

Using DC Power

This chapter applies only to the Netra T1 DC200 server. If you have purchased a Netra T1 AC200 server, skip this chapter and go to Chapter 4.

This chapter provides information on grounding a Netra T1 DC200 server and on assembling the DC power connectors.

It contains the following sections:

- Section 3.1, “Grounding the Netra T1 DC200 Server” on page 3-2
- Section 3.2, “Assembling the DC Power Connectors” on page 3-3

3.1 Grounding the Netra T1 DC200 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.

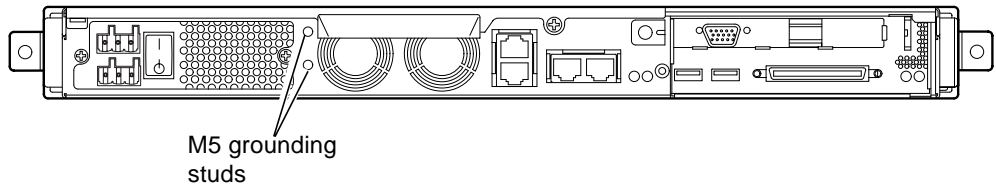


FIGURE 3-1 The Location of the Grounding Studs for Connecting the Two-Hole Lug

- **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 (6mm²) conductor, and that it has a 5/8-inch pitch.

Note – For Netra T1 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 *Netra T1 AC200 and DC200 Safety and Compliance Guide*.

3.2 Assembling the DC Power Connectors

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 mm²) (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 8 mm (0.31 inches) of insulation from each of the wires coming from the DC power source (see FIGURE 3-2).

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



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 pressing down on the screwdriver (see FIGURE 3-4).

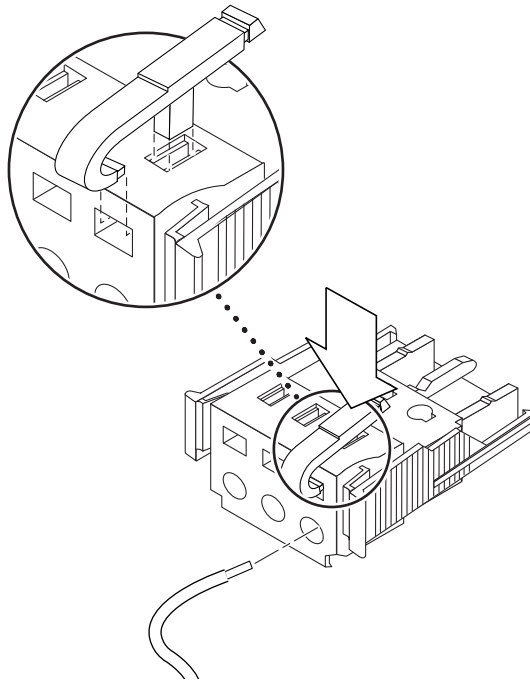


FIGURE 3-3 Opening the DC Connector Cage Clamp (Lever Method)

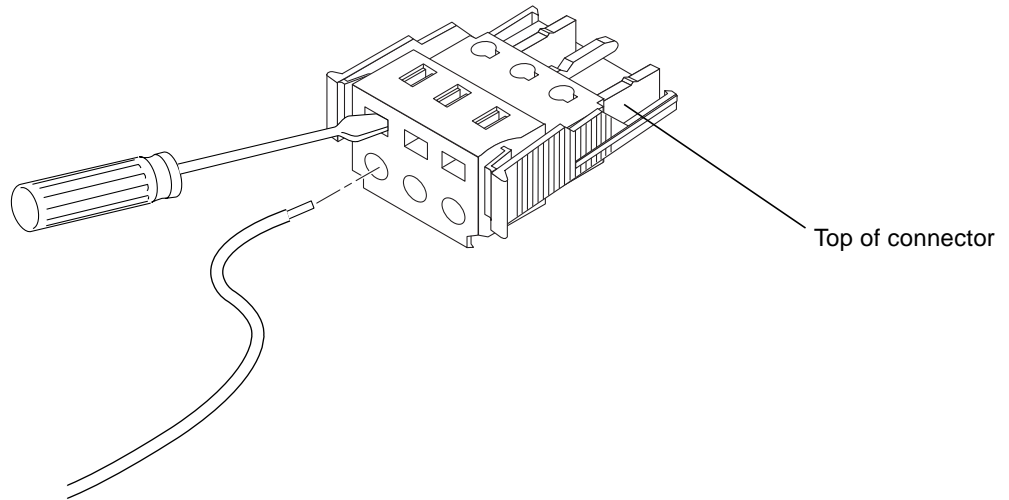


FIGURE 3-4 Opening the DC Connector Cage Clamp (Screwdriver Method)

- 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.

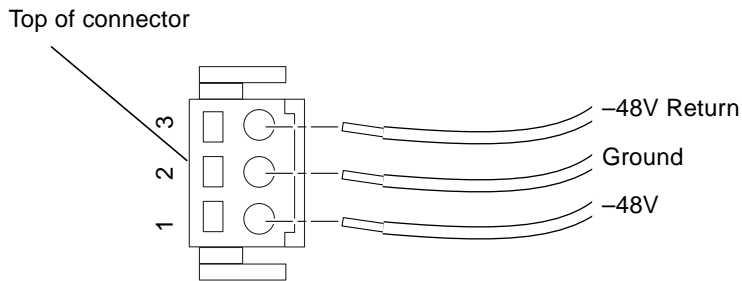


FIGURE 3-5 Assembling the DC Input Power Cable

- 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.

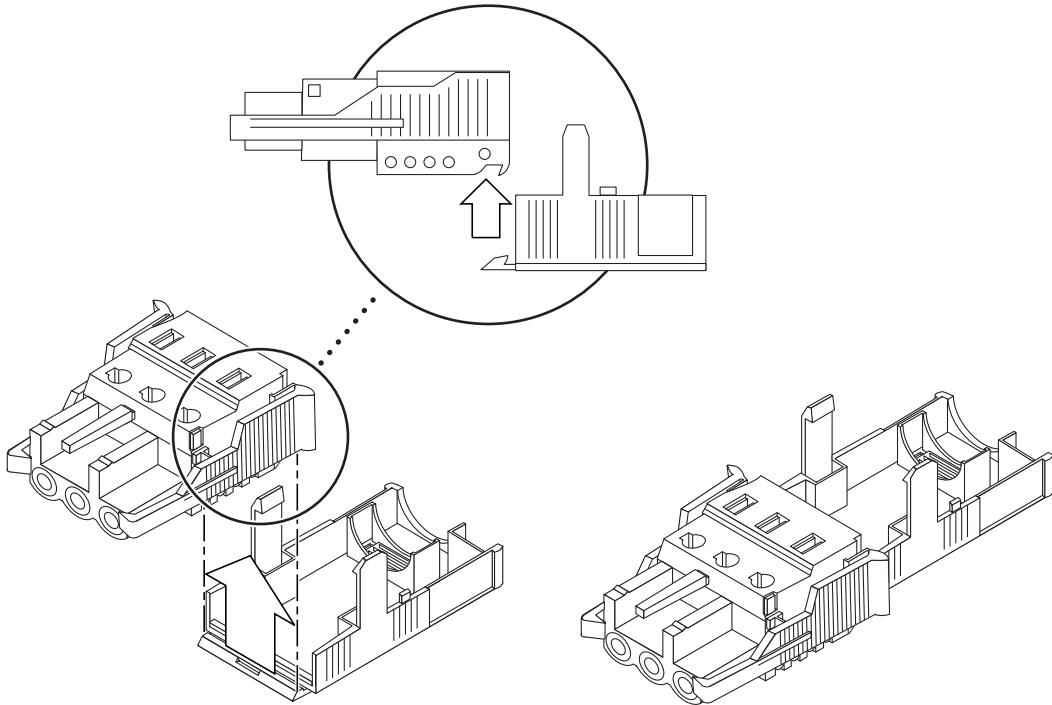


FIGURE 3-6 Inserting the Bottom Portion of the Strain Relief Housing

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).**

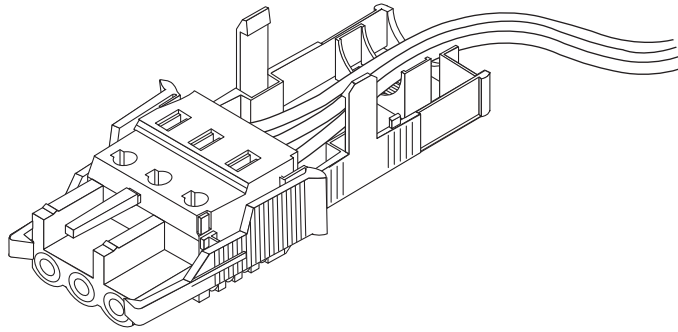


FIGURE 3-7 Routing the Wires Out of the Strain Relief Housing

- 3. Insert the tie wrap into the bottom portion of the strain relief housing (see FIGURE 3-8).**

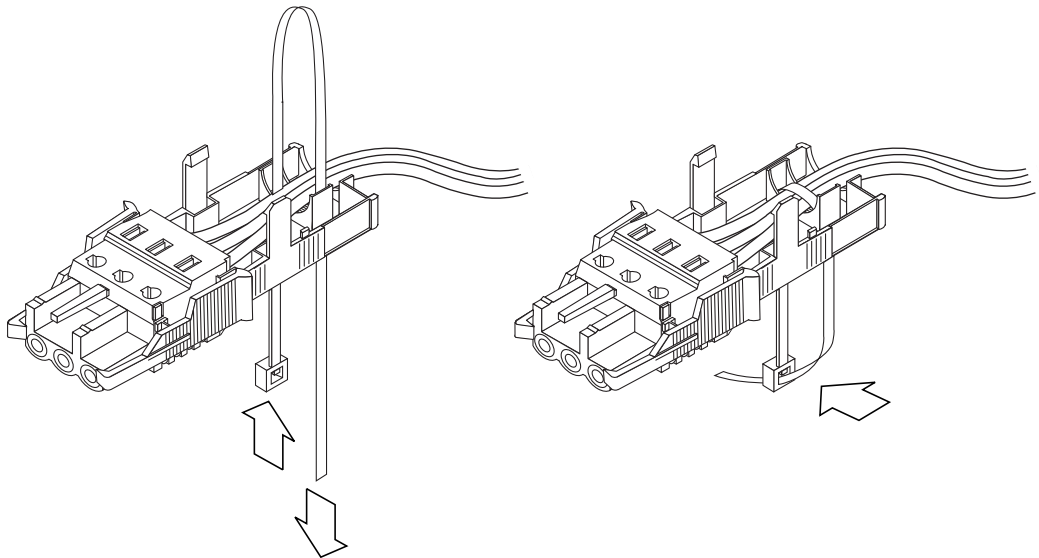


FIGURE 3-8 Securing the Wires to the Strain Relief Housing

- 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. Lower 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 the top and bottom portions of the strain relief housing together until they snap into place (see FIGURE 3-9).**

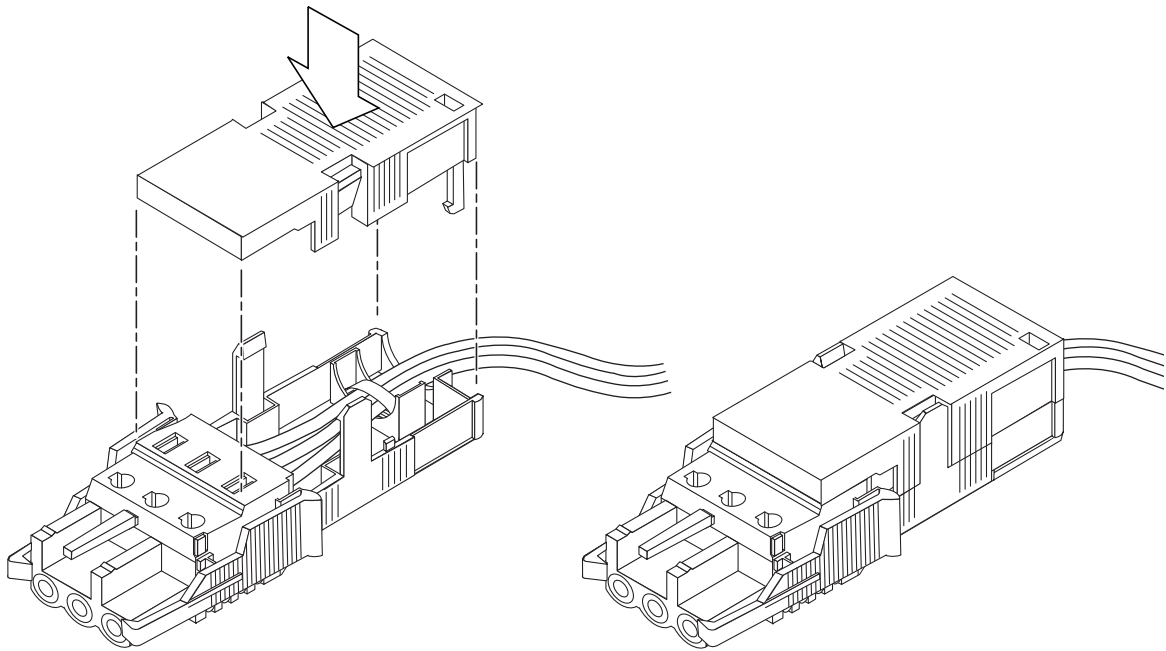


FIGURE 3-9 Assembling the Strain Relief Housing

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 Netra T1 server into a rack.

