



Netra™ 20 Installation and User's Guide

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Preface

This guide supports the Netra 20 server.

The guide comprises two parts:

- Part I, *Installation*, describes the installation of the Netra 20 server and is intended to be read by installation engineers, software support engineers and service personnel.
- Part II, *User Guide*, provides information about the system administration and software operation of the Netra 20 server and is intended for system users and administrators.

How This Book Is Organized

Chapter 1 provides an overview of the key features of the Netra 20 server.

Chapter 2 covers the environmental and site requirements.

Chapter 3 describes the electrical supply requirements.

Chapter 4 describes the external I/O connectors.

Chapter 5 explains how to install Solaris 8 Update 2/02.

Chapter 6 explains the information provided by the system, PSU and LOMlite2 LEDs.

Chapter 7 describes the start-up and boot processes.

Chapter 8 describes how to shutdown the operating environment and power down the system.

Chapter 9 lists OpenBoot PROM parameters supported by your Netra 20 server and describes their function.

Chapter 10 describes how to interface with your Netra 20 server using the LOMlite2 facility.

Chapter 11 describes how to use the LOMlite2 commands available in Solaris to monitor and manage your Netra 20 server.

Chapter 12 describes how to perform user service procedures safely.

Chapter 13 describes how to remove and install a hard disk drive.

Appendix A provides an illustrated list of replaceable parts and components.

Appendix B provides information about memory configuration.

Appendix C explains how to connect other equipment to the I/O connectors on your Netra 20 server.

Using UNIX Commands

This document might not contain information on basic UNIX[®] commands and procedures such as shutting down the system, booting the system, and configuring devices.

See one or more of the following for this information:

- *Solaris Handbook for Sun Peripherals*
- AnswerBook2[™] online documentation for the Solaris[™] operating environment
- Other software documentation that you received with your system

Typographic Conventions

Typeface ¹	Meaning	Examples
AaBbCc123	The names of commands, files, and directories; on-screen computer output	Edit your <code>.login</code> file. Use <code>ls -a</code> to list all files. % You have mail.
AaBbCc123	What you type, when contrasted with on-screen computer output	% su Password:
<i>AaBbCc123</i>	Book titles, new words or terms, words to be emphasized. Replace command-line variables with real names or values.	Read Chapter 6 in the <i>User's Guide</i> . These are called <i>class</i> options. You <i>must</i> be superuser to do this. To delete a file, type <code>rm filename</code> .

1. The settings on your browser might differ from these settings.

Shell and System Prompts

Shell	Prompt
C shell	<i>machine_name%</i>
C shell superuser	<i>machine_name#</i>
Bourne shell and Korn shell	\$
Bourne shell and Korn shell superuser	#
LOMlite2 prompt	lom>
OpenBoot PROM prompt	ok

Related Documentation

Application	Title	Part Number
Compliance and Safety	<i>Netra 20 Compliance and Safety Manual</i>	816-5279
Service System Reference	<i>Netra 20 Service and System Reference Manual</i>	806-7336
OpenBoot PROM	<i>OpenBoot 3.x Command Reference</i>	806-1377
	<i>OpenBoot PROM Quick Reference</i>	806-2908

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PART I Installation

Introducing the Netra 20 Server

This chapter lists the main features of the Netra 20 server.

The Netra 20 server is a single or dual processor device that uses the 900 MHz or 1.2 GHz UltraSPARC III+ processor and features:

- High performance processors
- High performance disk, system, memory and I/O subsystems
- High performance peripheral component interconnect (PCI) I/O
- Rack mounting options
- Front-to-back cooling
- AC and DC power supply options
- Alarms functionality for remote management
- System configuration card
- Hot swap disk drives
- Visual diagnostics
- Environmental monitoring

System Features

System unit components are housed in a 4RU rack-mounting enclosure designed to NEBS Level 3 standards. Overall chassis dimension (width x depth x height) are 445.2 mm x 508.1 mm x 176.6 mm (17.52 inches x 20.00 inches x 6.95 inches). Flange mounting kits are available for installing the system in 19-inch, 23-inch, 24-inch and 600-mm racks (see FIGURE 2-1). A slide adaptor kit is also available.

System unit electronics are contained on a single printed circuit board (motherboard). The motherboard contains the CPU modules, memory, system control application-specific integrated circuits (ASICs) and I/O ASICs.

A fully-configured system weighs approximately 27.3 kg (60 lb).

Operating Environment

- Solaris 8 Update 2/02 or later
- Solaris 9 Update 12/02 or later

Power

- Rack mounting enclosure with one single-feed 100–240VAC power supply unit (AC) or one twin-feed –48VDC/–60VDC power supply unit (DC)

Processors

- Support for up to two 900MHz UltraSPARC III processor modules or up to two 1.2 GHz UltraSPARC III+ processor modules, each with 8 Mbyte Ecache

Memory

- Support for up to eight 256 Mbyte-, 512 Mbyte- or 1 Gbyte Dual Inline Memory Module (DIMMS) installed in two groups of four providing from 1 to 8 Gbyte of memory

IO

- Four PCI 2.1-compliant slots:
 - one long¹ 64/32-bit, 66/33 MHz
 - two long¹ 64/32-bit, 33 MHz
 - one short² 64/32-bit, 33 MHz
- One 10/100BaseT Ethernet connection
- One Ultra SCSI connection
- Four USB connections (two twin series A ports) @ 12 Mb/s
- One external FC-AL connection
- Two internal FC-AL connections for hard disks
- Two RS232/RS423 serial ports
- One parallel port
- One DB-15 LOMlite2 alarms relay port
- One RJ45 LOMlite2 alarms serial port

System Configuration

- I2C system configuration card reader (SCCR)

1. Up to 312 mm long

2. Up to 174.6 mm long

Storage

- Up to two FC-AL 1-inch hot swap hard disks (73 Gbyte)
- External hardware RAID support through PCI
- Software RAID support Sun Logical Volume Manager (SLVM)
- Up to two removable media drives (DVD-ROM and DDS-4 DAT)

Reliability, Availability and Serviceability

- LOMLite2 automatic system restart
- Remote diagnosis via Solaris and LOMLite2
- Hot swap disks
- Diagnostic LEDs
- Environmental monitoring
- Field Replaceable Unit (FRU) ID support

Documentation

- Installation and User's Guide (this document)
- Service and System Reference Manual
- Compliance and Safety Manual
- Release Notes

Software Support

- Lights Out Management 2.0 (LOMlite2)
- SLVM (Sun Logical Volume Manager)
- SunVTS™ 4.4 (Sun Validation Test Suite)
- SunMC (Sun Management Center)
- SNMP (Sun Netra SNMP Management Agent)
- SunCluster
- SRS/SunUP™ ready

PCI Card Support

The Netra 20 server supports the following PCI cards:

- SunSwift
- Fast Ethernet
- Quad Fast Ethernet (QFE)
- Dual Ethernet, Dual SCSI
- High Speed Serial Interface (HSI)
- Serial Asynchronous Interface (SAI)
- ATM-155
- Dual Ultra-3 Differential SCSI
- Gigabit Ethernet
- FC-AL
- FC-AL and Gigabit Ethernet combination
- SSL Crypto Accelerator
- XVR-500 IFBLite+

System Unit Components

The system unit components are listed by part number in Appendix A.

Note – The part numbers listed in Appendix A were correct when this manual was published but they are subject to change without notice. The numerical references in FIGURE A-1 correlate to the references listed in TABLE A-1 and TABLE A-2. Before you order a replacement part, refer to your authorized Sun sales representative or service provider to confirm the part number.

Site Requirements

This section provides information you should consider when choosing a location for your Netra 20 system.

The chapter contains the following sections:

- “Before Installing the Netra 20 Server” on page 7
- “Environmental Considerations” on page 8
- “Mechanical Considerations” on page 12

Before Installing the Netra 20 Server

The Netra 20 server is available with either an AC or DC power supply unit.

When locating a site for your system, confirm that the correct AC mains power or DC power can be provided. Refer to Chapter 3 for further information.

Environmental Considerations

The system should be installed in an environment within the following specific parameter ranges:

- Ambient temperature
 - operating: 5° to 40°C (41° to 104°F)
 - storage: -40° to 70°C (-40° to 158°F)
- Relative humidity
 - operating: 5 to 85% non-condensing¹
 - storage: 10 to 95% non-condensing
- Elevation
 - operating: 0 to +3000m (9840 feet)
 - storage: 0 to +12000m (39400 feet)

Dimensions

- Height: 176.6mm (6.95in.) 4U NOM
- Width: 445.2mm (17.52in.)
- Depth: 508.1mm (20.00in.)
- Weight: maximum 27.3kg (60lb)

These dimensions are for the product in its normal 19-inch configuration, but without slide handles fitted; other rack sizes require the use of central rack-mount flange adaptors. The overall width of these flanges varies according to the rack size as shown in FIGURE 2-1.

1. Subject to a maximum absolute humidity of 0.024kg of water per kg of dry air.

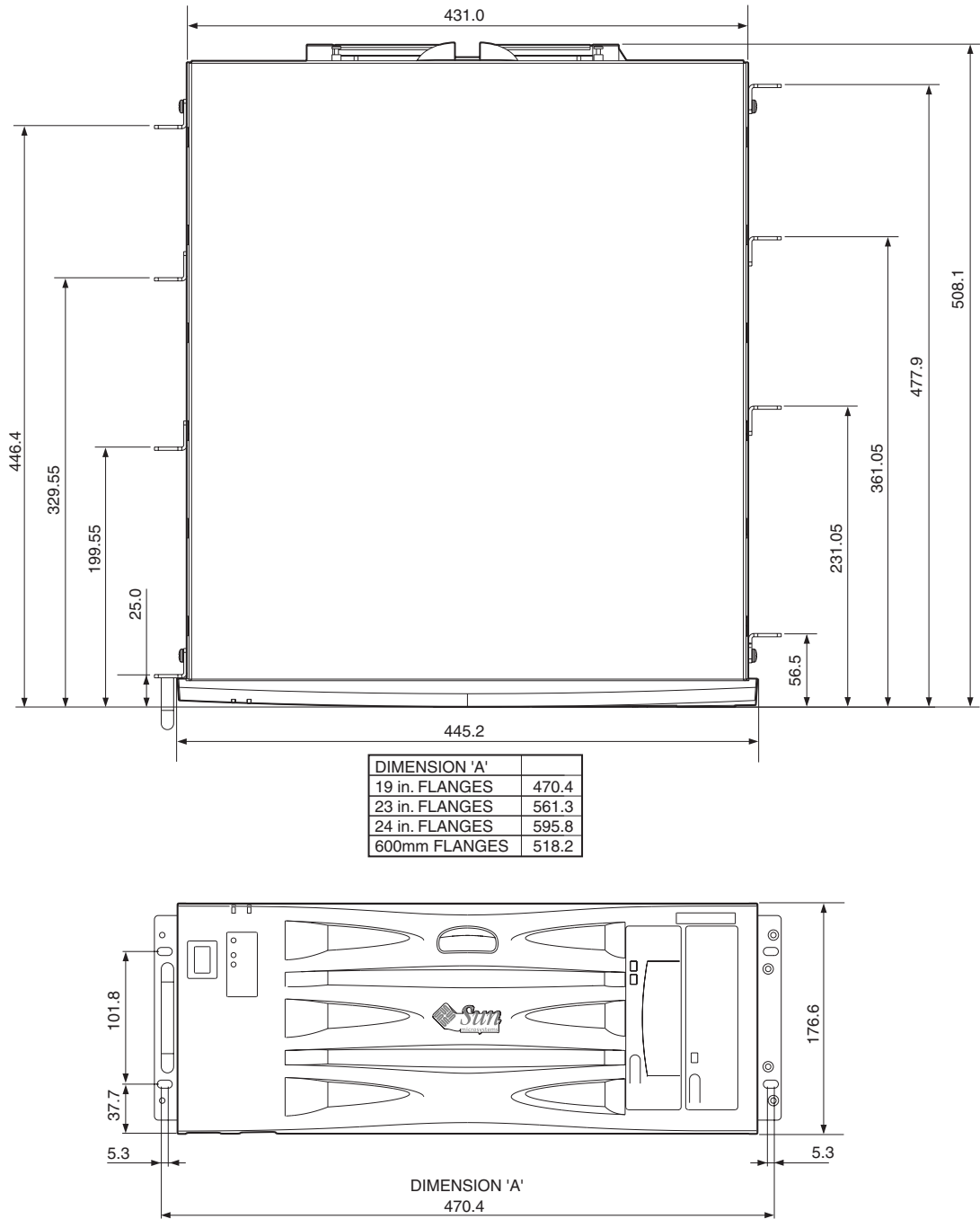


FIGURE 2-1 Netra 20 System Dimensions and Mounting Options (dimensions in mm)

Forced Air Cooling Requirements

1. Ensure that the airflow through the host equipment frame is adequate. The basic cooling airflow requirement for the Netra 20 system is an installed volumetric airflow rate of 100cfm per server.
2. Air is drawn through the front of the Netra 20 enclosure and expelled from the rear of the enclosure. The host equipment rack should present as few obstructions to the airflow as possible near the front and rear of the Netra 20 system. The minimum frame ventilation requirement is 250 cm² free area at both the front and rear face for each installed Netra 20 system.

Unrestricted access to external air is required at the front face. Exhaust airflow from the rear of the Netra 20 system can be directed from the rear of the frame in an open system or through the top of the frame in a closed system (see FIGURE 2-4).

3. If you have fitted the optional air filter, inspect it regularly and replace it, if necessary, to maintain adequate airflow. Air filters are available in packs of ten (part no. X7216A).

