



Netra™ 240 Server Service Manual

Sun Microsystems, Inc.
www.sun.com

Part No. 817-2699-13
December 2005, Revision A

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Preface

The *Netra 240 Server Service Manual* is for the use of qualified service personnel only. It provides detailed service procedures for the Netra™ 240 server.

Before You Read This Book

This book does not cover server installation and rackmounting. For detailed information on those topics, refer to the *Netra 240 Server Installation Guide* (817-2698).

Before following any of the procedures described in this book, ensure that you have read the *Important Safety Information for Sun Hardware Systems Manual* (816-7190).

Using UNIX Commands

This document might not contain information on basic UNIX® commands and procedures such as shutting down the system, booting the system, and configuring devices. See the following for this information:

- Software documentation that you received with your system
- Solaris™ operating environment documentation, which is at <http://docs.sun.com>

Typographic Conventions

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

Shell Prompts

Shell	Prompt
C shell	<i>machine-name%</i>
C shell superuser	<i>machine-name#</i>
Bourne shell and Korn shell	\$
Bourne shell and Korn shell superuser	#
ALOM shell	sc>
OpenBoot™ PROM shell	ok

Related Documentation

Application	Title	Part Number
Installation overview	<i>Netra 240 Server Quick Start Guide</i>	817-3904
Latest product updates	<i>Netra 240 Server Release Notes</i>	817-3142
Compliance and safety	<i>Important Safety Information for Sun Hardware Systems</i>	816-7190
	<i>Netra 240 Server Safety and Compliance Manual</i>	817-3511
Documentation web site location	<i>Sun Netra 240 Server Product Documentation</i>	817-2697
Installation	<i>Netra 240 Server Installation Guide</i>	817-2698
Lights out management	<i>Sun Advanced Lights Out Manager Software User's Guide for the Netra 240 Server</i>	817-3174
Administration	<i>Netra 240 Server System Administration Guide</i>	817-2700

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Identifying the Netra 240 Server Components and LEDs

This chapter contains the following sections:

- [“Identifying the Netra 240 Server Components” on page 1](#)
- [“Identifying the Netra 240 Server LED Indicators” on page 8](#)

Note – Illustrations may contain optional components that are not available on all standard configurations of the Netra 240 server.

Identifying the Netra 240 Server Components

The components for the Netra 240 server can be broken down into three areas:

- Front and rear panel components—[Chapter 3](#)
- Rotating service module components—[Chapter 4](#)
- Miscellaneous internal components—[Chapter 5](#)

Refer to [TABLE 1-1](#) for more information on identifying the Netra 240 server components and where the service instructions are located in this document.

TABLE 1-1 Locating Illustrations and Service Instructions for Netra 240 Server Components

Component/Service Instructions	Illustration
"Air Duct and Rear Fan Assembly" on page 68	FIGURE 1-2
"Air Filter" on page 36	FIGURE 1-1
"Alarm Board" on page 54	FIGURE 1-2
"Bezel Assembly" on page 34	FIGURE 1-1
"DVD Drive" on page 45	FIGURE 1-1
"Front Fan Assembly Tray" on page 56	FIGURE 1-2
"Hard Drives" on page 40	FIGURE 1-1
"Hardware Cryptographic Module" on page 85	FIGURE 1-3
"Memory Modules" on page 70	FIGURE 1-3
"PCI Cards" on page 76	FIGURE 1-2
"Power Distribution Board" on page 81	FIGURE 1-2
"Power Supply Unit" on page 49	FIGURE 1-2
For processor fans and heat sinks: "System Board Assembly" on page 87	FIGURE 1-3
For rotating service module: "Accessing Rotating Service Module Components" on page 30	FIGURE 1-2
"System Configuration Card" on page 38	FIGURE 1-1
"System Configuration Card Reader Cluster" on page 61	FIGURE 1-2
"SCSI Interface Board" on page 58	FIGURE 1-2
"System Board Assembly" on page 87	FIGURE 1-4

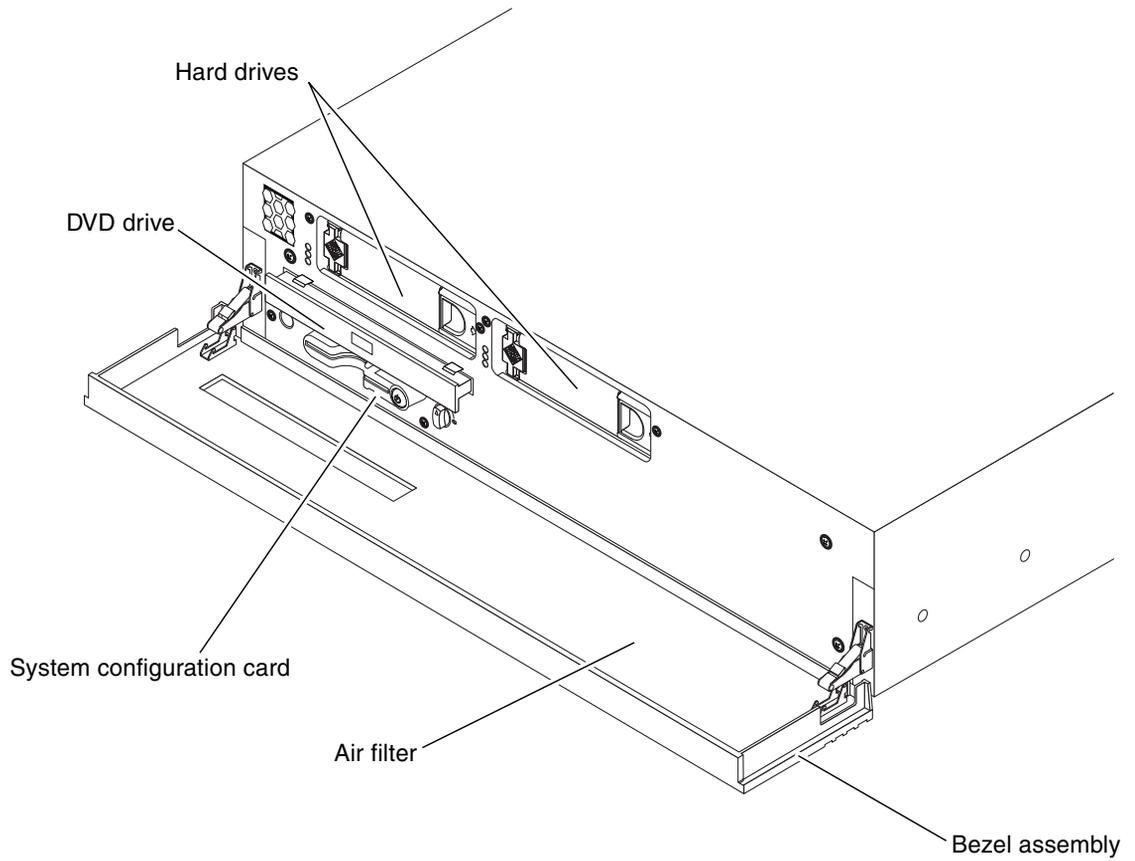


FIGURE 1-1 Front Panel Components

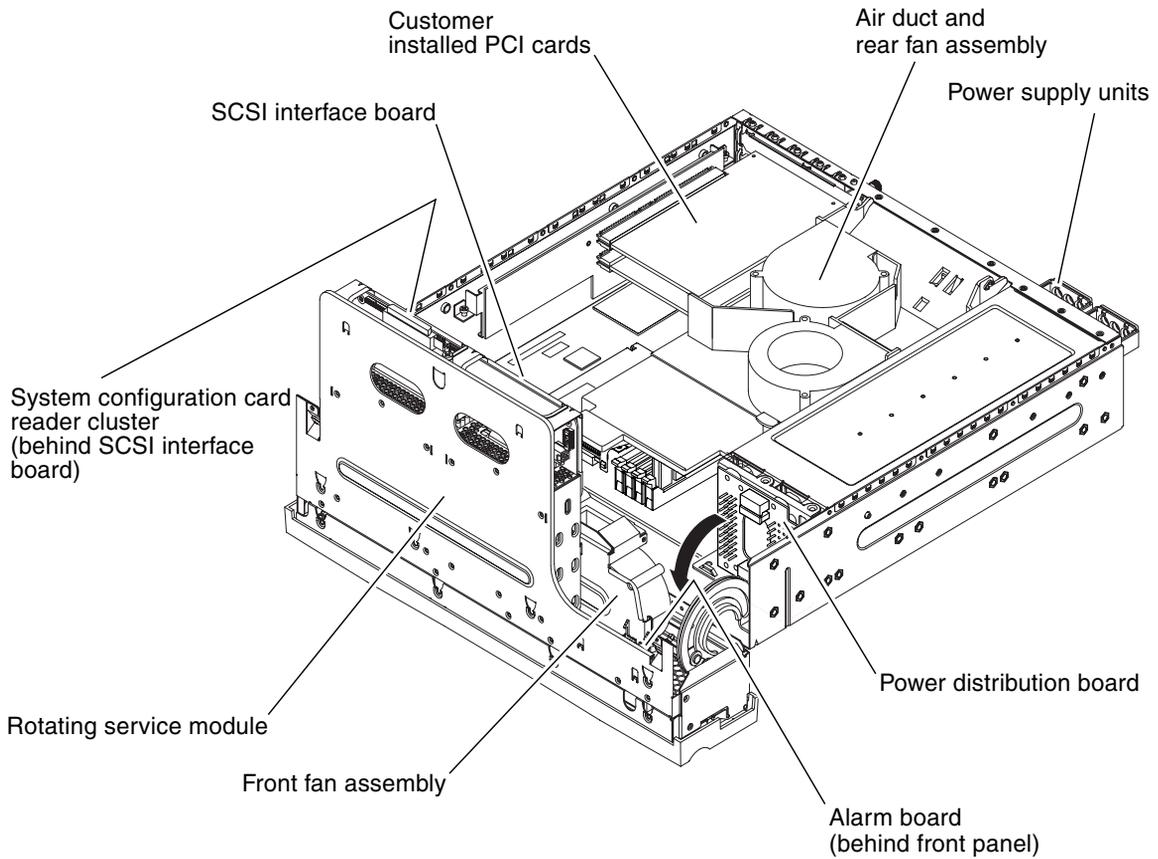


FIGURE 1-2 Rotating Service Module – Miscellaneous Internal Components and Rear Panel Components

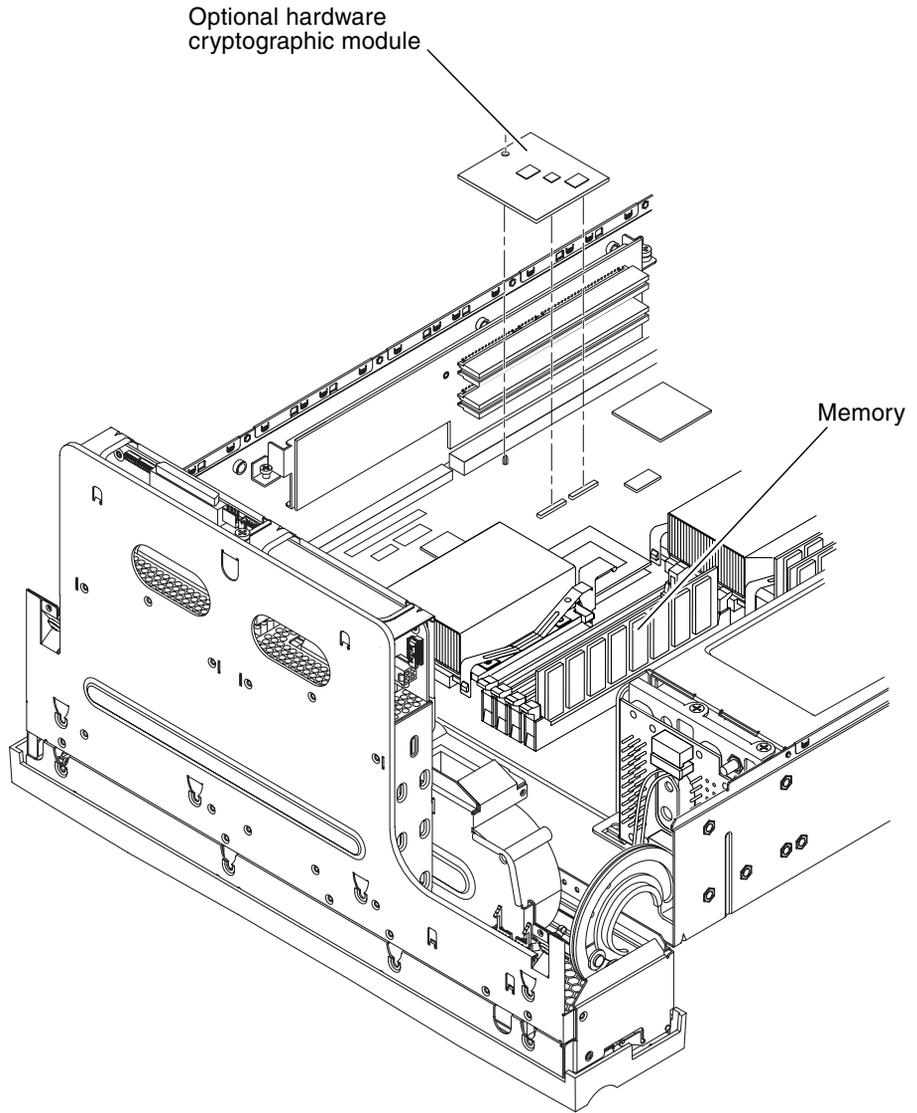


FIGURE 1-3 Hardware Cryptographic Module and Memory

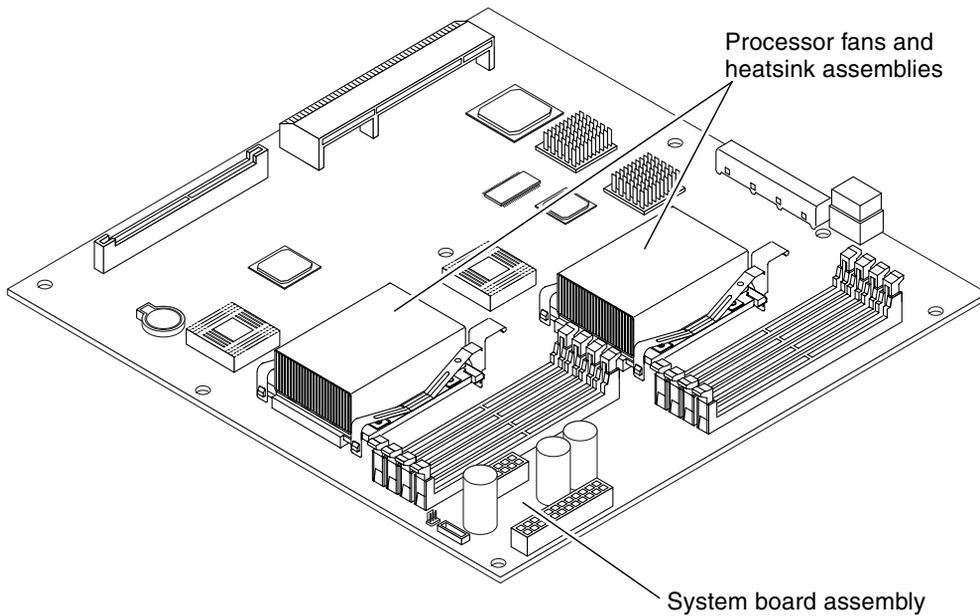


FIGURE 1-4 Processor Fans and Heat Sink Assemblies on a Replacement System Board

Note – The Netra 240 server comes installed with heat sink assemblies, and no processor fans, on the system board(s). However, processor fans and heat sink assemblies are present on a field-replaceable system board assembly. See [Appendix A](#) for system board FRU part numbers and “[Installing a System Board](#)” on [page 95](#) for instructions on removing the processor fans during system board installation.

Optional Components

[TABLE 1-2](#) lists the optional server components.

Note – The list of optional components might be updated at any time. Refer to the Sun StoreSM web site (<http://store.sun.com>) for the most current list of Netra 240 server supported components.

TABLE 1-2 Optional Components

Component	Description
Storage disk (Maximum 2 disks per server)	73 GB 15K RPM 1-inch SCSI hard drive
Drive	146 GB sun Fire 15K drive
Memory (Multiple of 2 DIMMs, and a Maximum of 4 DIMMs per CPU)	512 MB memory expansion (2 x 256 MB DIMMs) 1 GB memory expansion (2 x 512 MB DIMMs) 2 GB memory expansion (2 x 1 GB DIMMs) 512 MB memory expansion (2 x 256 MB SPD 1.0 DIMMs) 1 GB memory expansion (2 x 512 MB SPD 1.0 DIMMs) 2 GB memory expansion (2 x 1 GB SPD 1.0 DIMMs)
Sun Crypto Accelerator 500 card	Sun Crypto Accelerator 500
Removable media	Internal slim DVD-ROM drive Internal slim DVD-RW drive
Rackmount kits	19-inch 2-post rackmount kit 23-inch 2-post rackmount kit 600mm x 600mm rackmount kit 19-inch 4-post slide mount kit
Wago kit	Companion part to the power supply part
Processor upgrade kit	1.28 GHz processor kit
Air filter pack	Air filter pack containing 10 foam filters

[TABLE 1-3](#) lists the optional PCI cards.

TABLE 1-3 Supported PCI Cards

Description	Maximum Number Supported
Sun GigaSwift Ethernet UTP	2
Sun GigaSwift Ethernet MMF	2
High Speed Serial Interface PCI (HSI/P) 2.0	1
Serial Asynchronous Interface PCI (SAI/P) adapter 3.0	2
Dual Ultra-2 SCSI/Dual FastEthernet PCI	1

TABLE 1-3 Supported PCI Cards (*Continued*)

Description	Maximum Number Supported
Sun Crypto Accelerator 4000 UTP (Ipsec-copper)	1
Dual Differential Ultra/Wide SCSI (UDWIS/P)	2
PCI Dual Channel Ultra3 SCSI host adapter	2
PCI Single FC-AL Host adapter	1
Note: This adapter has been qualified, but not NEBS tested.	
Sun Crypto Accelerator 4000 UTP (Ipsec-fiber)	1
Dual Fibre Channel PCI Network Adapter	2
Single Fibre-Channel 2-GB PCI Network Adapter	2
Dual Fibre-Channel 2-GB PCI Network Adapter	2
Dual Gigabit Ethernet + Dual SCSI PCI Adapter	1
Sun XVR-100 Graphics Accelerator	1
Sun XVR-600 Graphics Accelerator	1
Sun Quad Gigabit Ethernet	1
Dual channel LVD Ultra320 SCSI PCI Adapter HBA	2
Sun GigaSwift Ethernet UTP PCI Adapter	2
Sun Gigabit Ethernet MMF PCI Adapter	2

Identifying the Netra 240 Server LED Indicators

The server has LED indicators associated with the server itself and with various components. The server status indicators are located on the bezel and are repeated on the back panel. The components with LED indicators to convey status are the dry contact alarm card, power supply units, Ethernet port, and hard drives. Details on the network link indicators and the network speed indicators are also provided.

Front Panel Indicators

[TABLE 1-4](#) to [TABLE 1-6](#) provide details about the indicators on the front panel and a description of the dry contact alarm states of the Netra 240 server. See [FIGURE 1-5](#) and [FIGURE 1-6](#) for the location of the front panel indicators.

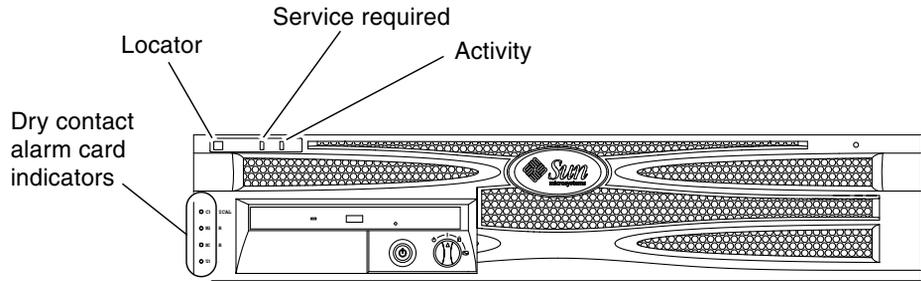


FIGURE 1-5 Location of the Front Panel Indicators

TABLE 1-4 Server Status Indicators (Front and Rear Panels)

Indicator	LED Color	LED State	Meaning
Activity	Green	On	The server is powered up and running the Solaris™ Operating System (Solaris OS).
		Off	Either power is not present or Solaris software is not running.
Service Required	Amber	On	The server has detected a problem and requires the attention of service personnel.
		Off	The server has no detected faults.
Locator	White	On	A continuous light turns on and identifies the server from others in a rack, when the <code>ALOM setlocator</code> command is used.

TABLE 1-5 Alarm Indicators and Dry Contact Alarm States

Indicator and Relay Labels	Indicator Color	Application or Server State	Condition or Action	System Indicator State	Alarm Indicator State	Relay NC ^{iv} State	Relay NO ^v State	Comments
Critical (Alarm0)	Red	Server state (Power on/off and Solaris OS functional/not functional)	No power input	Off	Off	Closed	Open	Default state
			System power off	Off	Off ⁱⁱⁱ	Closed	Open	Input power connected
			System power turns on; Solaris OS not fully loaded	On	Off ⁱⁱⁱ	Closed	Open	Transient state
			Solaris OS successfully loaded	Off	Off	Open	Closed	Normal operating state
			Watchdog timeout	Off	On	Closed	Open	Transient state, reboot Solaris OS
			Solaris OS shutdown initiated by user ⁱ	Off	Off ⁱⁱⁱ	Closed	Open	Transient state
			Lost input power	Off	Off	Closed	Open	Default state
			System power shutdown by user	Off	Off ⁱⁱⁱ	Closed	Open	Transient state
		Application state	User sets Critical alarm on ⁱⁱ	--	On	Closed	Open	Critical fault detected
		User sets Critical alarm off ⁱⁱ	--	Off	Open	Closed	Critical fault cleared	
Major (Alarm1)	Red	Application state	User sets Major alarm on ⁱⁱ	--	On	Open	Closed	Major fault detected
			User sets Major alarm off ⁱⁱ	--	Off	Closed	Open	Major fault cleared

TABLE 1-5 Alarm Indicators and Dry Contact Alarm States (Continued)

Indicator and Relay Labels	Indicator Color	Application or Server State	Condition or Action	System Indicator State	Alarm Indicator State	Relay NC ^{iv} State	Relay NO ^v State	Comments
Minor (Alarm2)	Amber	Application state	User sets Minor alarm on ⁱⁱ	--	On	Open	Closed	Minor fault detected
			User sets Minor alarm off ⁱⁱⁱ	--	Off	Closed	Open	Minor fault cleared
User (Alarm3)	Amber	Application state	User sets User alarm on ⁱⁱ	--	On	Open	Closed	User fault detected
			User sets User alarm off ⁱⁱⁱ	--	Off	Closed	Open	User fault cleared

- i The user can shut down the system using commands such as `init0` and `init6`. This does not include the system power shutdown.
- ii Based on a determination of the fault conditions, the user can turn the alarm on using the Solaris platform alarm API or ALOM CLI. For more information on the alarm API, refer to the *Netra 240 Server System Administration Guide* (part no. 817-2700) and for more information on ALOM CLI, refer to the *Sun Advanced Lights Out Manager Software User's Guide for the Netra 240 Server* (part no. 817-3174).
- iii The implementation of this alarm indicator state is subject to change.
- iv NC state is the normally closed state. This state represents the default mode of the relay contacts in the normally closed state.
- v NO state is the normally open state. This state represents the default mode of the relay contacts in the normally open state.

In all cases when the user sets an alarm, a message is displayed on the console. For example, when the critical alarm is set, the following message is displayed on the console:

```
SC Alert: CRITICAL ALARM is set
```

Note that in some instances when the critical alarm is set, the associated alarm indicator is not lit. This implementation is subject to change in future (see Footnote ⁱⁱⁱ of TABLE 1-5).

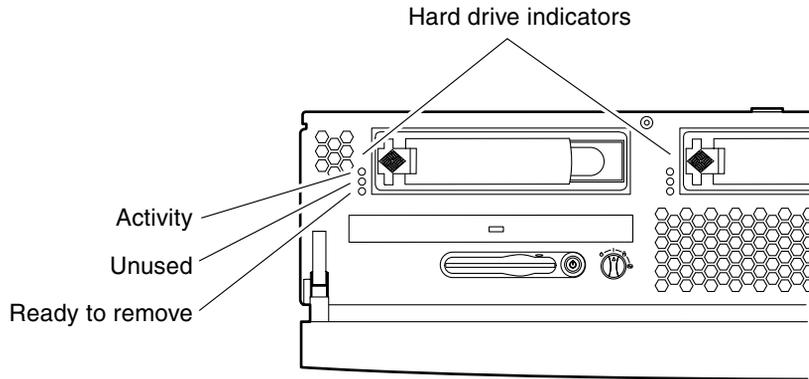


FIGURE 1-6 Hard Drive Indicators

TABLE 1-6 Hard Drive Indicators

Indicator	LED Color	LED State	Component Status
Activity	Green	Flashing	Active SCSI transactions.
		Off	No activity.
Unused			Reserved for future use.
Ready to remove	Blue	On	Ready to remove.
		Off	Not ready to remove.

Rear Panel Indicators

[TABLE 1-7](#) to [TABLE 1-9](#) below provide details about the indicators on the rear panel of the Netra 240 server. See [FIGURE 1-7](#) and [FIGURE 1-8](#) for the location of the rear panel indicators.

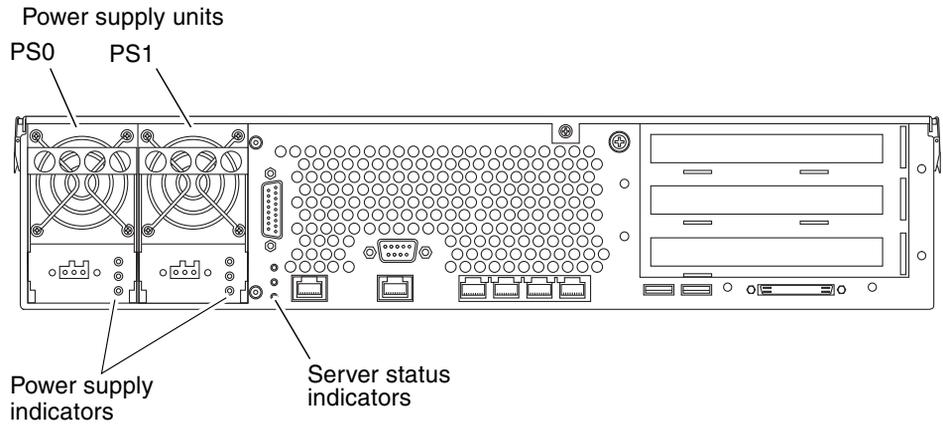


FIGURE 1-7 Rear Panel Indicators

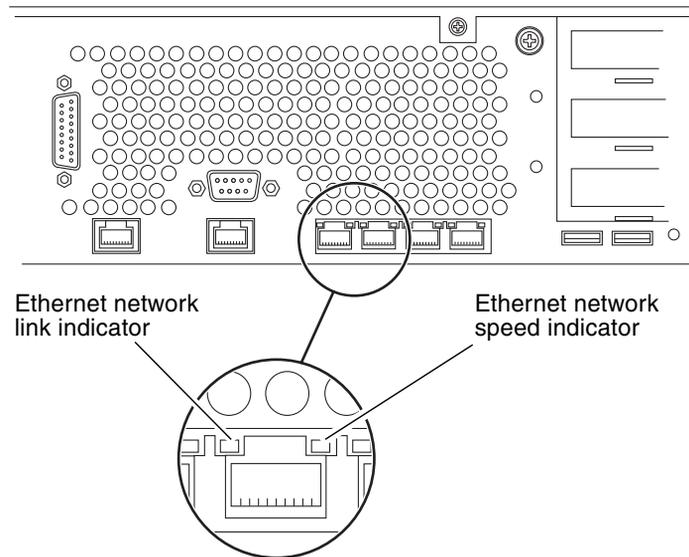


FIGURE 1-8 Ethernet Network Indicators

TABLE 1-7 Network Link Indicators

LED Color	LED State	Network Link Status
Green	On	Link is established.
	Blinking	Link is transferring data.
	Off	Link is not established.