This chapter tells you how to install or remove the hot-pluggable hard disk drives available for the Netra T1 server. 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 Netra T1 server, how to identify the parts of the server, and how to install a CD-ROM drive, DIMM, and PCI card.

For the part numbers of the hardware components that are 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 Hard Disk Drives” on page 4-2
- Section 4.2, “Opening the Netra T1 Server” on page 4-4
- Section 4.3, “Identifying Server Components” on page 4-6
- Section 4.4, “Installing and Removing a 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 4-15

4.1 Installing and Removing Hot-Pluggable Hard Disk Drives

The hard disk drives are hot-pluggable modules. You do not need to power off the server or remove it from the rack to install or remove hard disk drives.

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 disk drive is touching the top of the enclosure. If you try to install it with the bottom of the disk 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 drive.

- If you are *removing* a hard disk drive, locate the latch at the front of the disk drive and slide it to the right (see FIGURE 4-1). This causes the metal lever to open. Holding the latch, pull the disk drive out of its bay.

4. Replace the grilles and front bezel.

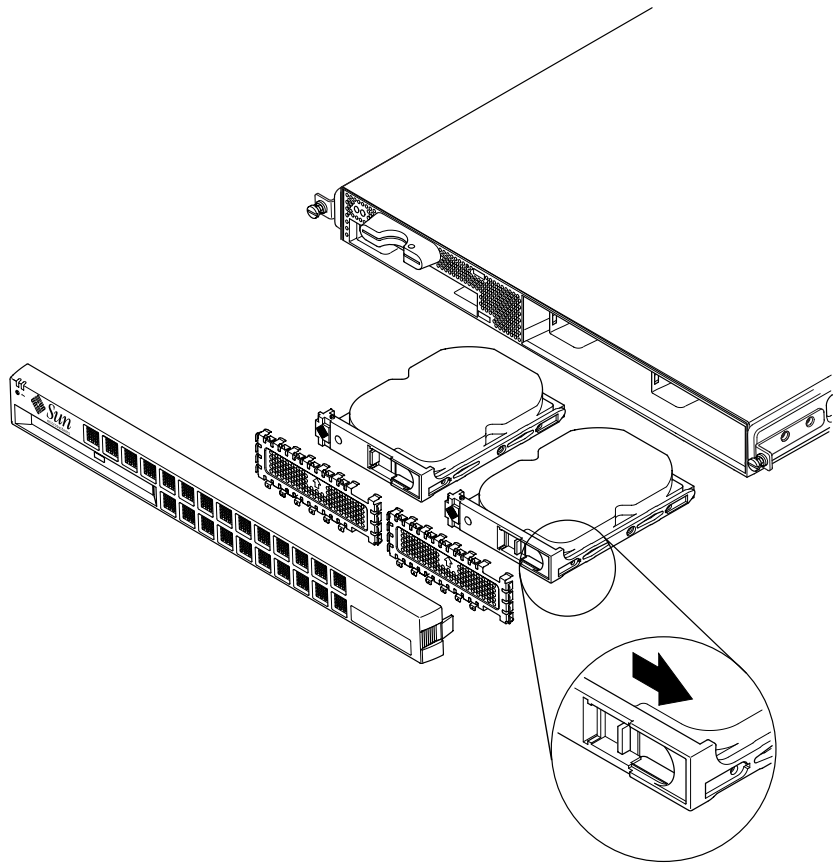


FIGURE 4-1 Inserting and Removing Hard Disks

4.2

Opening the Netra T1 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.

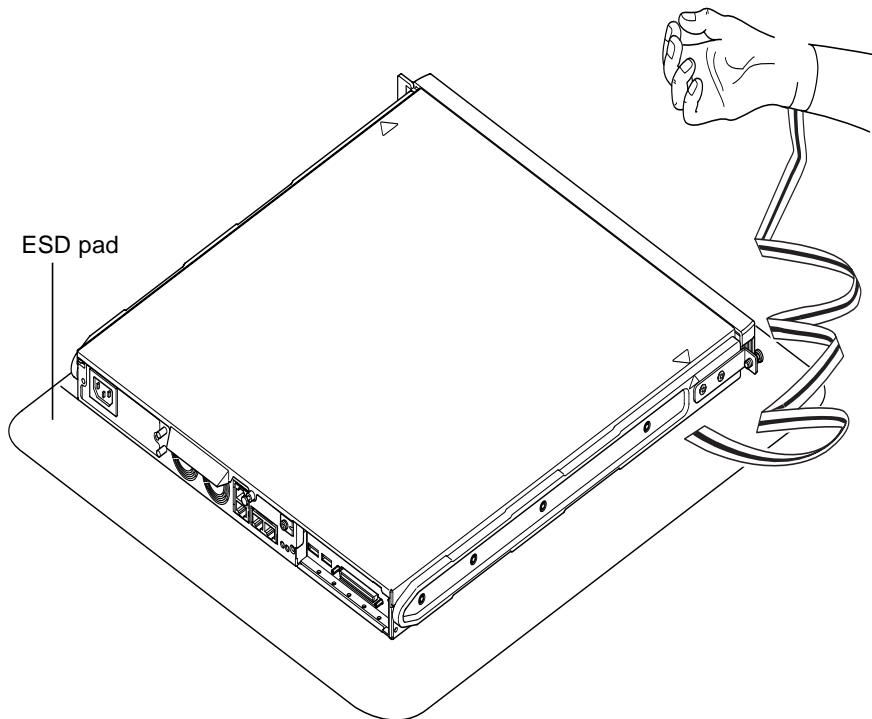


FIGURE 4-2 Using the Antistatic Wrist Strap Supplied With the Server

1. **Begin the procedure based on the status of your server:**

- 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).

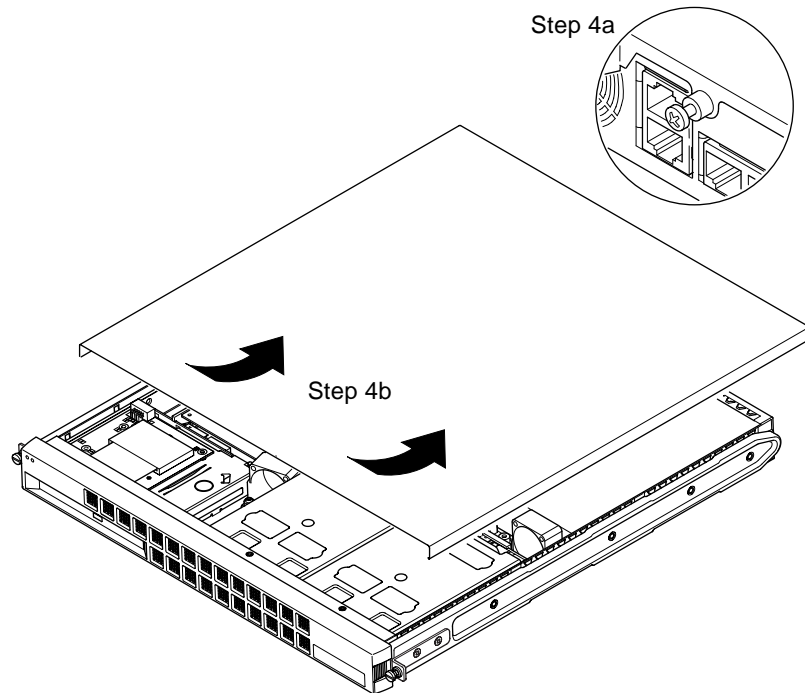


FIGURE 4-3 Removing the Top Cover

4.3 Identifying Server Components

Key to FIGURE 4-4:

1. PCI card (optional)
2. System configuration card reader
3. Top cover
4. Hard disk drive
5. CD-ROM drive
6. Filler panel
7. Front bezel
8. Grilles
9. PCI card slide support rail
10. DIMM
11. Power Supply Unit
12. Fans 1 and 2
13. Fan 3 (CPU)
14. Fan 4

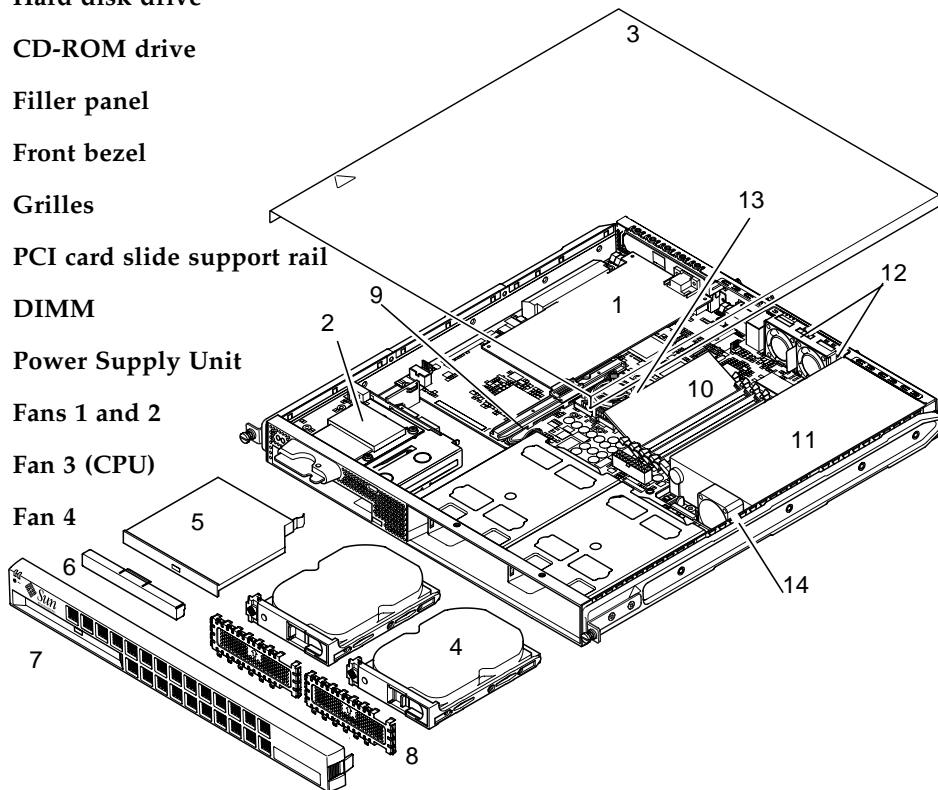
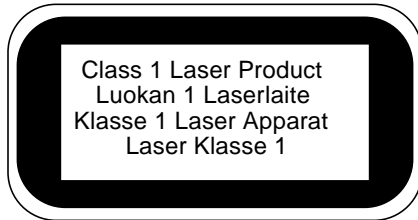


FIGURE 4-4 Components of the Netra T1 Server

4.4 Installing and Removing a CD-ROM Drive



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

4.4.1 Installing a CD-ROM Drive



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

1. **Remove the top cover by following the procedure described in Section 4.2, “Opening the Netra T1 Server” on page 4-4.**
Make sure you disconnect all power cables and wear an antistatic wrist strap.
1. **Remove the front bezel.**
Release it from the server by pressing in on the tabs at either end of the bezel.
2. **If you have a full-length PCI card installed, you must remove it before installing the CD-ROM drive (see Section 4.6.2, “Removing a PCI Card” on page 4-14).**
3. **Squeeze and pull out the filler panel at the front of the CD-ROM enclosure.**

4. Carefully insert the CD-ROM drive into its enclosure (see FIGURE 4-5), making sure that the catch at the rear of the CD-ROM drive clicks onto the chassis.

Guide the CD-ROM drive in making sure that its connectors align with, and then engage with, the connectors on the CD-ROM paddleboard (see FIGURE 4-5) at the back of the CD-ROM enclosure. You may need to hold the paddleboard by the black IDE connector to guide the CD-ROM drive home.

5. 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).
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 4-15).
7. Replace the front bezel.

