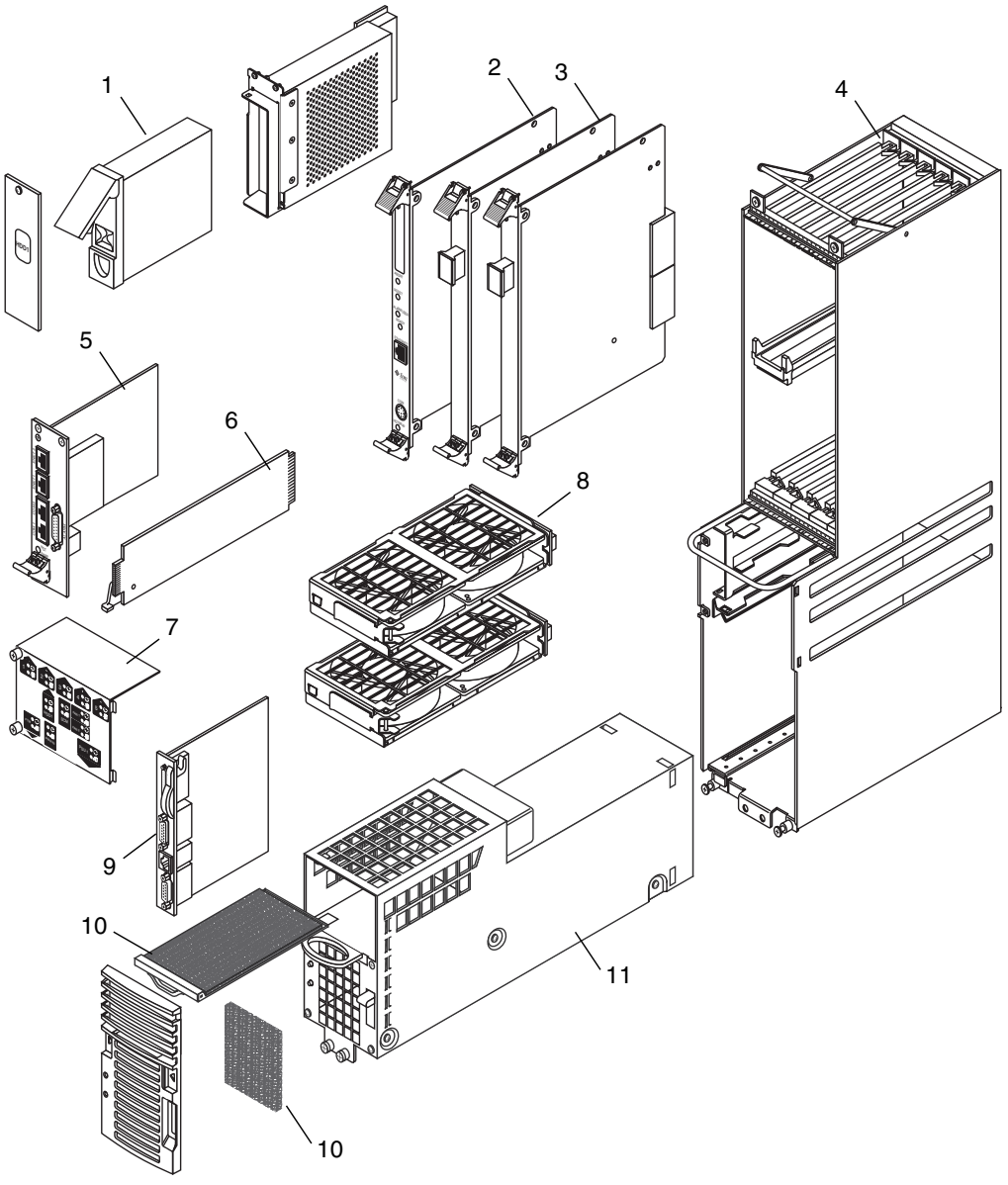

FIGURE 11-3 Illustrated Parts Breakdown, Netra CT 410 Server

PART 6 Appendixes, Glossary, and Index

APPENDIX **A**

Connector Pinouts

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

A.1 Host CPU Boards

The following sections illustrate the connectors for the host boards designed for use in a Netra CT 410/810 server chassis.

A.1.1 Netra CP2140 Host CPU Board

FIGURE A-1 shows the locations of the connectors on the Netra CP2140 host CPU board.

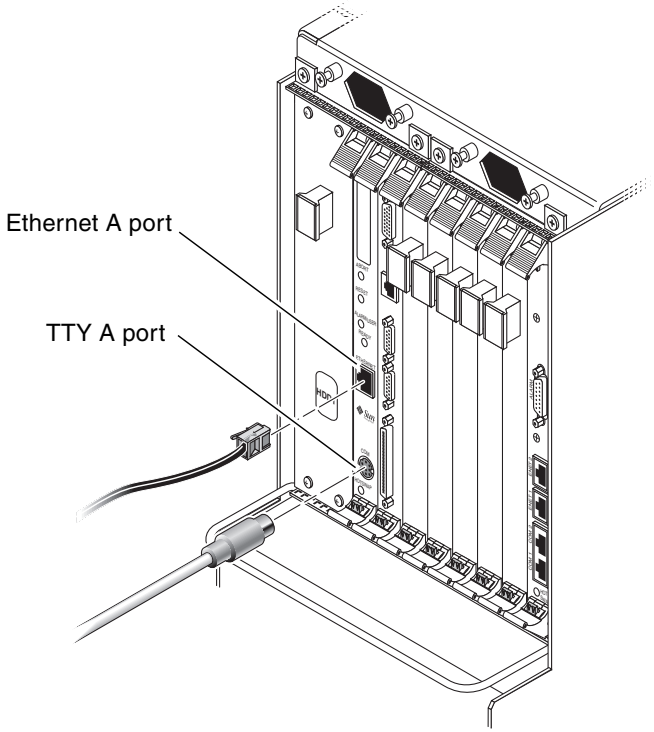

FIGURE A-1 Connectors on the Netra CP2140 Host CPU Board

A.1.1.1 Ethernet A Port

The twisted pair Ethernet connector is an RJ-45 connector. The controller auto-negotiates to either 10BASE-T or 100/1000 BASE-T.

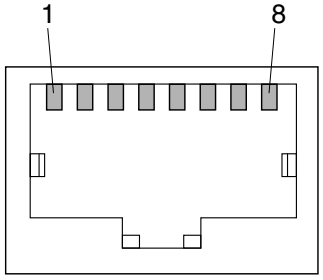

FIGURE A-2 RJ-45 Ethernet Connector Diagram

TABLE A-1 Ethernet Connector Pinouts, CPU Board (J2301)

Pin No.	Description
1	TXD+
2	TXD-
3	RXD+
4	4T_D3P
5	4T_D3P
6	RXD-
7	4T_D4P
8	4T_D4P

A.1.1.2 TTY A Port

This port is connected logically to serial port A. It is intended to be used only for serial output to a terminal.

Caution – Serial port A is connected through the rear cPCI connectors. No mechanism is provided to disable simultaneous input from the front panel and the rear cPCI connectors. Attempts to input data from both ports place the board in an unknown state.

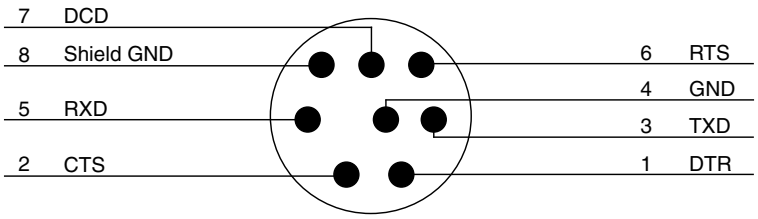

FIGURE A-3 TTY A Connector

TABLE A-2 shows the TTY A connector pinouts.

TABLE A-2 TTY A Connector Pinouts

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

A.1.2 Netra CP2500 Host CPU Board

FIGURE A-4 shows the locations of the connectors on the Netra CP2500 host CPU board.

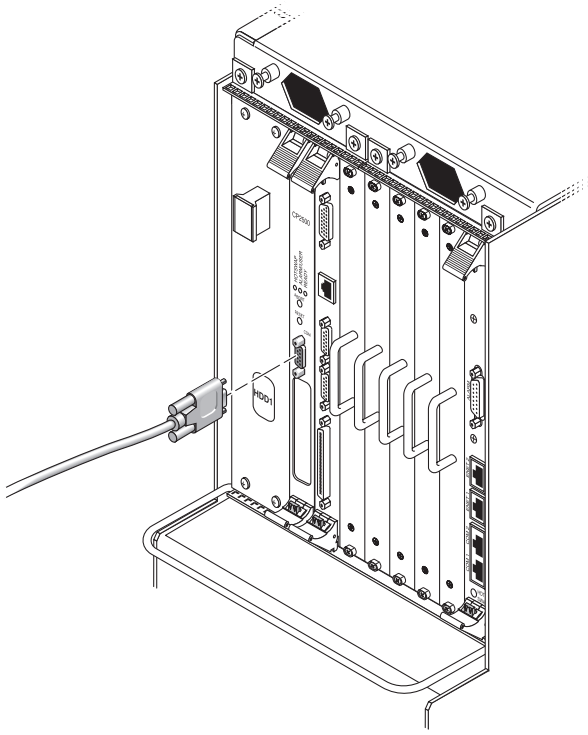

FIGURE A-4 Connectors on the Netra CP2500 Host CPU Board

A.1.2.1 PMC Connector

FIGURE A-5 and FIGURE A-6 show the location of PMC port connectors and pins. The following tables define contact allocations.

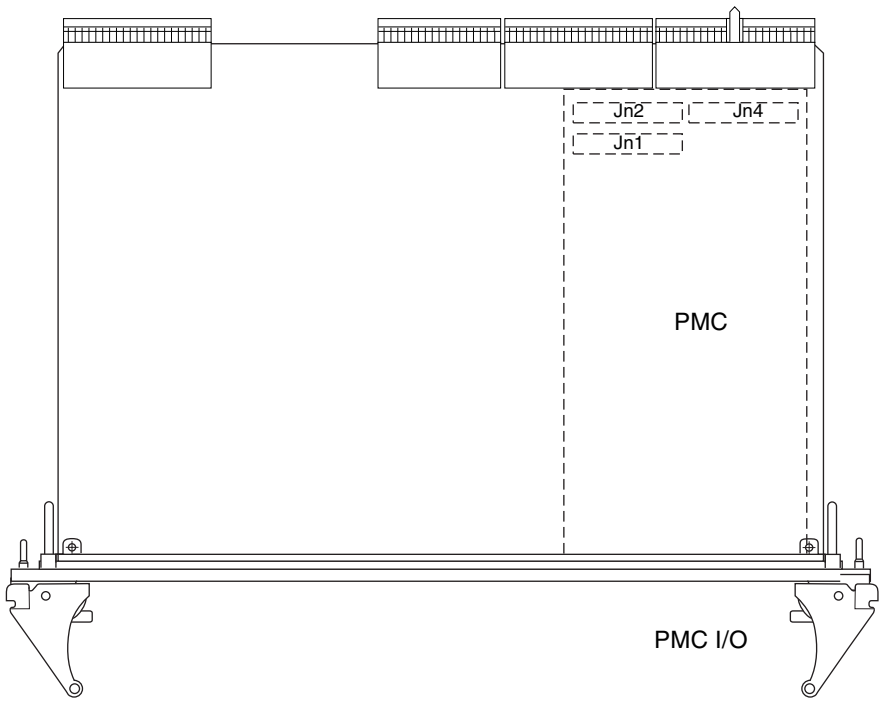

FIGURE A-5 Netra CP2500 Board PMC Port Connectors

Note – The P1386.1 standard reserves the Jn3 64-pin connector for PCI 64-bit extensions, so it is not fitted on the Netra CP2500 board.

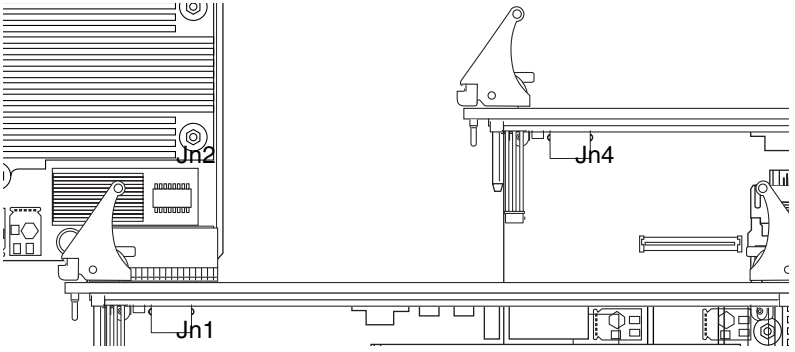

FIGURE A-6 PMC Connector Slot Connector Pins

A.1.2.2 PMC Connector Interfaces

Corresponding to the Common Mezzanine Card (CMC) specification, the PMC A slot is comprised of three PMC connectors – Jn1, Jn2, and Jn4. (The Jn3 connector is not fitted on the Netra CP2500 board.)