For a summary of what the network speed indicators mean, see [TABLE 1-8](#).

TABLE 1-8 Network Speed Indicators

LED Color	LED State	Network Speed Status
Green	On	The network link is established and running at its maximum supported speed.
	Off	<ul style="list-style-type: none">• If the network activity indicator is on, the network link is established but not running at its maximum supported speed.• If the network activity indicator is off, the network link is not established.

TABLE 1-9 Power Supply Unit Indicators

LED Color	LED State	Component Status
Green	On	Power is present and the PSU is active.
	Off	Either power is not present, or the PSU has shut down due to an internal protection event.
Amber	On	The power supply unit has shut down due to an internal protection event and requires service attention.
	Off	The power supply unit is operating normally.
Blue	On	The power supply unit is ready to be removed.
	Off	The power supply unit is not ready for removal.

Preparing to Service the System

This chapter contains the following sections:

- [“Tip Warning” on page 15](#)
- [“Controlling Server Power” on page 16](#)
- [“Initiating a Reconfiguration Boot” on page 24](#)
- [“Accessing Internal Components” on page 27](#)
- [“Accessing Rotating Service Module Components” on page 30](#)
- [“Avoiding Electrostatic Discharge” on page 32](#)

Note – Illustrations might contain optional components that are not available on all standard configurations of the Netra 240 server.

Tip Warning



Caution – When the Netra 240 server is removed from the rack and placed on a table for servicing, do not pull the server too far out with the rotating service module open, or the server could tip over. When the rotating service module is open, do not remove both the power supply units and the system board from the server or the server will tip over.

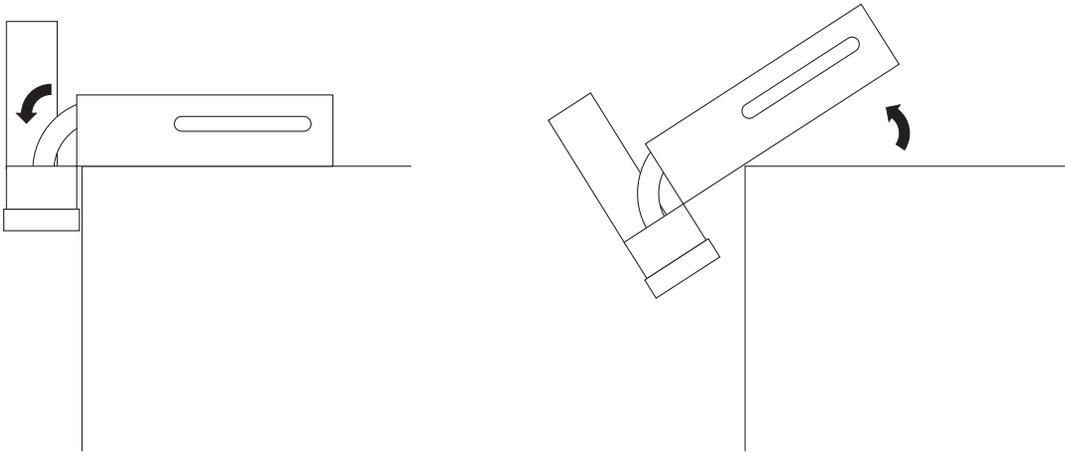


FIGURE 2-1 Netra 240 Server Tip Hazard

Controlling Server Power

You must open the bezel to access the On/Standby button and the rotary switch. The On/Standby button controls only the *power state* of the server. It does not *isolate* the server from its electrical power source. Turning the power off does not disable the ALOM. For information on controlling server power using software, refer to the *Sun Advanced Lights Out Manager Software User's Guide for the Netra 240 Server (817-3174)*.

The On/Standby button is a momentary switch and has two operation modes:

- Press and immediately release.
- Press and hold down for more than 4 seconds.

The On/Standby button does not power off the server. It toggles the server between on and standby ([FIGURE 2-2](#)). The results of these actions are summarized in [TABLE 2-1](#).

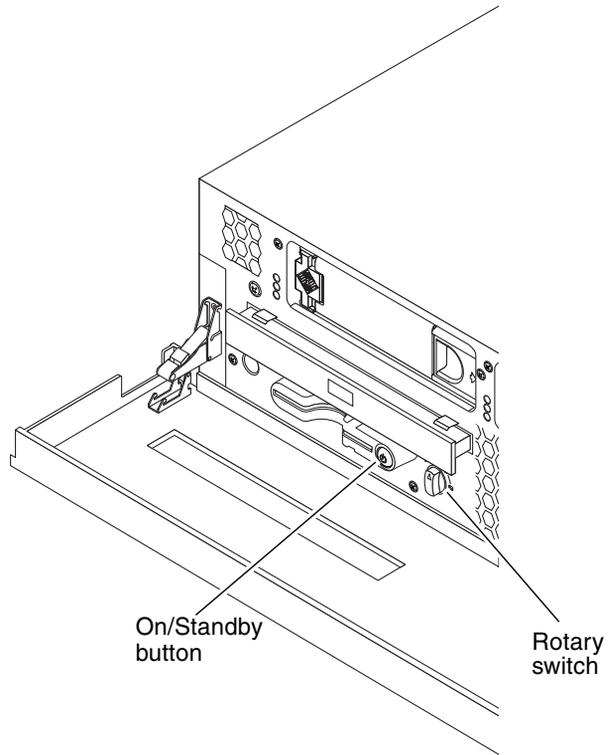


FIGURE 2-2 On/Standby Button and Rotary Switch

The server immediately goes into Standby mode as soon as it is connected to a power source. As long as it remains connected to the power source, the server stays in either the Standby or On power state. An explanation of the power states is provided in [TABLE 2-1](#).

TABLE 2-1 On/Standby Button Power States, Actions, and Results

Server Power State	Description	Press and Release	Press Down for More than 4 Seconds
On (with Solaris software running)	Server is connected to a power source and the power is enabled.	Software performs orderly shutdown. Server enters Standby state.	Server enters Standby state directly.
On (with Solaris software not running)	Server is connected to a power source and the power is enabled.	No effect.	Server enters Standby state directly.
Standby	Server is connected to a power source but the power is not enabled.	Server enters On power state.	Server enters On power state.
Off	Server is not connected to a power source. Power cable is disconnected.	No effect.	No effect.

Note – The only way to remove power totally from the server is to disconnect the power cable.

Open the front bezel for access to the rotary switch ([FIGURE 2-2](#)). An explanation of the rotary positions and server behaviors is provided in [TABLE 2-2](#). The switch positions are shown in [FIGURE 2-3](#). [TABLE 2-3](#) provides the system control rotary switch functions and positions.

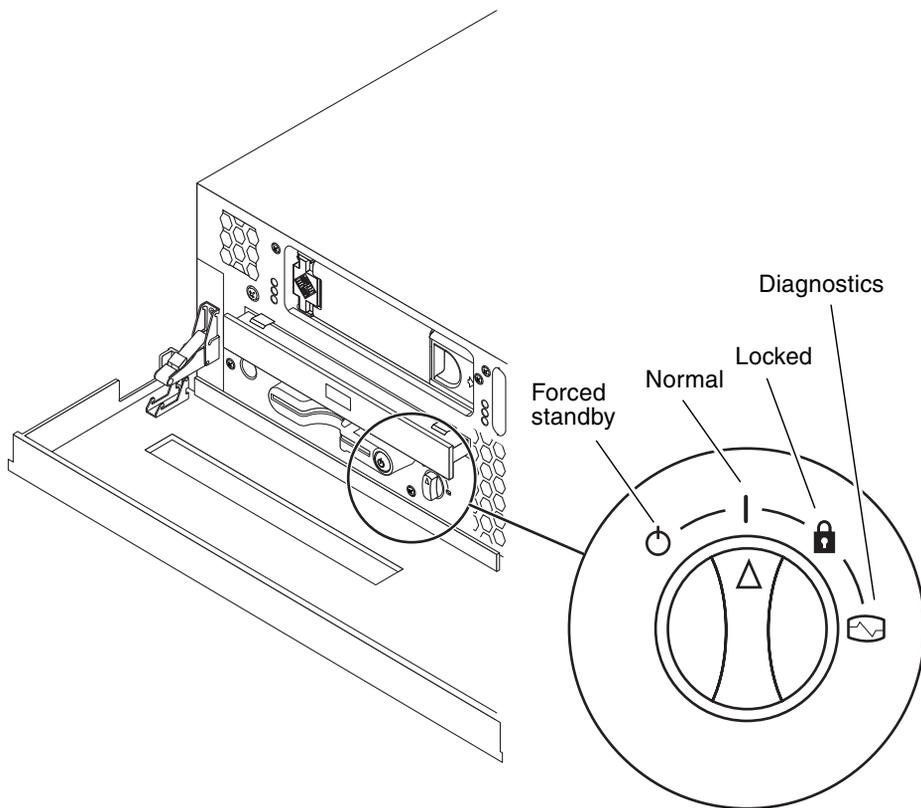


FIGURE 2-3 Rotary Switch Positions

TABLE 2-2 Rotary Switch Positions and Server Behaviors

Rotary Switch Positions	Server Behavior
Normal	Normal operation
Diagnostics	Full POST during system boot
Locked	Disable On/Standby button Write-protect ALOM Flash PROM Write-protect OpenBoot PROM/POST Flash PROM Disable suspension to OpenBoot PROM/kadb ⁱ
Forced Standby	Force server into Standby mode Disable on/standby button Disable remote power control Write-protect ALOM Flash PROM

ⁱ When the rotary switch is in the locked position, you cannot drop to OpenBoot PROM/kadb manually by issuing the `break` command.

The level of deployment security and the level of diagnostic testing for the rotary switch is summarized in [TABLE 2-3](#).

TABLE 2-3 System Control Rotary Switch Functions and Positions

Function	System Control Rotary Switch Position			
	Normal ⁱ	Diagnostics ⁱⁱ	Locked	Forced-Standby
Physically lock front bezel	No	No	No	No
Disable button power control	No	No	Yes	Yes
Disable remote power control	No	No	No	Yes
Force system to the Standby state	No	No	No	Yes
Write-protect ALOM flash PROM	No	No	Yes	No
Write-protect OpenBoot PROM/POST flash PROM	No	No	Yes	N/A
Force full POST during system boot	No	Yes	No	N/A
Disable suspension to OpenBoot PROM/kadb	No	No	Yes	N/A

i When the rotary switch is set to the Normal position, the OpenBoot PROM `diag` parameter determines the level of POST that is run.

ii When set to the Diagnostics position, the rotary switch overrides the OpenBoot PROM `diag` parameter.

Powering On the Server

Do not use this power-on procedure if you have just added any new internal option or external storage device, or if you have removed a storage device without replacing it. To power on the system under those circumstances, you must initiate a reconfiguration boot. For those instructions, see [“Initiating a Reconfiguration Boot” on page 24](#).



Caution – Never move the system when the system power is on. Movement can cause catastrophic disk drive failure. Always power off the system before moving it.

1. Establish a connection to the system console.

If you are powering on the system for the first time, connect a terminal to the serial management port. For more information on establishing a connection, refer to the *Netra 240 Server Installation Guide* (817-2698).

2. Connect the server to a power source.

Once connected, the server automatically goes into Standby power mode.

Note – As soon as the input power cables are connected to the system, the ALOM boots and displays its power-on self-test (POST) messages. Though the system power is still off, the ALOM software is already monitoring the system. Regardless of the system power state, as long as the power cords are connected and providing standby power, the ALOM is monitoring the system.

3. **Turn on power to any peripherals and external storage devices you have connected to the server.**

Read the documentation supplied with the device for specific instructions.

4. **Grip the bezel at the two finger holds and rotate it down to its open position (FIGURE 2-4).**

Note – You must open the front bezel to access the rotary switch.

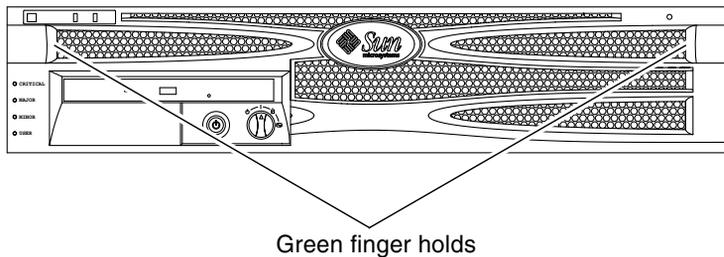


FIGURE 2-4 Finger Holds on the Bezel

5. **Set the rotary switch to the Normal or Diagnostics position (TABLE 2-2 and FIGURE 2-3).**
6. **Press the On/Standby button.**

Verbose POST output is immediately displayed to the system console if diagnostics are enabled at power-on. The system console is directed to the serial and network management ports.

The system can take anywhere from 30 seconds to 5 minutes before text messages appear on the system monitor (if one is attached) or the system prompt appears on an attached terminal. The time depends on the system configuration (number of CPUs, memory modules, PCI cards, and console configuration) and the level of power-on self-test (POST) and OpenBoot Diagnostics tests being performed. The System Activity LED lights when the server is running under control of the Solaris platform.

7. Turn the rotary switch to the Locked position (FIGURE 2-3).
This prevents anyone from accidentally powering off the system.
8. Close the bezel.

Powering On the Server Remotely

To issue software commands, you need to set up an alphanumeric terminal connection, a local graphics monitor connection, an ALOM connection, or a TIP connection to the Netra 240 server.

Do not use this power-on procedure if you have just added any new internal option or external storage device, or if you have removed a storage device without replacing it. To power on the system under those circumstances, you must initiate a reconfiguration boot. For those instructions, see “Initiating a Reconfiguration Boot” on page 24.



Caution – Never move the system when the system power is on. Movement can cause catastrophic hard drive failure. Always power off the system before moving it.

1. Log in to the ALOM.
2. Type the following command:

```
sc> poweron
```

Powering Off the Server



Caution – Applications running on the Solaris platform can be adversely affected by a poorly executed system shutdown. Make sure that you stop and exit applications, then shut down the operating system before powering off the system.

1. Notify users that the system will be powered down.
2. Back up system files and data.
3. Grip the bezel at the two finger holds and rotate it down to its open position (FIGURE 2-4).
4. Ensure that the rotary switch is in the Normal or Diagnostics position (FIGURE 2-3).

5. **Press and release the On/Standby button on the bezel (FIGURE 2-2).**

The system begins an orderly software system shutdown.

Note – Pressing and releasing the On/Standby button initiates an orderly software shutdown. Pressing and holding the button for four seconds causes an immediate hardware shutdown. Whenever possible, initiate an orderly shutdown. Forcing an immediate hardware shutdown can corrupt the hard drive and cause loss of data.

6. **Wait for the front panel green Activity LED to go out.**

Refer to [FIGURE 1-5](#) for the location of the Activity LED.

7. **Disconnect both power input cables.**

This is the only way to remove power from the server. Electrical power is present when the server is in Standby mode.



Caution – As long as the power input cables are connected, potentially hazardous energy is present inside the server.

8. **Close the bezel.**

Powering Off the Server Remotely

To issue software commands, set up an alphanumeric terminal connection, a local graphics monitor connection, ALOM connection, or a T1P connection to the Netra 240 server.

You can power off the system remotely either from the `ok` prompt or from the ALOM `sc>` prompt.



Caution – Applications running on the Solaris platform can be adversely affected by a poorly executed system shutdown. Ensure that you stop and exit applications. Then shut down the operating system before powering off the system.

Powering Off the System From the `ok` Prompt

1. **Before getting to the `ok` prompt, notify users that the system will be powered off.**
2. **Back up the system files and data, if necessary.**

3. Get to the `ok` prompt.

See [“Initiating a Reconfiguration Boot”](#) on page 24.

4. At the `ok` prompt, issue the following command:

```
ok power-off
```

Powering Off the System From the ALOM System Controller Prompt

1. Log in to the ALOM.

2. Determine whether Solaris software is running by executing the `showplatform ALOM` command.

If Solaris software is running, then go to [Step 3](#), otherwise go to [Step 4](#).

3. If Solaris software is running, notify users that the system will be powered off and back up the system files and data, if necessary.

4. Issue the following command:

```
sc> poweroff
```

For more information on powering off from the ALOM system controller prompt including an immediate forced shutdown, refer to the *Sun Advanced Lights Out Manager Software User's Guide for the Netra 240 Server* (817-3174). Information on ALOM is also available in the *Netra 240 Server System Administration Guide* (817-2700).

Initiating a Reconfiguration Boot

After installing any new internal option or external storage device, you must perform a reconfiguration boot so that the operating system is able to recognize the newly installed device(s). In addition, if you remove any device and do not install a replacement device prior to rebooting the system, you must perform a reconfiguration boot in order for the operating system to recognize the configuration change. This requirement also applies to any component that is connected to the system I²C bus to ensure proper environmental monitoring.

This requirement *does not* apply to any component that is:

- Installed or removed as part of a hot-plug operation
- Installed or removed before the operating system is installed
- Installed as an identical replacement for a component that is already recognized by the operating system

To issue software commands, you need to set up an alphanumeric terminal connection, a local graphics monitor connection, ALOM connection, or a TIP connection to the Netra 240 server.



Caution – Before you power on the system, make sure that the system doors and all panels are properly installed.

This procedure assumes that you are accessing the system console using the serial management or network management port. For more information, refer to the *Netra 240 Server Installation Guide* (817-2698).

1. **Turn on power to any external peripherals and storage devices.**
Read the documentation supplied with the device for specific instructions.
2. **Turn on power to the alphanumeric terminal or local graphics monitor, or log in to the ALOM.**
3. **Turn the rotary switch to the Diagnostics position.**
Use the Diagnostics position to run power-on self-test (POST) and OpenBoot Diagnostics tests to verify that the system functions correctly with the new part(s) you just installed. See “[Controlling Server Power](#)” on page 16 for information about rotary switch settings.
4. **Press the On/Standby button to power on the system.**
5. **If you are logged in to the `sc>` prompt, switch to the `ok` prompt. Type:**

```
sc> console
```

6. **When the system banner is displayed on the system console, immediately abort the boot process to access the system `ok` prompt.**

The system banner contains the Ethernet address and host ID. To abort the boot process, use one of the following methods:

- Hold down the Stop (or L1) key and press A on your keyboard.
- Press the Break key on the terminal keyboard.
- Use the UNIX command `tip`, to send a break signal to the system console by typing the characters `~#`.
- Type the `break` command at the `sc>` prompt.

7. If you have not done so already, disable the OpenBoot automatic boot operation:

```
ok setenv auto-boot? false  
ok reset-all
```

You must set the `auto-boot?` variable to `false` and issue the `reset-all` command to ensure that the system correctly initiates upon reboot. If you do not issue these commands, the system might fail to initialize, because the boot process was aborted in [Step 6](#).

8. (Optional) Re-enable the OpenBoot automatic boot operation:

```
ok setenv auto-boot? true
```

Set the `auto-boot?` variable back to `true` so that the system boots automatically after a system reset.

9. At the `ok` prompt, type the following command:

```
ok boot -r
```

The `boot -r` command rebuilds the device tree for the system, incorporating any newly installed options so that the operating system recognizes them.

Note – The system banner takes anywhere from 30 seconds to 5 minutes to appear. The time depends on the system configuration (number of CPUs, memory modules, PCI cards) and the level of POST and OpenBoot Diagnostics tests being performed. For more information about OpenBoot configuration variables, see [Appendix C](#).

10. Turn the rotary switch to the Locked position.

This prevents anyone from accidentally powering off the system.

The system server status LED indicators provide power-on status information. For information about the system LEDs, see [“Front Panel Indicators” on page 8](#).

If the system encounters a problem during startup, and the rotary switch is in the Normal position, restart the system in diagnostics mode to determine the source of the problem. Turn the rotary switch to the Diagnostics position and power cycle the system. See [“Powering Off the Server” on page 22](#).

For information about system diagnostics tools, see the *Netra 240 Server System Administration Guide* (817-2700).

Accessing Internal Components

The cover detaches to provide access to the internal components of the server. You must remove the cover to perform the procedures in [Chapter 4](#) and [Chapter 5](#) of this document.



Caution – Disconnect both power input cables before carrying out this procedure. As long as the power input cables are connected, potentially hazardous energy is present inside the server.



Caution – After servicing, replace and fasten the cover before plugging in the power input cables or turning power on.

Removing the Server Cover

1. **Power off the server.**

See [“Powering Off the Server”](#) on page 22.

2. **Using a No. 2 Phillips screwdriver, loosen the captive screw in the back of the cover (FIGURE 2-5).**

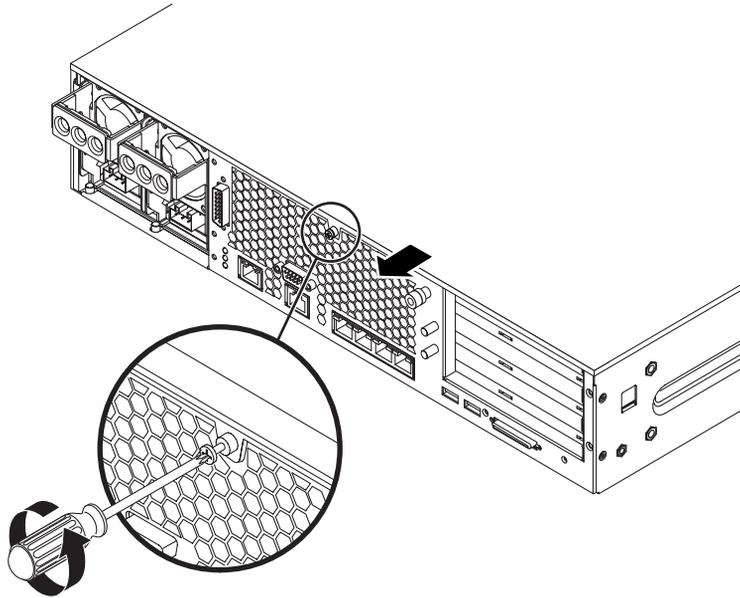


FIGURE 2-5 Removing the Server Cover

- 3. Grasp the cover at the sides and slide it toward the back of the server, then lift it up and away from the server (FIGURE 2-5).**
- 4. Hang the cover on the Netra 240 server, if necessary (FIGURE 2-6).**

You must open the rotating service module to hang the cover on the server. Refer to [“Accessing Rotating Service Module Components”](#) on page 30 for those instructions.

To hang the cover downward, open the front bezel by gripping the bezel at the two finger holds and rotating it down to its open position (FIGURE 2-4).

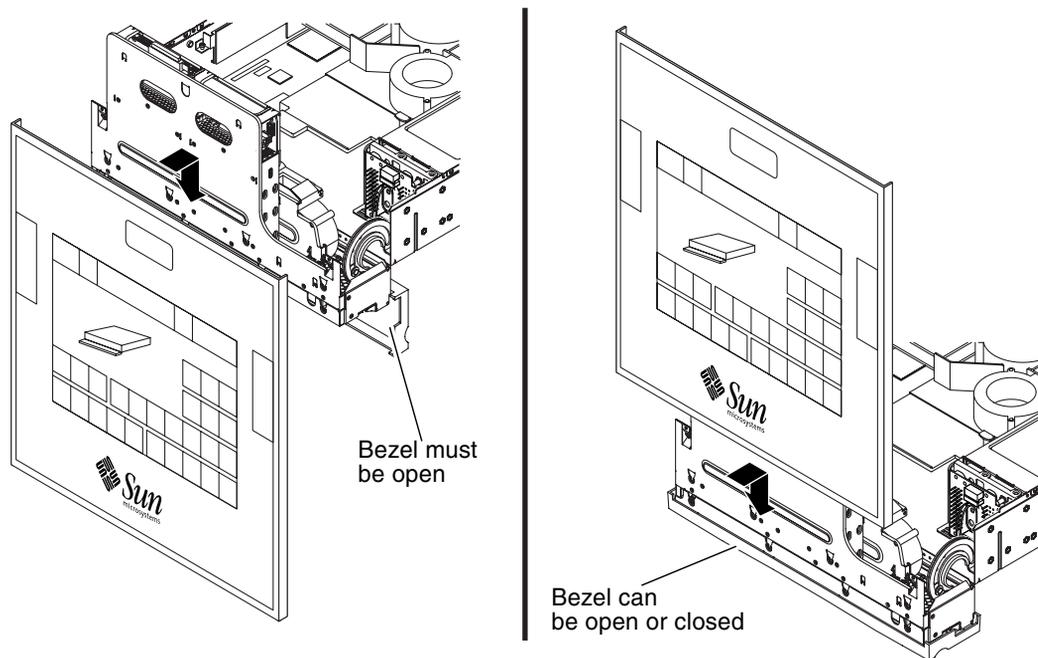


FIGURE 2-6 Two Methods of Hanging the Detached Cover on a Netra 240 Server

Installing the Server Cover

Following are the instructions for installing the cover back onto the server once you have completed the service procedures for the internal components.

- 1. Place the server cover back on top of the server and push it all the way forward.**
Ensure that the rear corners of the cover are properly seated.
- 2. Tighten the captive screw in the back of the cover** ([FIGURE 2-5](#)).
- 3. Power on the server.**
See [“Powering On the Server”](#) on page 20.

Accessing Rotating Service Module Components

You must open the rotating service module to access certain server components. The procedures for servicing the rotating service module components are provided in [Chapter 4](#).

Opening the Rotating Service Module

- 1. Power off the server.**
See [“Powering Off the Server”](#) on page 22.
- 2. Remove the server cover.**
See [“Removing the Server Cover”](#) on page 27.
- 3. Loosen the two captive screws on the rotating service module and open the module (FIGURE 2-7).**

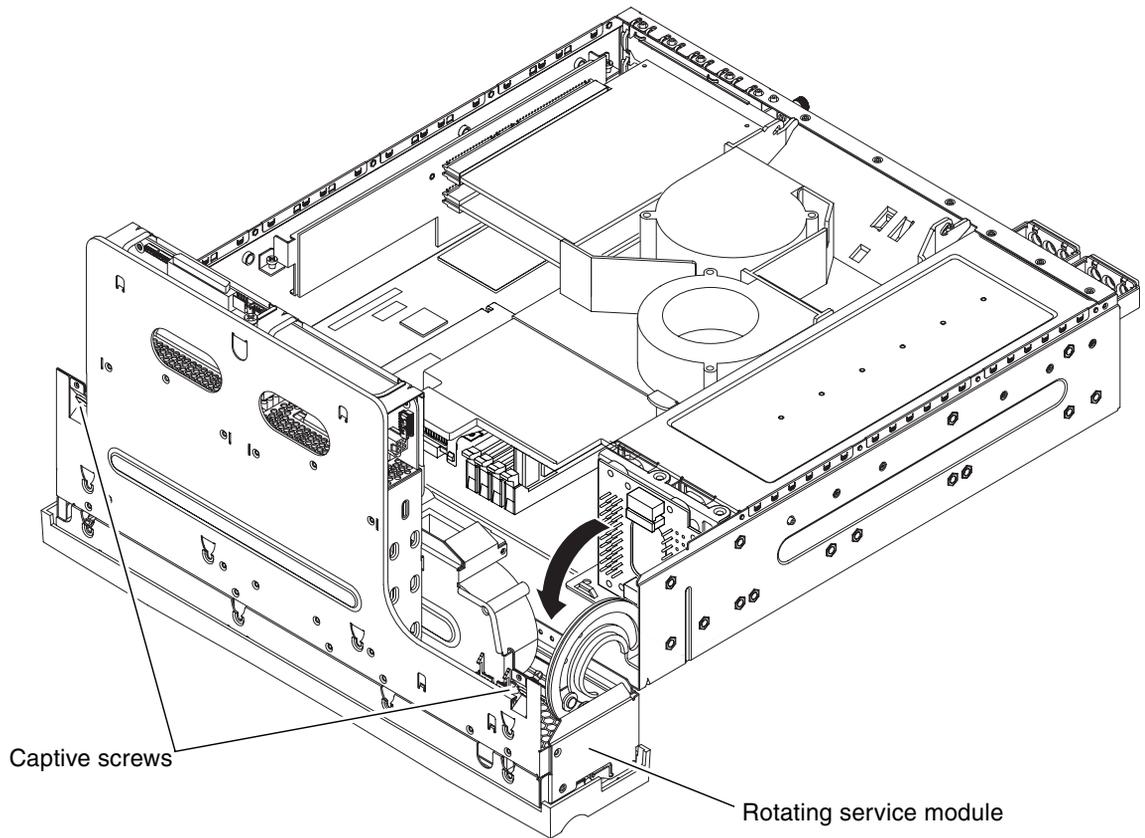


FIGURE 2-7 Opening the Rotating Service Module

Closing the Rotating Service Module

Following are the instructions for closing the rotating service module once you have completed the service procedures for the rotating service module components (see [Chapter 4](#)).

