Sun microsystems

Sun Fire™ V120 and Netra™ 120 Server User's Guide

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Preface

The *Sun Fire V120 and Netra 120 Server User's Guide* describes how to install, manage, and maintain the Sun Fire™ V120 and Netra™ 120 servers. The manual is intended for system administrators who have experience in setting up networked Solaris™ servers.

How This Book Is Organized

Part I Installation and Configuration

Chapter 1 introduces the Sun Fire™ V120 and Netra™ 120 servers, lists the customer-installable hardware and software components available for them, and identifies the main features of the servers' front and back panels.

Chapter 2 provides information about the power and cooling requirements for the Sun Fire™ V120 and Netra™ 120 servers.

Chapter 3 describes how to assemble the DC input power cable.

Chapter 4 describes how to install optional (hot-pluggable) Hard Disk Drives and also how to open the server, identify its components, and install memory DIMMs, a PCI expansion card, or a DVD or CD-ROM drive.

Chapter 5 describes how to install the server into different types of racks.

Chapter 6 describes how to connect the cables and set up serial connections to the server.

Chapter 7 describes how to perform the initial power-on and configuration of the server.

Part II Remote and Local Management

Chapter 8 describes how to use the Lights-Out Management (LOM) shell to power the server on and off or reset it remotely. It also describes how to use this shell to view status information about the server's fans, power supply, supply rails, operating temperature, and internal circuit breakers.

Chapter 9 describes how to use the LOM-specific Solaris commands to monitor and manage the system. This chapter also explains how to configure the LOM device to restart the server automatically after a system lockup.

Part III Troubleshooting and Maintenance

Chapter 10 lists some problems that you might encounter while setting up or using the server and tells you how to solve them. It also describes the server's LEDs.

Chapter 11 lists the field-replaceable units (FRUs) that you can order for your server and tells you how to install them.

Part IV Appendixes

Appendix A tells you how to install and remove Hard Disk Drives from the server without shutting the operating system down.

Appendix B provides information on re-installing Solaris and the Lights-Out Management (LOM) software.

Appendix C describes the parameters you can configure in the LOM driver configuration file.

Appendix D provides the locations and the factory default settings of the jumpers on the system board.

Using Solaris Commands

This document does not contain information on basic Solaris commands and procedures such as shutting down the system, booting the system, and configuring devices.

See one or more of the following for this information:

- AnswerBook2™ online documentation for the Solaris operating environment
- Other software documentation that you received with your system

Typographic Conventions

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

Shell Prompts

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

Related Documentation

Application	Title	Part Number
Installation	*Sun Fire V120 and Netra 120 Servers: Product Notes*	816-2093-xx
Installation overview	*Sun Fire V120 and Netra 120 Servers: Setup Poster*	816-2091-xx
Safety	*Sun Fire V120, Netra 120, and Netra T1 Servers: Safety and Compliance Guide*	806-6135-xx

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

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- `http://docs.sun.com`

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`docfeedback@sun.com`

Please include the part number (816-2090-10) of your document in the subject line of your email.

Safety Precautions

For your protection, observe the following safety precautions when setting up your equipment:

- Follow all cautions and instructions marked on the equipment.
- Never push objects of any kind through openings in the equipment. Dangerous voltages may be present. Conductive foreign objects can produce a short circuit that could cause fire, electric shock, or damage to your equipment.

Symbols

The following symbols may appear in this manual:

Caution – There is a risk of personal injury and equipment damage. Follow the instructions.

Caution – Hazardous voltages are present. To reduce the risk of electric shock and danger to personal health, follow the instructions.

PART **I**   Installation and Configuration

Introduction

This chapter lists the features of the Sun Fire V120 and Netra 120 servers, the contents of the ship kit, and the optional hardware and software that is available for them. It also describes the front and back panels, lists the tools you will need to use to install a server, and describes the servers' tolerance of, or suitability for, various environmental conditions. Finally, the chapter offers some guidance to help you decide whether to mount the system in a rack or a cabinet.

The chapter contains the following sections:

- Section 1.1, "Overview of the Sun Fire V120 and Netra 120 Servers" on page 1-2
- Section 1.2, "Contents of the Ship Kit" on page 1-3
- Section 1.3, "Optional Hardware and Software" on page 1-5
- Section 1.4, "Front Panel" on page 1-6
- Section 1.5, "Back Panel" on page 1-7
- Section 1.6, "The Fans Inside the Sun Fire V120 and Netra 120 Servers" on page 1-8
- Section 1.8, "Environmental Specifications" on page 1-9
- Section 1.9, "Choosing Between a Rack and a Cabinet" on page 1-10

1.1　Overview of the Sun Fire V120 and Netra 120 Servers
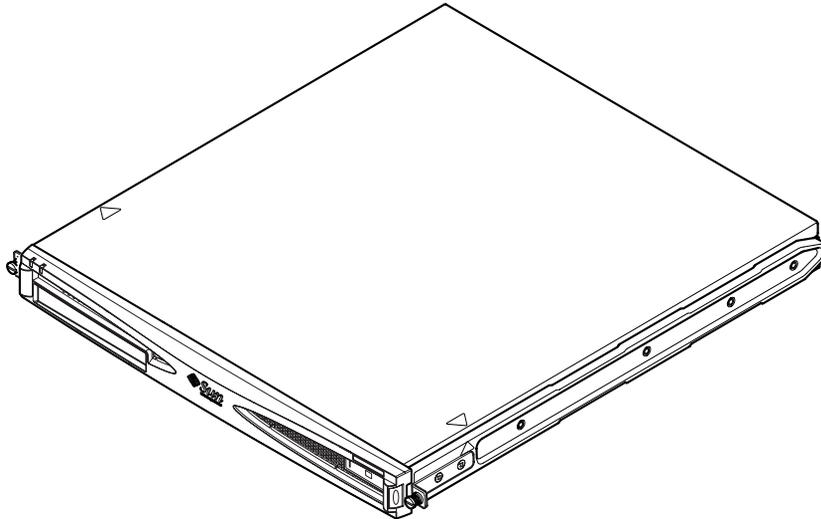
FIGURE 1-1　The Sun Fire V120 Server

The Sun Fire™ V120 and Netra™ 120 servers are single-processor, thin (1U) servers designed primarily for use by telecommunications carriers and internet service providers. They are also suitable for use within corporate customer networks, wherever there is a need to maximize the density of high-performance Solaris servers.

The Sun Fire V120 and Netra 120 servers are identical except that the Sun Fire V120 is powered by an AC supply and the Netra 120 by –48VDC/–60VDC supplies. This is the only difference between the two models.

The servers both have the following features:

- Rackmounting enclosure with single power supply
- UltraSPARC™ IIe+ 550 or 650 MHz processor
- Four DIMM sockets accepting 256 MB or 512 MB PC133 memory modules (giving a maximum of 2 GB of memory)
- One 33-MHz, 32-bit, 5V PCI card slot
- Two 10/100 Mbps RJ-45 Ethernet ports
- Console/Lights-Out Management (LOM) RJ-45 serial port

- Second RJ-45 serial port
- Optional DVD or CD-ROM drive
- Support for up to two low-profile, 3.5-inch Fast-40 (Ultra2SCSI) disks
- Support for up to two USB connections
- External Fast-40 (Ultra2SCSI) Multimode 68-pin port

These servers are designed to be rackmounted. Their components are housed in a casing with the following dimensions:

- Height: 1.72 inches (43.6 mm)
- Width: 17.2 inches (436.7 mm)
- Depth: 18.8 inches (478 mm)
- Weight (when all option modules are installed): 10 kg (22 lb)

1.2 Contents of the Ship Kit

TABLE 1-1   Contents of the Ship Kit

Item	Quantity	Part Number
19-inch rackmounting brackets	4	340-5819-02
Cable management bracket	1	340-6151-01
Sun slide rail	2	540-4362-01
RJ-45 to RJ-45 patch cable for Ethernet or serial connection	2	530-2093-01
RJ-45 to DB-25 adapter	1	530-2889-02
DC connector kit (for Netra 120 systems only)	1	565-1644-01
10-32 UNF Sun rackmounting screw kit	1	565-1645-01
Side-mounting bracket screw kit	1	565-1654-01
Sun Fire V120 and Netra 120 Server User's Guide (this manual)	1	816-2090-10
Sun Fire V120 and Netra 120 Set Up Poster	1	816-2091-xx
Sun Fire V120, Netra 120, and Netra T1 Servers: Safety and Compliance Guide	1	806-6135-xx
Sun Fire V120 and Netra 120 Server Product Notes	1	816-2093-xx
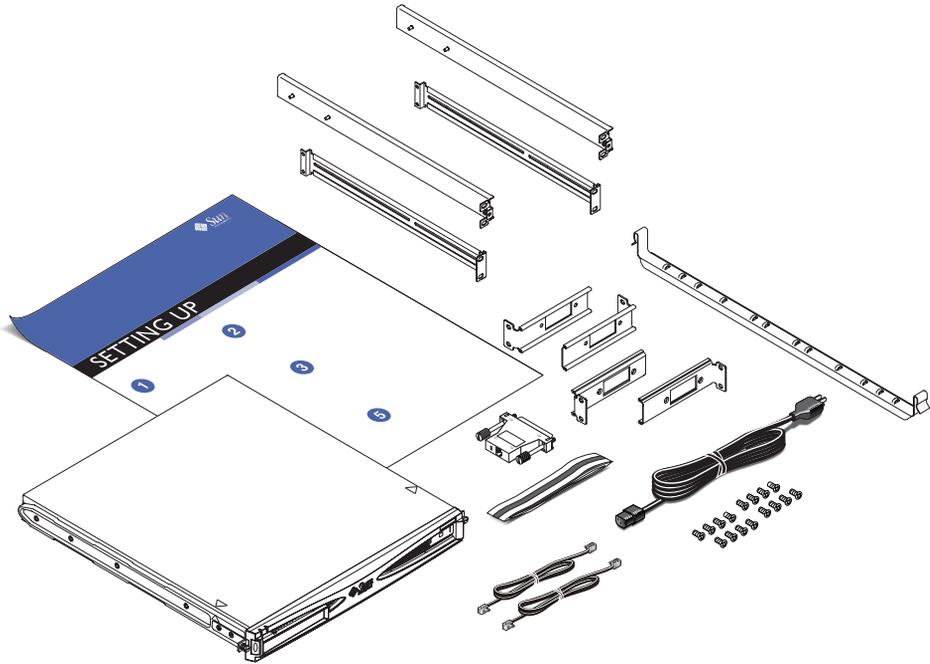
FIGURE 1-2 Contents of the Ship Kit

1.3 Optional Hardware and Software

TABLE 1-2 lists the customer-installable hardware components and software packages that are available for the Sun Fire V120 and Netra 120 servers. To order any of these options, contact your local Sun sales representative.

TABLE 1-2 Customer-Installable Hardware and Software

Optional Components	Part Number
19-inch rackmount kit	X7085A
23-inch rackmount kit	X6966A
24-inch rackmount kit	X6967A
600-mm rackmount kit	X6968A
Internal CD-ROM drive	X7088A
Internal DVD-ROM drive	X1288A
18 GB hard disk	X5239A
36 GB hard disk	X5244A
256 MB DIMM	X7091A
512 MB DIMM	X7092A
Power splitter cable	X7098A
5-pack serial port adapter	X6973A
Gigabit Ethernet PCI Adapter 2.0	X1141A
FastEthernet 10/100Base-T F/W UltraSCSI PCI Adapter 1.0	X1032A
FastEthernet 10/100Base-T PCI Adapter 2.0	X1033A
Quad FastEthernet PCI Adapter (QFE)	X1034A
High-Speed Serial Interface PCI Adapter 2.0	X1155A
ATM PCI Adapter 4.0 (155-Mbps Multi-Mode Fiber Interface)	X1157A
ATM PCI Adapter 4.0 (155-Mbps UTP Interface)	X1158A
Dual-Channel UltraSCSI Differential PCI Host Adapter	X6541A
Serial Asynchronous Interface PCI Adapter	X2156A
Crypto Accelerator PCI Adapter	X1133A
Single-Loop FC-AL PCI Host Adapter	X6729A
Gigabit Ethernet and FC-AL PCI Adapter	X2069A

1.4 Front Panel

The illustration below shows the location of the Power and Fault LEDs, and the DVD-ROM drive bay.

Power LED

Fault LED

DVD-ROM drive bay
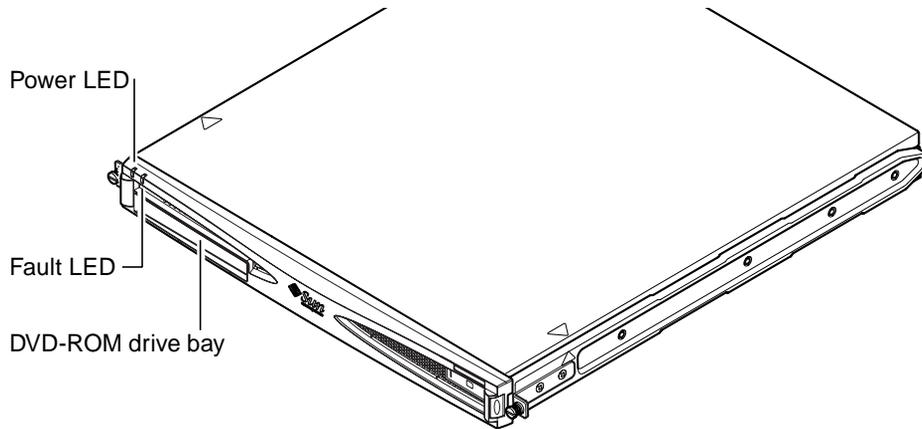
FIGURE 1-3 The Front Panel of the Sun Fire V120 and Netra 120 Servers

1.5 Back Panel

FIGURE 1-4 shows the components on the Sun Fire V120 server's back panel.
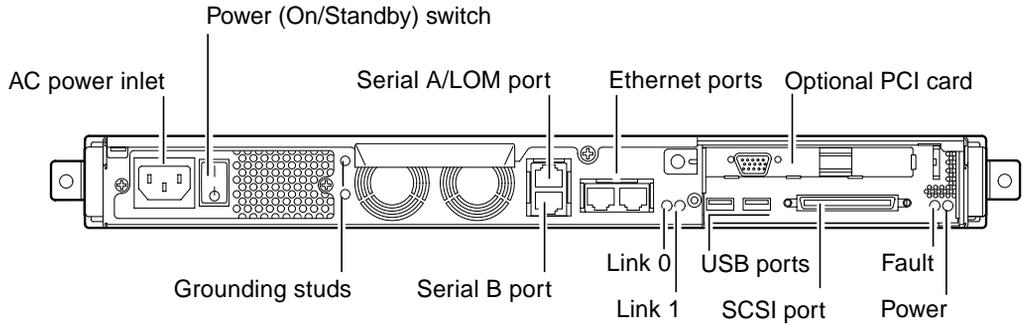
FIGURE 1-4 The Back Panel of the Sun Fire V120 Server

FIGURE 1-5 shows the components on the Netra 120 server's back panel. Except for the power inlets, they are identical to the components on the back panel of the Sun Fire V120.
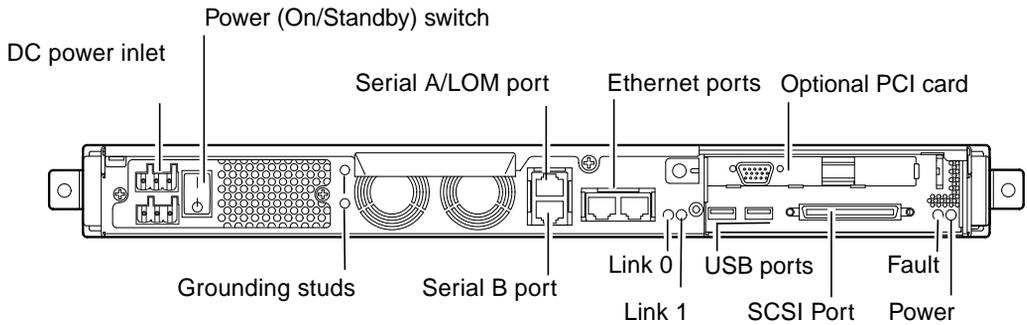
FIGURE 1-5 The Back Panel of the Netra 120 Server

1.6 The Fans Inside the Sun Fire V120 and Netra 120 Servers

The Sun Fire V120 and Netra 120 servers contain four fans. These are monitored by the LOM device, so you can use the Lights-Out Management (LOM) commands to check their status. For more information, see Chapter 8 and Chapter 9.

For a diagram showing the position of the fans inside the server, see "Identifying Server Components" on page 4-6.

1.7 Tools You Need for Installation

- An 8-mm wrench (for assembling the rackmounting).
- A small flat-head screwdriver (for levering the grilles when installing hard disks).
- An ESD pad and an antistatic wrist strap and earthing point (to protect the components of the system if you need to install any hardware options).
- A No. 2 Phillips screwdriver.
- For Netra 120 servers that are stacked on top of each other in a rack, you need to use a right-angled two-hole lug. Use a UL/CSA-approved component, such as the one supplied by Thomas & Betts (part number: 54204-UB). You will also need a crimping tool, such as the Thomas & Betts crimping tool (part number: TBM 5-S).

1.8 Environmental Specifications

This section gives storage, operating and environmental compliance information.

1.8.1 Tolerance of Environmental Conditions

You can operate and store the system safely in the following conditions:

- Ambient temperature
    - Operating: 5˚C to 40˚C (temporary operation outside these limits is permitted for a maximum of 96 hours within the range –5˚C to 55˚C)
    - Storage: –40˚C to 70˚C
- Relative humidity
    - Operating: 5% to 85% (non-condensing)
    - Storage: 10% to 95% (non-condensing)
- Altitude
    - Operating: –300 m to +3000 m
    - Storage: –300 m to +12000 m
- Earthquake
  The system conforms to the NEBS requirements for earthquake zone 4

1.8.2 Acoustic Noise Generated by the Server

The server generates less than 60 dBA at a distance of 23.67 inches (600 mm) and a height of 59.17 inches (1500 mm) while operating in an ambient temperature of 25˚C.

1.8.3 Environmental Compliance Information

- NEBS environmental criteria
  The system conforms to GR-63-CORE issue 1, October 1995
- Electromagnetic compatibility
    - Immunity: The system conforms to GR-1089-CORE and EN50082-1
    - Emissions: The system conforms to GR-1089-CORE, EN55022 Class A and FCC Class A
- Safety
  The system conforms to UL 1950 (3rd edition), EN60950, GR-1089-CORE

1.9 Choosing Between a Rack and a Cabinet

You can install the Sun Fire V120 or Netra 120 server in either a rack or a cabinet. Factors that might influence your decision include:

- **Security**
  If other people have access to the room in which your server is located, you can increase security by locking the server in a cabinet.

- **Thermal issues**
  Cabinets often require additional fans, because the servers you install in them are generating heat in an enclosed space. Two-post racks, however, might require no special cooling systems.

- **Flooring**
  Two-post telco relay racks are designed so that cables can be run overhead. Cabinets often require cables to be run under the floor.

What's Next?

When you have read this chapter, go to Chapter 2 to find out how to estimate the power and cooling requirements for your server.

Power and Cooling

This chapter contains information about the power consumption of the Sun Fire V120 and Netra 120 servers. It also tells you how to estimate the amount of heat that your cooling system must dissipate.

The chapter contains the following sections:

- Section 2.1, "Operating Power Limits and Ranges" on page 2-2
- Section 2.2, "Power Consumption" on page 2-3
- Section 2.3, "Estimating Heat Dissipation" on page 2-4

Note – The power supply on the Sun Fire V120 server continues to regulate all outputs for at least 20 milliseconds after AC power is removed. On the Netra 120 server, the power supply continues to regulate all outputs for at least 4.5 milliseconds after DC power is removed.

Note – Standby power is available whenever input power is connected.

2.1 Operating Power Limits and Ranges

The table below gives operating and power information for the Sun Fire V120 and Netra 120 servers.

TABLE 2-1   Operating Power Limits and Ranges for Sun Fire V120 and Netra 120 Servers

Description	Sun Fire V120 Server (AC power)	Netra 120 Server (DC power)
Maximum operating current	2A @ 90 VAC	4A @ −40 VDC
Maximum in-rush current (cold start)	20A peak upon a restart performed 60 seconds or more after the removal of AC power	20A peak upon a restart performed 60 seconds or more after the removal of DC power
Maximum in-rush current (warm start)	40A peak upon a restart performed less than 60 seconds but more than 200 milliseconds after the removal of AC power	40A peak upon a restart performed less than 60 seconds but more than 200 milliseconds after the removal of DC power
Maximum in-rush current (hot start)	100A peak upon a restart performed less than 200 milliseconds after the removal of AC power	100A peak upon a restart performed less than 200 milliseconds after the removal of DC power
Operating input voltage range	90-264 V_{rms}	−40 to −75 VDC
Voltage frequency range	47-63 Hz	DC
Power factor	0.8 to 1.0	Not applicable
BTU rating	550 BTU	550 BTU

*For both servers, the in-rush current decays to the normal operating current in less than 200 milliseconds. The in-rush decaying peaks last for less than 3 milliseconds in each half cycle.

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. Such occurrences are unlikely in a real installation.

2.2 Power Consumption

To estimate the total power consumption for several Sun Fire V120 or Netra 120 servers installed in a single rack or cabinet, add together the individual power requirement figures for each of the systems that you have installed (see TABLE 2-2).

TABLE 2-2   Power Consumption for the Available Configurations of the Server

Server Model	Hardware Options Installed	Power Consumption (Nominal)	Power Consumption (Maximum)
Sun Fire V120	550MHz CPU 36 GB hard disk 512 MB DIMM	55 W	73 VA
Sun Fire V120	650MHz CPU 2x36 GB hard disk 1 GB DIMM	74 W	100 VA
Sun Fire V120	650MHz CPU 1x36 GB hard disk 512 MB DIMM	58 W	78 VA
Netra 120	650MHz CPU 36 GB hard disk 512 MB DIMM	58 W	70 W

Note – Adding optional hardware components to your system will increase its power consumption. For a list of the optional hardware components available for these servers, see Section 1.3, "Optional Hardware and Software" on page 1-5.

2.3 Estimating Heat Dissipation

To estimate the amount of heat generated by a Sun Fire V120 or Netra 120 server so that you can estimate the heat your cooling system must dissipate (see Section 2.2, "Power Consumption" on page 2-3), convert the figure for the server's power consumption from watts to BTU per hour.

A general formula for doing this is to multiply the figure for the power consumption by 3.415. For example, the heat that must be dissipated for a Sun Fire V120 server containing a 650 MHz processor, a single 36 GB hard disk drive, and a single 512 MB DIMM is:

58 x 3.415 = 198.07 BTU/hr

You can install up to 32 Sun Fire V120 or Netra 120 servers into a Sun StorEdge 72-inch rack. To estimate the heat your cooling system must dissipate, add together the nominal power consumption for each server in the rack, then multiply the result by 3.415. For example, 30 servers each containing a 650 MHz processor, containing a single 36 GB hard disk and a single 512 MB DIMM will generate the following amount of heat:

(30 x 58 W) x 3.415 = 5942.10 BTU/hr

What's Next?

When you have used this chapter to estimate the power and cooling requirements for your server, go to Chapter 3, which tells you how to assemble the DC input power cables for the Netra 120 server; or if you are installing a Sun Fire V120 server, go straight to Chapter 4 to find out how to install the optional hardware components available for both servers.

Using DC Power

This chapter applies only to the Netra 120 server. If you have purchased a Sun Fire V120 server, skip this chapter and go to Chapter 4.

This chapter provides information on grounding a Netra 120 server and on assembling the DC power connectors.

It contains the following sections:

- Section 3.1, "Grounding the Netra 120 Server" on page 3-2
- Section 3.2, "Assembling the DC Power Connectors" on page 3-3

3.1 Grounding the Netra 120 Server

The two M5 grounding studs on the server's back panel are the recommended safety grounding point (see FIGURE 3-1). However, an alternative grounding point is provided by the middle pin of the WAGO connector.
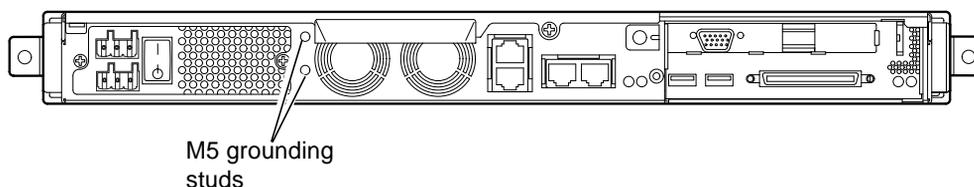
M5 grounding
studs

FIGURE 3-1   The Location of the Grounding Studs for Connecting the Two-Hole Lug

- **To ground the server, take a ground conductor and terminate it using a right-angled two-hole lug.**

  Make sure that it is UL/CSA-approved, that it is suitable for an 8 AWG (6mm^2) conductor, and that it has a 5/8-inch pitch.

Note – For Netra 120 servers that are stacked on top of each other in a rack, you need to use a right-angled two-hole lug. Use a UL/CSA-approved component, such as the one supplied by Thomas & Betts (part number: 54204-UB).

- **To secure the lug onto the ground conductor cable, use a UL/CSA-approved crimping tool, such as the one supplied by Thomas & Betts (part number: TBM 5-S).**

  Do not use a torque value of more than 3.5 Nm maximum.

  Connect the free end of the ground conductor cable to an earthing bar located near to the equipment.

Caution – External filtering and/or surge suppression devices may be required on the power feeds where branch circuit electromagnetic characteristics are unknown.

Note – For more information about grounding the server, refer to the *Sun Fire V120, Netra 120, and Netra T1 Servers: Safety and Compliance Guide* (part number: 816-3211).

3.2 Assembling the DC Power Connectors

The Netra 120 server has a dedicated connector kit; this section explains how to use it.

3.2.1 The Insulated Conductors You Need to Use

The insulated conductors you use must have the following characteristics:

- Material: tinned copper (multistranded)
- Size: 12 AWG (2.5 mm^2) (maximum)
- Rating:
  - 300 vrms (minimum)
  - 75° C
  - Low-smoke fume (LSF)
- Fire resistance:
  - VW-1
  - GR63-CORE compliant

You need two supply conductors:

- One -48V (or -60V) DC supply conductor (return, RTN) grounded at source
- One DC supply conductor (- minus)

Finally, you need one power supply unit (PSU) ground conductor.

3.2.2 Assembling the DC Input Power Cable

1. **Determine how many DC input power cables you will need from each DC power source.**

2. **Turn off power to the DC power source through the circuit breakers.**

   Caution – Do *not* proceed with these instructions until you have turned off the power to the DC power source through the circuit breakers.

3. **Take a DC connector from the ship kit.**

4. **Locate the Supply and Return wires (and the PSU Ground, if you are using it) coming from the DC power source that you intend to use in the connection to your server:**

- −48V Supply
- PSU Ground
- −48V Return

5. **Strip 0.31 inches (8 mm) of insulation from each of the wires coming from the DC power source (see** FIGURE 3-2**).**

   Do not strip more than 0.31 inches (8 mm) from each wire. Doing so will leave uninsulated wire exposed from the DC connector after the assembly is complete.

0.31 in. (8 mm)

FIGURE 3-2 Stripping the Insulation From the Wire

6. Insert the tip of the cage clamp operating lever into the rectangular hole directly above the hole in the DC connector where you want to insert the first wire.

Then press down on the cage clamp operating lever (see FIGURE 3-3). This opens the cage clamp for this section of the DC connector.

You can also open the DC connector cage clamp by inserting a small slotted screwdriver into the rectangular hole directly above the hole in the DC connector where you want to insert the first wire, and then pressing down on the screwdriver (see FIGURE 3-4).
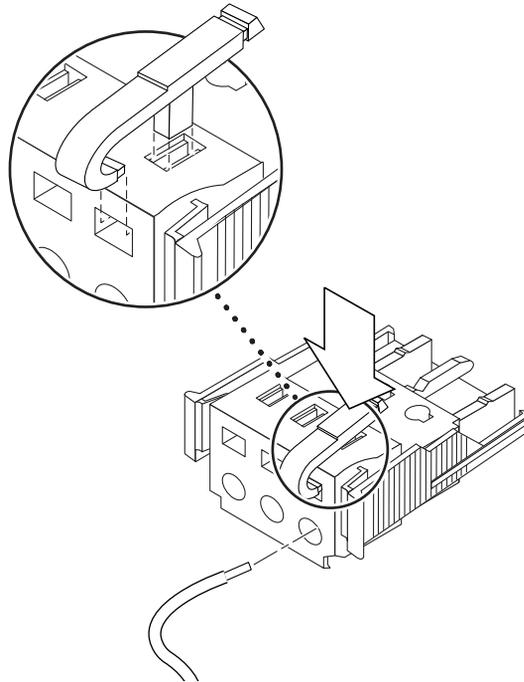
FIGURE 3-3 Opening the DC Connector Cage Clamp (Lever Method)

Top of connector
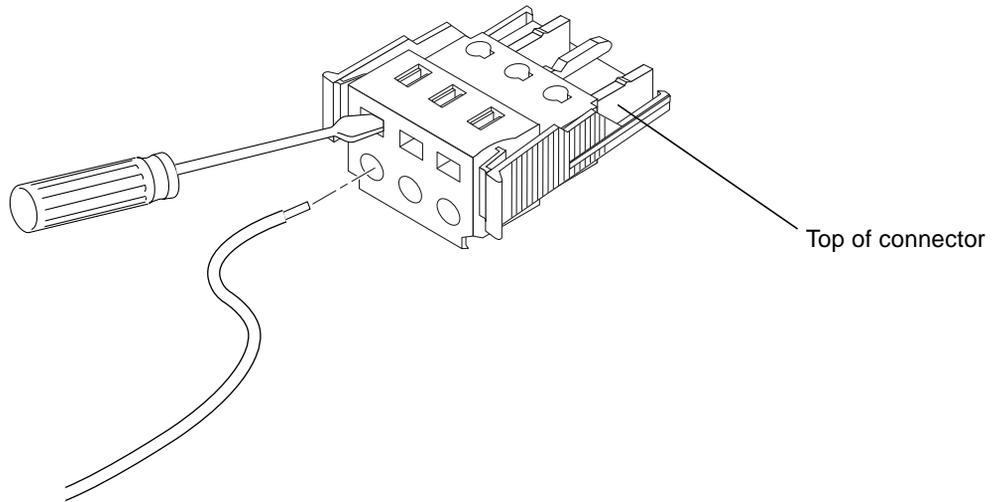
FIGURE 3-4 Opening the DC Connector Cage Clamp (Screwdriver Method)

7. Feed the exposed section of the appropriate wire into that hole in the DC connector.

FIGURE 3-5 shows which wires should be inserted into each hole in the DC connector.