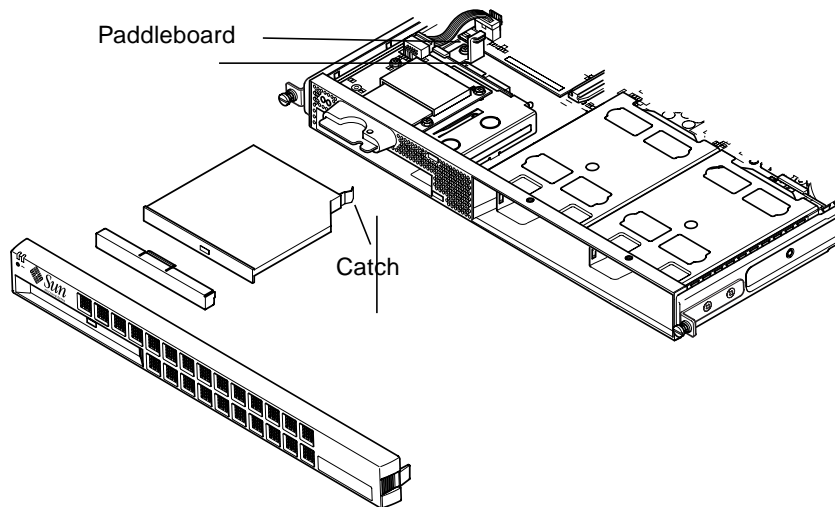


FIGURE 4-5 Installing an Internal CD-ROM Drive

4.4.2 Removing a CD-ROM Drive

1. **Remove the top cover by following the procedure described in Section 4.2, “Opening the Netra T1 Server” on page 4-4.**

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

1. **Remove the front bezel.**

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

2. **Unclip the catch which fastens the CD-ROM drive to the chassis. This catch is located at the back right-hand corner of the CD-ROM enclosure.**
3. **Carefully but firmly pull the CD-ROM drive out of its connector at the rear of the enclosure and pull the CD-ROM drive out.**
4. **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 4-15).**
5. **Replace the front bezel.**

4.5 Installing and Removing Memory

There are four memory module sockets on the Netra T1 system board. You can install a 256- or 512-Mbyte DIMM into each socket. For the maximum 2 Gbytes of memory, install four 512-Mbyte 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 Netra T1 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 4-15).

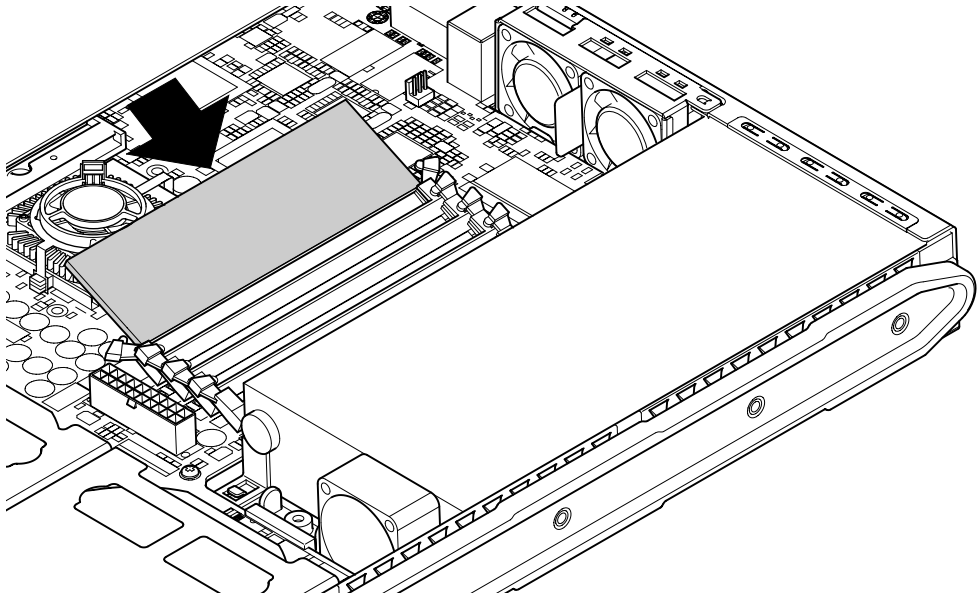


FIGURE 4-6 Installing Memory into a Socket on the System Board

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

4.6.1 Installing a PCI Card

For a list of the PCI cards available from your local Sun Sales representative, see Chapter 11.

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

To install a PCI card into the Netra T1, do the following:

- 1. Remove the top cover by following the procedure described in “Opening the Netra T1 Server” on page 4-4.**

Make sure you wear an antistatic wrist strap and that you 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 (see FIGURE 4-7) 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).

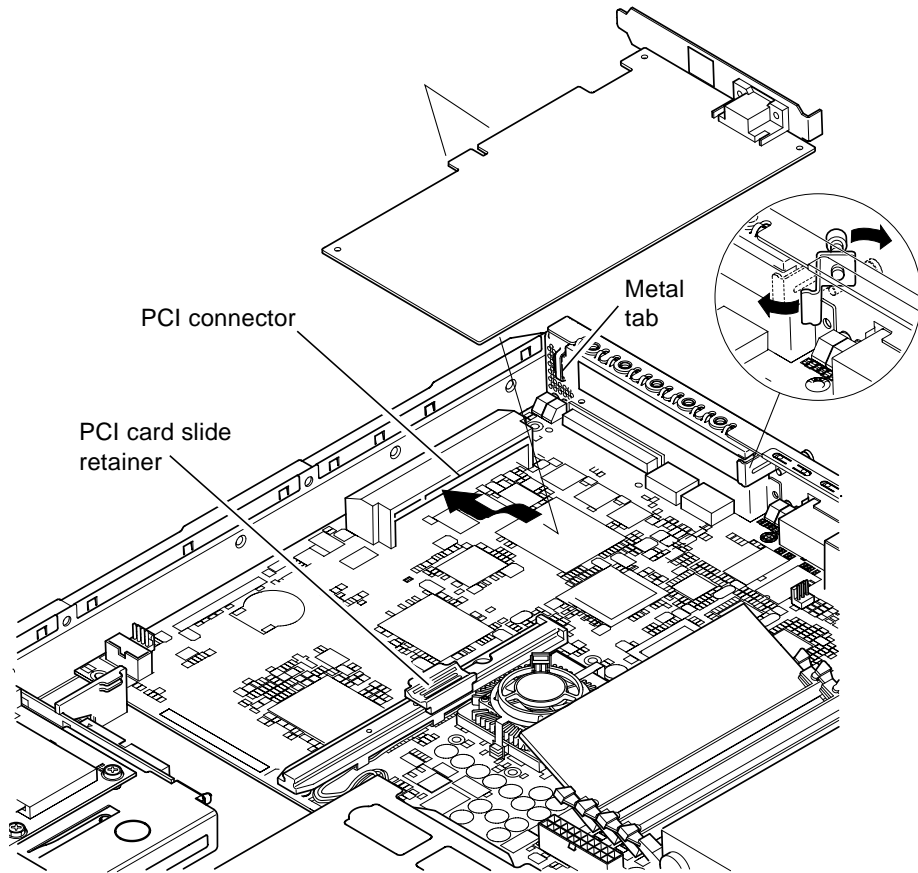


FIGURE 4-7 The Rotating Retention Bracket and the Position of a PCI Card

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 end of the card into the groove in the plastic bracket shown in FIGURE 4-8; this provides extra support.

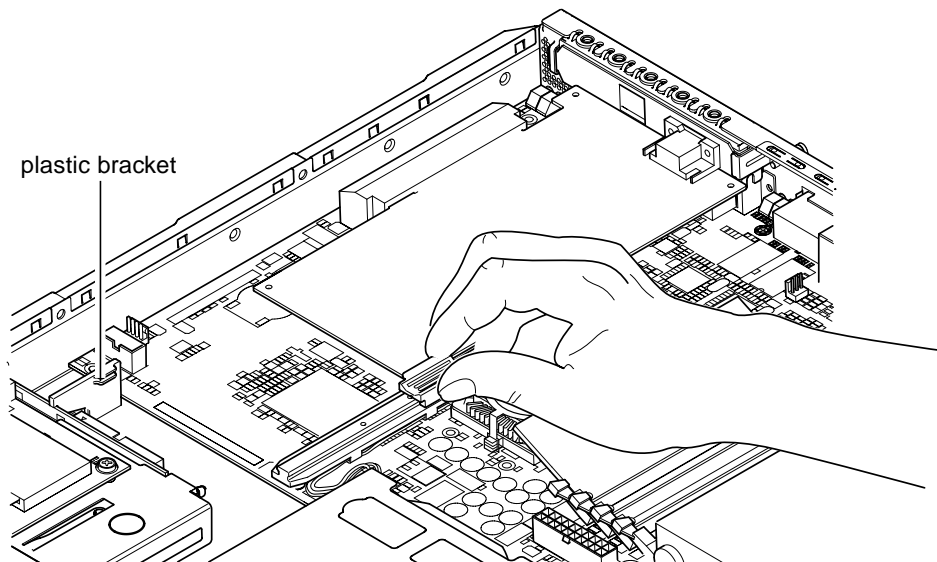


FIGURE 4-8 Using the PCI Card Retainer, Slide Support Rail, and Plastic Bracket

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 4-15).

4.6.2 Removing a PCI Card

1. **Remove the top cover by following the procedure described in “Opening the Netra T1 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 4-15).**

4.7 Replacing the Server's Top Cover

- When you have finished installing an option module, replace the top cover, making sure the alignment arrows on the lid and chassis line up. Then tighten the captive retaining screw at the rear (see FIGURE 4-9).

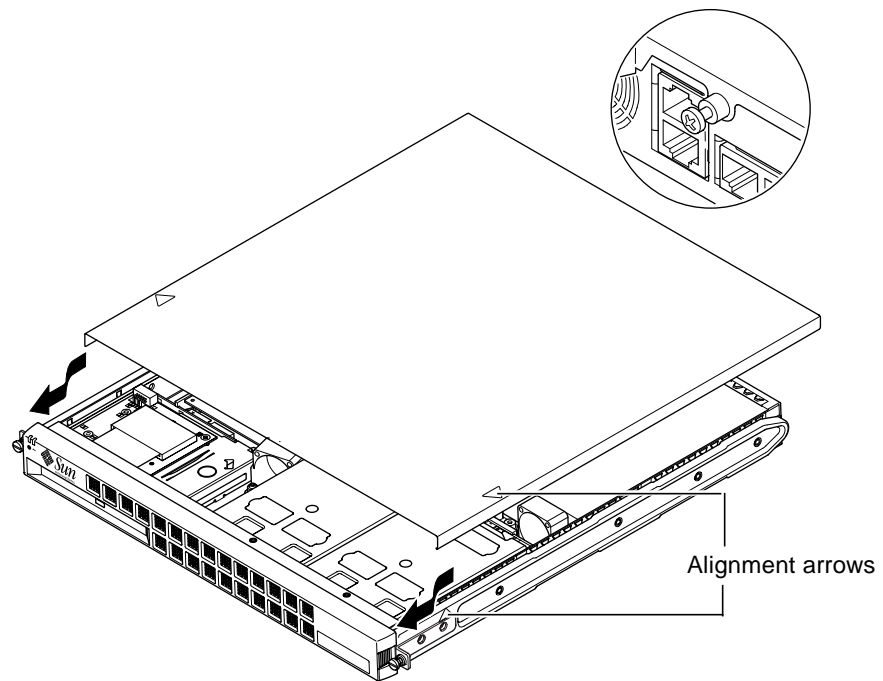


FIGURE 4-9 Replacing the Top Cover

What's Next?

When you have installed the optional hardware components you need, go to Chapter 5 for information about installing the Netra T1 server into a rack.

Installing the Server Into a Rack

This chapter tells you how to install a Netra T1 server into a rack.

The chapter contains the following sections:

- Section 5.1, “Installing Into a 19-Inch Four-Post Rack” on page 5-2
- Section 5.2, “Installing Into a Two-Post Relay Rack” on page 5-12

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).

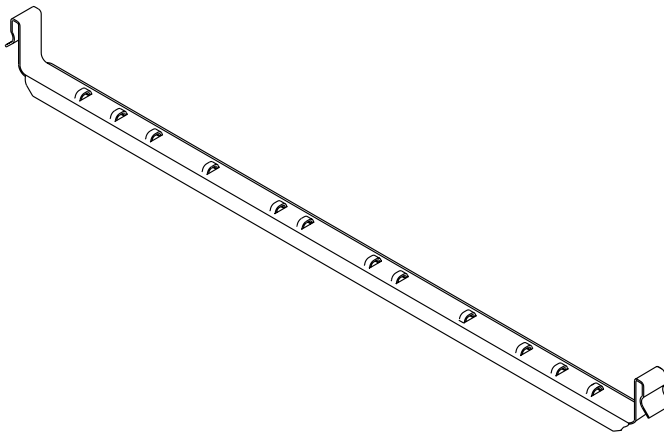


FIGURE 5-1 Cable Management Bracket

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 StorEdge 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).