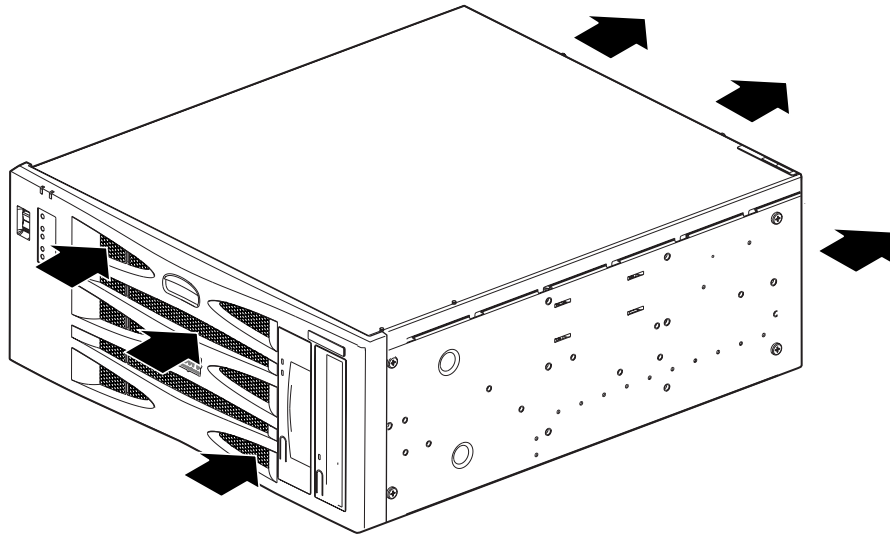


FIGURE 2-2 Netra 20 System Airflow

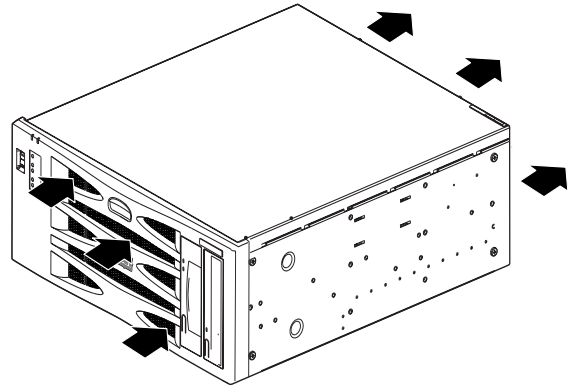
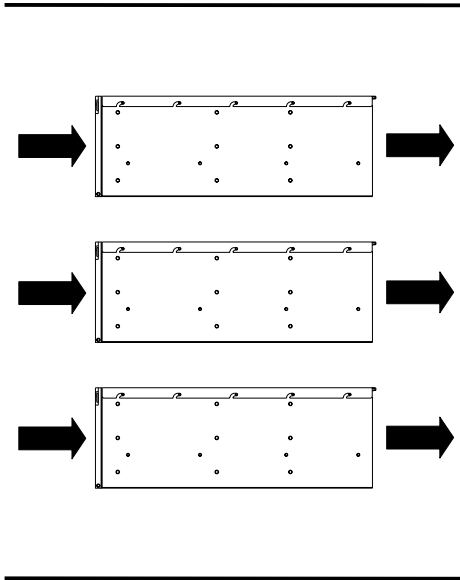


FIGURE 2-3 Netra 20 System Airflow (Open Frame)

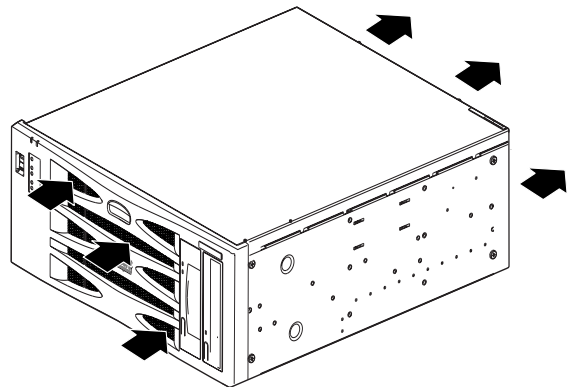
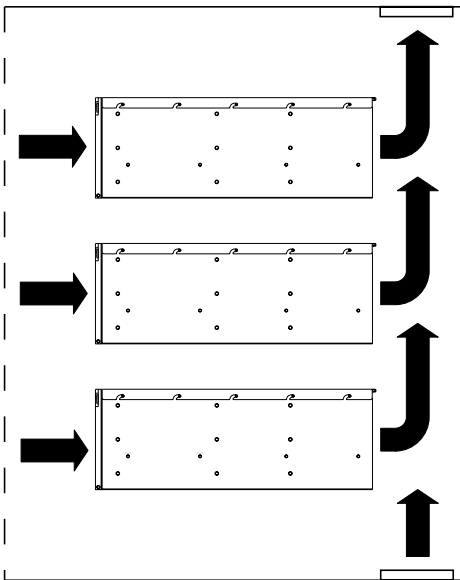


FIGURE 2-4 Netra 20 System Airflow (Closed Frame)

Mechanical Considerations



Caution – The Netra 20 system must be installed only by suitably-trained service personnel. When fully configured with hardware, the system can weigh up to 27.3kg (60lb). At least two persons are required to install a fully-configured unit.

Mounting Flanges

The Netra 20 chassis has been designed for a wide variety of mounting options and rack sizes. A choice of mounting flanges to suit 19-inch, 23-inch, 24-inch or 600-mm nominal frame widths, and a slide adaptor kit can be ordered as required:

- Optional component X7099A (19-inch slide adaptor kit)
- Optional component X6902A (23-inch configuration)
- Optional component X6903A (24-inch configuration)
- Optional component X6904A (600mm configuration)

Mounting flanges for a 19-inch frame are supplied with the system.



Caution – The instructions in the following paragraphs are for use only by suitably-trained installation engineers.

Select the mounting position most suitable for the rack type and seismic environment (see caution below). Four fixing locations are provided on a Netra 20 system; one at the front, two in the centre and one at the rear.

Fit the mounting flanges in the selected position using the six M5 countersunk screws provided with the mounting kit and a Phillips No. 1 screwdriver. The handles, also supplied in the kit, can be fitted to the mounting flanges before or after you attach the flanges to the system.

To mount the slides, all eight (four per side) M4 screws must be fitted. The recommended tightening torque for the M4 recess head screws is 1.7Nm (1.25lbf-ft).

Secure the system within the rack frame using screws suitable for the equipment frame. Their size depends on the frame requirements, but they must be at least M5 (10/32). All screws must be fitted; there are positions provided for eight screws (four per side) in total. The recommended torque value for the M5 recess head screws is 4.0Nm (3.0lbf-ft).

Detailed instructions for fitting the flanges and sliding rails are provided in the *Adjustable Rackmount Installation Guide* provided with your system.



Caution – For installations located in earthquake risk zones, use at least two hard mounting locations (four flanges). The rack must be bolted to the floor.



Caution – Where systems are installed in racks that are not bolted to the floor, deploy any rack stabilization provided before installing the system.

Removing the Shipping Plates

Remove the two M5 screws securing each plate to the system.

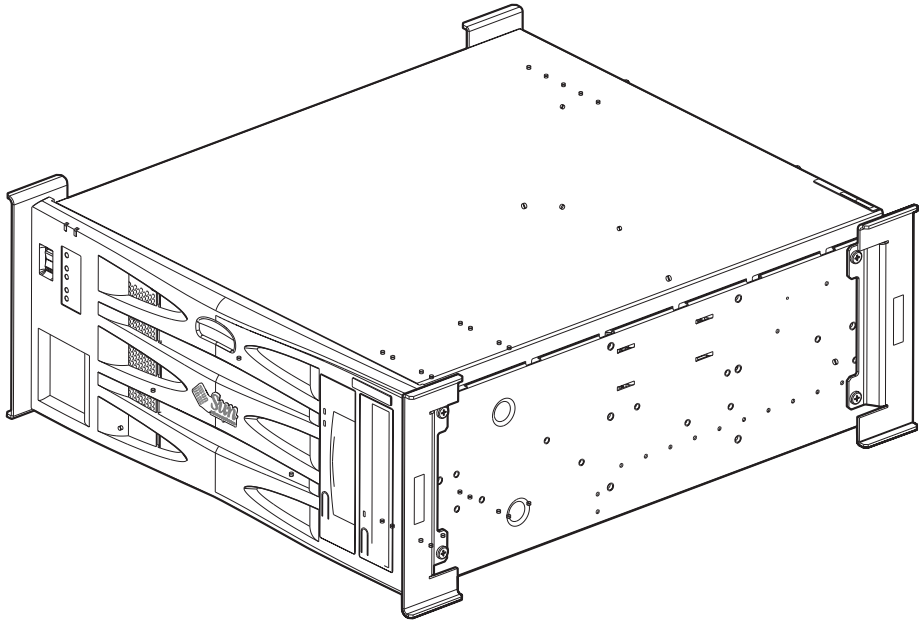


FIGURE 2-5 Shipping Plates

Note – Please retain the plates and system packaging for future use.

Installing the Electrical Supply

This chapter provides information about the electrical supply installation and the operating characteristics of the AC and DC power supply units.

The chapter contains the following sections:

- “Input Current, Power and Thermal Dissipation” on page 15
- “AC Power Supply” on page 16
- “DC Power Supply” on page 19
- “System Switch” on page 30
- “Powering On the System” on page 30
- “Powering Off the System” on page 32

Input Current, Power and Thermal Dissipation

The maximum input current, power and thermal dissipation for the Netra 20 are as follows:

TABLE 3-1 Input Current, Power and Thermal Dissipation

Input Voltage	Current	Power	Thermal Dissipation
90 VAC, 47Hz	6.86A	755W	2370BTU
230VAC, 63Hz	2.27A	703W	2207BTU
-48VDC	16.4A	790W	2481BTU
-60VDC	13.4A	802W	2518BTU

AC Power Supply

Connector

The AC server has an IEC 60320 appliance coupler for connection to mains power.

The AC power cord is the primary means of disconnection for the AC system.

AC Input

Operating Voltage and Frequency

TABLE 3-2 AC Power Supply Input Requirements

	Minimum	Maximum
Voltage	90 V _{rms}	264 V _{rms}
Frequency	47Hz	63Hz

Current

Inrush

The maximum inrush current is 25 A_{peak} upon start up or restart after power has been removed for 60s or longer. Circuit breakers must not be tripped by an inrush current of 25A lasting 200ms.

Operating

The maximum normal input line current is less than 7.2 A_{rms} at 100VAC under standard test conditions.

Power Off Mode

The maximum input power of the system in power off or remote off state is less than 30VA.

Source Site Requirements

The site requirements for the AC power source are as follows:

- Overcurrent protection devices must be provided as part of each host equipment rack.
- Circuit breakers must be located between the AC source and the Netra 20 system.
- Circuit breakers must not trip when presented with an inrush current of 25 A lasting 200ms.

Note – Overcurrent devices must meet applicable national and local electrical safety codes and be approved for the intended application.

Disconnection and Isolation

The disconnect devices for servicing are defined as:

- The appliance inlet on the rear of the system
- The circuit breakers in the rack in which the system is mounted
- The mains plug

Ensure that these remain accessible after installation.



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

Overcurrent Protection

The AC outlet socket should be protected by a 15A double-pole double-throw circuit breaker.

Chassis Enclosure Grounding

The requirements are:

- One Thomas & Betts two-hole lug (part number: 54204-UB) suitable for 8AWG conductor or UL/CSA approved equivalent having 5/8-inch pitch (torque value: 3.5Nm maximum)

Two M5 studs and cupwasher nuts are supplied on the rear of the chassis for connection.

- A Thomas & Betts crimping tool (part number: TBM 5-S), or approved equivalent to secure the lug on to the cable
- An earthing bus bar that is near the equipment and easily accessible.

The safety earth path is established by the connection of the grounding conductor within the AC power cord to a *reliably* earthed socket outlet located near the equipment.

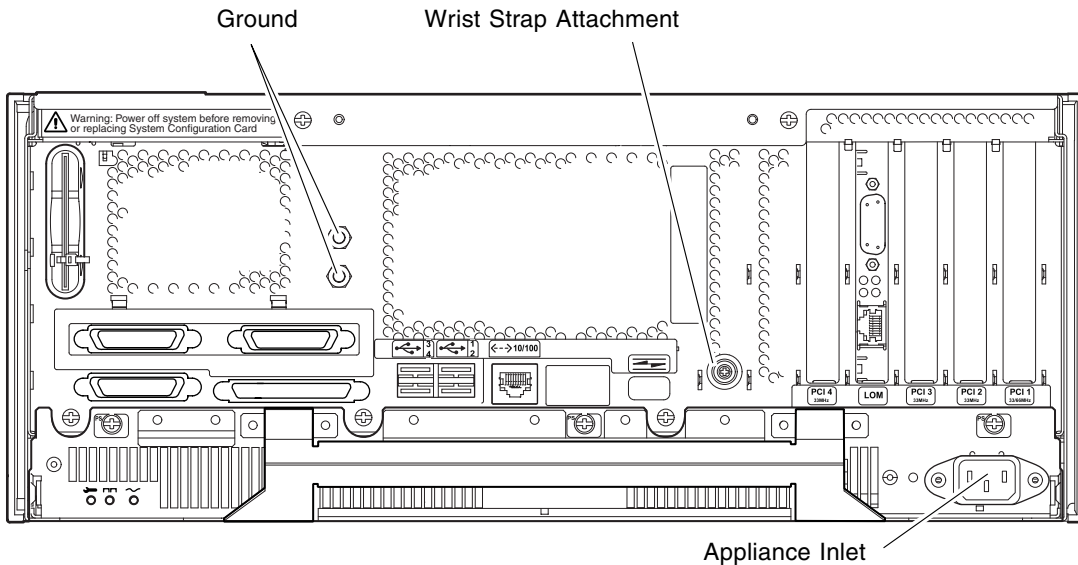


FIGURE 3-1 Netra 20 AC System Grounding Points



Caution – Wear an antistatic wrist strap and use an ESD-protected mat when handling components. When servicing or removing system unit components, use an antistatic wrist strap with a 10 mm press stud connection and attach the antistatic wrist strap to the press stud at the rear or front of the chassis before removing the top access cover.