Top of connector

3
2
1

−48V Return

Ground

−48V
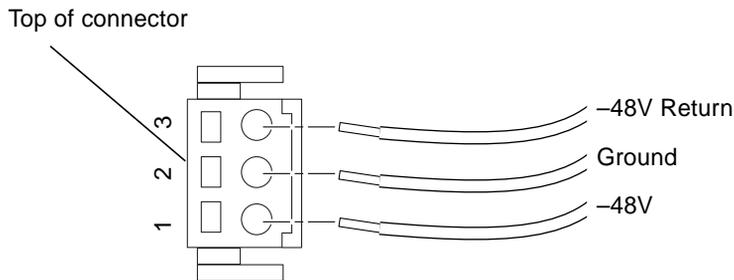
FIGURE 3-5 Assembling the DC Input Power Cable

8. Repeat Step 6 and Step 7 for the other two wires to complete the assembly of the DC input power cable.

9. Repeat Step 4 through Step 8 to create a second DC input power cable.

If you need to remove a wire from the DC connector, insert the cage clamp operating lever or a small screwdriver into the slot directly above the wire and press down (FIGURE 3-3 and FIGURE 3-4).

3.2.3 Installing the Strain Relief Housings

1. **Insert the bottom portion of the strain relief housing into the notch on the DC connector until it snaps into place (see** FIGURE 3-6**).**

   Make sure that the strain relief housing snaps into place on the DC connector, otherwise you will not be able to complete the assembly correctly.
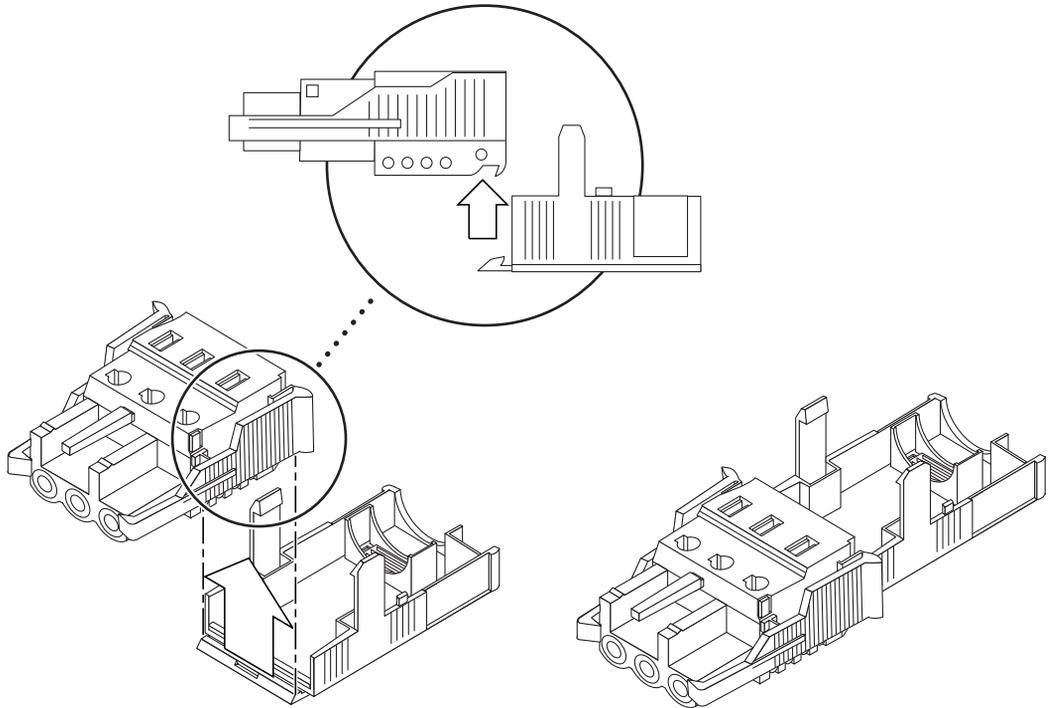
FIGURE 3-6   Inserting the Bottom Portion of the Strain Relief Housing

2. **Route the three wires coming from the DC power source through the opening at the end of the bottom portion of the strain relief housing (see** FIGURE 3-7**).**
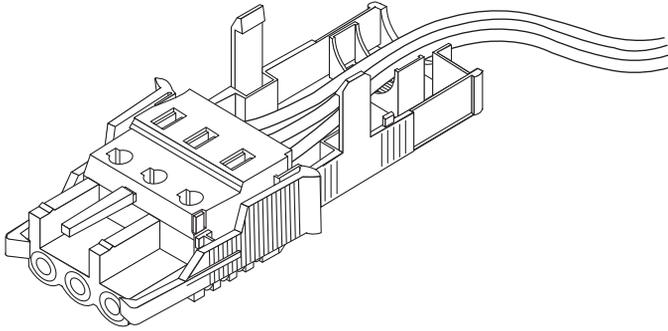
FIGURE 3-7   Routing the Wires Out of the Strain Relief Housing

3. Insert the tie wrap into the bottom portion of the strain relief housing (see FIGURE 3-8**).**
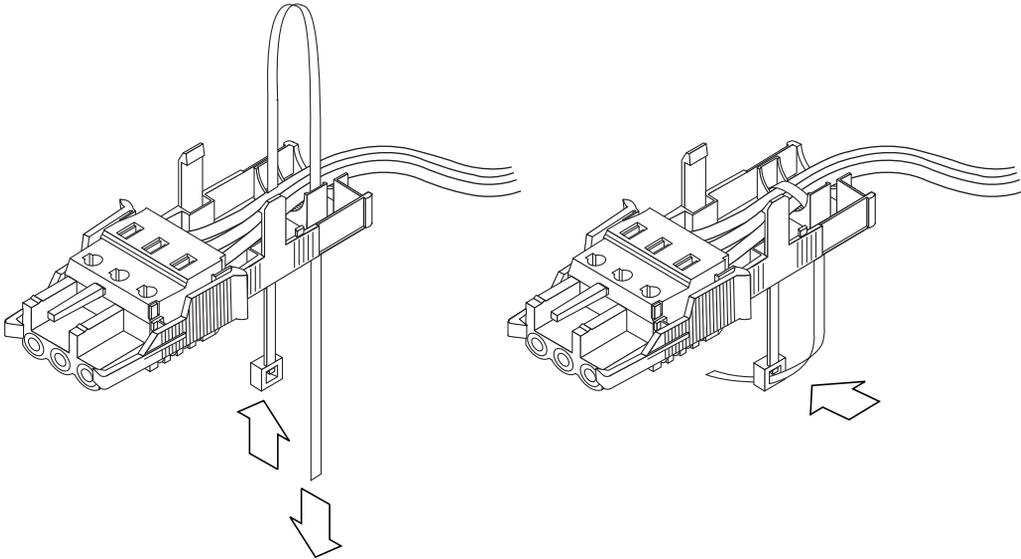
FIGURE 3-8   Securing the Wires to the Strain Relief Housing

4. Loop the tie wrap over the wires and back out of the strain relief housing and tighten the tie wrap to secure the wires to the strain relief housing (see FIGURE 3-8**).**

5. Position the top portion of the strain relief housing so that the three prongs on the top portion fit into the openings in the DC connector, and push them together until they snap into place (see FIGURE 3-9**).**
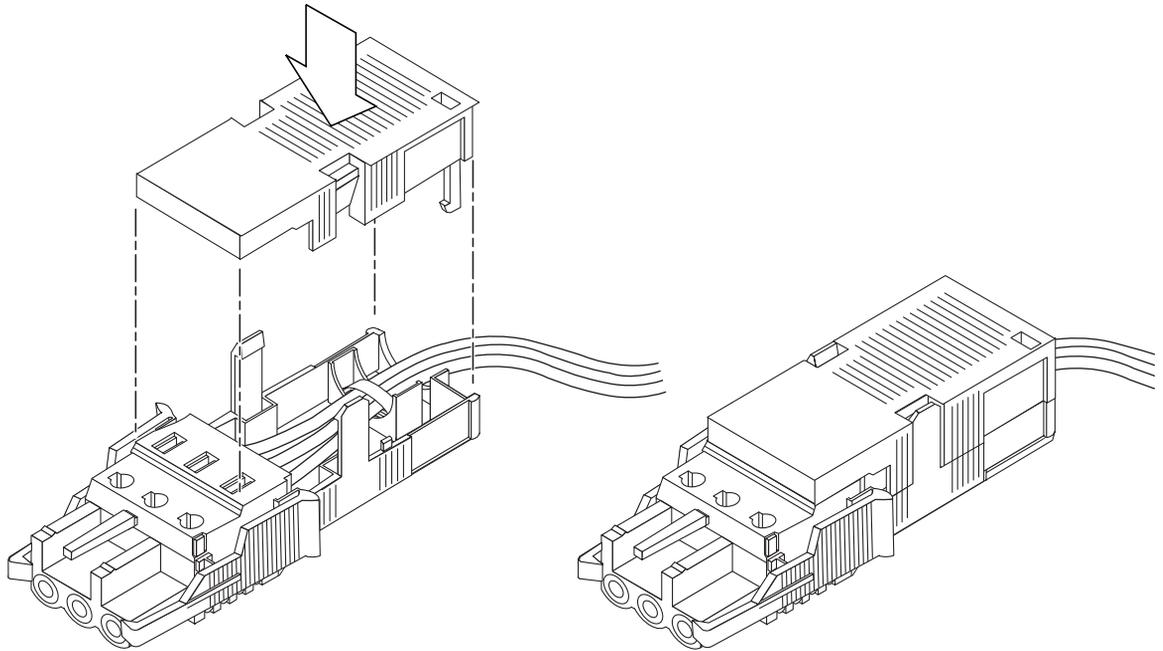
FIGURE 3-9   Assembling the Strain Relief Housing

What's Next?

The DC input power cables for your server are now completely assembled. For information about connecting the power cords and other cables, see Chapter 6. Do not power on the server (see Chapter 7) until you have installed any optional hardware components you need (see Chapter 4) and until you have installed the server securely into a rack or cabinet (see Chapter 5).

Installing Optional Hardware Components

If you do not want to install any optional hardware components, skip this chapter and go straight to Chapter 5, which tells you how to install the Sun Fire V120 and Netra 120 servers into a rack.

This chapter tells you how to install or remove the hot-pluggable Hard Disk Drives. To do this, you do not need to power off the server or remove it from the rack. This chapter also tells you how to remove the cover of the server, how to identify the parts of the server, how to install a DVD or CD-ROM drive, and how to install DIMMs and a PCI card.

For the part numbers of the hardware components available from your local Sun sales representative, see Section 1.3, "Optional Hardware and Software" on page 1-5.

This chapter contains the following sections:

- Section 4.1, "Installing and Removing Hot-Pluggable SCSI Hard Disk Drives" on page 4-2
- Section 4.2, "Opening the Server" on page 4-4
- Section 4.3, "Identifying Server Components" on page 4-6
- Section 4.4, "Installing and Removing a DVD or CD-ROM Drive" on page 4-7
- Section 4.5, "Installing and Removing Memory" on page 4-9
- Section 4.6, "Installing and Removing a PCI Card" on page 4-11
- Section 4.7, "Replacing the Server's Top Cover" on page 4-14

4.1 Installing and Removing Hot-Pluggable SCSI Hard Disk Drives

Note – The server and Hard Disk Drives contain electronic parts that are extremely sensitive to static electricity. Do not touch any metal parts. Wear an antistatic wrist strap.

The Hard Disk Drives are hot-pluggable modules. This means that you do not need to power off the server or remove it from the rack to install or remove the Hard Disk Drives.

However, you do need to make sure that no system or application software is using a Hard Disk Drive when you remove it.

Note – If you intend to remove a Hard Disk Drive with Solaris running, follow the instructions in Appendix A before performing the steps below.

1. **Remove the front bezel.**

   Release the bezel from the server by pressing in on the tabs at either end of the bezel.

2. **Pull out the grilles.**

3. **Do one of the following:**

   ■ If you are *installing* a Hard Disk Drive, slide it into its tray at the front of the server (see FIGURE 4-1). Push it in firmly until the metal lever starts to close: this indicates that it has engaged with the backplane connector. Then, push the metal lever until the disk drive clicks into place.

   Note – When inserting a Hard Disk Drive into its enclosure, make sure the top of the drive is touching the top of the enclosure. If you try to install it with the bottom of the drive touching the bottom of the enclosure, the drive will not align with the slide rails inside the enclosure, and you will not be able to insert the disk.

   ■ If you are *removing* a Hard Disk Drive, locate the latch at the front of the disk and slide it to the right (see FIGURE 4-1). This causes the metal lever to open. Holding the latch, pull the disk part way out of its bay and leave it for a minute to make sure it has stopped spinning. (If a disk is fully removed while it is still spinning, gyroscopic forces can damage its bearings.) When it has stopped spinning, pull it out of the chassis.

4. **Replace the grilles and front bezel.**

5. **If you have just installed a Hard Disk Drive and you have Solaris running, you must now perform the steps in Section A.1, "Installing a SCSI Hard Disk Drive With Solaris Running" on page A-2.**
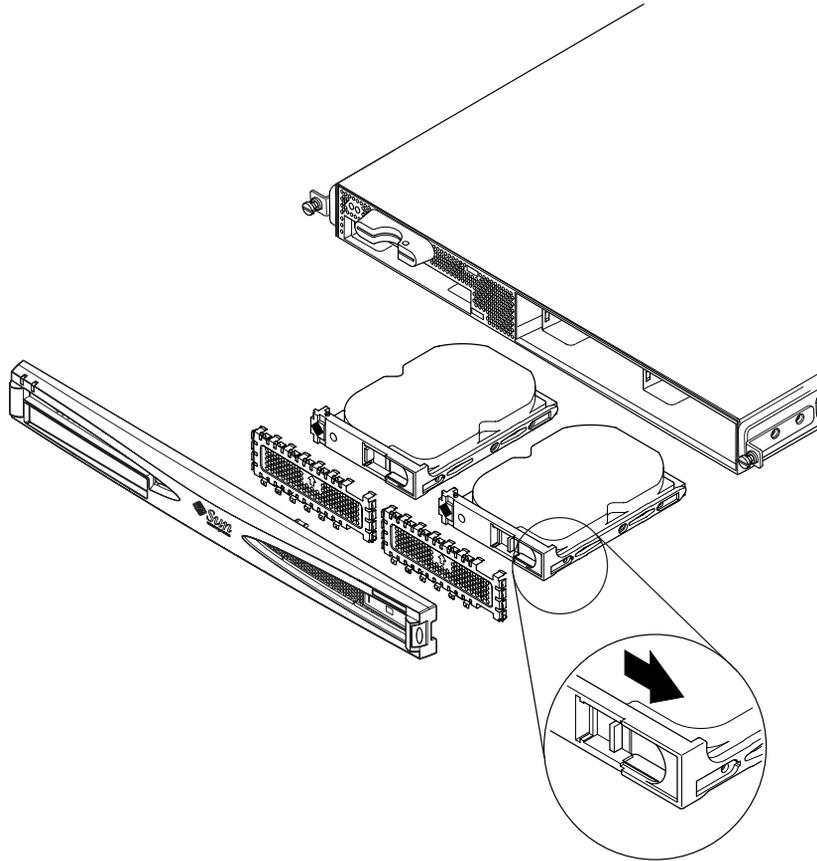
FIGURE 4-1   Inserting and Removing Hard Disks

4.2 Opening the Server

⚠ **Caution –** The server contains electronic parts that are extremely sensitive to static electricity. Do not touch any metal parts. Place the server on top of a grounded electrostatic discharge (ESD) pad. Attach the disposable antistatic wrist strap supplied with the server to its metal base before touching any of the internal components.

⚠ **Caution –** Before attempting to remove the cover, make sure that all power cords and all other cables have been disconnected from the server.
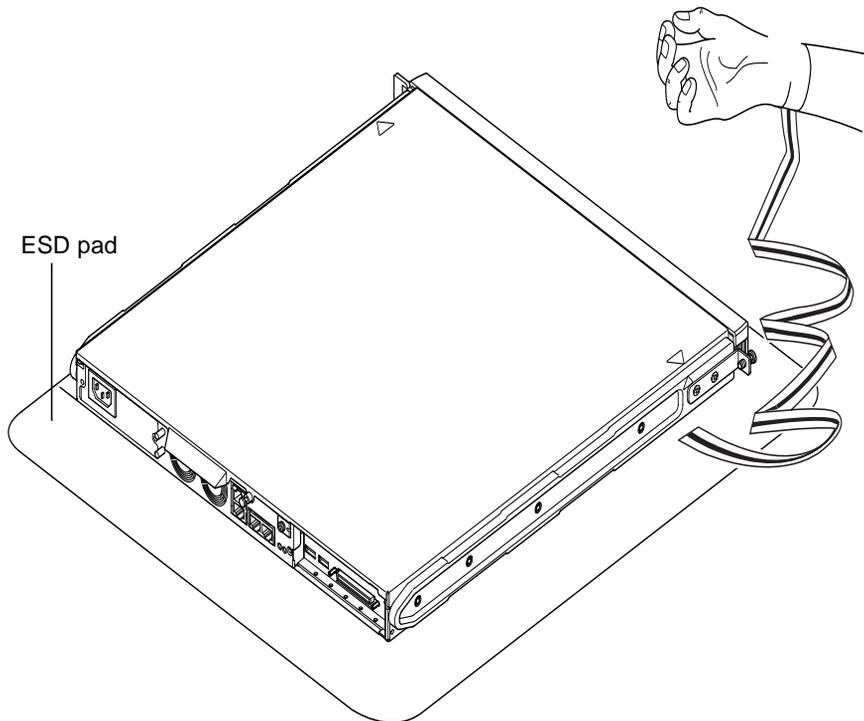
FIGURE 4-2 Using the Antistatic Wrist Strap Supplied With the Server

1. **If your server is new and you have just removed it from its packaging, go straight to Step 3.**

   If your server is currently in use, but you need to open it to install or replace a hardware component, then:

   a. **Shut down and power off the server.**

   b. **Disconnect the power cord(s).**

   c. **Disconnect all other cables.**

2. **If you have installed the server into a rack or cabinet, remove it from the rack or cabinet.**

3. **Place the server on a grounded ESD surface and use an antistatic wrist strap.**

4. **Remove the server's top cover (see** FIGURE 4-3**):**

   a. **Undo the captive screw at the rear center of the unit (see** FIGURE 4-3**).**

   b. **Slide the top cover back and lift it off (see** FIGURE 4-3**).**
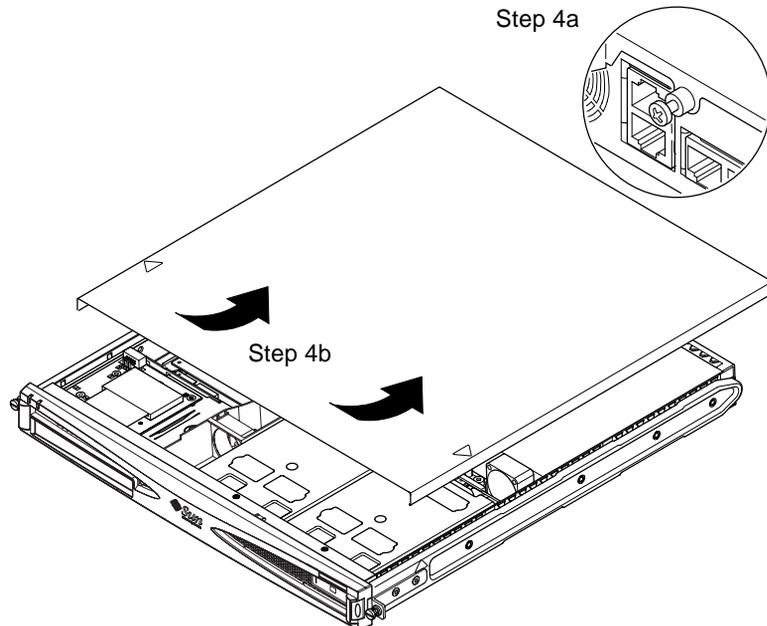
FIGURE 4-3   Removing the Top Cover

4.3 Identifying Server Components

The major components of the Sun Fire V120 and Netra 120 servers, and the location of each component, are shown below, in FIGURE 4-4:

1. **PCI card (optional)**

2. **System configuration card reader**

3. **Top cover**

4. **Hard Disk Drive**

5. **Optional DVD or CD-ROM drive**

6. **Filler panel**

7. **Front bezel**

8. **Grills**

9. **Fan 3 ducting**

10. **DIMM**

11. **Power Supply Unit**

12. **Fans 1 and 2**

13. **Fan 3 (CPU)**

14. **Fan 4**
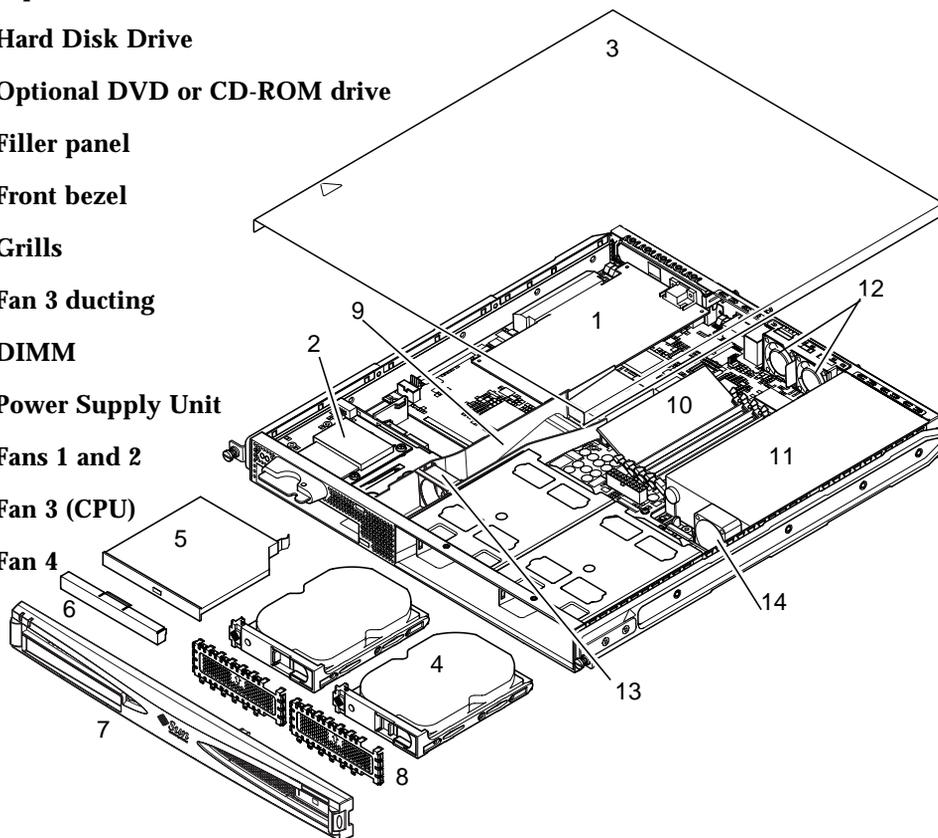
FIGURE 4-4   Components of the Sun Fire V120 and Netra 120 Servers

4.4   Installing and Removing a DVD or CD-ROM Drive

```
Class 1 Laser Product
Luokan 1 Laserlaite
Klasse 1 Laser Apparat
Laser Klasse 1
```

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

4.4.1   Installing a DVD or CD-ROM Drive

Note – If you are going to install a full-length PCI card, install the DVD or CD-ROM drive first. If you have a full-length PCI card already installed, you need to remove it before installing the DVD or CD-ROM drive.

1. **Remove the top cover by following the procedure described in Section 4.2, "Opening the Server" on page 4-4.**

   Make sure you disconnect all power cables and wear an antistatic wrist strap.

2. **Remove the front bezel.**

   Release it from the server by pressing in on the tabs at either end of the bezel.

3. **If you have a full-length PCI card installed, you must remove it before installing the DVD or CD-ROM drive (see Section 4.6.2, "Removing a PCI Card" on page 4-14).**

4. **Squeeze and pull out the filler panel at the front of the DVD or CD-ROM enclosure.**

5. **Carefully insert the DVD or CD-ROM drive into the chassis (see** FIGURE 4-5**).**

   Make sure that the catch at the rear of the DVD or CD-ROM drive clicks onto the
   chassis. Guide the drive in so that its connectors align with, and then engage with,
   the connectors on the paddleboard (see FIGURE 4-5) at the back of the drive's
   enclosure in the chassis. You may need to hold the paddleboard by the black IDE
   connector to guide the DVD or CD-ROM drive home.

6. **Re-install the full-length PCI card if you removed one (see Section 4.6, "Installing
   and Removing a PCI Card" on page 4-11).**

7. **Replace the server's cover and tighten the captive screw (see** FIGURE 4-9 **in
   Section 4.7, "Replacing the Server's Top Cover" on page 4-14).**

8. **Replace the front bezel.**
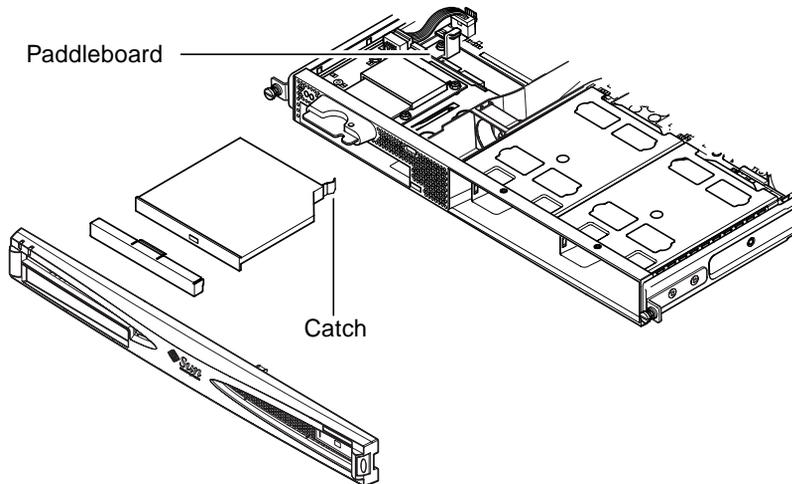
FIGURE 4-5   Installing an Internal DVD or CD-ROM Drive

4.4.2   Removing a DVD or CD-ROM Drive

1. **Remove the top cover by following the procedure described in Section 4.2, "Opening the Server" on page 4-4.**

   Make sure you disconnect all power cables and wear an antistatic wrist strap.

2. **Remove the front bezel.**

   Release it from the server by pressing in on the tabs at either end of the bezel.

3. **Unclip the catch that fastens the DVD or CD-ROM drive to the chassis.**

   This catch is located at the back right-hand corner of the drive's casing.

4. **Carefully but firmly pull the DVD or CD-ROM drive out of its connector at the rear of the enclosure and pull the drive out of the chassis.**

5. **Replace the server cover and tighten the captive screw (see** FIGURE 4-9 **in Section 4.7, "Replacing the Server's Top Cover" on page 4-14).**

6. **Replace the front bezel.**

4.5   Installing and Removing Memory

There are four memory module sockets on the server's system board. You can install a 256 or 512 MB DIMM into each socket. For the maximum 2 Gbytes of memory, install four 512 MB DIMMs. For the sales part numbers of the DIMMs available from your local Sun sales representative, see Chapter 1.

1. **Remove the top cover by following the procedure described in Section 4.2, "Opening the Server" on page 4-4.**

   Make sure you wear an antistatic wrist strap and that you disconnect all power cables.

2. **Insert the memory module into a vacant DIMM socket, or, if you are removing memory, open the latches at the sides of the socket and remove the module.**

3. Replace the server's cover and tighten the captive screw (see FIGURE 4-9 **in Section 4.7, "Replacing the Server's Top Cover" on page 4-14).**
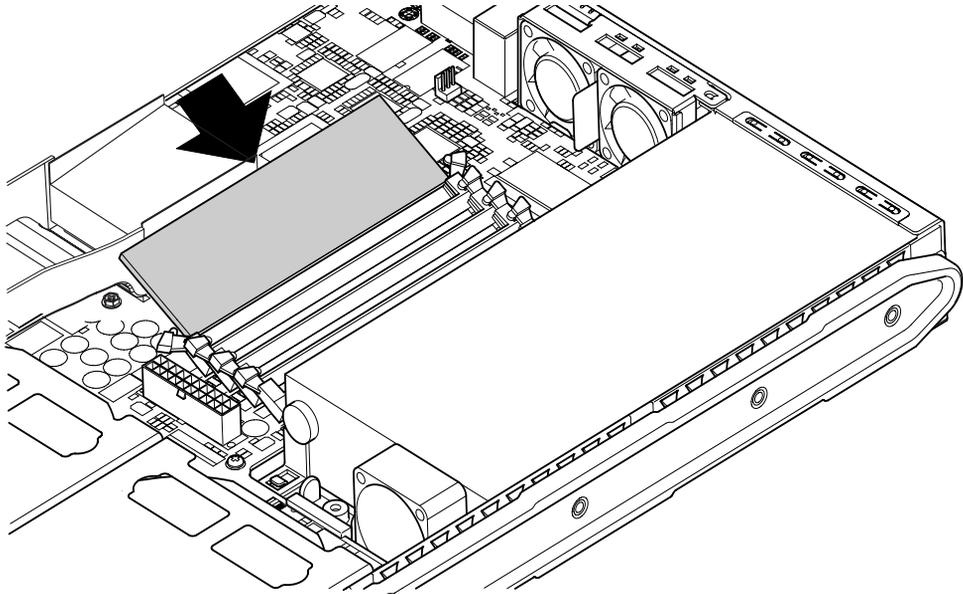
FIGURE 4-6   Installing Memory into a Socket on the System Board

---

Note – There are four DIMM slots. The one nearest to the CPU fan is slot 0. The one nearest to the power supply unit is slot 3. Put the first DIMM in slot 0, and install subsequent DIMMs in contiguous slots.

4.6 Installing and Removing a PCI Card

For a list of the PCI cards available from your local Sun Sales representative, see "Optional Hardware and Software" on page 1-5.

4.6.1 Installing a PCI Card

Note – If you are installing a full-length PCI card and you also want to install a DVD-ROM drive, install the DVD-ROM drive first (see Section 4.4, "Installing and Removing a DVD or CD-ROM Drive" on page 4-7). Otherwise, when you install the DVD-ROM drive, you will have to remove the PCI card that you have installed.

To install a PCI card into the server, do the following:

1. **Remove the top cover by following the procedure described in "Opening the Server" on page 4-4.**

   Make sure you wear an antistatic wrist strap and disconnect all power cables.

2. **Remove the filler panel protecting the PCI connector.**

3. **Loosen the captive screw holding the PCI slot's retention bracket in place (see** FIGURE 4-7**).**

   Rotate the retention bracket through 90 degrees (see FIGURE 4-7). This releases the filler panel in the PCI slot, enabling you to remove the filler panel. Remove it.