1. Close the rotating service module back into position.
2. Tighten the two captive screws to secure the rotating service module to the server ([FIGURE 2-7](#)).
3. Install the server cover back onto the server.
See [“Installing the Server Cover”](#) on page 29.

4. Power on the server.

See [“Powering On the Server”](#) on page 20.

Avoiding Electrostatic Discharge

Whenever you work with the server’s internal components, follow this procedure to prevent damage caused by static electricity.

You need the following items:

- Antistatic wrist or foot strap
- Antistatic mat

1. Power off the system.

See [“Powering Off the Server”](#) on page 22.

2. Remove the server cover.

See [“Removing the Server Cover”](#) on page 27.

3. Attach one end of the antistatic strap to the grounding point inside the server, and the other end to your wrist ([FIGURE 2-8](#)).

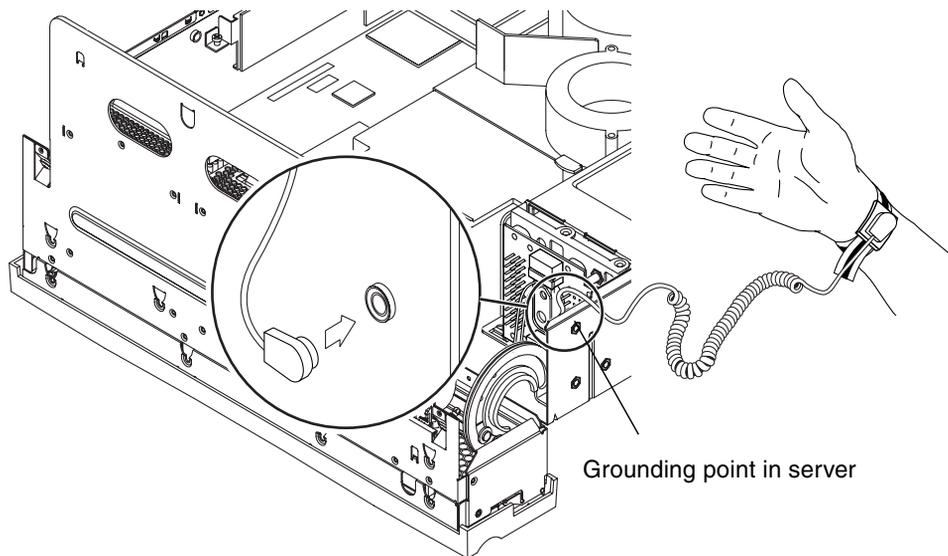


FIGURE 2-8 Grounding Point in the Server

Removing and Replacing Front and Rear Panel Components



Caution – The procedures in this section are for qualified service engineers only.



Caution – Before carrying out any of the procedures in this chapter, read [“Avoiding Electrostatic Discharge”](#) on page 32, and wear a properly grounded antistatic strap.



Caution – Printed circuit boards and hard drives contain electronic components that are extremely sensitive to static electricity. Ordinary amounts of static from your clothes or the work environment can destroy components. Do not touch the components or any metal parts without taking proper antistatic precautions.

Note – Illustrations might contain optional components that are not available on all standard configurations of the Netra 240 server.

This chapter gives removal and replacement procedures for the following components:

- [“Bezel Assembly”](#) on page 34
- [“Air Filter”](#) on page 36
- [“System Configuration Card”](#) on page 38
- [“Hard Drives”](#) on page 40
- [“DVD Drive”](#) on page 45
- [“Power Supply Unit”](#) on page 49

Bezel Assembly

The bezel assembly includes the bezel, the server status indicator board, the alarm LEDs, and the hinges (FIGURE 3-1). The assembly is replaced as a single unit.

Removing the Bezel Assembly

1. **Power off the server.**
See “Powering Off the Server” on page 22.
2. **Ensure that the server is properly grounded.**
See “Avoiding Electrostatic Discharge” on page 32.
3. **Grip the bezel at the two finger holds and rotate it down to its open position (FIGURE 3-1).**

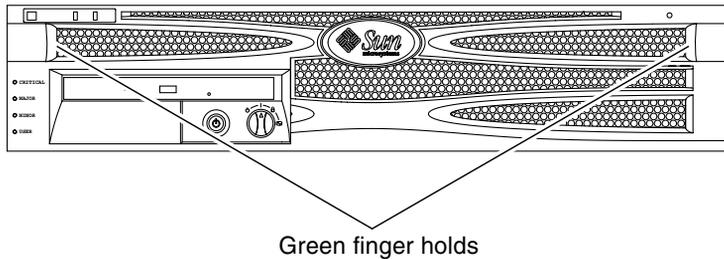


FIGURE 3-1 Finger Holds on the Bezel

4. **Disconnect the bezel cables (the server status indicator cable and the alarm LED cable) connecting the bezel assembly to the server (FIGURE 3-2).**

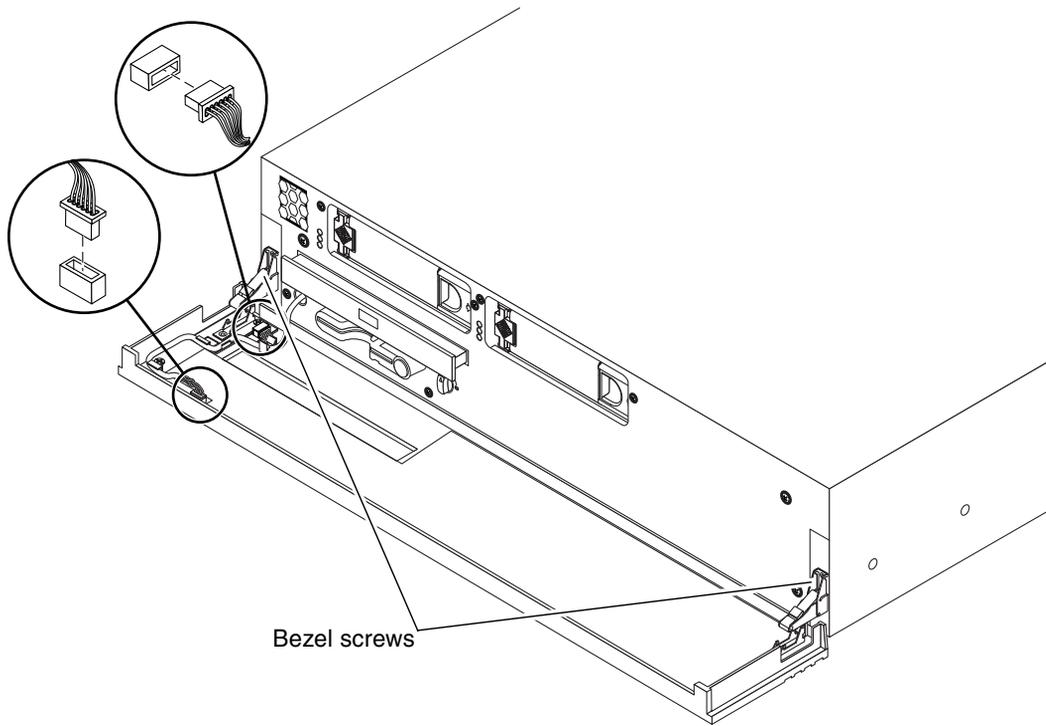


FIGURE 3-2 Disconnecting the Bezel Cables

5. Unscrew and remove the bezel screws from the bezel hinges.
6. Lift and pull the bezel forward to remove it from the server.

Installing the Bezel Assembly

1. Mount the new bezel and hinges onto the server.
2. Secure the bezel assembly to the server using the screws.
3. Reconnect the bezel cables ([FIGURE 3-2](#)).
4. Close the bezel assembly.
5. Power on the server.
See [“Powering On the Server”](#) on page 20.

Air Filter

The air filter is fitted on the inside of the Netra 240 bezel.

Removing the Air Filter

1. **Ensure that the server is properly grounded.**
See [“Avoiding Electrostatic Discharge”](#) on page 32.
2. **Grip the bezel at the two finger holds and rotate it down to its open position** (FIGURE 3-1).
3. **Lift out the air filter from the inside of the bezel by gripping it near the DVD bay area** (FIGURE 3-3).

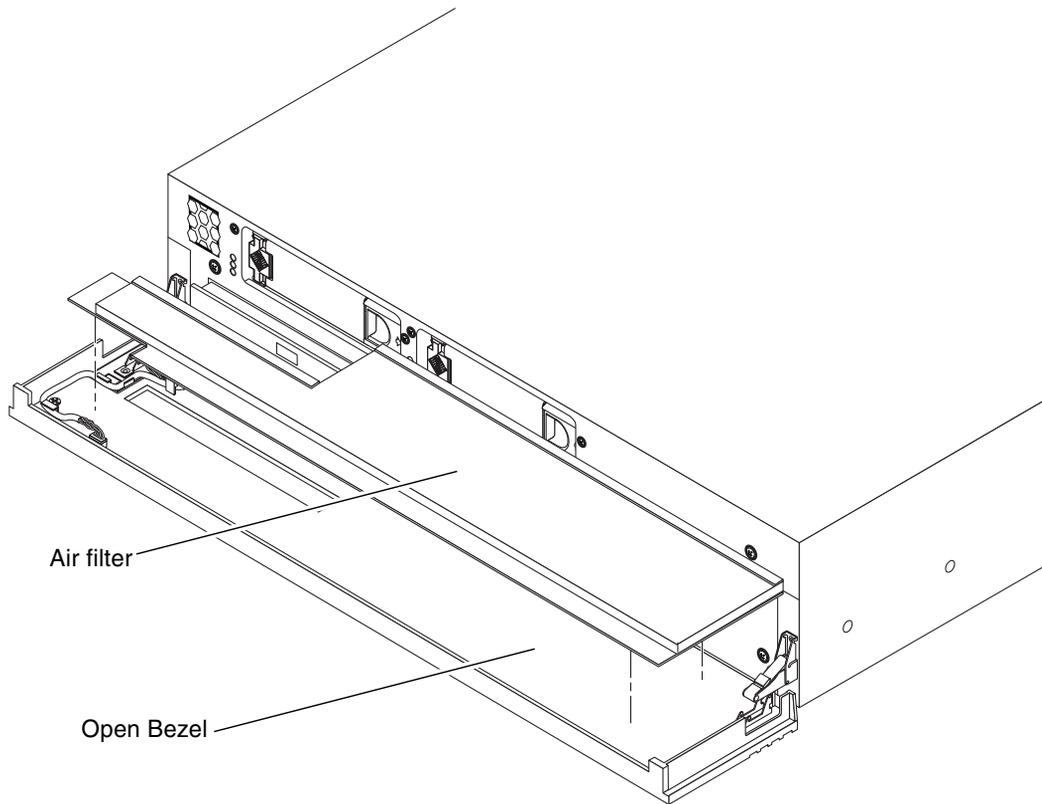


FIGURE 3-3 Removing and Replacing the Air Filter From the Bezel

Installing the Air Filter

1. Snap the new air filter into place in the bezel (FIGURE 3-3).
2. Close the bezel.

System Configuration Card

The system configuration card (SCC) ships tied in place to prevent the card from getting lost. The SCC contains a server's unique network identity information, including the MAC address and host ID (stored in the IDPROM), and the OpenBoot PROM configuration (also known as NVRAM). For more on the NVRAM, see [Appendix C](#).

You can use the procedures in this section to either replace a faulty SCC or to swap a server's unique configuration information from one server to another.

If the system configuration card is faulty or lost, a replacement card can be obtained from Sun Services. See [Appendix A](#) for the system configuration card part number. For more information on how to contact Sun Services, read the *Netra 240 Server Release Notes* (817-3142).

The replacement system configuration card is not programmed with any OpenBoot PROM and ALOM configurations. Upon initial insertion in the Netra 240 server, you are prompted for confirmation that you wish to use the new card. It is then configured with the default configuration for the server.



Caution – The system configuration card must be installed and in place at all times while the system is running. If you remove a system configuration card while the system is running, the system powers off within 30 seconds.



Caution – Avoid contact with the gold terminals on the underside of the card.



Caution – Never remove the system configuration card while the server is booting or running the Solaris software. Before removing or inserting the system configuration card, remove power from the server, or put it into Standby mode.

Removing a System Configuration Card

1. **Power off the server.**

See [“Powering Off the Server” on page 22](#). If you are swapping configuration information from one server to another, you must power off both servers before proceeding.

2. **Open the front bezel** ([FIGURE 3-1](#)).

3. Cut and remove the tie wrap that secures the system configuration card, and remove the card from the system configuration card reader (FIGURE 3-4).

Note – Once the system configuration card is inserted into the system configuration card reader, secure a new tie wrap to discourage accidental or unintentional removal of the card.

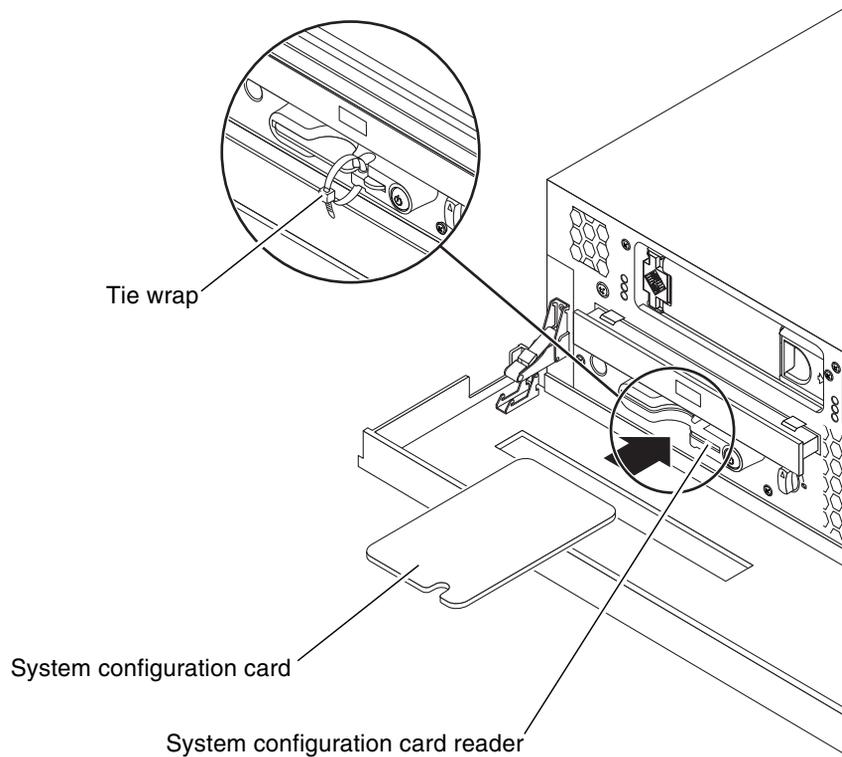


FIGURE 3-4 Removing and Inserting a System Configuration Card

Inserting a System Configuration Card

1. Insert the system configuration card into the system configuration card reader (FIGURE 3-4).
2. Replace the tie wrap on the card.

Note – By replacing the tie wrap, you ensure that the system configuration card is properly seated in the card reader (see [FIGURE 3-4](#)). If the card projects out of the card reader, the system does not boot properly. The tie wrap discourages accidental or unintentional removal of the system configuration card.

3. Power on the server(s).

See “[Powering On the Server](#)” on page 20.



Caution – Never remove the system configuration card while the server is booting or running the Solaris software. Before removing or inserting the system configuration card, either remove power from the server, or put it into Standby mode.

Hard Drives

The Netra 240 server has slots for up to two internal hard drives. The slots accept any Sun Low Voltage Differential (LVD) SCSI hard drive conforming to the 1-inch SCA-2 form factor.

Note – If a Netra 240 server uses one hard drive only, ensure that the filler panel is fitted in the other hard drive bay. The server must not run without a filler in the unoccupied hard drive bay. If you remove the hard drive slot filler panel, retain it for future use.

Removing a Hard Drive

If you are removing a hard drive while the operating system is still running, you must remove the drive logically from the operating system before physically removing it from the server. If you are removing a hard drive from a server that is powered off, skip to [Step 6](#) in these procedures.

Use the following instructions in conjunction with the `cfgadm(M)` man page.

1. Check that the hard drive you want to remove is visible to the operating system.

```
# format
Searching for disks...done

AVAILABLE DISK SELECTIONS:
    0. c1t0d0 <SUN36G cyl 24620 alt 2 hd 27 sec 107>
       /pci@1c,600000/scsi@2/sd@0,0
    1. c1t1d0 <SUN36G cyl 24620 alt 2 hd 27 sec 107>
       /pci@1c,600000/scsi@2/sd@1,0
Specify disk (enter its number):
```

2. Determine the correct Ap_Id label for the hard drive that you want to remove.

```
# cfgadm -al
Ap_Id          Type          Receptacle Occupant    Condition
c0             scsi-bus     connected  configured unknown
c0::dsk/c0t0d0 CD-ROM       connected  configured unknown
c1             scsi-bus     connected  configured unknown
c1::dsk/c1t0d0 disk         connected  configured unknown
c1::dsk/c1t1d0 disk         connected  configured unknown
c2             scsi-bus     connected  unconfigured unknown
usb0/1         unknown      empty      unconfigured ok
usb0/2         unknown      empty      unconfigured ok
```



Caution – Before proceeding, you must remove the hard drive from all its software mount positions and delete any swap areas in use on the disk. If the drive is the system boot device, do not proceed further with these instructions. Do not attempt to unconfigure the boot disk.

3. Unconfigure the hard drive that you intend to remove.

Use the `unconfigure` command and specify the device you intend to remove. For example, if it is Disk 1, type:

```
# cfgadm -c unconfigure c1::dsk/c1t1d0
```

4. Check that the device is now unconfigured:

```
# cfgadm -al
Ap_Id          Type          Receptacle Occupant      Condition
c0             scsi-bus     connected  configured   unknown
c0::dsk/c0t0d0 CD-ROM       connected  configured   unknown
c1             scsi-bus     connected  configured   unknown
c1::dsk/c1t0d0 disk         connected  configured   unknown
c1::dsk/c1t1d0 unavailable  connected  unconfigured unknown
c2             scsi-bus     connected  unconfigured unknown
usb0/1         unknown      empty      unconfigured ok
usb0/2         unknown      empty      unconfigured ok
```

5. Confirm that the hard drive you want to remove from the server is no longer visible to the operating system:

```
# format
Searching for disks...done

AVAILABLE DISK SELECTIONS:
    0. c1t0d0 <SUN72G cyl 14087 alt 2 hd 24 sec 424>
       /pci@1c,600000/scsi@2/sd@0,0
Specify disk (enter its number):
```

6. Ensure that the server is properly grounded.

See [“Avoiding Electrostatic Discharge” on page 32](#).

7. Grip the bezel at the two finger holds and rotate it down to open (FIGURE 3-1).

8. Check that the blue indicator LED is lit on the hard drive.

The blue LED comes on when the hard drive is ready to remove. See [FIGURE 1-6](#) for the location of the LED indicators for the hard drive.

9. Slide the catch at the front of the hard drive to the right (FIGURE 3-5).

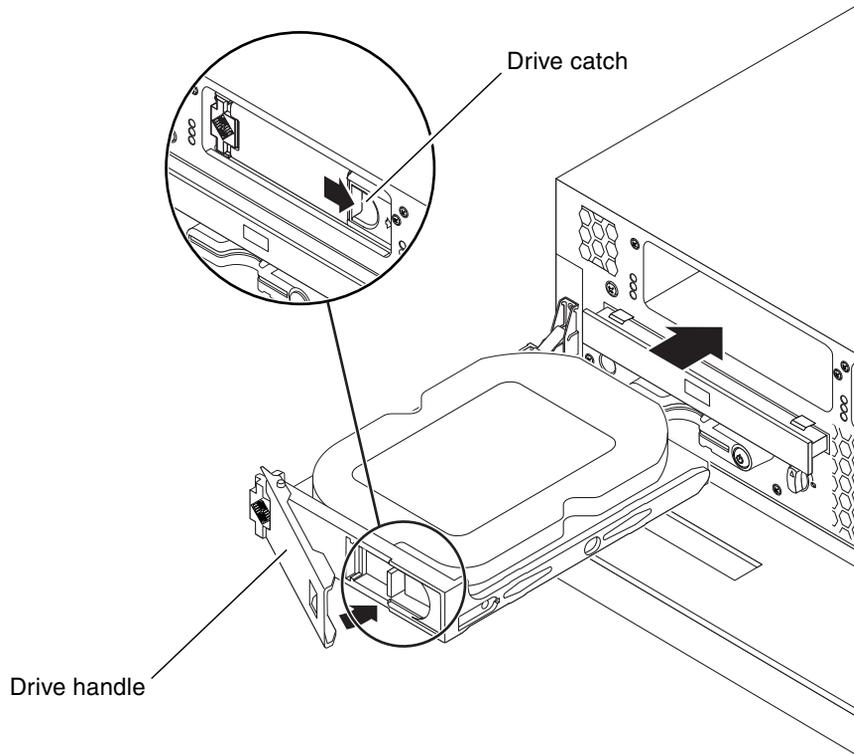


FIGURE 3-5 Removing and Installing a Hard Drive

10. Pull the handle and remove the hard drive from the server by sliding it out from its bay.

Installing a Hard Drive

1. Slide the catch on the front of the hard drive to the right ([FIGURE 3-5](#)).

This releases the handle on the front of the hard drive. The lever must be open *before* you insert the hard drive into the server. If the lever is closed, the hard drive will not engage with the server correctly.

2. Slide the hard drive into its bay at the front of the server.

Push the drive in firmly until the metal lever starts to close. This indicates that the hard drive has engaged with its connector in the server.

3. Push the metal lever until the drive clicks into place.

4. Close the bezel.

5. Determine if the server is powered off or not.

- If you are installing a hard drive in a server that is powered off, see [“Powering On the Server” on page 20](#) to power the server back on. The server recognizes the new hard drive once it has completely booted up.
- If you are installing a hard drive in a server that is powered on, continue with these procedures so that your server recognizes the new hard drive.

6. Log into the system as superuser and run the `format` command so that the drive is visible to the operating system.

Type the following command. (The typical output shown is from a system containing two hard drives.)

```
# format
Searching for disks...done

AVAILABLE DISK SELECTIONS:
   0. c1t0d0 <SUN36G cyl 24620 alt 2 hd 27 sec 107>
      /pci@1c,600000/scsi@2/sd@0,0
   1. c1t1d0 <SUN36G cyl 24620 alt 2 hd 27 sec 107>
      /pci@1c,600000/scsi@2/sd@1,0

Specify disk (enter its number):
```

7. Determine the label of the new hard drive.

The label appears in the `Ap_Id` column of the sample output. Type:

```
# cfgadm -al
Ap_Id          Type          Receptacle  Occupant    Condition
c0             scsi-bus     connected   configured  unknown
c0::dsk/c0t0d0 CD-ROM       connected   configured  unknown
c1             scsi-bus     connected   configured  unknown
c1::dsk/c1t0d0 disk         connected   configured  unknown
c1::dsk/c1t1d0 unavailable  connected   unconfigured unknown
c2             scsi-bus     connected   unconfigured unknown
usb0/1         unknown      empty       unconfigured ok
usb0/2         unknown      empty       unconfigured ok
```

In the preceding sample output, the new drive is Disk 1.

8. Connect the new drive logically to the operating system.

Type the following command, specifying the correct Ap_Id label for the drive you have installed (in this sample command the Ap_Id label is for Disk 1):

```
# cfgadm -c configure c1::dsk/c1t1d0
```

9. Confirm that the drive is now connected and configured:

```
# cfgadm -al
Ap_Id          Type          Receptacle Occupant      Condition
c0             scsi-bus     connected  configured   unknown
c0::dsk/c0t0d0 CD-ROM       connected  configured   unknown
c1             scsi-bus     connected  configured   unknown
c1::dsk/c1t0d0 disk         connected  configured   unknown
c1::dsk/c1t1d0 disk         connected  configured   unknown
c2             scsi-bus     connected  unconfigured  unknown
usb0/1         unknown      empty      unconfigured  ok
usb0/2         unknown      empty      unconfigured  ok
```

The drive is now available to be mounted for operation.

DVD Drive

The DVD drive is not hot-swappable. Before you can remove or insert an optional DVD-ROM drive or an optional DVD-RW drive, the server must be powered down and the power input cables disconnected from the rear of the server.



Caution – Follow the instructions in this section carefully. The DVD drive contains a laser device. Do not attempt to open the DVD drive enclosure or remove a DVD drive using any procedures other than those contained in this section. If you do, you risk being exposed to radiation.

- To install a new DVD drive in the server, go to [“Installing a DVD Drive” on page 47](#).
- To replace a faulty DVD drive, first go to [“Removing a DVD Drive” on page 46](#) to remove the faulty drive. Then go to [“Installing a DVD Drive” on page 47](#) to install the new drive.

Removing a DVD Drive

1. Power off the server.

See [“Powering Off the Server”](#) on page 22.

2. Grip the bezel at the two finger holds and rotate it down to open ([FIGURE 3-1](#)).
3. Unclip the catches that fasten the DVD drive to the chassis ([FIGURE 3-6](#)).

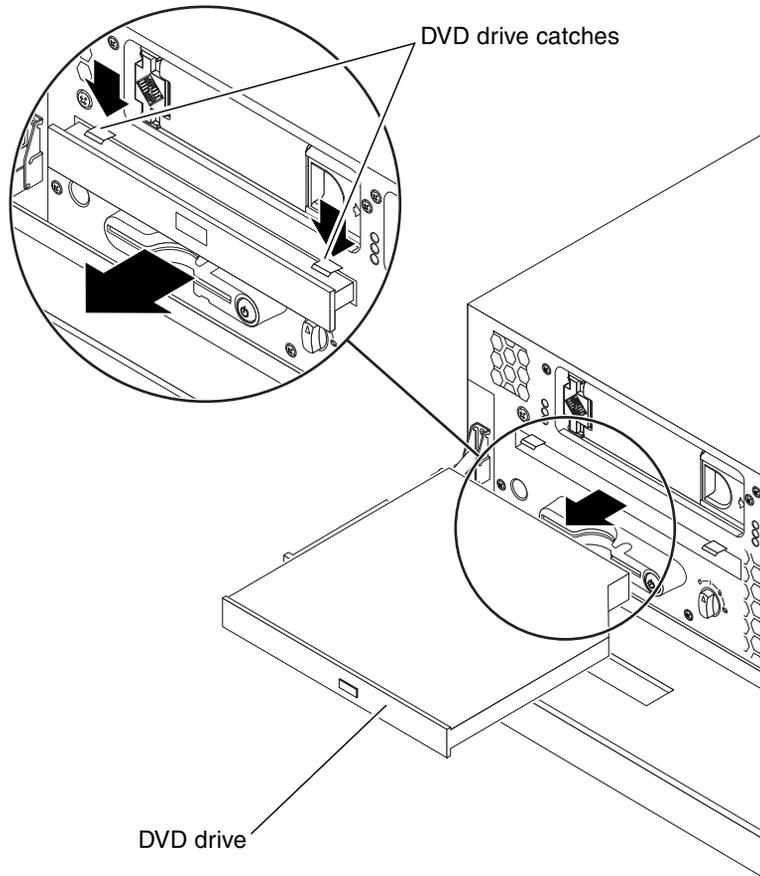


FIGURE 3-6 Removing a DVD Drive

4. Pull the DVD drive toward you until it is free of its connectors and out of the server.

Installing a DVD Drive

1. If the server is powered on, power off the server.

See [“Powering Off the Server”](#) on page 22.