Caution – Do not open the top access cover until you have powered down the system and removed the power cable.

DC Output

The maximum continuous output power rating is 500W for single or dual input supply. The maximum continuous rating per output is shown in TABLE 3-3.

TABLE 3-3 DC Output Ratings (AC PSU)

Output	Voltage (V)	Current (A)	Regulation Band (V)
1	3.3	38	3.23 to 3.43
2	5.0	48	4.85 to 5.25
3	12	10	11.40 to 12.60
4	-12	0.5	12.60 to -11.65
5	5.0	1.25	4.75 to 5.25

DC Power Supply

Connector

The DC system has two 3-position Wago connectors per power supply. The mating connectors are specified in the section “Power and Grounding Connections” on page 23.

To isolate the system, break all connections by opening all external circuit breakers.

DC Input

TABLE 3-4 DC Power Supply Input Requirements

Electrical Element	Requirement
Voltage ¹	-48VDC / -60VDC
Max. operating current	12A @ -48VDC / 10A @ -60VDC
Max. inrush current	30A @ -48VDC / 24A @ -60VDC

1. The DC power supply range is -40VDC to -75VDC.

Source Site Requirements

The DC source must be:

- -48VDC or -60VDC nominal centralized DC power system
- Electrically isolated from any AC power source
- Reliably connected to earth (that is, the battery room positive bus is connected to the grounding electrode)
- Rated for a minimum of 20 A per feed pair

Note – The Netra 20 DC system must be installed in a *restricted access location*. The IEC, EN and UL 60950 define a restricted access location as an area intended for qualified or trained personnel only and having access controlled by a locking mechanism, such as a key lock or an access card system.

Overcurrent Protection Requirements

- Overcurrent protection devices must be provided as part of each host equipment rack.
- Two 20 A single-pole, fast trip, DC-rated circuit breakers (one per ungrounded supply conductor) must be located in the negative supply conductor between the DC power source and the DC system.
- Circuit breakers must not trip when presented with inrush current of 30 A lasting 250ms.

Note – Overcurrent devices must meet applicable national and local electrical safety codes and be approved for the intended application.

Disconnection and Isolation

The disconnect devices for servicing are defined as:

- The circuit breakers in *both* negative supply conductors
- *Both* DC input connectors

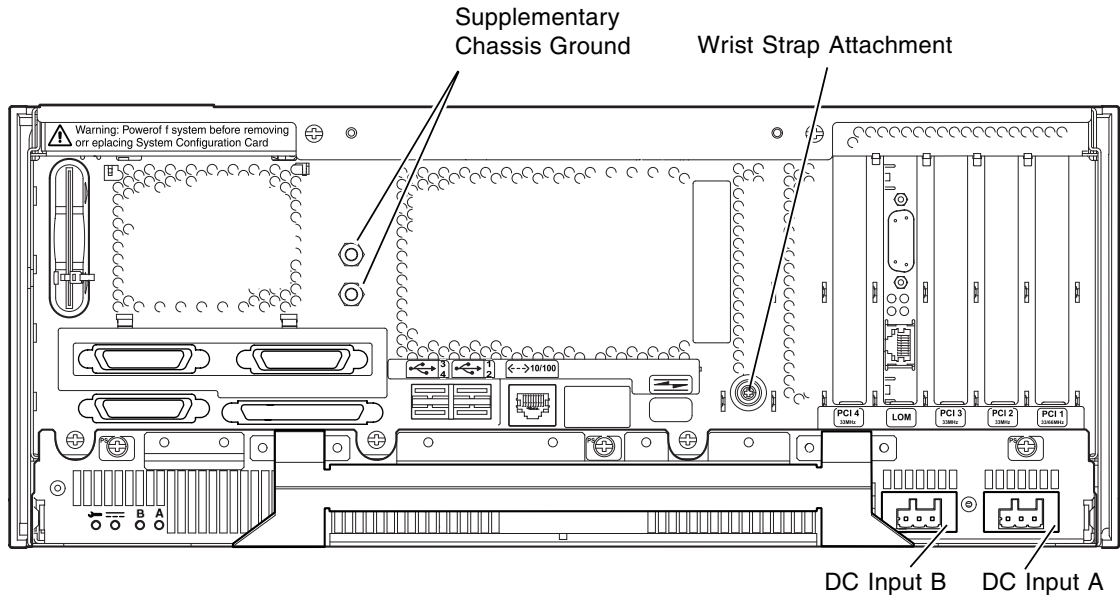


FIGURE 3-2 Netra 20 DC System Grounding Points

Connection Materials

Chassis Ground

The requirements are:

- One Thomas & Betts two-hole lug (part number: 54204-UB) suitable for 8AWG conductor or UL/CSA approved equivalent having 5/8-inch pitch. Torque value: 3.5Nm maximum. Two M5 studs and cupwasher nuts are supplied on the rear of the chassis for connection.
- A Thomas & Betts crimping tool (part number: TBM 5-S), or approved equivalent to secure the lug on to the cable.
- An earthing bus bar that is near the equipment and easily accessible.



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

Note – It is good practice to connect the chassis grounding conductor before applying power to the system via the Wago connectors.

DC Supply and Ground Conductor

The requirements are:

- Suitable conductor material: tinned copper only
- Conductors: 12 AWG maximum (between the DC chassis and circuit breaker).
There are three conductors:
 - -48VDC/-60VDC Supply (pin 1)
 - Ground connection to power supply (pin 2)
 - -48VDC/-60VDC Return (pin 3)
- System ground conductor: 8 AWG
- Cable insulation rating: minimum 75°C, low smoke fume (LSF), flame retardant
- Cable must conform to GR63CORE fire resistance requirements
- Branch circuit cable insulation color: per applicable National Electrical Codes
- Grounding cable insulation color: green/yellow



Caution – Wear an antistatic wrist strap and use an ESD-protected mat when handling components. When servicing or removing system unit components, use an antistatic wrist strap with a 10mm press stud connection and attach the antistatic wrist strap to the press stud at the rear or front of the chassis before removing the top access cover.



Caution – Do not open the top access cover until you have powered down the system and removed the DC source from both input connectors.

DC Output

The maximum continuous output power rating is 500W for single or dual input supply. The maximum continuous rating per output is shown in TABLE 3-5.

TABLE 3-5 DC Output Ratings (DC PSU)

Output	Voltage (V)	Current (A)	Regulation Band (V)
1	3.3	38	3.23 to 3.43
2	5.0	48	4.85 to 5.25
3	12	10	11.4 to 12.6
4	-12	0.5	-12.60 to -11.65
5	5.0	1.5	4.75 to 5.25

Power and Grounding Connections

The following DC connection materials are provided in the DC input connector kit:

- Two Wago DC input connectors and strain relief housings
- One cage clamp operating lever
- Two wire ties

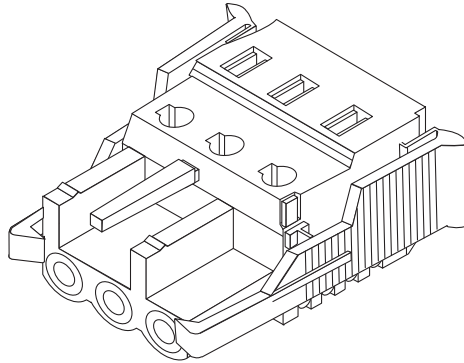


FIGURE 3-3 DC Input Connector

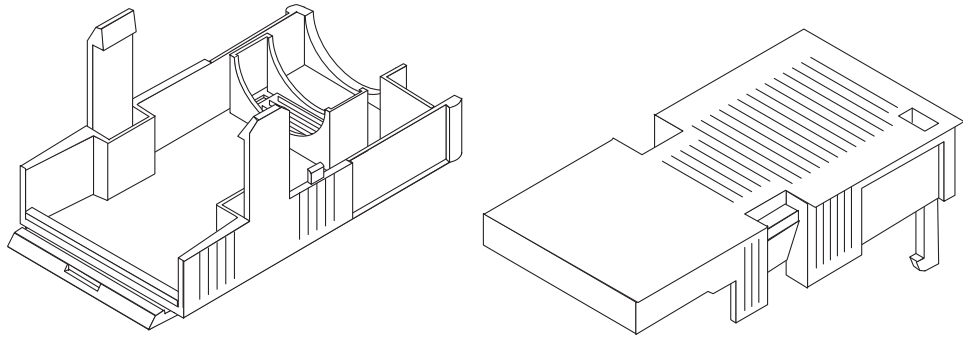


FIGURE 3-4 Strain Relief Housings

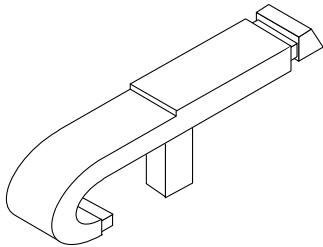


FIGURE 3-5 Cage Clamp Operating Lever

FIGURE 3-6 shows the power connector on the DC power supply on your system.

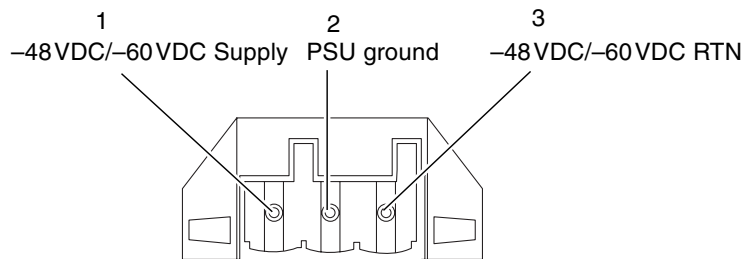


FIGURE 3-6 Power Connector on the DC Power Supply

Wiring the DC Input Power Connector

1. Turn off power to the DC power source by opening 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.

2. Strip 8mm (0.31 inches) of insulation from each of the wires to be fitted to the connector.

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

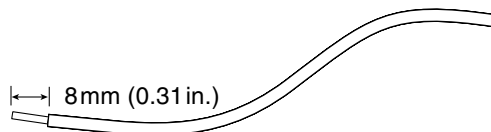


FIGURE 3-7 Stripping the Insulation From the Wire

3. Using a DC connector from the kit, insert the tip of a cage clamp operating lever into the rectangular hole directly above the hole in the DC connector where you want to insert the first wire and press down on the cage clamp operating lever.

This opens the cage clamp for this section of the DC input 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.

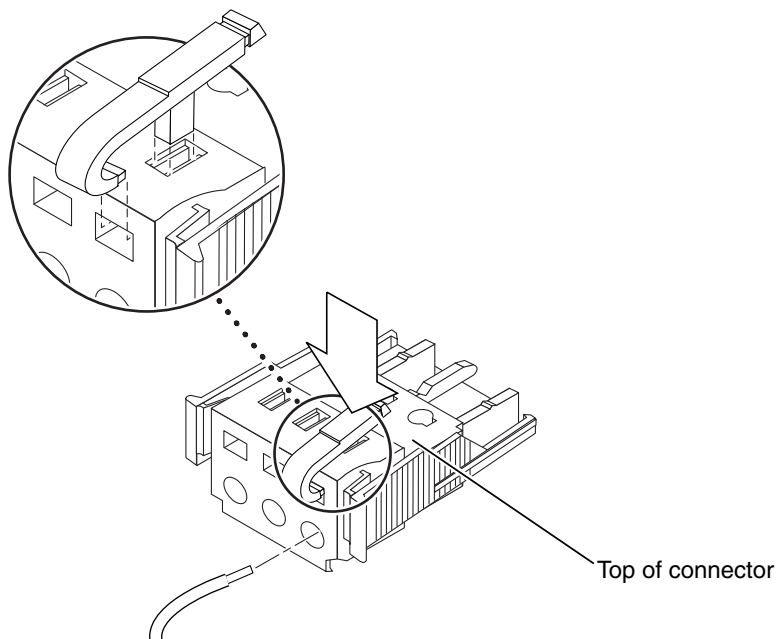


FIGURE 3-8 Opening the DC Connector Cage Clamp Using the Cage Clamp Operating Lever

4. Feed the stripped end of each wire into the appropriate hole in the DC input connector.

FIGURE 3-9 shows which wires should be inserted into each hole in the connector.

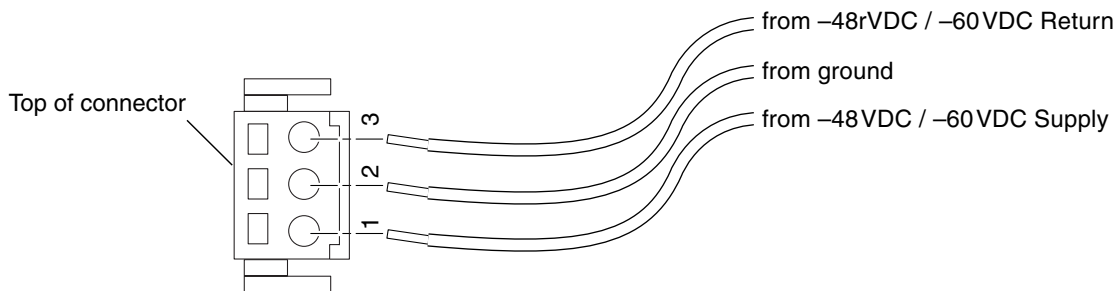


FIGURE 3-9 Assembling the DC Input Power Cable

5. Repeat Step 3 and Step 4 for the other two wires to complete the assembly of the DC input power cable.

6.If you are not using the optional strain relief housing, secure the wires together with a wire tie.