Note – Sun does not support installing a PIM device on either the RTM-S or the RTM-H.

The following tables list the PMC slot connector interfaces.

TABLE A-3 PMC Jn1 Connector Interface

Pin	Description	Pin	Description
1	Not connected	2	-12V
3	GND	4	PMC_A_INT_A_L
5	PMC_A_INT_B_L	6	PMC_A_INT_C_L
7	PMC_BUSMODE1_L[1]	8	VCC (5V)
9	PMC_A_INT_D_L	10	NC
11	GND	12	NC
13	PMC_CLK	14	GND
15	GND	16	PMC_GNT_L
17	PMC_REQ_L	18	VCC
19	LOCAL_VIO	20	PCI_B_AD<31>
21	PCI_B_AD<28>	22	PCI_B_AD<27>
23	PCI_B_AD<25>	24	GND
25	GND	26	PCI_B_CBE3_L
27	PCI_B_AD<22>	28	PCI_B_AD<21>
29	PCI_B_AD<19>	30	VCC
31	LOCAL_VIO	32	PCI_B_AD<17>
33	PCI_B_FRAME_L	34	GND
35	GND	36	PCI_B_IRDY_L
37	PCI_B_DEVSEL_L	38	VCC
39	GND	40	PCI_B_LOCK_L
41	PMC_SDONE	42	PMC_SB0_L

TABLE A-3 PMC Jn1 Connector Interface *(Continued)*

Pin	Description	Pin	Description
43	PCI_B_PAR	44	GND
45	LOCAL_VIO	46	PCI_B_AD<15>
47	PCI_B_AD<12>	48	PCI_B_AD<11>
49	PCI_B_AD<9>	50	VCC
51	GND	52	PCI_B_CBE_L<0>
53	PCI_B_AD<6>	54	PCI_B_AD<5>
55	PCI_B_AD<4>	56	GND
57	LOCAL_VIO	58	PCI_B_AD<3>
59	PCI_B_AD<2>	60	PCI_B_AD<1>
61	PCI_B_AD<0>	62	VCC
63	GND	64	PCI_B_REQ64_L

1 BUSMODE signals require a pull-up.

TABLE A-4 PMC Jn2 Connector Interface

Pin	Description	Pin	Description
1	+12V	2	JTAG_PMC_RST_L
3	TMS	4	PMC_TDO
5	PMC_TDI	6	GND
7	GND	8	NC
9	NC	10	NC
11	PMC_BUSMODE2_L	12	VDD (3.3V)
13	PCI_B_RST_L	14	PMC_BUSMODE3_L
15	VDD	16	PMC_BUSMODE4_L
17	NC	18	GND
19	PCI_B_AD<30>	20	PCI_B_AD<29>
21	GND	22	PCI_B_AD<26>
23	PCI_B_AD<24>	24	VDD
25	PCI_B_IDSEL	26	PCI_B_AD<23>
27	VDD	28	PCI_B_AD<20>
29	PCI_B_AD<18>	30	GND
31	PCI_B_AD<16>	32	PCI_B_CBE_L<2>
33	GND	34	NC
35	PCI_B_TRDY_L	36	VDD
37	GND	38	PCI_B_STOP_L
39	PCI_B_PERR_L	40	GND
41	VDD	42	PCI_B_SERR_L
43	PCI_B_CBE_L<1>	44	GND
45	PCI_B_AD<14>	46	PCI_B_AD<13>
47	GND	48	PCI_B_AD<10>
49	PCI_B_AD<8>	50	VDD
51	PCI_B_AD<7>	52	NC
53	VDD	54	NC
55	NC	56	GND
57	NC	58	NC

TABLE A-4 PMC Jn2 Connector Interface *(Continued)*

Pin	Description	Pin	Description
59	GND	60	NC
61	PCI_B_ACK64_L	62	VDD
63	GND	64	NC

Note – The P1386.1 standard reserves the Jn3 64-pin connector for PCI 64-bit extensions. It is not fitted on these boards.

TABLE A-5 PMC Jn4 Connector Interface

Pin	Description	Pin	Description
1	Not connected	2	Not connected
3	Not connected	4	Not connected
5	Not connected	6	Not connected
7	Not connected	8	Not connected
9	Not connected	10	Not connected
11	Not connected	12	Not connected
13	Not connected	14	Not connected
15	Not connected	16	Not connected
17	Not connected	18	Not connected
19	Not connected	20	Not connected
21	Not connected	22	Not connected
23	Not connected	24	Not connected
25	Not connected	26	Not connected
27	Not connected	28	Not connected
29	Not connected	30	Not connected
31	Not connected	32	Not connected
33	PMC_A_IO_33	34	PMC_A_IO_34
35	PMC_A_IO_35	36	PMC_A_IO_36
37	PMC_A_IO_37	38	PMC_A_IO_38
39	PMC_A_IO_39	40	PMC_A_IO_40
41	PMC_A_IO_41	42	PMC_A_IO_42

TABLE A-5 PMC Jn4 Connector Interface *(Continued)*

Pin	Description	Pin	Description
43	PMC_A_IO_43	44	PMC_A_IO_44
45	PMC_A_IO_45	46	PMC_A_IO_46
47	PMC_A_IO_47	48	PMC_A_IO_48
49	Not connected	50	Not connected
51	Not connected	52	Not connected
53	Not connected	54	Not connected
55	Not connected	56	Not connected
57	Not connected	58	Not connected
59	Not connected	60	Not connected
61	Not connected	62	Not connected
63	Not connected	64	Not connected

A.1.2.3 Front Panel Serial Connector

This section contains the pin assignments for the front panel serial port connector.

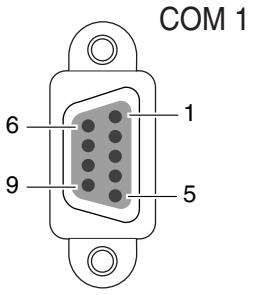

FIGURE A-7 Front Panel Serial Port Diagram

TABLE A-2 shows the serial port connector (TTYA) pin assignments.

TABLE A-6 Serial Micro DB9 Connector Pinouts

Pin	Signal Name	Pin	Signal Name
1	SER_DCD	6	SER_OSR
2	SER_RXD	7	SER_RTS
3	SER_TXD	8	SER_CTS
4	SER_DTR	9	SER_RI
5	SER_GND		

A.1.2.4 Backplane Connectors

FIGURE A-8 shows contact numbering as seen from the back of the Netra CT board.

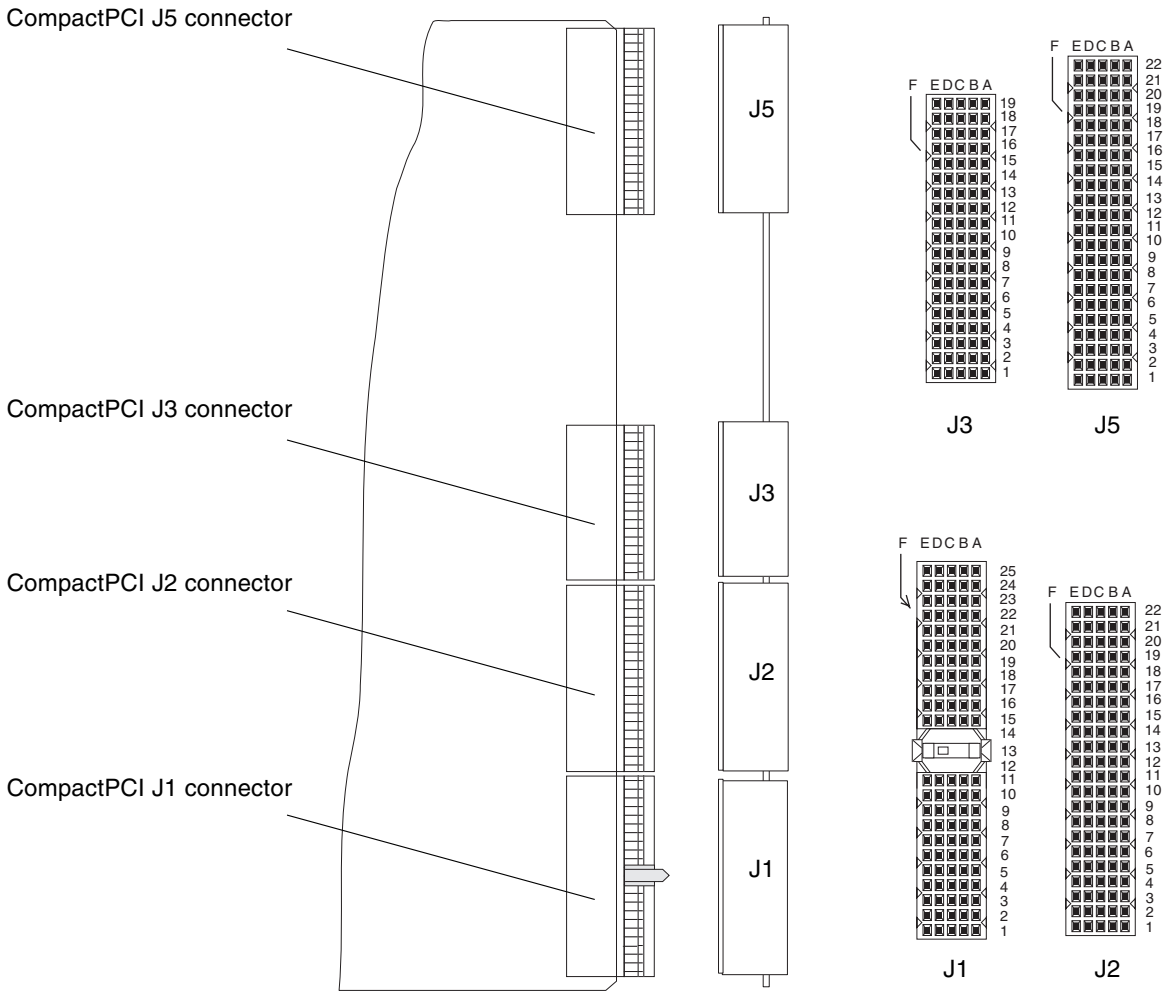

FIGURE A-8 Backplane Connector Contact Numbering

Note – The CompactPCI J4 connector is not populated on the Netra CP2500 board.

A.1.2.5 CompactPCI J1/P1 Connector Pinouts

TABLE A-7 lists the CompactPCI J1/P1 connector pin assignments.

TABLE A-7 CompactPCI J2/P2 Connector Pin Assignments

Pin	Row Z	Row A	Row B	Row C	Row D	Row E	Row F
25	GND	+EP_5V	CPCI_REQ64#	CPCI_ENUM#	+EP_3.3V	+EP_5V	GND
24	GND	CPCI_AD[1]	+EP_5V	LP_VIO/unused	CPCI_AD[0]	CPCI_ACK64#	GND
23	GND	+EP_3.3V	CPCI_AD[4]	CPCI_AD[3]	LP_+EP_5V	CPCI_AD[2]	GND
22	GND	CPCI_AD[7]	GND	LP_+EP_3.3V	CPCI_AD[6]	CPCI_AD[5]	GND
21	GND	+EP_3.3V	CPCI_AD[9]	CPCI_AD[8]	m66en	CPCI_C/BE[0]#	GND
20	GND	CPCI_AD[12]	GND	VIO[1] (+EP_SV)	CPCI_AD[11]	CPCI_AD[10]	GND
19	GND	+EP_3.3V	CPCI_AD[15]	CPCI_AD[14]	LP_GND	CPCI_AD[13]	GND
18	GND	CPCI_SERR#	GND	+EP_3.3V	CPCI_PAR	CPCI_C/BE[1]#	GND
17	GND	+EP_3.3V	IPMB_SCL	IPMB_SDA	LP_GND	CPCI_PERR#	GND
16	GND	CPCI_DEVSL#	GND	VIO* (+EP_SV)	CPCI_STOP#	lock#	GND
15	GND	+EP_3.3V	CPCI_FRAME#	CPCI_IRDY#	CPCI_BD_SEL#	CPCI_TRDY#	GND
14	Key						Key
13	Key						Key
12	Key						Key
11	GND	CPCI_AD[18]	CPCI_AD[17]	CPCI_AD[16]	LP_GND	CPCI_C/BE[2]#	GND
10	GND	CPCI_AD[21]	GND	+EP_3.3V	CPCI_AD[20]	CPCI_AD[19]	GND
9	GND	CPCI_C/BE[3]#	CPCI_IDSEL	CPCI_AD[23]	LP_GND	CPCI_AD[22]	GND
8	GND	CPCI_AD[26]	GND	VIO* (+EP_SV)	CPCI_AD[25]	CPCI_AD[24]	GND
7	GND	CPCI_AD[30]	CPCI_AD[29]	CPCI_AD[28]	LP_GND	CPCI_AD[27]	GND
6	GND	CPCI_REQ0#	PCI_PRES#	LP_+EP_3.3V	CPCI_CLK0	CPCI_AD[31]	GND
5	GND	BRSVP	BRSVP	CPCI_RST#	LP_GND	CPCI_GNT0#	GND
4	GND	IPMB_PWR	HEALTHY#_out	LP_VIO/unused	intp	ints	GND
3	GND	CPCI_INTA#	CPCI_INTB#	CPCI_INTC#	LP_+EP_5V	CPCI_INTD#	GND
2	GND	tck	+EP_5V	tms	tdo	tdi	GND
1	GND	+EP_5V	-EP_12V	trst#	+EP_12V	+EP_5V	GND

1 **Caution –** Backplane power (VIO) *must* be +EP_5V.