2. If a filler panel is installed, remove the filler panel from the DVD drive slot by pulling it towards you ([FIGURE 3-7](#)).

Note – Retain the DVD drive slot filler panel for future use.

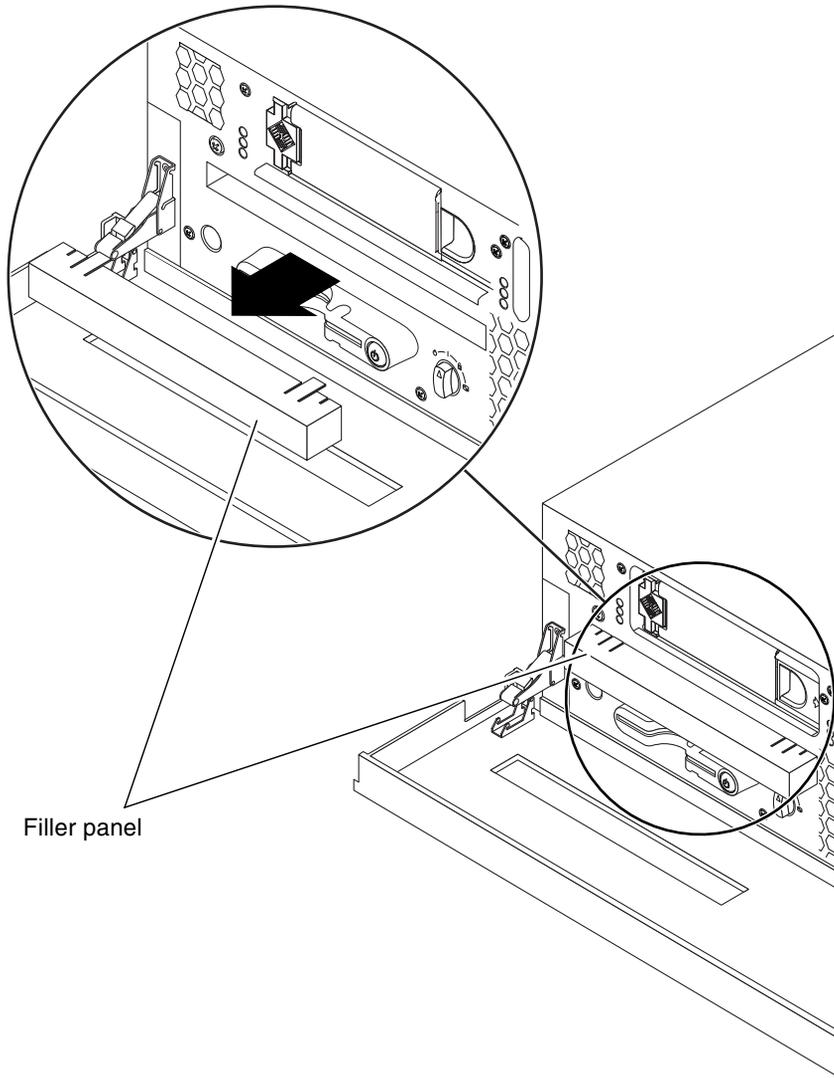


FIGURE 3-7 Location of the DVD Drive Slot With a Filler Panel

3. Push the DVD drive firmly into the drive slot until the DVD connector is inserted into the system and the clips engage with the chassis ([FIGURE 3-6](#)).
4. Close the bezel.
5. Power on the server.
See [“Powering On the Server”](#) on page 20.

Power Supply Unit

The Netra 240 server has dual redundant power supplies. You can hot-swap one power supply while the other is still running, without having to power off the server.



Caution – The power supplies contain pinch points. Be very careful when opening and closing the levers on the power supplies. Keep your hands and fingers away from the base and sides of the levers. For more information about these pinch points, refer to the power supply labels.

Removing a Power Supply Unit

1. At the ALOM prompt, type:

```
sc> removefru -y PSn
```

Where *n* is the power supply unit identifier (1 or 2). For example, to replace power supply unit 1, you would enter:

```
sc> removefru -y PS1
```

When the blue OK to Remove LED on the back of the power supply unit lights up, you can safely remove the unit. See [FIGURE 1-7](#) for the location of the LED indicators for the power supply unit.

2. Disconnect the power input cable from the power supply unit being replaced.



Caution – Do not remove the power input cable from the remaining power supply unit. Doing so causes the system to go through an immediate ungraceful shutdown.

3. Pull the lever on the back of the power supply unit down ([FIGURE 3-8](#)).

This disconnects the power supply unit from the power distribution board inside the server.

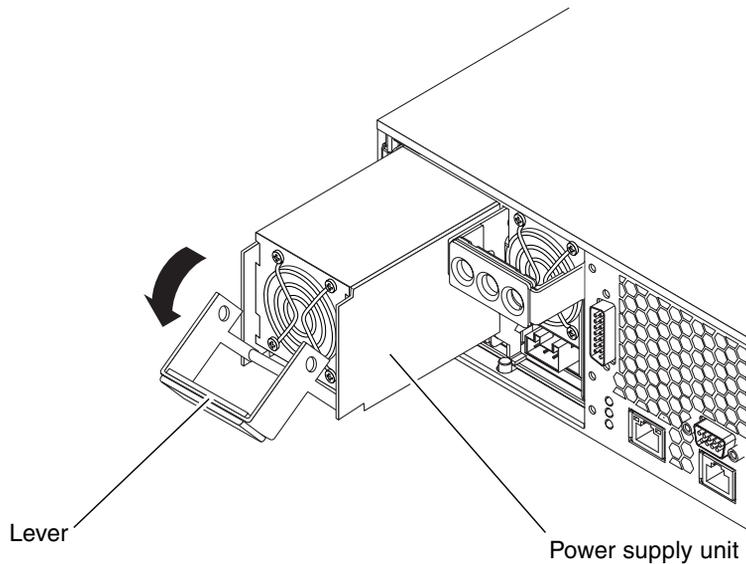


FIGURE 3-8 Removing a Power Supply Unit

4. Slide the power supply unit out of the server chassis by pulling on the lever (FIGURE 3-8).

Installing a Power Supply Unit

1. Insert the power supply unit in the power supply unit bay.
2. Slide the power supply unit into the server until you feel it engage with the power distribution board inside.
Ensure that the lever does not return to a vertical position until the power supply unit engages with the power distribution board. If the lever is vertical, the power supply unit does not engage correctly.
3. Press the lever up until it clicks.
Returning the lever to a vertical position engages the power supply unit with the power distribution board inside the server.

4. At the ALOM prompt, type:

```
sc> poweron PSn
```

Where *n* is the power supply unit identifier (0 or 1). For example, to power on power supply unit 1, you would type:

```
sc> poweron PS1
```

5. Use the power supply unit LED indicators to verify that the power supply unit is up and running.

The green LED on the back of the power supply unit should light up, indicating that the power supply unit is functioning properly. See [FIGURE 1-7](#) for the location of the LED indicators for the power supply unit. If the green LED on the back of the power supply unit does not light up, repeat [Step 1](#) to [Step 5](#).

Removing and Replacing Rotating Service Module Components



Caution – The procedures in this section are for qualified service engineers only.



Caution – Before carrying out any of the procedures in this chapter, read [“Avoiding Electrostatic Discharge” on page 32](#) and wear a properly grounded antistatic strap.



Caution – Printed circuit boards and hard drives contain electronic components that are extremely sensitive to static electricity. Ordinary amounts of static from your clothes or the work environment can destroy components. Do not touch the components or any metal parts without taking proper antistatic precautions.

Note – Illustrations may contain optional components that are not available on all standard configurations of the Netra 240 server.

This chapter provides removal and replacement procedures for the following components:

- [“Alarm Board” on page 54](#)
- [“Front Fan Assembly Tray” on page 56](#)
- [“SCSI Interface Board” on page 58](#)
- [“System Configuration Card Reader Cluster” on page 61](#)

Alarm Board

The alarm board is an LED card with four alarm indicators that is mounted on the rotating service module. The user can reset or apply various applications to the system by configuring the alarm indicator states.

Removing the Alarm Board

- 1. Power off the server.**
See [“Powering Off the Server”](#) on page 22.
- 2. Remove the server cover.**
See [“Removing the Server Cover”](#) on page 27.
- 3. Open the rotating service module.**
See [“Opening the Rotating Service Module”](#) on page 30.
- 4. Ensure that the server is properly grounded.**
See [“Avoiding Electrostatic Discharge”](#) on page 32.
- 5. Push back the securing tabs and detach the ribbon cable and the cable to the SCSI board (FIGURE 4-1).**
- 6. Using a No. 2 Phillips screwdriver, loosen the green captive screw that secures the alarm board to the rotating service module (FIGURE 4-1).**

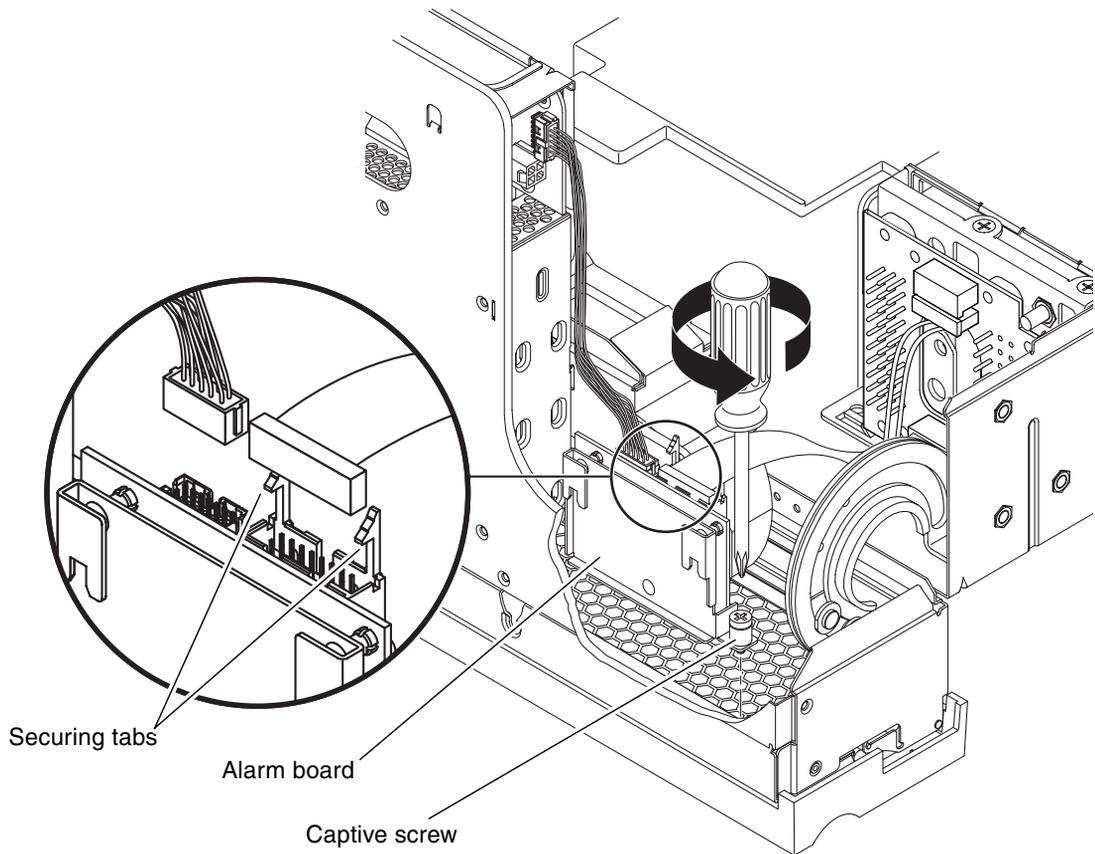


FIGURE 4-1 Removing the Alarm Board

7. Lift the alarm board up and out of the server.

Installing the Alarm Board

1. Place the alarm board into position in the rotating service module ([FIGURE 4-1](#)).
2. Tighten the captive screw to secure the alarm board to the rotating service module ([FIGURE 4-1](#)).
3. Connect the ribbon cable and the cable to the SCSI board to the alarm board and set the securing tabs ([FIGURE 4-1](#)).
4. Close the rotating service module.
See [“Closing the Rotating Service Module”](#) on page 31.

5. Install the server cover.

See [“Installing the Server Cover”](#) on page 29.

6. Power on the server.

See [“Powering On the Server”](#) on page 20.

Front Fan Assembly Tray

The front fan assembly tray is located behind the rotating service module. The front fan assembly tray contains two fans, F2 and F3. The entire front fan assembly tray should be replaced if one of these fans fail.

Removing the Front Fan Assembly Tray

1. Power off the server.

See [“Powering Off the Server”](#) on page 22.

2. Remove the server cover.

See [“Removing the Server Cover”](#) on page 27.

3. Open the rotating service module.

See [“Opening the Rotating Service Module”](#) on page 30.

4. Ensure that the server is properly grounded.

See [“Avoiding Electrostatic Discharge”](#) on page 32.

5. Detach the two front fan assembly cables from the system board connectors (FIGURE 4-2).

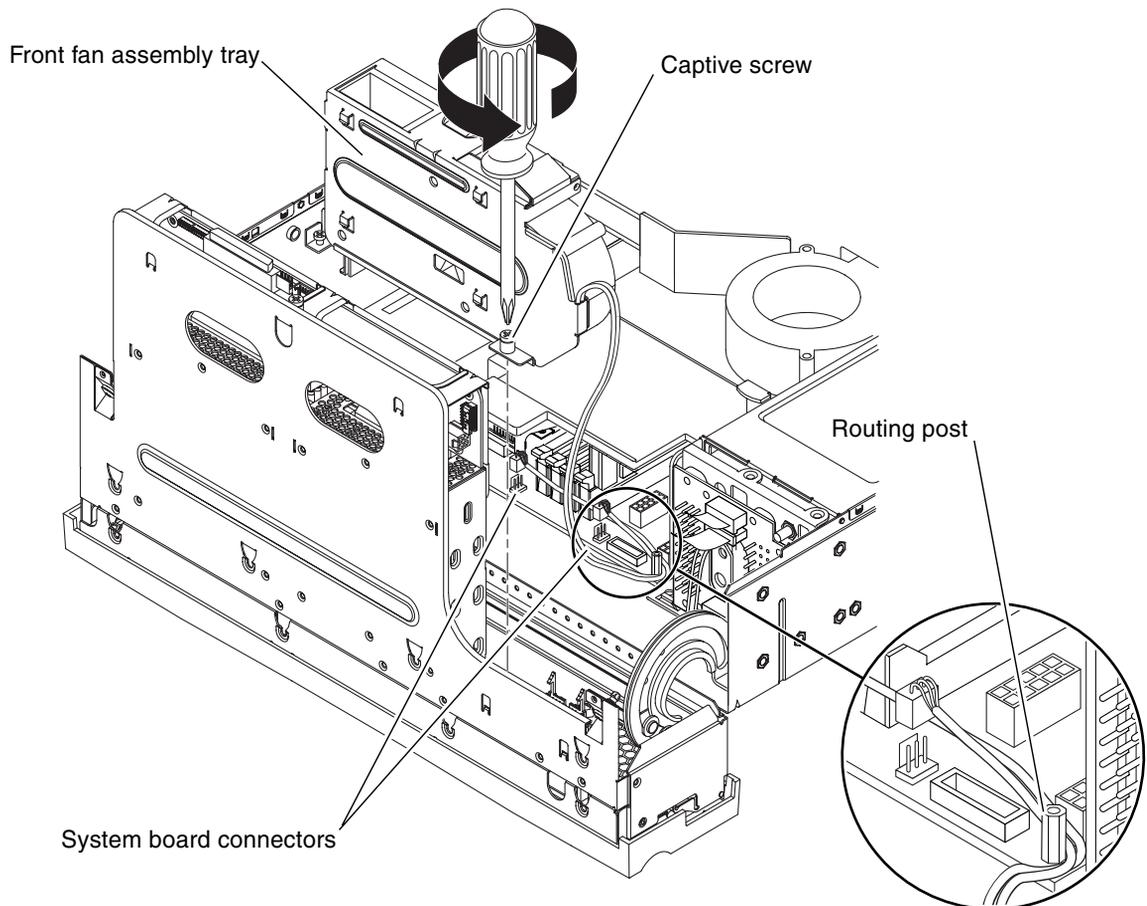


FIGURE 4-2 Removing the Front Fan Assembly Tray

6. Using a No. 2 Phillips screwdriver, loosen the green captive screw that secures the front fan assembly tray to the rotating service module (FIGURE 4-2).
7. Lift the front fan assembly tray straight up and remove it from the server (FIGURE 4-2).

Installing the Front Fan Assembly Tray

1. Place the front fan assembly tray into position in the rotating service module (FIGURE 4-2).
2. Tighten the captive screw to secure the front fan assembly tray to the rotating service module (FIGURE 4-2).

3. **Connect the two cables to the system board and route it behind the post** ([FIGURE 4-2](#)).

Note – Refer to the chassis label for an illustration of the correct routing of the cables.

4. **Close the rotating service module.**
See [“Closing the Rotating Service Module”](#) on page 31.
5. **Install the server cover.**
See [“Installing the Server Cover”](#) on page 29.
6. **Power on the server.**
See [“Powering On the Server”](#) on page 20.

SCSI Interface Board

The SCSI interface board houses the two hard drives.

Removing the SCSI Interface Board

1. **Power off the server.**
See [“Powering Off the Server”](#) on page 22.
2. **Grip the bezel at the two finger holds and rotate it down to its open position** ([FIGURE 2-4](#)).
3. **Make a note of which drive bay holds each hard drive.**
You remove the hard drives in the next step. However, you want to install the hard drives back into the same slots that you removed them from at the end of this procedure.
4. **Remove the hard drives from the drive bays.**
See [“Removing a Hard Drive”](#) on page 40.
5. **Remove the server cover.**
See [“Removing the Server Cover”](#) on page 27.

6. Open the rotating service module.

See “Opening the Rotating Service Module” on page 30.

7. Ensure that the server is properly grounded.

See “Avoiding Electrostatic Discharge” on page 32.

8. Using a No. 2 Phillips screwdriver, loosen the green captive screw on the top of the SCSI interface board (FIGURE 4-3).

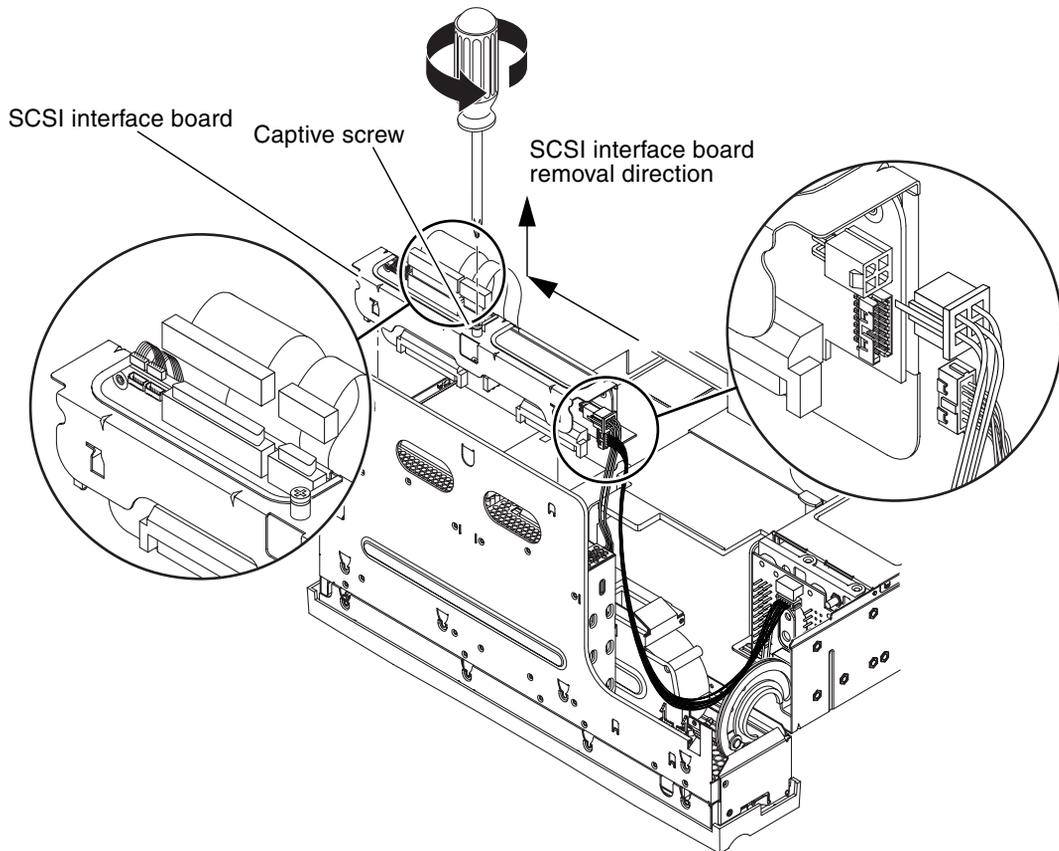


FIGURE 4-3 Removing the SCSI Interface Board

9. Detach the bezel cables, the SCSI interface cable, the DVD power/I²C interface ribbon cable, the alarm board cable, and the SCSI interface board power cable from the SCSI interface board (FIGURE 4-3).

10. When standing in the front of the server, slide the SCSI interface board to the left and then up to remove it from the rotating service module.

Installing the SCSI Interface Board

- 1. When standing in the front of the server, place the SCSI interface board into position in the rotating service module (FIGURE 4-3).**

Align the six tabs on the SCSI interface board, then slide the assembly down and to the right to lock into position.
- 2. Tighten the captive screw to secure the board to the rotating service module (FIGURE 4-3).**
- 3. Attach and route the bezel cables, the SCSI interface cable, the DVD power/I²C interface ribbon cable, the alarm board cable, and the SCSI interface board power cable to the SCSI interface board (FIGURE 4-3).**
- 4. Close the rotating service module.**

See [“Closing the Rotating Service Module” on page 31](#).
- 5. Install the server cover.**

See [“Installing the Server Cover” on page 29](#).
- 6. Grip the bezel at the two finger holds and rotate it down to its open position (FIGURE 2-4).**
- 7. Install the hard drives back into the drive bays.**

See [“Installing a Hard Drive” on page 43](#). Refer to the notes that you took earlier in the procedure to install the hard drives back into the proper bays.
- 8. Power on the server.**

See [“Powering On the Server” on page 20](#).

System Configuration Card Reader Cluster

The system configuration card reader cluster includes the DVD drive bay, the rotary switch, and the system configuration card bay.

Removing the System Configuration Card Reader Cluster

- 1. Power off the server.**
See [“Powering Off the Server”](#) on page 22.
- 2. Grip the bezel at the two finger holds and rotate it down to its open position (FIGURE 2-4).**
- 3. Remove the system configuration card from the system configuration card reader.**
See [“Removing a System Configuration Card”](#) on page 38.
- 4. Remove the DVD-ROM drive from the server.**
See [“Removing a DVD Drive”](#) on page 46.
- 5. Remove the server cover.**
See [“Removing the Server Cover”](#) on page 27.
- 6. Open the rotating service module.**
See [“Opening the Rotating Service Module”](#) on page 30.
- 7. Ensure that the server is properly grounded.**
See [“Avoiding Electrostatic Discharge”](#) on page 32.
- 8. Lift the SCSI/IDE cable clamp out of the way (FIGURE 4-4).**
The clamp has a green cap that is attached to the chassis, and holds the SCSI interface cable and the IDE cable.

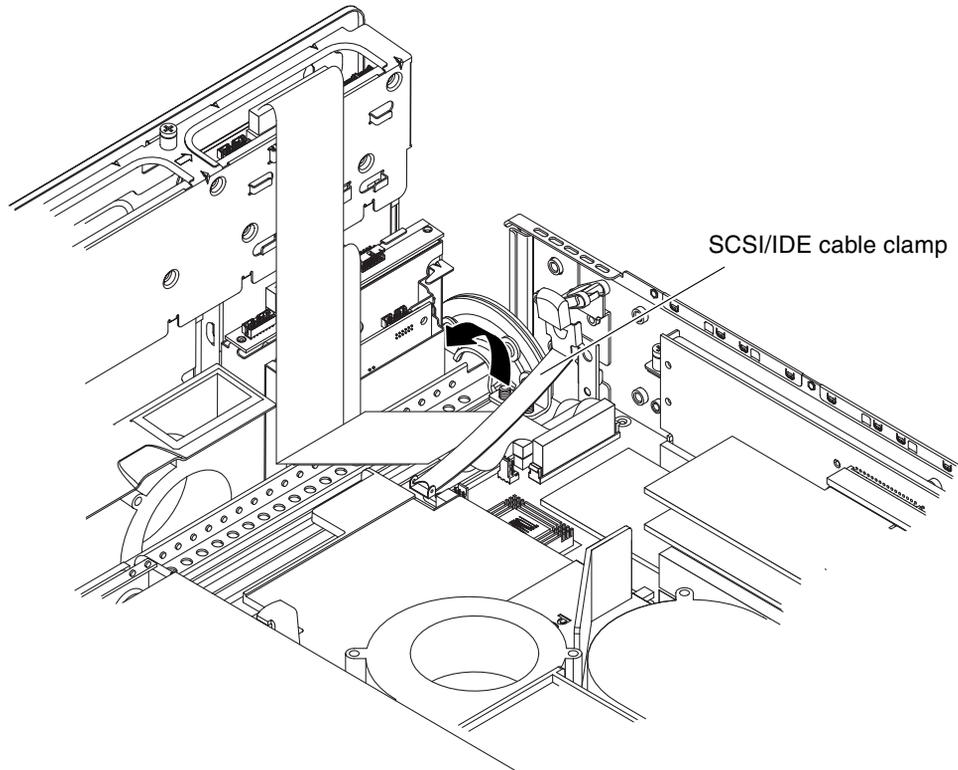


FIGURE 4-4 Lifting the SCSI/IDE Cable Clamp

9. Unplug the cables in the sequence below ([FIGURE 4-5](#) and [FIGURE 4-6](#)):
 - a. Unplug the SCSI interface board cable from the system board and remove it out of the way.