7.Repeat Step 2 through Step 6 to wire the other DC input power connector.

Note that you will require a separate DC power source for each DC input.

If you need to remove a wire from the DC input connector, insert the cage clamp operating lever or a small screwdriver into the slot directly above the wire to free the wire from the cage clamp, and press down (FIGURE 3-8).

Installing the Strain Relief Housings

1.Take the DC input connector and insert the bottom portion of the strain relief housing into the notch on the DC input connector until it snaps into place.

Make sure the strain relief housing snaps into place on the DC input connector; you will not be able to complete the assembly correctly if the strain relief housing is not snapped into place.

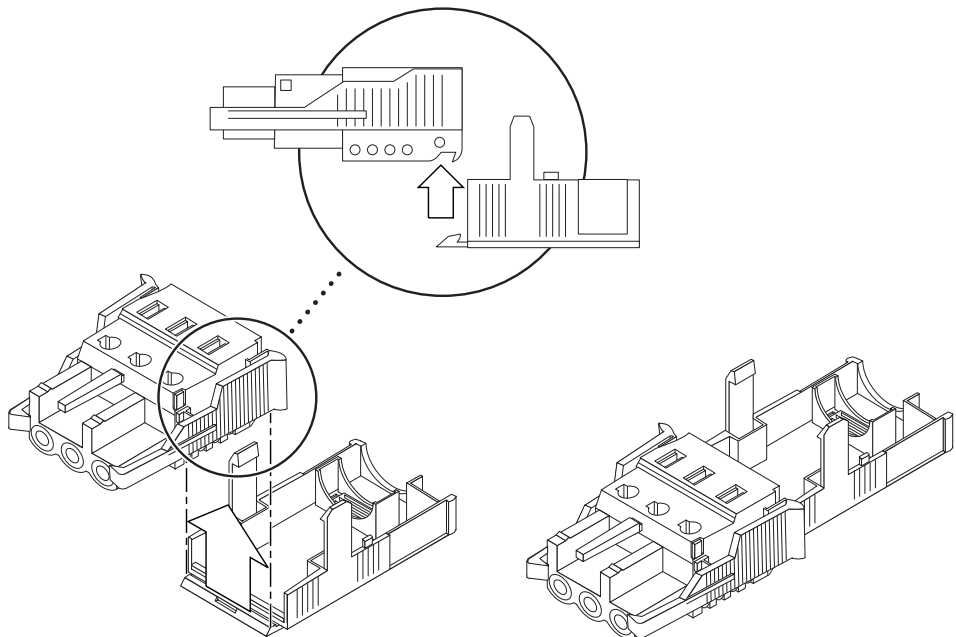


FIGURE 3-10 Inserting the Bottom Portion of the Strain Relief Housing

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.

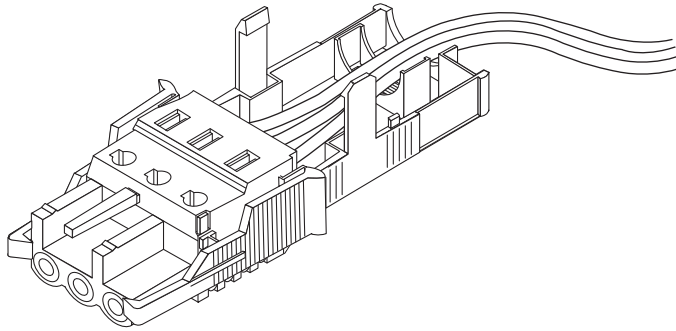


FIGURE 3-11 Routing the Wires Out of the Bottom Portion of the Strain Relief Housing

3. Insert the wire tie into the bottom portion of the strain relief housing.

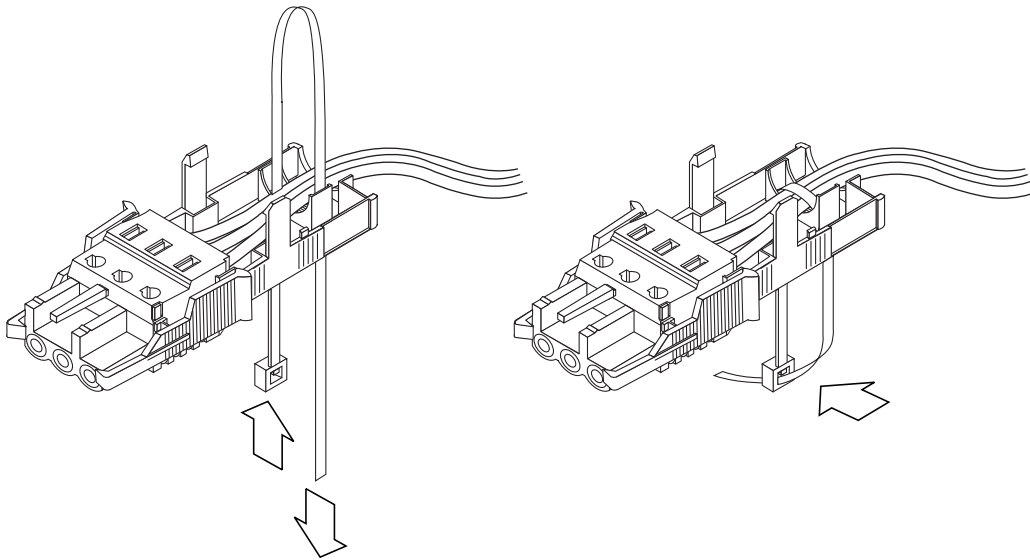


FIGURE 3-12 Securing the Wires to the Strain Relief Housing

4. Loop the wire tie over the wires and back out of the strain relief housing, then tighten the wire tie to secure the wires to the strain relief housing (FIGURE 3-12).

5. Lower the three prongs on the top portion of the strain relief housing into the openings in the DC input connector, then push the top portion and bottom portion of the strain relief housing together until they snap into place.

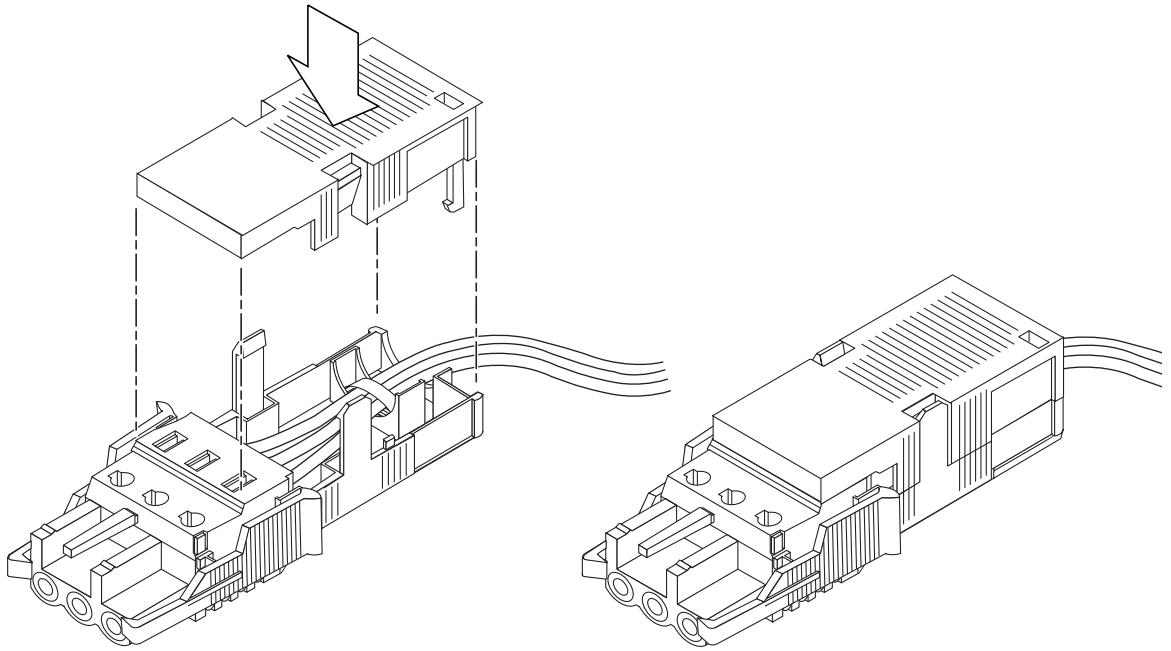


FIGURE 3-13 Assembling the Strain Relief Housing

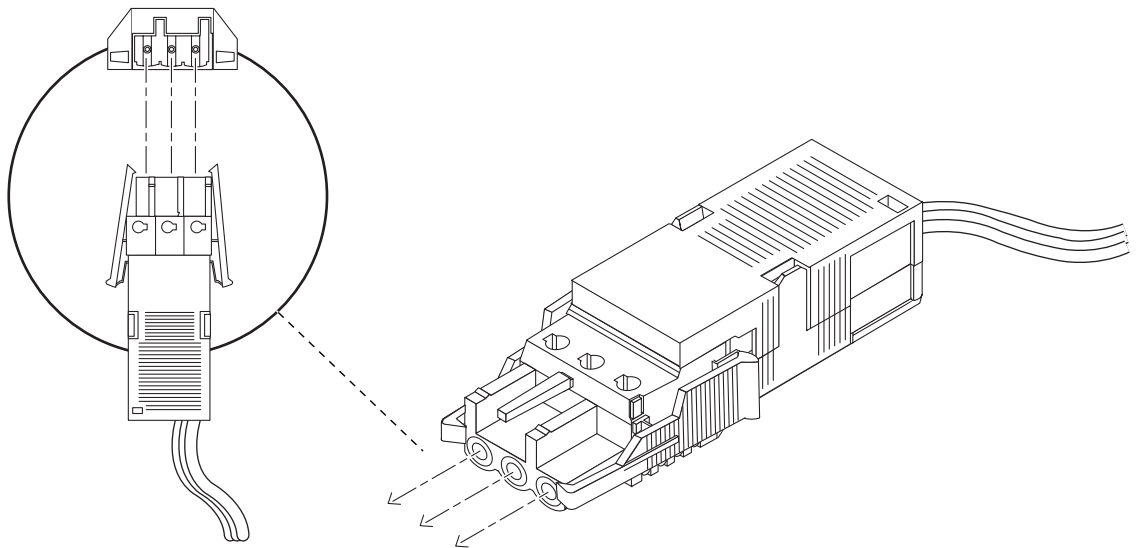


FIGURE 3-14 Connecting the DC Power Cable to the Netra DC Power Supply

The DC input power cables for your system are now completely assembled. FIGURE 3-14 shows how the DC input power cable will connect to the DC inlet connector.

System Switch

The system switch of the Netra 20 system functions as a standby device enabling and disabling the power module outputs. The system switch is a rocker, momentary switch.

The system does not contain any integral circuit breakers. To isolate the system from the mains power, you must remove the input power connector.

Note – The ON/STBY switch handles low voltage signals only; the high-power circuits do not pass through this switch.

Powering On the System

Prior to powering on, inspect the supply conductors for mechanical security.

Netra 20 AC System

1. Plug the system into the mains supply.
2. Momentarily set the front panel ON/STBY system switch to the ON | position and hold it until the system starts to power up.

Netra 20 DC System

1. Insert both DC input connectors.
2. Close both DC circuit breakers.
3. Momentarily set the front panel ON/STBY system switch to the ON | position and hold it until the system starts to power up.

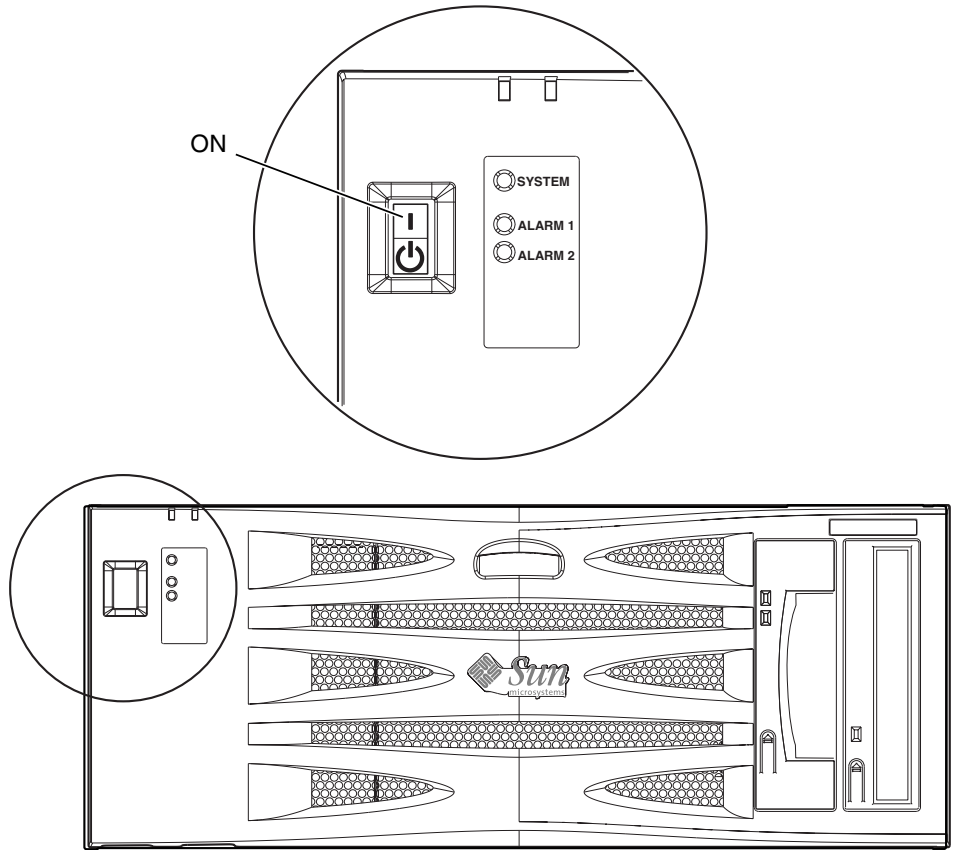


FIGURE 3-15 System Power-On (Front Panel, AC System Shown)


Powering Off the System

Chapter 8 describes how to power off the system using software.