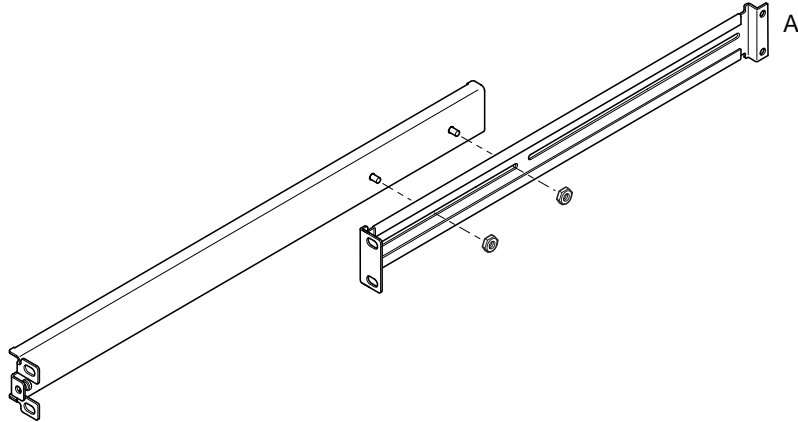


FIGURE 5-2 Positioning the Slide Mounts for a Sun StorEdge 72-Inch Tall Rack

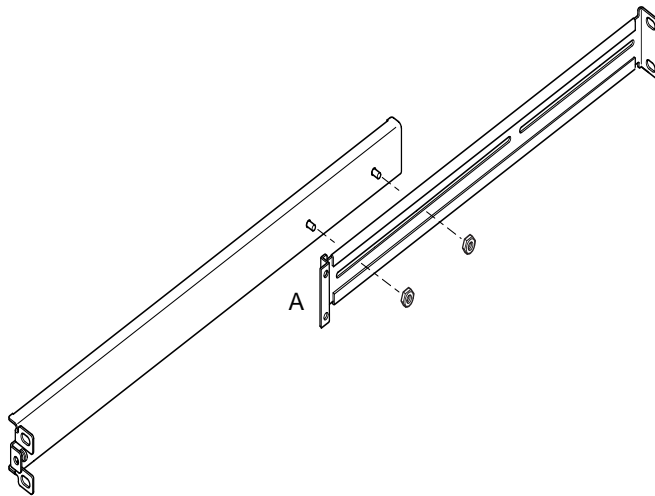


FIGURE 5-3 Positioning the Slide Mounts for a Standard 19-Inch Wide Rack

- 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.

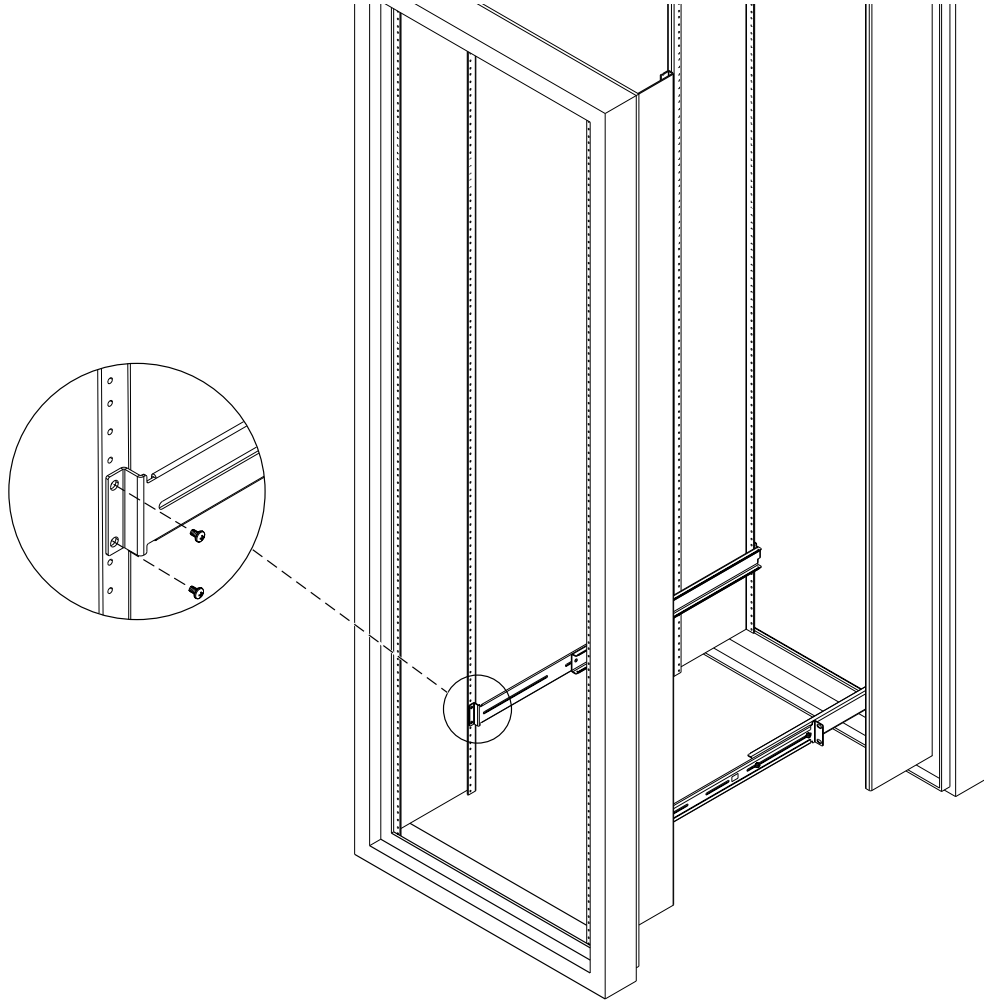


FIGURE 5-4 Fastening the Slide Mounts to a Sun StorEdge 72-inch Tall Rack – Rear View (Side Panels Removed for Clarity)

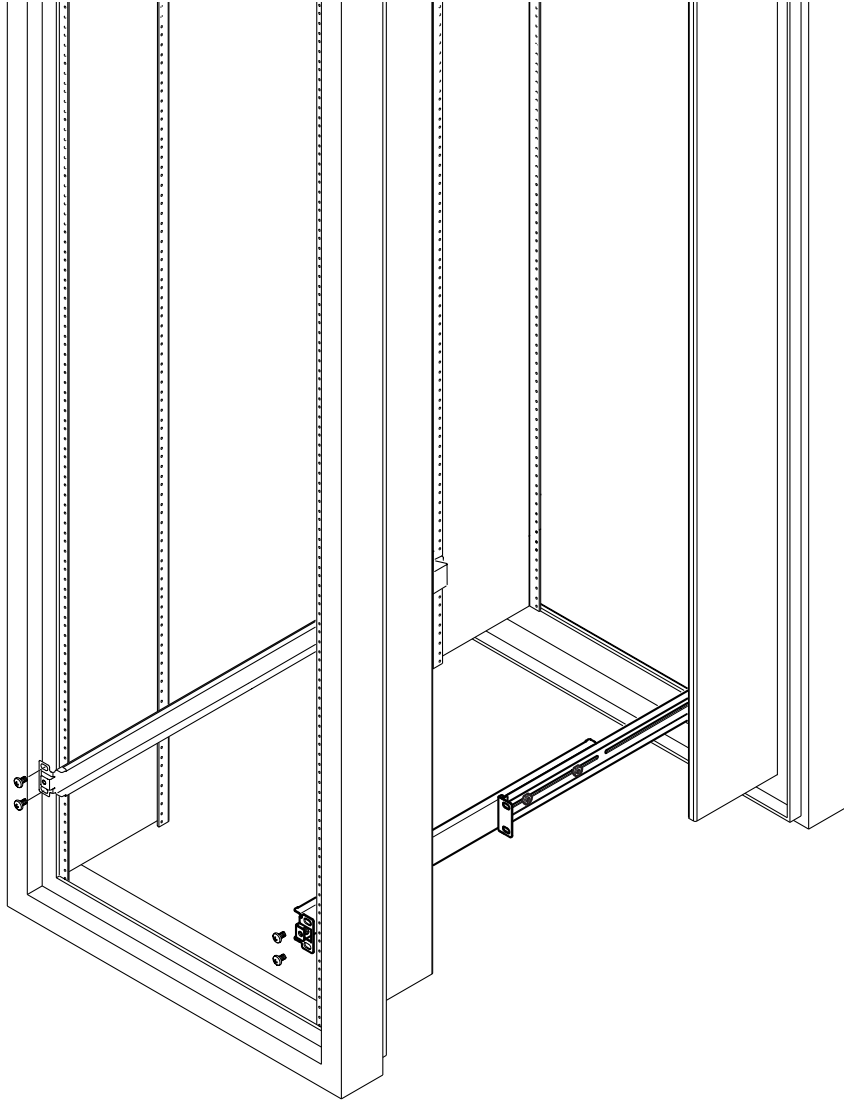


FIGURE 5-5 Fastening the Slide Mounts to a Sun StorEdge 72-inch Expansion Rack – Front View (Side Panels Removed for Clarity)