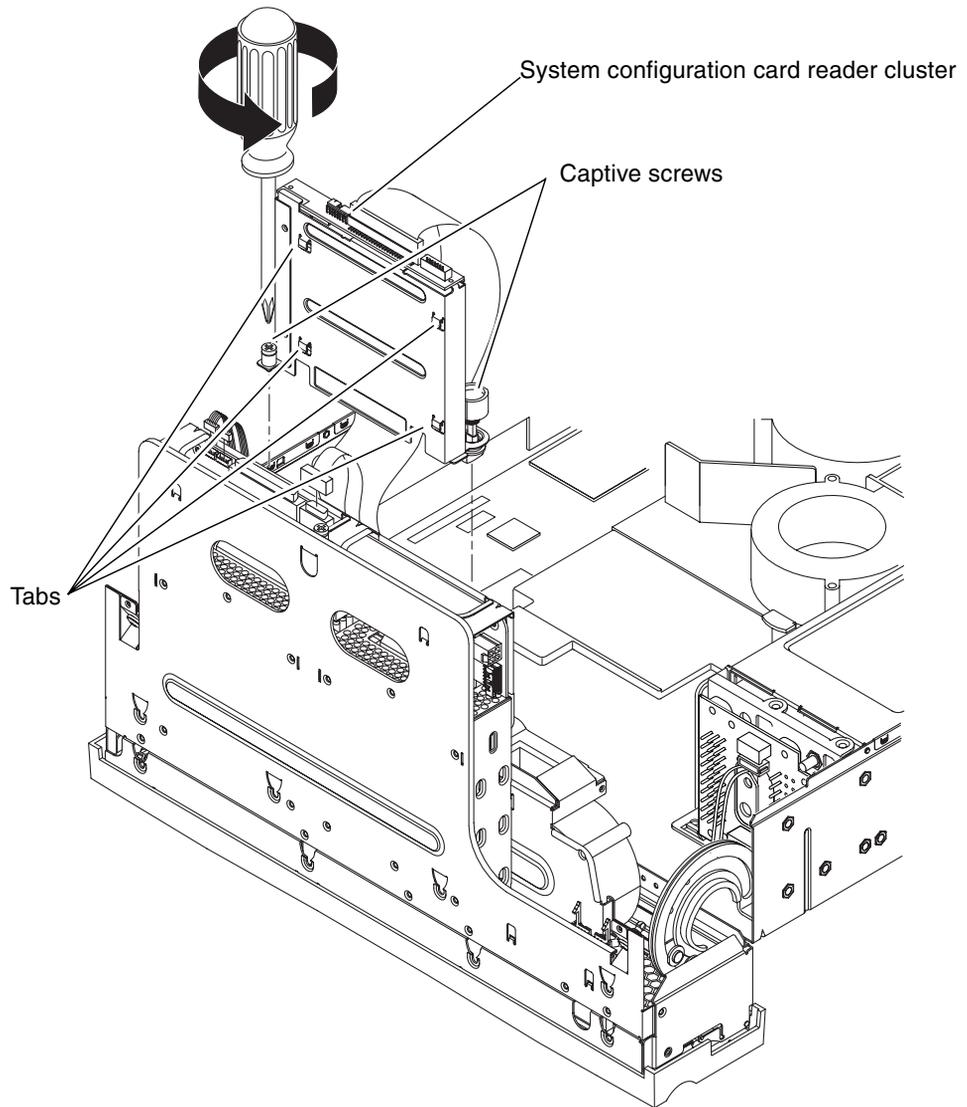


FIGURE 4-6 Removing the System Configuration Card Reader Cluster

Installing the System Configuration Card Reader Cluster

- 1. Place the system configuration card reader cluster in position in the rotating service module (FIGURE 4-6).**

Ensure that the four tabs are properly inserted into their locations.
- 2. Using a No. 2 Phillips screwdriver, tighten the two captive screws to secure the cluster to the rotating service module (FIGURE 4-6).**
- 3. Plug the cables back in:**
 - a. Plug the IDE cable into the system board.**
 - b. Plug the bezel cables into the SCSI interface board.**
 - c. Plug the DVD power/I²C interface ribbon cable into the SCSI interface board.**
 - d. Plug the SCSI interface cable.**
- 4. Press the SCSI/IDE cable clamp back down to secure the SCSI interface and IDE cables.**

The cable clamp is attached to the chassis and has a green cap. See [FIGURE 4-4](#) for the location of this clamp.
- 5. Close the rotating service module.**

See [“Closing the Rotating Service Module”](#) on page 31.
- 6. Install the server cover.**

See [“Installing the Server Cover”](#) on page 29.
- 7. Grip the bezel at the two finger holds and rotate it down to its open position (FIGURE 2-4).**
- 8. Install the DVD drive back into the server.**

See [“Installing a DVD Drive”](#) on page 47.
- 9. Install the system configuration card back into the system configuration card reader.**

See [“Inserting a System Configuration Card”](#) on page 39.
- 10. Close the bezel door.**
- 11. Power on the server.**

See [“Powering On the Server”](#) on page 20.

Removing and Replacing Miscellaneous Internal Components



Caution – The procedures in this section are for qualified service engineers only.



Caution – Before carrying out any of the procedures in this chapter, read [“Avoiding Electrostatic Discharge” on page 32](#), and wear a properly grounded antistatic strap.



Caution – Printed circuit boards and hard drives contain electronic components that are extremely sensitive to static electricity. Ordinary amounts of static from your clothes or the work environment can destroy components. Do not touch the components or any metal parts without taking proper antistatic precautions.

Note – Illustrations might contain optional components that are not available on all standard configurations of the Netra 240 server.

This chapter provides removal and replacement procedures for the following components:

- [“Air Duct and Rear Fan Assembly” on page 68](#)
- [“Memory Modules” on page 70](#)
- [“PCI Cards” on page 76](#)
- [“Power Distribution Board” on page 81](#)
- [“Hardware Cryptographic Module” on page 85](#)
- [“System Board Assembly” on page 87](#)

Air Duct and Rear Fan Assembly

The air duct and rear fan assembly contains two fans, F0 and F1. The entire rear fan assembly should be replaced if one of these fans fail.

Removing or Rotating the Air Duct and Rear Fan Assembly

- 1. Power off the server.**
See [“Powering Off the Server”](#) on page 22.
- 2. Remove the server cover.**
See [“Removing the Server Cover”](#) on page 27.
- 3. Open the rotating service module.**
See [“Opening the Rotating Service Module”](#) on page 30.
- 4. Ensure that the server is properly grounded.**
See [“Avoiding Electrostatic Discharge”](#) on page 32.
- 5. Determine if you want to gain access to the components beneath the air duct and rear fan assembly, or if you want to completely remove the assembly from the server (refer to [FIGURE 5-1](#) for both sets of instructions).**
 - If you want to gain access to components beneath the air duct and rear fan assembly, push the tab on the right of the assembly to the rear of the system, then rotate it up and out of the way.
 - If you want to completely remove the air duct and rear fan assembly from the server:
 - a. Push the tab on the right of the assembly to the rear of the assembly and rotate the assembly up.**
 - b. Unplug the two lower cables from the system board.**
 - c. Dislodge the assembly from the rear supports and slide it out of the system.**

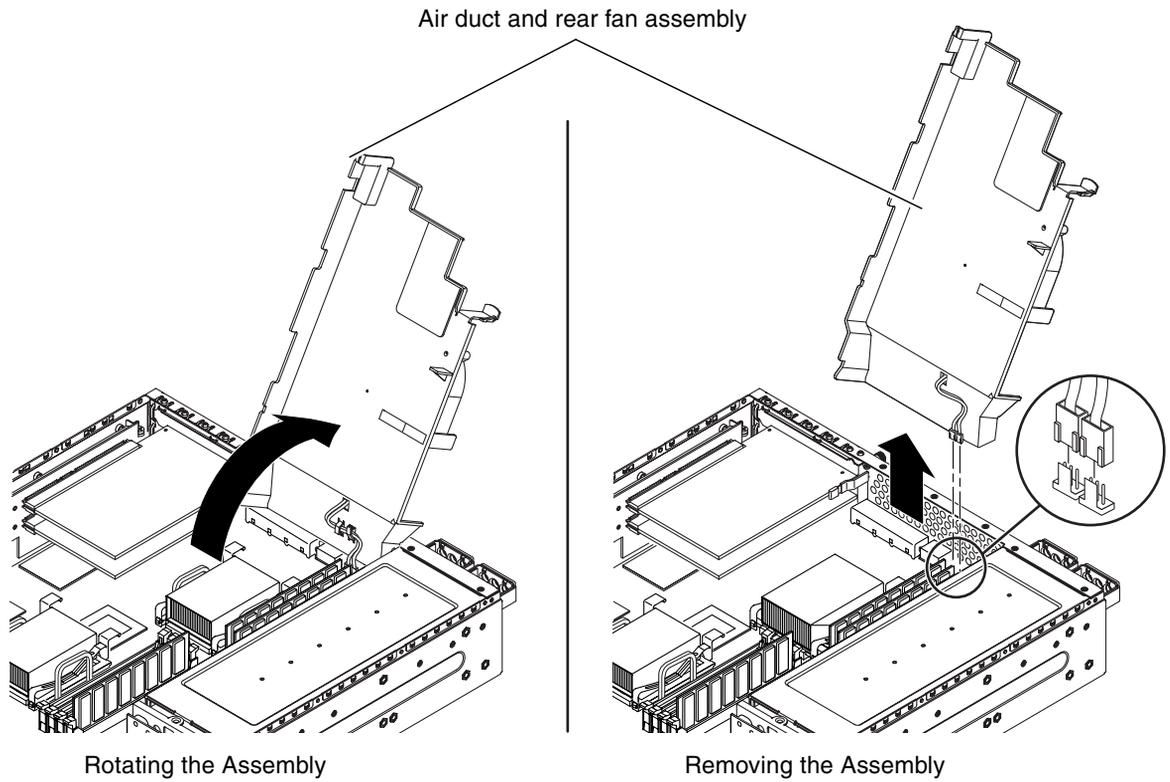


FIGURE 5-1 Removing/Rotating the Air Duct and Rear Fan Assembly

Installing or Closing the Air Duct and Rear Fan Assembly

1. Slide the air duct and rear fan assembly into position.
2. Plug in the two lower cables from the system board ([FIGURE 5-1](#)).
3. Rotate the assembly back in position and press down to snap the locking tab.
4. Close the rotating service module.
See [“Closing the Rotating Service Module”](#) on page 31.
5. Install the server cover.
See [“Installing the Server Cover”](#) on page 29.
6. Power on the server.
See [“Powering On the Server”](#) on page 20.

Memory Modules

There are eight DIMM slots on the system board, with four DIMM slots adjacent to each CPU socket. Because memory is installed as matched DIMM pairs, these slots are divided into two DIMM banks per CPU (see [FIGURE 5-2](#) for their locations).

Therefore, CPU0 has four corresponding DIMM slots divided into two banks, Bank0 and Bank1. CPU1 has four corresponding DIMM slots divided into two banks, Bank0 and Bank1.

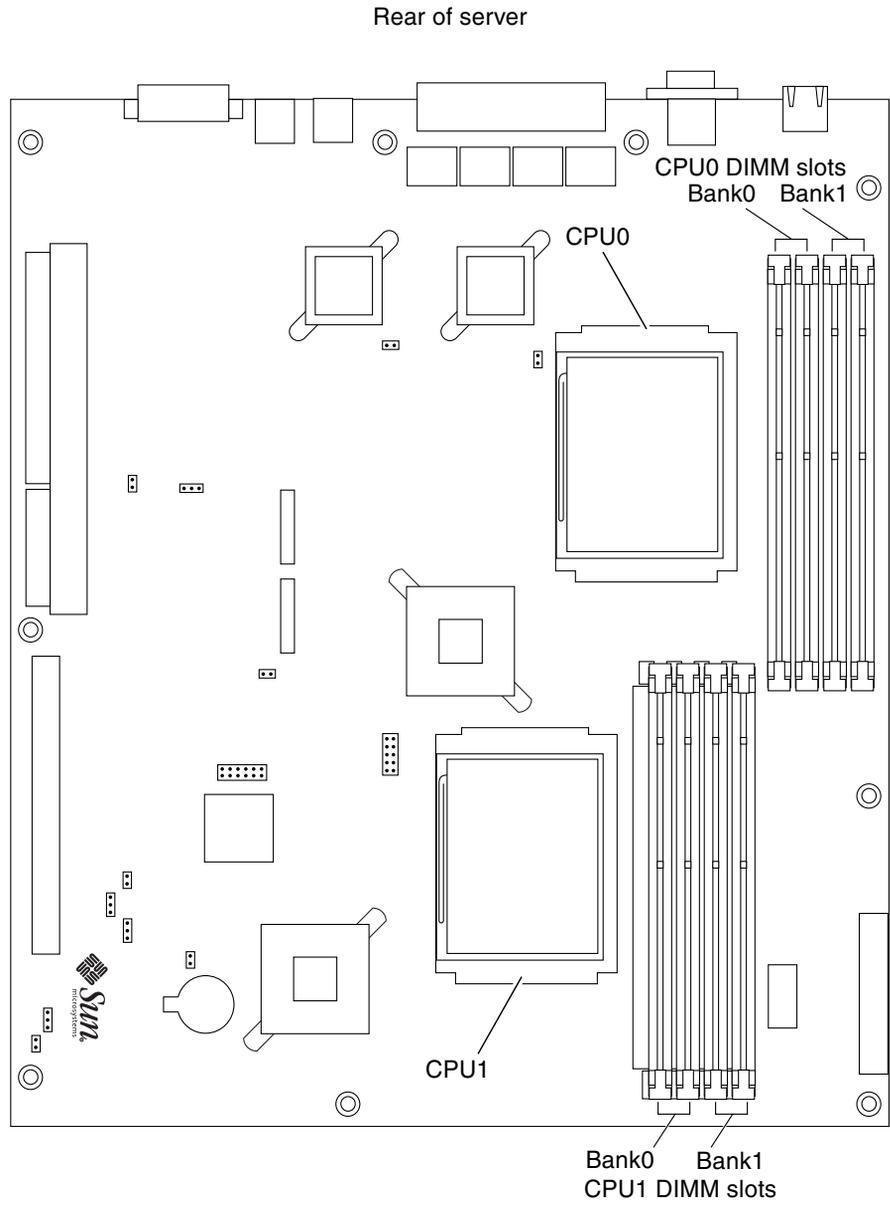


FIGURE 5-2 System Board CPUs and Corresponding Memory Locations

Memory is available in DIMM pairs. For a list of the available memory options, see [“Miscellaneous Internal Components” on page 111](#).

- To install one or more new memory modules in your server, go to [“Installing Memory Modules” on page 74](#).
- To replace faulty memory modules in the server, first go to [“Removing Memory Modules” on page 72](#) to remove the faulty memory module(s), then go to [“Installing Memory Modules” on page 74](#) to install the replacement memory module(s).

Removing Memory Modules

1. Power off the server.

See [“Powering Off the Server” on page 22](#).

2. Remove the server cover.

See [“Removing the Server Cover” on page 27](#).

3. Open the rotating service module.

See [“Opening the Rotating Service Module” on page 30](#).

4. Ensure that the server is properly grounded.

See [“Avoiding Electrostatic Discharge” on page 32](#).

5. Rotate the air duct and rear fan assembly up.

See [“Removing or Rotating the Air Duct and Rear Fan Assembly” on page 68](#). Note that you only have to rotate the assembly up, not remove it from the server.

6. Press down on the latches at the sides of the memory socket (FIGURE 5-3).

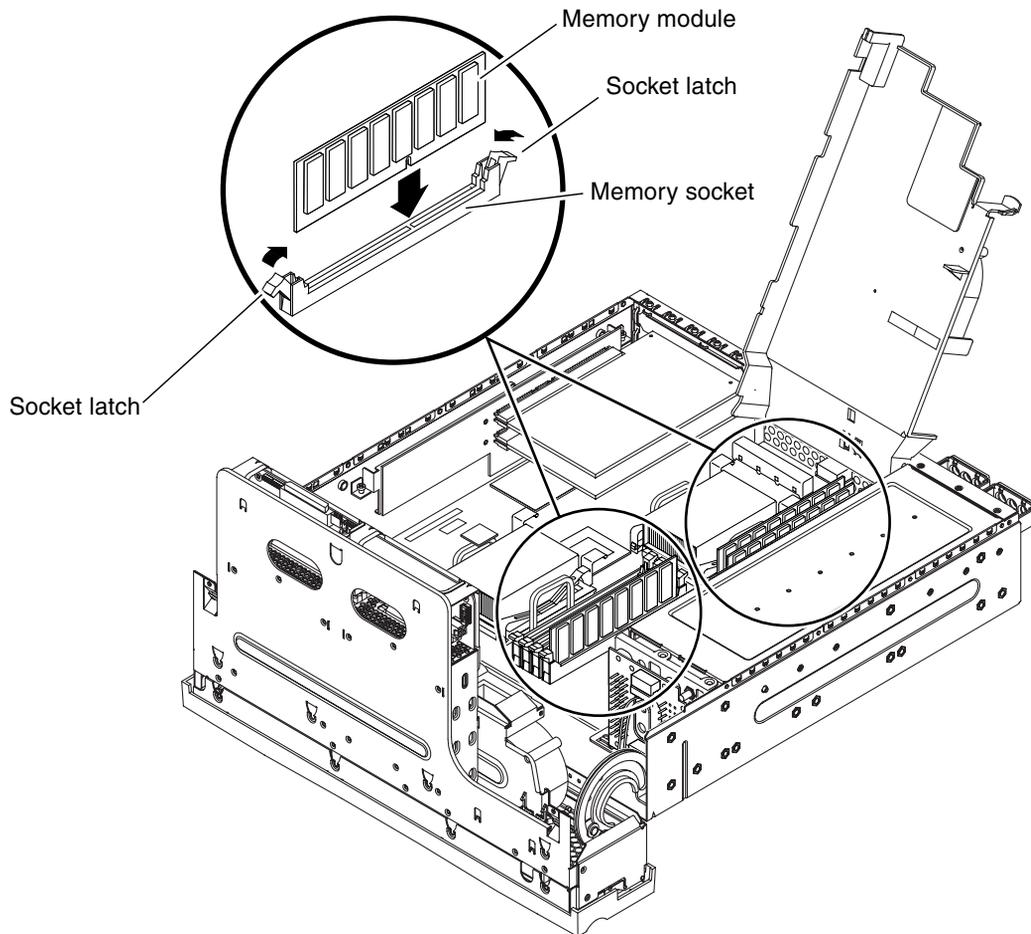


FIGURE 5-3 Removing and Inserting Memory

7. Remove the memory module from the socket.

Installing Memory Modules

Memory Configuration Rules

When you install memory, follow these configuration rules:

- All memory must be installed on the system board as matched DIMM pairs, where each DIMM in the pair shares the same characteristics.
- All DIMM pairs on the system board must share the following characteristics:
 - Vendor
 - Type
 - Capacity
 - Speed
- On a single-processor system board, install the first DIMM pair in the memory bank next to the CPU. For example, on a single-processor system board, the CPU is installed in the CPU0 slot. Therefore, you must install the first DIMM pair in CPU0 DIMM Bank0 (see [FIGURE 5-2](#)).
- A dual-processor system board must have a minimum of one DIMM pair installed in CPU0 DIMM Bank0 (see [FIGURE 5-2](#)).
- When installing additional memory, see [TABLE 5-1](#) and [TABLE 5-2](#) for the proper installation order of the DIMM pairs.

TABLE 5-1 DIMM Pair Installation Order for a Single-Processor Server

DIMM Pair	System Board DIMM Bank
First DIMM pair	CPU0 DIMM Bank0
Second DIMM pair	CPU0 DIMM Bank1

TABLE 5-2 DIMM Pair Installation Order for a Dual-Processor Server

DIMM Pair	System Board DIMM Bank
First DIMM pair	CPU0 DIMM Bank0
Second DIMM pair	CPU1 DIMM Bank0
Third DIMM pair	CPU0 DIMM Bank1
Fourth DIMM pair	CPU1 DIMM Bank1

1. **Prepare the server for servicing, if you have not done so already:**
 - a. **Power off the server.**
See [“Powering Off the Server”](#) on page 22.
 - b. **Remove the server cover.**
See [“Removing the Server Cover”](#) on page 27.
 - c. **Close the rotating service module.**
See [“Opening the Rotating Service Module”](#) on page 30.
 - d. **Ensure that the server is properly grounded.**
See [“Avoiding Electrostatic Discharge”](#) on page 32.
 - e. **Rotate the air duct and rear fan assembly up.**
See [“Removing or Rotating the Air Duct and Rear Fan Assembly”](#) on page 68.
Note that you only have to rotate the assembly up, not remove it from the server.
2. **Locate the correct memory socket (FIGURE 5-3).**
3. **Ensure that the socket latches are open.**
4. **Press the memory module in the memory socket.**
5. **Press down until the socket latches snap into place.**
6. **Close the air duct and rear fan assembly.**
See [“Installing or Closing the Air Duct and Rear Fan Assembly”](#) on page 70.
7. **Close the rotating service module.**
See [“Closing the Rotating Service Module”](#) on page 31.
8. **Install the server cover.**
See [“Installing the Server Cover”](#) on page 29.
9. **Power on the server.**
See [“Powering On the Server”](#) on page 20.

PCI Cards

The Netra 240 server supports one full-length 64-bit PCI card running at 33 MHz or 66 MHz (PCI0), and two half-length 64-bit PCI cards running at 33 MHz (PCI1 and PCI2). They are 3.3V (PCI 0) and 5V (PCI 1-2). The server can support a maximum of 25W per card, but no more than 45W spread over all three slots. The PCI cards are *not* hot-swappable.

Note – Add PCI cards to the Netra 240 server in order from PCI 0 to PCI 2. This corresponds to populating the PCI slots from bottom to top.

The following procedures describe how to remove and install individual PCI cards into the Netra 240 server.

- To install one or more new PCI cards in your server, go to [“Installing a PCI Card” on page 80](#).
- To replace a faulty PCI card in the server, first go to [“Removing a PCI Card” on page 77](#) to remove the PCI card, then go to [“Installing a PCI Card” on page 80](#) to install the replacement PCI card.

Removing a PCI Card

1. Power off the server.

See [“Powering Off the Server”](#) on page 22.

2. Remove the server cover.

See [“Removing the Server Cover”](#) on page 27.

3. Open the rotating service module.

See [“Opening the Rotating Service Module”](#) on page 30.

4. Ensure that the server is properly grounded.

See [“Avoiding Electrostatic Discharge”](#) on page 32.

5. Completely remove the air duct and rear fan assembly.

See [“Removing or Rotating the Air Duct and Rear Fan Assembly”](#) on page 68.

6. Using a No. 2 Phillips screwdriver, unscrew the PCI lockdown screw on the back of the server (FIGURE 5-4).

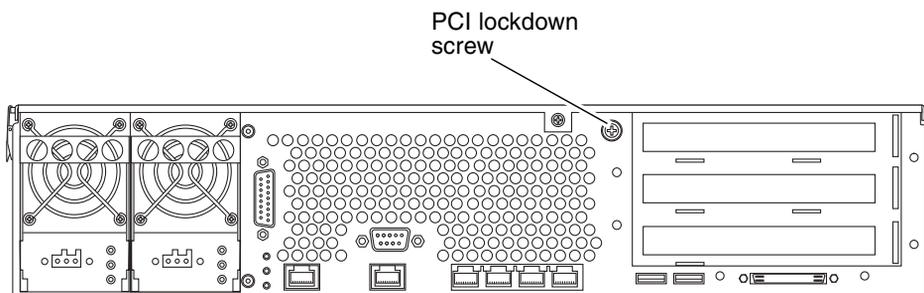


FIGURE 5-4 Location of the PCI Lockdown Screw

7. Remove the PCI lockdown bracket on the inside of the server ([FIGURE 5-5](#)).

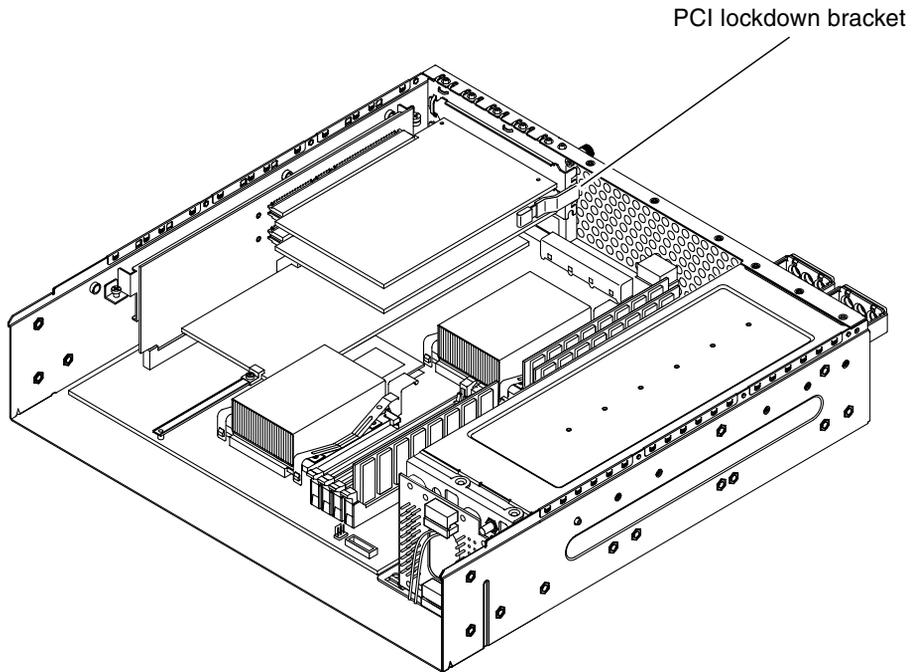


FIGURE 5-5 Location of the PCI Lockdown Bracket

8. Determine which of the PCI cards you are removing from the server.

- If you are removing one of the two half-length PCI cards installed in the upper positions (PCI1 or PCI2), unseat the PCI card from the connector and lift it out of the server (FIGURE 5-6).

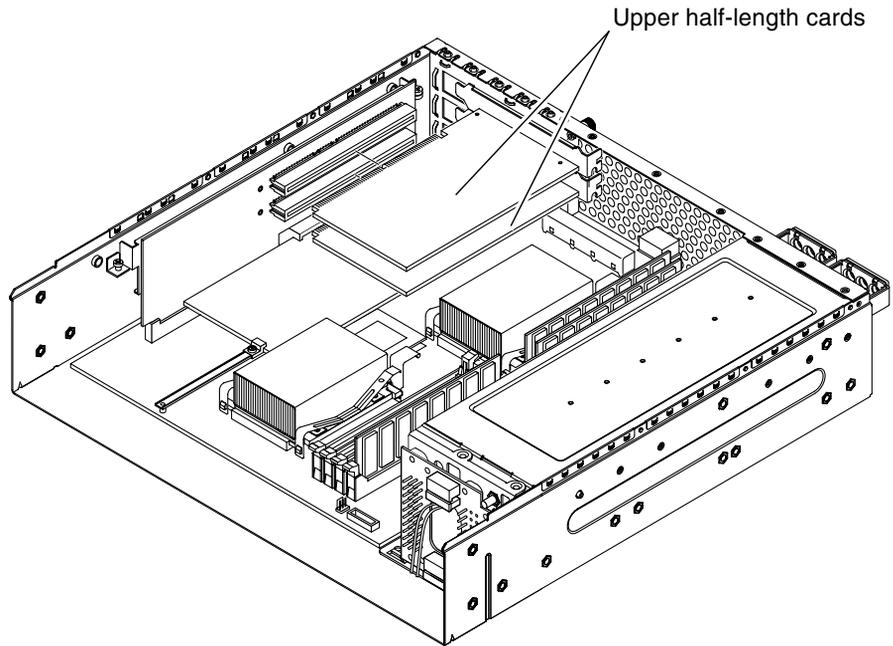


FIGURE 5-6 Removing and Installing the Upper Half-Length PCI Cards

- If you are removing the full-size PCI card at the lowest position (PCI0), follow these instructions:

- a. Pull up on the handle for the PCI card support and slide the support clear of the PCI card (FIGURE 5-7).

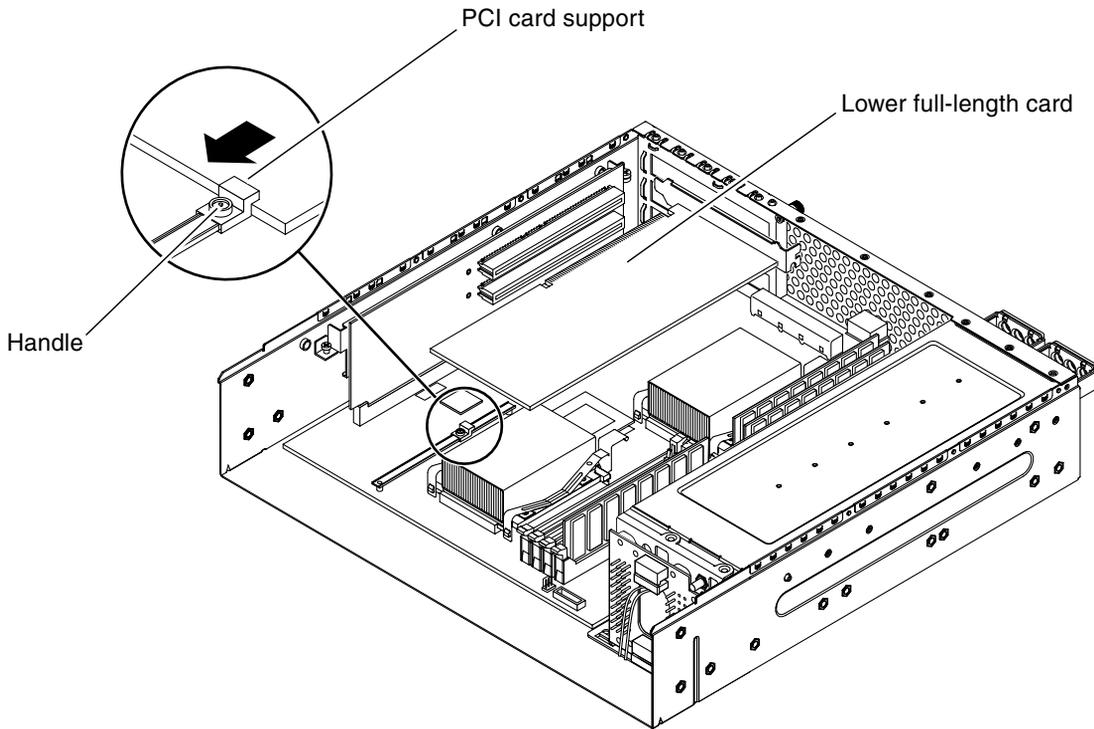


FIGURE 5-7 Removing and Installing the Lower Full-Length PCI Card

- b. Unseat the PCI card from the connector and lift it out of the server (FIGURE 5-7).