A.1.2.6 CompactPCI J1/P1 Signal Descriptions

Caution – Backplane power input (VIO) ***must*** be 5V.

TABLE A-8 CompactPCI J1/P1 Signal Descriptions

Signal Name	Description
+EP_5V	Backplane power input, EP_5V.
+EP_3.3V	Backplane power input, EP_3.3V.
+EP_12V	Backplane power input, EP_12V.
-EP_12V	Backplane power input, -EP_12V.
VIO	Backplane power input, which *must* be EP_5V.
LP_*	Long power pins. Refer to the PCIMG Hot Swap Spec R2.0, Section 4.2.1.
CPCI_RST#	cPCI reset.
CPCI_CLK[7..0]	cPCI clock. Provides timing for all cPCI transactions.
CPCI_AD[63..0]	cPCI bus Interface 64-bit multiplexed address and data.
CPCI_C/BE[7..0]#	cPCI bus command and byte enables; multiplexed on the same PCI signals.
CPCI_FRAME#	cPCI frame. Indicates the beginning of a PCI bus cycle.
CPCI_DEVSEL#	cPCI device select. Indicates PCI device response to selection.
CPCI_IRDY#	cPCI initiator ready. indicate bus master ability to complete the current data phase.
CPCI_TRDY#	cPCI target ready. Indicates target ability to complete the current data phase.
CPCI_STOP#	cPCI stop. Indicates initiator or target is requesting to stop the current transaction.
CPCI_IDSEL	cPCI initialization device select. Chip select during configuration read and write.
CPCI_REQ64#	cPCI request 64-bit transfer.
CPCI_ACK64#	cPCI Acknowledge 64-bit Transfer.
CPCI_PAR	cPCI parity bit. Calculated across AD[31..0] and C/BE[3..0].
CPCI_PERR#	Parity error.
CPCI_SERR#	cPCI system error.
CPCI_INT[A-D]	cPCI interrupts.
CPCI_REQ[7..0]#	cPCI request. Indicates to arbiter an agent desires use of the cPCI bus.
CPCI_GNT[7..0]#	cPCI grant. Indicates to agent access to the bus has been granted.
CPCI_BD_SEL#	PICMG 2.1 R1.0 hot-swap signal. Indicate board presence, SC drives to power on.
CPCI_ENUM#	PICMG 2.1 R1.0 hot-swap signal. Send or receive insertion or extraction event.

TABLE A-8 CompactPCI J1/P1 Signal Descriptions *(Continued)*

Signal Name	Description
HEALTHY#_out	PICMG 2.1 R1.0 hot-swap signal. Indicates health of the board, and signals to the SC that the board is suitable to be released from reset and enabled onto the bus.
IPMB_SCL	IPMI bus clock signal. Refer to the PCIMG 2.9 R1.0 cPCI System Management document.
IPMB_SDA	IPMI bus data signal. Refer to the PCIMG 2.9 R1.0 cPCI System Management document.
IPMB_PWR	Back-up power signal. Refer to the PCIMG 2.9 R1.0 cPCI System Management document.
PCI_PRES#	Indicates the backplane slot supports the cPCI interface.
m66en	66MHz cPCI bus speed enable; not supported.
lock#	cPCI Lock; not supported.
intp	Non-cPCI Interrupt; not supported.
ints	Non-cPCI Interrupt; not supported.
tck, tms, tdo, tdi	JTAG Signals; not supported, unconnected.
BRSVP	Backplane bused reserve pins, unconnected.

A.1.2.7 CompactPCI J2/P2 Connector Pinouts

TABLE A-9 lists the CompactPCI J2 connector pin assignments.

TABLE A-9 CompactPCI J2/P2 Connector Pin Assignments

Pin	Row Z	Row A	Row B	Row C	Row D	Row E	Row F
22	GND	CPCI_GA4	CPCI_GA3	CPCI_GA2	CPCI_GA1	CPCI_GA0	GND
21	GND	CPCI_CLK6	GND	RSV	RSV	rsv	GND
20	GND	CPCI_CLK5	GND	rsv	GND	rsv	GND
19	GND	GND	GND	rsv	rsv	rsv	GND
18	GND	BRSVP	BRSVP	BRSVP	GND	BRSVP	GND
17	GND	BRSVP	GND	BP_PB_RST#	CPCI_REQ6#	CPCI_GNT6#	GND
16	GND	BRSVP	BRSVP	DEG#	GND	BRSVP	GND
15	GND	BRSVP	GND	FAL#	CPCI_REQ5#	CPCI_GNT5#	GND
14	GND	CPCI_AD[35]	CPCI_AD[34]	CPCI_AD[33]	GND	CPCI_AD[32]	GND
13	GND	CPCI_AD[38]	GND	VIO/unused	CPCI_AD[37]	CPCI_AD[36]	GND
12	GND	CPCI_AD[42]	CPCI_AD[41]	CPCI_AD[40]	GND	CPCI_AD[39]	GND
11	GND	CPCI_AD[45]	GND	VIO/unused	CPCI_AD[44]	CPCI_AD[43]	GND
10	GND	CPCI_AD[49]	CPCI_AD[48]	CPCI_AD[47]	GND	CPCI_AD[46]	GND

TABLE A-9 CompactPCI J2/P2 Connector Pin Assignments *(Continued)*

Pin	Row Z	Row A	Row B	Row C	Row D	Row E	Row F
9	GND	CPCI_AD[52]	GND	VIO[1] (+EP_5V)	CPCI_AD[51]	CPCI_AD[50]	GND
8	GND	CPCI_AD[56]	CPCI_AD[55]	CPCI_AD[54]	GND	CPCI_AD[53]	GND
7	GND	CPCI_AD[59]	GND	VIO* (+EP_5V)	CPCI_AD[58]	CPCI_AD[57]	GND
6	GND	CPCI_AD[63]	CPCI_AD[62]	CPCI_AD[61]	GND	CPCI_AD[60]	GND
5	GND	CPCI_C/BE[5]#	CPCI_64_EN#	VIO* (+EP_5V)	CPCI_C/BE[4]#	CPCI_PAR64	GND
4	GND	rsv	BRSVP	CPCI_C/BE[7]#	GND	CPCI_C/BE[6]#	GND
3	GND	CPCI_CLK4	GND	CPCI_GNT3#	CPCI_REQ4#	CPCI_GNT4#	GND
2	GND	CPCI_CLK2	CPCI_CLK3	CPCI_SYSEN#	CPCI_GNT2#	CPCI_REQ3#	GND
1	GND	CPCI_CLK1	GND	CPCI_REQ1#	CPCI_GNT1#	CPCI_REQ2#	GND

1 **Caution –** Select VIO pins ***must*** be 5V, and *not* universal.

A.1.2.8 CompactPCI J2/P2 Signal Descriptions

Caution – Select VIO pins ***must*** be set to 5V, and *not* to universal.

TABLE A-10 CompactPCI J2/P2 Signal Descriptions

Signal Name	Description
CPCI_GA[4..0]	Geographical Address. Signals for unique slot identification.
BRSVP	Bused reserve pins.
PRST#	Backplane button reset input to SMC.
DEG#, FAL#	Power subsystem status signals input to SMC.
CPCI_64_EN#	PICMG hot-swap spec 2.1 R1.0 signal; designates 64-bit capability of backplane slot.
CPCI_PAR64	cPCI parity 64 bit; calculated across AD[63..32] and C/ BE[7..4]#.
CPCI_SYSEN#	System slot identification, grounded on the cPCI system slot.

A.1.2.9 CompactPCI J3/P3 Connector Pinouts

TABLE A-11 lists the CompactPCI J3 connector pin assignments.

TABLE A-11 CompactPCI J3/P3 Connector Pin Assignments

Pin	Row Z	Row A	Row B	Row C	Row D	Row E	Row F
19	GND	RTM GND	RTM GND	RTM GND	RTM GND	RTM GND	GND
18	GND	PSB_A_TX_POS	PSB_A_TX_NEG	GND	GbE_A_TX_POS	GbE_A_TX_NEG	GND
17	GND	PSB_A_RX_POS	PSB_A_RX_NEG	GND	GbE_A_RX_POS	GbE_A_RX_NEG	GND
16	GND	PSB_B_TX_POS	PSB_B_TX_NEG	GND	GbE_B_TX_POS	GbE_B_TX_NEG	GND
15	GND	PSB_B_RX_POS	PSB_B_RX_NEG	GND	GbE_B_RX_POS	GbE_B_RX_NEG	GND
14	GND	RTM +3.3V	RTM +3.3V	RTM +3.3V	RTM +3.3V	RTM +3.3V	GND
13	GND	PCI A AD[31]	PCI A AD[30]	PCI A AD[29]	PCI A AD[28]	PCI A AD[27]	GND
12	GND	PCI A AD[26]	PCI A AD[25]	PCI A AD[24]	PCI A AD[23]	PCI A AD[22]	GND
11	GND	PCI A AD[21]	PCI A AD[20]	PCI A AD[19]	PCI A AD[18]	PCI A AD[17]	GND
10	GND	PCI A AD[16]	PCI A AD[15]	PCI A AD[14]	PCI A AD[13]	PCI A AD[12]	GND
9	GND	PCI A AD[11]	PCI A AD[10]	PCI A AD[9]	PCI A AD[8]	PCI A AD[7]	GND
8	GND	PCI A AD[6]	PCI A AD[5]	PCI A AD[4]	PCI A AD[3]	PCI A AD[2]	GND
7	GND	PCI A AD[1]	PCI A AD[0]	PCI A FRAM#	PCI A DVSL#	PCI A IRDY#	GND
6	GND	PCI A CBE0#	healthy_BP_RSV	PCI A CBE1#	PCI A TRDY#	PCI A STOP#	GND
5	GND	RTM SCA INT#	healthy_BP_RSV	RTM NTB INT#	PCI A PAR	PCI A CBE3#	GND
4	GND	RTM SCB INT#	healthy_BP_RSV	RTM NTA INT#	PCI A CBE2#	PCI A RTM CLKB	GND
3	GND	PCI A GNT 1#	healthy_BP_RSV	PCI A REQ1#	PCI A RST#	PCI A SERR#	GND
2	GND	PCI A GNT 2#	healthy_BP_RSV	PCI A REQ2#	SMC_3P3V	healthy_BP_RSV	GND
1	GND	Vdd 2.5V	healthy_BP_RSV	PCI A 66EN	PCI A RTM CLKA	PCI A PERR#	GND

A.1.2.10 CompactPCI J3/P3 Signal Descriptions

TABLE A-12 CompactPCI J3/P3 Signal Descriptions

Signal Name	Description
GbE/PSB_TX/RX_POS/NEG	PICMG 2.16 node board 10/100/1000 network signals.
32-bit PCI bus	32-bit PCI bus signaling and additional power pins to support SCSI controller on RTM-H. Optional.

A.1.2.11 CompactPCI J5/P5 Connector Pinouts

TABLE A-13 lists the CompactPCI J5 connector pin assignments.

TABLE A-13 CompactPCI J5/P5 Connector Pin Assignments

Pin	Row Z	Row A	Row B	Row C	Row D	Row E	Row F
22	GND	RSV	GND	No Connect	+5V	BP_XIR#	GND
21	GND	P1 LINKLED#	P1 ACTLED#	P2 LINKLED#	RTM I2C SCL	P2 ACTLED#	GND
20	GND	+5V	RSV	RSV	RTM I2C SDA	+12V	GND
19	GND	RSV	GND	VCC	SMC PWR	-12V	GND
18	GND	RSV	RSV	RSV	GND	+5V	GND
17	GND	RSV	RSV	RSV	RSV	RSV	GND
16	GND	RSV	RSV	RSV	RSV	RSV	GND
15	GND	RSV	RSV	RSV	RSV	RSV	GND
14	GND	RTSA	CTSA	RIA	GND	DTRA	GND
13	GND	DCDA	+5V	RXDA	DSRA	TXDA	GND
12	GND	RTSB	CTSB	RIB	+5V	DTRB	GND
11	GND	DCDB	GND	RXDB	DSRB	TXDB	GND
10	GND	PMC IO[36]	PMC IO[45]	PMC IO[47]	PMC IO[46]	PMC IO[48]	GND
9	GND	PMC IO[34]	PMC IO[41]	PMC IO[43]	PMC IO[42]	PMC IO[44]	GND
8	GND	PMC IO[35]	PMC IO[37]	PMC IO[39]	PMC IO[38]	PMC IO[40]	GND
7	GND	PMC IO[33]	RSV	RSV	RSV	RSV	GND
6	GND	RSV	GND	RSV	RSV	RSV	GND
5	GND	RSV	RSV	RSV	RSV	RSV	GND
4	GND	RSV	RSV	GND	RSV	RSV	GND
3	GND	RSV	RSV	RSV	RSV	RSV	GND
2	GND	RSV	RSV	RSV	RSV	RSV	GND
1	GND	RSV	RSV	RSV	RSV	RSV	GND

A.1.2.12 CompactPCI J5/P5 Signal Descriptions

TABLE A-14 lists the serial COM port (A and B) and RS232 level signal descriptions.