Caution – Before turning off system power, exit from the operating system. Failure to do so may result in data loss.

AC System

1. Where necessary, notify the users that the system is going down.
2. Back up system files and data.
3. Halt the operating system.
4. Momentarily set the front panel ON/STBY system switch to the STBY  position until the system powers down.
5. Verify that the Power LED is off.
6. Disconnect the AC power connector from the rear of the system.



Caution – Regardless of the position of the ON/STBY switch, where an AC power cord remains connected to the system, potentially dangerous voltages could be present within the power supply.

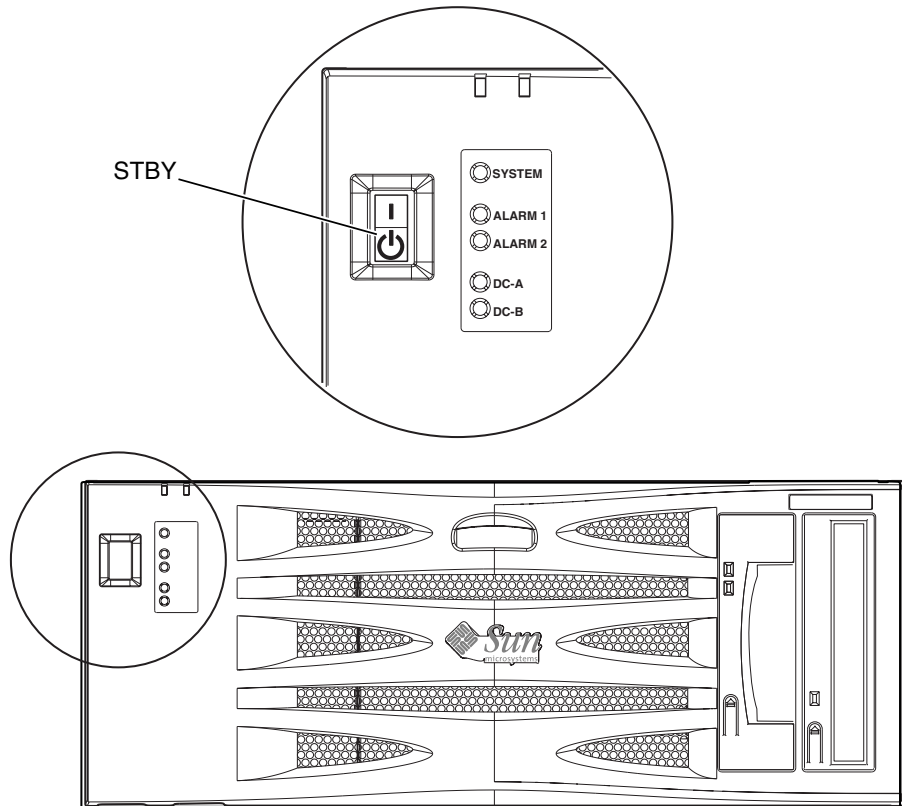



FIGURE 3-16 System Power-off (Front Panel, DC System Shown)

DC System

1. Where necessary, notify the users that the system is going down.
2. Back up system files and data.
3. Halt the operating system.
4. Momentarily set the front panel ON/STBY system switch to the STBY  position until the system powers down.
5. Verify that the Power LED is off.
6. Open both DC circuit breakers.
7. Detach both DC input connectors.

External I/O Connectors

This chapter provides information about the external I/O connectors.

The chapter contains the following sections:

- “Parallel Connector” on page 36
- “Serial Connectors” on page 38
- “SCSI Connector” on page 39
- “Ethernet Connector” on page 42
- “FC-AL Connector” on page 43
- “USB Connectors” on page 44
- “Alarms Ports” on page 45

FIGURE 4-1 shows the locations of the Netra 20 system rear panel connectors.

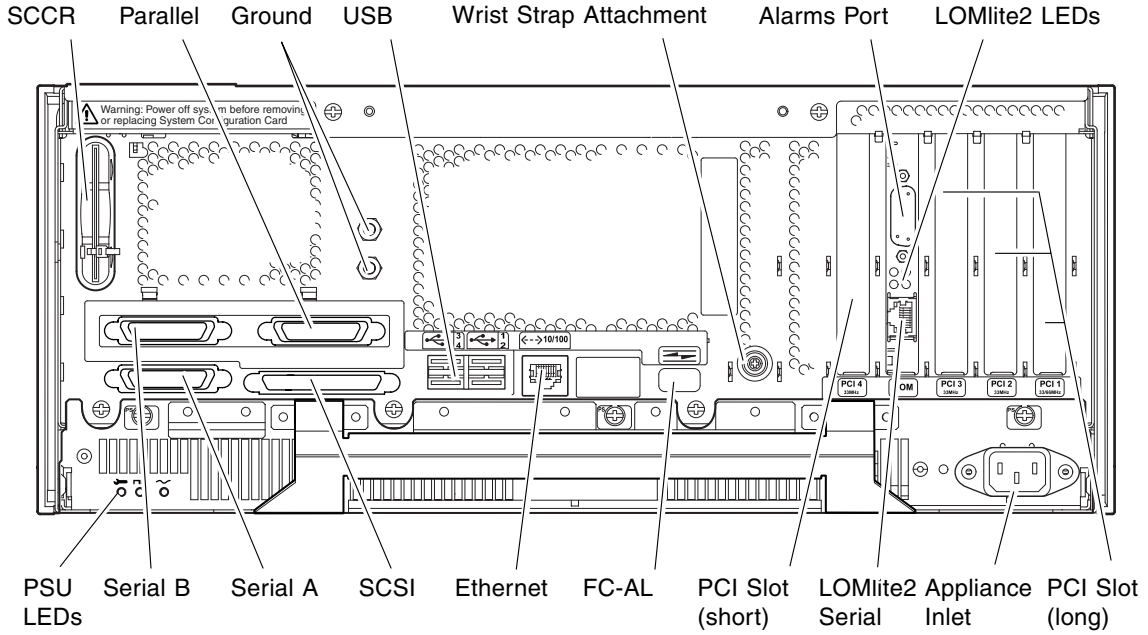


FIGURE 4-1 Rear Panel Connectors (AC System Shown)

Parallel Connector

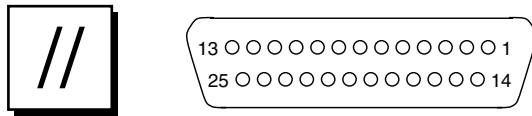


FIGURE 4-2 DB-25 Parallel Connector

TABLE 4-1 Parallel Connector Pinout

Pin	Signal Name	I/O	Service
1	DATA_STROBE_L		Data Strobe (active LOW)
2	DAT(0)		Data Bit 0
3	DAT(1)		Data Bit 1
4	DAT(2)		Data Bit 2
5	DAT(3)		Data Bit 3
6	DAT(4)		Data Bit 4
7	DAT(5)		Data Bit 5
8	DAT(6)		Data Bit 6
9	DAT(7)		Data Bit 7
10	ACK_L		Acknowledge (active LOW)
11	BSY		Busy (active HIGH)
12	PERROR		Paper End (active HIGH)
13	SELECT_L		Select (active LOW)
14	AFXN_L		Auto Line Feed (active LOW)
15	ERROR_L		Error (active LOW)
16	RESET_L		Initialize Printer (prime active LOW)
17	IN_L		Select Input (active LOW)
18	GND		Ground
19	GND		Ground
20	GND		Ground
21	GND		Ground
22	GND		Ground
23	GND		Ground
24	GND		Ground
25	GND		Ground

Serial Connectors



FIGURE 4-3 DB-25 Serial Connectors

TABLE 4-2 Serial Connector Pinout, RS423/RS232

Pin	Function	I/O	Signal Description
1			Not connected
2	TxD	O	Transmit Data
3	RxD	I	Receive Data
4	RTS	O	Ready To Send
5	CTS	I	Clear To Send
6	DSR	I	Data Set Ready
7	GND		Signal Ground
8	DCD	I	Data Carrier Detect
9–14			Not connected
15	TRxC	I	Transmit Clock
16			Not connected
17	RTxC	I	Receive Clock
18–19			Not connected
20	DTR	O	Data Terminal Ready
21–23			Not connected
24	TxC	O	Transmit Clock
25			Not connected

SCSI Connector

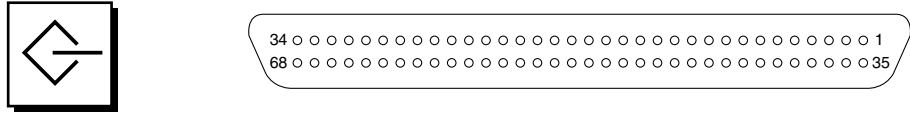


FIGURE 4-4 68-Pin SCSI Connector

TABLE 4-3 68-Pin SCSI Connector Pinout

Pin	Signal Name	Pin	Signal Name
1	GND	21	GND
2	GND	22	GND
3	GND	23	GND
4	GND	24	GND
5	GND	25	GND
6	GND	26	GND
7	GND	27	GND
8	GND	28	GND
9	GND	29	GND
10	GND	30	GND
11	GND	31	GND
12	GND	32	GND
13	GND	33	GND
14	GND	34	GND
15	GND	35	-DB<12>
16	GND	36	-DB<13>
17	TERMPWR	37	-DB<14>
18	TERMPWR	38	-DB<15>
19	Not connected	39	-PAR<1>
20	GND	40	-DB<0>

TABLE 4-3 68-Pin SCSI Connector Pinout (*Continued*)

Pin	Signal Name	Pin	Signal Name
41	-DB<1>	55	-ATN
42	-DB<2>	56	GND
43	-DB<3>	57	-BSY
44	-DB<4>	58	-ACK
45	-DB<5>	59	-RST
46	-DB<6>	60	-MSG
47	-DB<7>	61	-SEL
48	-PAR<0>	62	-CD
49	GND	63	-REQ
50	TERM.DIS	64	-IO
51	TERMPWR	65	-DB<8>
52	TERMPWR	66	-DB<9>
53	Reserved	67	-DB<10>
54	GND	68	-DB<11>

Note – All signals shown in TABLE 4-3 are active low.

SCSI Implementation

- SCSI-3 Fast-20 (UltraSCSI) parallel interface external 16-bit single-ended bus
 - 40 Mbps data transfer rate
 - Support for 16 SCSI addresses:
 - Target 0 to 6 and 8 to F for devices
 - Target 7 reserved for SCSI host adapter on main logic board
- Support for up to three internal devices (including the host adapter) on an 8-bit, narrow single-ended bus:
 - Fast-20 SCSI removable media device target 4
 - Fast-20 SCSI removable media device target 6
 - Fast-10 SCSI removable media device DAT target 5
 - Fast-10 SCSI removable media device DVD-ROM target 6
- Support for external 8-bit and 16-bit SCSI devices via 68-pin SCSI connector mounted on an adapter board

SCSI Cabling and Configuration

The SCSI-3 Fast-20 (UltraSCSI) specification requires that the external SCSI bus length be limited to 3m (10 feet) for less than five devices (internal and external), and 1.5m (5 feet) for five to eight devices. When SCSI-3 and SCSI-2 devices are connected to the Netra 20 system SCSI bus, the system enables each device to operate at its respective data transfer rate. The last external SCSI device in a daisy-chain must be terminated internally (active termination) or with an external terminator according to Forced-Perfect Termination (FPT) technology.

SCSI Cabling Procedure

- 1.Count the number of SCSI devices on the system SCSI bus. Be sure to count the host adapter as a SCSI device.
- 2.Determine the total SCSI bus length.

TABLE 4-4 Determining SCSI Bus Length

SCSI Implementation	Bus Width	Data Transfer Rate, Mb/s	Number of Devices	SCSI Bus Length
SCSI-2, Fast	8 bits	10	1–8	6.0m
SCSI-2, Fast/Wide	16 bits	20	1–8	6.0m
SCSI-3 Parallel Interface, Fast-20 Wide (UltraSCSI) (WideUltra)	16 bits	40	1–4	3.0m
SCSI-3 Parallel Interface, Fast-20 Wide (UltraSCSI) (WideUltra)	16 bits	40	5–8 ¹	1.5m

1. The maximum number of single-ended/differential SCSI devices is 16.

- 3.Verify the cable type used to connect external SCSI devices. You must use Fast-20 SCSI cable(s).

Ensure that the total SCSI cable length does not exceed the permissible total SCSI bus length.