Installing a PCI Card

1. Prepare the server for servicing, if you have not done so already:
 - a. Power off the server.
See [“Powering Off the Server”](#) on page 22.
 - b. Remove the server cover.
See [“Removing the Server Cover”](#) on page 27.
 - c. Open the rotating service module.
See [“Opening the Rotating Service Module”](#) on page 30.

- d. **Ensure that the server is properly grounded.**
See [“Avoiding Electrostatic Discharge”](#) on page 32.
- e. **Completely remove the air duct and rear fan assembly.**
See [“Removing or Rotating the Air Duct and Rear Fan Assembly”](#) on page 68.
2. **Insert the PCI card in the appropriate slot and press it firmly into its connector.**
[FIGURE 5-6](#) shows the slots for the upper half-length PCI cards, and [FIGURE 5-7](#) shows the slots for the lower full-length PCI card.
3. **If you are installing the lower full-length PCI card, pull up on the handle for the PCI card support and slide the PCI card support completely against the PCI card ([FIGURE 5-7](#)).**
4. **Reattach the PCI lockdown bracket and tighten the PCI lockdown screw ([FIGURE 5-5](#) and [FIGURE 5-4](#)).**
5. **Install the air duct and rear fan assembly.**
See [“Installing or Closing the Air Duct and Rear Fan Assembly”](#) on page 70.
6. **Close the rotating service module.**
See [“Closing the Rotating Service Module”](#) on page 31.
7. **Install the server cover.**
See [“Installing the Server Cover”](#) on page 29.
8. **Power on the server.**
See [“Powering On the Server”](#) on page 20.

Power Distribution Board

The power distribution board distributes power to the components in the Netra 240 server.

Removing the Power Distribution Board

1. **Power off the server.**
See [“Powering Off the Server”](#) on page 22.
2. **Disconnect the power input cables from both power supply units.**

3. Remove the server cover.

See “Removing the Server Cover” on page 27.

4. Open the rotating service module.

See “Opening the Rotating Service Module” on page 30.

5. Ensure that the server is properly grounded.

See “Avoiding Electrostatic Discharge” on page 32.

6. Disconnect the power distribution board wiring harness from the three connectors on the system board (FIGURE 5-8).

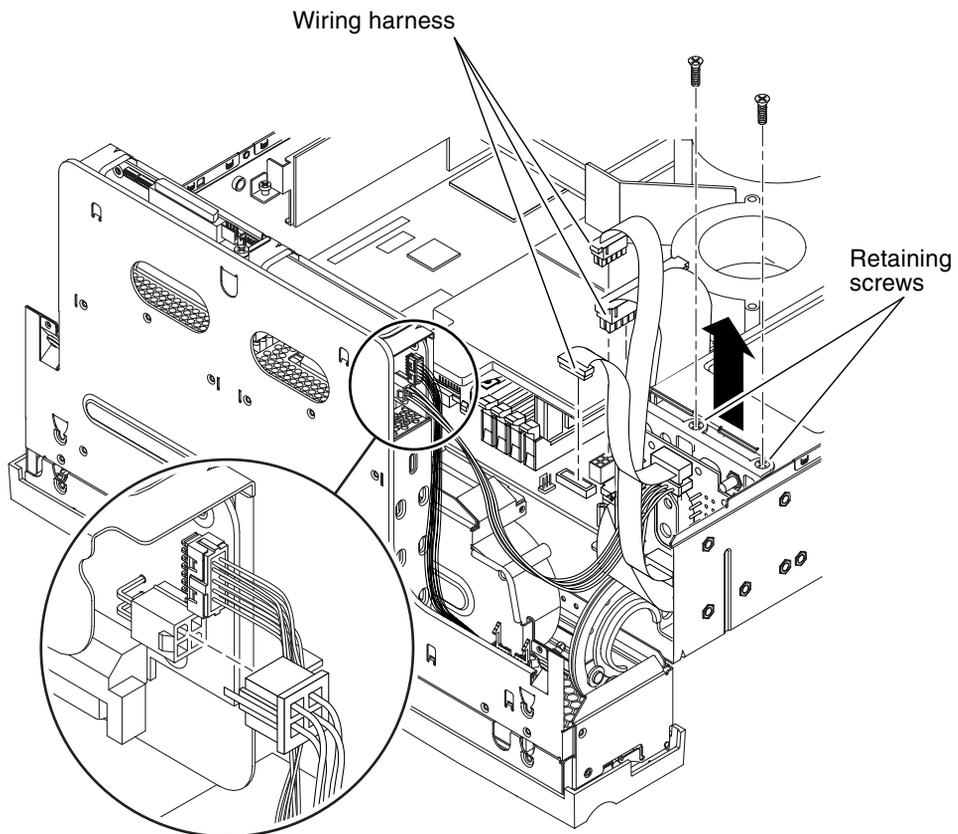


FIGURE 5-8 Removing the Power Distribution Board

7. Disconnect the power distribution board cable from the SCSI interface board (FIGURE 5-8).



Caution – The power supplies contain pinch points. Be very careful when opening and closing the levers on the power supplies. Keep your hands and fingers away from the base and sides of the levers. For more information about these pinch points, refer to the power supply labels.

- Pull the lever on the back of each power supply unit down (FIGURE 5-9).**
This disconnects the power supply unit from the power distribution board.

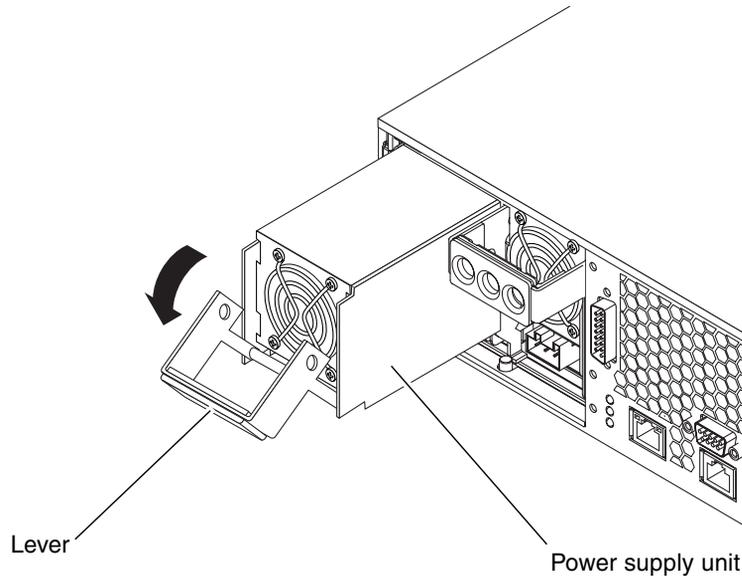


FIGURE 5-9 Disengaging a Power Supply Unit

- Slide each power supply unit part of the way out of the server chassis by pulling on the lever (FIGURE 5-9).**
You do not have to completely remove the power supply units from the server.
- Using a No. 2 Phillips screwdriver, unscrew the two retaining screws that hold the power distribution board in place (FIGURE 5-8).**
- Lift the power distribution board up and out of the server.**

Installing the Power Distribution Board

1. Insert the power distribution board in the server chassis (FIGURE 5-8).
2. Using a No. 2 Phillips screwdriver, secure the power distribution board to the server using the two retaining screws (FIGURE 5-8).
3. Connect the power distribution board cable to the SCSI interface board (FIGURE 5-8).
4. Connect the power distribution board wiring harness to the three connectors on the system board (FIGURE 5-8).



Caution – The power supplies contain pinch points. Be very careful when opening and closing the levers on the power supplies. Keep your hands and fingers away from the base and sides of the levers. For more information about these pinch points, refer to the power supply labels.

5. Insert the two power supply units in the power supply unit bays.
6. Slide each power supply unit into the server until you feel it engage with the power distribution board.
Ensure that the lever does not return to a vertical position until the power supply unit engages with the power distribution board. If the lever returns to vertical, the power supply unit does not engage correctly.
7. Press the lever up on each power supply unit until it clicks.
Returning the lever to a vertical position engages the power supply unit with the power distribution board inside the server.
8. Close the rotating service module.
See “Closing the Rotating Service Module” on page 31.
9. Install the server cover.
See “Installing the Server Cover” on page 29.
10. Power on the server.
See “Powering On the Server” on page 20.

Hardware Cryptographic Module

The optional hardware cryptographic module clips onto the Netra 240 server system board. For more information, see the documentation that is shipped with the optional hardware cryptographic module.

Removing the Hardware Cryptographic Module

1. Power off the server.

See [“Powering Off the Server”](#) on page 22.

2. Remove the server cover.

See [“Removing the Server Cover”](#) on page 27.

3. Open the rotating service module.

See [“Opening the Rotating Service Module”](#) on page 30.

4. Ensure that the server is properly grounded.

See [“Avoiding Electrostatic Discharge”](#) on page 32.

5. Remove all PCI cards from the PCI riser card assembly, if required.

See [“Removing a PCI Card”](#) on page 77.

6. Locate the retaining standoff that secures the hardware cryptographic module onto the system board (FIGURE 5-10).

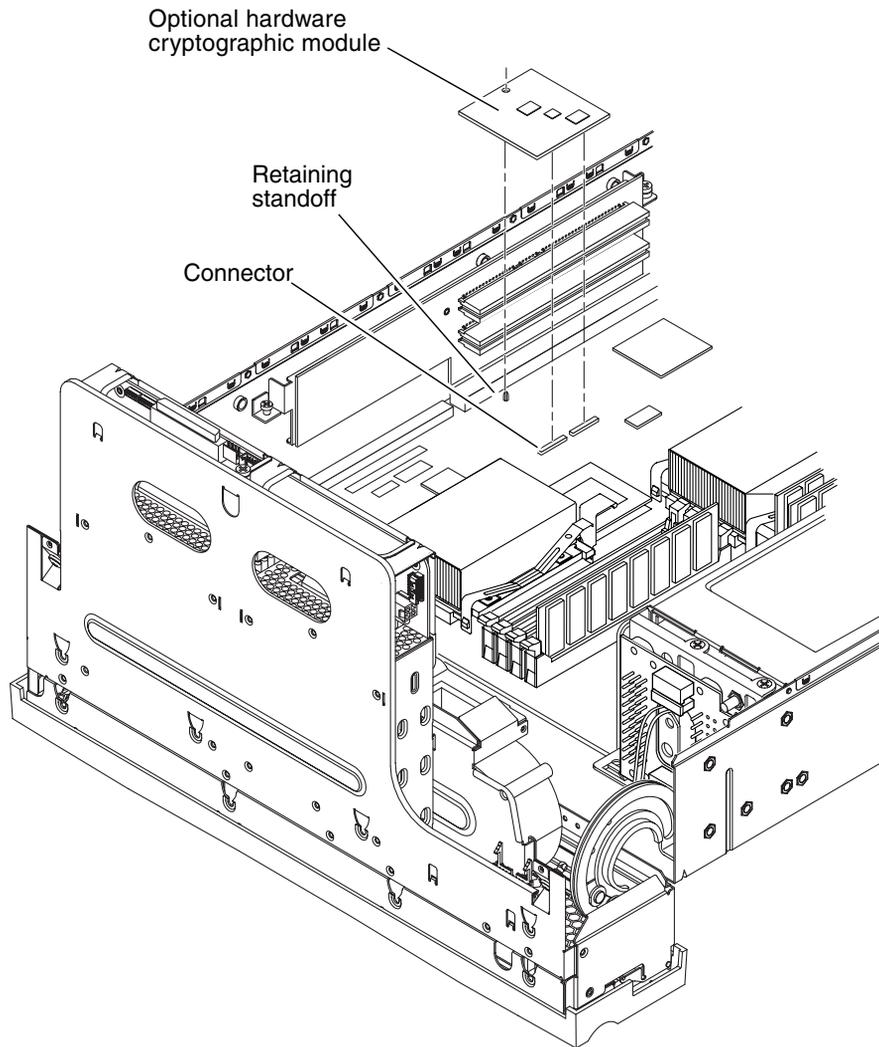


FIGURE 5-10 Removing and Installing the Hardware Cryptographic Module

7. Squeeze the retaining standoff to compress it.
8. Lift the hardware cryptographic module away from the chassis ([FIGURE 5-10](#)).

Installing the Hardware Cryptographic Module

1. Press the retaining standoff into the system board.
2. Insert the hardware cryptographic module onto the retaining standoff and connector on the system board (FIGURE 5-10).
3. Press the hardware cryptographic module down to fully seat it.
4. Insert all PCI cards back into the PCI riser card assembly.
See “Installing a PCI Card” on page 80.
5. Install the air duct and rear fan assembly.
See “Installing or Closing the Air Duct and Rear Fan Assembly” on page 70.
6. Close the rotating service module.
See “Closing the Rotating Service Module” on page 31.
7. Install the server cover.
See “Installing the Server Cover” on page 29.
8. Power on the server.
See “Powering On the Server” on page 20.

For information on configuring and using the hardware cryptographic module, refer to the documentation that is shipped with it.

System Board Assembly



Caution – The assembly might be very hot. Let it cool before beginning this procedure.

Removing the System Board

1. Power off the server.
See “Powering Off the Server” on page 22.
2. Remove the server cover.
See “Removing the Server Cover” on page 27.

3. **Open the rotating service module.**
See [“Opening the Rotating Service Module”](#) on page 30.
4. **Ensure that the server is properly grounded.**
See [“Avoiding Electrostatic Discharge”](#) on page 32.
5. **Completely remove the air duct and rear fan assembly.**
See [“Removing or Rotating the Air Duct and Rear Fan Assembly”](#) on page 68.
6. **Remove all PCI cards from the PCI riser card assembly.**
See [“Removing a PCI Card”](#) on page 77.
7. **Using a No. 2 Phillips screwdriver, unscrew the two captive screws that secure the PCI riser card assembly to the system board (FIGURE 5-11).**

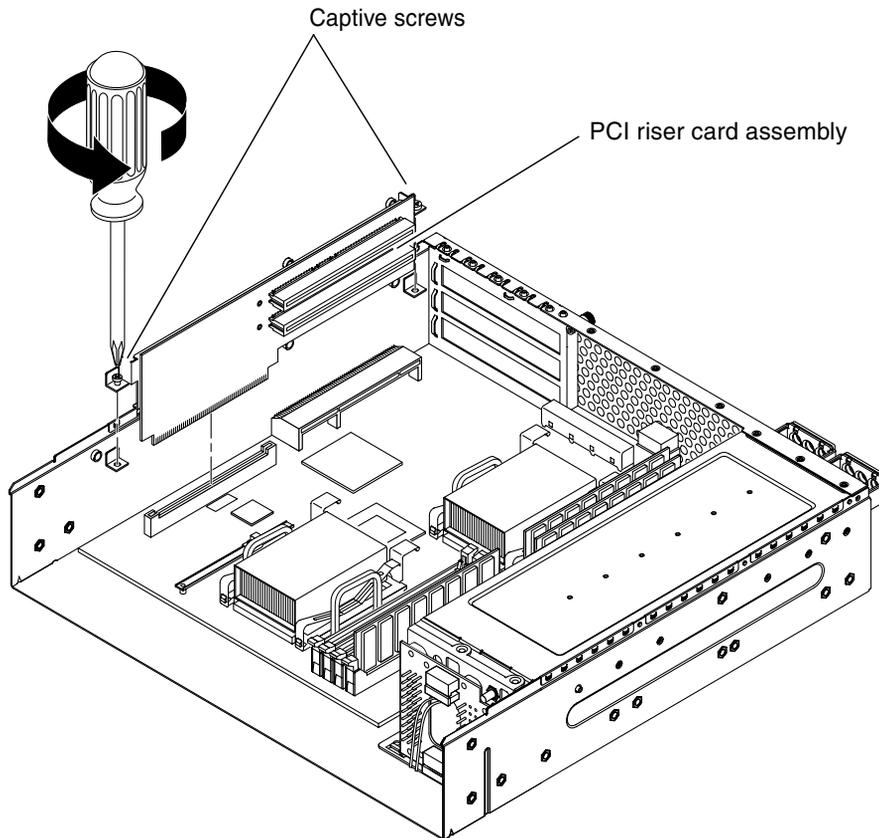


FIGURE 5-11 Removing the PCI Riser Card Assembly

8. Pull the PCI riser card assembly straight up to detach it from the system board (FIGURE 5-11).

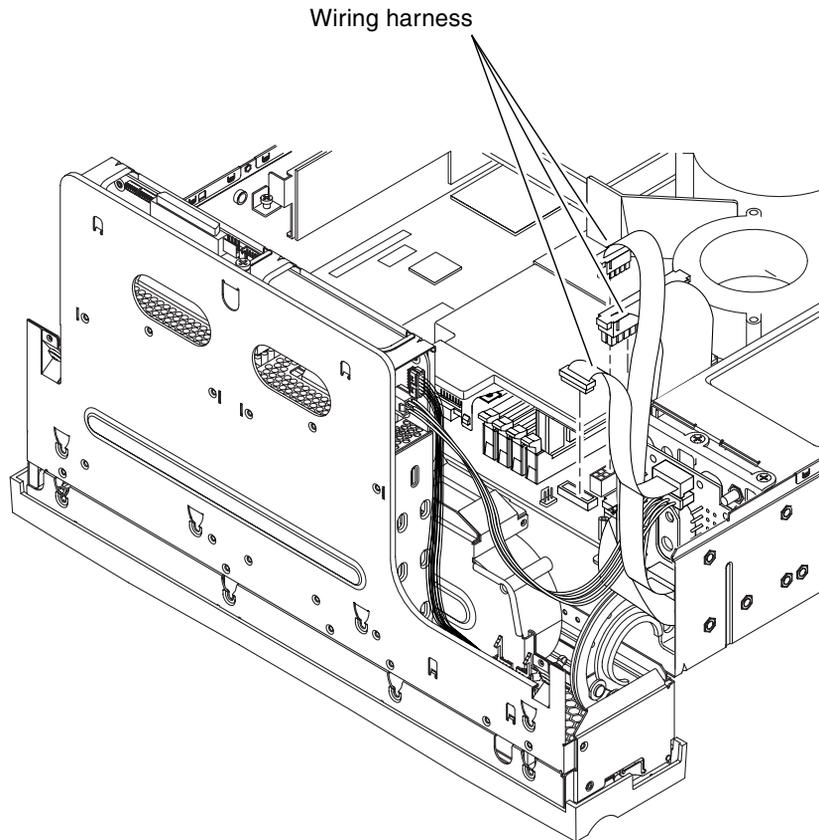


FIGURE 5-12 Disconnecting the PDB Wiring Harness From the System Board

9. Disconnect the PDB wiring harness from the system board (FIGURE 5-12).

10. Lift the SCSI/IDE cable clamp out of the way (FIGURE 5-13).

The clamp has a green cap that is attached to the chassis, and holds the SCSI interface cable and the IDE cable.

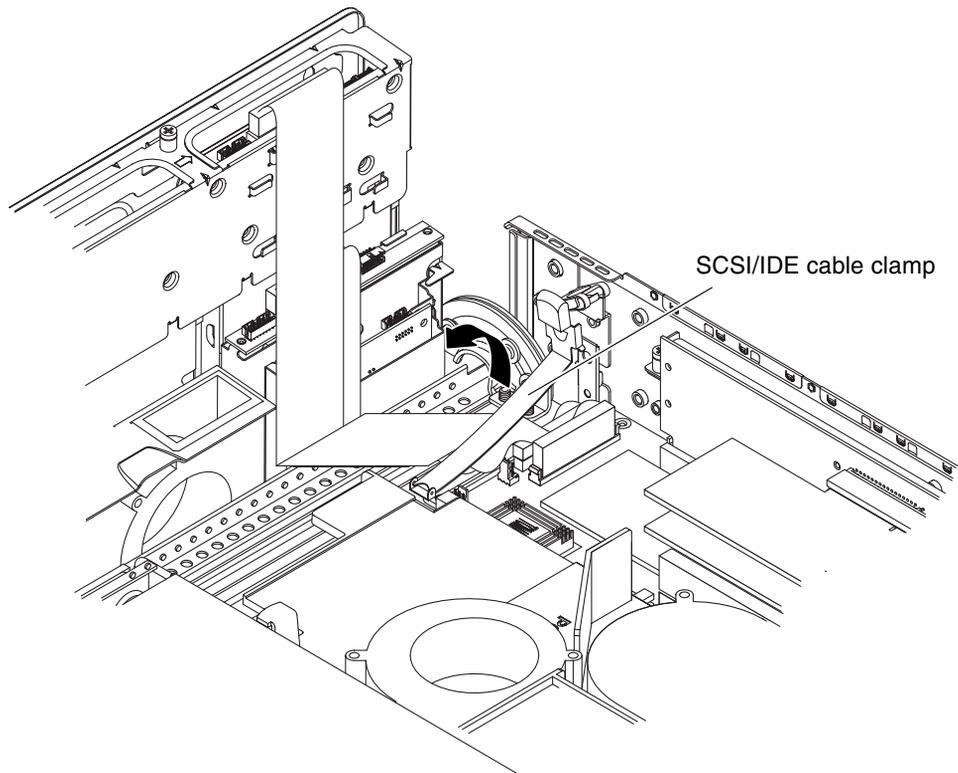


FIGURE 5-13 Lifting the SCSI/IDE Cable Clamp

11. Disconnect the interface board SCSI and IDE cables from the system board (FIGURE 5-14).

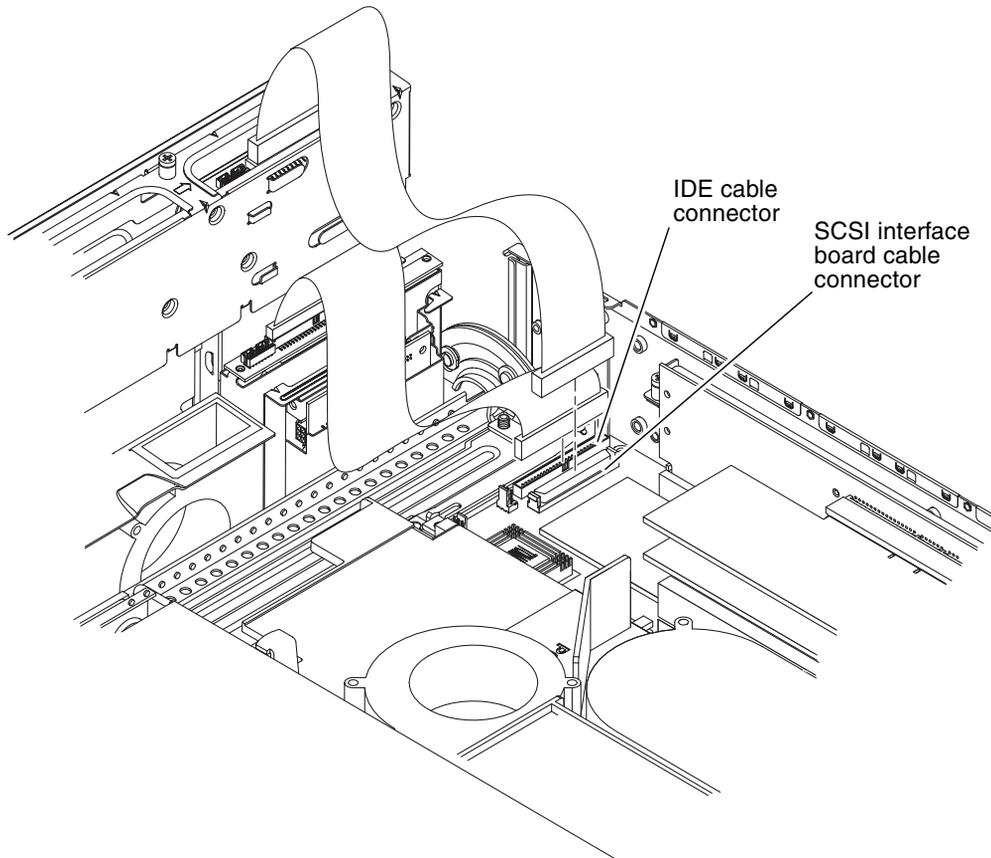


FIGURE 5-14 Removing the SCSI Interface Board Cable and the IDE Cable From the System Board

- 12. Disconnect the front fan assembly cables from the system board connectors** (FIGURE 5-15).

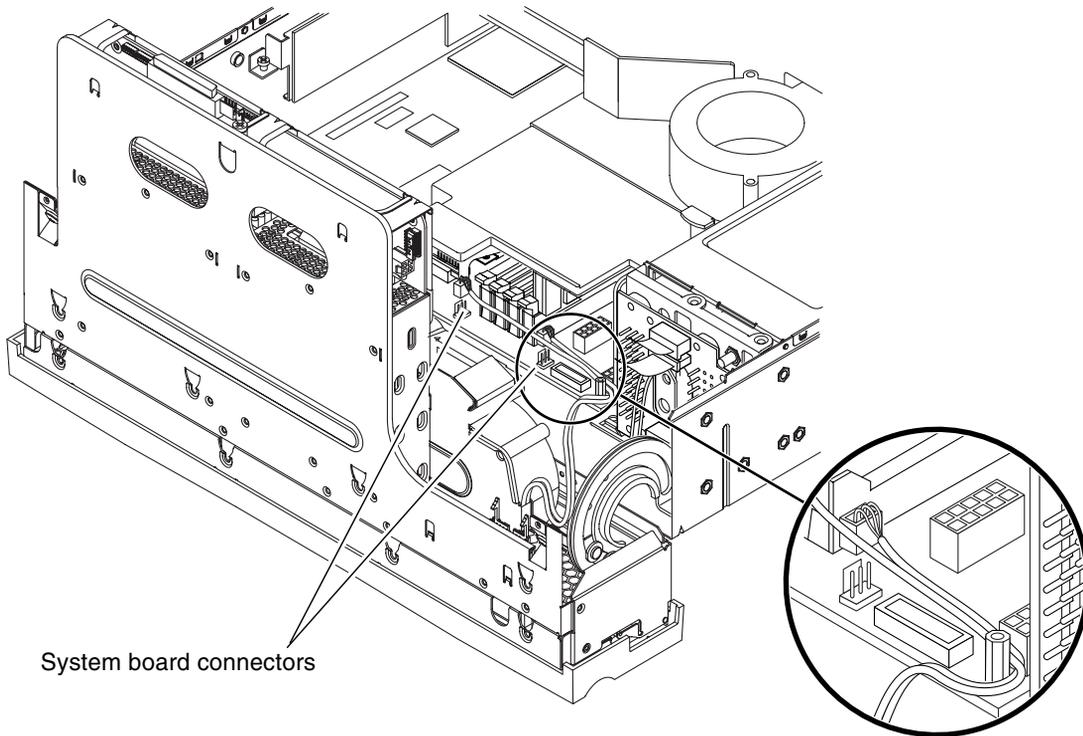


FIGURE 5-15 Detaching the Front Fan Assembly Cables From the System Board Connectors

- 13. Remove the Hardware Cryptographic Module.**

See [“Removing the Hardware Cryptographic Module”](#) on page 85.