TABLE A-14 Serial COM Port and RS232 Level CompactPCI J5/P5 Signal Descriptions

Pin Signal	Description
CTS	Clear to send.
DCD	Data carrier detected.
DSR	Data set ready.
DTR	Data terminal ready.
RI	Ring indicator.
RTS	Request to send.
RXD	Serial receive data.
TXD	Serial transmit data.

FIGURE A-9 lists the miscellaneous signal descriptions.

TABLE A-15 Miscellaneous CompactPCI J5/P5 Signal Descriptions

Pin Signal	Description
BP_XIR_L	Button reset system input. Active low.

A.1.2.13 DIP Switch Settings

The Netra CP2500 board contains two DIP switches on one bank. The SW3301 DIP switch bank is located on the component side of the board between the front panel and heat sink (see FIGURE A-9). TABLE A-16 describes these switch settings.

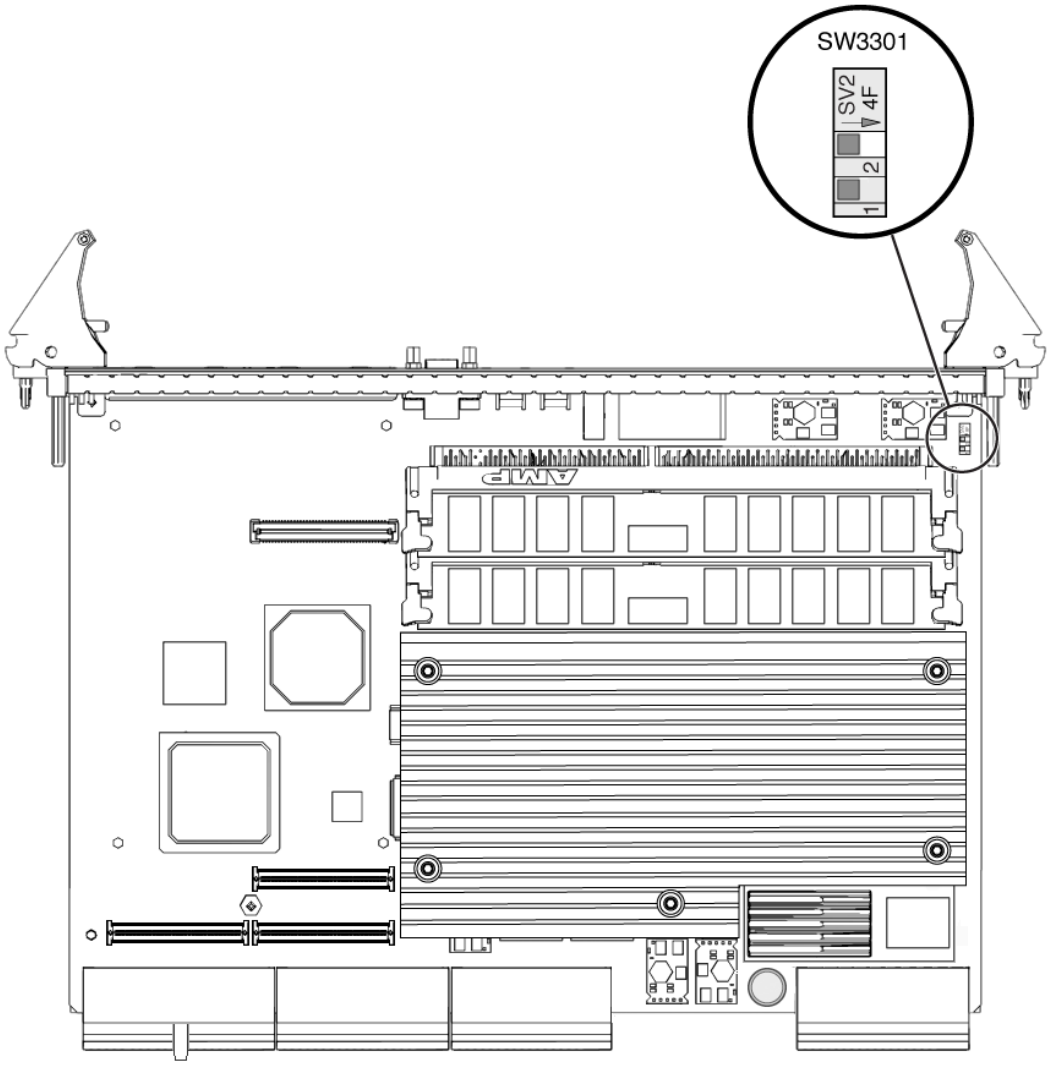

FIGURE A-9 SW3301 DIP Switch Location

Note – By default, the SW3301 DIP switches are both set in an *open* position, which means they are set in the opposite direction of the arrow. FIGURE A-9 shows the two switches in the default, open position.

TABLE A-16 SW3301 Switch Descriptions

Switch	Switch Setting	Description
1	Open	Boot the board from the main OpenBoot PROM image (default setting)
	Closed	Boot the board from the backup OpenBoot PROM image in the system flash
2	Open	Board is set to operate in a cPCI server (default setting)
	Closed	Board is set to operate in a cPSB chassis

Note – When switch 2 is set to the *closed* position (the cPSB chassis setting), the board's cPCI bridge will not be taken out of reset.

Note – The Netra CP2500 board is only supported in a Netra CT 410 server, Netra CT 810 server, or a third-party cPSB chassis. Sun does not support operating the Netra CP2500 board in a third-party cPCI server.

A.2 Host Rear Transition Modules

The following are possible *host* board and rear transition module combinations:

- Netra CP2140 and Netra CPU transition card (CTC, hereafter referred to as rear transition module)
- Netra CP2500 and Netra CP2500 RTM-H (rear transition module-host)

A.2.1 Netra CP2140 Host RTMs

FIGURE A-10 shows the locations of the connectors on the Netra CP2140 rear transition module. When using the Netra CP2140 host board, the RTM is the same for both the Netra CT 810 server and the Netra CT 410; only the location in the rear board cage differs.

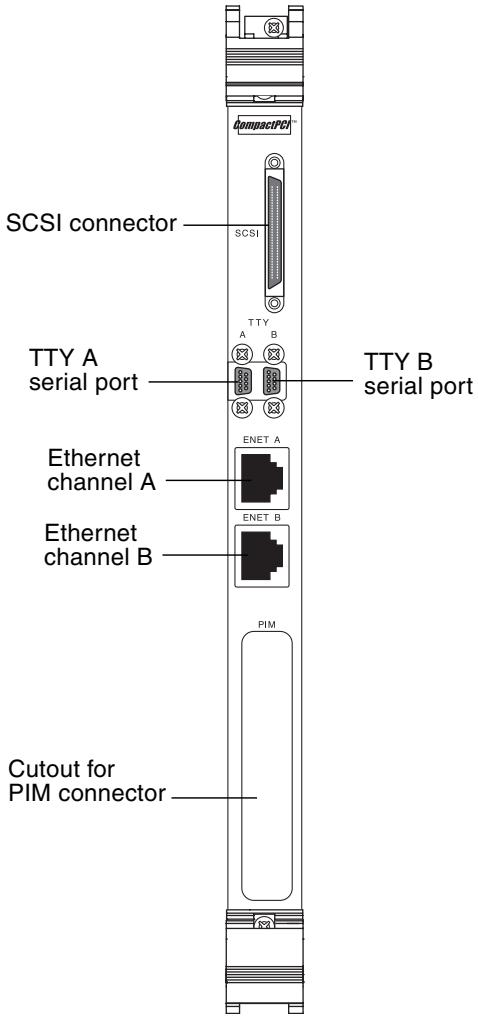

FIGURE A-10 Connectors on the Netra CP2140 Rear Transition Module

A.2.1.1 SCSI (VHDC)

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

TABLE A-17 SCSI Port Pinouts, CPU RTC

Pin No.	Signal	Pin No.	Signal	Pin No.	Signal
1	GND	24	GND	47	DATA 7
2	PRES_L	25	GND	48	PL_L
3	GND	26	GND	49	PRES_L
4	GND	27	GND	50	GND
5	GND	28	GND	51	TERM PWR
6	GND	29	GND	52	TERM PWR
7	GND	30	GND	53	GND
8	GND	31	GND	54	GND
9	GND	32	GND	55	ATN_L
10	GND	33	GND	56	GND
11	GND	34	GND	57	BSY_L
12	GND	35	DATA 12	58	ACK_L
13	GND	36	DATA 13	59	RST_L
14	GND	37	DATA 14	60	MSG_L
15	GND	38	DATA 15	61	DEL_L
16	GND	39	PH_L	62	CD_L
17	TERM PWR	40	DATA 0	63	REQ_L
18	TERM PWR	41	DATA 1	64	IO_L
19	GND	42	DATA 2	65	DATA 8
20	GND	43	DATA 3	66	DATA 9
21	GND	44	DATA 4	67	DATA 10
22	GND	45	DATA 5	68	DATA 11
23	GND	46	DATA 6		

A.2.1.2 TTY A and B Ports

The TTY A and B ports are stacked mini 9-pin connectors. The signal interface of the connector is as follows.

TABLE A-18 Signal Interfaces for TTY A and B Port Connectors

TTY A of Dual Connector		TTY B of Dual Connector	
Pin	**Signal**	**Pin**	**Signal**
P1A	DCDA	P1B	DCDB
P2A	RXDA	P2B	RXDB
P3A	TXDA	P3B	TXDB
P4A	DTRA	P4B	DTRB
P5A	DGNDA	P5B	DGNDB
P6A	DSRA	P6B	DSRB
P7A	RTSA	P7B	RTSB
P8A	CTSA	P8B	CTSB
P9A	RIA	P9B	RIB

Note – The two TTY ports require the use of specific adapter cables. Use the Serial Cable Adapter, MDSM-9F to DB9M, (6 inch, 9 wires), P/N C-CEL-10110-10. The manufacturer is Computer Cable Makers Inc. and cables can be ordered directly from the manufacturer.

A.2.1.3 Ethernet A and B Ports

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

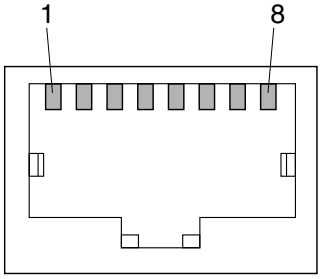

FIGURE A-11 RJ-45 Ethernet Connector Diagram

TABLE A-19 Ethernet A and B Connector Pinouts, CPU RTM

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

A.2.1.4 PIM Module Interface

The host CPU rear transition module supports a PCI mezzanine card (PMC) I/O module (PIM). A PIM is generally located on a rear transition module to enable rear I/O from the CompactPCI bus chassis. Custom PIMs provide additional I/Os that do not fit on the standard rear transition module rear panel. (For more information on PIM slot mechanics, electrical and logical information, refer to *VITA 36 - PMC I/O Module Standard* available `http://www.vita.com` and the *IEEE P1386 Standard*). The single-sized PIM measures 2.92 inches (74 mm) wide and 2.72 inches (69 mm) deep.

The PIM module must be mounted on the host CPU rear transition module *before* the rear transition module is inserted in a Netra CT server.

Caution – A PIM module must be used with its matching PMC. Any other combination could lead to damage of the PIM or PMC.

A.2.2 Netra CP2500 Host RTMs

FIGURE A-12 shows connectors on the Netra CP2500 host rear transition module (RTM-H). When using the Netra CP2500 host board, the RTM-H is the same for both the Netra CT 810 server and the Netra CT 410; only the location in the rear board cage differs.