SCSI-2 (UltraSCSI) External Devices

If you connect SCSI-2 (UltraSCSI, 40 Mb data transfer rate) external devices to a Netra 20 system, follow these cabling and configuration guidelines (as shown in FIGURE 4-5) to ensure proper device addressing and operation:

- If all external mass storage devices use 68-pin connectors, connect all non Sun devices to the Netra 20 system first and follow them with Sun devices. Sun devices use auto-termination.
- If external mass storage devices consist of 68-pin Sun devices and 50-pin devices, connect the Sun 68-pin devices to the Netra 20 system first and terminate the daisy chain with the 50-pin device and its terminator.
- The total SCSI bus length for all external SCSI devices is 6.0m (19.7ft), including the internal cabling.

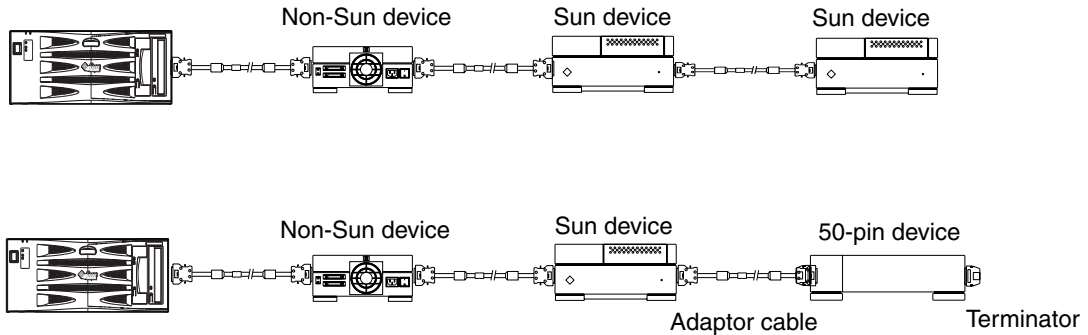


FIGURE 4-5 Connecting External Mass Storage Devices

Ethernet Connector



FIGURE 4-6 RJ45 TPE Socket

TABLE 4-5 TPE Connector Pinout

Pin	Description	Pin	Description
1	Transmit Data +	5	Common Mode Termination

TABLE 4-5 TPE Connector Pinout

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

TPE Cable-Type Connectivity

The following types of twisted-pair Ethernet cable can be connected to the 8-pin TPE connector:

- For 10BASE-T applications, shielded twisted-pair (STP) cable:
 - Category 3 (STP-3, *voice* grade)
 - Category 4 (STP-4)
 - Category 5 (STP-5, *data* grade)
- For 100BASE-T applications, shielded twisted-pair category 5 (STP-5, *data* grade) cable.

TABLE 4-6 TPE STP-5 Cable Lengths

Cable Type	Application(s)	Max Length (Metric)	Max Length (Imperial)
Shielded twisted pair category 5 (STP-5, <i>data</i> grade)	10BASE-T	1000m	3281 feet
Shielded twisted pair category 5 (STP-5, <i>data</i> grade)	100BASE-T	100m	328 feet

FC-AL Connector

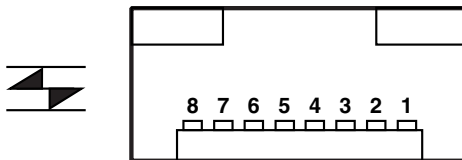
**FIGURE 4-7** FC-AL Connector

TABLE 4-7 FC-AL Connector Pinout

Pin	Description	Pin	Description
1	Transmit Data TX_P	5	
2		6	Receive Data TX_N
3	Transmit Data TX_N	7	
4		8	Receive Data TX_P

USB Connectors

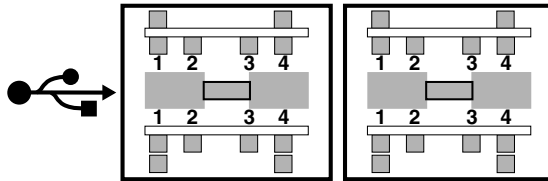


FIGURE 4-8 USB Connector

TABLE 4-8 USB Connector Pinout

Pin	Description	Pin	Description
1	VCC +5VDC	3	Data +
2	Data -	4	Ground

Alarms Ports

The alarms service port connector (male DB-15) and LOM port connector (RJ45) are located on the alarms card. TABLE 4-9 list the pinouts for the alarms service port connector.

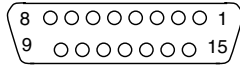


FIGURE 4-9 DB-15 (Male) Alarms Service Port Connector

TABLE 4-9 Alarms Service Port Connector Pinout

Pin	Signal Name	Pin	Signal Name
1	Not connected	9	ALARM1_NC
2	Not connected	10	ALARM1_COM
3	Not connected	11	ALARM2_NO
4	Not connected	12	ALARM2_NC
5	SYSTEM_NO	13	ALARM2_COM
6	SYSTEM_NC	14	Not connected
7	SYSTEM_COM	15	Not connected
8	ALARM1_NO	Shell	CHGND

The remote Lights Out Management serial port is located below the alarms port. The connector is a shielded RJ45 and TABLE 4-10 lists the connector pinout.

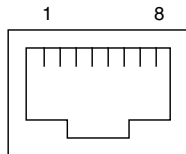


FIGURE 4-10 RJ45 Lights Out Management Serial Connector

TABLE 4-10 Lights Out Management Serial Connector Pinout

Pin	Signal Name	Pin	Signal Name
1	RTS	5	REF (0V)
2	DTR	6	RXD
3	TXD	7	DSR
4	REF (0V)	8	CTS
Shell	CHGND		

System Configuration Card Reader

The slot for system configuration card reader (SCCR) smart card is located at the extreme left hand side of the rear panel (see FIGURE 4-1). For details of the SCCR refer to Chapter 9.

Installing Solaris

A separate installation CD is not required and you should use the installation CD supplied in the Solaris media kit to install the operating environment.

Follow the standard procedure for installing Solaris, as described in the documentation provided in the media kit.

The Lights Out Management 2 software (mandatory) and SunVTS software (optional) are included on the Software Supplemental CD supplied in the media kit.

Note – Solaris 8 Update 2/02 includes version 4.6 of SunVTS on the Software Supplement CD. This update will not work with earlier revisions of SunVTS.

PART II User's Guide

LED Indicators

This chapter describes the function of the LEDs on the Netra 20 system.

The chapter contains the following sections:

- “System LEDs” on page 51
- “LOMlite 2 LEDs” on page 54
- “PSU LEDs” on page 56

The Netra 20 server has three sets of LEDs that show the status of the system.

System LEDs

The system LEDs are located behind the front fascia, immediately to the right of the ON/STBY switch as you face the unit, as shown in FIGURE 6-1.

Light pipes transmit the Power, System, Alarm1, Alarm2 and Fault LEDs through the fascia and are visible from the front of the system. To view the remaining LEDs, you must lower the front fascia.

The Alarm1, Alarm2, System and Fault LEDs are mirrored on the LOMlite2 card visible from the rear of the system (see “LOMlite 2 LEDs” on page 54).

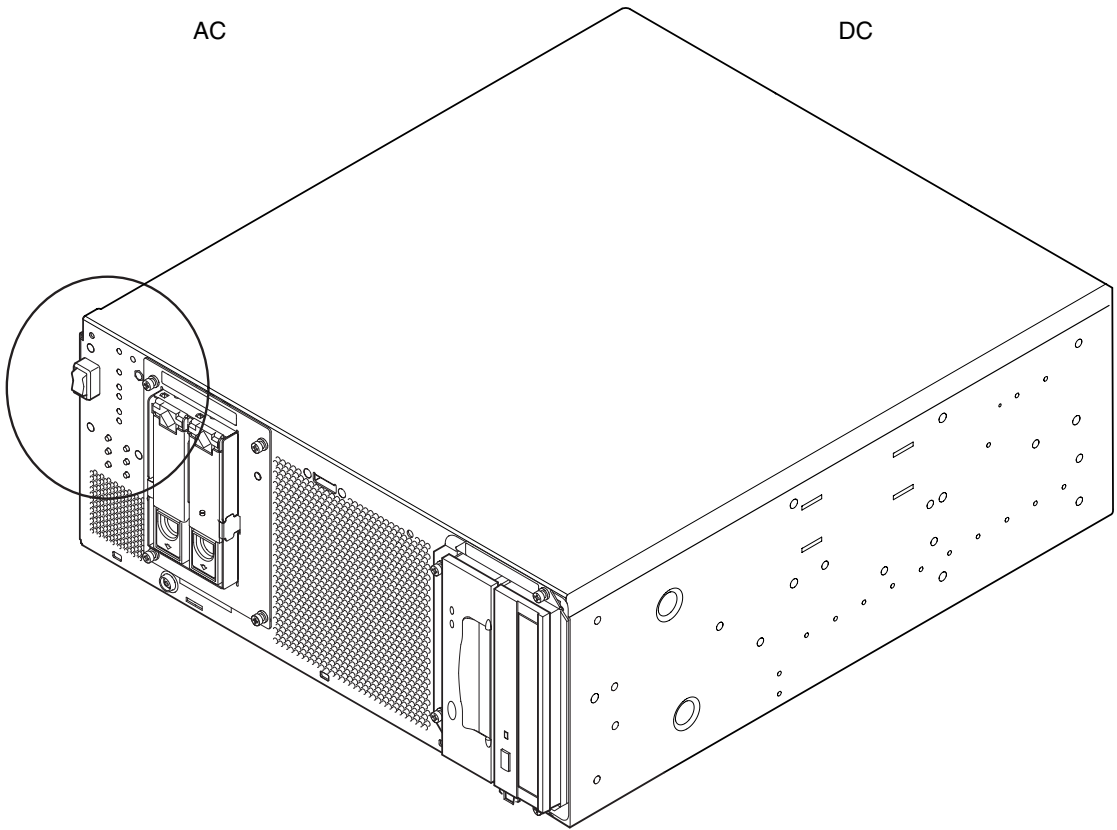
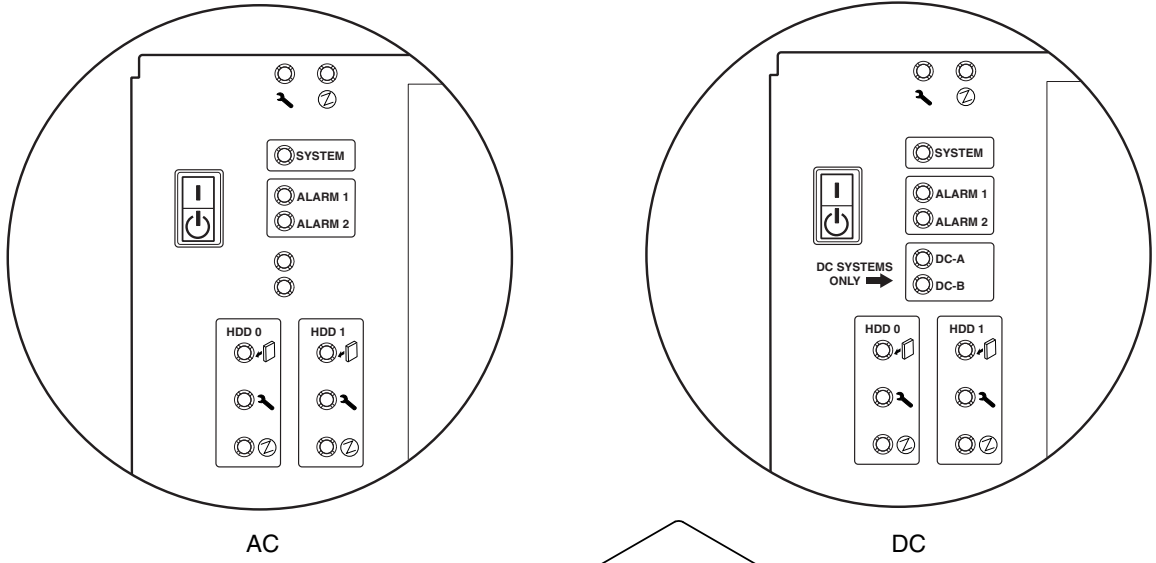










FIGURE 6-1 Front Panel System LEDs

TABLE 6-1 Front Panel System LED Functions

LED	Icon	Color	Function
Power		Green	Illuminated continuously while power is supplied to the system.
System ¹	SYSTEM	Green	Off (or reset) during power up procedures and illuminated when UNIX is running and the Alarms driver is installed. This LED is reset by a hardware Watchdog timeout, or whenever the user-defined Alarm3 is asserted.
Alarm1 ¹	ALARM1	Amber	Illuminated whenever the user-defined Alarm1 is asserted
Alarm2 ¹	ALARM2	Amber	Illuminated whenever the user-defined Alarm2 is asserted
Input A OK	DC-A	Green	Illuminated when the input voltage from feeder A is above 37V Off when Input A is below 35V Not used in the AC version
Input B OK	DC-B	Green	Illuminated when the input voltage from feeder B is above 37V Off when Input B is below 35V Not used in the AC version
Fault ¹		Amber	Driven by the LOMlite2 module under identified system fault conditions
Disk0 Active ²		Green	Illuminated when Disk0 is active
Disk0 OK to Remove ²		Blue	Illuminated , in response to a user request, when Disk0 can be removed safely without affecting the system operation
Disk0 Fault ²		Amber	Illuminated when the system has identified a fault in Disk0
Disk1 Active ²		Green	Illuminated when Disk1 is active
Disk1 OK to Remove ²		Blue	Illuminated , in response to a user request, when disk1 can be removed safely without affecting the system operation
Disk1 Fault ²		Amber	Illuminated when the system has identified a fault in Disk1


1. These LEDs are duplicated on the LOMlite2 card face plate (see “LOMlite 2 LEDs” on page 54).

2. Lower the front fascia to view these LEDs.

LOMlite 2 LEDs

The LOMlite2 status LEDs, which mirror the alarm status and power LEDs on the front panel, are located on the rear of the system, between the LOMlite2 DB-15 alarm relay port and RJ45 serial port, as shown in FIGURE 6-2.