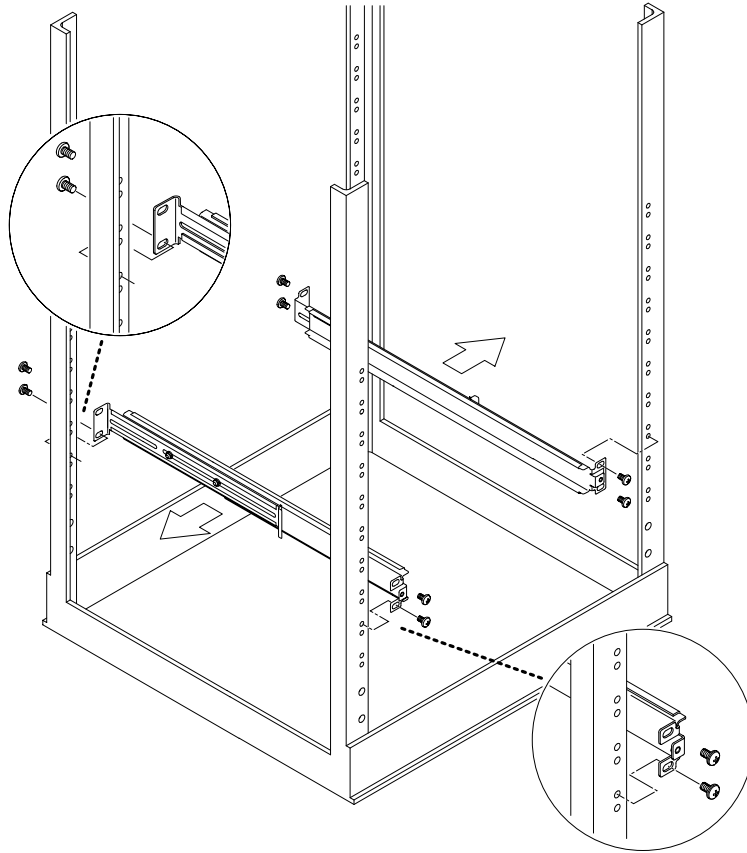


FIGURE 5-6 Fastening the Slide Mounts to a Standard 19-inch Rack

7. Slide the Netra T1 server into the rack (see FIGURE 5-7).

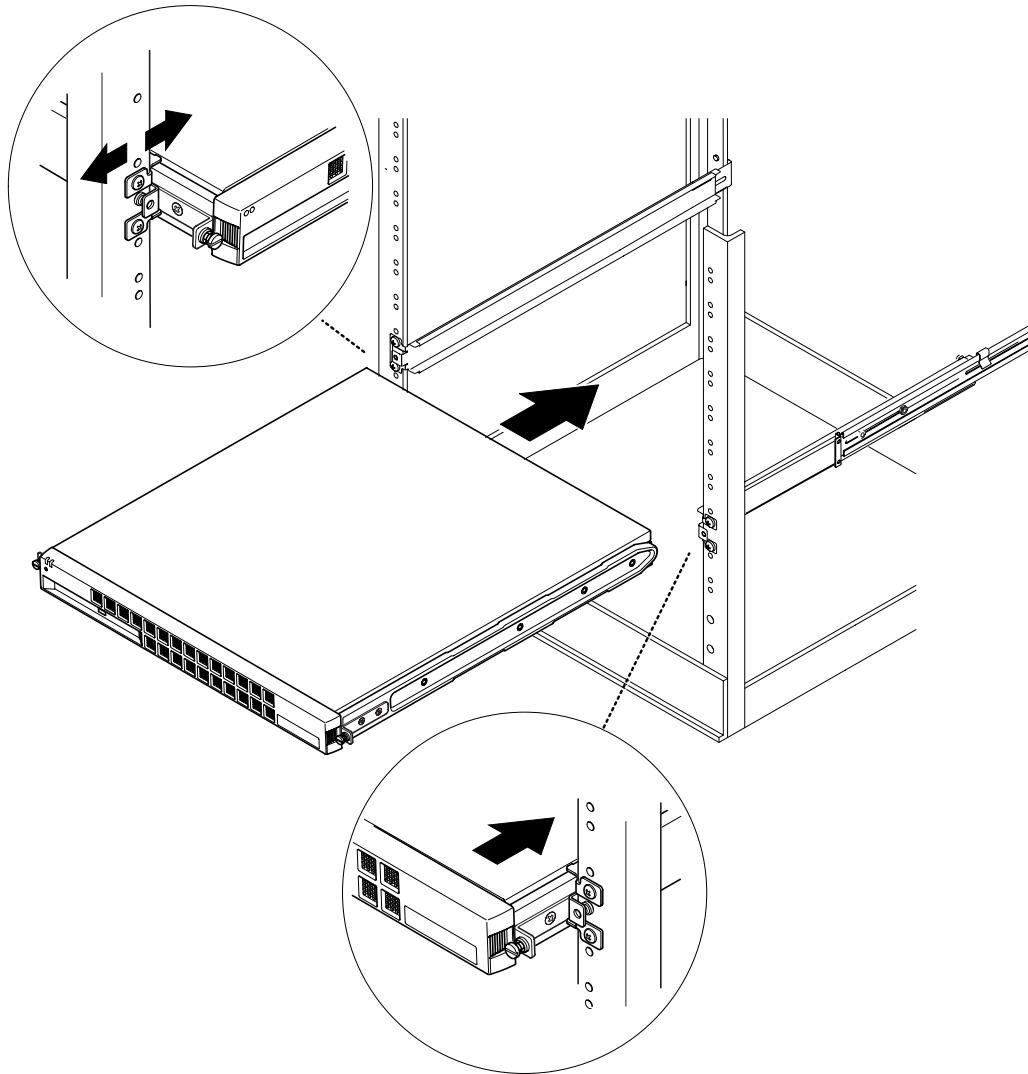


FIGURE 5-7 Sliding the Netra T1 Server Into a Standard 19-Inch Rack

8. **Align the thumbscrews on the sides of the server with the slide mounts in the rack (see FIGURE 5-8).**

If necessary, readjust the slide mounts to align the server properly. The thumbscrews need to be finger-tight.

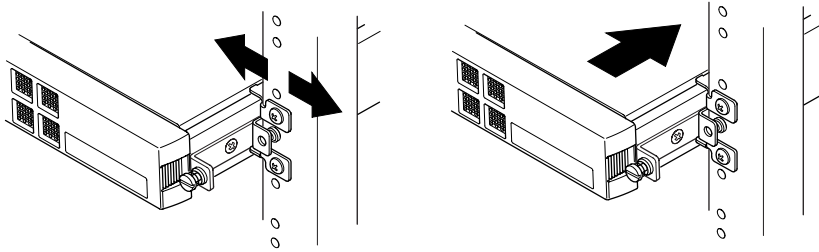


FIGURE 5-8 Adjusting the Slide Mounts and Screwing the Server Into the Rack

9. **Tighten the slide mounts in the rack if you have not fully secured them yet.**
10. **When the slide mounts are secure, 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.

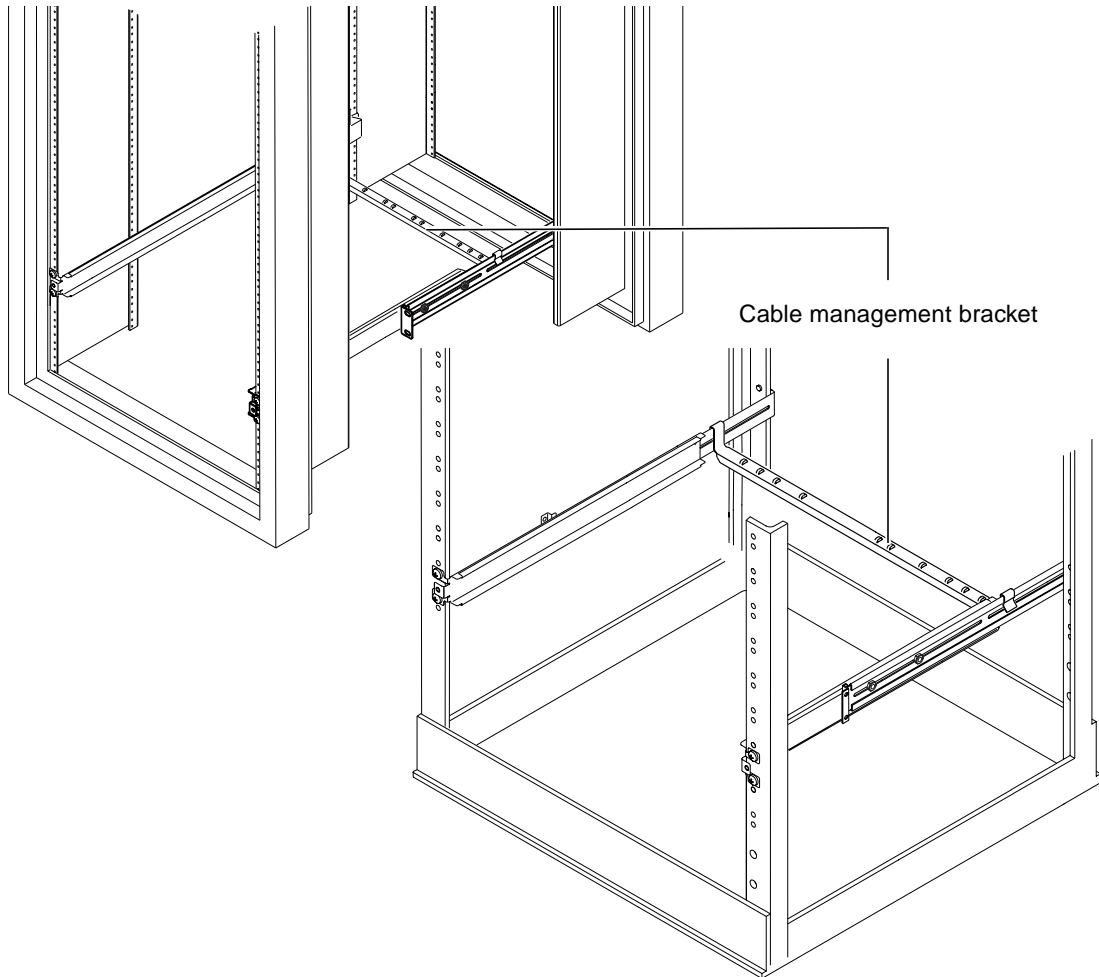


FIGURE 5-9 Fitting the Cable Management Bracket to a Sun StorEdge or a Standard 19-Inch Rack

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 Netra T1 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 rack mounting brackets from either side of the server (see FIGURE 5-10).

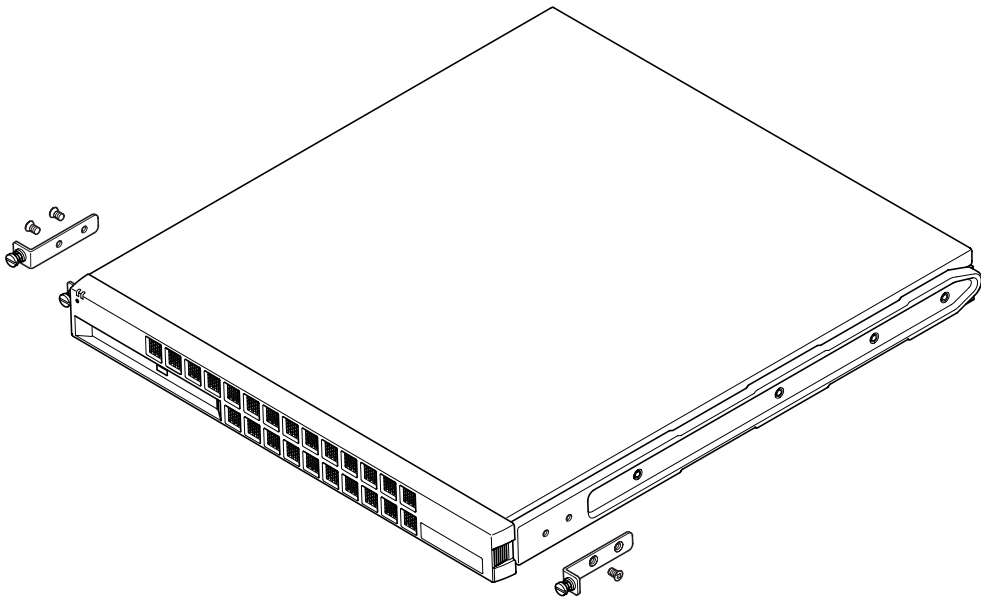


FIGURE 5-10 Removing the Thumbscrew Brackets

2. Remove the first, third and fourth fixing screws from the plastic slide-mounts on the sides of the unit (see FIGURE 5-11).
3. Fit the two front fixed brackets to the rearmost two of the three tapped holes towards the front of the server.

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

Note – Do not fit the rear brackets until you have completed steps 1 through 4.

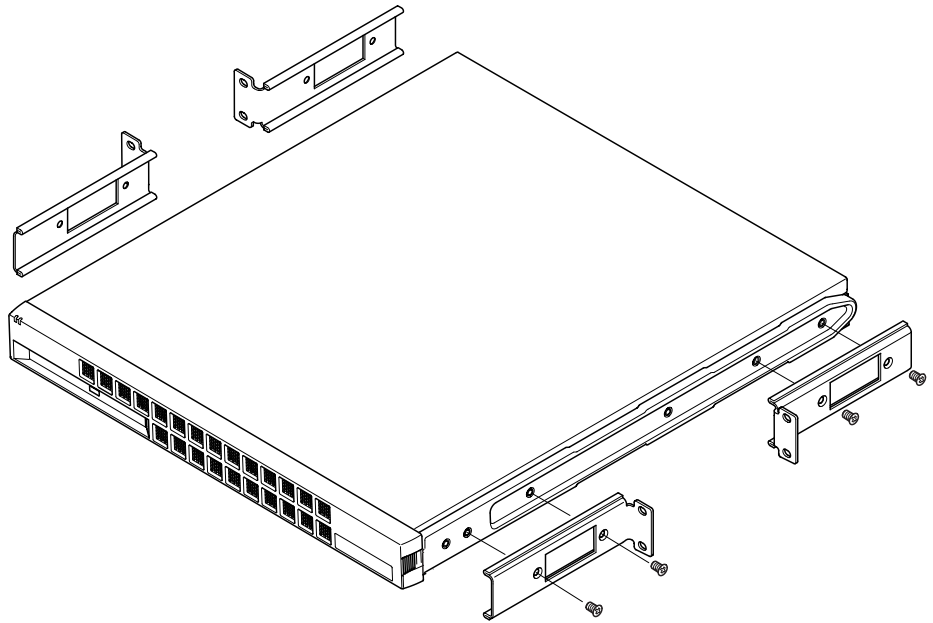


FIGURE 5-11 Fitting the Fixed Mounting Brackets

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.

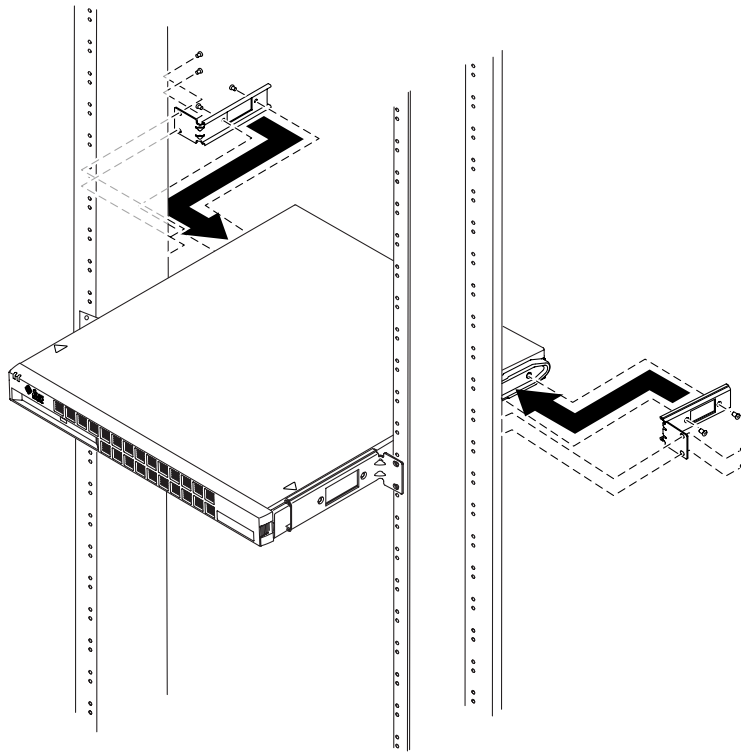


FIGURE 5-12 The Netra T1 Server Installed in a Two-Post Rack

What's Next?