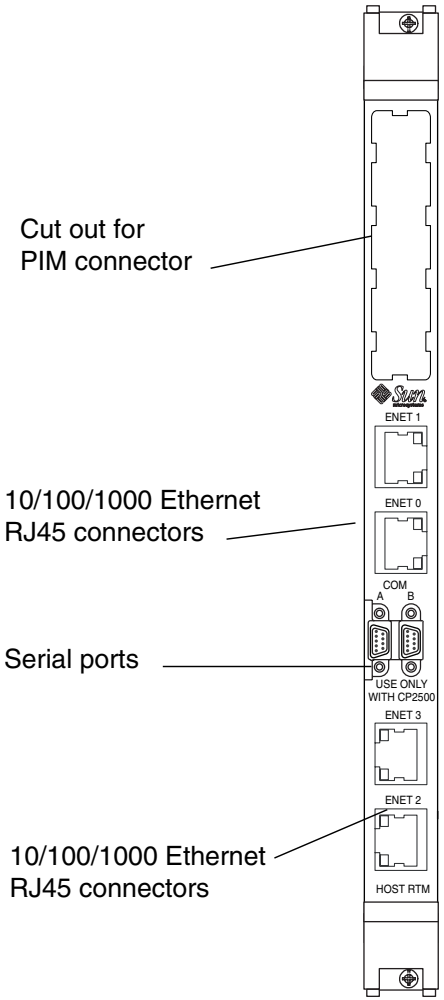

FIGURE A-12 Connectors on the Netra CP2500 Rear Transition Module-Host (RTM-H)

A.2.2.1 Serial Ports

Two serial ports from the Netra CP2500 transition module are available through the rear panel with single-stacked, 9-pin connectors. One connector is assigned to Port A and the other connector to Port B (FIGURE A-13).

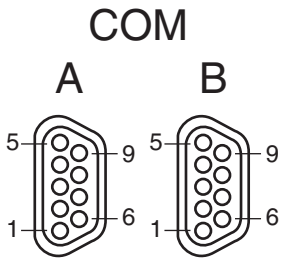

FIGURE A-13 Serial Port Connector Pins

The signal interface of the connectors are described in the following two tables.

TABLE A-20 Serial Port A

Pin	Signal
1	SER_A_DCD
2	SER_A_RXD
3	SER_A_TXD
4	SER_A_DTR
5	GND_A
6	SER_A_DSR
7	SER_A_RTS
8	SER_A_CTS
9	SER_A_RI

TABLE A-21 Serial Port B

Pin	Signal
1	SER_B_DCD
2	SER_B_RXD
3	SER_B_TXD

TABLE A-21 Serial Port B *(Continued)*

Pin	Signal
4	SER_B_DTR
5	GND_B
6	SER_B_DSR
7	SER_B_RTS
8	SER_B_CTS
9	SER_B_RI

A.2.2.2 Ethernet Connectors

Two single-jack RJ45 XFMRS XFGIB look-CLYGI-4MS Ethernet connectors and two single-jack RJ45 Amphenol RJH55381 Ethernet conectors located on the transition module's back panel, provide two 10/100/1000 Mbps Ethernet ports.

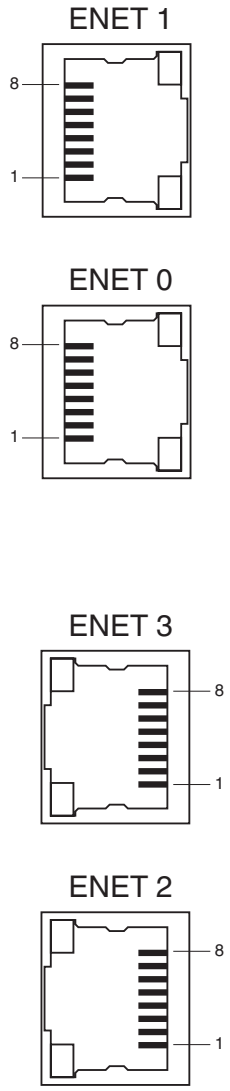

FIGURE A-14 Ethernet Port Connector Pins

Ethernet ports, ENET0 and ENET1 are not available if the Netra CP2500 board is set to use the chassis's packet-switched backplane (PSB) Ethernet network. In order to use the transition module's Ethernet connectors, you must set the S1301 and S1302 switches to the On position (see FIGURE A-16), which is their default position.

TABLE A-22 lists the pin assignments for the two RJ45 XFMRS XFGIB look-CLYGI-4MS Ethernet connectors.

TABLE A-22 ENET0 and ENET1

ENET0		ENET1	
Pin	**Signal**	**Pin**	**Signal**
1	TRDP0	1	TRDP0
2	TRDN0	2	TRDN0
3	TRDP1	3	TRDP1
4	TRDP2	4	TRDP2
5	TRDN2	5	TRDN2
6	TRDN1	6	TRDN1
7	TRDP3	7	TRDP3
8	TRDN3	8	TRDN3

TABLE A-23 lists the pin assignments for the two single-jack RJ45 Amphenol RJH55381 Ethernet conectors.

TABLE A-23 ENET2 and ENET3

ENET3		ENET4	
Pin	**Signal**	**Pin**	**Signal**
1	TRDP0	1	TRDP0
2	TRDN0	2	TRDN0
3	TRDP1	3	TRDP1
4	TRDP2	4	TRDP2
5	TRDN2	5	TRDN2
6	TRDN1	6	TRDN1
7	TRDP3	7	TRDP3
8	TRDN3	8	TRDN3

A.2.2.3 On-Board Interfaces and Connectors on the Netra CP2500 Transition Module

FIGURE A-15 shows the on-board interfaces and connectors on the RTM-H. FIGURE A-16 shows the on-board interfaces and connectors on the RTM-S. The numbers in parentheses display how the interfaces are labeled on the transition module.

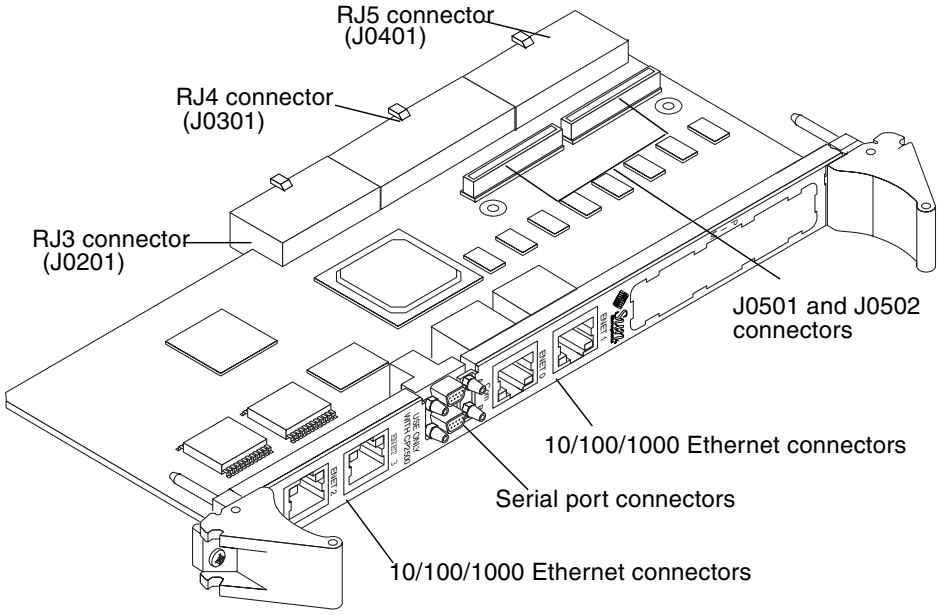

FIGURE A-15 On-Board Connectors and Interfaces for the Netra CP2500 RTM-H

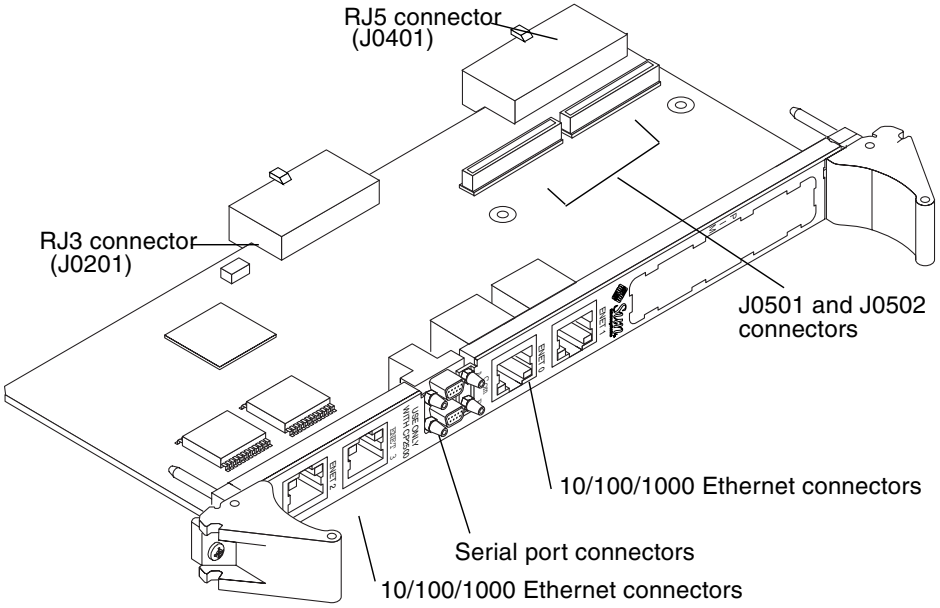

FIGURE A-16 On-Board Connectors and Interfaces for the Netra CP2500 RTM-S

I²C Serial Bus Access Header

The I²C serial bus is routed onto the Netra CP2500 RTM through the RJ5 backplane connector (which is labeled as J0401 on the transition module). The Netra CP2500 transition module I²C bus supports one I²C function–providing information about itself through nonvolatile memory. FIGURE A-17 shows the I²C serial bus access header J1502and TABLE A-24 lists the pin assignments.

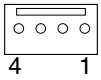

FIGURE A-17 I²C Serial Bus Access Header Pins

TABLE A-24 I²C Serial Bus Access Header Pin Assignments

Pin	Signal
1	12C_PWR (SMC 3.3V)
2	RTM_SDA (Data/Address)
3	RTM_SCL (Clock)
4	GND

J0501 and J0502 Connectors

The PIM slot has two 64-pin connectors, J0501 and J0502. See FIGURE A-15 and FIGURE A-16 for the location of these connectors on the RTMs. See FIGURE A-18 for the connector pin numbering.

Note – PIM cards are not currently supported.

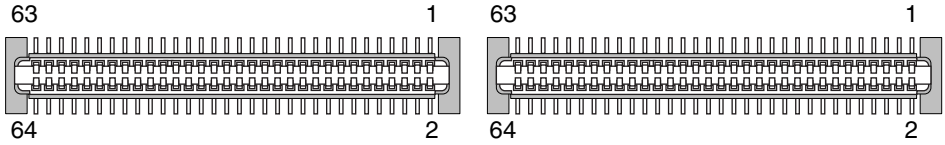

FIGURE A-18 J0501 and J0502 Connector Pins

J0501 and J0502 Connector Pin Assignments

TABLE A-25 lists the pin assignments for the J0501 connector, and TABLE A-26 lists the pin assignments for the J0502 connector.

TABLE A-25 J0501 Pin Assignments

Signal Name	Pin	Pin	Signal Name
None	1	2	None
None	3	4	None
None	5	6	None
None	7	8	None
None	9	10	None
None	11	12	None
None	13	14	None
None	15	16	None
None	17	18	None
None	19	20	None
None	21	22	None
None	23	24	None
None	25	26	None
None	27	28	None

TABLE A-25 J0501 Pin Assignments *(Continued)*

Signal Name	Pin	Pin	Signal Name
None	29	30	None
None	31	32	None
PMCIO<33>	33	34	PMCIO<34>
PMCIO<35>	35	36	PMCIO<36>
PMCIO<37>	37	38	PMCIO<38>
PMCIO<39>	39	40	PMCIO<40>
PMCIO<41>	41	42	PMCIO<42>
PMCIO<43>	43	44	PMCIO<44>
PMCIO<45>	45	46	PMCIO<46>
PMCIO<47>	47	48	PMCIO<48>
None	49	50	None
None	51	52	None
None	53	54	None
None	55	56	None
None	57	58	None
None	59	60	None
None	61	62	None
None	63	64	None

TABLE A-26 J0502 Pin Assignments

Signal Name	Pin	Pin	Signal Name
None	1	2	+12V
None	3	4	None
+5V	5	6	None
None	7	8	None
None	9	10	+3.3V
None	11	12	None
GND	13	14	None
None	15	16	None
None	17	18	GND

TABLE A-26 J0502 Pin Assignments *(Continued)*

Signal Name	Pin	Pin	Signal Name
None	19	20	None
+5V	21	22	None
None	23	24	None
None	25	26	+3.3V
None	27	28	None
GND	29	30	None
None	31	32	None
None	33	34	GND
None	35	36	None
+5V	37	38	None
None	39	40	None
None	41	42	+3.3V
None	43	44	None
GND	45	46	None
None	47	48	None
None	49	50	GND
None	51	52	None
+5V	53	54	None
None	55	56	None
None	57	58	+3.3V
None	59	60	None
+12V	61	62	None
None	63	64	None

A.2.2.4 Backplane Interfaces

The Netra CP2500 RTM-H interfaces to the bus through the CompactPCI RJ3 (labeled as J0201 on the transition module), RJ4 (J0301), and RJ5 (J0401) backplane connectors. The Netra CP2500 RTM-S interfaces to the bus through the Compact PCI RJ3 (labeled as J0201 on the transition module) and RJ5 (J0401) connectors. The pin assignments for these three sets of connectors are provided in this section.