TABLE 6-2 LOMlite2 Status LED Functions

LED	Legend	Color	Function
Alarm 1	1	Amber	Illuminated when user-defined Alarm 1 is asserted
Alarm 2	2	Amber	Illuminated when user-defined Alarm 2 is asserted
Fault		Amber	Driven by the LOMlite 2 card and illuminated when a system fault condition exists
System	SYS	Green	Illuminated when Solaris is running and the LOMlite2 driver is installed Off while the system is powering up Reset by watchdog timeout, assertion of user-defined Alarm 3

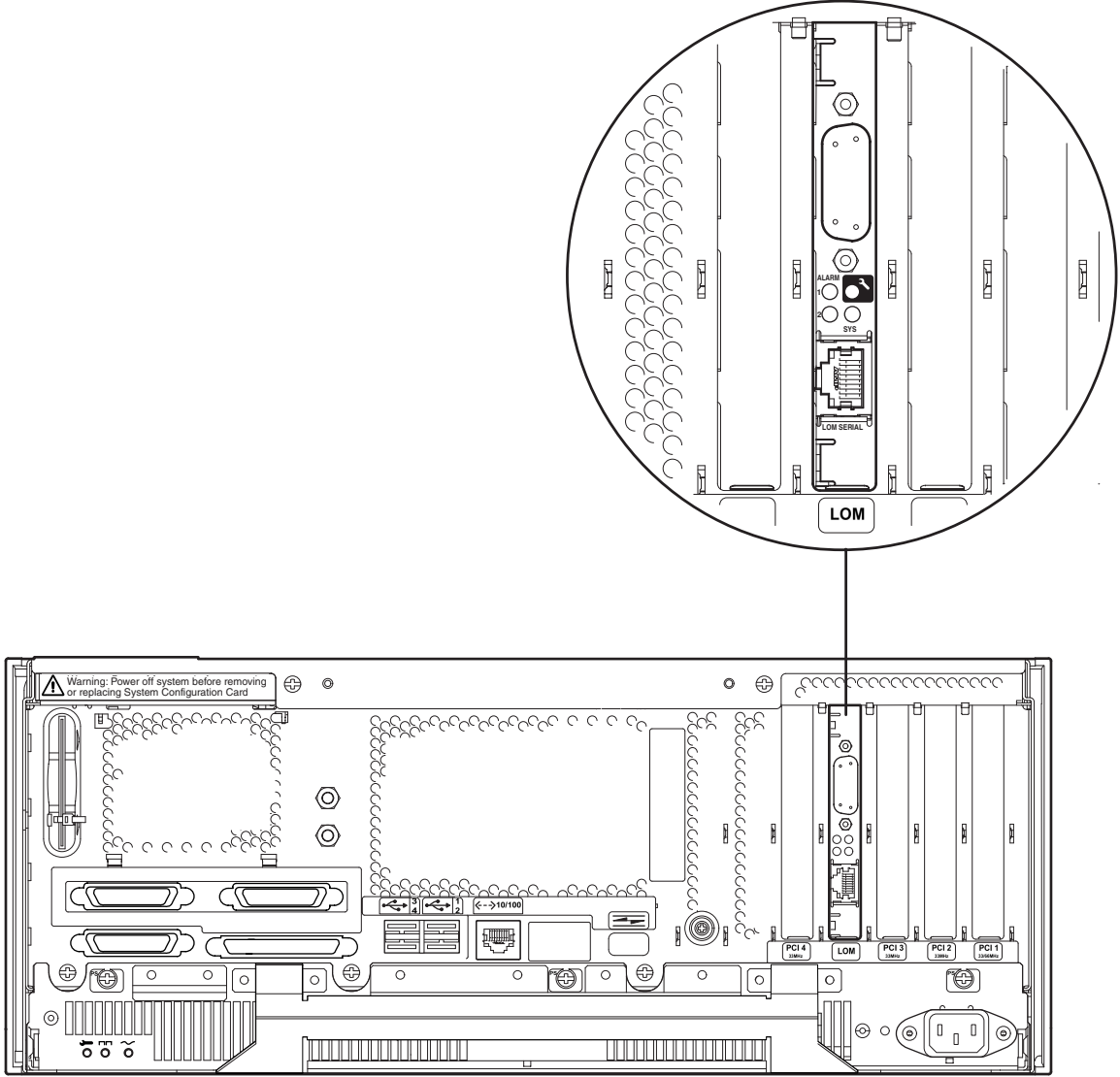


FIGURE 6-2 LOMLite2 Status LEDs

PSU LEDs

The PSU status LEDs are located at the left hand end of the PSU.

Netra 20 AC System

TABLE 6-3 PSU Status LED Functions (Netra 20 AC System)

LED	Icon	Color	Function
AC Input OK	~	Green	Illuminated when AC is present and above 85 VAC
PSOK	□□	Green	Illuminated when output voltages are within operating range Flashes when PSU is in Standby mode
Fail	⚡	Amber	Illuminated when PSU is in a Fault condition or has shutdown Off when PSU is enabled (OK) Flashes if unit is within 10°C of thermal shutdown

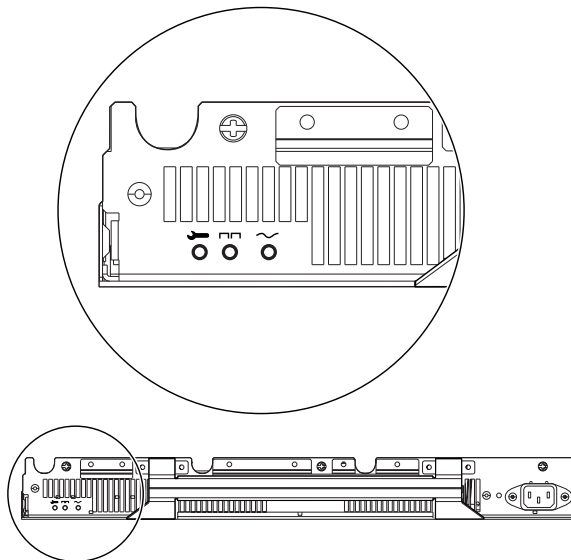




FIGURE 6-3 PSU Status LEDs (Netra 20 AC System)

Netra 20 DC System

TABLE 6-4 PSU Status LED Functions (Netra 20 DC System)

LED	Icon	Color	Function
Fail		Amber	Illuminated when PSU is in a Fault condition Off when PSU is not enabled (OK) Flashes if unit is within 10°C of thermal shutdown or has shutdown
PSOK		Green	Illuminated when output voltages are within operating range Flashes when PSU is in Standby mode
Input B OK	B	Green	Illuminated when input voltage from feeder B is above 37V Off when Input B is below 35V
Input A OK	A	Green	Illuminated when input voltage from feeder A is above 37V Off when Input A is below 35V

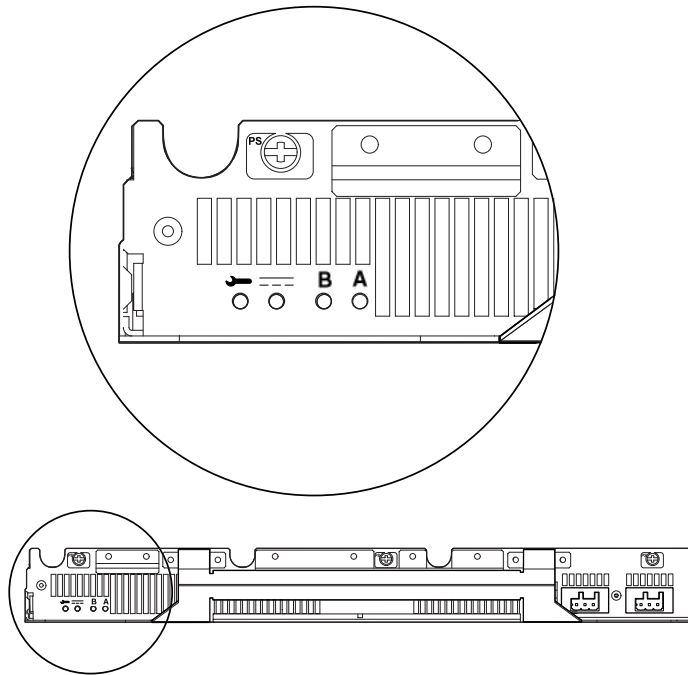


FIGURE 6-4 PSU Status LEDs (Netra 20 DC System)

System Start-Up and Operation

This chapter describes the system start-up and boot processes.

The chapter contains the following sections:

- “Starting the System” on page 59
- “System Prompts” on page 60

Starting the System

Use this procedure to start a system that has been powered down completely.

1. **Connect and power on any peripheral devices, console or terminal, and external storage devices.**
2. **Press the ON switch on the front panel until the system starts to power up.**
3. **Wait for the system to boot or until the `ok` prompt is displayed.**

Note – If the OBP `auto-boot?` variable is set to `false`, the system will boot only to the `ok` prompt. To complete the boot process, type `boot` at the `ok` prompt.

System Prompts

The following default system prompts are used by the Netra 20 system:

- ok—OpenBoot™ PROM (OBP) prompt
- lom>—Lights Out Management (LOMlite2) prompt
- #—Solaris superuser prompt (Bourne and Korn shell)

FIGURE 7-1 shows the relationship between the three prompts and how to change from one to another.

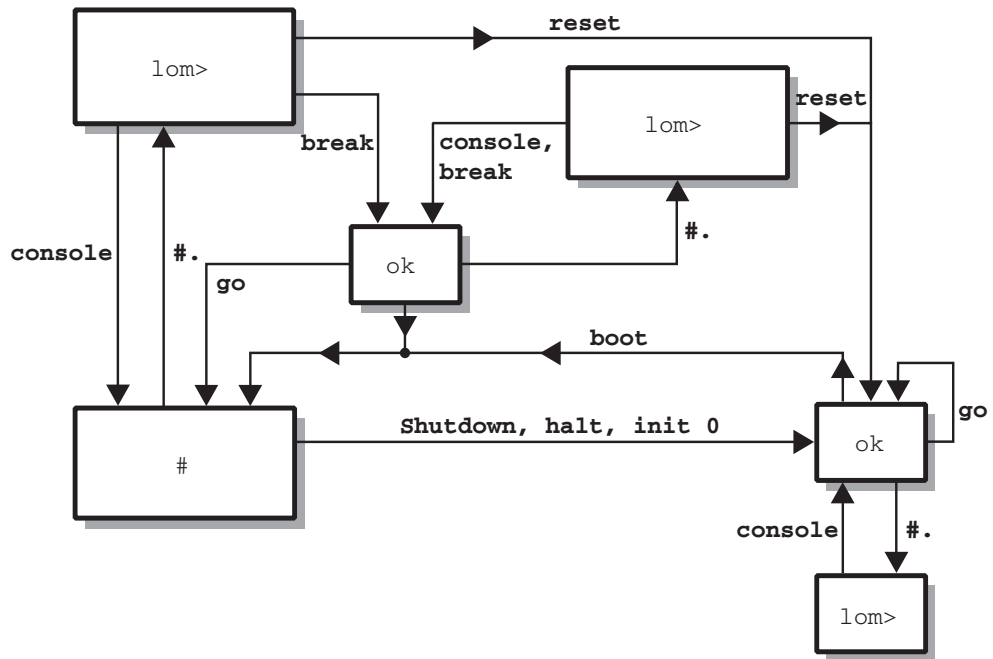


FIGURE 7-1 System Prompt Flow Diagram

System Shut-Down

This chapter describes the procedures for shutting down the operating environment and powering down the Netra 20 server.

Powering Down the System

1. **Notify users that the system will be powered down.**
2. **If necessary, back up the system and data files.**
3. **Halt the operating environment (see TABLE 8-1).**
4. **Wait for the system halt message and the `ok` prompt to appear on the system console.**
5. **Power off the system (see TABLE 8-2).**

Note – Step 4 and Step 5 may proceed automatically, depending on the command you use to halt the operating environment in Step 3.

6. **Disconnect the power to any peripherals, console or terminal, and external storage devices.**

Shut Down Procedures

The procedures for shutting down the operating environment are shown in TABLE 8-1.

TABLE 8-1 Operating Environment Shut Down Procedures

Prompt	Command or Action	Result
Solaris	# shutdown -y -g0 -i0	The operating environment shuts down gracefully leaving the system at the PROM monitor level (ok prompt).
Solaris	# init 0	The operating environment shuts down leaving the system at the PROM monitor level (ok prompt).
	Momentarily press the STBY switch.	The operating environment shuts down immediately and then the system powers down leaving the 5V supply to the LOMlite2 card active.

Power Down Procedures

The procedures for powering down the system are shown in TABLE 8-2.

TABLE 8-2 System Power Down Procedures

Prompt	Command	Result
OBP	ok> power-off	The system immediately powers down.
LOM	lom> poweroff	The system immediately powers down.
Solaris	# shutdown -y -g0 -i5	The operating environment shuts down gracefully and then the system powers down.
Solaris	# init 5	The operating environment shuts down and then the system powers down.
Solaris	# init 0	The operating environment shuts down leaving the system at the PROM monitor level (ok prompt).