When you have installed the Netra T1 server into the rack, go to Chapter 6 for information about connecting the cables and setting up serial connections.

Connecting the Cables

This chapter describes how to connect the power cables and the Ethernet and serial cables to the Netra T1 server. 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 the Netra T1 Server From a Laptop Running Microsoft Windows” on page 6-9

6.1 Connecting the Cables to the Server

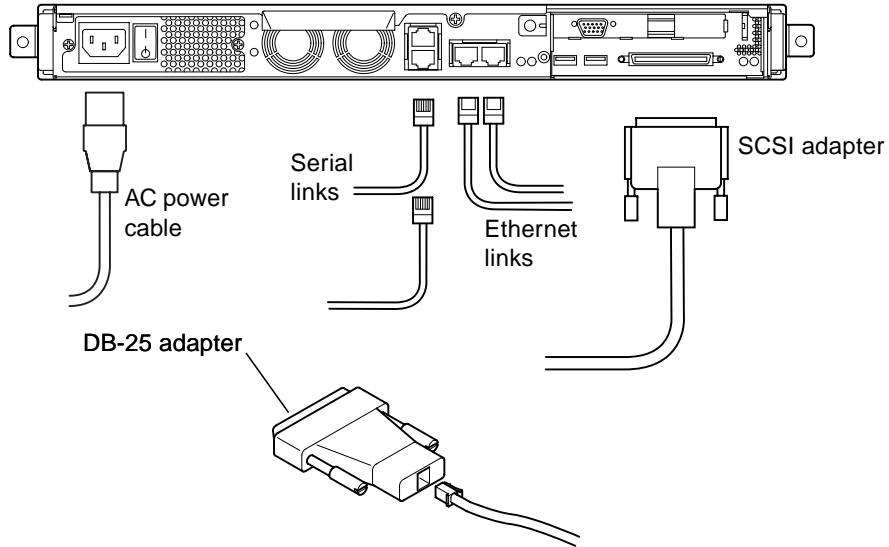


FIGURE 6-1 Connecting the Cables to the Netra T1 AC200 Server

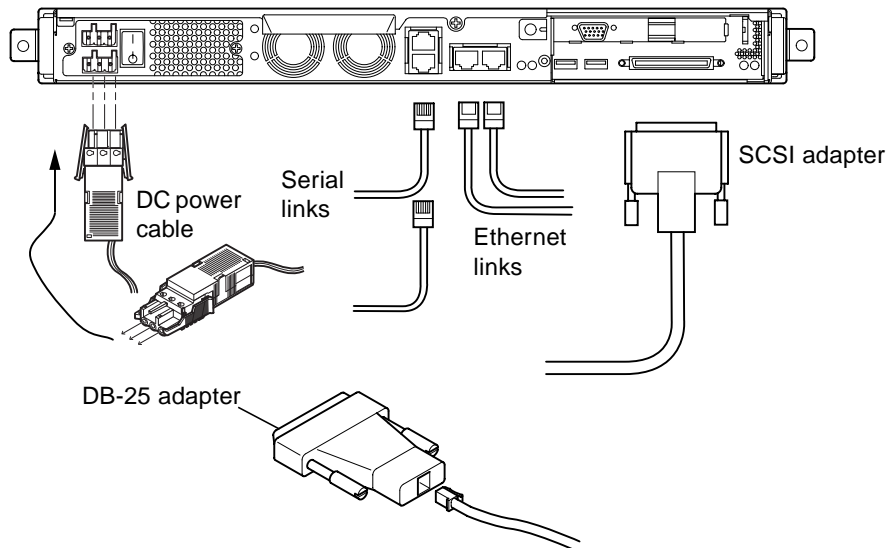


FIGURE 6-2 Connecting the Cables to the Netra T1 DC200 Server

Before following the instructions in this section, make sure you have installed the Netra T1 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 Netra T1 server's remote monitoring and management facilities, make sure you 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 Netra T1 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 6-2 and FIGURE 6-1). 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 6.2, "Using a Single DC Power Cord" on page 6-4.

4. If you need to connect the Netra T1 server to an external SCSI device, you will need to use the SCSI cable supplied with that device.

The Netra T1 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 apply DC power to the Netra T1 server and you have only one DC power cord connected to the server, the LOMlite2 generates a poweron event, but it also generates an inlet failure event which causes the fault indicator light (not blinking).

Similarly, if you remove a single DC power cord from a Netra T1 server that is powered on, the LOMlite2 generates an inlet failure event and the fault indicator lights (not blinking).

If you intend to run the Netra T1 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 the Netra T1 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 rear 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 Netra T1 AC200 and DC200 servers, 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 Netra T1 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 Netra T1 server's serial ports correspond with the pinouts for the RJ45 ports on the Asynchronous Serial Interface Breakout Cable supplied by Cisco for use with the Cisco L2511 terminal server. For terminals from other manufacturers, you may need to make your own crossover 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 Netra T1 AC200 and DC200 servers, 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 Serial B port.

6.3.1 Connecting to a Terminal Server

The serial ports on the Netra T1 server are DTE ports. If you are connecting them to other DTE ports, then the cabling between the devices you are connecting needs to perform a crossover.

The pinouts for the Netra T1 server's 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 L2511 Terminal Server (and you are connecting the Netra T1 server to it using the Cisco Asynchronous Serial Interface Breakout Cable), you can do either of the following:

- Connect the Breakout Cable directly to the Netra T1 server.
- Connect the Breakout Cable to a patch panel and use the straight-through patch cable (supplied by Sun) to connect the patch panel to the Netra T1 server (see FIGURE 6-3).

Note – You do not have to use the Netra T1 server with 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 Netra T1 server's serial ports. If they do not, then write down which pins carry the signals listed in the second column in TABLE 6-1. Then make a crossover cable taking each of the Netra T1 server's pins to the correct pin on your terminal server's serial port.

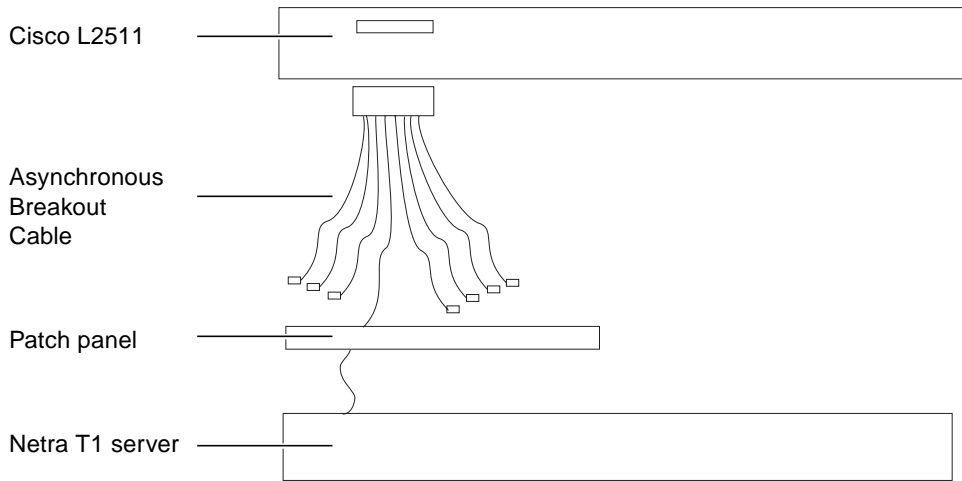


FIGURE 6-3 Patch Panel Connection Between a Cisco L2511 and a Netra T1 Server

Note – When viewed from the rear of the Netra T1 server, pin 1 of the RJ-45 serial port is on the left, pin 8 on the right.

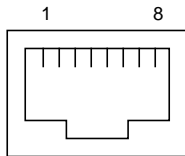


FIGURE 6-4 Serial Port Pins 1 to 8

TABLE 6-1 Serial Port Connection to a Terminal Server

Pinout on Netra T1 server	Signal to connect to on 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

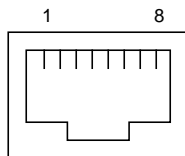
TABLE 6-1 Serial Port Connection to a Terminal Server

Pinout on Netra T1 server	Signal to connect to on Terminal Server
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 Netra T1 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 crossovers. The Sun-supplied DB-25 adapter enables you to connect to any Sun system. The crossovers it performs are listed in TABLE 6-2.

Note – When viewed from the rear of the Netra T1 server, pin 1 of the RJ-45 serial port is on the left, pin 8 on the right.

**FIGURE 6-5** Pins 1 to 8 on the Serial Ports**TABLE 6-2** Pin Crossovers in 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 Netra T1 server's serial ports to a DB-9 (9-pin) adapter that performs the pin crossovers listed in TABLE 6-3.

Note – When viewed from the rear of the Netra T1 server, pin 1 of the RJ-45 serial port is on the left, pin 8 on the right.

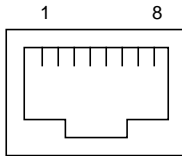


FIGURE 6-6 Pins 1 to 8 on the Serial Ports

TABLE 6-3 Pin Crossovers for 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 LOMlite2 (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 LOMlite2 device’s serial configuration will reflect the new settings. By default, however, the OpenBoot PROM and LOMlite2 serial configuration is as described in TABLE 6-4.

6.4 Connecting to the Netra T1 Server From a Laptop Running Microsoft Windows

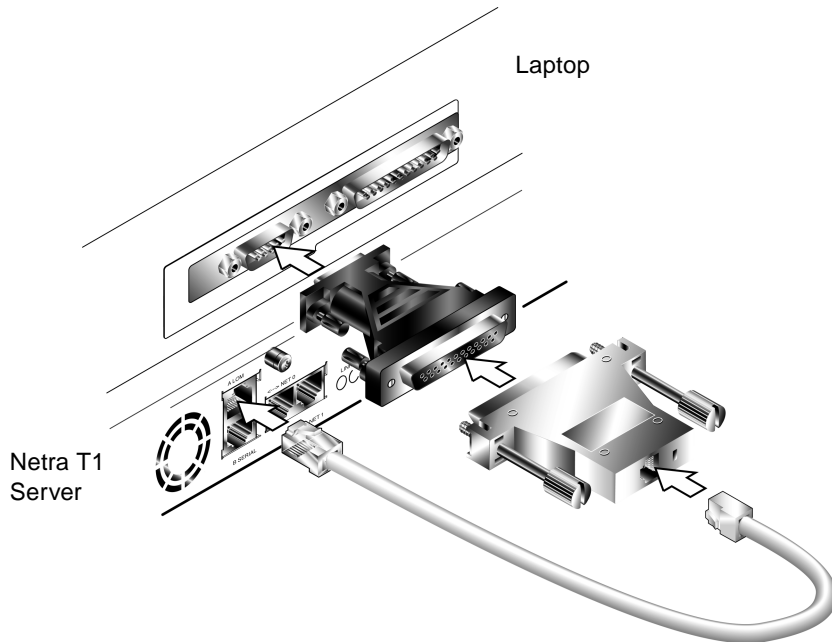
6.4.1 Connecting the Netra T1 Server to the Laptop

Note – Make sure you 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 Netra T1 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 Netra T1 server.

FIGURE 1 Connecting the Netra T1 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 of this description are available from home computer suppliers and electronics stores. The pin crossovers that the adapter must perform are listed in TABLE 6-3.

TABLE 6-5 Crossovers Inside 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

TABLE 6-5 Crossovers Inside the 25x9-way D-type Female-to-Female Adapter

9-way Female Connector	25-way Female Connector
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 Netra T1 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 Netra T1 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 Netra T1 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 Netra T1 Server

This chapter tells you how to connect to and power on the Netra T1 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 7-8

7.1 Preparing to Configure the Server

To perform the initial configuration of the Netra T1 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 Configuring Using a Terminal Server

- To access the Netra T1 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 Netra T1 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 Netra T1 server from a dumb terminal, set up a connection between the terminal and the Netra T1 server.
- To access the Netra T1 server from a Sun workstation 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 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 LOMlite2 From the Console on the Serial A/LOM Port” on page 8-19).