4. **If you are installing a full-length PCI card, slide the PCI card retainer off the PCI slide support rail on the system board.**

5. **Insert the PCI card firmly into the PCI connector (see** FIGURE 4-7**) making sure that the PCI card's bracket is correctly positioned against the rear of the chassis.**

   The tapered end of the bracket must be inside the small metal tab designed for it on the chassis (see FIGURE 4-7).
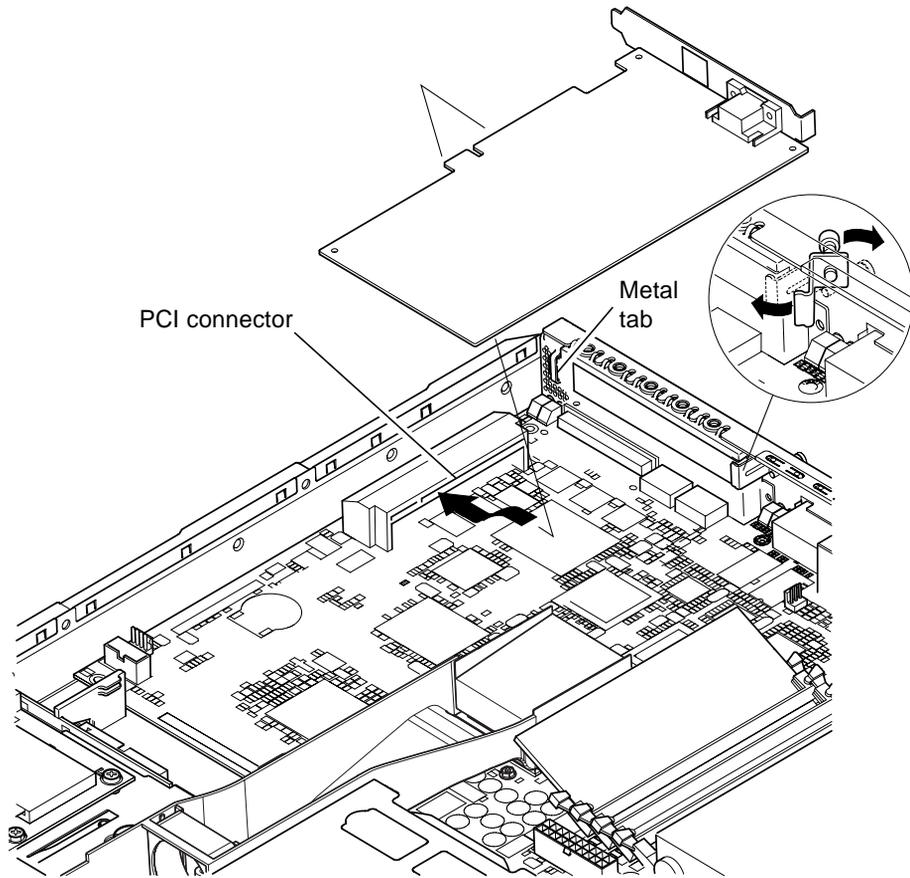
FIGURE 4-7 The Rotating Retention Bracket and the Position of a PCI Card

6. **Slide the PCI card retainer into a position at the back of the PCI card to prevent excessive flexing of the board (see** FIGURE 4-8**).**

   If you are installing a full-length PCI card, insert the back end of the card into the groove in the plastic bracket shown in FIGURE 4-8; this provides extra support.
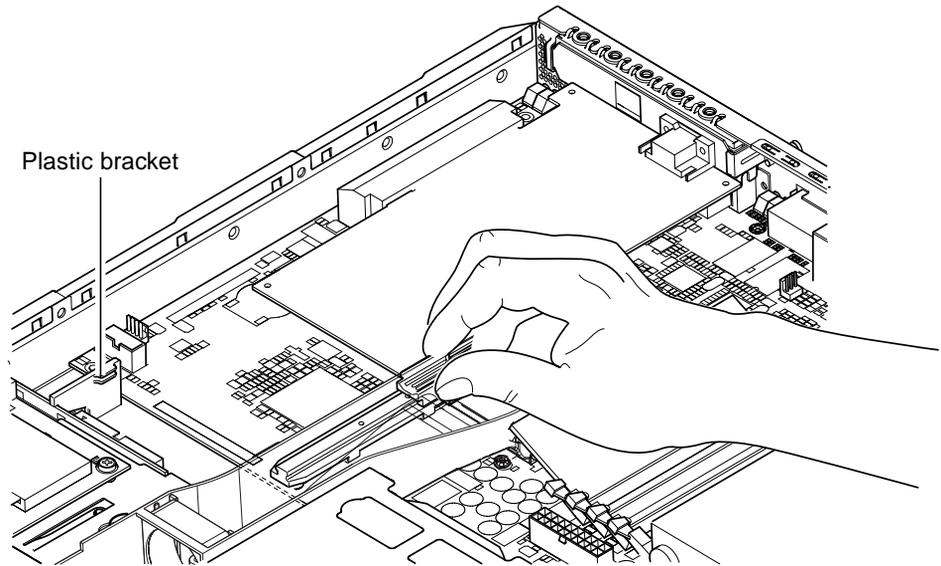
Plastic bracket

FIGURE 4-8 Using the PCI Card Retainer, Slide Support Rail, and Plastic Bracket

7. **Reposition and tighten the rotating retention bracket (see** FIGURE 4-7**) to secure the PCI card to the chassis.**

8. **Replace the server's cover and tighten the captive screw (see** FIGURE 4-9 **in Section 4.7, "Replacing the Server's Top Cover" on page 4-14).**

4.6.2 Removing a PCI Card

1. **Remove the top cover by following the procedure described in "Opening the Server" on page 4-4.**

   Make sure you wear an antistatic wrist strap and that you disconnect all power cables.

2. **Loosen the captive screw that secures the rotating retention bracket (the screw and bracket are illustrated in** FIGURE 4-7**).**

   Rotate the retention bracket through 90 degrees (see FIGURE 4-7).

3. **Move the PCI card retainer along the PCI slide support rail until it is no longer touching the PCI card (see** FIGURE 4-8**).**

4. **Remove the PCI card from the PCI connector.**

5. **Replace the filler panel that protects the pins in the PCI connector.**

6. **Replace the filler panel for the PCI slot (in the back panel of the chassis), and tighten the captive screw that secures the rotating retention bracket (see** FIGURE 4-7**).**

7. **Replace the server cover and tighten the captive screw (see** FIGURE 4-9 **in Section 4.7, "Replacing the Server's Top Cover" on page 4-14).**

4.7 Replacing the Server's Top Cover

When you have finished installing an option module, replace the server's top cover.

1. **Lower the lid onto the server with the indented arrows on the lid and side of the server lining up.**

2. **Slide the lid home towards the front of the server.**

3. **Tighten the captive retaining screw at the rear (see** FIGURE 4-9**).**

Alignment arrows
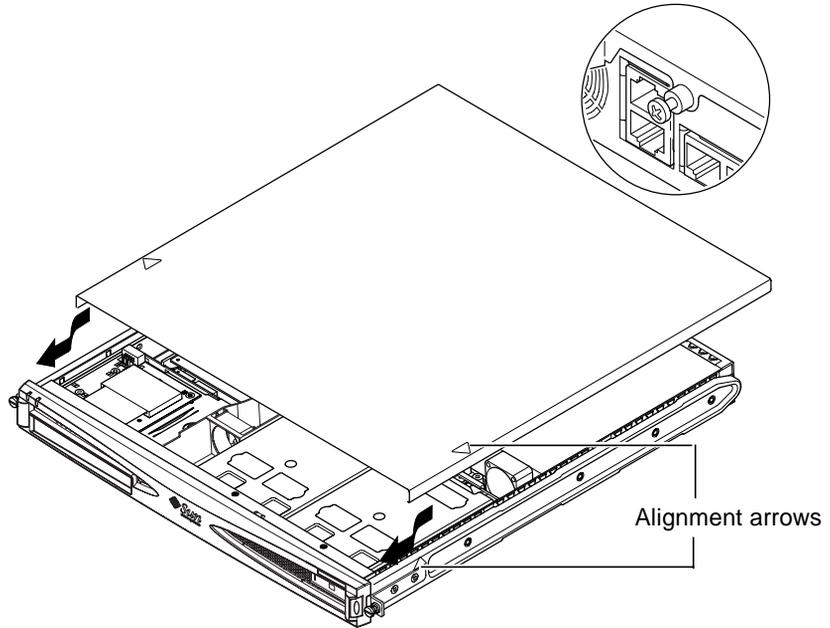
FIGURE 4-9   Replacing the Top Cover

What's Next?

When you have installed the optional hardware components you need, go to Chapter 5 for information about installing the Sun Fire V120 and Netra 120 servers into a rack.

Installing the Server Into a Rack

This chapter tells you how to install a Sun Fire V120 or Netra 120 server into a rack.

The chapter contains the following sections:

5.1 Installing Into a 19-Inch Four-Post Rack

5.1.1 The 19-Inch Rackmounting Kit

The mounting slides can each be used on either side of the rack. The parts required are listed in TABLE 5-1. The part number of the rackmounting kit is X6919A (see Section 1.3, "Optional Hardware and Software" on page 1-5).

TABLE 5-1 19-inch Rackmounting Kit

Item	Quantity	Part No.
Front slide	2	340-6125
Rear slide	2	340-6234
Cable management bracket	1	340-6151
M4 nuts	4	240-1373
Rack screw kit	1	565-1645

A bracket is provided to aid cable management at the back of the server (see FIGURE 5-1).
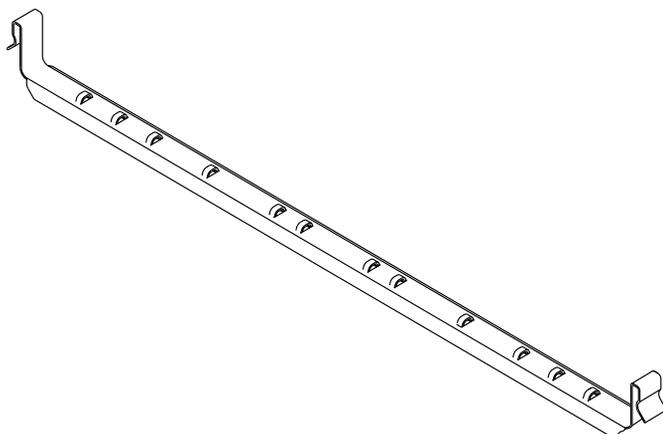
FIGURE 5-1 Cable Management Bracket

5.1.2 Assembling the Slides and Mounting the Server

1. Position the two parts of the slide so that the double-angled ear (A) is in the correct position for the rack you are installing into.

- For the Sun 72-inch tall (19-inch wide) rack, the double-angled ear (A) must be to the rear (see FIGURE 5-2).

- For a standard 19-inch wide rack, the double-angled ear (A) must be to the front (see FIGURE 5-3).
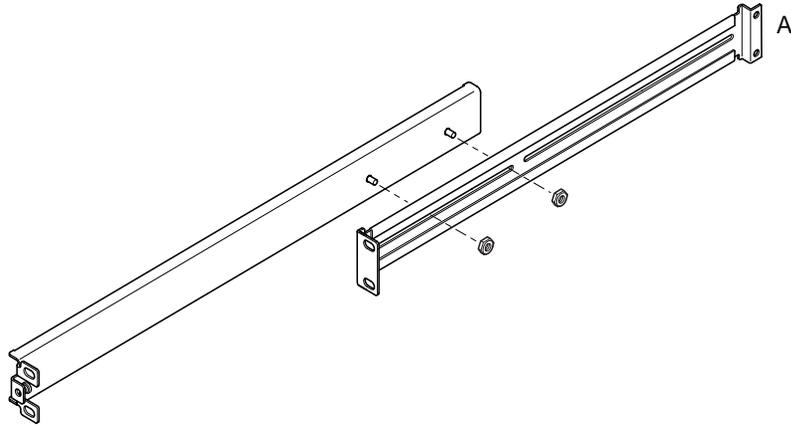
FIGURE 5-2 Positioning the Slide Mounts for a Sun StorEdge 72-Inch Tall Rack
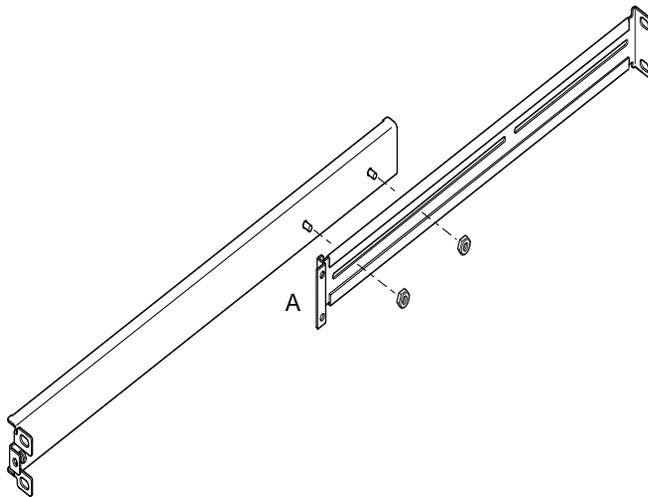
FIGURE 5-3 Positioning the Slide Mounts for a Standard 19-Inch Wide Rack

2. **Loosely screw the two parts of the slide mounts together, using the M4 nuts supplied.**

3. **Measure the distance between the front and back posts of your rack.**

4. **Adjust the slide mounts so that the distance between the front and back mounting ears is approximately the distance between the front and back posts of the rack.**

5. **Move the brackets so that the studs are in suitable slots, and tighten the nuts.**

6. **Fasten the mounting slides to the rack, using the screws supplied.**

   For the Sun StorEdge 72-inch rack, refer to FIGURE 5-4 and FIGURE 5-5. Leave the screws slightly loose to allow adjustment when you slide the server into the rack.

   For a standard 19-inch rack, refer to FIGURE 5-6. Leave the screws slightly loose to allow adjustment when you slide the server into the rack.
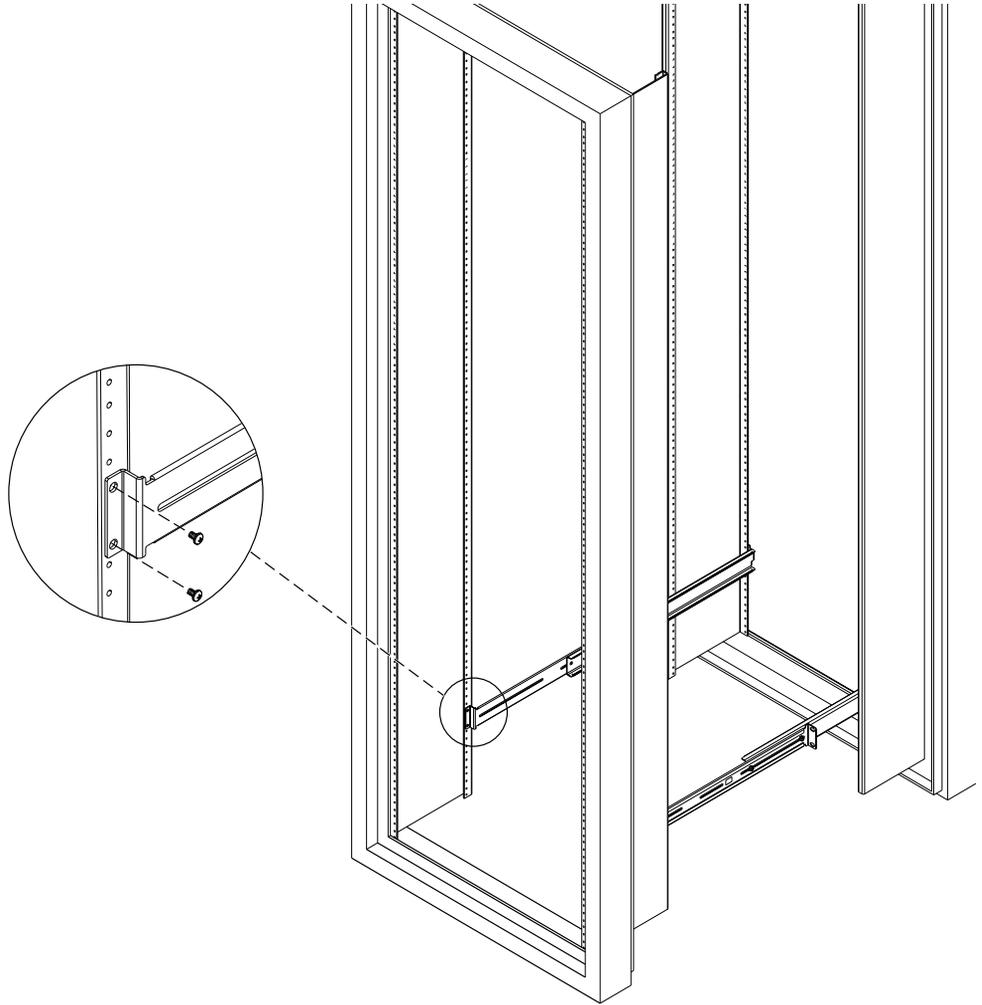
FIGURE 5-4   Fastening the Slide Mounts to a Sun StorEdge 72-inch Tall Rack–Rear View (Side Panels Removed for Clarity)
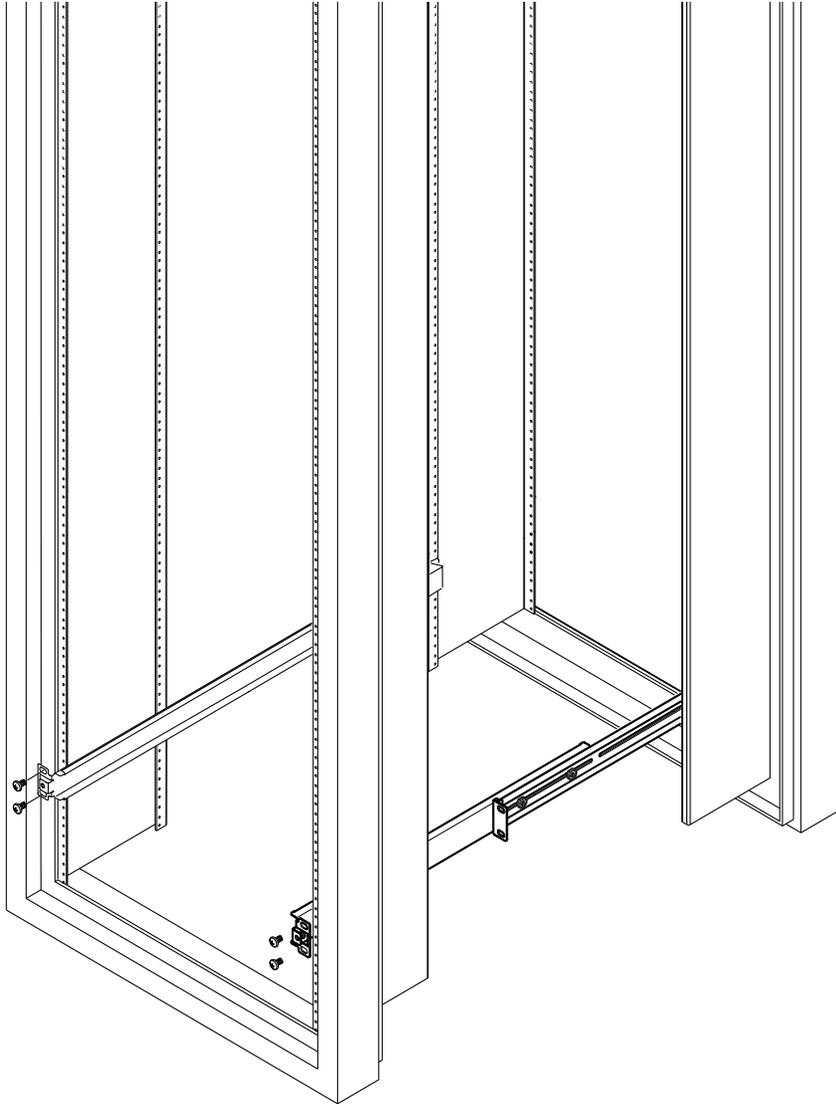
FIGURE 5-5 Fastening the Slide Mounts to a Sun StorEdge 72-inch Expansion Rack–Front View (Side Panels Removed for Clarity)
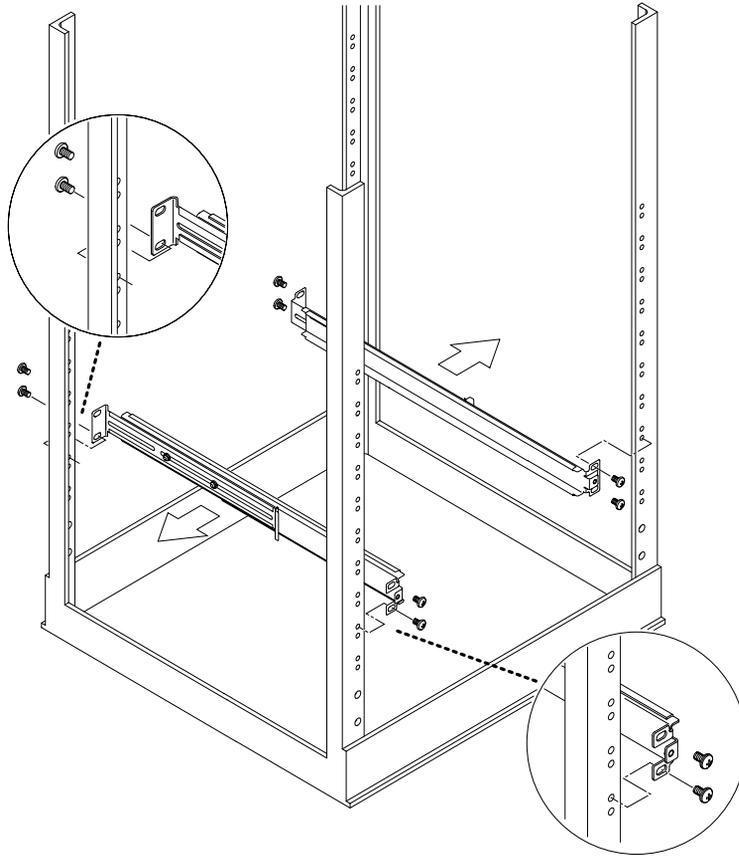
FIGURE 5-6 Fastening the Slide Mounts to a Standard 19-inch Rack

7. Slide the server into the rack (see FIGURE 5-7**).**
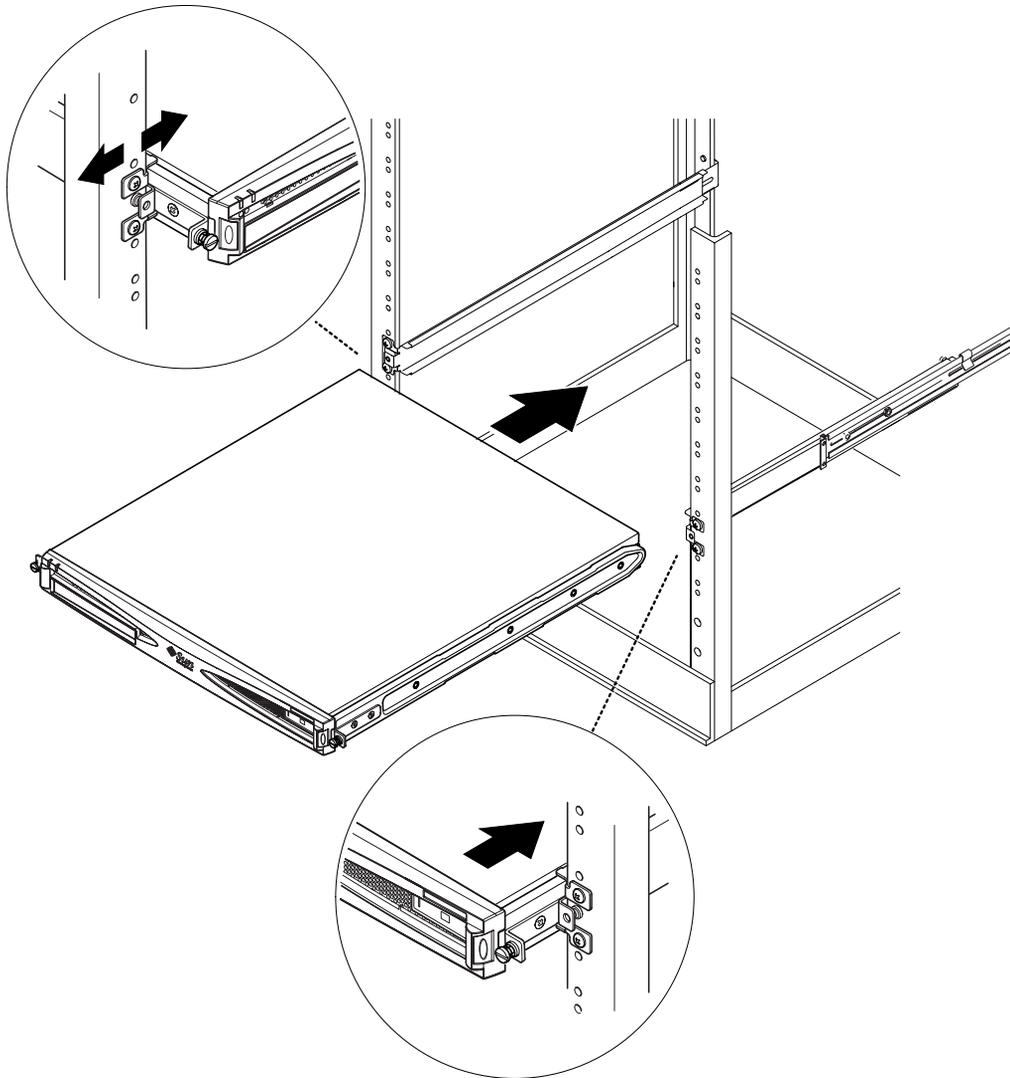
FIGURE 5-7   Sliding the Server Into a Standard 19-Inch Rack

8. **Align the server so that the thumbscrews on its sides fit into the slide mounts in the rack (see** FIGURE 5-8**).**

   If necessary, readjust the slide mounts so that the server aligns correctly. This job is easier with the thumbscrews done up finger-tight.
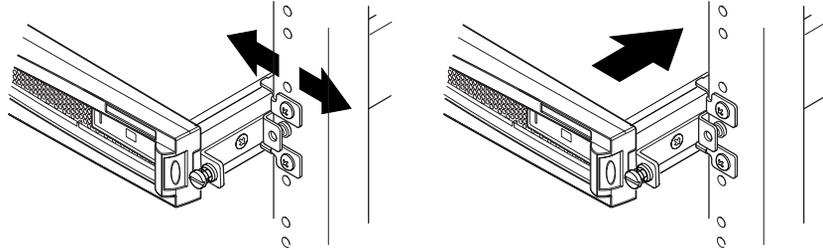
FIGURE 5-8   Adjusting the Slide Mounts and Screwing the Server Into the Rack

9. **Tighten the slide mounts in the rack.**

10. **Use a screwdriver to tighten the thumbscrews on the side of the server.**

    The server is now securely installed in the rack.

5.1.3 Fitting the Cable Management Bracket

● **Hook the bracket over the slide mounts at the rear of the server (see** FIGURE 5-9**).**

You can use the loops in the bracket to secure the cables with cable ties.

Cable management bracket
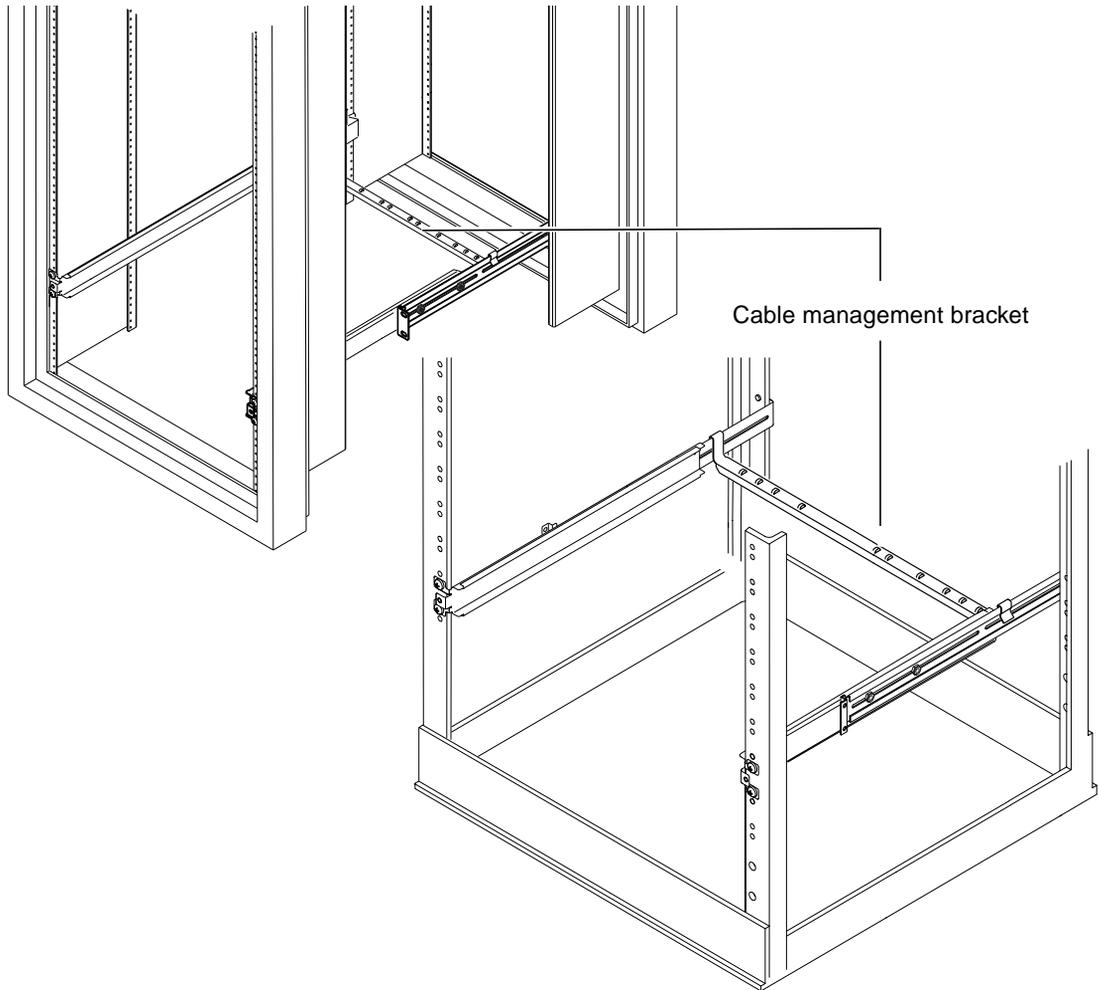
FIGURE 5-9 Fitting the Cable Management Bracket to a Sun StorEdge or a Standard 19-Inch Rack

5.1.4   Tips for Using a Sun StorEdge 72-inch Rack

- For maximum stability, fill the rack from the bottom up and leave at least 4U of space free at the top.

- To prevent warm air flowing to the front of the rack and being recirculated (which would reduce the efficiency of your cooling system and potentially cause overheating), close off the empty spaces at the top of the rack with filler panels. The following filler panels are available from your local Sun sales representative:

  - 1U (part number: 330-2610-01)
  - 2U (part number: 330-2611-01)
  - 3U (part number: 330-2613-01)
  - 4U (part number: 330-2614-01)
  - 5U (part number: 330-2615-01)

- Position your racks so that the warm air exhaust from one rack does not flow directly into the cool air intake area for another.

- If space is limited at the back of your Sun StorEdge 72-inch rack, install a redundant fan tray (part number: X9819A) into the top of the rack. This pulls air up through the top of the rack to prevent the build-up of heat behind it.

What's Next?

When you have installed your server into the rack, go to Chapter 6 for information about connecting the cables and setting up serial connections.