CompactPCI RJ3 Connector (J0201)

TABLE A-27 shows the pin assignments for the CompactPCI RJ3 connector. This connector is labeled J0201 on the RTM. (See FIGURE A-16 for the location).

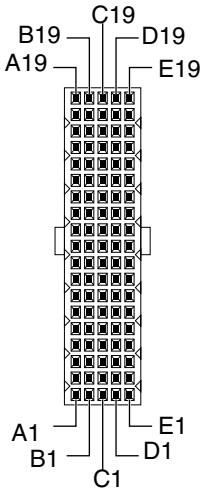

FIGURE A-19 CompactPCI RJ3 Connector (J0201) Pins

TABLE A-27 CompactPCI RJ3 Connector (J0201) Pin Assignments

Pin #	Row A	Row B	Row C	Row D	Row E
19	GND	GND	GND	GND	GND
18	A_TRD_0P	A_TRD_0N	GND	A_TRD_2P	A_TRD_2N
17	A_TRD_1P	A_TRD_1N	GND	A_TRD_3P	A_TRD_3N
16	B_TRD_0P	B_TRD_0N	GND	B_TRD_2P	B_TRD_2N
15	B_TRD_1P	B_TRD_1N	GND	B_TRD_3P	B_TRD_3N
14	+3.3V	+3.3V	+3.3V	+5V	+5V
13	PCI_AD<31>	PCI_AD<30>	PCI_AD<29>	PCI_AD<28>	PCI_AD<27>
12	PCI_AD<26>	PCI_AD<25>	PCI_AD<24>	PCI_AD<23>	PCI_AD<22>
11	PCI_AD<21>	PCI_AD<20>	PCI_AD<19>	PCI_AD<18>	PCI_AD<17>
10	PCI_AD<16>	PCI_AD<15>	PCI_AD<14>	PCI_AD<13>	PCI_AD<12>
9	PCI_AD<11>	PCI_AD<10>	PCI_AD<9>	PCI_AD<8>	PCI_AD<7>
8	PCI_AD<6>	PCI_AD<5>	PCI_AD<4>	PCI_AD<3>	PCI_AD<2>

TABLE A-27 CompactPCI RJ3 Connector (J0201) Pin Assignments *(Continued)*

Pin #	Row A	Row B	Row C	Row D	Row E
7	PCI_AD<1>	PCI_AD<0>	PCI_FRAME_N	PCI_DEVSEL_N	PCI_IRDY_N
6	PCI_CBE<0>	RSV_HLTH<5>	PCI_CBE<1>	PCI_TRDY_N	PCI_STOP_N
5	PCI_SC_INTA_N	RSV_HLTH<4>	PCI_NT_INTB_N	PCI_PAR	PCI_CBE<3>
4	PCI_SC_INTB_N	RSV_HLTH<3>	PCI_NT_INTA_N	PCI_CBE<2>	PCI_RTM_CLKB
3	PCI_GNT__N<1>	RSV_HLTH<2>	PCI_REQ_N<1>	PCI_RST_N	PCI_SERR<N>
2	PCI_GNT__N<2>	RSV_HLTH<1>	PCI_REQ_N<2>	SMC_3.3V	RSV_HLYH<6>
1	+2.5V	RSV_HLTH<0>	PCI_M66EN	PCI_RTM_CLKA	PCI_PERR_N

Note – The pin assignments for every pin in rows F and Z are ground.

CompactPCI RJ4 Connector (J0301)

TABLE A-28 shows the pin assignments for the CompactPCI RJ4 connector. This connector is labeled J0301 on the RTM. (See FIGURE A-16 for the location).

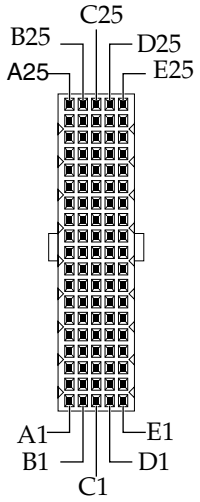

FIGURE A-20 CompactPCI RJ4 Connector (J0301) Pins

TABLE A-28 CompactPCI RJ4 Connector (J0301) Pin Assignments

Pin #	Row A	Row B	Row C	Row D	Row E
25	MII_A_CRS	MII_A_COL	EXT_MII_A_MDIO	MII_A_TX_ER	N/C
24	MII_A_RX_DV	MII_A_RX_ER	MII_A_TX_CLKI	GND	MCA_INT_L
23	MII_A_RXD1	MII_A_RXD2	GND	MII_A_RXD3	MII_A_RX_CLK
22	GND	MII_A_TXD0	MII_A_TX_EN	MII_A_MGT_CLK	MII_A__RXD0
21	MII_A_TXD3	GND	MII_A_TXD2	GND	MII_A_TXD1
20	N/C	N/C	LOCAL_12C_INT_L	GND	RIO_A_PHY_EN
19	MII_B_COL	EXT_MII_B_MDIO	MII_B-TX_ER	N/C	N/C
18	MII_B_RX_CLK	MII_B_RX_DV	MII_B_RX_ER	MII_B_TX_CLKI	MII_B_CRS
17	MII_B_RXD0	GND	MII_B_RXD1	MII_B_RXD2	MII_B_RXD3
16	MII_B_TXD1	MII_B_TXD0	MII_B_TX_EN	MII_B_MGT_CLK	GND
15	GND	N/C	N/C	MII_B_TXD3	MII_B_TXD2
11	TYPE0	TYPE1	J4_12C_SDA	GND	GND
10	SMC_TX	SMC_RX	PWROFF	N/C	N/C
9	GND	GND	J4_12C_SCL	TERMPWR_A	TERMPWR_B
8	A_SCSI_DP<1>	A_SCSI_D<15>	A_SCSI_D<14>	A_SCSI_D<13>	A_SCSI_D<12>
7	A_SCSI_D<4>	A_SCSI_D<3>	A_SCSI_D<2>	A_SCSI_D<1>	A_SCSI_D<0>
6	GND	A_SCSI_DP<0>	A_SCSI_D<7>	A_SCSI_D<6>	A_SCSI_D<5>
5	GND	CRTM_PRES_L	N/C	N/C	N/C
4	A_SCSI_RST_L	A_SCSI_ACK_L	A_SCSI_BSY_L	GND	A_SCSI_ATN_L
3	A_SCSI_IO_L	A_SCSI_REQ_L	A_SCSI_CD_L	A_SCSI_SEL_L	A_SCSI_MSG_L
2	TERMA_DIS_L	A_SCSI_D<11>	A_SCSI_D<10>	A_SCSI_D<9>	A_SCSI_D<8>
1	N/C	N/C	N/C	N/C	GPIO_J431

CompactPCI RJ5 Connector (J0401)

TABLE A-29 shows the pin assignments for the CompactPCI RJ5 connector. This connector is labeled J0401 on the transition module. (See FIGURE A-16 for the location).

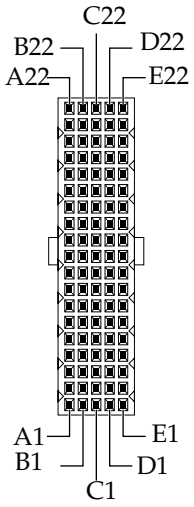

FIGURE A-21 CompactPCI RJ5 Connector (J0401) Pins

TABLE A-29 CompactPCI RJ5 Connector (J0401) Pin Assignments

Pin #	Row A	Row B	Row C	Row D	Row E
22	XBACK_RST_IN_N	GND	DIAG_N_OC	+5V	BP_XIR_N
21	CPSB_A_LNK_N	CPSB_A_ACT_N	CPSB_B_LNK_N	RTM_SCL	CPSB_B_ACT_N
20	+5V			RTM_SDA	+12V
19	RSV_PAR_DS_N	GND	+5V	N/C	-12V
18	RSV_PAR_AUTO_FD_N			GND	+5V
17	RSV_PAR_DATA<2>	RSV_PAR_INIT_N	RSV_PAR_DATA <1>	RSV_PAR_ERROR_N	RSV_PAR_DATA <0>
16	RSV_PAR_DATA<6>	RSV_PAR_DATA <5>	RSV_PAR_DATA <4>	RSV_PAR_DATA <3>	RSV_PAR_SLIN_N
15	RSV_PAR_SEL_N	RSV_PAR_PE	RSV_PAR_BUSY	RSV_PAR_ACK_N	RSV_PAR_DATA <7>
14	A_RTS	A_CTS	A_RI	GND	A_DTR
13	A_DCD	+5V	A_RXD	A_DSR	A_TXD
12	B_RTS	B_CTS	B_RI	+5V	B_DTR
11	B_DCD	GND	B_RXD	B_DSR	B_TXD

TABLE A-29 CompactPCI RJ5 Connector (J0401) Pin Assignments *(Continued)*

Pin #	Row A	Row B	Row C	Row D	Row E
10	PMCIO<36>	PMCIO<45>	PMCIO<47>	PMCIO<46>	PMCIO<48>
9	PMCIO<34>	PMCIO<41>	PMCIO<43>	PMCIO<42>	PMCIO<44>
8	PMCIO<35>	PMCIO<37>	PMCIO<39>	PMCIO<38>	PMCIO<40>
7	PMCIO<33>	B_SCSI_D<2>	B_SCSI_D<1>	B_SCSI_D<0>	PMCIOC
6	B_SCSI_D<6>	GND	B_SCSI_D<5>	B_SCSI_D<4>	B_SCSI_D<3>
5	B_SCSI_D<10>	B_SCSI_D<9>	B_SCSI_D<8>	B_SCSI_DP<0>	B_SCSI_D<7>
4	B_SCSI_D<13>	B_SCSI_D<12>	GND	PMCIOB	B_SCSI_D<11>
3	TERMB_DIS_L	B_SCSI_DP<1>	B_SCSI_D<15>	PMCIOA	B_SCSI_D<14>
2	B_SCSI_IO_L	B_SCSI_REQ_L	B_SCSI_CD_L	B_SCSI_SEL_L	B_SCSI_MSG_L
1	XBACK_RST_OUT_N	B_SCSI_RST_L	B_SCSI_ACK_L	B_SCSI_BSY_L	B_SCSI_ATN_L

A.3 Alarm Card, 6U Single-Wide

FIGURE A-22 shows the locations of the connectors on the 6U single-wide alarm card. Note that the figure shows the 6U single-wide alarm card installed in a Netra CT 810 server; the 6U single-wide alarm card is installed in a different slot in a Netra CT 410 server, however the ports are exactly the same.

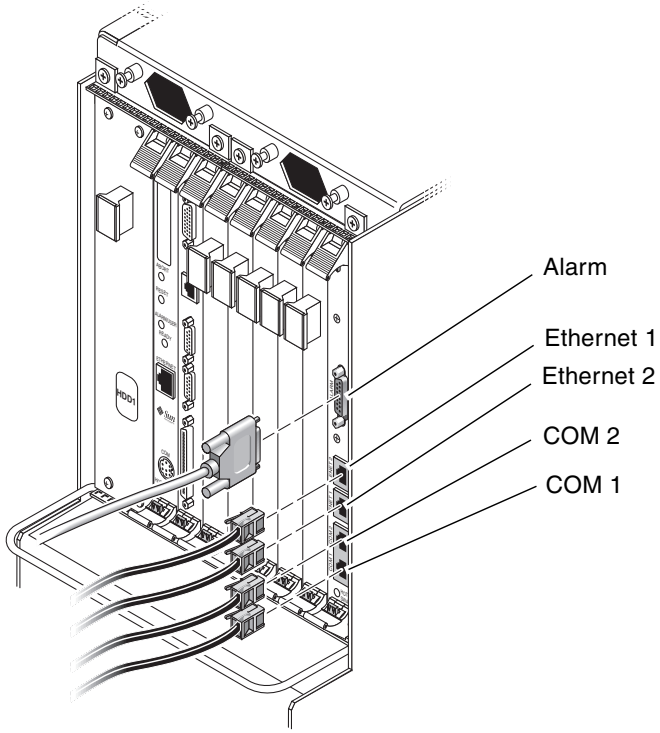

FIGURE A-22 Connector Ports in the 6U Single-Wide Alarm Card

A.3.1 Alarm Port

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

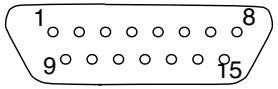

FIGURE A-23 Alarm Port

TABLE A-30 Alarm Port Pinouts

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

A.3.2 Ethernet Ports 1 and 2

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

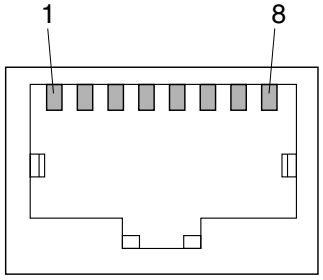

FIGURE A-24 RJ-45 Ethernet Connector Diagram

TABLE A-31 Ethernet Port 1 and 2 Pinouts

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

A.3.3 COM Ports 1 and 2

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

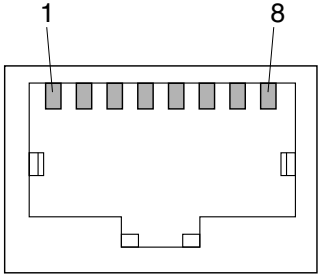

FIGURE A-25 RJ-45 Ethernet Connector Diagram

TABLE A-32 COM Port 1 Pinouts

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

TABLE A-33 COM Port 2 Pinouts

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

A.4 Alarm Card, 3U Double-Wide

FIGURE A-26 shows the locations of the connectors on the 3U double-wide alarm card for the Netra CT 410 server.