7.2 Powering On the Server

When the Netra T1 AC200 and DC200 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 7-8.

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 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 8 Advanced Installation Guide* which accompanies the Solaris 8 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. During booting you will be prompted for certain information. The first question the system asks you is what language you want it to use when it prompts you for the information it needs. Specify a language.
5. Specify your locale.
6. Specify the type of terminal you are using to communicate with the Netra T1 server.
7. Specify whether you need IPv6 enabled, then follow the instructions on the screen.
8. Specify whether you want to enable the Kerberos Security mechanism, then follow the instructions on the screen.
9. Confirm the information you have typed in and, when prompted, provide the time and date information the system needs.
10. When prompted, give a password (if any) for users logging in as root.
11. When asked if you want the server to perform Automatic Power Saving Shutdown, answer No.

Note – If you answer Yes, the server will automatically put itself into Standby mode after a period of idleness.

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. During booting you will be prompted for certain information. The first question the system asks you is what language you want it to use when it prompts you for the information it needs. Specify a language.
5. Specify your locale.
6. Specify the type of terminal you are using to communicate with the Netra T1 server.
7. Specify whether the IP address is to be configured manually or by DHCP. If manually, specify an IP address when prompted.
8. 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`.
9. Specify a Host Name for the server.
10. Specify whether you need IPv6 enabled, then follow the instructions on the screen.
11. Specify whether you want 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 a part of.
14. Specify whether you want the system to search the network for a Name Server or whether you want it 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.
16. Specify whether the Netra T1 server is to be part of a subnet.
17. Specify a Netmask for the server.
18. Confirm the information you have typed in and, when prompted, provide the time and date information the system needs.
19. When prompted, give a password (if any) for users logging in as root.

20. When asked if you want the server to perform Automatic Power Saving Shutdown, answer No.

Note – If you answer Yes, the server will automatically put itself into Standby mode after a period of idleness.

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. During booting you will be prompted for certain information. The first question the system asks you is what language you want it to use when it prompts you for the information it needs. Specify a language.
5. Specify your locale.
6. Specify the type of terminal you are using to communicate with the Netra T1 server.
7. When prompted to indicate whether you want the server to be networked, specify No.
8. Specify a Host Name for the server.
9. Confirm the information you have given.
10. Specify the date and time information.
11. When prompted, give a password (if any) for users logging in as root.
12. When asked if you want the server to perform Automatic Power Saving Shutdown, answer No.

Note – If you answer Yes, the server will automatically put itself into Standby mode after a period of idleness.

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 Netra T1 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, return to the lom> prompt by typing the LOM escape sequence. By default, this is:

```
# .#
```

When the lom> prompt appears, 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 Netra T1 server) is not an On/Off switch, it is an On/Standby switch. It does not isolate the equipment.

The power (On/Standby) switch of the Netra T1 server 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.

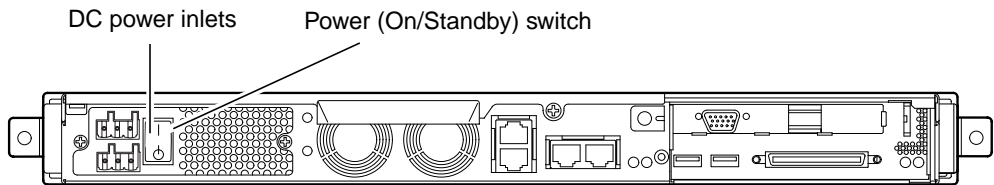


FIGURE 7-1 Netra T1 DC200 Server Power (On/Standby) Switch

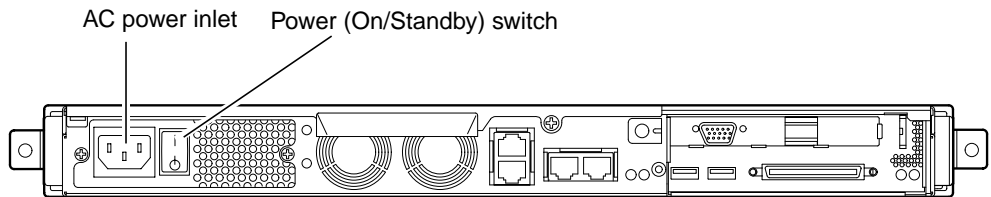


FIGURE 7-2 Netra T1 AC200 Server Power (On/Standby) Switch

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.

PART II Remote and Local Management

Managing the Netra T1 Server From the lom> Prompt

This chapter introduces the LOMlite2 Lights-Out Management facilities available for the Netra T1 server 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 LOMlite2 Shell” on page 8-3
- Section 8.3, “Monitoring the Server From the LOMlite2 Shell” on page 8-8
- Section 8.4, “Setting Up LOMlite2 Privileges for Named Users” on page 8-13
- Section 8.5, “Setting the LOMlite2 Device’s Configurable Variables” on page 8-17
- Section 8.6, “Separating the LOMlite2 From the Console on the Serial A/LOM Port” on page 8-19
- Section 8.7, “Viewing the Event Reports That the LOMlite2 Sends to syslogd” on page 8-20
- Section 8.8, “The LOMlite2 Shell Command List” on page 8-21
- Section 8.9, “Checking the Status of the Server’s Fans” on page 8-24

Note – For information about configuring the LOMlite2 device to restart the server automatically in the event of a lockup, see Chapter 9.

Note – For information about how to configure the LOMlite2 device-driver, see Appendix A.

8.1 Introduction to Lights-Out Management

The system board in the Netra T1 server contains a LOMlite2 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).

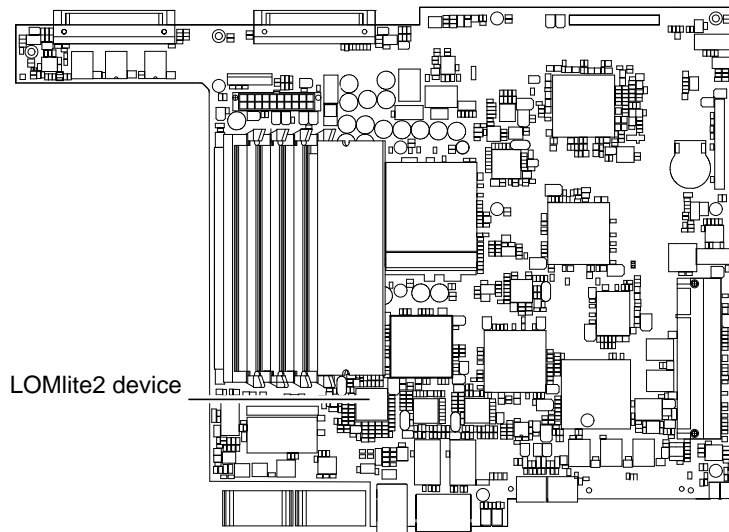


FIGURE 8-1 The Location of the Lights-Out Management Device on the System Board

Note – The Netra T1 server is supplied with the Solaris 8 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 Netra T1 server locally or remotely. If you ever need to re-install Solaris 8 and you want to use the Lights-Out Management facilities, you must also re-install the Netra Lights-Out Management software from the CD entitled *Software Supplement for the Solaris 8 Operating Environment*. This CD is included with the CDs supplied with the Solaris software. The LOM software is in the following directory: `/Netra_t_Lights_Out_Management_2.0`. The three packages you need are called: `SUNWlomm`, `SUNWlomr`, and `SUNWlomu`.

8.2 Powering On or Resetting the Server From the LOMlite2 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 Netra T1 (see Chapter 6).

There are two ways of interrogating the LOMlite2 device or of sending it commands to perform. One is by executing LOMlite2 commands from the `lom>` shell prompt. This chapter tells you how to do this. The other is by executing LOMlite2-specific Solaris commands from the console prompt. For information about the LOMlite2 commands available with the Solarisoperatring environment, see Chapter 9.

When the Netra T1 AC200 and DC200 servers are connected to a power source, they are always either fully powered or in standby power mode. To remove power entirely from the server you must disconnect its power cables or open all external circuit breakers. The methods referred to in this chapter for powering the server on and off by using `lom>` prompt commands are methods either of powering the server on or of returning it to standby power mode. The `poweroff` command does not power the 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 LOMlite2 user permission. If you have not set up any named users of the LOMlite2 device, then you have `r`-level permission by default. If you have set up one or more named users, then you must explicitly give them `r`-level permission to execute these commands. For more information about user privileges, see Section 8.4, “Setting Up LOMlite2 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 LOMlite2 uses standby power and so remains active even when the Netra T1 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 LOMlite2 escape sequence:

```
# #.
```

When you type the LOMlite2 escape sequence, the LOMlite2 device takes control of the Serial A/LOM port and the `lom>` prompt appears on your terminal screen. You can type the LOMlite2 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 LOMlite2 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 LOMlite2 device (instead of shared between the LOMlite2 and the console), this command will have no effect. For information about dedicating the Serial A/LOM port to the LOMlite2 device, see Section 8.6, “Separating the LOMlite2 From the Console on the Serial A/LOM Port” on page 8-19.

Note – If you have set up named users of the LOMlite2 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 LOMlite2 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 LOMlite2 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 LOMlite2 device, this command will have no effect. For information about dedicating the Serial A/LOM port to the LOMlite2 device, see Section 8.6, “Separating the LOMlite2 From the Console on the Serial A/LOM Port” on page 8-19. To use the `break` command, you must have `c`-level LOMlite2 user privileges. For more information, see Section 8.4, “Setting Up LOMlite2 Privileges for Named Users” on page 8-13.

8.2.6 Controlling the Server’s Booting Behavior

The LOMlite2 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 Netra T1 server: you cannot use them from a keyboard that is connected to the server via a serial link.)

You must have `r`-level LOMlite2 permission to use the `bootmode` command. For information about user privileges, see Section 8.4, “Setting Up LOMlite2 Privileges for Named Users” on page 8-13.

8.2.6.1 Boot Modes Available

If you use the `bootmode` command without arguments, the LOMlite2 device reports just the current boot mode. The boot modes available are listed in TABLE 8-1.

TABLE 8-1 Boot Modes

Mode	Description
<code>-u</code>	This option does not represent a boot mode. However, if you have previously dedicated the Serial A/LOM port to the LOMlite2 device and now want to share the port between the console and the LOMlite2 device, you can use the <code>-u</code> 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 LOMlite2 From the Console on the Serial A/LOM Port” on page 8-19.
<code>normal</code>	In this mode, the server boots using your OpenBoot™ PROM settings. To cause this parameter to take effect, you must reset the server after executing the <code>bootmode</code> command at the <code>lom></code> prompt.
<code>forth</code>	In this mode, the server does not boot to Solaris but stops the boot cycle at the <code>ok</code> 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 <code>bootmode forth</code> command at the <code>lom></code> prompt and then reset the server. (It is only when the server resets that it reads the new <code>forth</code> parameter from the LOMlite2 device.)
<code>reset_nvram</code>	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 <code>bootmode</code> command at the <code>lom></code> prompt.
<code>diag</code>	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 <code>bootmode</code> command at the <code>lom></code> prompt.
<code>skip_diag</code>	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 <code>bootmode</code> command at the <code>lom></code> prompt.

8.3 Monitoring the Server From the LOMlite2 Shell

This section describes the commands that enable you to check the status of the components monitored by the LOMlite2 device. It also describes how to view the events stored in the LOMlite2 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 LOMlite2 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 8-24.

Note – If the fans, PSU output, or supply rails fail on your Netra T1 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 SCSI 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 LOMlite2 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 LOMlite2 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 LOMlite2 Device Event Log (Oldest Event Reported First)

Note – If the fans, PSU output, or supply rails fail on your Netra T1 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 LOMlite2 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 LOMlite2 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 LOMlite2 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 LOMlite2 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 LOMlite2 device to update the status of all the components it monitors.

8.4 Setting Up LOMlite2 Privileges for Named Users

You can specify up to four named users of the LOMlite2 device on a Netra T1 AC200 or DC200 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 areas of authorization are available for named users. By default, all four are open to them. However, if you specify any (using the `lom> userperm` command), only the one or ones that you specify will be available.

8.4.1 Permissions Available for LOMlite2 Users

The four areas of authorization available by default are:

- **Console permission (c-level)**
This enables the named user to exit from the `lom>` prompt to the Solaris prompt (if the Serial A/LOM port is shared between the LOMlite2 and the console).
- **User administration permission (u-level)**
This enables the named user to add and delete users and alter their permissions.
- **Administration permission (a-level)**
This enables the named user to change the LOMlite2 device's configuration variables (see Section 8.1, "Introduction to Lights-Out Management" on page 8-2).
- **Reset permission (r-level)**
This enables the user you have named to reset the server and to power it on and off using the LOMlite2 device.