5.2 Installing Into a Two-Post Relay Rack

5.2.1 The Fixed Mounting Bracket Kit

The parts you require are listed in TABLE 5-2.

TABLE 5-2 Fixed Mounting Bracket Kit

Item	Quantity	Part No.
Brackets	4	340-5819
M4 x 8-mm countersunk Phillips screw kit	1	565-1654

5.2.2 Attaching the Fixed-Mounting Brackets

1. **Remove the thumbscrew rackmounting brackets from either side of the server (see** FIGURE 5-10**).**
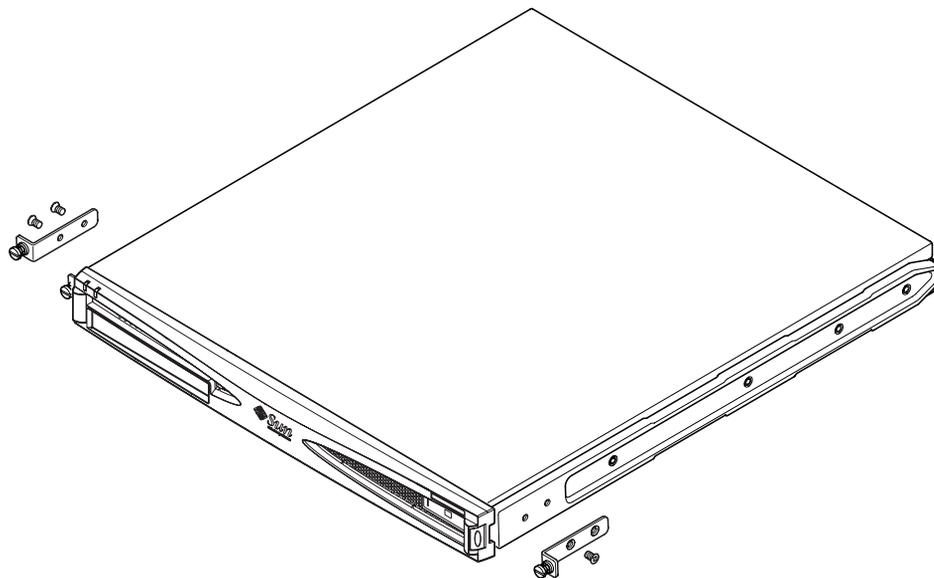
FIGURE 5-10 Removing the Thumbscrew Brackets

2. **Remove the first, third, and fourth screws from the plastic slide-mounts on the sides of the server (see** FIGURE 5-11**).**

3. **Fit the front brackets to the second and third of the tapped holes along the side of the server (counting from the front of the server towards the rear).**

   Use the Phillips-head countersunk screws provided. See FIGURE 5-11, but do *not* fit the rear brackets yet.

Note – Only fit the rear brackets when you have completed steps 1 through 4.
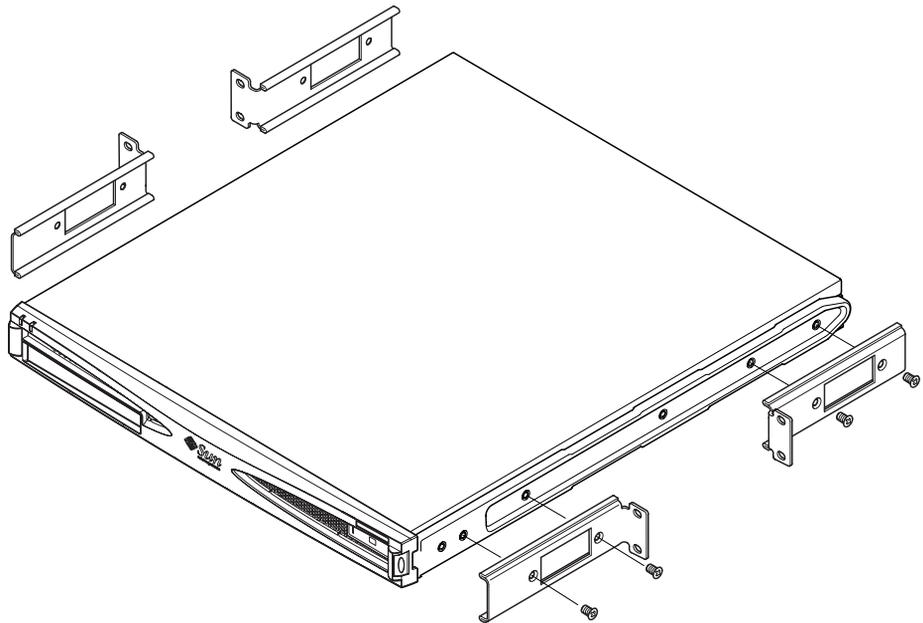
FIGURE 5-11 Fitting the Fixed Mounting Brackets

4. **Secure the server to the rack using the front brackets only, but do not fully tighten the screws yet.**

5. **Fit the two rear fixed brackets to the two tapped holes at the rear of the server on each side, using the Phillips-head countersunk screws provided (see** FIGURE 5-12**).**

6. **Align the screws and tighten them.**
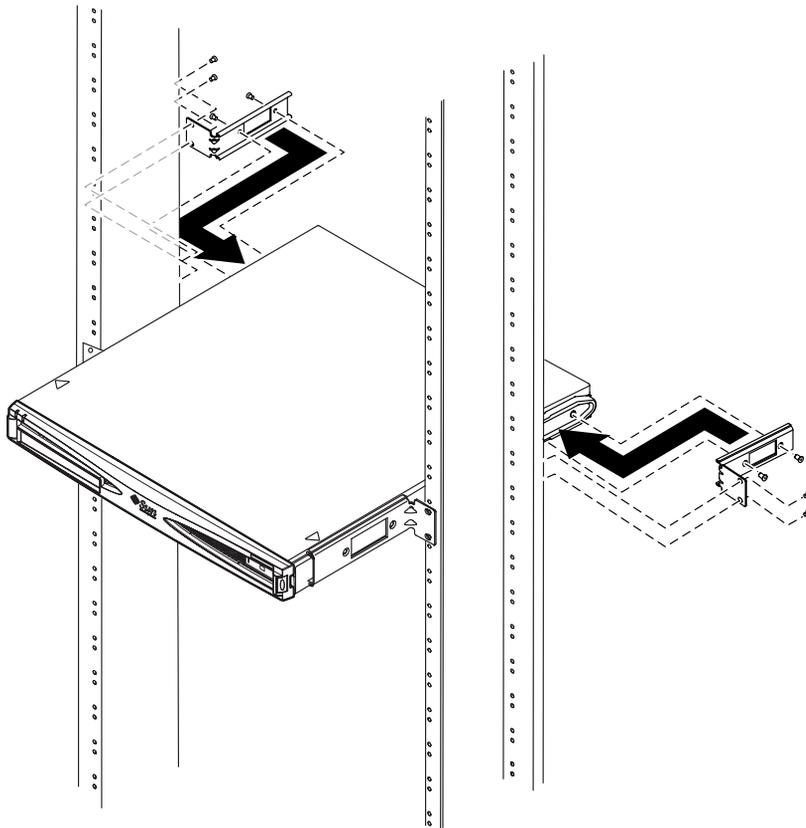
FIGURE 5-12 The Server Installed in a Two-Post Rack

What's Next?

When you have installed the server into the rack, go to Chapter 6 for information about connecting the cables and setting up serial connections.

CHAPTER **6**

Connecting the Cables

This chapter describes how to connect the power cables and the Ethernet and serial cables to the Sun Fire V120 and Netra 120 servers. It also tells you how to set up the serial connections you need.

Make sure you have installed the server into a rack or cabinet (see Chapter 5) before following the instructions in this chapter.

This chapter contains the following sections:

- Section 6.1, "Connecting the Cables to the Server" on page 6-2
- Section 6.2, "Using a Single DC Power Cord" on page 6-4
- Section 6.3, "Setting Up Serial Connections" on page 6-4
- Section 6.4, "Connecting to Your Server From a Laptop Running Microsoft Windows" on page 6-10

6.1 Connecting the Cables to the Server
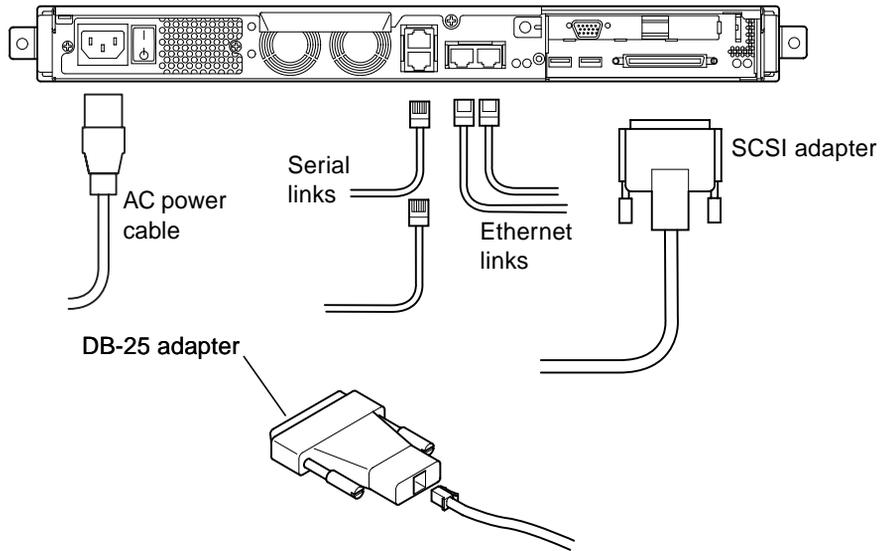
FIGURE 6-1   Connecting the Cables to the Sun Fire V120 Server
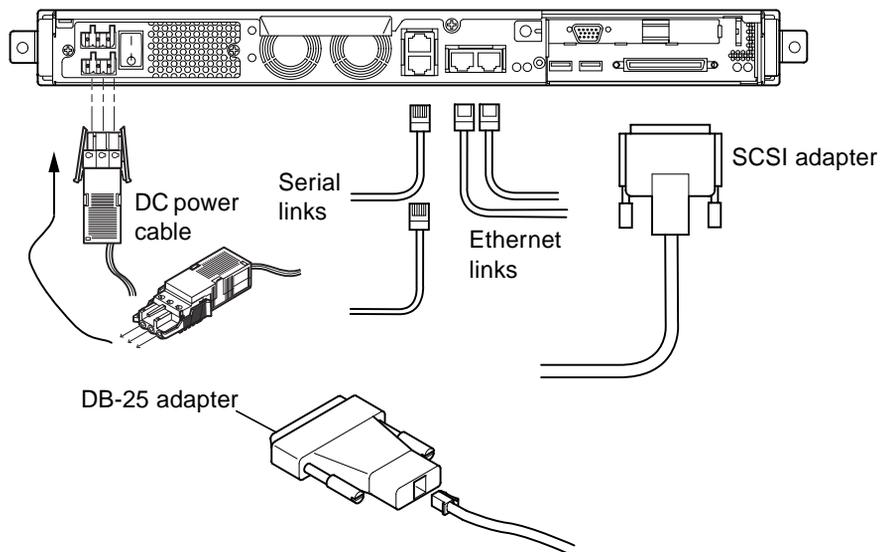
FIGURE 6-2   Connecting the Cables to the Netra 120 Server

Before following the instructions in this section, make sure you have installed the server into a rack or cabinet (see Chapter 5).

1. **Connect the power cord or cords.**

2. **Connect the server to at least one Ethernet hub.**

   You can connect to a maximum of two Ethernet hubs (unless you have a PCI adapter installed).

3. **Connect a serial device to the Serial A/LOM port.**

   To use the server's remote monitoring and management facilities, you must use the port labeled Serial A/LOM. For more information about remote monitoring and management, see Chapter 8 and Chapter 9.

   If you intend to configure the server directly from a dumb terminal or a Sun workstation, insert the loose end of the serial cable into the DB-25 adapter supplied (see FIGURE 6-1 and FIGURE 6-2). Then plug the adapter into the DB-25 serial connector on the terminal or Sun workstation you intend to use.

   For more information, see Section 6.3, "Setting Up Serial Connections" on page 6-4.

4. **If you need to connect the server to an external SCSI device, you will need to use the SCSI cable supplied with that device.**

   The server's external SCSI bus is compatible with SCSI devices of the following types:

   - Single Ended (SE)
   - Low Voltage Differential (LVD)
   - Narrow (8-bit)
   - Wide (16-bit)

Caution – AC-powered Sun products are designed to work with single-phase power systems that have a grounded neutral conductor. To reduce the risk of electric shock, do not plug Sun products into any other type of power system. Contact your facilities manager or a qualified electrician if you are not sure what type of power is supplied to your building.

Caution – Your AC-powered Sun product is shipped with a grounding type (three-wire) power cord. To reduce the risk of electric shock, always plug the cord into a grounded outlet.

6.2 Using a Single DC Power Cord

If you are using a Netra 120 server and you have only one DC power cord connected to the server, the LOM generates a power-on event, but it also generates an inlet failure event and causes the fault indicator to be lit and to remain lit.

Similarly, if you remove a single DC power cord from a Netra 120 server that is powered on, the LOM generates an inlet failure event and causes the fault indicator to be lit and to remain lit.

If you intend to run the Netra 120 server using only one DC supply cord, then ignore these inlet failure events and turn off the fault indicator by typing:

```
lom> faultoff
```

6.3 Setting Up Serial Connections

To perform the initial configuration when you install a Sun Fire V120 or Netra 120 server, and also for ongoing monitoring and management of the server, you will need to use at least one of the serial ports on the server's back panel. You can connect either or both serial ports to any of the following devices:

- **Dumb terminal**
  For this connection, you can use the standard RJ-45 patch cable supplied with the server, but you need to insert one end into the DB-25 adapter also supplied.

- **Sun workstation**
  For this connection, you can use the standard RJ-45 patch cable supplied with the server, but you need to insert one end into the DB-25 adapter also supplied.

- **Terminal server (or patch panel connected to a terminal server)**
  The pinouts for the server's serial ports correspond with the pinouts for the RJ-45 ports on the Cisco AS2511-RJ Terminal Server. For terminal servers from other manufacturers, you may need to make your own roll-over cable (see Section 6.3.1, "Connecting to a Terminal Server" on page 6-5).

- **Modem**
  For this connection, you can use the standard RJ-45 patch cable supplied with the server, but you need to insert one end into the DB-25 adapter also supplied.

Note – Do not use the Serial A/LOM port for binary data transfers. To perform anything other than ASCII transfers, use the port labeled Serial B.

6.3.1   Connecting to a Terminal Server

The serial ports on the Sun Fire V120 and Netra 120 servers are DTE ports. If you are connecting them to other DTE ports, then the cabling between the devices you are connecting needs to take account of this. The pinouts for the Sun Fire V120 and Netra 120 servers' serial ports correspond with the pinouts for the RJ-45 ports on Cisco terminal servers. This means, for example, that if you are using a Cisco AS2511-RJ Terminal Server, you can do either of the following:

- Connect a roll-over cable directly to the Sun Fire V120 or Netra 120 server.
- Connect a roll-over cable to a patch panel and use a straight-through patch cable to connect the patch panel to the Sun Fire V120 or Netra 120 server (see FIGURE 6-3).

Note – You do not have to use a Cisco terminal server. For other terminal servers, check the manufacturer's documentation to see if the pinouts of the serial ports on the terminal server match the pinouts of the Sun Fire V120 or Netra 120 server's serial ports. If they do not, then write down which pins on the terminal server's serial ports carry the signals listed in the right-hand column in TABLE 6-1. Then make a roll-over cable taking each of the pins on the Sun Fire V120 or Netra 120 server's serial port to the correct pin on your terminal server's serial port.
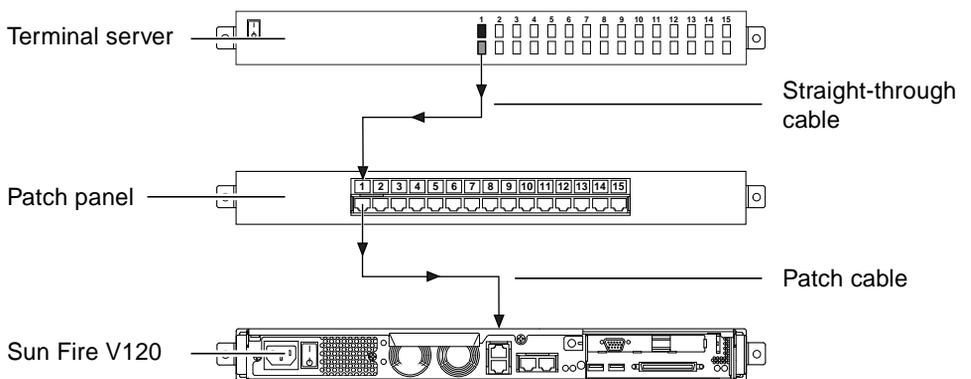
FIGURE 6-3   Patch Panel Connection Between a Terminal Server and a Sun Fire V120

Note – When the Sun Fire V120 and Netra 120 servers are viewed from the rear, pin 1 of the RJ-45 serial port is on the left, and pin 8 is on the right.
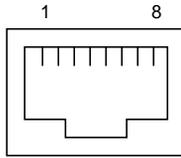
FIGURE 6-4   Pins 1 to 8 on the Serial Port

TABLE 6-1   Serial Port Connection to a Terminal Server

Pin number on Sun Fire V120 and Netra 120	Signal	Signal to connect to on the Terminal Server
Pin 1	RTS	CTS
Pin 2	DTR	DSR
Pin 3	TXD	RXD
Pin 4	Signal Ground	Signal Ground
Pin 5	Signal Ground	Signal Ground
Pin 6	RXD	TXD
Pin 7	DSR	DTR
Pin 8	CTS	RTS

6.3.2   Using a DB-25 Adapter for Your Serial Link

The pinouts are identical for both of the RJ-45 serial ports on the rear panel of your server. To connect from a VT100 terminal, you need to use either the DB-25 (25-Pin DSUB male to 8-POS RJ-45 female) adapter supplied by Sun (part number 530-2889) with your server or an alternative adapter that performs the same pin inter-connections. The Sun-supplied DB-25 adapter enables you to connect to any Sun system. The pin inter-connections it performs are listed in TABLE 6-2.

Note – When the Sun Fire V120 and Netra 120 servers are viewed from the rear, pin 1 of the RJ-45 serial port is on the left, and pin 8 is on the right.
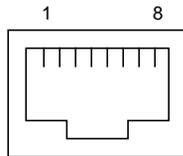
FIGURE 6-5   Pins 1 to 8 on the Serial Ports

TABLE 6-2   Pin Inter-connections Performed by the Sun DB-25 (25-pin) Adapter

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

6.3.3 Using a DB-9 Adapter for Your Serial Link

To connect to a terminal that has a 9-pin serial connector, connect one of the Sun Fire V120 or Netra 120 server's serial ports to a DB-9 (9-pin) adapter that performs the pin inter-connections listed in TABLE 6-3.

Note – When the Sun Fire V120 and Netra 120 servers are viewed from the rear, pin 1 of the RJ-45 serial port is on the left, and pin 8 is on the right.
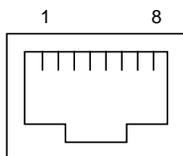
FIGURE 6-6   Pins 1 to 8 on the Serial Ports

TABLE 6-3   Pin Inter-connections Required to be Performed by a DB-9 (9-pin) Adapter

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

6.3.4　Settings for the Serial Connections

The settings you need to use for a serial connection are listed in TABLE 6-4. If you need to perform binary data transfers (that is, transfers of anything other than simple ASCII character streams), use the Serial B port. Communication on the Serial A/LOM port is subject to interruption by the Lights-Out Management device (see Chapter 8).

TABLE 6-4　Default Settings for Connecting to the Serial A/LOM or Serial B Port

Parameter	Setting
Connector	Serial A/LOM or Serial B (use Serial B for binary data transfers)
Rate	9600 baud
Parity	No
Stop bits	1
Data bits	8

Note – If you ever change the OpenBoot PROM's serial configuration and then restart the server, the LOM device's serial configuration will reflect the new settings. By default, however, both the OpenBoot PROM and the LOM serial configuration are as described in TABLE 6-4.

6.4 Connecting to Your Server From a Laptop Running Microsoft Windows

6.4.1 Connecting the Sun Fire V120 or Netra 120 Server to the Laptop

Note – Do not attempt to use the laptop's (25-pin) parallel port instead of its serial port. The serial port is a male 9-pin D-type connector.

1. **Connect the RJ-45 to RJ-45 patch cable (supplied with the server) to the Serial A/LOM port on the back panel of the server.**

2. **Connect the other end of the patch cable to the RJ-45 connector on the silver-colored DB25 (25-way DSUB male-to-female 8 POS RJ-45) adapter (part number 530-2889-0x) supplied with the Sun Fire V120 or Netra 120 server.**

   FIGURE 1 Connecting the Server to the Serial Port on a Laptop
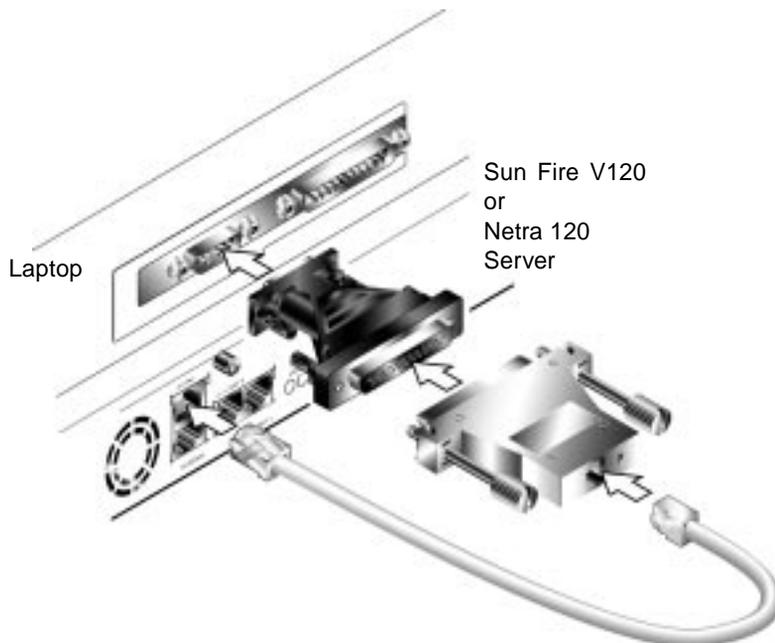
3. **Next connect the 25-way D-type male connector to an adapter that has one 25-way female connector and one 9-way D-type female connector.**

Sun does not supply a 25x9-way D-type female-to-female adapter. However, adapters like this are available from home computer suppliers and electronics stores. The pin inter-connections that the adapter must perform are listed in TABLE 6-3.

TABLE 6-5 Pin Inter-connections Required to be Performed by the 25x9-way D-type Female-to-Female Adapter

9-way Female Connector	25-way Female Connector
Pin 1	Pin 8
Pin 2	Pin 3
Pin 3	Pin 2
Pin 4	Pin 20
Pin 5	Pin 7
Pin 6	Pin 6
Pin 7	Pin 4
Pin 8	Pin 5
Pin 9	Pin 22

4. **Finally, connect the 9-way female connector to the serial port on the laptop.**

6.4.2 Using Microsoft Windows HyperTerminal

Note – If you normally connect the serial port on your laptop to a handheld device, you must close the Hot Sync Manager before following the instructions in this section. Otherwise you will not be able to use the serial port to communicate with the Sun Fire V120 or Netra 120 server.

The instructions in this section were verified on a laptop PC running Microsoft Windows 98 and with HyperTerminal Applet version 3.0.

1. **Run the Windows HyperTerminal utility.**

2. **In the HyperTerminal window, double-click the Hyperttrm.exe icon.**

3. **In the Connection Description window, specify a name for the HyperTerminal connection you are creating on the laptop.**

   Then select an icon for it and click OK.

4. **In the Connect to... window, click the arrow for the "Connect using" option and select the port you are using for your connection to the server.**

   Unless you have a particular reason for using a different port, select DIRECT TO COM1. Click OK.

5. **In the COM1 Properties Port Settings window, set the parameters as follows:**

   Bits per second: **9600**
   Data bits: **8**
   Parity: None
   Stop bits: **1**
   Flow control: specify either "Xon/Xoff" or "None".

   Note – Do not select "Hardware" for the Flow control option.

   Click OK.

6. **Your HyperTerminal session is now active. From the File menu, select Properties.**

7. **In the Properties window, click the Settings tab.**

   On the Settings tab, click the arrow for the "Emulation" option and select VT100. For the "Telnet terminal" option, specify VT100. Click OK.

8. **If your Sun Fire V120 or Netra 120 server is not powered on, the** lom> **prompt will appear in the HyperTerminal window.**

   To power the server on, either use the rocker switch on the server's back panel, or type:

   ```
   lom> poweron
   ```

   What's Next?

   When you have connected the cables and set up serial connections, you are ready to power on the server (see Chapter 7).

Powering On the Sun Fire V120 or Netra 120 Server

This chapter tells you how to connect to and power on the Sun Fire V120 or Netra 120 server.

The chapter contains the following sections:

- Section 7.1, "Preparing to Configure the Server" on page 7-2
- Section 7.2, "Powering On the Server" on page 7-3
- Section 7.3, "Using the Power (On/Standby) Switch" on page 7-7

7.1 Preparing to Configure the Server

To perform the initial configuration of the Sun Fire V120 or Netra 120 server, set up a serial connection using the port labeled Serial A/LOM on the server's back panel (see Chapter 6). Make sure you have the server's power cord(s) connected (see Chapter 6).

7.1.1 Using a Terminal Server

● **To access the Sun Fire V120 or Netra 120 server from a Sun workstation through a terminal server, open a terminal session on the Sun workstation and type:**

```
# telnet IP-address-of-terminal-server  port-number
```

For example, for a Sun Fire V120 server connected to port 10000 on a terminal server whose IP address is 192.20.30.10, you would type:

```
# telnet 192.20.30.10 10000
```

7.1.2 Configuring From a Terminal or Workstation

● **To access the server from a dumb terminal, set up a connection between the terminal and the server.**

● **To access the server from a Sun workstation that is directly connected to the server, set up the connections between the devices, then open a terminal session and type:**

```
# tip /dev/term/a -9600
```

The tip command above assumes that your console is using its ttya port. If you later configure your console to use its ttyb port, you will need to type the following to set up a tip session:

```
# tip /dev/term/b -9600
```

For information about dedicating the console to Serial B, see Section 8.6, "Separating the LOM From the Console on the Serial A/LOM Port" on page 8-19).

7.2 Powering On the Server

When the Sun Fire V120 and Netra 120 servers are connected to mains electricity, they are always either fully powered or in standby power mode. To remove power from a server, you must disconnect its power cables. The methods referred to in this section and the next section for powering a server on and off by using `lom>` prompt commands or by using the rocker switch on the server's back panel are methods either of powering the server on or returning it to standby power mode. They cannot be used to power the server off completely.

For more information, see Section 7.3, "Using the Power (On/Standby) Switch" on page 7-7.

7.2.1 Powering On for the First Time With the Server's Details Registered at a Name Server

> **Note –** Follow the instructions in this section only if you have have a Name Server installed on your network. If you need instructions on how to use a Name Server to automate the process of configuring the Solaris operating environment on multiple servers, refer to the *Solaris Advanced Installation Guide* which accompanies the Solaris CDs.

1. **Connect the server to the power supply but do not power it on.**

2. **Set up a serial connection to the Serial A/LOM port and also a connection to at least one Ethernet hub (as described in Chapter 6).**

3. **At the `lom>` prompt, type the following command to power on the server:**

```
lom> poweron
```

For more information about the `lom>` prompt and the commands that are available from it, see Chapter 8.

4. **Specify the type of terminal you are using to communicate with the Sun Fire V120 or Netra 120 server.**

5. **Specify whether you need IPv6 enabled, then follow the instructions on the screen.**

6. **Specify whether you want to to enable the Kerberos Security mechanism, then follow the instructions on the screen.**

7. **When prompted, give a password (if any) for users logging in as root.**

When you have provided the information the system needs, it will boot.

7.2.2 Powering On the Server for the First Time Without Having Its Details Registered

Follow the instructions in this section if you do not have a Name Server configured on your network.

Before following the instructions in this section, read them to find out what information the system prompts you for when you start it for the first time.

1. **Connect the server to the power supply but do not power it on.**

2. **Set up a serial connection to the Serial A/LOM port and also a connection to at least one Ethernet hub (as described in Chapter 6).**

3. **At the** `lom>` **prompt, type the following command to power on the server:**

```
lom> poweron
```

For more information about the `lom>` prompt and the commands that are available from it, see Chapter 8.

4. **When prompted, specify the type of terminal you are using to communicate with the Sun Fire V120 or Netra 120 server.**

5. **When prompted to indicate whether you want the server to be networked, answer Yes.**

6. **Specify whether the IP address is to be configured by DHCP.**

7. **Specify which of the Ethernet ports you intend to use as the primary Ethernet connection.**

For the port labeled NET0, specify `eri0`. For the port labeled NET1, specify `eri1`.

8. **Specify a Host Name for the server.**

9. **If prompted, specify the IP address for the system.**

   The system prompts you for this address if you declined to use DHCP in Step 6. It also asks you whether the server is to be part of a subnet, and if you answer Yes it prompts you to provide the netmask of the subnet.

10. **Specify whether you need IPv6 enabled, then follow the instructions on the screen.**

11. **Specify whether you want to to enable the Kerberos Security mechanism, then follow the instructions on the screen.**

12. **Specify the Name Service you want the server to use.**

13. **Specify the name of the Domain that the server will be part of.**

14. **Specify whether you want the system to search the network for a Name Server or to use a particular Name Server.**

15. **If you chose to use a particular Name Server, specify the Host Name and IP address of the Name Server, and then confirm the information you have provided.**

16. **Now go to the Name Server, and create entries in its network administration files for the system you have just been setting up.**

17. **When you come back to the system you are setting up, you will be prompted for the time and date information the system needs.**

18. **Finally, when prompted, give a password (if any) for users logging in as root.**

   When you have provided the information the system needs, it will boot.

7.2.3   Powering On a Standalone Server for the First Time

1. **Connect the server to the power supply but do not power it on.**

2. **Set up a serial connection using the Serial A/LOM port (as described in Chapter 6).**

3. **At the `lom>` prompt, type the following command to power on the server:**

```
lom> poweron
```

   For more information about the `lom>` prompt and the commands that are available from it, see Chapter 8.

4. **When prompted, specify the type of terminal you are using to communicate with the server.**

5. **When prompted to indicate whether you want the server to be networked, specify No.**

6. **Specify a Host Name for the server.**

7. **Confirm the information you have given.**

8. **Specify the date and time information the system needs.**

9. **When prompted, give a password (if any) for users logging in as root.**

   When you have provided the information the system needs, it will boot.

7.2.4 Clearing Your Configuration and Starting Again

If you need to clear the configuration of the server so that you can start the power on process again as if from a previously unused server, follow the instructions below:

1. **Boot the server into Solaris by typing:**

```
ok boot
```

2. **At the Solaris prompt, type:**

```
# sys-unconfig
```

3. **When prompted to confirm that you want to create a "blank" server, type y.**

4. **When the server has unconfigured itself, it displays the ok prompt.**

   To reconfigure it, first power down the system by typing the following:

```
ok power-off
```

5. **Then follow the instructions in either of the following sections:**
   - Section 7.2.1, "Powering On for the First Time With the Server's Details Registered at a Name Server" on page 7-3 or
   - Section 7.2.2, "Powering On the Server for the First Time Without Having Its Details Registered" on page 7-4.