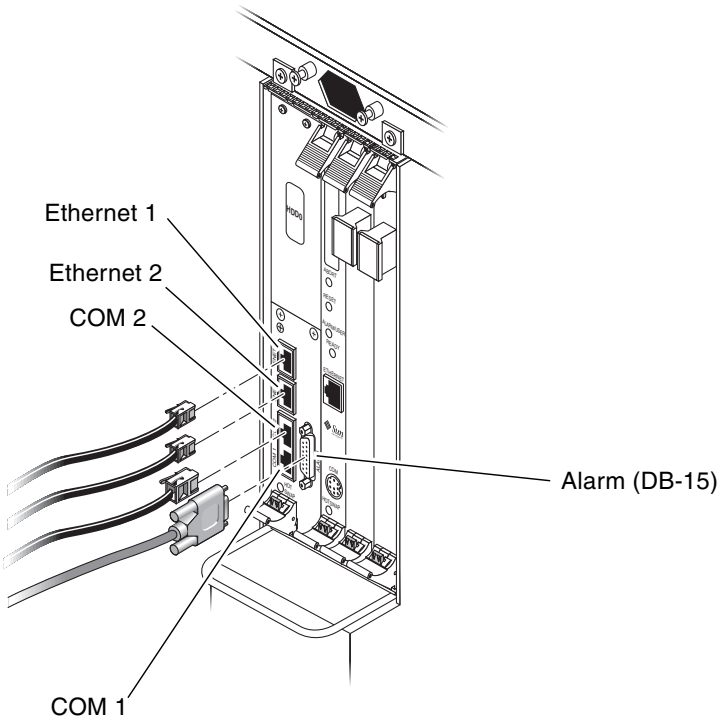

FIGURE A-26 Connectors on the Alarm Card (Netra CT 410 Server)

A.4.1 Ethernet Ports 1 and 2

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

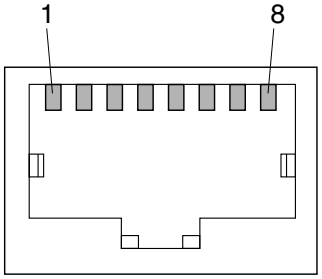

FIGURE A-27 RJ-45 Ethernet Connector Diagram

TABLE A-34 Ethernet Port 1 and 2 Pinouts

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

A.4.2 COM Ports 1 and 2

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

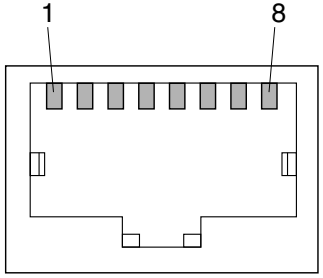

FIGURE A-28 RJ-45 Ethernet Connector Diagram

TABLE A-35 COM Port 1 Pinouts

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

TABLE A-36 COM Port 2 Pinouts

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

A.4.3 Alarm Port

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

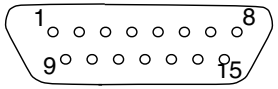

FIGURE A-29 Alarm Port

TABLE A-37 Alarm Port Pinouts

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

A.5 Alarm Rear Transition Module

FIGURE A-22 shows the locations of the connectors on the alarm rear transition module (RTC).

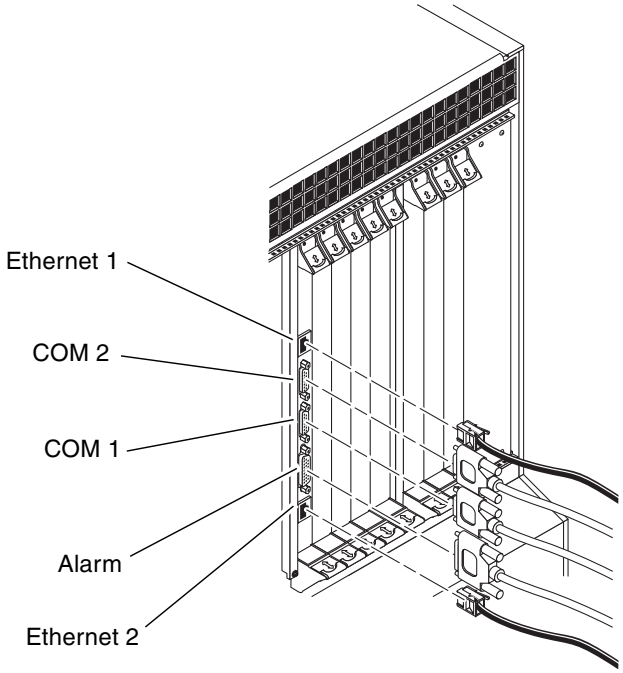

FIGURE A-30 Connectors on the Alarm Rear Transition Module

A.5.1 Ethernet Ports 1 and 2

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

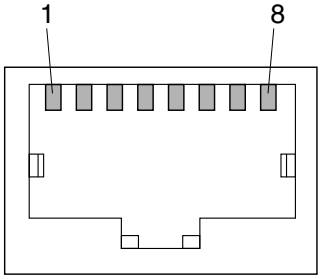

FIGURE A-31 RJ-45 Ethernet Connector Diagram

TABLE A-38 Ethernet Port 1 and 2 Pinouts

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

A.5.2 COM Ports 1 and 2

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

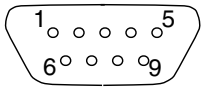

FIGURE A-32 COM Port 1 and 2

TABLE A-39 COM Port 1 and 2 Connector Pinouts, Alarm Rear Transition module

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

A.5.3 Alarm Port

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

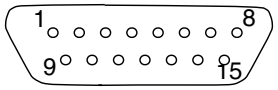

FIGURE A-33 Alarm Port

TABLE A-40 Alarm Port Pinouts

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

APPENDIX **B**

Connecting a Terminal Console to a Server

One way to power on and off your server is to log in to the server either remotely, where you log in to the Netra CT server as superuser through another server on the network, or directly, where you connect a terminal console to your Netra CT server. A terminal console can be an ASCII terminal, workstation, or PC laptop.

For a direct login, the connection to use varies depending on the Netra CT server model, the terminal console type, and the board you are connecting to:

- If you are using an ASCII terminal to power on and off a Netra CT server, go to Section B.1, “To Use an ASCII Terminal” on page B-2.
- If you are using a Solaris workstation to power on and off a Netra CT server, go to Section B.2, “To Use a Solaris Workstation” on page B-4.
- If you are using a PC laptop to power on and off a Netra CT server, go to Section B.3, “To Use a PC Laptop” on page B-5.

B.1 To Use an ASCII Terminal

1. **Obtain the appropriate cables and adapters and make the necessary connections.**

   You might need one or more cables and adapters to connect the ASCII terminal to the server. The cables and adapters you need vary, depending on the server model and the board that you are connecting to.

   - If you are connecting an ASCII terminal to a *CPU board or rear transition module*, use the information in TABLE B-1 to make the necessary connections.
   - If you are connecting an ASCII terminal to an *alarm card or alarm rear transition module*, use the information in TABLE B-2 to make the necessary connections.

TABLE B-1 Connecting an ASCII Terminal to a CPU Board or Rear Transition Module

Server Type	TTY A Port on Netra CT Server	Adapter	Cable	Adapter	Serial Port on Terminal
Netra CT 810 server	DB-9 male on the rear transition module. See Section A.2, "Host Rear Transition Modules" on page A-23.	Not needed	DB-9 female-to-DB-25 male straight-through	DB-25 female-to-DB-25 female gender changer	DB-25 male
Netra CT 410 server	DB-9 male on the rear transition module. See Section A.2, "Host Rear Transition Modules" on page A-23.	Not needed	DB-9 female-to-DB-25 male straight-through	DB-25 female-to-DB-25 female gender changer	DB-25 male

TABLE B-2 Connecting an ASCII Terminal to an Alarm Card or Alarm Rear Transition Module

Server Type	COM 1 Port on Netra CT Server	Adapter	Cable	Adapter	Serial Port on Terminal
Netra CT 810 server	DB-9 male on the alarm rear transition module. See Section A.5, "Alarm Rear Transition Module" on page A-52.	Not needed	DB-9 female-to-DB-25 male straight-through	DB-25 female-to-DB-25 female gender changer	DB-25 male
Netra CT 410 server	DB-9 male on the alarm rear transition module. See Section A.5, "Alarm Rear Transition Module" on page A-52.	Not needed	DB-9 female-to-DB-25 male straight-through	DB-25 female-to-DB-25 female gender changer	DB-25 male

2. **Access the "Set Up Menu" of the ASCII terminal and bring up the Serial Communications section.**

3. **Set up the serial port communications parameters.**

   The default settings should match the values reported on the host serial port.

   - Hardwired modem connection
   - No parity
   - 9600 baud
   - 1 stop bit
   - 8-bit data

4. **Test the connection.**

   Verify that communication is established to the server and the keyboard/display of the ASCII terminal.

B.2 To Use a Solaris Workstation

1. **Get the appropriate cables and adapters and make the necessary connections.**

   You might need one or more cables and adapters to connect a Solaris workstation to the server. The cables and adapters you need vary, depending on the server model and the board that you are connecting to.

   - If you are connecting a Solaris workstation to a *CPU board or rear transition module*, use the information in TABLE B-3 to make the necessary connections.
   - If you are connecting a Solaris workstation to an *alarm card or alarm rear transition module*, use the information in TABLE B-4 to make the necessary connections.

TABLE B-3 Connecting a Solaris Workstation to a CPU Board or Rear Transition Module

Server Type	TTY A Port on Netra CT Server	Adapter	Cable	Adapter	Serial Port on Workstation
Netra CT 810 server	DB-9 male on the rear transition module. See Section A.2, "Host Rear Transition Modules" on page A-23.	Not needed	DB-9 female-to-DB-25 male null modem	Not needed	DB-25 female
Netra CT 410 server	DB-9 male on the rear transition module. See Section A.2, "Host Rear Transition Modules" on page A-23.	Not needed	DB-9 female-to-DB-25 male null modem	Not needed	DB-25 female

TABLE B-4 Connecting a Solaris Workstation to an Alarm Card or Alarm Rear Transition Module

Server Type	COM 1 Port on Netra CT Server	Adapter	Cable	Adapter	Serial Port on Workstation
Netra CT 810 server	DB-9 male on the alarm rear transition module. See Section A.5, "Alarm Rear Transition Module" on page A-52.	Not needed	DB-9 female-to-DB-25 male null modem	Not needed	DB-25 female
Netra CT 410 server	DB-9 male on the alarm rear transition module. See Section A.5, "Alarm Rear Transition Module" on page A-52.	Not needed	DB-9 female-to-DB-25 male null modem	Not needed	DB-25 female

2. **Check the `/etc/remote` file for the appropriate line.**

   To connect to the TTY A or COM 1 port on the workstation, check for:

```
tip -9600 /dev/ttya
```

3. **Enter `tip hardwire` at the prompt.**

   The response should be the word `connected`.

   To disconnect the `tip` window, enter `~.` (tilde period) at the prompt.

B.3 To Use a PC Laptop

1. **Get the appropriate cables and adapters and make the necessary connections.**

   You might need one or more cables and adapters to connect a PC laptop to the server. The cables and adapters you need vary, depending on the model server you have and the board that you are connecting to.

   - If you are connecting a PC laptop to a *CPU board or rear transition module*, use the information in TABLE B-5 to make the necessary connections.
   - If you are connecting a PC laptop to an *alarm card or alarm rear transition module*, use the information in TABLE B-6 to make the necessary connections.