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

8.4.2 Creating a LOMlite2 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, “Permissions Available for LOMlite2 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 LOMlite2 User Account

- **Type:**

```
lom> userpassword user name
```

where the *user name* is the name of a LOMlite2 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, “Permissions Available for LOMlite2 Users” on page 8-13).

8.4.4 Viewing Details of a LOMlite2 User Account

- Type:

```
lom> usershow user name
```

where the *user name* is the name of an existing LOMlite2 user account.

Note – You must have User Administration (u-level) authorization to view the details of a LOMlite2 user account (see Section 8.4.1, “Permissions Available for LOMlite2 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 LOMlite2 User Account

- Type:

```
lom> userdel user name
```

where the *user name* is the name of an existing LOMlite2 user account.

Note – You must have User Administration (a-level) authorization to delete a user account (see Section 8.4.1, “Permissions Available for LOMlite2 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 areas of authorization are available to each named user you set up.

- **To limit users to a particular area or areas of authorization, type:**

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

You can specify:

- **No parameters**
This makes all four areas available to the named user.
- **All four parameters** (for example, `userperm cuar`)
This also makes all four areas 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 LOMlite2 and the console).
- **u**
This stands for “user administration permission”. It enables the named user to add and delete users and alter their areas of authorization by using the `userperm` command.
- **a**
This stands for “administration permission”. It enables the named user to change the LOMlite2 device’s configuration variables (see Section 8.5, “Setting the LOMlite2 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 LOMlite2 device.

8.4.8 Quitting a LOMlite2 Named User Session

- **Type:**

```
lom> logout
```

This returns you to the LOMlite2 login prompt.

8.5 Setting the LOMlite2 Device's Configurable Variables

There are some variables that you can use as arguments to the `set` command in the LOMlite2 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 LOMlite2 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 LOMlite2 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 LOMlite2 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 LOMlite2 From the Console on the Serial A/LOM Port

By default, the LOMlite2 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 LOMlite2 device from interrupting the console, either turn serial event reporting off (see Section 9.3.4, “Stopping the LOMlite2 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 LOMlite2 device and use the Serial B port for console activity (see below).

The advantages of dedicating the Serial A/LOM port to the LOMlite2 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 LOMlite2 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 LOMlite2 device, you cannot use the `console` command to quit the LOMlite2 shell. Instead, for access to Solaris, you must connect to the Netra T1 server using the Serial B port.
- Preventing a user with console access from using the LOMlite2 escape sequence to exit Solaris and access the LOMlite2 shell. If you dedicate the Serial B port to the console, users cannot bring up the LOMlite2 shell and this means that they cannot interrogate or reconfigure the LOMlite2 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 LOMlite2

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 LOMlite2 device.

8.6.2 Sharing Serial A/LOM Between the LOMlite2 and the Console

By default, the Serial A/LOM port is shared by the LOMlite2 device and the console. Therefore, you only need to follow the instructions in this section if you have configured the Netra T1 server by using the instructions in the previous section (Section 8.6.1, “Dedicating Serial A/LOM to the LOMlite2” on page 8-19) and you now want to share the Serial A/LOM port between the LOMlite2 and the console.

To share the port between the LOMlite2 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 LOMlite2 device and the console.

8.7 Viewing the Event Reports That the LOMlite2 Sends to syslogd

The LOMlite2 device monitors the status of the fans, supply rails, temperature, and power supply even when the server is powered down (the LOMlite2 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 LOMlite2 device. When Solaris is running, the LOMlite2 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 LOMlite2 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 LOMlite2 device. For example, an event is generated when a user logs in or out.

8.8 The LOMlite2 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
<code>alarmoff n</code>	Sets alarm <i>n</i> off. (Where <i>n</i> 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.
<code>alarmon n</code>	Sets alarm <i>n</i> on. See the description for the <code>alarmoff</code> command.
<code>break</code>	Takes the server down to the <code>ok</code> prompt.
<code>bootmode</code>	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 LOMlite2 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 <code>check</code> command. This updates the status of all monitored components.
console	This command takes you out of the LOMlite2 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 LOMlite2 device's Event Log.
logout	This command is for use by named users you have set up with password access to the LOMlite2 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 Netra T1 server.
show model	Displays the server model.
show hostname	Displays the server name (this command is equivalent to the Solaris <code>uname -n</code> command).
show eventlog	Displays the LOMlite2 device's event log. The event log is the list of the last 10 events to have been stored in the LOMlite2 device. The most recent event is the one at the bottom of the list.
show escape	Displays the current LOMlite2 escape sequence.
show	Displays all the information available with the <code>show</code> command.
useradd	Adds a user to the LOMlite2 device's list of permitted users.
userdel	Deletes a user from the LOMlite2 device's list of permitted users.
usershow	Displays the details of a named user's LOMlite2 account.

TABLE 8-2 LOM Commands (*Continued*)

Command	Effect
userpassword	Sets or changes a user's password.
userperm	Sets the permission levels for a named user.
version	Displays the version number of the LOMlite2 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.

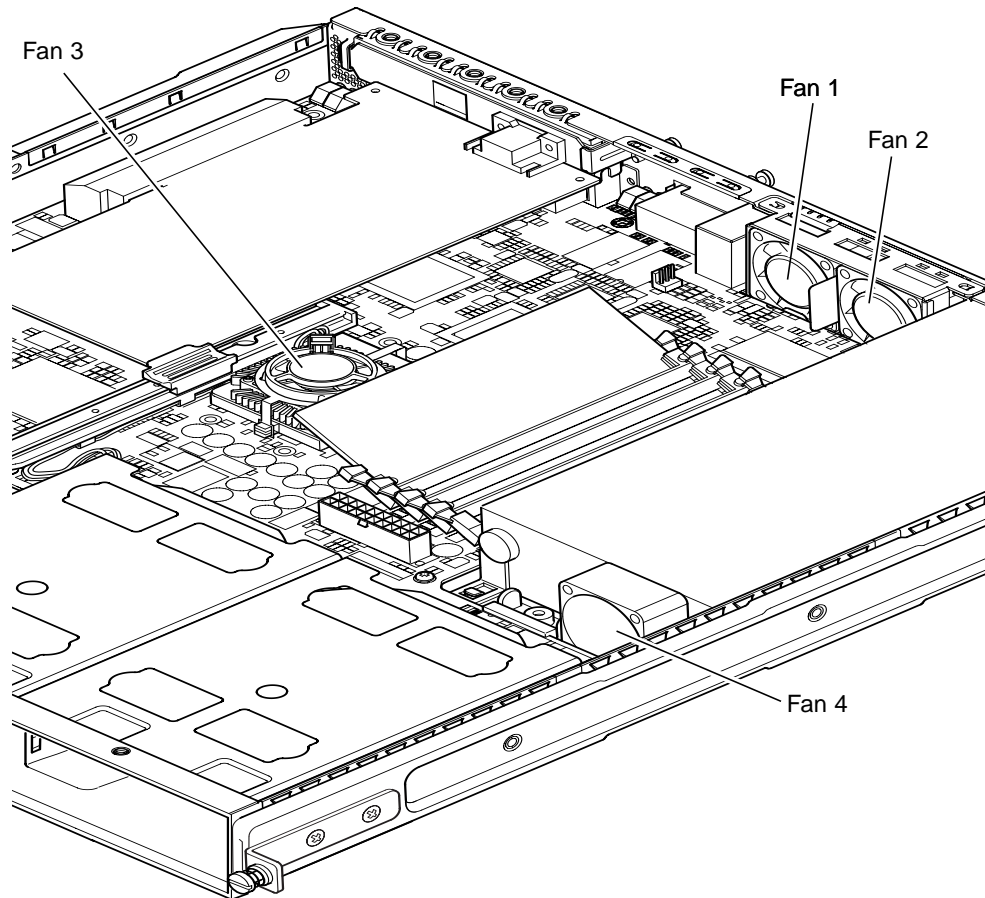


FIGURE 8-4 Locations of Fans 1, 2, 3, and 4

- To check the status of the fans, type:

```
lom> environment
```

Managing the Netra T1 Server From the Solaris Prompt

This chapter tells you how to use the LOMlite2-specific commands available in the Solaris 8 operating environment for monitoring and managing a Netra T1 server.

For an introduction to the LOMlite2 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 LOMlite2 device driver, see Appendix A.

Note – The Netra T1 server is supplied with the Solaris 8 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 Netra T1 server locally or remotely. If you ever need to re-install Solaris 8 and you want to use the Lights-Out Management facilities, you must also re-install the Netra Lights-Out Management software from the CD entitled *Software Supplement for the Solaris 8 Operating Environment*. This CD is included with the CDs supplied with the Solaris 8 software. The LOM software is in the following directory: `/Netra_t_Lights_Out_Management_2.0.` directory. The three packages you need are called: SUNWlomm, SUNWlomr, and SuNWlomu.

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 Netra T1 server (see Chapter 6).

There are two ways of interrogating the LOMlite2 device or of sending it commands to perform.

- One is by executing LOMlite2 commands from the `lom>` shell prompt. For information about how to do this, see Chapter 8.
- The other is by executing LOMlite2-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 LOMlite2 Documentation

- To view the manual pages for the LOMlite2 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 LOMlite2 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 8-24. 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 Netra T1 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 Netra T1 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 LOMlite2 Automatic Server Restart Configuration (lom -w)

For full information about enabling and using the LOMlite2’s Automatic Server Restart (ASR), see Section 9.2, “Configuring Automatic Server Restart (ASR)” on page 9-8.

- To find out how the LOMlite2’s watchdog is currently configured, type:

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

The LOMlite2’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 LOMlite2 device does not, by default, automatically restart the server after a lockup.

- To configure the LOMlite2 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 more information, see Section 9.2, “Configuring Automatic Server Restart (ASR)” on page 9-8.

9.1.8 Viewing the Configuration of the LOMlite2 Device (`lom -c`)

- To view the settings of all the configurable variables for the LOMlite2 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=Netra T1 200
#
```

9.1.9 Viewing All Component Status Data With the LOMlite2 Device’s Configuration Data (`lom -a`)

- To view all the status data stored by the LOMlite2 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 LOMlite2 Device Event Log (Oldest Event Reported First)

9.2 Configuring Automatic Server Restart (ASR)

You can configure the LOMlite2 device to restart the server automatically after a lockup. The LOMlite2 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 LOMlite2 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 LOMlite2 Watchdog to Restart the System After a Lockup

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

This is the script that runs the LOMlite2 watchdog process:

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

When you have done this, the LOMlite2 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 LOMlite2 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 LOMlite2 device to perform an automatic server restart after a lockup, see Section 9.2.1, “Configuring the LOMlite2 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 LOMlite2 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 `prioctl` command is as follows:

```
prioctl -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 LOMlite2 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 LOMlite2 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 LOMlite2 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 LOMlite2 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 LOMlite2 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 LOMlite2 device from sending reports to the Serial A/LOM port, how to remove driver protection from the device driver, how to make the LOMlite2 interface backward compatible, and how to upgrade the firmware on the LOMlite2 device.

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

There are three alarms associated with the LOMlite2 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` -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 LOMlite2 from Sending Reports to the Serial A/LOM Port (lom -E off)

LOMlite2 event reports can interfere with information you are attempting to send or receive on the Serial A/LOM port.

- To stop the LOMlite2 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 LOMlite2 device. The LOMlite2 interrupts the console whenever it needs to send an event report. To prevent the LOMlite2 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 LOMlite2 device and to use the Serial B port as your console port, see Section 8.6, “Separating the LOMlite2 From the Console on the Serial A/LOM Port” on page 8-19 (Chapter 8).

9.3.5 Removing Driver Protection From the LOMlite2 Driver (`lom -U`)

By default, the LOMlite2 driver cannot be unloaded. This is because the driver is required by the watchdog process. If you unload the driver and you have configured the system to restart when the watchdog times out, the watchdog will time out causing a system reset. For information about configuring the system to restart automatically after a lock-up, see Section 9.2, “Configuring Automatic Server Restart (ASR)” on page 9-8).

To remove driver protection from the LOMlite2 driver so that you can unload the driver:

1. **Turn the watchdog process off by typing:**

```
# lom -W off
```

2. **Unload the driver by typing:**

```
# lom -U
```

9.3.6 Making the LOMlite2 Interface Backward Compatible (`lom -B`)

If you have scripts written to the LOMlite interface on the Netra t1 Model 100/105 server or the Netra t 1400/1405 server and you want to use these scripts on the Netra T1 AC200 or DC200 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.

9.3.7 Upgrading the LOMlite2 Firmware (`lom -G filename`)

To upgrade the firmware on the LOMlite2 device, obtain the new firmware package from SunSolveSM 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 – LOMlite2 firmware upgrades will be released as patches and will include detailed installation instructions.