7.3 Using the Power (On/Standby) Switch

Caution – The power switch (on the rear panel of the Sun Fire V120 and Netra 120 servers) is not an On/Off switch, it is an On/Standby switch. It does not isolate the equipment.

The power (On/Standby) switch on the Sun Fire V120 and Netra 120 servers is a rocker, momentary switch. It controls only low voltage signals; no high-voltage circuits pass through it. This means that the main method of connecting or disconnecting power is by inserting or removing the power supply cord(s). The server contains no integral circuit breakers. To isolate it, you must break all connections to it. If you do not do this by removing the power supply cord(s), you must instead open all external circuit breakers.

DC power inlets   Power (On/Standby) switch
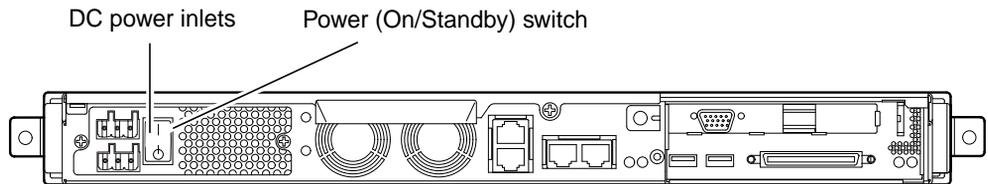
FIGURE 7-1 Netra 120 Server Power (On/Standby) Switch

AC power inlet   Power (On/Standby) switch
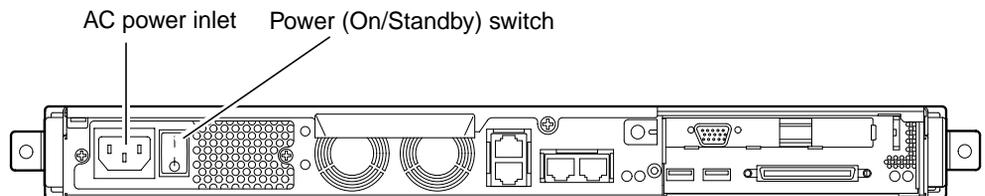
FIGURE 7-2 Sun Fire V120 Server Power (On/Standby) Switch

The symbols on the switch are as follows:

On – Press this to apply power to the server.

Standby – Press this to put the server into standby mode.

What's Next?

When you have powered on the server and booted and logged in, your server is ready to use.

For information about managing the server, see Chapter 8 and Chapter 9.

Remote and Local Management

CHAPTER **8**

Managing the Server From the `lom>` Prompt

This chapter introduces the LOM Lights-Out Management facilities available for the Sun Fire V120 and Netra 120 servers and tells you how to use the `/usr/sbin/lom` utility which provides a user interface to the device.

The chapter contains the following sections:

- Section 8.1, "Introduction to Lights-Out Management" on page 8-2
- Section 8.2, "Powering On or Resetting the Server From the LOM Shell" on page 8-3
- Section 8.3, "Monitoring the Server From the LOM Shell" on page 8-8
- Section 8.4, "Setting Up LOM Privileges for Named Users" on page 8-13
- Section 8.5, "Setting the LOM Device's Configurable Variables" on page 8-17
- Section 8.6, "Separating the LOM From the Console on the Serial A/LOM Port" on page 8-19
- Section 8.7, "Viewing the Event Reports That the LOM Sends to syslogd" on page 8-20
- Section 8.8, "The LOM Shell Command List" on page 8-21
- Section 8.9, "Checking the Status of the Server's Fans" on page 8-23

Note – For information about configuring the LOM device to restart the server automatically in the event of a lockup, see Chapter 9.

Note – For information about how to configure the LOM device-driver, see Appendix C.

8.1 Introduction to Lights-Out Management

The system board in the Sun Fire V120 and Netra 120 servers contains a LOM device (see FIGURE 8-1). This device provides management facilities that enable you to detect and respond quickly to problems. The facilities are particularly useful for managing servers that are deployed in a "lights out" environment. However, you can also use them to perform quick onsite management tasks at a locally connected terminal.

You can use the LOM facilities remotely or from a local connection to:

■ Power the server on or down to standby mode.

■ Monitor the server's temperature and the status of its power supply, fans, supply rails, fault LED and alarms, even when the server is in standby mode.

■ Turn a Fault LED on.

■ Configure the server to restart automatically after a lockup (see Chapter 9).

LOM device ─────
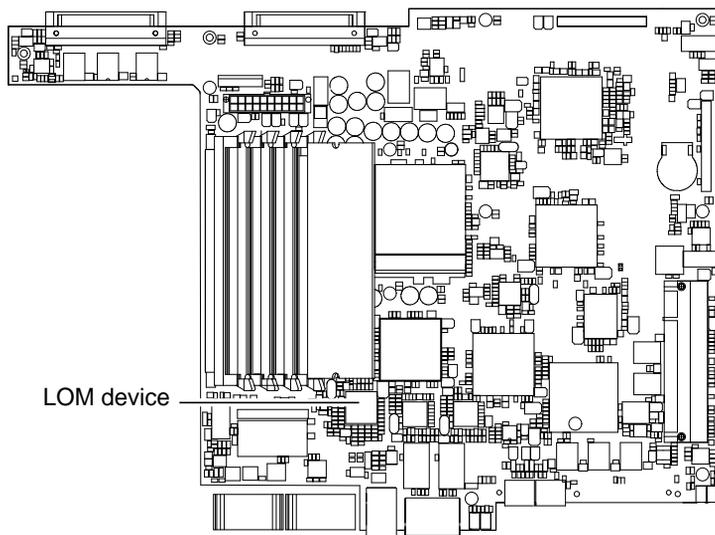
FIGURE 8-1   The Location of the Lights-Out Management Device on the System Board

Note – The Sun Fire V120 and Netra 120 servers are supplied with the Solaris operating environment installed and with the supplementary Lights-Out Management (LOM) software described in this chapter and Chapter 9 also installed. This software enables you to manage the server locally or remotely. If you ever need to re-install Solaris and you want to use the Lights-Out Management facilities, you must also
re-install the Lights-Out Management software from the CD entitled *Software Supplement for the Solaris Operating Environment*. This CD is included with the Solaris media kit. For the location of the LOM packages on the CD, refer to the *Solaris Hardware Platform Guide* for the release of Solaris that you are using.

8.2 Powering On or Resetting the Server From the LOM Shell

To use the Lights-Out Management facilities either remotely or locally, you need a terminal connection to the Serial A/LOM port on the back of the server (see Chapter 6).

There are two ways of interrogating the LOM device or of sending it commands to perform. One is by executing LOM commands from the `lom>` shell prompt. This chapter tells you how to do this. The other is by executing LOM-specific Solaris commands from the console prompt. For information about the LOM commands available with the Solaris operating environment, see Chapter 9.

When the Sun Fire V120 and Netra 120 servers are connected to a power source, they are always either fully powered or in standby power mode. To remove power entirely from these servers you must disconnect their power cables or open all external circuit breakers. The methods referred to in this chapter for powering the servers on and off by using `lom>` prompt commands are in fact methods either of powering them on or of returning them to standby power mode. The `poweroff` command described in this chapter does not power a server off completely.

Note – All commands that involve powering on or off, resetting, or specifying the boot mode of the server require you or the named user to have `r`-level LOM user permission. If you have not set up any named users of the LOM device, then you (and they) have `r`-level permission by default. If you have set up one or more named users and you want any of them to use the commands that involve powering on or off, resetting, or specifying the boot-mode of the server, then you must explicitly give those users `r`-level permission. For more information about user privileges, see Section 8.4, "Setting Up LOM Privileges for Named Users" on page 8-13.

8.2.1 Powering the Server On or Down to Standby Mode

If the server you are connected to is not powered on but is connected to mains electricity, you will see the `lom>` prompt at your terminal. Remember that the LOM uses standby power and so remains active even when the Sun Fire V120 or Netra 120 server is not powered on.

● **To power on the server, type:**

```
lom> poweron
```

● **To power the server down to standby mode, type:**

```
lom> poweroff
```

8.2.2 Displaying the `lom>` Prompt

When you connect a terminal to the Serial A/LOM port, you will only see the `lom>` prompt if the server is powered off. If it is powered on and has not already been put into LOM mode, it will display the console prompt.

● **To display the `lom>` prompt, type the following LOM escape sequence:**

```
# #.
```

When you type the LOM escape sequence, the LOM device takes control of the Serial A/LOM port and the `lom>` prompt appears on your terminal screen. You can type the LOM escape sequence at any time.

Note – If you are at the console and you type the first character of the LOM escape sequence (by default this is #), there is a second's delay before the character appears on the screen. This is because the server waits to see if you type the dot (.) character next. If you do, the `lom>` prompt is displayed. If you do not, the # character appears on the screen.

For information about changing the first character of the LOM escape sequence, see Section 9.3.3, "Changing the First Character of the Sequence for Escaping to the lom> Prompt (lom -X)" on page 9-12.

8.2.3   Exiting From the `lom>` Prompt

● **To return to the Solaris console prompt from the `lom>` prompt, type:**

```
lom> console
```

Note – If you have the Serial A/LOM port dedicated to the LOM device (instead of shared between the LOM and the console), this command will have no effect. For information about dedicating the Serial A/LOM port to the LOM device, see Section 8.6, "Separating the LOM From the Console on the Serial A/LOM Port" on page 8-19.

Note – If you have set up named users of the LOM device, the users need c-level permission to execute the `console` command. Without it, the command will not work. For more information about setting up user permissions, see Section 8.4, "Setting Up LOM Privileges for Named Users" on page 8-13.

8.2.4   Resetting the Server

● **To reset the server, type:**

```
lom> reset
```

● **To perform a limited reset affecting the processor only, type:**

```
lom> reset -x
```

The −x option generates the equivalent of an externally initiated reset (XIR) of the server. You must have r-level permission to use this command (for information about user authorization levels, see Section 8.4, "Setting Up LOM Privileges for Named Users" on page 8-13). The −x option takes the server into OpenBoot PROM mode and causes it to display the `ok` prompt. It is useful for driver or kernel debugging, because most of the contents of the server's memory and registers are preserved. The server does not automatically return to Solaris when you reset it using the −x option. Instead you must reboot it from the `ok` prompt.

8.2.5 Displaying the `ok` or `kadb` Prompt

To display the `ok` or `kadb` prompt, type the following at the `lom>` prompt:

```
lom> break
```

Note – If you have the Serial A/LOM port dedicated to the LOM device, this command will have no effect. For information about dedicating the Serial A/LOM port to the LOM device, see Section 8.6, "Separating the LOM From the Console on the Serial A/LOM Port" on page 8-19. To use the `break` command, you must have `c`-level LOM user privileges. For more information, see Section 8.4, "Setting Up LOM Privileges for Named Users" on page 8-13.

8.2.6 Controlling the Server's Booting Behavior

The LOM shell includes a `bootmode` command:

```
bootmode [-u][normal|forth|reset_nvram|diag|skip_diag]
```

This command enables you to dictate the behavior of the server after a reset. Its functionality is identical to the functionality available on Sun keyboards via the L1 key combinations. (However, the `bootmode` command is provided because the L1 key combinations are not available for the Sun Fire V120 or Netra 120 server: you cannot use these key combinations from a keyboard that is connected to the server via a serial link.)

You must have `r`-level LOM permission to use the `bootmode` command. For information about user privileges, see Section 8.4, "Setting Up LOM Privileges for Named Users" on page 8-13.

8.2.6.1 Boot Modes Available

If you use the bootmode command without arguments, the LOM device reports just the current boot mode. The boot modes available are listed in TABLE 8-1.

TABLE 8-1 Boot Modes

Mode	Description
-u	This option does not represent a boot mode. However, if you have previously dedicated the Serial A/LOM port to the LOM device and now want to share the port between the console and the LOM device, you can use the -u option to achieve this. It is a quick alternative to the procedure described for sharing the Serial A/LOM port in the section called "Separating the LOM From the Console on the Serial A/LOM Port" on page 8-19.
normal	In this mode, the server boots using your OpenBoot^{TM} PROM settings. To cause this parameter to take effect, you must reset the server after executing the bootmode command at the lom> prompt.
forth	In this mode, the server does not boot to Solaris but stops the boot cycle at the ok prompt. The command is equivalent to the L1-F key combination for Sun keyboards. To cause the parameter to take effect, you must execute the bootmode forth command at the lom> prompt and then reset the server. (It is only when the server resets that it reads the new forth parameter from the LOM device.)
reset_nvram	In this mode, the server returns all NVRAM data to its factory-default setting. The command is equivalent to the L1-N key combination for Sun keyboards. To cause the parameter to take effect, you must reset the server after executing the bootmode command at the lom> prompt.
diag	In this mode, the server performs full self-diagnostics as part of the boot process. The command is equivalent to the L1-D key combination for Sun keyboards. To cause the parameter to take effect, you must power off and then power on the server within 10 minutes after executing the bootmode command at the lom> prompt.
skip_diag	In this mode, the server skips the diagnostics part of the boot process. To cause the parameter to take effect, you must power off and then power on the server within 10 minutes after executing the bootmode command at the lom> prompt.

8.3 Monitoring the Server From the LOM Shell

This section describes the commands that enable you to check the status of the components monitored by the LOM device. It also describes how to view the events stored in the LOM device's event log.

8.3.1 Checking How Long the Server Has Been Running

To find out how much time has elapsed since the last boot, type:

```
lom> date
Time since last boot: +8d+20h48m2s
```

or:

```
lom> showdate
Time since last boot: +8d+12h23m6s
```

8.3.2 Checking the Current Status of All Components

To see the current status of all the components monitored by the LOM device, type:

```
lom> environment
```

FIGURE 8-2 shows some sample output from the environment command. In this example, all the components are running normally and none are faulty.

Note – For the locations of the different fans, see Section 8.9, "Checking the Status of the Server's Fans" on page 8-23.

Note – If the fans, PSU output, or supply rails fail on your server, you may need to replace components. For information about ordering and installing field-replaceable components, see Chapter 11.

```
lom>environment
Fault OFF
Alarm 1 OFF
Alarm 2 OFF
Alarm 3 OFF

Fans:
1 OK speed 99%
2 OK speed 95%
3 OK speed 100%
4 OK speed 100%

PSUs:
1 OK

Temperature sensors:
1 enclosure 28degC OK

Overheat sensors:
1 cpu OK

Circuit breakers:
1 SCSIA TERM OK
2 USB OK
3 SCC OK

Supply rails:
1 5V OK
2 3V3 OK
3 +12V OK
4 -12V OK
5 VDD OK
6 +3VSB OK
7 BATTERY OK

lom>
```

FIGURE 8-2   Sample Output From the `environment` Command

8.3.3 Viewing the LOM Device's Event Log

8.3.3.1 Viewing the Last 10 Events in the Event Log

Type the following:

```
lom> show eventlog
```

FIGURE 8-3 shows a sample event log display. The eventlog command reports the last 10 events. Note that the first event is the oldest and that each event has a time-stamp indicating the hours and minutes (and, if applicable, days) since:

■ the LOM device was last powered off (that is, since all power to the server, including standby power, was last removed), or,

■ if the server has been booted since all power was last removed, then the time-stamp indicates the number of days, hours, and minutes since the last reboot.

```
lom>show eventlog
Eventlog:
+0h0m0s host power on
+0h0m21s host reset
9/15/2000 17:35:28 LOM time reference
+0h3m20s Fault LED ON
+0h3m24s Fault LED OFF
+0h39m34s Alarm 1 ON
+0h39m40s Alarm 3 ON
+0h39m54s Alarm 3 OFF
+0h40m0s Alarm 1 OFF
+0h40m57s Fan 4 FATAL FAULT: failed
+0h40m58s Fault LED ON
```

FIGURE 8-3   Sample LOM Device Event Log (Oldest Event Reported First)

Note – If the fans, PSU output, or supply rails fail on your server, you may need to replace components. For information about ordering and installing field-replaceable components, see Chapter 11.

8.3.3.2 Viewing the Entire Event Log

● **Type:**

```
lom> loghistory [pause x] [level y]
```

where *x* is the number of lines you want the screen to pause after displaying, and *y* is the severity level of the events you want to see. By default, the loghistory command displays all the events in the log and does not pause the display.

If you specify a severity level, you will see reports for the level you specify and above. For example, if you specify level 2, you will see reports of level 2 and level 1 events. If you specify level 3, you will see reports of level 3, level 2, and level 1 events.

If you do not specify a level, you will see events for all levels.

For more information about severity levels, see Section 8.7, "Viewing the Event Reports That the LOM Sends to syslogd" on page 8-20.

Each entry in the log includes the time of the event, the server's host name, a unique identifier for the event and a user-friendly text message describing the event.

Note – The LOM device's Event Log is never cleared and can contain several hundred entries. Events are stored from the very first time the server boots. Eventually the buffer may become full, but when this happens the LOM device will start again at the beginning of the buffer, over-writing the earliest events.

8.3.3.3 Viewing All Events From the First to the *n*th Event Logged

● **Type:**

```
lom> loghistory index +n [pause x] [level y]
```

where *n* is the number of events you want to see that have been logged since the first event in the current log, *x* is the number of lines you want the screen to pause after displaying, and *y* is the severity level of the events you want to see. By default, the loghistory command does not pause the display.

8.3.3.4 Viewing All Events From the Last One Logged to *n*th Event Before It

● **Type:**

```
lom> loghistory index -n [pause x] [level y]
```

where *n* is the number of events you want to see listed that were logged before the last event in the current log, *x* is the number of lines you want the screen to pause after displaying, and *y* is the severity level of the events you want to see. By default, the loghistory command does not pause the display.

● **To see the last five events, type:**

```
lom> loghistory index -5
+0h39m34s Alarm 1 ON
+0h39m40s Alarm 3 ON
+0h39m54s Alarm 3 OFF
+0h40m0s Alarm 1 OFF
+0h40m58s Fault LED ON
```

8.3.4 Checking That a Component Has Been Fixed

If a monitored component has failed, the LOM device does not continue to report the failure.

● **To check the status of the component, for example, after attempting to fix it, type:**

```
lom> check
```

This causes the LOM device to update the status of all the components it monitors.

8.4 Setting Up LOM Privileges for Named Users

You can specify up to four named users of the LOM device on a Sun Fire V120 or Netra 120 server. By default no users are set up and therefore no user login prompt appears when you use the LOM escape sequence.

However, if you set up one or more users, every time you use the LOM escape sequence to display the `lom>` prompt you will be prompted for a user name and password. Therefore, one of the user accounts you set up, must be for yourself.

Four levels of authorization are available for named users. By default all four levels are open to them. However, if you specify any (using the `lom> userperm` command), only the level or levels that you specify will be available.

8.4.1 Permission Levels Available for LOM Users

The four levels of authorization are:

- **Console permission (c-level)**
  With this level of permission a named user can exit from the `lom>` prompt to the Solaris prompt (if the Serial A/LOM port is shared between the LOM and the console).

- **User administration permission (u-level)**
  With this level of permission a named user can add and delete users and alter their permission levels.

- **Administration permission (a-level)**
  With this level of permission a named user can change the LOM device's configuration variables (see Section 8.1, "Introduction to Lights-Out Management" on page 8-2).

- **Reset permission (r-level)**
  With this level of permission a named user can reset the server and power it on and off using the LOM device.

For information about how to assign one or more of these levels of authorization to a named user, see Section 8.4.7, "Specifying Permissions for a Named User" on page 8-16.

8.4.2 Creating a LOM User Account

● **Type:**

```
lom> useradd user name
```

where the *user name* is up to eight characters long, begins with an alphabetic character and contains at least one lower-case alphabetic character. You can use any of the following characters in the user name:

■ Alphabetic

■ Numeric

■ Period (.)

■ Underscore (_)

■ Hyphen (-)

Note – You must have User Administration (a-level) authorization to add a user (see Section 8.4.1, "Permission Levels Available for LOM Users" on page 8-13). If you have not added any users, you have a-level and all other levels of authorization by default.

8.4.3 Specifying the Password for a LOM User Account

● **Type:**

```
lom> userpassword user name
```

where the *user name* is the name of a LOM user account that already exists.

Note – You must have User Administration (u-level) authorization to set a password for a user (see Section 8.4.1, "Permission Levels Available for LOM Users" on page 8-13).

8.4.4　Viewing Details of a LOM User Account

● **Type:**

```
lom> usershow user name
```

where the *user name* is the name of an existing LOM user account.

Note – You must have User Administration (u-level) authorization to view the details of a LOM user account (see Section 8.4.1, "Permission Levels Available for LOM Users" on page 8-13).

8.4.5　Changing Your Own User Password

1. **To change the password for the account you are currently logged into, type:**

```
lom> password
```

2. **When prompted, specify the current password.**

3. **When prompted, specify the new password you want to use.**

4. **Specify the new password again to confirm it.**

8.4.6　Deleting a LOM User Account

● **Type:**

```
lom> userdel user name
```

where the *user name* is the name of an existing LOM user account.

Note – You must have User Administration (a-level) authorization to delete a user account (see Section 8.4.1, "Permission Levels Available for LOM Users" on page 8-13).

If you delete all the users you have set up, you will no longer see the login prompt when you go to the lom> prompt.

8.4.7 Specifying Permissions for a Named User

By default, all four levels of permission are available to each named user you set up.

● **To limit users to a particular level of permission, type:**

```
lom> userperm username [c][u][a][r]
```

You can specify:

- **No parameters**
  This makes all four levels available to the named user.
- **All four parameters** (for example, userperm cuar)
  This also makes all four levels available to the named user.
- **One, two or three parameters**
  This makes only the parameter or parameters you specify available.

The parameters are:

- **c**
  This stands for "console permission". It enables the named user to exit from the lom> prompt to the Solaris prompt (as long as the Serial A/LOM port is shared between the LOM and the console).
- **u**
  This stands for "user administration permission". It enables the named user to add and delete users and alter their permission levels by using the userperm command.
- **a**
  This stands for "administration permission". It enables the named user to change the LOM device's configuration variables (see Section 8.5, "Setting the LOM Device's Configurable Variables" on page 8-17).
- **r**
  This stands for "reset permission". It enables the user you have named to reset the server and to power it on and off using the LOM device.

8.4.8 Quitting a LOM Named User Session

● **Type:**

```
lom> logout
```

This returns you to the LOM login prompt.

8.5 Setting the LOM Device's Configurable Variables

There are some variables that you can use as arguments to the `set` command in the LOM shell. The `set` command duplicates the `faulton`, `faultoff`, `alarmon` and `alarmoff` commands by taking them as arguments. It also takes the argument `event_reporting`, which enables you to stop the LOM device from sending event reports to the Serial A/LOM port.

Note – To execute the commands described in this section, a named user must have a-level permission. For more information, see Section 8.4, "Setting Up LOM Privileges for Named Users" on page 8-13.

8.5.1 Turning the Fault LED on

● **To turn the Fault LED on by setting the `faulton` variable, type:**

```
lom> set faulton
```

8.5.2 Turning the Fault LED off

● **To turn the Fault LED off by setting the `faultoff` variable, type:**

```
lom> set faultoff
```

8.5.3 Setting the `alarmon` *n* Software Flag

● **Set the** `alarmon` *n* **variable by typing:**

```
lom> set alarmon n
```

where *n* is the number of the alarm you want to turn on: 1, 2, or 3.

8.5.4 Setting the `alarmoff` *n* Software Flag

● **To set the** `alarmoff` **configuration variable, type:**

```
lom> set alarmoff n
```

where *n* is the number of the alarm you want to turn off: 1, 2, or 3.

8.5.5 Stopping the LOM Sending Event Reports to the Serial A/LOM port

● **Set the** `event_reporting` **variable on by typing:**

```
lom> set eventreporting on
```

Note – This is the equivalent of using the `lom -E on` command from the Solaris shell (see Chapter 9).

● **Set the** `event_reporting` **variable off by typing:**

```
lom> set eventreporting off
```

Note – This is the equivalent of using the `lom -E off` command from the Solaris shell (see Chapter 9).

8.6 Separating the LOM From the Console on the Serial A/LOM Port

By default, the LOM device shares the Serial A/LOM port with the console, and when it has an event report to send it takes control of the Serial A/LOM port itself, interrupting any console activity you are performing. To prevent the LOM device from interrupting the console, either turn serial event reporting off (see Section 9.3.4, "Stopping the LOM from Sending Reports to the Serial A/LOM Port (lom -E off)" on page 9-12), or dedicate the Serial A/LOM port to the LOM device and use the Serial B port for console activity (see below).

The advantages of dedicating the Serial A/LOM port to the LOM device and using Serial B as your Console port include:

- Preserving the ability to power on or reset the server (from the `lom>` prompt on Serial A/LOM) even if for any reason you lose access to Solaris on your console port (Serial B).

- Capturing all LOM events passively on a terminal connected to the dedicated LOM port (Serial A/LOM). Note, however, that if you dedicate the Serial A/LOM port to the LOM device, you cannot use the `console` command to quit the LOM shell. Instead, for access to Solaris, you must connect to the Sun Fire V120 or Netra 120 server using the Serial B port.

- Preventing a user with console access from using the LOM escape sequence to exit Solaris and access the LOM shell. If you dedicate the Serial B port to the console, users cannot bring up the LOM shell and this means that they cannot interrogate or reconfigure the LOM device.

- Performing binary data transfers. To perform anything other than ASCII transfers, you need to use the Serial B port.

8.6.1 Dedicating Serial A/LOM to the LOM

1. **Set up console connections to both the Serial A/LOM port and the Serial B port.**

2. **At the Solaris prompt, type:**

```
# eeprom input-device=ttyb
# eeprom output-device=ttyb
# reboot
```

The Serial B port (ttyb) is now your console port. The Serial A/LOM port remains in the control of the LOM device.

8.6.2   Sharing Serial A/LOM Between the LOM and the Console

By default, the Serial A/LOM port is shared by the LOM device and the console. Therefore, you only need to follow the instructions in this section if you have configured the server by using the instructions in the previous section (Section 8.6.1, "Dedicating Serial A/LOM to the LOM" on page 8-19) and you now want to share the Serial A/LOM port between the LOM and the console.

To share the port between the LOM device and the console:

1. **Set up console connections to both the Serial A/LOM port and the Serial B port.**

2. **At the Solaris prompt, type:**

```
# eeprom input-device=ttya
# eeprom output-device=ttya
# reboot
```

The Serial A/LOM port (ttya) is now shared between the LOM device and the console.

8.7   Viewing the Event Reports That the LOM Sends to `syslogd`

The LOM device monitors the status of the fans, supply rails, temperature, and power supply even when the server is powered down (the LOM device operates on standby power). If it detects a fault, it turns on the Fault LED on the server's front and back panels and stores a report in an event log which resides in memory on the LOM device. When Solaris is running, the LOM device also sends event reports to `syslogd`. `syslogd` handles these in the way it has been configured to handle event reports. This means that by default it sends them to the console and stores them in the following file:

```
/var/adm/messages
```

In this file the reports are displayed with a label identifying them as `lom` reports and indicating their severity. The different levels of severity are, in descending order:

1. **Fatal**

   These events might concern, for example, exceeded temperature thresholds or supply rail failures. Fatal events may cause the server to shut itself down.

2. **Warning**

   These events might concern fans turning too slowly, the Fault LED having been turned on, or the System Configuration Card having been removed. They are not events that cause the server to shut down, but they do require immediate attention.

3. **Info**

   These events are most likely to inform you that some problem is now OK. For example, if you re-insert the System Configuration Card, the LOM device will generate an event to say that the System Configuration Card has been restored.

4. **User**

   User level events concern the activity of named users whom you have authorized to access the LOM device. For example, an event is generated when a user logs in or out.

8.8 The LOM Shell Command List

The commands you can execute from the `lom>` prompt are listed in TABLE 8-2.

TABLE 8-2   LOM Commands

Command	Effect
`alarmoff` *n*	Sets alarm *n* off. (Where n is 1, 2, or 3.) These three alarms are software flags. They are associated with no specific conditions but are available to be set by your own processes.
`alarmon` *n*	Sets alarm *n* on. See the description for the `alarmoff` command.
`break`	Takes the server down to the `ok` prompt.
`bootmode`	Determines the behavior of the server during the boot process.

TABLE 8-2 LOM Commands *(Continued)*

Command	Effect
check	Resets monitoring to report all failures. If a monitored component has failed, the LOM device will not continue to report the same failure. To check the status of the component, for example, after attempting to fix it, issue the check command. This updates the status of all monitored components.
console	This command takes you out of the LOM shell and back to the Solaris prompt. It returns control of the serial connection to the console.
environment	Displays the temperature of the server and the status of the fans, the power supply, the over-temperature monitors, the supply rails and circuit breakers, the alarms, and the fault LED.
faulton	Sets the Fault LED to On.
faultoff	Sets the Fault LED to Off.
help	Displays the list of LOM commands.
loghistory	Displays all the events in the LOM device's Event Log.
logout	This command is for use by named users you have set up with password access to the LOM device. It returns them to the LOM user login prompt.
poweron	Powers the server on.
poweroff	Powers the server down to standby power mode.
reset	Resets the server.
show model	Displays the server model.
show hostname	Displays the server name (this command is equivalent to the Solaris uname -n command).
show eventlog	Displays the LOM device's event log. The event log is the list of the last 10 events to have been stored in the LOM device. The most recent event is the one at the bottom of the list.
show escape	Displays the current LOM escape sequence.
show	Displays all the information available with the show command.
useradd	Adds a user to the LOM device's list of permitted users.
userdel	Deletes a user from the LOM device's list of permitted users.
usershow	Displays the details of a named user's LOM account.
userpassword	Sets or changes a user's password.
userperm	Sets the permission levels for a named user.
version	Displays the version number of the LOM device.