TABLE B-5 Connecting a PC Laptop to a CPU Board or Rear Transition Module

Server Type	TTY A Port on Netra CT Server	Adapter	Cable	Adapter	Serial Port on PC Laptop
Netra CT 810 server	• *Rear-access* model: DB-9 male on the rear transition module. See Section A.2, "Host Rear Transition Modules" on page A-23.	Not needed	DB-9 female-to-DB-9 female null modem	Not needed	DB-9 male
Netra CT 410 server	• *Front-access* model: DIN-8 female on the module. See Section A.1, "Host CPU Boards" on page A-2. • *Rear-access* model: DB-9 male on the rear transition module. See Section A.2, "Host Rear Transition Modules" on page A-23.	Not needed	• *Front-access* model: DIN-8 male-to-DB-25 male • *Rear-access* model: DB-9 female-to-DB-9 female null modem	• *Front-access* model: DB-25 female-to-DB-9 female • *Rear-access* model: Adapter not needed	DB-9 male

TABLE B-6 Connecting a PC Laptop to an Alarm Card or Alarm Rear Transition Module

Server Type	COM 1 Port on Netra CT Server	Adapter	Cable	Adapter	Serial Port on PC Laptop
Netra CT 810 server	• *Front-access* model: RJ-45 on the alarm card. See Section A.3, "Alarm Card, 6U Single-Wide" on page A-44. • *Rear-access* model: DB-9 male on the alarm rear transition module. See Section A.5, "Alarm Rear Transition Module" on page A-52.	• *Front-access* model: RJ-45-to-DB-9 male • *Rear-access* model: Not needed	DB-9 female-to-DB-9 female null modem	Not needed	DB-9 male
Netra CT 410 server	• *Front-access* model: RJ-45 on the alarm card. See Section A.3, "Alarm Card, 6U Single-Wide" on page A-44 or Section A.4, "Alarm Card, 3U Double-Wide" on page A-48. • *Rear-access* model: DB-9 male on the alarm rear transition module. See Section A.5, "Alarm Rear Transition Module" on page A-52.	• *Front-access* model: RJ-45-to-DB-9 male • *Rear-access* model: Not needed	DB-9 female-to-DB-9 female null modem	Not needed	DB-9 male

2. **Set the following connection parameters:**
   - No parity
   - 9600 baud
   - 1 stop bit
   - 8-bit data

APPENDIX **C**

Error Messages

This appendix describes error messages that you might see while operating or servicing a Netra CT server, their meanings, and the actions necessary for each. All error messages in this appendix are written to the `/var/adm/messages` file on your system.

TABLE C-1 Netra CT Server Error Messages

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

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

C.1 Generic Error Messages

Message

```
This program must be run on the same chassis.
```

Action

You must restart `mcnet`. Change directories to the `mcn` directory.

- If you are performing a procedure on a Netra CT *810* server, go to:

```
# cd /usr/platform/SUNW,NetraCT-810/mcn
```

- If you are performing a procedure on a Netra CT *410* server, go to:

```
# cd /usr/platform/SUNW,NetraCT-410/mcn
```

Then, enter this command:

```
# ./mcnet start
```

C.2 `scsb` Error Messages

Message

```
Alarm and Slot presence state bits do not match!
```

Cause

A problem was encountered when a hot-swap alarm card was installed in the server.

Action

Run `prtdiag` to determine the state of the I/O slot. If the alarm card is not listed when you run `prtdiag`, remove and reinsert the alarm card into the slot.

Message

```
SCSB: Should NOT remove SCB(#) while cPCI Slot # is in RESET
with a possible bad board. scsb#0: Slot # Now out of Reset!
```

Cause

The system controller board was removed from the server while the amber Okay to Remove LED was ON for an I/O slot.

Action

Enable *basic* hot-swap on all the I/O slots in the server using the instructions in Chapter 5. Once basic hot-swap is enabled on all I/O slots, it is safe to remove the system controller board from the server.

Message

```
scsb#0: ALERT! Lost HEALTHY# on Slot #, Occupant Offline
scsb#0: ALERT! Lost HEALTHY# on Slot #, Occupant Online!!!
```

Cause

The CompactPCI board lost its HEALTHY report.

Action

The CompactPCI board failed or is damaged. Configure the board, then unconfigure it using the instructions in Chapter 6. If the error messages repeat, then the board has failed. Replace the I/O board, using the instructions in Chapter 6.

If the system has taken the board offline because the board stopped sending a HEALTHY signal, the following message is displayed:

Message

```
scsb#0: Slot # successfully taken offline

scsb#0: Bad (non friendly ?) Board in Slot # ? Taking it
Offline.
```

Cause

The system identified an I/O board that is sending repeated interrupts, and the system has taken the board offline.

Action

Replace the I/O board using the instructions in Chapter 6.

Message

```
scsb#0: Could not Update %s LEDs.
scsb#0: Could not Blink %s LEDs.
```

Cause

An Inter-Integrated Circuit (I^2C) error resulted in an LED change failure. The LEDs on the system status panel might give incorrect information as a result.

Action

Use the `prtdiag` tool to print the correct LED states. Remove and reinstall the system controller board to correct the problem. See Chapter 8 for instructions.

Message

```
scsb#0: hsc_board_healthy: No Slot Info.
```

Cause

A disabled slot that is no longer being monitored by the system (due to errors or user request) is having HEALTHY state changes and sending full-hot-swap style interrupts to the CPU.

Action

Remove the I/O board from the slot. If the error messages repeat, set the I/O slot to basic hot-swap, using the instructions in Chapter 5.

Message

```
scsb#0: hsc_enum_intr:  No Last Board Insertion Info.
```

Cause

A CompactPCI board that is probably damaged is installed in an I/O slot in the system. The board has an error causing it to continually interrupt the CPU with hot-swap service events when there is no change to the board's state. The board continually reports itself "inserted" after it has been acknowledged. Because no board is "claiming" the event, no slot number can be given. See also `scsb#0: Slot # successfully taken offline`.

Action

Remove the I/O board from the server, using the instructions in Chapter 6. If the error message repeats, the system controller board might have failed. Try replacing the system controller board using the instructions in Chapter 8.

Message

```
scsb#0: hsc_restore:  Cannot reset disconnected slot #
```

Cause

The system controller board was installed in the server while the amber Okay to Remove LED was ON for an I/O slot.

Action

Enable *basic* hot-swap on all the I/O slots in the server using the instructions in Chapter 5. Once basic hot-swap is enabled on all I/O slots, remove the system controller board from the server.

Message

```
scsb0: I2C TRANSFER Failed
scsb0: Error Reading Healthy# Registers
scsb#0: scsb_reset_slot: error reading Reset regs
```

Cause

An error occurred when the `scsb` driver received the `retry` command from the system controller board.

Action

Retry. If the error persists, the system controller board is damaged and should be replaced. See Chapter 8 for instructions.

Message

```
scsb#0: no HEALTHY# signal on slot#
```

Cause

You tried to connect or configure a hot-swappable I/O board that was not reporting itself HEALTHY. The board has failed or was not inserted properly.

Action

Remove the I/O board from the server and reinsert it, making sure the board is completely and properly inserted into the server. If the error message repeats, then the board has failed. Replace the I/O board, using the instructions in Chapter 6.

Message

```
scsb#0: Reset Not Asserted on Healthy# Failed slot#
```

Cause

You rebooted the system with a failed board. The OpenBoot PROM has taken it out of reset and probed it.

Action

The board is probably damaged and should not be used. Unconfigure the board manually, and remove the board from the system using the instructions in Chapter 6.

Message

```
scsb#0: slot # Occupant configured, Regained HEALTHY#!
scsb#0: slot # Occupant Unconfigured, Regained HEALTHY#!
```

Cause

A CompactPCI board is sending conflicting HEALTHY and UNHEALTHY signals.

Action

The board has failed. Replace the I/O board using the instructions in Chapter 6.

Message

```
scsb#0: Successfully Downgraded to Basic Hotswap Mode
```

Cause

Basic hot-swap was enabled on the system.

Action

No action is necessary.

Message

```
scsb#0: Successfully Upgraded to Full Hotswap Mode
```

Cause

Full hot-swap was enabled on the system.

Action

No action is necessary.

C.3 Anticipated Hardware Failure

C.3.1 Transient Interrupts

Message

```
Interrupt Level 4--Not serviced
```

Cause

Such a message occurring intermittently is always a result of the underlying hardware doing something unpredictable.

Transient interrupts occur when, for example, a fan is starting to fail, and it fails long enough to generate an interrupt but then resumes operation. By the time the fan driver is queried, it denies the interruption because now it is functioning normally.

Action

The condition is a result of the architecture of interrupt generation and response. As long as the generating hardware has resumed normal operation, no further action is required.

C.3.2 Soft Hang

Message

```
Interrupt Level 4--Not serviced
```

Cause

This message, occurring continuously, signals a soft hang of the system. The presenting symptom is that the system is noticeably sluggish because it is busy processing interrupts.

A soft hang occurs when a component such as a power supply sends a level high interrupt and keeps it high. The kernel notices and polls the devices. Each device answers negatively, including the culprit power supply. Meanwhile, the CPU continues with minimal work before returning to the querying process. This error condition is a serious problem because the failing component remains unidentified.

Action

Completely power the server off, then on again using the instructions in Chapter 2. When the system boots, it always boots interrupts low (masked), and attaches the drivers one by one. Use OpenBoot PROM commands to probe the components and determine which one has failed.

C.4 I²C Complaints

Message

```
NO ADDERSS ACK 80
```

Cause

This message indicates a problem with Inter-Integrated Circuit (I²C), and often it's the `pcf8584` driver that complains, followed by the address it is trying to access (for example, `NO ADDRESS ACK 80`. indicates a problem with address 80, which is the fixed address of the system controller board).

Most of the Sun drivers print a secondary error message, but the principal error message comes from `pcf8584`. The interface to this is through an ioctl, so it is done through software. This message indicates a problem, but not the severity. Sometimes such a message is normal.

For example when a power supply is removed, the Present line goes low and the SCB sets the bit high (interrupt). The kernel `pcf8584` goes down the device line querying for interrupts in the order in which the devices boot, each one answering. The message `8584 NO ADDR ACK 0x9E` occurs when the device is removed. Because it happened after the driver tried to query the hardware, this spurious error message occurs. This condition happens with fans and power supplies.

Action

If the error message occurs during a hot-swap operation, it is erroneous and can be ignored. If the error message occurs during normal operation, it might indicate a problem with the I²C device.

C.5 Bus Busy Complaints

Message

```
Bus busy, cleared after initializing
```

Cause

This is a transient 1^2C error message.

Action

Usually no action is necessary because the system recovers from most transient 1^2C errors. If the system becomes unresponsive, completely power the server off, then power it back on. Watch the power-on self-test (POST) messages to determine the cause of the error.

APPENDIX **D**

System Specifications

This appendix gives the system specifications for Netra CT servers.

D.1 Physical Specifications

TABLE D-1 Netra CT Server Chassis Physical Specifications

	U.S.	Metric
Width	17.5 inches	444.5 mm
Depth:		
• Default configuration, with rackmount brackets extended	15.8 inches	400 mm
• With rackmount brackets flush against the bottom of the chassis	13.8 inches	350 mm
Height	21 inches	533.6 mm
Weight (empty)	74 lb	33.6 kg
Weight (fully loaded)	150 lb	68 kg

TABLE D-2 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

TABLE D-3 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

D.2 Electrical Specifications

TABLE D-4 Power Requirements

Electrical Element	Requirement
Voltage (nominal)	-48 VDC, -60 VDC
Input current (maximum)	14 A
Max. input surge current	17 A

D.3 Environmental Specifications

TABLE D-5 Environmental Specifications

Type	Location	Minimum to Maximum Range
Temperature	Operating	-5°C to 45°C (23°F to 113°F)
	Nonoperating	-40°C to 70°C (-38°F to 158°F)
Short term (less than 96 consecutive hrs)	Operating	-5°C to 55°C (23°F to 131°F)
Relative humidity (noncondensing)	Operating	5% to 93% RH
	Nonoperating	93% RH max
Altitude	Operating	0 ft to 13,123 ft (0 m to 4000 m)
	Nonoperating	0 ft to 39,370 ft (0 m to 12,000 m)
Declared noise emissions in accordance with ISO 9296		
Chassis with two Netra CT 810 servers		Sound power LWAd Operating 6.7 B (1B = 10 dB)
		Idle 6.7 B
Chassis with four Netra CT 410 servers		Sound power LWAd Operating 7.1 B (1B = 10 dB)
		Idle 7.1 B

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.

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.

CPU transition card (CTC) The CPU transition card, also referred to as a rear transition module, is specifically paired to a Netra CP2140 host board. The CTC extends the connectors to the rear of the chassis

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 disk 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 and replace boards from and in a running server. See *full hot-swap*, *basic hot-swap*

L

LSF Acronym for low smoke fume.

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.

MOH Acronym for managed object hierarchy.

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.

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

PMC Acronym for the PCI mezzanine card (PMC).

R

rear transition module The rear transition modules extend the connectors to the rear of the chassis.

reliability, availability, and serviceability (RAS) Refers to hardware and software features that implement or improve the reliability, availability and serviceability of a server.

S

system status panel A module that uses LEDs to indicate the status of key components within the Netra CT servers. The system status panel has one set of LEDs for each component within that particular server.

system controller board A hot-swappable component located behind the system status panel. It feeds system status information to the system status panel, where LEDs give feedback on the status of the key components within the Netra CT servers.

U

U A unit of measure equal to 1.75 inches.

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