14. Unscrew and remove the DB-9 and SCSI jackposts on the server back panel (FIGURE 5-16).

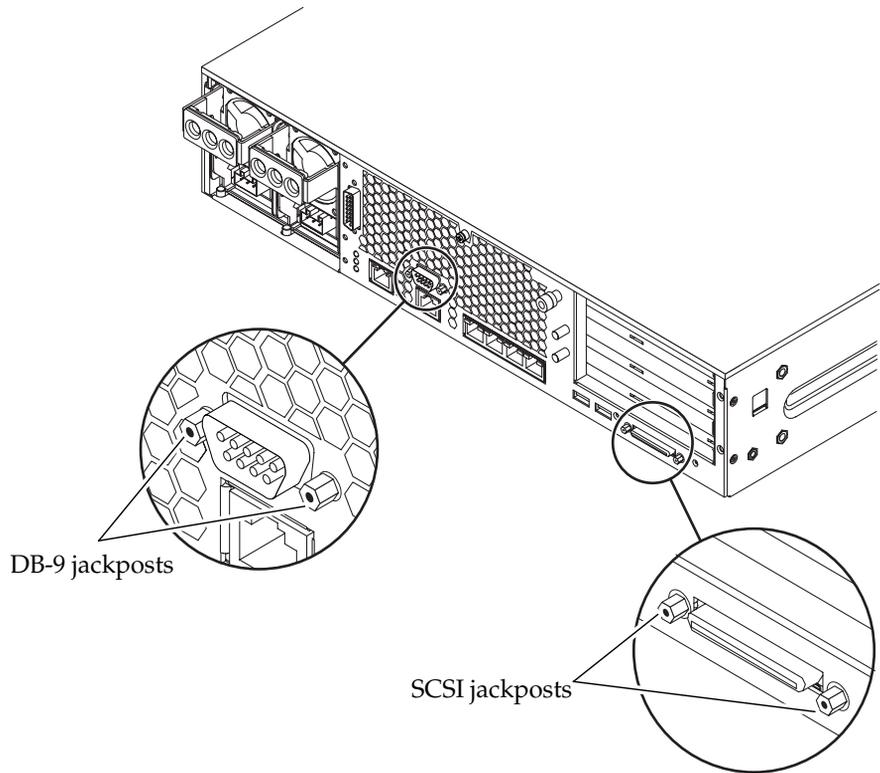


FIGURE 5-16 Removing the DB-9 and SCSI Jackposts From the Server

15. Unscrew the two screws and remove the PCI card support (FIGURE 5-17).

16. Remove the ten screws that secure the system board to the bottom of the chassis (FIGURE 5-17).

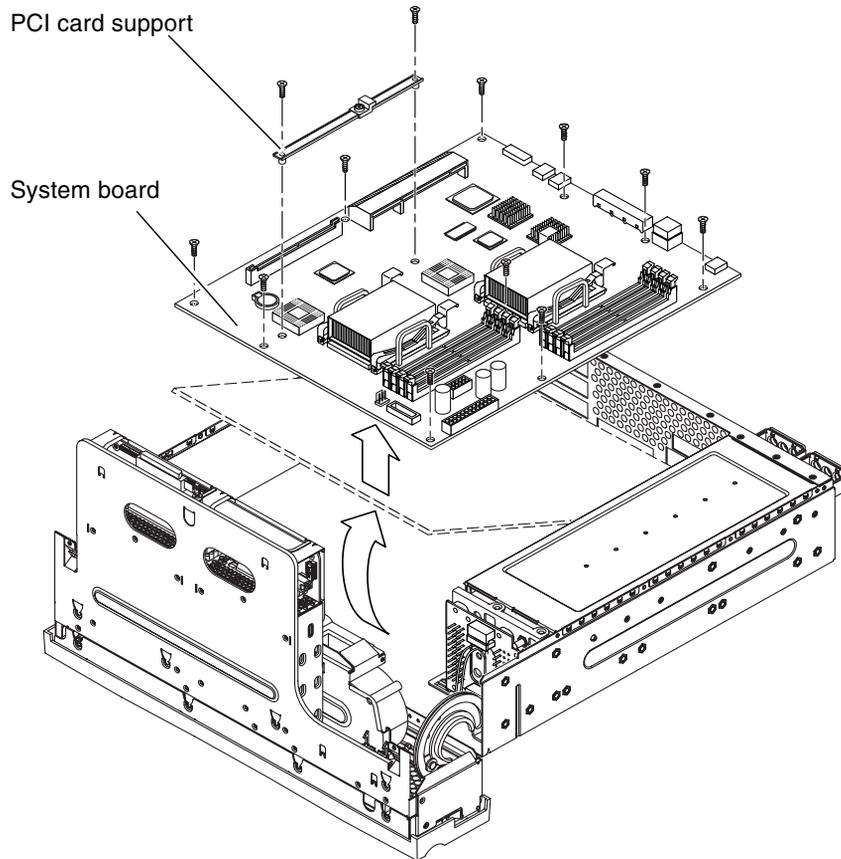


FIGURE 5-17 Removing and Installing a System Board

17. Lift the front of the system board slightly and slide the system board toward the front of the chassis so that the SCSI, Ethernet, and serial connectors come free from the chassis (FIGURE 5-17).
18. Lift the system board out of the chassis.

Installing a System Board



Caution – The system board ships with CPU heat sinks containing fans. Before installing the replacement system board into the Netra 240 server chassis, you must first remove the fans from the CPU heat sink assemblies.

1. Place the replacement system board on a clean, static-free worktable.
2. Locate the CPU heat sink assemblies on the system board (FIGURE 5-18).

Depending on your system board FRU, there are either one or two CPU heat sink assemblies.

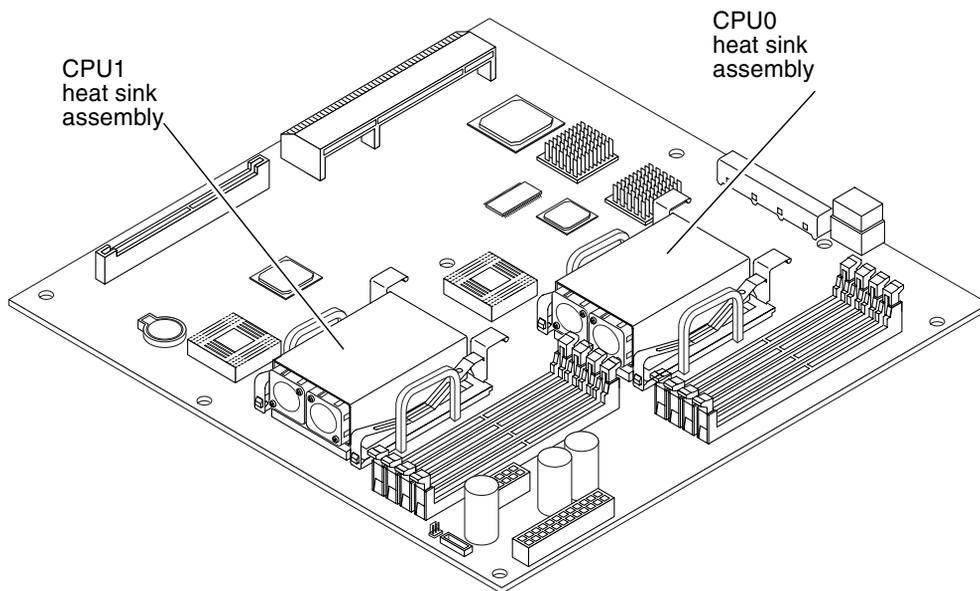


FIGURE 5-18 Location of the CPU Heat Sink Assemblies

3. Detach the fan power cable connectors from the system board (FIGURE 5-19).

Follow the fan power cables from the fans to the cable connectors on the system board.

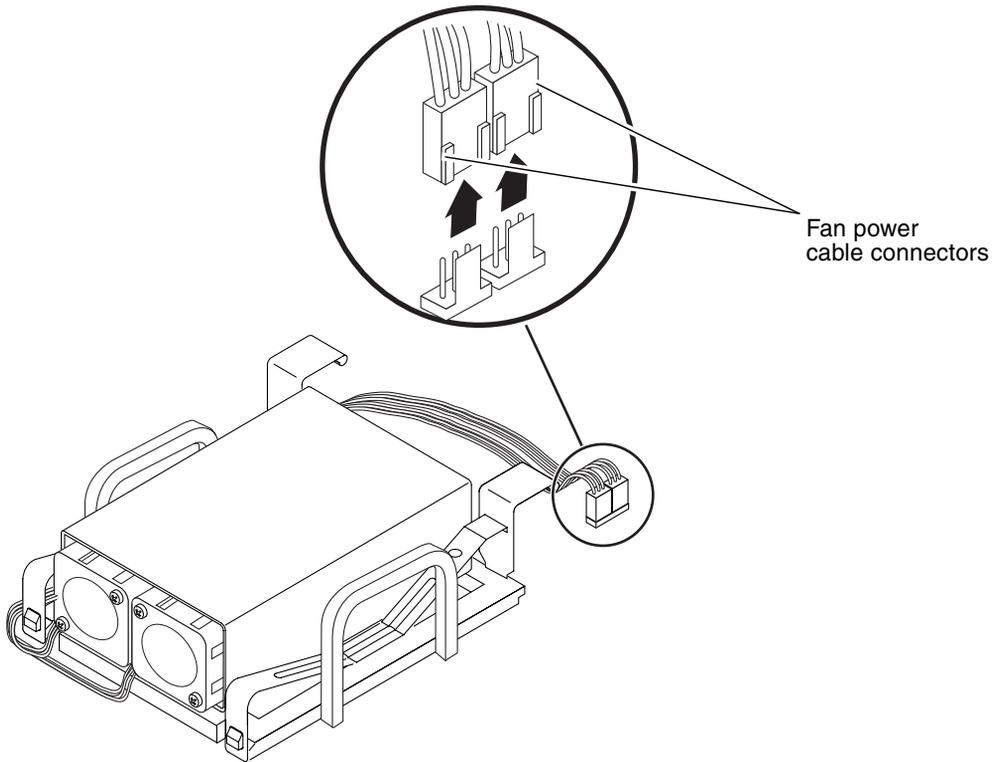


FIGURE 5-19 Detaching the Fan Power Cables

Note – The connectors for the CPU0 heat sink fans are labeled P0 F0 and P0 F1. The connectors for the CPU1 heat sink fans are labeled P1 F0 and P1 F1.

4. Unlock the heat sink from the CPU socket by first pressing down on the fasteners securing the heat sink assembly and then lifting them up (FIGURE 5-20). Repeat this step for both fasteners on the heat sink.

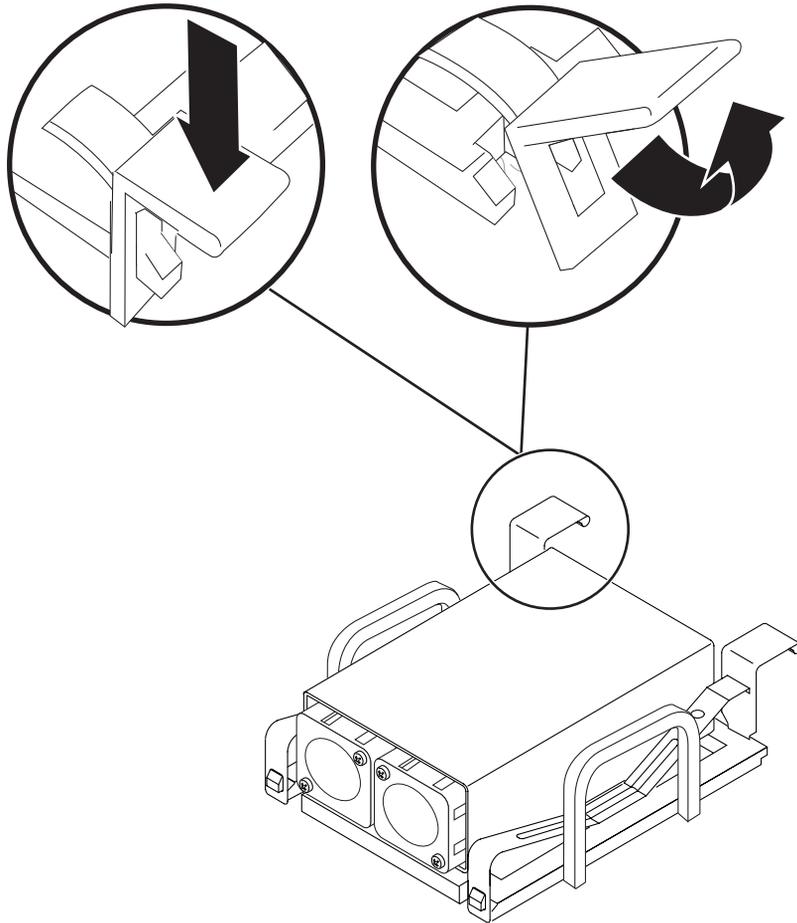


FIGURE 5-20 Unlocking the Heat Sink Fasteners

5. Carefully pull the heat sink up from the CPU socket ([FIGURE 5-21](#)).

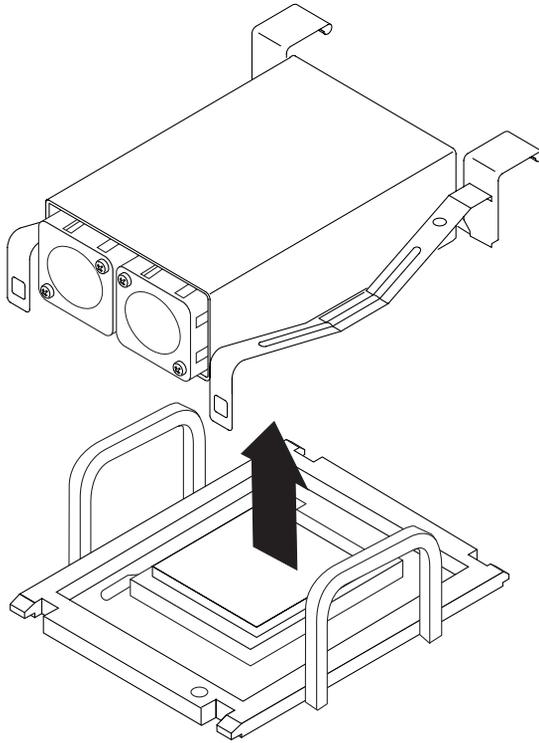


FIGURE 5-21 Lifting the Heat Sink From the CPU Socket

6. Using a No. 1 Phillips screwdriver, remove the screws securing the fans to the heat sink and remove the fans (FIGURE 5-22).

Two screws secure each fan. Set the fans and screws aside after removing them from the heat sink.

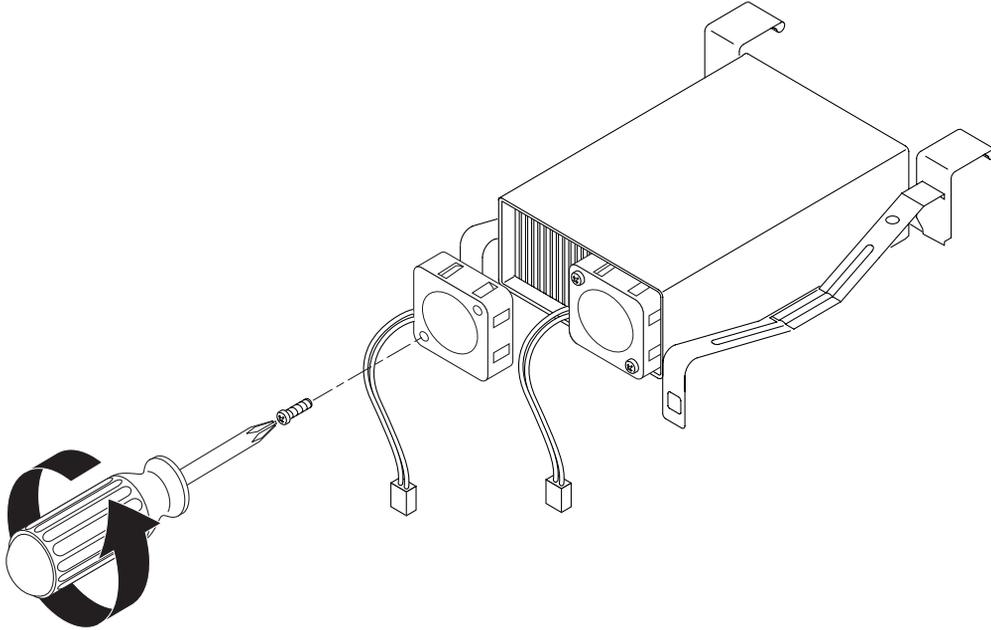


FIGURE 5-22 Removing the Heat Sink Fans

7. Carefully replace the heat sink on the CPU socket, and secure the heat sink by first attaching the rear clips and then pushing down the two front fasteners to the CPU socket ([FIGURE 5-23](#)).

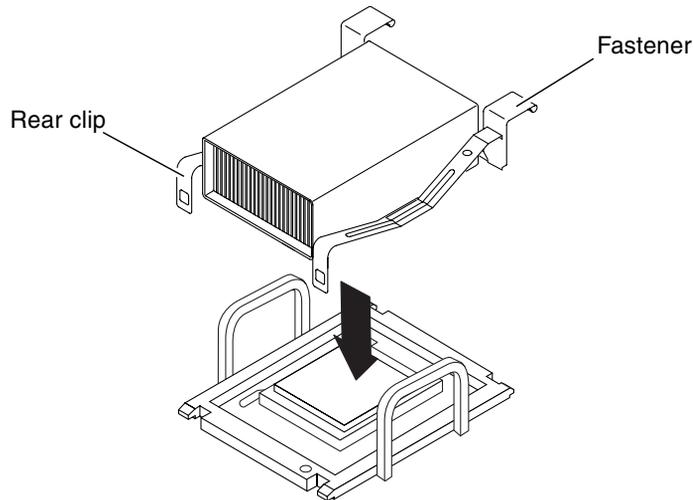


FIGURE 5-23 Replacing the Heat Sink on the CPU Socket

8. If your system board has two CPU heat sinks, repeat [Step 3](#) through [Step 7](#) for the second heat sink.
9. Position the new system board so that the SCSI, Ethernet, and serial connectors are firmly positioned in their slots at the rear of the chassis and insert the board into the chassis ([FIGURE 5-17](#)).
10. Install all ten of the system board screws.
Do not put any screws in the holes for the PCI card slide retainer. These holes are identified by a circle printed around their circumference.
11. Replace the PCI card support and install the two screws that secure it ([FIGURE 5-17](#)).
Ensure that the arrow embossed on the slider points to the rear of the server.
12. Install and secure the DB-9 and SCSI jackposts to the server back panel ([FIGURE 5-16](#)).
13. Install the Hardware Cryptographic Module.
See [“Installing the Hardware Cryptographic Module”](#) on page 87.

14. Connect the front fan assembly cables to the system board connectors.

See [FIGURE 5-15](#) to locate the system board connectors.

Note – Refer to the chassis label for an illustration of the correct routing of the cables.

15. Connect the interface board SCSI and IDE cables to the system board.

See [FIGURE 5-14](#) to locate the cables.

16. Press the SCSI/IDE cable clamp back down to secure the SCSI interface and IDE cables.

The cable clamp is attached to the chassis and has a green cap. See [FIGURE 5-13](#) for the location of this clamp.

17. Connect the PDB wiring harness to the system board.

See [FIGURE 5-12](#) to locate the wiring harness.

18. Place the PCI riser card assembly in position in the server ([FIGURE 5-11](#)).

- a. Press down on the top of the assembly to fully seat it into the system board.
- b. Tighten the two captive screws that secure the PCI riser card assembly to the system board ([FIGURE 5-11](#)).

19. Insert all PCI cards back into the PCI riser card assembly.

See “[Installing a PCI Card](#)” on page 80.

20. Install the air duct and rear fan assembly.

See “[Installing or Closing the Air Duct and Rear Fan Assembly](#)” on page 70.

21. Close the rotating service module.

See “[Closing the Rotating Service Module](#)” on page 31.

22. Install the server cover.

See “[Installing the Server Cover](#)” on page 29.

23. Power on the server.

See “[Powering On the Server](#)” on page 20.

System Board Jumper Settings

This chapter contains information on default jumper settings. This information enables you to restore the default system jumper configurations if required. See [FIGURE 6-1](#) for the jumper locations. The default jumper settings are listed in [TABLE 6-1](#).



Caution – Changing the setting for JP1 could cause damage to the server.



Caution – Do not change the settings for the JP5 jumper. Only service personnel should modify the settings for this jumper.

Note – Illustrations might contain optional components that are not available on all standard configurations of the Netra 240 server.

TABLE 6-1 Default Jumper Settings

Jumper ID	Default Setting	Additional Information
JP1 ⁱ	1-2 Fitted 3-4 Fitted 5-6 Not fitted 7-8 Not fitted 9-10 Fitted	Processor core voltage. Do not alter this jumper setting.
JP2	1-2 Not fitted	ALOM Flash ROM swap halves. Only service personnel should modify this setting. Fitting a jumper affects the swap.
JP3	1-2 Not fitted	ALOM reset. Used only for testing the system.

TABLE 6-1 Default Jumper Settings *(Continued)*

Jumper ID	Default Setting	Additional Information
JP4	1-2 Fitted 3-4 Fitted 5-6 Not fitted 7-8 Not fitted 9-10 Not fitted	System configuration. Do not alter this jumper setting.
JP5 ⁱⁱ	1-2 Not fitted	Only service personnel should modify this setting.
JP6	1-2 Fitted (this is a non-functional setting) 2-3 Not fitted	ROMBO enable. Only service personnel should modify this setting. Fit jumper to 2-3 to enable ROMBO.
JP8	1-2 Fitted	Clear CMOS. Only service personnel should modify this setting. Fit jumper to 2-3 to clear CMOS.
JP10	1-2 Not fitted	Override PSON#. Only service personnel should modify this setting.
JP11	1-2 Not fitted	ROM write-protect. Only service personnel should modify this setting.
JP12	1-2 Not fitted	ALOM console bypass. Only service personnel should modify this setting.
JP13	1-2 Fitted (this is a non-functional setting) 2-3 Not fitted	OpenBoot PROM Flash ROM swap halves. Only service personnel should modify this setting. Fit jumper to 2-3 to affect swap.
JP14	1-2 Not fitted	ALOM AFT mode. Used for testing the system only.

i Changing the setting for JP1 could cause damage to the server.

ii Do not change the settings for the JP5 jumper. Only service personnel should modify the settings for this jumper.

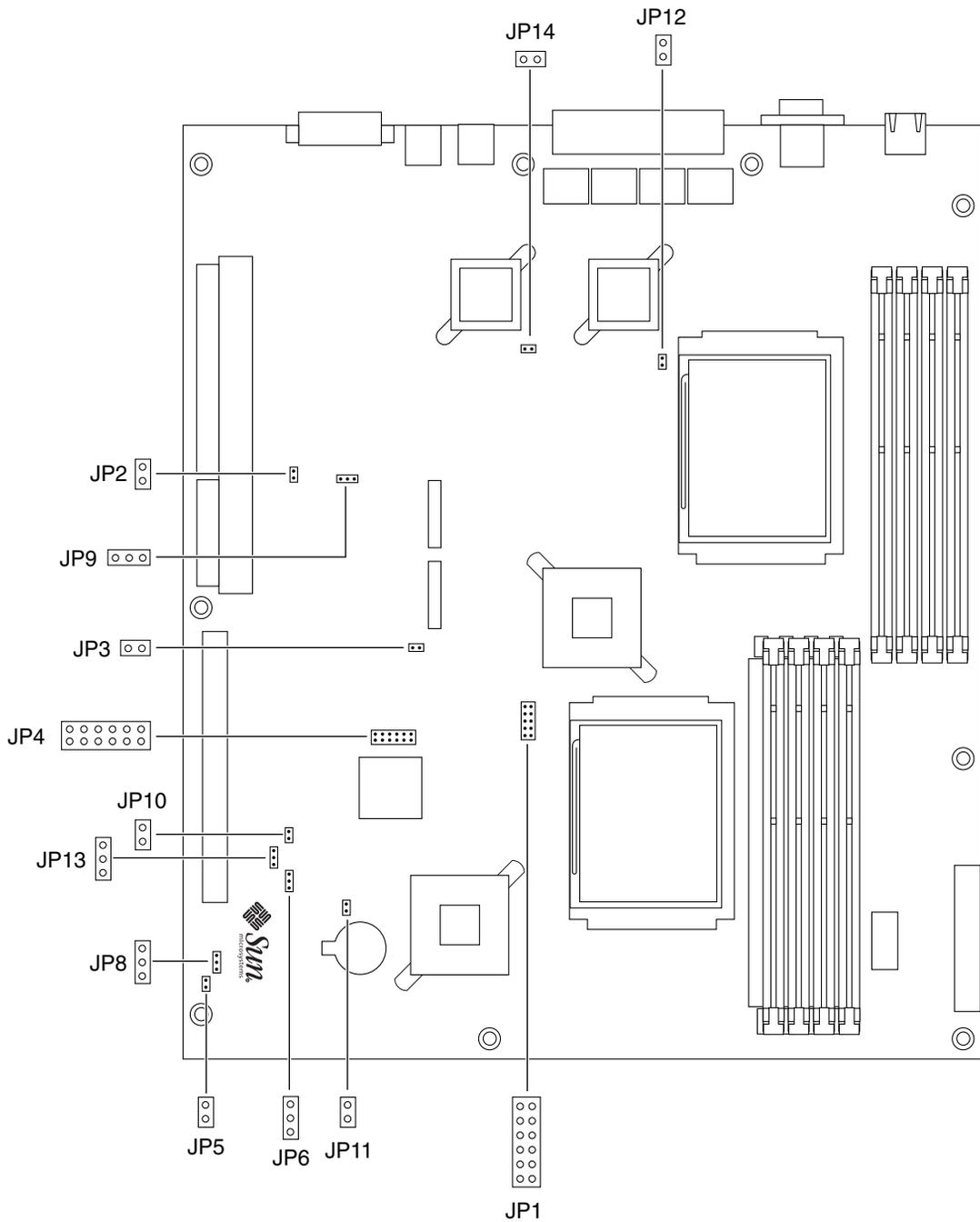


FIGURE 6-1 Location of Jumpers on the Netra 240 System Board

Illustrated Parts Breakdown

This appendix contains a sequence of illustrations that show how the various pieces of the server fit together. Use the accompanying tables as a reference for ordering field-replaceable units (FRUs).

Consult the *Sun Service Handbook* or your authorized Sun sales representative or service provider for part numbers prior to ordering a replacement part.

Note – Illustrations might contain optional components that are not available on all standard configurations of the Netra 240 server.