8.9 Checking the Status of the Server's Fans

Event reports about the fans inside the server include the number of the fan to which they relate. Fans 1 and 2 expel hot air from the server; Fan 3 cools the CPU. Fan 4 is the power supply fan; if this fan fails, you must replace the PSU.
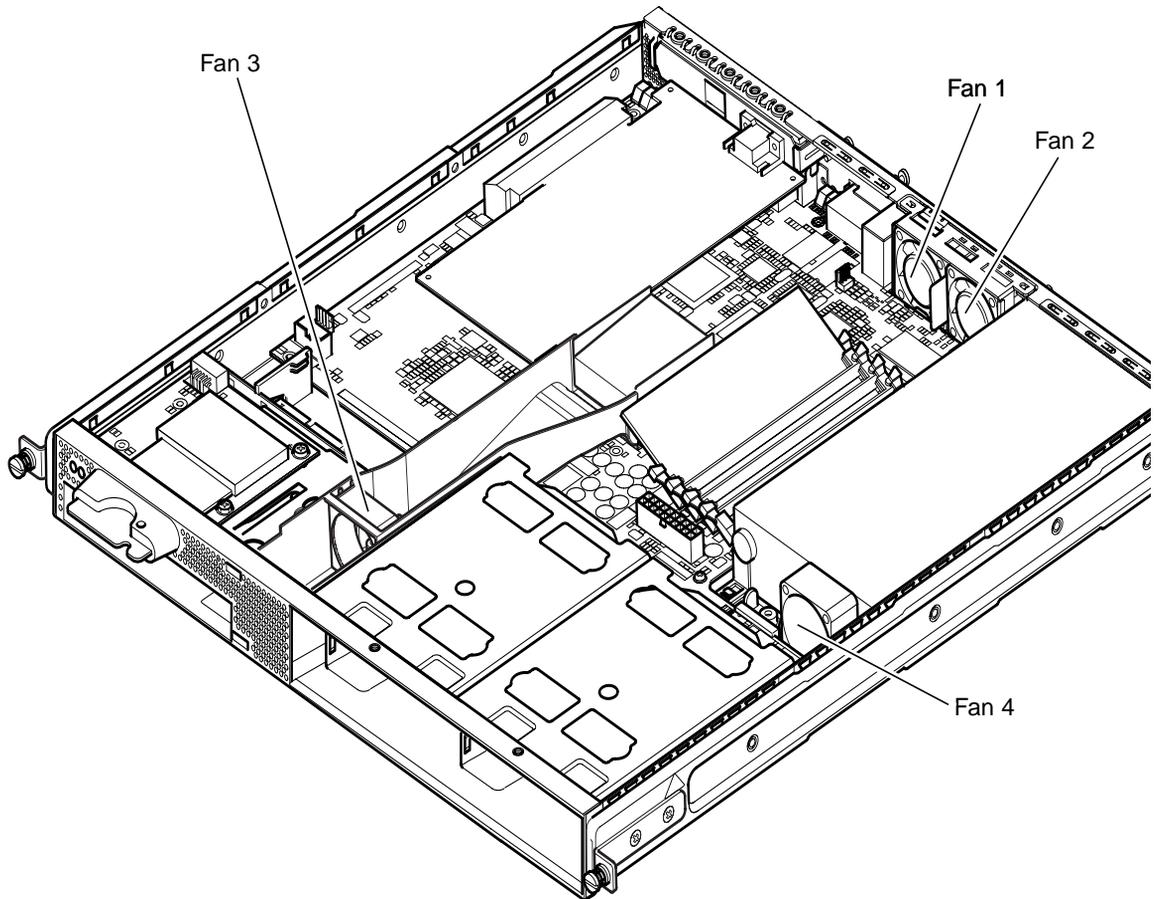
FIGURE 8-4 Locations of Fans 1, 2, 3, and 4

● **To check the status of the fans, type:**

```
lom> environment
```

Managing the Server From the Solaris Prompt

This chapter tells you how to use the LOM-specific commands available in the Solaris operating environment for monitoring and managing a Sun Fire V120 or Netra 120 server.

For an introduction to the LOM device and a description of an alternative user interface to it, see Chapter 8.

The chapter contains the following sections:

- Section 9.1, "Monitoring the System From Solaris" on page 9-2
- Section 9.2, "Configuring Automatic Server Restart (ASR)" on page 9-8
- Section 9.3, "Other LOM Tasks You Can Perform From Solaris" on page 9-11

Note – For information about how to configure the LOM device driver, see Appendix C.

Note – The Sun Fire V120 and Netra 120 servers are supplied with the Solaris operating environment installed and with the supplementary Lights-Out Management (LOM) software described in this chapter and Chapter 8 also installed. This software enables you to manage the server locally or remotely. If you ever need to re-install Solaris and you want to use the Lights-Out Management facilities, you must also re-install the Lights-Out Management software from the CD entitled *Software Supplement for the Solaris Operating Environment*. This CD is included with the Solaris media kit. For the location of the LOM packages on the CD, refer to the *Solaris Hardware Platform Guide* for the release of Solaris that you are using.

9.1 Monitoring the System From Solaris

To use the Lights-Out Management (LOM) facilities either remotely or locally, you need a terminal connection to the Serial A/LOM port on the server (see Chapter 6).

There are two ways of interrogating the LOM device or of sending it commands to perform.

- One is by executing LOM commands from the lom> shell prompt. For information about how to do this, see Chapter 8.
- The other is by executing LOM-specific Solaris commands from the Solaris prompt. These commands are described in this chapter.

The Solaris commands described in this section are all available from the main Solaris # prompt. They run a utility called /usr/sbin/lom.

Where appropriate, the command lines given in this section are accompanied by typical output from the commands.

9.1.1 Viewing Online LOM Documentation

- **To view the manual pages for the LOM utility, type:**

```
# man lom
```

9.1.2 Checking the Power Supply Unit (lom -p)

- **To check that the input lines and the output line for the power supply unit are working normally, type:**

```
# lom -p
PSUs:
1 OK

#
```

> **Note –** If there are any failures of the PSU that affect more than just the input or output lines, Solaris will not run. However, if standby power is present, you can still use the LOM shell commands described in Chapter 8.

9.1.3   Checking the Fans (`lom -f`)

● **To check the fans, type:**

```
# lom -f
Fans:
1 OK speed 99%
2 OK speed 95%
3 OK speed 100%
4 OK speed 100%


#
```

For the locations of each fan, see Section 8.9, "Checking the Status of the Server's Fans" on page 8-23. If you need to replace a fan, contact your local Sun sales representative and quote the part number of the component you need. For information, see Section 11.2, "Field Replaceable Units" on page 11-4.

9.1.4   Checking the Supply Rail Voltages and Internal Circuit Breakers (`lom -v`)

The supply rails are the server's internal power lines. If the status of any of these is `faulty`, contact your local Sun sales representative. It means that you have either a faulty system board or a faulty PSU. For information about ordering and installing replacements of these components, see Chapter 11.

The `-v` option also displays the status of the Sun Fire V120 or Netra 120 server's internal circuit breakers. For any that have been tripped, the status will read `faulty`. The system contains three circuit breakers: one for the SCSI connector, one for the USB ports, and one for the System Configuration Card reader. If there is a problem with the circuit breakers or the SCSI or USB port circuit breakers, remove the device connected to the relevant port. When you do this, the circuit breakers will automatically recover themselves. If there is a problem with the circuit breaker for the System Configuration Card, it means that you do not have a valid System Configuration Card inserted.

● **To check the status of the supply rails and internal circuit breakers, type:**

```
# lom -v
Supply voltages:
 1 5V status=ok
 2 3V3 status=ok
 3 +12V status=ok
 4 -12V status=ok
 5 VDD status=ok
 6 +3VSB status=ok
 7 BATTERY status=ok

System status flags (circuit breakers):
 1 SCSIA TERM status=ok
 2 USB status=ok
 3 SCC status=ok
```

9.1.5 Checking the Internal Temperature (`lom -t`)

● **To check the internal temperature of the system and also the system's warning and shutdown threshold temperatures, type:**

```
# lom -t
System Temperature Sensors:
1 enclosure 25 degC : warning 67 degC : shutdown 72 degC

System Over-temperature Sensors:
1 cpu status=ok
 #
```

9.1.6 Checking the Status of the Fault LED and Alarms (`lom -l`)

● **To check whether the Fault LED and alarms are on or off, type:**

```
# lom -l
LOMlite alarm states:
Alarm1=off
Alarm2=off
Alarm3=off
Fault LED=on
#
```

Alarms 1, 2, and 3 are software flags. They are associated with no specific conditions but are available to be set by your own processes or from the command line (see Section 9.3.1, "Turning Alarms On and Off (lom -A)" on page 9-11).

9.1.7 Changing the LOM Automatic Server Restart Configuration (`lom -w`)

For full information about enabling and using the LOM's Automatic Server Restart (ASR) facility, see Section 9.2, "Configuring Automatic Server Restart (ASR)" on page 9-8.

● **To find out how the LOM's watchdog is currently configured, type:**

```
# lom -w
LOMlite watchdog (ASR) settings:
Watchdog=on
Hardware reset=off
Timeout=40 s
#
```

The LOM's watchdog is enabled by default when Solaris boots. This means that, by default, if the watchdog does not receive a "pat" for 40,000 milliseconds, it will turn on the Fault LED on the front and back panels of the system, generate a LOM event report, and — if configured to do so — perform an automatic server restart. However, although the watchdog is enabled by default when Solaris boots, the `Hardware reset` option is not. This means that the LOM device does not, by default, automatically restart the server after a lockup.

● **To configure the LOM device to perform an automatic server restart (ASR) after a lockup, you must enable the** `Hardware reset` **option as well as the** `Watchdog` **option. For information about how to do this, see Section 9.2, "Configuring Automatic Server Restart (ASR)" on page 9-8.**

9.1.8 Viewing the Configuration of the LOM Device (`lom -c`)

● **To view the settings of all the configurable variables for the LOM device, type:**

```
# lom -c
LOMlite configuration settings:
serial escape character=#
serial event reporting=default
Event reporting level=fatal, warning & information
Serial security=enabled
Disable watchdog on break=disabled
Automatic return to console=disabled
alarm3 mode=watchdog
firmware version=3.0
firmware checksum=2983
product revision=0.0
product ID=120
#
```

9.1.9 Viewing All Component Status Data With the LOM Device's Configuration Data (`lom -a`)

● **To view all the status data stored by the LOM device plus the details of the device's own configuration, type:**

```
# lom -a
```

9.1.10 Viewing the Event Log (`lom -e`)

● **To see the event log, type:**

```
# lom -e n,[x]
```

where *n* is the number of reports (up to 128) that you want to see and *x* specifies the level of reports you are interested in. There are four levels of events:

1. Fatal events
2. Warning events
3. Information events
4. User events

If you specify a level, you will see reports for that level and above. For example, if you specify level 2, you will see reports of level 2 and level 1 events. If you specify level 3, you will see reports of level 3, level 2, and level 1 events.

If you do not specify a level, you will see reports of level 3, level 2, and level 1 events.

FIGURE 9-1 shows a sample event log display. Note that the first event is the oldest and that each event has a date-stamp indicating the days, hours and minutes since the system was last booted.

```
# lom -e 10
LOMlite Event Log:
+0h0m21s host reset
9/15/2000 17:35:28 GMT LOM time reference
+0h3m20s   fault led state - ON
+0h3m24s   fault led state - OFF
+0h39m34s Alarm 1 ON
+0h39m40s Alarm 3 ON
+0h39m54s Alarm 3 OFF
+0h40m0s Alarm 1 OFF
+0h48m52s fault led state - OFF
+0h49m39s Fan 1 FATAL FAULT: failed
+0h50m58s fault led state - ON

# lom -e 10
```

FIGURE 9-1   Sample LOM Device Event Log (Oldest Event Reported First)

9.2 Configuring Automatic Server Restart (ASR)

You can configure the LOM device to restart the server automatically after a lockup. The LOM device has a watchdog process that, by default, expects to be patted every 10,000 milliseconds. If it does not receive a pat after 40,000 milliseconds (default), the LOM device turns the front and back fault LEDs on and generates a LOM event report. However, it does not automatically restart the system unless you have configured it to do so.

9.2.1 Configuring the LOM Watchdog to Restart the System After a Lockup

● **Add the** `-R` **option to the** `priocntl` **command in the script file called** `/etc/rc2.d/S25lom`**.**

This is the script that runs the LOM watchdog process:

```
# priocntl -e -c RT lom -W on,40000,10000 -R on
```

When you have done this, the LOM device will restart the server whenever the watchdog times out.

You can turn the option on and off from the Solaris command prompt. For more information, see Section 9.2.3, "Setting the Hardware Reset Option From a Script or Command (lom -R on)" on page 9-10.

However, as long as you have the `-R on` option set in `/etc/rc2.d/S25lom`, the Hardware Reset option will always be enabled when you start the system.

9.2.2 Enabling the LOM Watchdog Process From Your Own Script or Command (`lom -W on`)

Note – You do not normally need to do this. If you want to configure the LOM device to perform an automatic server restart after a lockup, see Section 9.2.1, "Configuring the LOM Watchdog to Restart the System After a Lockup" on page 9-8. Only use the `lom -W on` option on the command line or in another script file if for some reason you have removed the `/etc/rc2.d/S25lom` script.

The LOM device's watchdog process is enabled by default and, if you type `lom -W on` while this watchdog process is already running, the command will have no effect. You can only run this command if you have removed the `/etc/rc2.d/S25lom` script file or you have turned the watchdog off manually by using the `lom -W off` command.

The default `priocntl` command is as follows:

```
priocntl -e -c RT lom -W on,40000,10000
```

The number 40,000 on this command line indicates the watchdog's timeout period in milliseconds; you can specify a different number. The number 10,000 indicates its pat interval in milliseconds; again, you can specify a different number.

Note – Do not specify a watchdog timeout period of less than 5,000 milliseconds. If you do, you might find that the watchdog times out frequently even though the server has not locked up. And this could cause your server to panic unnecessarily.

If the watchdog process times out (in other words, if it does not receive its expected pat), the LOM device will turn on the server's front and back Fault LEDs and generate a LOM event report. However, it will not automatically reset the system. To make it reset the system, you must use the -R option (see Section 9.2.3, "Setting the Hardware Reset Option From a Script or Command (lom -R on)" on page 9-10.)

- **If you have no LOM watchdog process running already and you want the process to run, type the following, or add it to another script file:**

```
# lom -W on,40000,10000
```

- **If you want the LOM device to perform an automatic server restart after a lockup, you must include the** `-R on` **option in the command, as follows:**

```
# lom -W on,40000,10000 -R on
```

Note – Unless you include the `lom -W on` and `-R on` options in a script file, you will need to execute the `lom` command every time you reboot the system. (That is, if you want to use the automatic server restart facility.) Otherwise the watchdog will not run, and the server will not reset after a lockup.

9.2.3 Setting the `Hardware Reset` Option From a Script or Command (`lom -R on`)

To make the LOM device's watchdog process trigger an automatic server restart (ASR) after a lockup, add the `-R on` option to the command in your `/etc/rc2.d/S25lom` script file. This is the script that runs the watchdog. For full instructions about how to do this, see Section 9.2.1, "Configuring the LOM Watchdog to Restart the System After a Lockup" on page 9-8.

● **However, if for any reason you are not using the script file provided with your system (`/etc/rc2.d/S25lom`) but have instead enabled the watchdog from the command line or from another script file, you can turn the `Hardware reset` option on by typing the following at the command line:**

```
# lom -R on
```

● **To turn the `Hardware reset` option off from the command line,type:**

```
# lom -R off
```

9.3 Other LOM Tasks You Can Perform From Solaris

This section tells you how to turn the alarms and Fault LEDs on and off by using the `lom` command. It also tells you how to change the first character of the LOM escape sequence, how to stop the LOM device from sending reports to the Serial A/LOM port, how to remove driver protection from the device driver, how to make the LOM interface backward compatible, and how to upgrade the firmware on the LOM device.

9.3.1 Turning Alarms On and Off (`lom -A`)

There are three alarms associated with the LOM device. They are associated with no specific conditions but are software flags available to be set by your own processes or from the command line.

- **To turn an alarm on from the command line, type:**

```
# lom -A on,n
```

where *n* is the number of the alarm you want to set: 1, 2, or 3.

- **To turn the alarm off again, type:**

```
# lom -A off,n
```

where *n* is the number of the alarm you want to turn off: 1, 2, or 3.

9.3.2 Turning the Fault LED On and Off (`lom -F`)

- **To turn the Fault LED on, type:**

```
# lom -F on
```

● **To turn the Fault LED off again, type:**

```
# lom -F off
```

9.3.3 Changing the First Character of the Sequence for Escaping to the `lom>` Prompt (`lom -X`)

The character sequence #. (hash, dot) enables you to escape from Solaris to the `lom>` prompt.

● **To change the first character of this default `lom` escape sequence, type:**

```
# lom -X x
```

where *x* is the alpha-numeric character you want to use instead of #.

Note – If you are at the console and you type the first character of the LOM escape sequence (by default this is #), there is a second's delay before the character appears on the screen. This is because the system waits to see if you type the dot (.) character next. And, if you do, the `lom>` prompt appears. If you do not, the # character appears. If you want to change the LOM escape character, use a character that is not included in many console commands. Otherwise the delay between when you strike the key and when the character appears on the screen may affect your typing at the console.

9.3.4 Stopping the LOM from Sending Reports to the Serial A/LOM Port (`lom -E off`)

LOM event reports can interfere with information you are attempting to send or receive on the Serial A/LOM port.

● **To stop the LOM device from sending reports to the Serial A/LOM port, type:**

```
# lom -E off
```

By default, the Serial A/LOM port is shared by the console and the LOM device. The LOM interrupts the console whenever it needs to send an event report. To prevent the LOM from interrupting the console on Serial A/LOM, turn serial event reporting off.

● **To turn serial event reporting on again, type:**

```
# lom -E on
```

If you want to dedicate the Serial A/LOM port to the LOM device and to use the Serial B port as your console port, see Section 8.6, "Separating the LOM From the Console on the Serial A/LOM Port" on page 8-19 (Chapter 8).

9.3.5   Making the LOM Interface Backward Compatible (`lom -B`)

If you have scripts written to the LOM interface on the Netra t1 Model 100/105 server or the Netra t 1400/1405 server and you want to use these scripts on a Sun Fire V120 or a Netra 120 server, you can add file system links that make this possible. To do so, simply type:

```
# lom -B
```

When you have done this, you will be able to use the old scripts on the new system.

9.3.6   Upgrading the LOM Firmware (`lom -G` *filename*)

To upgrade the firmware on the LOM device, obtain the new firmware package from SunSolve[SM] or from your local Sun sales representative, and type the following:

```
# lom -G filename
```

where *filename* is the name of the file containing the new firmware.

Note – LOM firmware upgrades will be released as patches and will include detailed installation instructions.

PART **III**   Troubleshooting and Maintenance

Troubleshooting

This chapter provides introductory information on the diagnostics tools available for the Sun Fire V120 and Netra 120 servers. It also lists some problems that you might encounter when setting up or using a Sun Fire V120 or Netra 120 server and tells you how to solve them. Finally, the chapter explains how to interpret the LEDs on the servers' front and back panels.

The chapter contains the following sections:

- Section 10.1, "Introduction to the POST, obdiag, and SunVTS Diagnostic Tools" on page 10-2
- Section 10.2, "Additional Diagnostic Tests for Specific Devices" on page 10-8
- Section 10.3, "Solutions to Problems You Might Encounter" on page 10-10
- Section 10.4, "Interpreting the Front and Back Panel LEDs" on page 10-12

10.1 Introduction to the POST, `obdiag`, and SunVTS Diagnostic Tools

The following diagnostic tools are available for the Sun Fire V120 and Netra 120 servers:

- Power On Self Test (POST) Diagnostics
- OpenBoot Diagnostics (obdiag)
- SunVTS

If you need to contact Sun to report a problem with your system, it will help the engineers to resolve the problem if you can provide relevant diagnostic information from these tools.

10.1.1 Using POST Diagnostics

To view Power On Self Test (POST) diagnostic and error messages you need to have a serial connection set up to the server. For more information, see "Setting Up Serial Connections" on page 6-4.

If your system has the OpenBoot PROM (OBP) variable `diag-switch?` set to `true`, then POST diagnostics will run automatically when you power on the server. However, the default setting for `diag-switch?` is `false`.

To start POST diagnostics, at the `ok` prompt, do the following:

1. **Type:**

```
ok setenv diag-switch? true
```

2. **Type:**

```
ok setenv diag-level value
```

where *value* is either min or max (depending on the quantity of diagnostic information you want to see).

3. **Type:**

```
ok reset-all
```

The system will now run POST diagnostics and display status and error messages in your console window. If POST detects an error, it displays an error message describing the failure. A sample error message is shown below:

```
Power On Self Test Failed. Cause: DIMM U0702 or System Board
```

4. **When you have finished running POST, restore the value of** `diag-switch?` **to** `false` **by typing the following (this minimizes the booting time):**

```
ok setenv diag-switch? false
```

10.1.2   Using OpenBoot Diagnostics (`obdiag`)

To run OpenBoot Diagnostics, do the following:

1. **Type:**

```
ok setenv diag-switch? true
ok setenv auto-boot? false
ok reset-all
```

2. **Type:**

```
ok obdiag
```

This command displays the OpenBoot Diagnostics menu.

FIGURE 10-1 Sample `obdiag` Menu

```
                                     obdiag
┌──────────────────────────────┬──────────────────────────┬────────────────────────┐
│ 1  SUNW,lomh@14,200000        │ 2  ebus@c                │ 3  flashprom@10,0      │
│ 4  i2c-nvram@0,a0             │ 5  ide@d                 │ 6  network@5,1         │
│ 7  network@c,1                │ 8  pmu@3                 │ 9  scsi@8              │
│ 10 scsi@8,1                   │ 11 serial@0,2e8          │ 12 serial@0,3f8        │
│ 13 usb@5,3                    │ 14 usb@c,3               │                        │
├──────────────────────────────┴──────────────────────────┴────────────────────────┤
│ Commands: test test-all except help what printenvs setenv versions                │
│ exit                                                                               │
└───────────────────────────────────────────────────────────────────────────────────┘
```

The tests are described in TABLE 10-1. Note the number that corresponds to the test you want to perform, and use it with the test command. For example, to test the primary Ethernet port, type:

```
obdiag> test 7
Hit the spacebar to interrupt testing
Testing /pci@1f,0/ethernet@c ..........................passed

Hit any key to return to the main menu.
```

3. **When you have finished testing, exit OpenBoot Diagnostics and restore the value of** auto-boot? **to true.**

To do this, type:

```
obdiag> exit
ok setenv auto-boot? true
ok auto-boot? true
ok boot
```

The function of each test is shown below.

TABLE 10-1 Open Boot Diagnostics Tests

Test number	Name	Description
1	SUNW,lomh@14,200000	tests the LOM device
2	ebus@c	tests the ebus interface
3	flashprom@10,0	tests the flashprom device
4	i2c-nvram@0,a0	tests the System Configuration Card
5	ide@d	tests the ide interface (to the CD-ROM or DVD drive)
6	network@5,1	tests the net1 Ethernet port
7	network@c,1	tests the net0 Ethernet port
8	pmu@3	tests the circuitry on the main CPU board
9	scsi@8	tests the internal SCSI interface
10	scsi@8,1	tests the external SCSI interface
11	serial@0,2e8	tests the serial B port (ttyb)

TABLE 10-1   Open Boot Diagnostics Tests

12	`serial@0,3f8`	tests the serial A/Lom port (ttya)
13	`usb@5,3`	tests usb interface 1
14	`usb@c,3`	tests usb interface 0

Note – If you have a PCI card installed in the server, then additional tests will appear on the `obdiag` menu.

10.1.3   Using SunVTS

SunVTS, the Sun Validation and Test Suite, is an online diagnostics tool which you can use to verify the configuration and functionality of hardware controllers, devices, and platforms. It runs in the Solaris operating environment and presents the following interfaces:

- command line interface
- serial (tty) interface
- graphical interface within a windowed desktop environment.

SunVTS software lets you view and control a testing session on a remotely connected server. Below is a list of some of the tests that are available:

TABLE 10-2   SunVTS Tests

SunVTS Test	Description
cdtest	Tests the CD-ROM drive
cputest	Tests the CPU
disktest	Tests the local disk drives
dvdtest	Tests the DVD drive
fputest	Tests the floating-point unit
nettest	Tests the Ethernet hardware on the system's CPU board and the networking hardware on any optional plug-in boards in the system
netlbtest	Performs a loopback test to check that the Ethernet adapter can send and receive packets

TABLE 10-2 SunVTS Tests

SunVTS Test	Description
pmem	Tests the physical memory (read only)
sutest	Tests the server's on-board serial ports
vmem	Tests the virtual memory (a combination of the swap partition and the physical memory)

10.1.3.1 To Find Out If SunVTS is Installed

● **Type:**

```
# pkginfo -l SUNWvts
```

If SunVTS software is loaded, information about the package will be displayed.

If SunVTS software is not loaded, you will see the following error message:

```
ERROR: information for "SUNWvts" was not found
```

10.1.3.2 Installing SunVTS

By default, SunVTS is not installed on the Sun Fire V120 or Netra 120 servers. However, it is available on the software supplement CD supplied with Solaris. For information about downloading it from this CD, refer to the *Sun Hardware Platform Guide* for the release of Solaris you are using.

To find out more about using SunVTS, refer to the SunVTS documentation that corresponds to the Solaris release that you are running.

10.1.3.3 Viewing SunVTS Documentation

The SunVTS documents are included on the Software Supplement CD that is part of each Solaris Media Kit release and is also accessible at http://docs.sun.com.

We recommend you consult the following SunVTS documents:

- *SunVTS User's Guide* describes how to install, configure, and run the SunVTS diagnostic software.
- *SunVTS Quick Reference Card* provides an overview of how to use the SunVTS CDE interface.

■ *SunVTS Test Reference Manual* provides details about each individual SunVTS test.

10.1.3.4   Using the SunVTS Graphical User Interface

To test the Sun Fire V120 or Netra 120 server by running a SunVTS session from a workstation using the SunVTS graphical user interface, follow the procedure below.

1. **Use the** xhost **command to give the remote server access to the local display. Type:**

```
# /usr/openwin/bin/xhost + remote_hostname
```

2. **Remotely log in to the server as superuser or root.**

3. **Type:**

```
# cd /opt/SUNWvts/bin
# ./sunvts -display local_hostname:0
```

where *local_hostname* is the name of the workstation you are using.

Note – The directory /opt/SUNWvts/bin is the default directory for SunVTS software. If you have the software installed in a different directory, use that path instead.

When you start SunVTS software, the SunVTS kernel probes the test system devices and displays the results on the Test Selection panel. There is an associated SunVTS test for each hardware device on your system.

You can fine-tune your testing session by selecting the appropriate check boxes for each of the tests you want to run.

10.2 Additional Diagnostic Tests for Specific Devices

10.2.1 Using the `probe-scsi` Command To Confirm That Hard Disk Drives Are Active

The `probe-scsi` command transmits an inquiry to SCSI devices connected to the system's internal SCSI interface. If a SCSI device is connected and active, the command displays the unit number, device type, and manufacturer name for that device.

FIGURE 10-2 `probe-scsi` Output Message

```
ok probe-scsi
Target 0
 Unit 0   Disk     SEAGATE ST336605LSUN36G 4207
Target 1
 Unit 0   Disk     SEAGATE ST336605LSUN36G 0136
```

The `probe-scsi-all` command transmits an inquiry to all SCSI devices connected to both the system's internal and its external SCSI interfaces. FIGURE 10-3 shows sample output from a Sun Fire V120 with no externally connected SCSI devices but containing two 36 GB Hard Disk Drives, both of them active.

FIGURE 10-3 `probe-scsi-all` Output Message

```
ok probe-scsi-all
/pci@1f,0/pci@1/scsi@8,1

/pci@1f,0/pci@1/scsi@8
Target 0
 Unit 0   Disk     SEAGATE ST336605LSUN36G 4207
Target 1
 Unit 0   Disk     SEAGATE ST336605LSUN36G 0136
```

10.2.2 Using the `probe-ide` Command To Confirm That the DVD or CD-ROM Drive is Connected

The `probe-ide` command transmits an inquiry command to internal and external IDE devices connected to the system's on-board IDE interface. The following sample output reports a DVD drive installed (as Device 0) and active in a Sun Fire V120 server.

FIGURE 10-4 `probe-ide` Output Message

```
ok probe-ide
 Device 0  ( Primary Master )
        Removable ATAPI Model: DV-28E-B

 Device 1  ( Primary Slave )
        Not Present

 Device 2  ( Secondary Master )
        Not Present

 Device 3  ( Secondary Slave )
        Not Present
```

10.2.3 Using the `watch-net` and `watch-net-all` Commands To Check the Network Connections

The `watch-net` diagnostics test monitors Ethernet packets on the primary network interface. The `watch-net-all` diagnostics test monitors Ethernet packets on the primary network interface and on any additional network interfaces connected to the system board. Good packets received by the system are indicated by a period (.). Errors such as the framing error and the cyclic redundancy check (CRC) error are indicated with an X and an associated error description.

Start the `watch-net` diagnostic test by typing the `watch-net` command at the `ok` prompt. For the `watch-net-all` diagnostic test, type `watch-net-all` at the `ok` prompt.

FIGURE 10-5 `watch-net` Diagnostic Output Message

```
{0} ok watch-net
Internal loopback test -- succeeded.
Link is -- up
Looking for Ethernet Packets.
'.' is a Good Packet. 'X' is a Bad Packet.
Type any key to stop.................................
```

FIGURE 10-6 `watch-net-all` Diagnostic Output Message

```
{0} ok watch-net-all
/pci@1f,0/pci@1,1/network@c,1
Internal loopback test -- succeeded.
Link is -- up
Looking for Ethernet Packets.
'.' is a Good Packet. 'X' is a Bad Packet.
Type any key to stop.
```

10.3   Solutions to Problems You Might Encounter

Problem: Cannot Set Up a Console Connection to the Server

The Sun Fire V120 and Netra 120 servers' serial port pinouts are listed in Chapter 6. Check that they are correct for the device (that is, the terminal or terminal server) that you are connecting to the server.

Problem: Cannot Display the `lom>` Prompt Using the "#." Escape Sequence

Check whether the first character of the "#." escape sequence has been changed (this is a user-configurable value). To check the current value, type the following from the Solaris prompt:

```
# lom -c
```

The information that this command displays includes the "serial escape character". If this is not "#", then type the character that is currently specified and follow it immediately with a dot.

Problem: OpenBoot PROM Initialization Aborts and the Server Will Not Boot

If the OpenBoot PROM initialization sequence aborts and the message 'NO IDPROM' is displayed when the operating system is attempting to read the serial number and MAC address, then you are attempting to boot without a valid System Configuration Card inserted. The System Configuration Card contains the serial number, MAC address, and NVRAM settings for the server.

Problem: Card Not Recognised During Installation or Bootup

The Sun Fire V120 and Netra 120 servers are fitted with a System Configuration Card. If the card moves during transit then the server will not be able to read the card, and as a result will not boot.

If the System Configuration Card has moved during transit, follow the steps below to make sure it is seated in the server correctly.

Note – The presence of the tie-wrap does not necessarily mean that the card is correctly located in the reader.

---

1. **Remove the front bezel by pushing on the clips at both ends until they release.**

2. **Press the System Configuration Card in as far as it will go.**

3. **Replace the bezel and continue installation.**

   For more information about the System Configuration Card, see Section 11.1, "Replacing a Server" on page 11-2.

10.4 Interpreting the Front and Back Panel LEDs

The Sun Fire V120 and Netra 120 servers each contain two front panel LEDs:

- **A Power LED** (see FIGURE 10-7)
  This LED is lit when the server is powered on. It is unlit when the server is in standby mode.

- **A Fault LED** (see FIGURE 10-7)
  When the Fault LED is lit (but not flashing), this indicates a problem that is not fatal to the server but that you should attend to as soon as possible. Circumstances that cause the Fault LED to light up include the following:

  - The temperature inside the server's enclosure is unusually high.

  - The voltage on one of the server's output supply rails is unusually high.

  - One of the server's internal circuit breakers has tripped, indicating a problem with a device connected to the SCSI or USB ports.

  - The System Configuration Card, containing the server's serial number, MAC address and NVRAM settings, has been removed.

  - One of the DC power inlets has failed.

  - The LOM watchdog has timed out, indicating that the server has locked up. You can configure the server to restart automatically after a lockup (see Section 9.2, "Configuring Automatic Server Restart (ASR)" on page 9-8).

When the Fault LED flashes on and off, a problem has occurred that is fatal to the server. Circumstances that cause the Fault LED to flash include the following:

- The speed of one of the fans inside the server is too low.

- The temperature inside the server's enclosure is too high. (By default, this causes the server to shut down. For information about configuring the server not to shut down in this condition, see Appendix C.)

- The voltage on one of the server's output supply rails is too high. (By default, this causes the server to shut down. For information about configuring the server not to shut down in this condition, see Appendix C.)
- The temperature inside the CPU is too high. (This causes the server to shut down.)
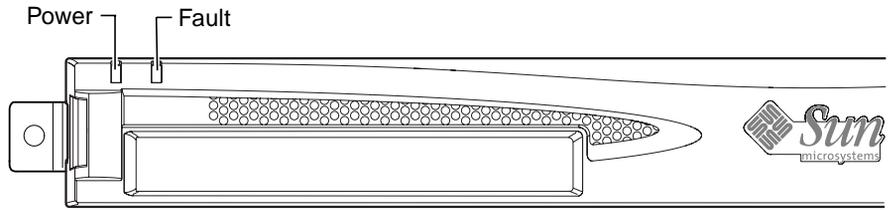
FIGURE 10-7 Front Panel Power and Fault LEDs

The server contains four rear panel LEDs (see FIGURE 10-8):

- **A Power LED**
  This replicates the Power LED on the front panel.

- **A Fault LED**
  This replicates the Fault LED on the front panel.

- **A Link LED for each Ethernet port**
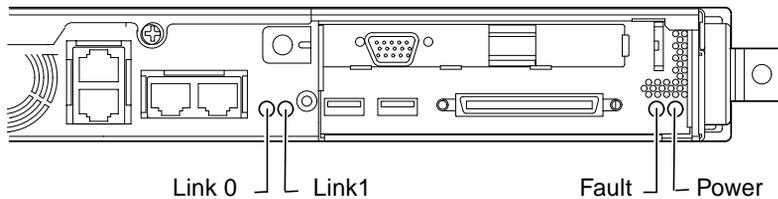 The light comes on to indicate that a connection has been established to the hub.

FIGURE 10-8 Back Panel Ethernet Link, Fault and Power LEDs

Replacing a Server or Replacing Individual Components

If you ever need to replace an entire Sun Fire V120 or Netra 120 server, this chapter describes how to transfer the old server's configuration information (including its MAC address, serial number and NVRAM settings) to a new server by using the old server's configuration card.

The chapter also lists the field replaceable units (FRUs) that you might need to order for your server during its life-time.

Finally, this chapter describes how to install the main FRUs, for example, the system board, power supply, and fans.

The chapter contains the following sections:

11.1 Replacing a Server

The Sun Fire V120 and Netra 120 servers contain a memory card (accessible by removing the unit's front bezel) called the System Configuration Card. This card contains the values for the system's IDPROM (Host ID, MAC address, date, and Cyclic Redundancy Check value) and NVRAM variables. It is designed to be removable so that, if you ever need to replace an entire server, you can transfer the host ID and configuration data onto the new server. This makes the replacement of the server transparent to your network.

To transfer the configuration to a new server:

1. **Power down both the old and the new servers.**

2. **Remove the front bezel from both the old and the new servers.**

3. **Remove the system configuration card from the old server and insert it into the new one.**

4. **Replace the front bezel on the new server.**

   You can secure the new system configuration card by fixing a tie-wrap through the hole in the front mounting of the memory card reader (see FIGURE 11-1).

Note – If you swap the System Configuration Card into a new Sun Fire V120 or Netra 120 server, transfer the hard disk(s) from the old server into the corresponding bay(s) on the new server. Otherwise, when you boot the new server, the operating system will prompt you for some of the information that you first configured the old system with, including the language, locale, and root password.

Caution – Never remove the System Configuration Card when the server is booting or running the Solaris operating environment. Power the server off or down to standby mode before removing or inserting the System Configuration Card.

<table>
<tr>
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</td>
<td>

Caution – Do not handle the System Configuration Card unless you need to transfer it to another system. If you need to handle it for this reason, avoid contact with the gold terminals on the underside of the card.
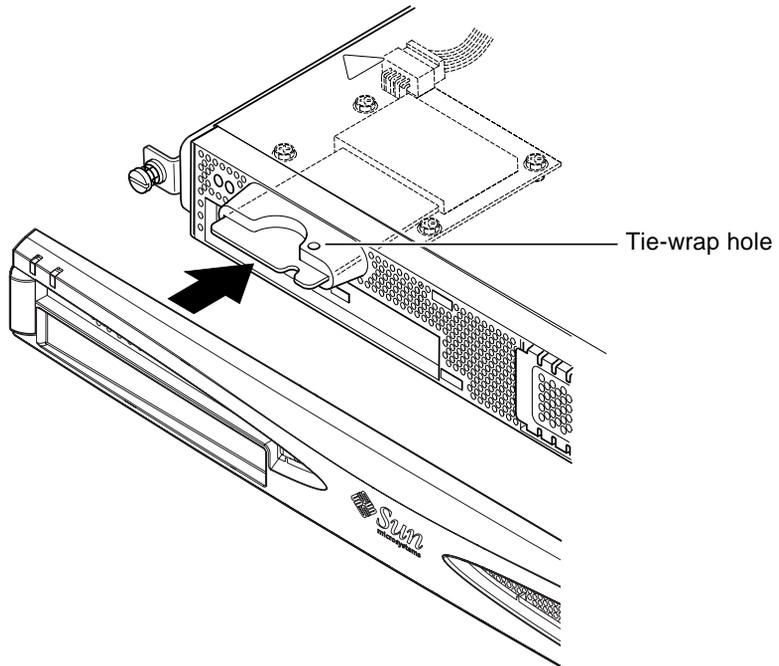
</td>
</tr>
</table>

FIGURE 11-1 Replacing the System Configuration Card

11.2 Field Replaceable Units

Note – The procedures in this chapter for replacing faulty components are for the attention of qualified service engineers only. If you need to replace a component, contact your local Sun sales representative who will put you in touch with the Sun Enterprise Service branch for your area. You can then arrange to return the system to Sun for repair under the terms of your warranty. Or alternatively you can order the components and have them installed by your own qualified service engineers.

TABLE 11-1 lists the field replaceable units (FRUs) available for the Sun Fire V120 and Netra 120 servers. FRUs are hardware components that are normally installed by Sun engineers and not by users.

TABLE 11-1 FRUs Available for the Sun Fire V120 and Netra 120 Servers

Component	Part Number
Internal CD-ROM (including cabling and paddle board)	F370-4278
Internal DVD-ROM (including cabling and paddle board)	F540-5014
18 Gbyte hard disk drive	F540-4177
36 Gbyte hard disk drive	F540-4689
256 Mbyte DIMM	F370-4237
512 Mbyte DIMM	F370-4281
1 Gbyte DIMM	F370-4874
System board (containing 550 MHz CPU)	F375-3064
System board (containing 650 MHz CPU)	F375-3065
Memory card reader (for the system configuration card)	F370-4290
AC power supply	F300-1488
DC power supply	F300-1489
Rear fan subassembly (containing Fans 1 and 2)	F540-5198
System configuration card	F370-4285
Fan 3 (CPU fan)	F370-4860
NVRAM chip (including carrier)	F100-6889

For instructions about how to install DIMMs, see Chapter 4.

11.3   Replacing the Memory Card Reader for the System Configuration Card

⚠ **Caution –** The procedure below is for the attention of qualified service engineers only. Before touching or replacing any components inside the server, disconnect all cables and follow the instructions in Section 4.2, "Opening the Server" on page 4-4 which tell you how to open the system. Always place the server on a grounded ESD pad and wear a properly grounded antistatic wrist strap.

1. **Open the server by following the instructions in Chapter 4 ("Opening the Server" on page 4-4).**

   Make sure all external cables are disconnected and pay particular attention to the information about how to prevent electrostatic discharge from your body from damaging the components of the server.

2. **With the server open and seated on top of an ESD pad, and with a properly grounded antistatic wrist strap on your wrist, remove the power cable from the connector on the memory card reader board (see** FIGURE 11-2**).**

3. **Unscrew the screws fixing the memory card reader board into the top of the CD-ROM drive bay (see** FIGURE 11-2**).**

   Do not discard the screws.

4. **Remove the old system configuration card reader.**

5. **Position the new memory card reader board by lining up its fixing holes with the holes in the top of the CD-ROM drive enclosure.**

6. **Insert and tighten the fixing screws.**

7. **Attach the power cable to the memory card reader board.**

Card
reader's
cable
connector
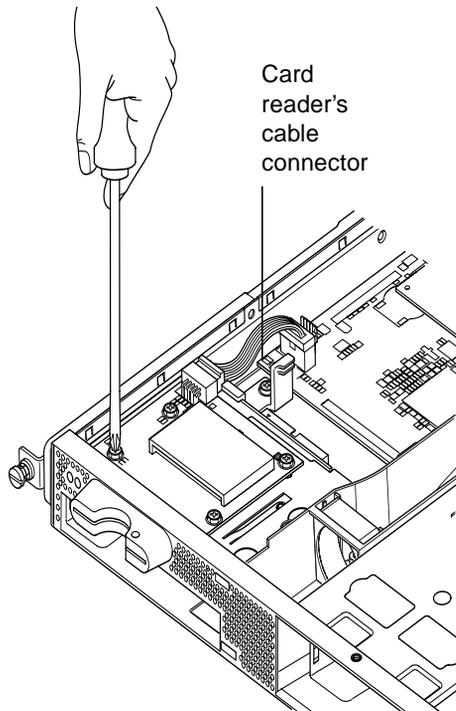
FIGURE 11-2 Removing the System Configuration Card Reader

11.4 Replacing the DVD or CD-ROM Drive, Cable, and Paddleboard

⚠️

Caution – The procedure below is for the attention of qualified service engineers only. Before touching or replacing any components inside the server, disconnect all cables and follow the instructions in Section 4.2, "Opening the Server" on page 4-4 which tell you how to open the server. Always place the server on a grounded ESD pad and wear a properly grounded antistatic wrist strap.

1. **Open the server by following the instructions in Chapter 4 ("Opening the Server" on page 4-4).**

   Make sure all external cables are disconnected and pay particular attention to the information about how to prevent electro-static discharge from your body from damaging the components of the server.

2. **With the system open and seated on top of an ESD pad, and with a properly grounded antistatic wrist strap on your wrist, do the following:**

   a. **Remove the old DVD or CD-ROM drive from the chassis (see Section 4.4.2, "Removing a DVD or CD-ROM Drive" on page 4-9).**

   b. **If you have a full-length PCI card installed, remove it (see Section 4.6.2, "Removing a PCI Card" on page 4-14).**

3. **Disconnect the memory card reader board's power cable from the system board (see FIGURE 11-3).**

4. **From the chassis base, unscrew the plastic bracket that secures the paddleboard (and that also provides support for a full-length PCI card).**

5. **Lift the paddleboard (with its ribbon cable) out of its guides at the back of the DVD or CD-ROM drive enclosure and discard it.**

6. **Connect the new IDE ribbon cable to the system board with the cable extending away from the system board and towards the DVD or CD-ROM drive (see FIGURE 11-3).**

7. **Now connect the ribbon cable to the connector on the paddleboard.**

8. **Insert the paddleboard into the guides at the back of the DVD or CD-ROM drive enclosure in the chassis.**

   Do not replace the plastic bracket yet.

9. **Reconnect the memory card reader board's power cable to its connector on the system board.**

10. **Insert the new DVD or CD-ROM drive (see Section 4.4.1, "Installing a DVD or CD-ROM Drive" on page 4-7).**

11. **Now replace the plastic bracket that secures the paddleboard, and screw it into the chassis base (see** FIGURE 11-3**).**

12. **Replace the full-length PCI card if you removed it earlier (see Section 4.6.1, "Installing a PCI Card" on page 4-11).**

13. **Replace the system cover and tighten the captive screw (see** FIGURE 4-9 **in Section 4.7, "Replacing the Server's Top Cover" on page 4-14).**

Plastic
bracket

Card
reader's
cable
connector
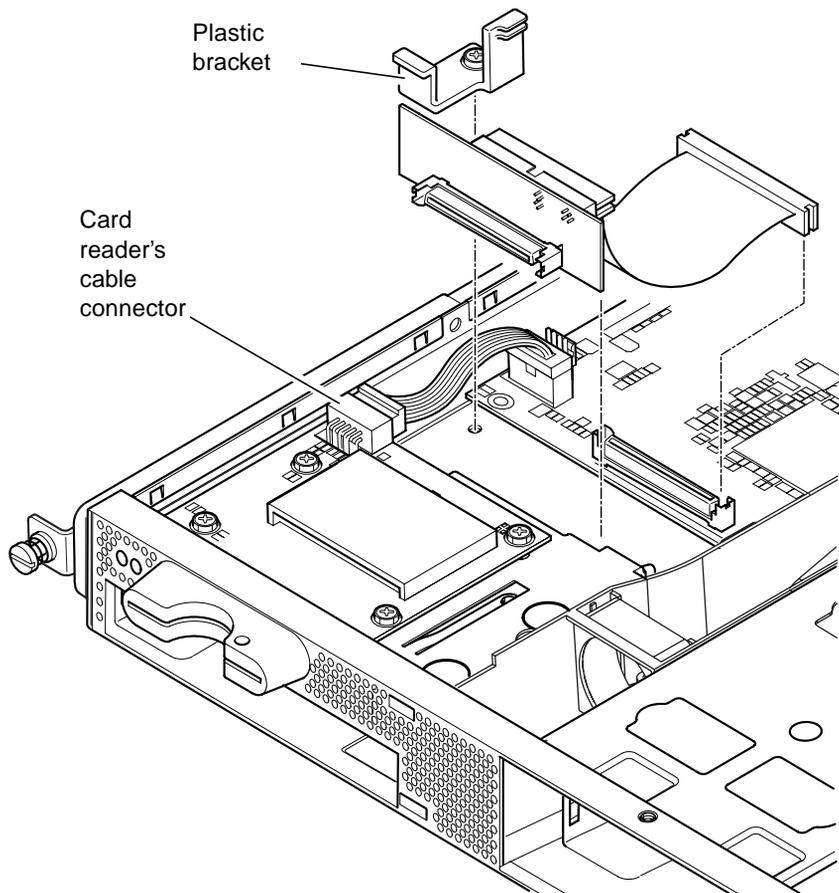
FIGURE 11-3 Replacing the Paddleboard at the Back of the DVD or CD-ROM Drive Enclosure

11.5 Replacing the NVRAM Chip

⚠ **Caution –** The procedure below is for the attention of qualified service engineers only. Before touching or replacing any components inside the server, disconnect all cables and follow the instructions in Section 4.2, "Opening the Server" on page 4-4 which tell you how to open the system. Always place the system on a grounded ESD pad and wear a properly grounded antistatic wrist strap.

The NVRAM chip on the server's system board contains a lithium battery that in time may need replacing. If you see the following message on your console when you boot the server:

```
Warning -- Real-Time-Clock (and NVRAM) battery is low
```

order a new NVRAM chip (part number: F100-6889) from your local Sun sales representative. Take note of the caution below.

⚠ **Caution –** There is a danger of explosion if the NVRAM chip is incorrectly replaced. Replace it only with a component of the same type as the used one (part number F100-6889). To replace the chip, follow any instructions supplied with the new component. Dispose of the used component according to the manufacturer's instructions.

The NVRAM chip is located in a carrier between the rear fan subassembly and the DIMM sockets on the system board (see FIGURE 11-4). To replace it:

1. **Make a note of the current settings of the environment parameters** diag-switch? **and** diag-level. **You will need these values to carry out Step 5.**

   To check the setting for diag-switch?, type:

   ```
   ok printenv diag-switch?
   ```

   To check the setting for diag-level, type:

   ```
   ok printenv diag-level
   ```

2. **Open the server by following the instructions in Section 4.2, "Opening the Server" on page 4-4).**

   Make sure all external cables are disconnected and pay particular attention to the information about how to prevent electrostatic discharge from your body from damaging the components of the server.

Hard disks

DIMM sockets
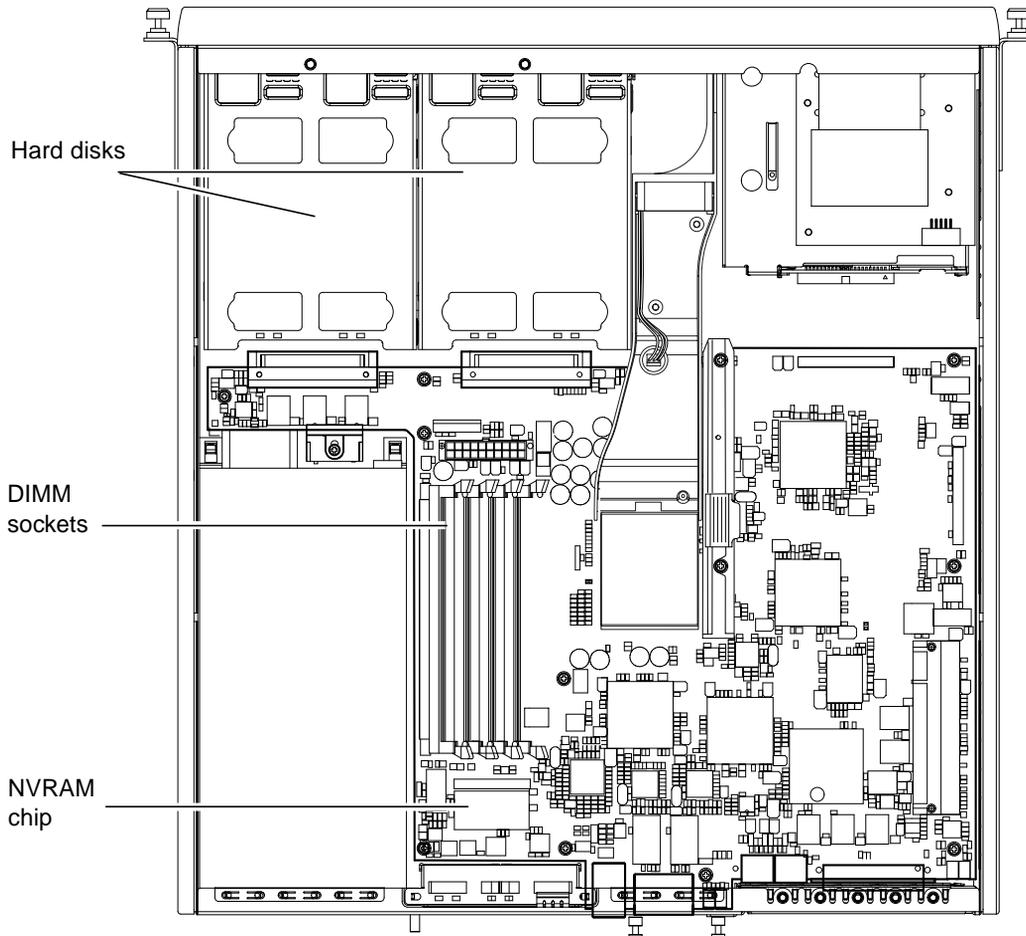
NVRAM chip

FIGURE 11-4 The Location of the NVRAM Chip

3. **Carefully take the NVRAM chip carrier lengthwise between your thumb and forefinger and pull it out of its socket (see** FIGURE 11-5**).**

4. **Holding the new NVRAM chip carrier in a similar fashion between your thumb and forefinger, position it over the socket and press firmly until the connectors engage.**

5. **When you have reconnected the cables and powered the server on, type the following at the** ok **prompt, using the values you noted in Step 1:**

```
ok reset-all
ok setenv diag-switch? noted_value
ok setenv diag-level noted_value
ok reset-all
```
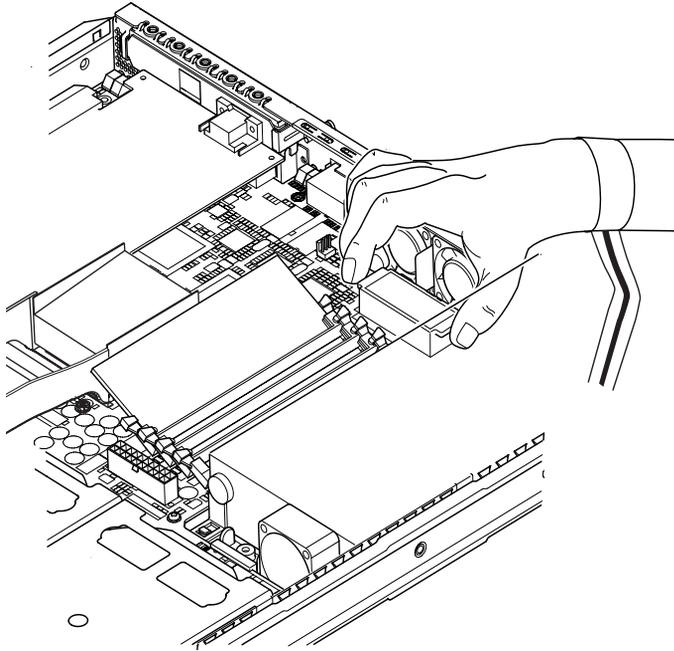

FIGURE 11-5 Replacing the NVRAM Chip

6. **Replace the system cover and tighten the captive screw (see** FIGURE 4-9 **in Section 4.7, "Replacing the Server's Top Cover" on page 4-14).**

11.6 Replacing the System Board

⚠️

Caution – The procedure below is for the attention of qualified service engineers only. Before touching or replacing any components inside the server, disconnect all cables and follow the instructions in Section 4.2, "Opening the Server" on page 4-4 which tell you how to open the server. Always place the server on a grounded ESD pad and wear a properly grounded antistatic wrist strap.

To perform the steps in this section, you need a 5mm nut-spinner to remove and replace the SCSI pillars on the rear of the chassis.

11.6.1 Removing the Old System Board

1. **Open the server by following the instructions in Section 4.2, "Opening the Server" on page 4-4.**

   Make sure all external cables are disconnected and pay particular attention to the information about how to prevent electro-static discharge from your body from damaging the components of the server.

2. **With the server open and seated on top of an ESD pad, and with a properly grounded antistatic wrist strap on your wrist, do the following:**

   a. **Disconnect all power supply cables from the system board.**

   b. **Disconnect the DVD or CD-ROM ribbon cable from the system board.**

   c. **Disconnect the memory card reader cable from the system board.**

3. **Remove the server's front bezel.**

4. **Remove the hard disk drives in the server (see Section 4.1, "Installing and Removing Hot-Pluggable SCSI Hard Disk Drives" on page 4-2).**

5. **Remove the PCI card if you have one installed (see Section 4.6.2, "Removing a PCI Card" on page 4-14).**

6. **Remove the DIMMs from their slots (see Section 4.5, "Installing and Removing Memory" on page 4-9).**

7. **Remove the rear fan subassembly (see Section 11.8, "Replacing the Rear Fan Subassembly (Fans 1 and 2)" on page 11-19).**

8. **Unplug the power cable for Fan 3 (see** FIGURE 11-6**) and undo the two screws that fasten the ducting assembly to the chassis.**
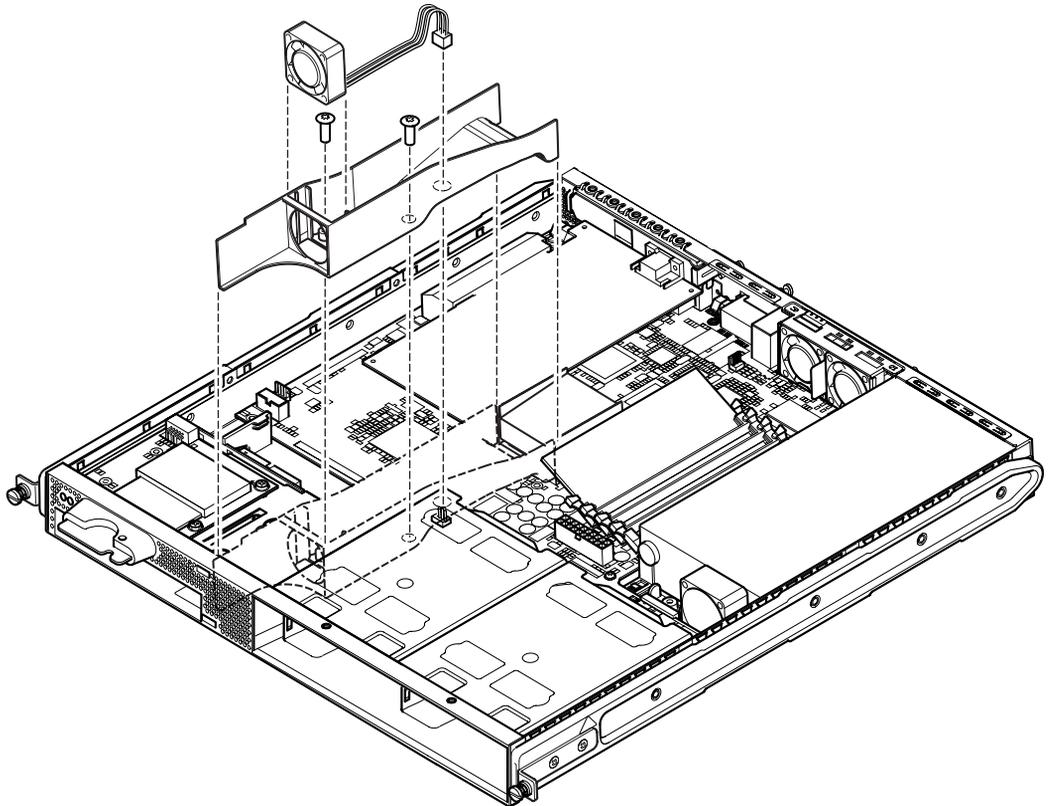
FIGURE 11-6 Unplugging and Removing the Fan 3 Assembly

9. **Pull the fan and ducting assembly away from the chassis (see** FIGURE 11-6**).**

10. **Unscrew the system board protection/support block (between the PSU and Hard Disk Drive bay 1) and slide it back as far as the PSU (see** FIGURE 11-7**).**

11. **Unscrew and remove the PCI card slide retainer (see** FIGURE 11-7**).**

12. **Unscrew all system board fixing screws (see** FIGURE 11-7**).**

13. **Unscrew the SCSI pillars on the back panel (see** FIGURE 11-7**).**

14. **Slide the system board towards the front of the chassis so that the SCSI, Ethernet and Serial connectors come free from the chassis.**

15. **Carefully lift out the system board.**

Alignment
stand-off

System board
protection/
support block

SCSI
pillars
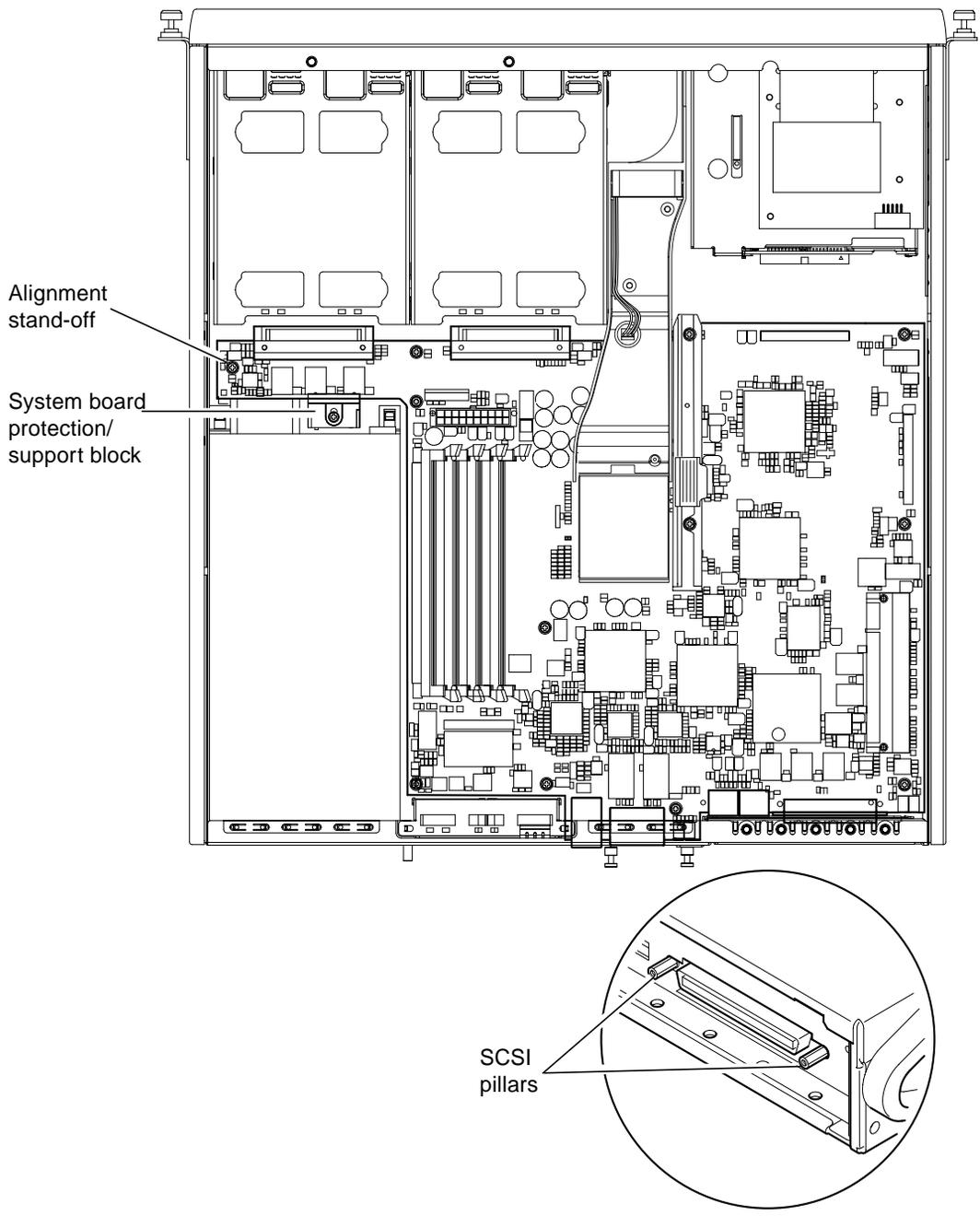
FIGURE 11-7 The System Board

11.6.2　Installing the New System Board

> **Note –** The system board contains a jumper (JP8) that identifies the hardware to the system software as either a Sun Fire V120 or a Netra 120. The factory default setting for JP8 on FRU replacement system boards (F375-3064 and F275-3065) identifies them as Sun Fire V120s. Before installing a new system board, make sure that the setting for JP8 is correct for the model of system you are installing it into. To check the jumper settings, see Appendix D. Do not alter any other jumper settings.