This illustrated parts breakdown is divided into the following sections:

- [“Front Panel Components” on page 108](#)
- [“Rotating Service Module, Internal and Rear Panel Components” on page 109](#)
- [“Miscellaneous Internal Components” on page 111](#)

Front Panel Components

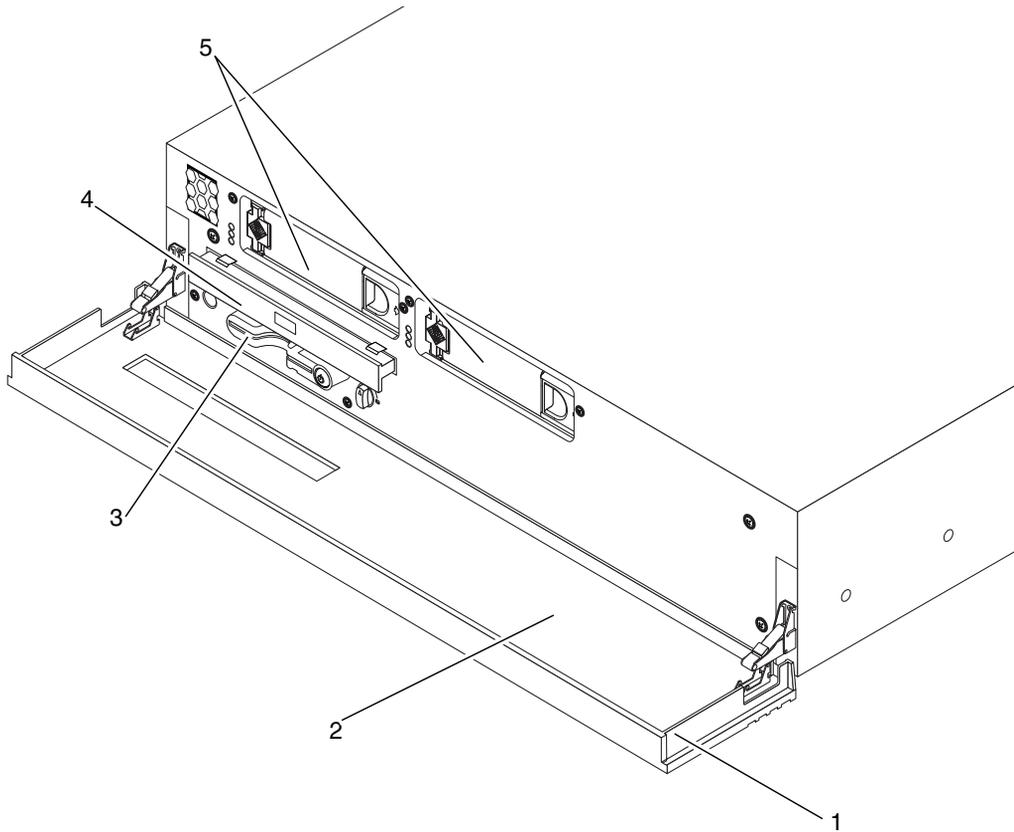


FIGURE A-1 Illustrated Parts Breakdown, Front Panel Components

TABLE A-1 Front Panel Components

Reference Number	Part
1	Bezel assembly
2	Air filter pack containing 10 foam filters
3	System configuration card
4	DVD drive—internal slim DVD-RW drive
4	DVD drive—internal slim DVD-ROM drive
5	Hard drive

Rotating Service Module, Internal and Rear Panel Components

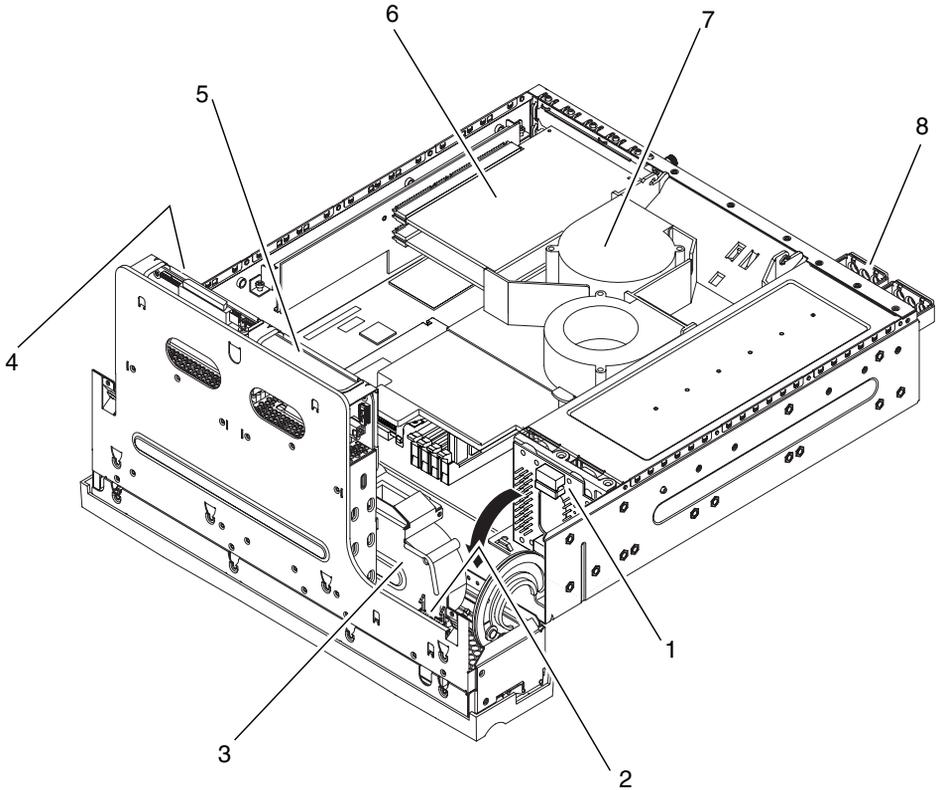


FIGURE A-2 Rotating Service Module, Internal and Rear Panel Components

TABLE A-2 Rotating Service Module, Internal and Rear Panel Components

Reference Number	Part
1	Power distribution board (PDB)
2	Alarm board (behind front panel)
3	Front fan assembly
4	System configuration card reader cluster
5	SCSI interface board

TABLE A-2 Rotating Service Module, Internal and Rear Panel Components *(Continued)*

Reference Number	Part
6	PCI card (optional)
7	Air duct and rear fan assembly
8	Power supply units (DC)
8	Power supply units (AC)

Miscellaneous Internal Components

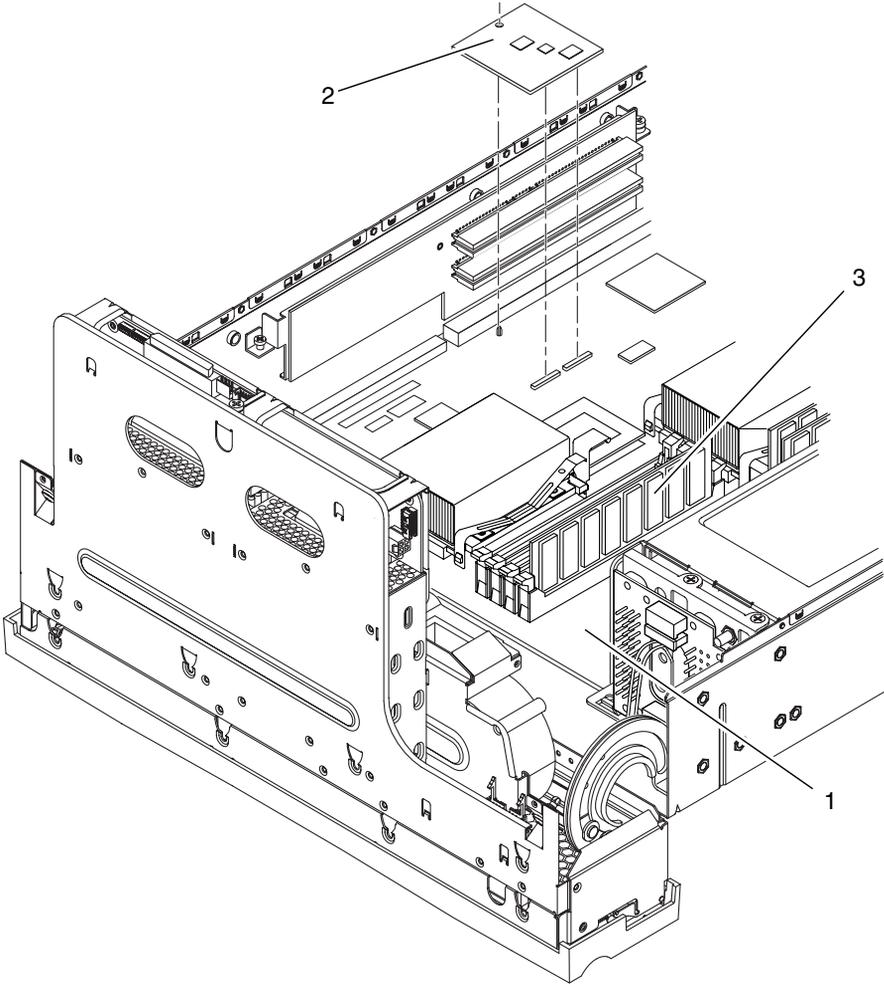


FIGURE A-3 Illustrated Parts Breakdown, Miscellaneous Internal Components

TABLE A-3 Miscellaneous Internal Components

Reference Number	Part
1	System board assembly: 1 x 1.28 GHz, 0 MB
1	System board assembly: 2 x 1.28 GHz, 0 MB
2	Hardware cryptographic module
3	Memory expansion SPD 0.0 DIMM: 2 x 256 MB
3	Memory expansion SPD 0.0 DIMM: 2 x 512 MB
3	Memory expansion SPD 0.0 DIMM: 2 x 1 GB
3	Memory expansion SPD 1.0 DIMM: 2 x 256 MB
3	Memory expansion SPD 1.0 DIMM: 2 x 512 MB
3	Memory expansion SPD 1.0 DIMM: 2 x 1 GB
3	Memory expansion 512MB DDR1 PC2100 (2x256MB), DDR 333
3	Memory expansion 1GB DDR1 PC2100 (2x512MB), DDR 333
3	Memory expansion 2GB DDR1 PC2100 (2x1GB), DDR 333

Connector Pinouts

This appendix gives the pinouts for the following Netra 240 server rear ports:

- [“Gigabit Ethernet Ports” on page 114](#)
- [“Network Management Port” on page 115](#)
- [“Serial Ports” on page 116](#)
- [“Alarm Port” on page 119](#)
- [“USB Ports” on page 120](#)
- [“SCSI Port” on page 121](#)

Gigabit Ethernet Ports

The Netra 240 server has four autonegotiating 10/100/1000BASE-T Gigabit Ethernet system domain ports. All four Ethernet ports use a standard RJ-45 connector, the transfer rates for which are given in [TABLE B-1](#). [FIGURE B-1](#) shows the pin numbering of the ports, and [TABLE B-2](#) describes the pin signals.

TABLE B-1 Ethernet Connection Transfer Rates

Connection Type	IEEE Terminology	Transfer Rate
Ethernet	10BASE-T	10 Mbit/s
Fast Ethernet	100BASE-TX	100 Mbits/s
Gigabit Ethernet	1000BASE-T	1000 Mbit/s

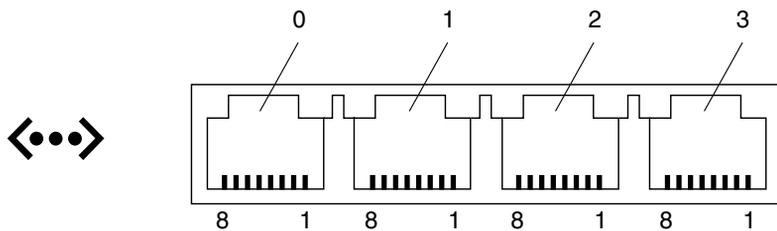


FIGURE B-1 Gigabit Ethernet Port Pin Numbering

TABLE B-2 Gigabit Ethernet Port Signals

Pin	Signal Description	Pin	Signal Description
1	Transmit/Receive Data 0 +	5	Transmit/Receive Data 2 -
2	Transmit/Receive Data 0 -	6	Transmit/Receive Data 1 -
3	Transmit/Receive Data 1 +	7	Transmit/Receive Data 3 +
4	Transmit/Receive Data 2 +	8	Transmit/Receive Data 3 -

Network Management Port

The server has one 10BASE-T Ethernet management domain interface, labeled NET MGT. For information on configuring this port for managing the server with ALOM, refer to the *Sun Advanced Lights Out Manager User Guide for the Netra 240 Server* (817-3174).



Caution – If you are planning to use the network management (NET MGT) port, you must use a shielded Ethernet cable to maintain your server’s NEBS compliance. The cable’s shield must be grounded at both ends.

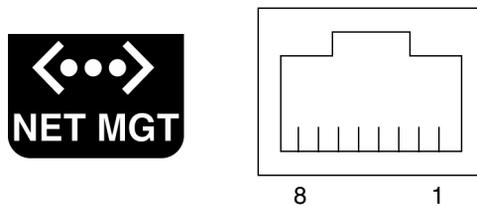


FIGURE B-2 Network Management Port Pin Numbering

TABLE B-3 Network Management Connector Signals

Pin	Signal Description	Pin	Signal Description
1	Transmit Data +	5	Common Mode Termination
2	Transmit Data –	6	Receive Data –
3	Receive Data +	7	Common Mode Termination
4	Common Mode Termination	8	Common Mode Termination

Serial Ports

The server has two serial ports, labeled SERIAL MGT and 10101. [TABLE B-4](#) lists the default serial connection settings for both serial ports.

TABLE B-4 Default Serial Connection Settings

Parameter	Setting
Connector	SERIAL MGT or 10101
Rate	9600 baud
Parity	None
Stop bits	1
Data bits	8

Serial Management Port

The serial management connector (labeled SERIAL MGT) is an RJ-45 connector that can be accessed from the back panel. This port is the default connection to the system, and you should use this port *only* for server management.



Caution – You must use a shielded Ethernet cable to maintain your server’s NEBS compliance. The cable’s shield must be grounded at both ends.

[FIGURE B-3](#) shows the pin numbering of the serial management port, and [TABLE B-5](#) describes the pin signals.

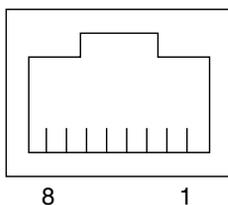


FIGURE B-3 Serial Management Port Pin Numbering

TABLE B-5 Serial Management RJ-45 Connector Signals

Pin	Signal Description	Pin	Signal Description
1	Request to Send	5	Ground
2	Data Terminal Ready	6	Receive Data
3	Transmit Data	7	Data Set Ready
4	Ground	8	Clear to Send

If you need to connect to the SERIAL MGT port using a cable with either a DB-9 or a DB-25 connector, use a supplied adapter to perform the crossovers given for each connector. The supplied RJ-45 to DB-9 and RJ-45 to DB-25 adapters are wired as described in [TABLE B-6](#) and [TABLE B-7](#).

RJ-45 to DB-9 Adapter Crossovers

TABLE B-6 RJ-45 to DB-9 Adapter Crossovers

Serial Port (RJ-45 Connector)		DB-9 Adapter	
Pin	Signal Description	Pin	Signal Description
1	RTS	8	CTS
2	DTR	6	DSR
3	TXD	2	RXD
4	Signal Ground	5	Signal Ground
5	Signal Ground	5	Signal Ground
6	RXD	3	TXD
7	DSR	4	DTR
8	CTS	7	RTS

RJ-45 to DB-25 Adapter Crossovers

TABLE B-7 RJ-45 to DB-25 Adapter Crossovers

Serial Port (RJ-45 Connector)		DB-25 Adapter	
Pin	Signal Description	Pin	Signal Description
1	RTS	5	CTS
2	DTR	6	DSR
3	TXD	3	RXD
4	Signal Ground	7	Signal Ground
5	Signal Ground	7	Signal Ground
6	RXD	2	TXD
7	DSR	20	DTR
8	CTS	4	RTS

Serial Port (10101)

The port labeled 10101 accepts a DB-9 connector. Use this port for general purpose serial data transfers. [FIGURE B-4](#) shows the pin numbering of the serial port, and [TABLE B-8](#) describes the pin signals.

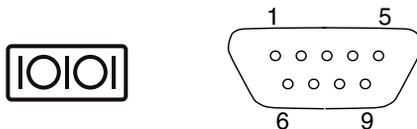


FIGURE B-4 Serial Port (10101) Pin Numbering

TABLE B-8 Serial Port (10101) Connector Signals

Pin	Signal Description	Pin	Signal Description
1	Data Carrier Detect	6	Data Set Ready
2	Receive Data	7	Request to Send
3	Transmit Data	8	Clear to Send
4	Data Terminal Ready	9	Ring Indicate
5	Ground		

Alarm Port

The alarm port on the alarm rear transition card uses a standard DB-15 connector. In a telecommunications environment, use this port to connect to the central office alarming system. [FIGURE B-5](#) shows the pin numbering of the alarm port, and [TABLE B-9](#) describes the pin signals.

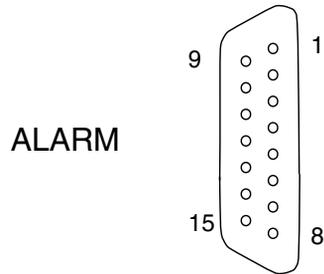


FIGURE B-5 Alarm Port Pin Numbering

TABLE B-9 Alarm Connector Signals

Pin	Service	Pin	Service
1	INPUT0 +	9	ALARM1_NC
2	INPUT0 -	10	ALARM1_COM
3	NC	11	ALARM2_NO
4	NC	12	ALARM2_NC
5	ALARM0_NC	13	ALARM2_COM
6	ALARM0_NO	14	ALARM3_NO
7	ALARM0_COM	15	ALARM3_COM
8	ALARM1_NO	CHASSIS	FRAME GND

USB Ports

The server has two USB ports for attaching supported USB 1.1 compliant devices. [FIGURE B-6](#) shows the pin numbering of the USB ports, and [TABLE B-10](#) describes the pin signals.

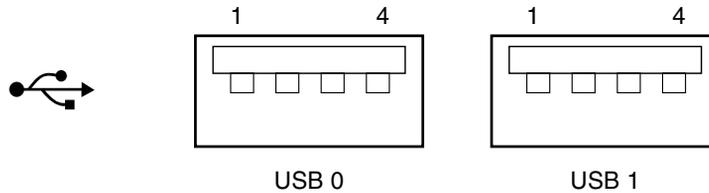


FIGURE B-6 USB Ports Pin Numbering

TABLE B-10 USB Connector Pin Signals

Pin	Signal Description
1	+5 V
2	DAT-
3	DAT+
4	Ground

SCSI Port

The SCSI port is a multimode Ultra 160SCSI interface. To operate at Ultra 160SCSI speeds, the part must be in Low Voltage Differential (LVD) mode. If a single-ended device is connected to the server, it automatically switches to single-ended mode. [FIGURE B-7](#) shows the pin numbering of the SCSI port, and [TABLE B-11](#) describes the pin signals.

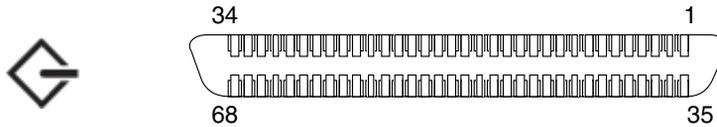


FIGURE B-7 SCSI Port Pin Numbering

TABLE B-11 SCSI Port Pin Signals

Pin	Signal Description	Pin	Signal Description
1	Data12 +	35	Data12 -
2	Data13 +	36	Data13 -
3	Data14 +	37	Data14 -
4	Data15 +	38	Data15 -
5	Parity1 +	39	Parity1 -
6	Data0 +	40	Data0 -
7	Data1 +	41	Data1 -
8	Data2 +	42	Data2 -
9	Data3 +	43	Data3 -
10	Data4 +	44	Data4 -
11	Data5 +	45	Data5 -
12	Data6 +	46	Data6 -
13	Data7 +	47	Data7 -
14	Parity0 +	48	Parity0 -
15	Ground	49	Ground
16	DIFF_SENSE	50	Ground
17	TERM_PWR	51	TERM_PWR
18	TERM_PWR	52	TERM_PWR

TABLE B-11 SCSI Port Pin Signals (*Continued*)

Pin	Signal Description	Pin	Signal Description
19	(N/C)	53	(N/C)
20	Ground	54	Ground
21	ATN +	55	ATN –
22	Ground	56	Ground
23	BSY +	57	BSY –
24	ACK +	58	ACK –
25	RST +	59	RST –
26	MSG +	60	MSG –
27	SEL +	61	SEL –
28	CD +	62	CD –
29	REQ +	63	REQ –
30	I/O +	64	I/O –
31	Data8 +	65	Data8 –
32	Data9 +	66	Data9 –
33	Data10 +	67	Data10 –
34	Data11 +	68	Data11 –

System Configuration Card and OpenBoot Configuration Parameters

This appendix provides information on the system configuration card (SCC) and the OpenBoot PROM configuration parameters stored on it. For more on the SCC, see [“System Configuration Card” on page 38](#).

The system configuration card is housed in a slot behind the front bezel, next to the On/Standby button (see [FIGURE C-1](#)). The card contains unique network identity information, including the MAC address and hostid (stored in the IDPROM), and the OpenBoot PROM configuration (also known as NVRAM).

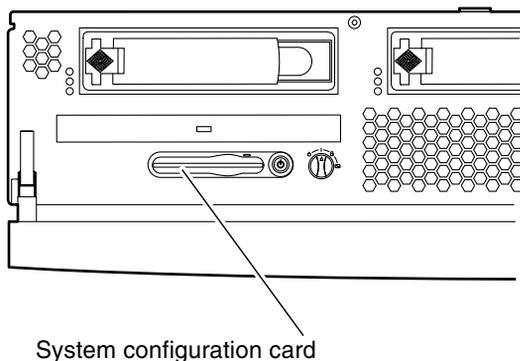


FIGURE C-1 Location of the System Configuration Card

The server attempts to access the system configuration card while booting.

- If a properly formatted card is not present in the reader, the system does not boot.
- If the content of the NVRAM section is invalid, the system is initialized with its default NVRAM configuration. The default values can be seen using the `printenv` command.

- If the content of the IDPROM section is invalid, OpenBoot PROM displays a warning message and the system does not auto-boot the Solaris platform. However, you can boot the system from the `ok` prompt using the `boot` command.

It is therefore essential that you store the system configuration card safely if you have to remove it from the server, and replace the card before restarting the system.

For more information, see [“System Configuration Card” on page 38](#). `passes`

TABLE C-1 OpenBoot PROM Configuration Parameters Stored on the System Configuration Card

Parameter	Default	Description
<code>diag-passes</code>	1	Defines the number of times self-test method(s) are performed.
<code>asr-policy</code>	normal	Defines the policy to be implemented by the <code>asr-package</code> .
<code>local-mac-address?</code>	true	If true, network drivers use their own MAC address, not that of the server.
<code>fcode-debug?</code>	false	If true, includes name fields for plug-in device FCodes.
<code>ttyb-rts-dtr-off</code>	false	If true, operating system does not assert <code>ttyb</code> , RTS, and DTR.
<code>ttyb-ignore-cd</code>	true	If true, operating system ignores carrier-detect on <code>ttyb</code> .
<code>ttya-rts-dtr-off</code>	false	If true, operating system does not assert <code>ttya</code> and RTS and DTR.
<code>ttya-ignore-cd</code>	true	If true, operating system ignores carrier-detect on <code>ttya</code> .
<code>silent-mode?</code>	false	Suppresses all messages if true and if <code>diag-switch?</code> is false.
<code>scsi-initiator-id</code>	7	SCSI-ID of the SCSI controller.
<code>oem-logo</code>	none	Contains custom logo for banner, enabled by <code>oem-logo?</code>
<code>oem-logo?</code>	false	If true, uses custom OEM logo, otherwise, uses Sun logo.
<code>oem-banner</code>	NA	Contains custom banner text, enabled by <code>oem-banner?</code>
<code>oem-banner?</code>	false	If true, uses custom OEM banner.
<code>ansi-terminal?</code>	true	If true, uses ANSI terminal.
<code>screen-#columns</code>	80	Sets number of columns on screen.

TABLE C-1 OpenBoot PROM Configuration Parameters Stored on the System Configuration Card (*Continued*)

Parameter	Default	Description
screen-#rows	34	Sets number of rows on screen.
ttya-mode	9600,8,n,1,-	ttya (baud rate, #bits, parity, #stop, handshake).
ttyb-mode	9600,8,n,1,-	ttyb (baud rate, #bits, parity, #stop, handshake).
output-device	ttya	Console output device.
input-device	ttya	Console input device.
auto-boot-on-error?	false	If true, boots client program on firmware error/s. If false, does not boot on firmware error.
load-base	16384	Address.
auto-boot?	true	If true, boots automatically after power on or reset.
boot-command	boot	Action following a boot command.
diag-file	none	File from which to boot if diag-switch? is true.
diag-device	net	Device from which to boot if diag-switch? is true.
boot-file	none	File to boot if diag-switch? is false.
boot-device	disk net	Device(s) from which to boot if diag-switch? is false.
use-nvramrc?	false	If true, executes commands in NVRAMRC during server startup.
nvramrc	none	Command script to execute if use-nvramrc? is true.
security-mode	none	Firmware security level (options: none, command, or full).
security-password	none	Firmware security password if security-mode is not none (never displayed). <i>Do not set this directly.</i>
security-#badlogins	none	Number of incorrect security password attempts.
post-trigger	power-on-reset	Matches the class of reset.
diag-script	none	Determines which devices are tested by OpenBoot diagnostics.

TABLE C-1 OpenBoot PROM Configuration Parameters Stored on the System Configuration Card (*Continued*)

Parameter	Default	Description
diag-level	max	Defines how diagnostic tests are run (options are off, min, med, max).
diag-switch?	false	If true: <ul style="list-style-type: none">• Runs in diagnostic mode.• After a boot request, boots diag-file from diag-device. If false: <ul style="list-style-type: none">• Runs in nondiagnostic mode.• Following a boot request, boots boot-file from boot-device.
obdiag-trigger	power-on-reset	Class of reset events that causes OpenBoot diagnostics tests.
error-reset-recovery	boot	Command to execute following a system reset generated by an error.

Specifications

This appendix provides the Netra 240 server specifications. This appendix is divided into the following sections:

- [“Physical Specifications” on page 127](#)
- [“Environmental Requirements” on page 128](#)
- [“Acoustic Noise Emissions” on page 129](#)
- [“Electrical Specifications” on page 129](#)
- [“NEBS Level 3 Compliance for the DC-Powered Server” on page 130](#)

Physical Specifications

TABLE D-1 Physical Specifications of the Netra 240 Server

Netra 240 Server Dimensions	Measurements
Height 2 rack units (RU)	3.44 inches (87.4 mm)
Width without bezel	16.73 inches (425 mm)
Width with bezel	17.4 inches (442 mm)
Depth from front bezel to system board connectors	19.0 inches (483 mm)
Depth to rear of power supply unit handle	20.06 inches (509.5 mm)
Weight (approximate) with full configuration (not including PCI cards and mounting brackets)	36 lbs (16.33 kg)
Weight (approximate) with full configuration (including PCI cards and mounting brackets)	41 lbs (18.6 kg)

Environmental Requirements

You can operate and store the system safely in the conditions detailed in [TABLE D-2](#).

TABLE D-2 DC and AC Server Operating and Storage Specifications

Specification	Operating	Storage
Ambient temperature	5°C (41°F) to 40°C (104°F) Short term ⁱ : -5°C (23°F) to 55°C (131°F)	-40°C (-40°F) to 70°C (158°F)
Relative humidity	5% to 85% relative humidity, noncondensing Short term ⁱ : 5% to 90% relative humidity, noncondensing, but not to exceed 0.024 kg water/kg dry air (0.053 lbs. water/2.205 lb. dry air)	Up to 93% relative humidity noncondensing, 38°C (100.4°F) max wet bulb
Altitude	Up to 3000 m (9842.4 ft.)	Up to 12000 m (39369.6 ft.)

ⁱ Short term (no more than 96 hours) temperature and humidity limits apply to servers with altitudes up to 1800 m (5905.44 ft.).

Acoustic Noise Emissions

The acoustic noise emissions on a Netra 240 server are as follows:

- Operating acoustic noise is 7.0 B (LWAd (1B=10dB))
- Idling acoustic noise is 7.0 B (LWAd (1B=10dB))

Declared noise emissions are in accordance with ISO 9296 standards.

Electrical Specifications

[TABLE D-3](#) gives operating power limits for the DC version of the Netra 240 server, and [TABLE D-4](#) provides the limits for the AC version of the server.

TABLE D-3 DC Operating Power Limits and Ranges

Description	Limit or Range
Operating Input Voltage Range	-40 VDC to -75 VDC
Maximum Operating Input Current	15 A @ 40 V
Maximum Operating Input Power	571 W

TABLE D-4 AC Operating Power Limits and Ranges

Description	Limit or Range
Operating Input Voltage Range	90 - 264 VAC
Operating Frequency Range	47 - 63 Hz
Maximum Operating Input Current	6.5 A @ 100 VAC
Maximum Operating Input Power	556 W

Note – The figures for the maximum operating current are provided to help you specify the fusing and cabling you need to deliver power to your equipment. However, these figures represent worst-case scenarios.

NEBS Level 3 Compliance for the DC-Powered Server

Telcordia certified that the DC-powered version of the Netra 240 server meets NEBS Level 3 requirements per SR-3580, including the appropriate sections of GR-63-CORE (*Network Equipment-Building System Requirements: Physical Protection*) and GR-1089-CORE (*Electromagnetic Compatibility and Electrical Safety – Generic Criteria for Network Telecommunications Equipment*).



Caution – To maintain NEBS compliance, the network management (NET MGT) Ethernet port and the RJ-45 serial management (SERIAL MGT) port must use shielded cables and both ends of the shield must be grounded. Refer to the *Netra 240 Installation Guide* (817-2698) for cabling information.

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