1. **Check that the setting for jumper JP8 on the new system board is correct for the model of server you are installing it into (see** Appendix D**).**

2. **Insert the new system board at an angle, and locate it so that the SCSI, Ethernet, and serial connectors are firmly positioned in their slots at the rear of the chassis.**

3. **Now position the system board on the alignment stand-off between the PSU fan and hard disk drive bay 1 (see** FIGURE 11-7**).**

4. **Insert the SCSI pillars (see** FIGURE 11-7**) and replace their screws loosely.**

5. **Insert all system board fixing screws loosely (see** FIGURE 11-7**). Do not put any screws in the holes for the PCI card slide retainer.**

6. **Tighten up the SCSI pillars, then tighten all the other screws.**

7. **Replace the PCI card slide retainer.**

8. **Replace the DIMMs that you removed from the old system board (see** Section 4.5, "Installing and Removing Memory" on page 4-9**).**

9. **Replace the rear fan assembly (see Section 11.8, "Replacing the Rear Fan Subassembly (Fans 1 and 2)" on page 11-19).**

10. **Replace the Fan 3 assembly by screwing the ducting back into the chassis and connecting the fan's power cable into the connector on the new system board (see** FIGURE 11-8 **).**
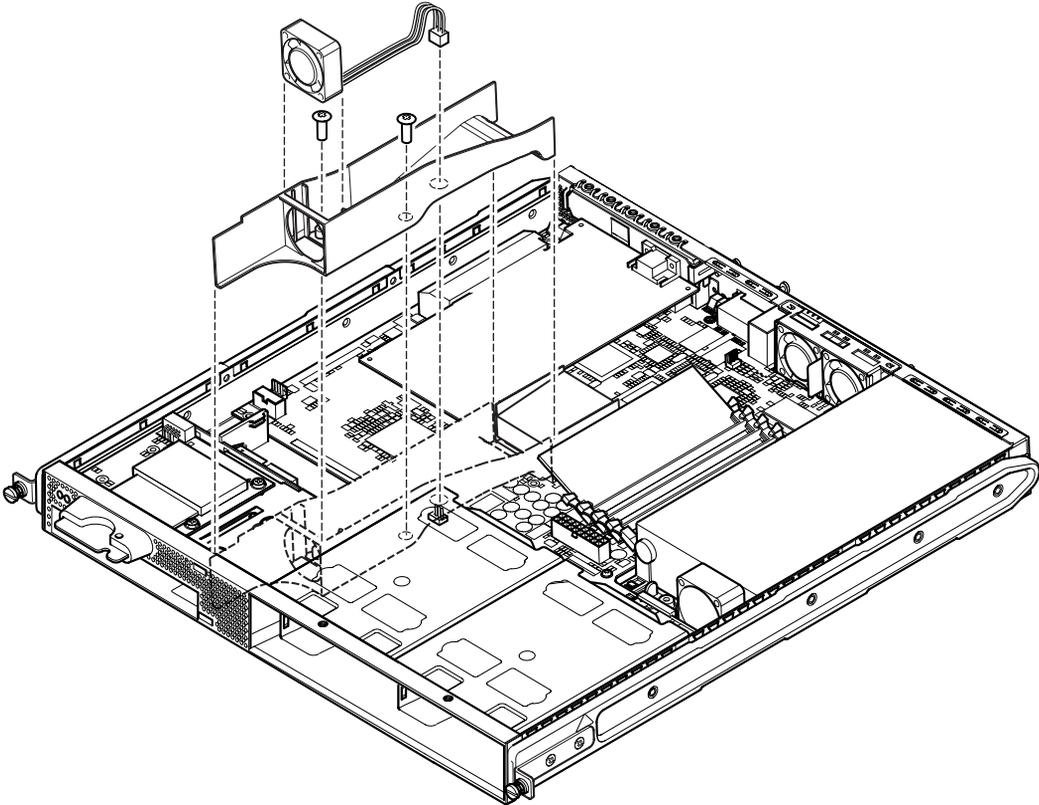
Replacing the Fan 3 Assembly

11. **Replace the PCI card if you removed it (see** Section 4.6.1, "Installing a PCI Card" on page 4-11**).**

12. **Slide the system board protection/support block forward until it engages with the the system board (see** FIGURE 11-7**).**

Tighten the screw to fix the block to the chassis.

13. **Reconnect all system board cables.**

14. **Replace the server's cover and tighten the captive screw (see** FIGURE 4-9 **in Section 4.7, "Replacing the Server's Top Cover" on page 4-14).**
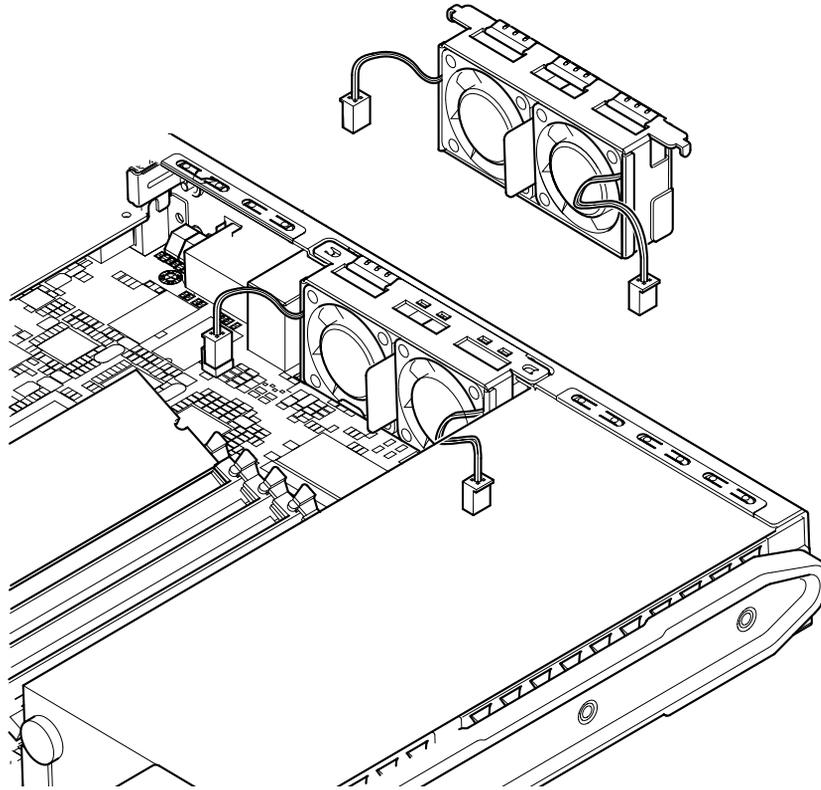
15. **Replace the front bezel.**

11.7 Replacing the Power Supply Unit

⚠ **Caution –** The procedure below is for the attention of qualified service engineers only. Before touching or replacing any components inside the server, disconnect all cables and follow the instructions in Section 4.2, "Opening the Server" on page 4-4 which tell you how to open the server. Always place the server on a grounded ESD pad and wear a properly grounded antistatic wrist strap.

1. **Open the server by following the instructions in Section 4.2, "Opening the Server" on page 4-4.**

   Make sure you disconnect all external cables and pay particular attention to the information about how to prevent electro-static discharge from your body from damaging the components of the server.

2. **With the server open and seated on top of an ESD pad, and with a properly grounded antistatic wrist strap on your wrist, disconnect the power supply cables from the system board.**

3. **Undo the two rear fixing screws (see** FIGURE 11-9**).**

4. **Move the power supply unit (PSU) towards the front of the system to release it from the location tabs in the base.**

   Lift it away from the chassis.

5. **Lift the new PSU over the location tabs and slide it backwards into place (see** FIGURE 11-9**).**

6. **Secure the two rear fixing screws.**

7. **Connect the power supply cables to the connectors on the system board.**

8. **Replace the server's cover and tighten the captive screw (see** FIGURE 4-9 **in Section 4.7, "Replacing the Server's Top Cover" on page 4-15).**
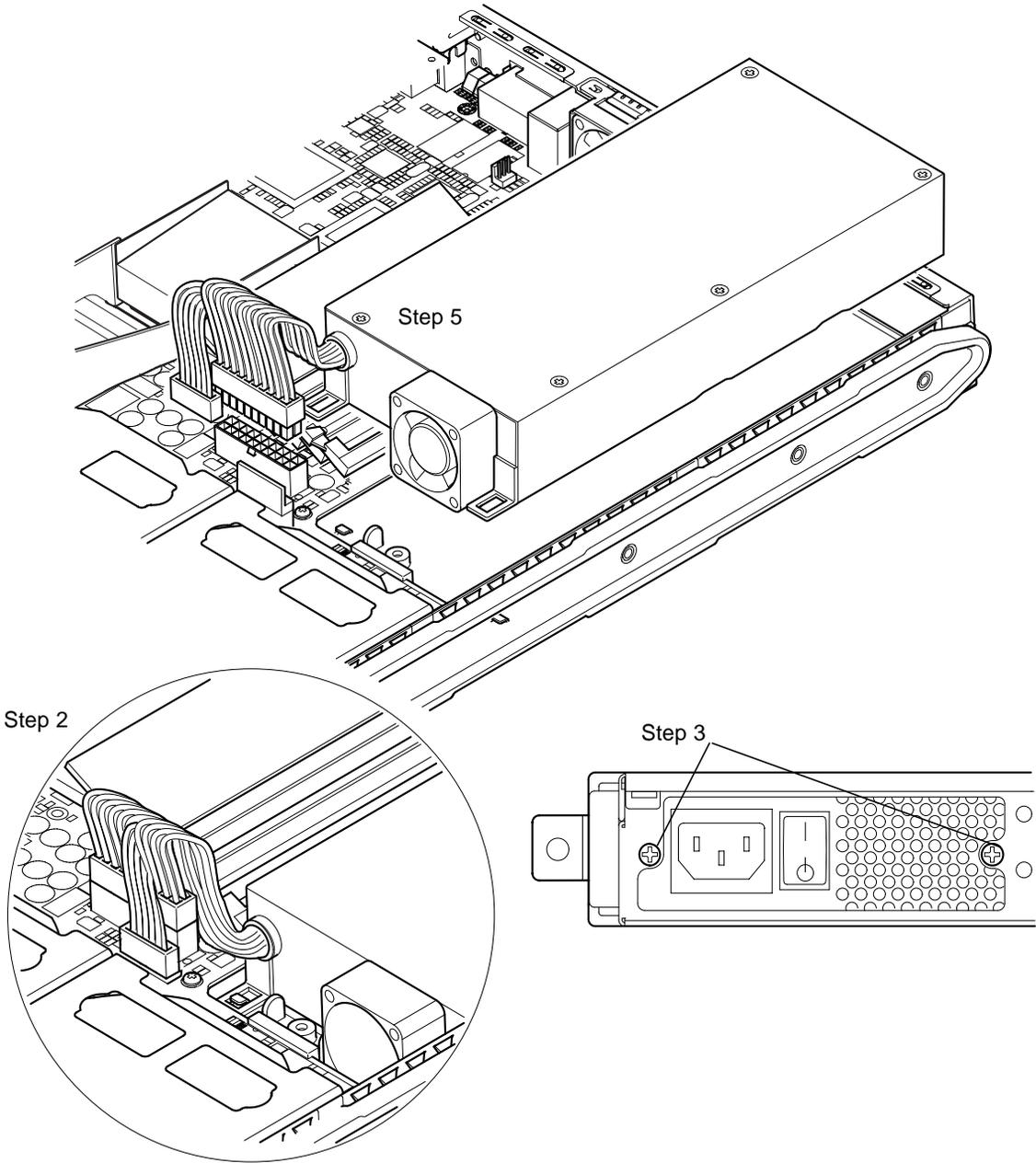
FIGURE 11-9 Replacing the Power Supply Unit

11.8 Replacing the Rear Fan Subassembly (Fans 1 and 2)

⚠ **Caution –** The procedure below is for the attention of qualified service engineers only. Before touching or replacing any components inside the server, disconnect all cables and follow the instructions in Section 4.2, "Opening the Server" on page 4-4 which tell you how to open the server. Always place the server on a grounded ESD pad and wear a properly grounded antistatic wrist strap.

1. **Open the server by following the instructions in Section 4.2, "Opening the Server" on page 4-4.**

   Make sure you disconnect all external cables and pay particular attention to the information about how to prevent electro-static discharge from your body from damaging the components of the server.

2. **With the server open and seated on top of an ESD pad, and with a properly grounded antistatic wrist strap on your wrist, disconnect the old subassembly's power cables from the system board (see** FIGURE 11-10**).**

3. **Lift out the old subassembly and discard it.**

4. **Insert the new fan subassembly into its bay in the chassis.**

5. **Connect the fan cables to the system board (see** FIGURE 11-10**).**

6. **Replace the server's cover and tighten the captive screw (see** FIGURE 4-9 **in Section 4.7, "Replacing the Server's Top Cover" on page 4-14).**

FIGURE 11-10 Replacing the Rear Fan Subassembly (Fans 1 and 2)

11.9 Replacing Fan 3

⚠️ **Caution –** The procedure below is for the attention of qualified service engineers only. Before touching or replacing any components inside the server, disconnect all cables and follow the instructions in Section 4.2, "Opening the Server" on page 4-4 which tell you how to open the server. Always place the server on a grounded ESD pad and wear a properly grounded antistatic wrist strap.

1. **Open the server by following the instructions in Section 4.2, "Opening the Server" on page 4-4.**

   Make sure all external cables are disconnected and pay particular attention to the information about how to prevent electrostatic discharge from your body from damaging the components of the server.

2. **With the server open and seated on top of a grounded ESD pad, and with a properly grounded antistatic wrist strap on your wrist, disconnect Fan 3's power cable (see** FIGURE 11-11**).**
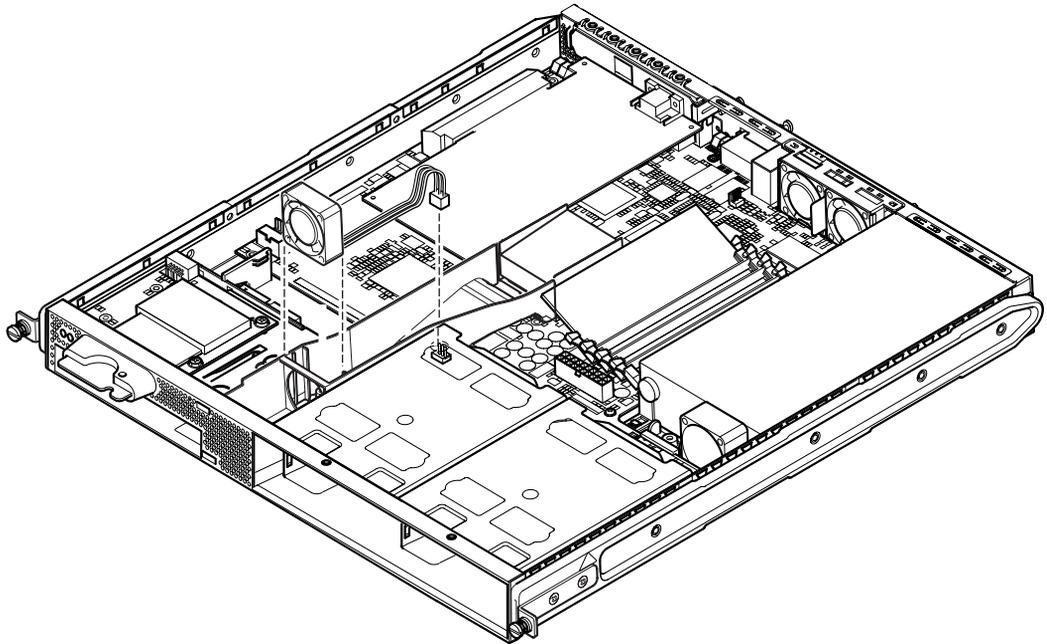
FIGURE 11-11 Disconnecting the Power Cable for Fan 3 and Lifting the Fan Out

3. **Take the fan between your forefinger and thumb and lift it out of its cradle.**

4. **Take the new fan and position it into the fan's cradle.**

5. **Connect the new fan's power cable to its connector on the system board.**

6. **Replace the server's cover and tighten the captive screw (see** FIGURE 4-9 **in Section 4.7, "Replacing the Server's Top Cover" on page 4-14).**

PART **IV**   Appendixes

Installing and Removing a SCSI Hard Disk Drive with Solaris Running

This appendix contains the following sections:

- Section A.1, "Installing a SCSI Hard Disk Drive With Solaris Running" on page A-2
- Section A.2, "Removing a SCSI Hard Disk Drive With Solaris Running" on page A-4

A.1 Installing a SCSI Hard Disk Drive With Solaris Running

Before performing the instructions in this section, install the Hard Disk Drive by following the instructions in Section 4.1, "Installing and Removing Hot-Pluggable SCSI Hard Disk Drives" on page 4-2.

We recommend you use the instructions below in conjunction with the cfgadm(M) man page.

1. **With the new Hard Disk Drive physically installed in the drive bay, log into the system as root and run the** format **command to make the disk visible to the Operating System.**

To do this, type the following (the sample output below is from a system containing two Hard Disk Drives):

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

AVAILABLE DISK SELECTIONS:
       0. c0t0d0 <SUN36G cyl 24427 alt 2 hd 27 sec 107>
          /pci@1f,0/pci@1/scsi@8/sd@0,0
       1. c0t1d0 <SUN36G cyl 24427 alt 2 hd 27 sec 107>
          /pci@1f,0/pci@1/scsi@8/sd@1,0
```

2. **Type the following command to find out the label of the new Hard Disk Drive (this appears in the** Ap_Id **column of the sample output):**

```
# 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
```

In the sample output above, the new disk is Disk 1 (in the server's outer drive bay).

3. **Connect the new disk logically to the Operating System by typing the following command, specifying the correct** `Ap_Id` **label for the disk you have installed (in this sample command the** `Ap_Id` **label is for Disk 1):**

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

4. **Confirm that the disk is now connected and configured by typing:**

```
# 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
```

5. **If you want to check that the disks are active, follow the instructions in Section 10.2.1, "Using the probe-scsi Command To Confirm That Hard Disk Drives Are Active" on page 10-8**

The disk is now available to be mounted for operation.

A.2 Removing a SCSI Hard Disk Drive With Solaris Running

If you are removing a Hard Disk Drive while the Operating System is still running, you must remove the drive logically from the Operating System before removing it physically. Follow the instructions in this section, then remove the Hard Disk Drive physically by following the instructions in Section 4.1, "Installing and Removing Hot-Pluggable SCSI Hard Disk Drives" on page 4-2.

We recommend you use the instructions below in conjunction with the cfgadm(M) man page.

1. **Check that the Hard Disk Drive you want to remove is visible to the Operating System.**

To do this, type the following:

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

AVAILABLE DISK SELECTIONS:
       0. c0t0d0 <SUN36G cyl 24427 alt 2 hd 27 sec 107>
          /pci@1f,0/pci@1/scsi@8/sd@0,0
       1. c0t1d0 <SUN36G cyl 24427 alt 2 hd 27 sec 107>
          /pci@1f,0/pci@1/scsi@8/sd@1,0
```

2. **Next find out the correct Ap_Id label for the Hard Disk Drive that you want to remove.**

To do this, type the following:

```
# 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
```

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

---

3. **Now unconfigure the Hard Disk Drive that you intend to remove.**

   To do this, 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".**

   To do this 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
   ```

5. **Confirm that the Hard Disk Drive you want to remove from the server is no longer visible to the Operating System.**

   To do this, type the following:

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

   AVAILABLE DISK SELECTIONS:
          0. c0t0d0 <SUN36G cyl 24427 alt 2 hd 27 sec 107>
             /pci@1f,0/pci@1/scsi@8/sd@0,0
   ```

6. **It is now safe to remove the Hard Disk Drive physically from the server without shutting down the Operating System.**

   To do this, follow the instructions in Section 4.1, "Installing and Removing Hot-Pluggable SCSI Hard Disk Drives" on page 4-2.

Reinstalling the Solaris Operating Environment

This appendix contains the following sections:

- Section B.1, "Reinstalling Solaris" on page B-2
- Section B.2, "Reinstalling the Lights-Out Management Software" on page B-2

B.1 Reinstalling Solaris

The Sun Fire V120 and Netra 120 servers are supplied with the Solaris operating environment preinstalled.

If for any reason you decide to reinstall the Solaris operating environment (for example, if you need to repartition your root disk or recover from a failure), obtain the Solaris media kit from your Sun sales representative, and follow the instructions in the *Solaris Installation Guide* and the *Solaris Advanced Installation Guide.*

For information about the versions of Solaris supported by the Sun Fire V120 and the Netra 120, refer to the Product Notes supplied with the server.

B.2 Reinstalling the Lights-Out Management Software

If you reinstall the Solaris operating environment and you intend to use the Lights-Out Management (LOM) facilities, you must re-install the Lights-Out Management software from the CD entitled *Software Supplement for the Solaris Operating Environment.* This CD is included in the Solaris media kit. For the location of the LOM packages on the CD, refer to the *Sun Hardware Platform Guide* for the release of Solaris that you are using.

Note – If you do not reinstall the LOM software, the LOM facilities will not be available and layered applications that are dependent on them (for example, the Sun Management Center software) will not function correctly.

Configuring the LOM Device Driver

This appendix describes the driver parameters you can set in the `lom.conf` configuration file. Some of these parameters are also configurable by means of the LOM-specific Solaris commands described in Chapter 9.

The appendix contains the following sections:

- Section C.1, "The LOM Device Driver" on page C-2
- Section C.2, "Configuring the LOM Device Driver" on page C-3

C.1 The LOM Device Driver

The LOM driver software included in Solaris is as follows:

- `/platform/sun4u/kernel/drv/lom` (the `lom` driver (32-bit))
- `/platform/sun4u/kernel/drv/sparcv9/lom` (the `lom` driver (64-bit))
- `/platform/sun4u/kernel/drv/lom.conf` (the `driver` configuration file)

C.2 Configuring the LOM Device Driver

The full list of parameters you can set in this file is given in TABLE C-1.

TABLE C-1   LOM Configuration File Parameters

Field	Format	Default	Effect
wdog_reset=	Boolean 0=FALSE 1=TRUE	0	Causes the LOM to reset the server after a watchdog timeout. Setting this to 1 is equivalent to using the lom -R on command described in Chapter 9.
wdog_alarm3=	Boolean 0=FALSE 1=TRUE	0	Turns on software alarm 3 when the LOM watchdog times out.
serial_events=	0=OFF 1=ON 2=ON WHEN DRIVER NOT LOADED	2	Causes the LOM to report events over the serial connection. Setting this parameter to 0 means that no events will be reported over the serial connection. Setting it to 1 means that events will be reported over the serial connection as well as to syslogd; this is equivalent to lom -E on. If you have dedicated the Serial A/LOM port to the LOM device, you need to set this parameter to 1. It ensures that you receive all event reports at the terminal you have connected to Serial A/LOM. Finally, setting the parameter to 2 means that events will be reported over the serial connection, but only when the driver is not running (when it is running they will be reported to syslogd).
disable_wdog_on_break=	Boolean 0=FALSE 1=TRUE	1	Causes the LOM to disable its watchdog if it detects a break signal on the Serial A/LOM port.

TABLE C-1 LOM Configuration File Parameters *(Continued)*

Field	Format	Default	Effect
disable_wdog_on_panic=	Boolean 0=FALSE 1=TRUE	1	Causes the LOM to try to disable its watchdog after a system panic.
faulty_voltage_shutdown=	Boolean 0=FALSE 1=TRUE	1	Causes the LOM to attempt first to shut down the system and, if that fails, to power off the system in the event of a fatal problem with the supply rails.
enclosure_warning_temp=	^{o}C	67	Specifies the temperature at which the LOM generates a temperature warning.
over_temperature_shutdown=	Boolean 0=FALSE 1=TRUE	1	Causes the LOM to attempt to shut down the system, or to power it off, if the enclosure temperature exceeds the level specified for the enclosure_shutdown_temp parameter.
enclosure_shutdown_temp=	^{o}C	72	Specifies the enclosure temperature above which the LOM attempts to shut the system down, or, if this fails, to power the system off. (The LOM device will only attempt to do either of these if over_temperature_shutdown is set to 1.)
serial_security=	Boolean 0=FALSE 1=TRUE	1	Enables and disables the LOM user security facilities even if user security has been configured. You can use this parameter to set up users again if your users have forgotten their passwords.

TABLE C-1 LOM Configuration File Parameters *(Continued)*

Field	Format	Default	Effect
serial_timeout=	Multiples of 4 secs	0	Specifies the idle period after which the LOM device gives control of the Serial A/LOM port back to the console when it has finished sending a report. By default, there is no delay at all. If you enable the serial_return= option , the serial_timeout= option specifies the period that the LOM waits after each LOMlite command before giving control of the Serial A/LOM port back to the console. By default, there is no delay.
serial_return=	Boolean 0=FALSE 1=TRUE	0	Causes the LOM to return the user to the console from the lom> prompt after each LOM shell command. You can use this option in conjunction with the serial_timeout= option.
reporting_level=	Number between 0 and 4	3	The severity level down to which you want to see LOM event reports. 0 means no reports. 1 means Fatal event reports only. 2 means Fatal and Warning event reports. 3 means Fatal, Warning and Information event reports. 4 means Fatal, Warning, Information and User event reports. (User event reports concern the user security facility, you will not see any unless you have enabled the security facility and set up users.)

Each parameter must be on a separate line and must befollowed by an equals sign (=) and a value, without spaces. Where the format is Boolean, 1 means true and 0 means false.

System Board Jumper Settings

This appendix describes the functions and factory-default settings of the jumpers on the system board of the Sun Fire V120 and Netra 120 servers.

The Netra T1 server's system board contains several jumpers.

We do not recommend you change the jumper settings. However, for reference, the factory-default settings are listed in TABLE D-1, and the locations of the jumpers are shown in FIGURE D-1 (which also illustrates the default settings).

TABLE D-1   Factory-Default Jumper Settings

Jumper	Default Setting	Description
JP8	1-2 (Open) 3-4 (Fitted)	This is the factory default setting for replacement system boards. It identifies the system to OpenBoot PROM and Solaris as a Sun Fire V120 server. If you are installing a new system board for a Sun Fire V120, make sure that the jumpers match this setting.
	1-2 (Fitted) 3-4 (Open)	This setting identifies the system to OpenBoot PROM and Solaris as a Netra 120 server. If you are installing a new system board into a Netra 120, you must set the jumpers on the replacement board to match this setting. (Note that the factory default setting is for the Sun Fire V120, not for the Netra 120 system. This is why you must change the setting before installing the new board.)
JP7	1-2 (Open) 3-4 (Open) 5-6 (Fitted)	This jumper setting tells the system that its main processor is a 550 MHz CPU. Do not alter this setting. It is correct for the CPU on your system board.
	1-2 (Open) 3-4 (Fitted) 5-6 (Open)	This jumper setting tells the system that its main processor is a 650 MHz CPU. Do not alter this setting. It is correct for the CPU on your system board.
JP9	1-2 (Fitted)	This jumper is for use by Sun engineers in the development of OBP software. Do not alter its setting.
JP13	1-2 (Open)	This jumper is for use by Sun service engineers. It resets the LOM device. Do not alter this setting.
JP14	1-2 (Open)	This jumper is for use by Sun service engineers in the event that the LOM device on the system board is broken. The default setting is Open. If you alter this setting to Fitted, then, if the LOM is broken, you can use the On/Standby rocker switch to power the system on (or down to standby mode). Note that the power signals from the On/Standby switch pass through the LOM device, and that setting this jumper to Fitted causes the signals from the rocker switch to bypass the LOM.

TABLE D-1 Factory-Default Jumper Settings *(Continued)*

Jumper	Default Setting	Description
JP15	1-2 (Open)	This jumper is for use by Sun service engineers only. It enables and disables emergency recovery of the LOM firmware. In its default state (Open), recovery of the firmware is not possible. However, service engineers might need to follow a special procedure to recover the firmware for the LOM, and this procedure involves temporarily changing the setting of JP15 to Fitted. Afterwards, it must always be returned to Open.
JP16	1-2 (Fitted)	This jumper write-enables the OBP software to allow you to update it. If you need to protect the OBP software from being over-written, change the jumper setting to Open.
JP17	1-2 (Open)	This jumper tells the DVD or CD-ROM drive (if one is installed) that it is a Master ATA device. For the DVD and CD-ROM drives currently available for the Sun Fire V120 and Netra 120 systems, this jumper must be Open.
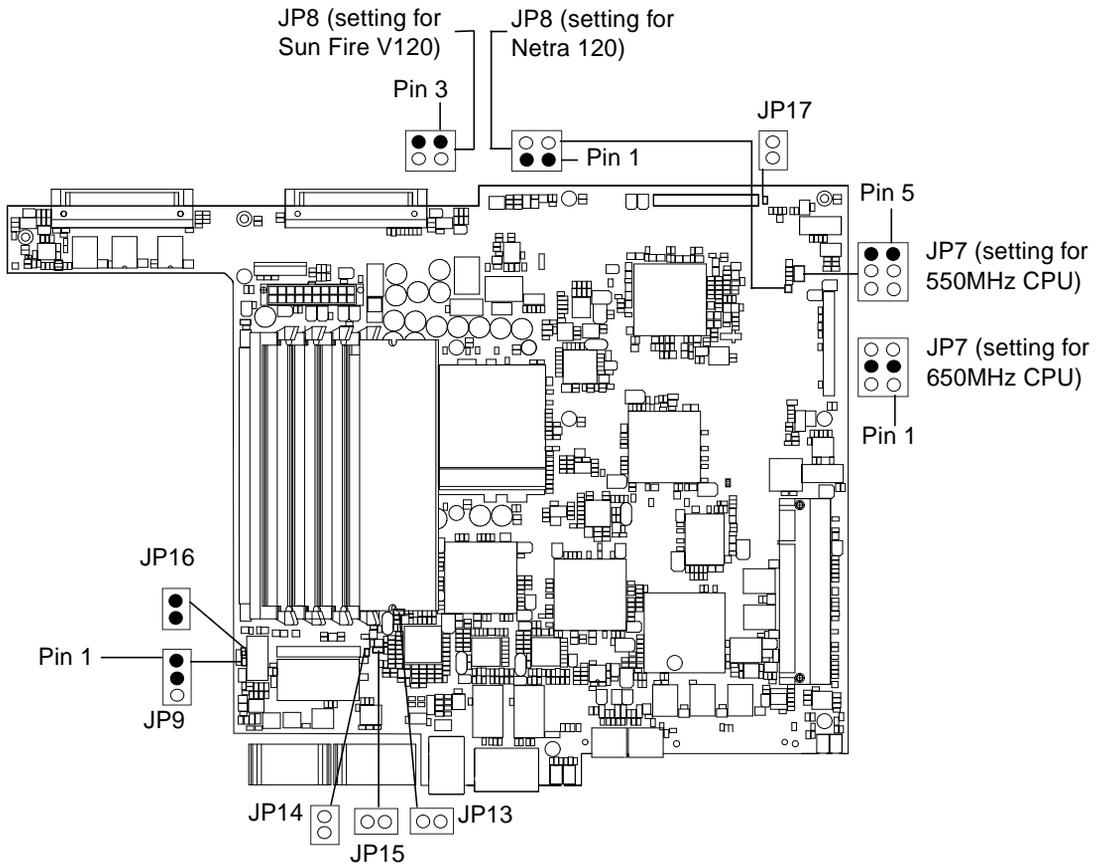
FIGURE D-1 System Board Jumper Locations and Default Settings

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