OpenBoot PROM

This chapter describes the function of the System Configuration Card (SCC), and lists the elements of the Solaris OpenBoot Command Reference that apply to the Netra 20 system.

The chapter contains the following sections:

- “System Configuration Card” on page 63
- “OBP Configuration Parameters” on page 64
- “Running Diagnostics” on page 66

System Configuration Card

The System Configuration Card Reader (SCCR) serves as a Server Identity Module to provide a portable host ID and system configuration mechanism. The Configuration Card contains unique network identity information, including the MAC address and host id (known as the idprom), and the OpenBoot PROM configuration (also known as nvram).

During the boot process, OBP attempts to access the SCCR.

- If a properly formatted card is not found to be present in the reader, the system will not boot.
- If the content of the nvram section is invalid, the system will be initialized with its default nvram configuration.
- If the content of the idprom section is invalid, OBP displays a warning message and the system will not auto-boot Solaris. However, you can boot the system from the `ok` prompt using the `boot` command.

It is therefore essential that you store the Configuration Card safely if you have to remove it from the system, (for example, to facilitate replacement of a component), and replace it before restarting the system.

In particular, note that:

- If the system configuration card is not present, the system will not boot.
- If you remove the system configuration card, the system will shut down after 60 seconds.

OBP Configuration Parameters

TABLE 9-1 lists the configuration parameters supported by the Netra 20 system and gives their default value.

TABLE 9-1 OBP Configuration Parameters

Parameter	Default	Description
ansi-terminal	true	
auto-boot?	true	If true, boot automatically after power on or reset
boot-command	boot	Action following a boot command
boot-device	disk net	Device(s) from which to boot if diag-switch? is false
boot-file	none	File to boot if diag-switch? is false
diag-device	net	Device to boot from if diag-switch> is true
diag-file	none	File from which to boot if diag-switch? is true
diag-level	min	Defines how diagnostic tests are run
diag-out-console	false	If true, directs POST/OBP diagnostics to the console when diag-switch? is true
diag-passes	1	Defines the number of times self-test method(s) are performed

TABLE 9-1 OBP Configuration Parameters (*Continued*)

Parameter	Default	Description
diag-switch?	false	If true: <ul style="list-style-type: none">• Run in diagnostic mode• After a boot request, boot diag-file from diag-device If false: <ul style="list-style-type: none">• Run in non diagnostic mode• Following a boot request, boot boot-file from boot-device
error-reset-recovery	boot	Command to execute following a system reset generated by an error
fcode-debug?	false	If true, include name fields for plug-in device FCodes
input-device	keyboard ¹	Power-on device (usually keyboard, ttya or ttyb)
load-base	16384	Address
local-mac-address?	false	If true, network drivers use their own MAC address, not the system's
mfg-mode	off	
nvrarc	none	Command script to execute if use-nvrarc? is true
oem-banner	empty string	Custom OEM banner (enabled when oem-banner? is true)
oem-banner?	false	If true, use custom OEM banner
oem-logo	no default	Bitmap custom OEM logo (enabled when oem-logo? is true)
oem logo?	false	If true, use custom OEM logo (otherwise use Sun logo)
output-device	screen ¹	Power-on output device (usually screen, ttya, or ttyb)
pcia-probe-list	4,1	Identifies number and order in which pci slots are probed
pcib-probe-list	5,6,1,2,3,4	As above
#power-cycles	no default	
screen-#columns	80	Sets number of columns on screen
screen-#rows	34	Sets number of rows on screen
scsi-initiator-id	7	scsi-id of the SCSI controller

TABLE 9-1 OBP Configuration Parameters (*Continued*)

Parameter	Default	Description
security-#badlogins	no default	Number of incorrect security password attempts
security-mode	none	Firmware security level (options: none, command, or full)
security-password	no default	Firmware security password if security-mode is not none (never displayed)— <i>do not set this directly</i>
silent-mode?	false	Suppress all messages if true and diag-switch? is false
test-args	no default	Arguments passed to self-tests and obdiag
ttya-mode	9600,8,n,1,-	TTYA (baud rate, #bits, parity, #stop, handshake)
ttyb-mode	9600,8,n,1,-	TTYB (baud rate, #bits, parity, #stop, handshake)
ttya-ignore-cd	true	If true, operating system ignores carrier-detect on TTYA
ttyb-ignore-cd	true	If true, operating system ignores carrier-detect on TTYB
ttya-rts-dtr-off	false	If true, operating system does not assert TTYA and RTS and DTR
ttyb-rts-dtr-off	false	If true, operating system does not assert TTYB and RTS and DTR
use-nvramrc?	false	If true, execute commands in NVRAMRC during system start-up

1. In the absence of a keyboard and screen, input-device and output-device both default to lom-console.

Running Diagnostics

For information on running diagnostic procedures, refer to the *Netra 20 Service and System Reference Manual*.

Lights Out Management

This chapter introduces the Lights Out Management (LOMlite 2) facilities available for the Netra 20 server and explains how to use the `/usr/sbin/lom` utility, which provides a user interface to the device.

The chapter contains the following sections:

- “Introducing Lights Out Management” on page 67
- “Powering On or Resetting the Server From the LOMlite2 Shell” on page 69
- “Monitoring the Server From the LOMlite2 Shell” on page 73
- “Setting Up LOMlite2 Privileges for Named Users” on page 78
- “Configuring the LOMlite2 Device” on page 82
- “Separating LOMlite2 From the Console on the LOM Console Port” on page 84
- “Viewing the `syslogd` File” on page 86
- “The LOMlite2 Shell Command List” on page 86

Introducing Lights Out Management

Management facilities that enable you to detect and respond quickly to problems are implemented by the LOMlite2 board, which is located as shown in FIGURE 10-1. The facilities are independent of Solaris—that is, they are available even when the system is in standby mode—and are particularly useful for managing servers that are deployed in a “lights out” environment. You can also use them to perform quick onsite management tasks at a locally-connected terminal.

You use the LOMlite facilities, remotely or from a local connection, to:

- Power on the server or power it 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 powered down
- Turn a Fault LED on or off
- Configure the server to restart automatically after a lockup
- Configure the behavior (boot) of the system after a reset

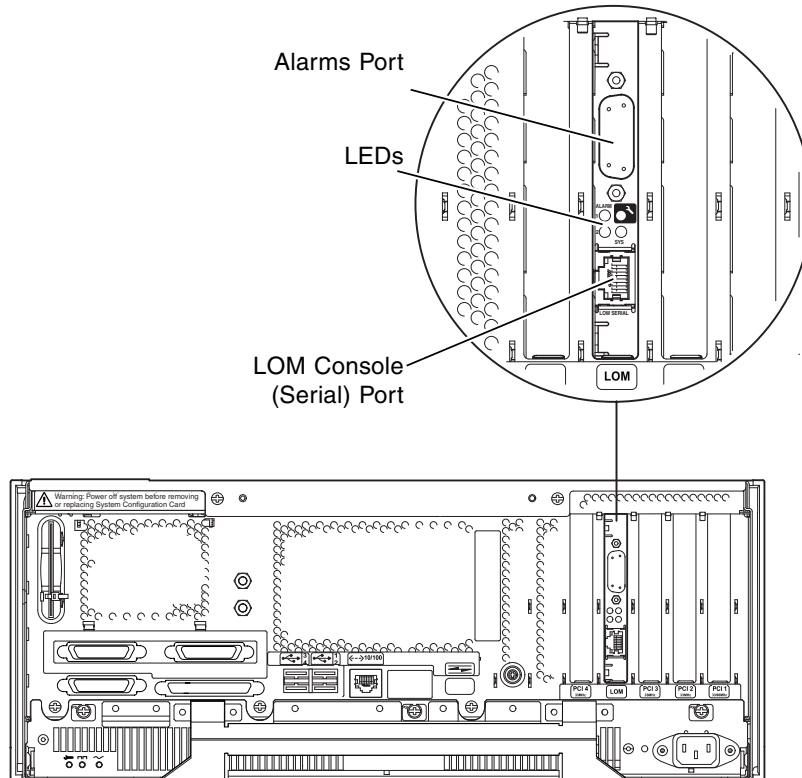


FIGURE 10-1 The Location of the Lights Out Management Device

LOM Console Port

LOMlite2 events are reported at the LOM console port, which it shares by default with the console. The LOM console port can be configured to display only LOMlite2 events, with normal console activity directed to `ttya` or `ttyb`. For further information, see “Separating LOMlite2 From the Console on the LOM Console Port” on page 84.

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 LOM console port on the Netra 20 server.

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

- By executing LOMlite2 commands from the `lom>` shell prompt
The remainder of the current chapter explains this method.
- By executing LOMlite2-specific Solaris commands from the console prompt
This facility is described in Chapter 11.

When a Netra 20 server is connected to a live electrical supply, it is always either fully powered or in standby power mode. The `lom>` prompt `poweron` and `poweroff` commands power on the system and return it to standby mode, respectively. To remove power entirely from the server you must disconnect its power cable or open all external circuit breakers.

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, you have `r`-level permission by default. If you have set up one or more named users, you must explicitly give them `r`-level permission to execute these commands. For more information about user privileges, see “Setting Up LOMlite2 Privileges for Named Users” on page 78.

Powering the Server On or Down to Standby Mode

The `lom>` prompt is accessible when the system is in standby mode. Remember that the LOMlite2 uses standby power and so remains active even when the Netra 20 server is not powered on.

- **To power on the server, type:**

```
lom> poweron
```

- To power the server down to standby mode, type:

```
lom> poweroff
```

Displaying the lom> Prompt

When you connect a terminal to the LOM console port, the lom> prompt is displayed only if the server is powered off. If the server 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 LOM console 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.

See also FIGURE 7-1 for a flow chart of the system prompts.

Exiting From the lom> Prompt

- To return to the Solaris console prompt from the lom> prompt, type:

```
lom> console
```

Note – If you have the LOM console 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 LOM console port to the LOMlite2 device, see “Separating LOMlite2 From the Console on the LOM Console Port” on page 84.

Note – If you have set up named users for the LOMlite2 device, they must have c-level permission to execute the `console` command. Without it, the command will not work. For more information about setting up user permissions, see “Setting Up LOMlite2 Privileges for Named Users” on page 78.

Resetting the Server

- To reset the server, type:

```
lom> reset
```

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 LOM console port dedicated to the LOMlite2 device, this command has no effect. For information about dedicating the LOM console port to the LOMlite2 device, see “Separating LOMlite2 From the Console on the LOM Console Port” on page 84. To use the `break` command, you must have c-level LOMlite2 user privileges. For more information, see “Setting Up LOMlite2 Privileges for Named Users” on page 78.

Controlling the Server’s Boot 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 20 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 “Setting Up LOMlite2 Privileges for Named Users” on page 78.

Boot Modes

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 10-1.

TABLE 10-1 Boot Modes

Mode	Description
<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>-u</code>	This option does not represent a boot mode. However, if you have previously dedicated the LOM console 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 followed by a reset to achieve this. It is a quick alternative to the procedure described for sharing the LOM console port in the section called “Separating LOMlite2 From the Console on the LOM Console Port” on page 84. 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.

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.

Checking the Current Status of All Components

To see the current status of all the components monitored by the LOMlite2 device, type:

```
lom> environment
```

CODE EXAMPLE 10-1 shows a sample output from the `environment` command. In this example, all the components are running normally and none is faulty.

If the fans, PSU output, or supply rails fail on your Netra 20 server, you may need to replace components. For information about ordering and installing field-replaceable components, see Appendix A.

CODE EXAMPLE 10-1 Sample Output from the `environment` Command

```
lom> environment
LEDs:
1 Power           ON
2 Fault           OFF
3 Supply A        OFF
4 Supply B        OFF
5 PSU ok          ON
6 PSU fail        OFF

Alarms:
1 -               OFF
2 -               OFF
3 -               OFF

PSUs:
1 AC              OK

Fans:
```

CODE EXAMPLE 10-1 Sample Output from the environment Command (*Continued*)

```
1 PSU1                OK speed 88%
2 PSU2                OK speed 84%
3 CPU                 OK speed 83%

Temperature sensors:
1 Ambient             OK 22degC
2 CPU0 enclosure     OK 22degC
3 CPU0 die           OK 56degC
4 CPU1 enclosure     OK 22degC
5 CPU1 die           OK 55degC

Overheat sensors:
1 PSU                OK

Circuit breakers:
1 SCC                OK
2 PSU                OK

lom>
```

Fan Identification

Event reports about the fans inside the server include the number of the fan to which they relate:

- Fan 1 and Fan 2 are the PSU fans
- Fan 3 is the CPU fan

LOMlite2 Event Log

Viewing the Last Ten Events in the Event Log

Type the following:

```
lom> show eventlog
```

The example 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)
- The last reboot, if the server has been booted since all power was last removed

CODE EXAMPLE 10-2 Sample LOMlite2 Event Log (Oldest Event Reported First)

```
lom>show eventlog
Eventlog:
+0h0m30s host FAULT: unexpected power off
+0h0m0s LOM booted
+0h0m0s PSU 1 FAULT: state change - inaccessible
+0h0m0s host power on
+2d+16h48m15s host FAULT: unexpected power off
+2d+16h48m15s Fault LED ON
+2d+16h48m24s host power on
+5d+19h44m51s host FAULT: unexpected power off
+5d+19h44m59s host power on
+5d+23h15m3s host FAULT: unexpected power off
lom>
```

Note – If the fans, PSU output, or supply rails fail on your Netra 20 server, you may need to replace components. For information about ordering and installing field-replaceable components, see Appendix A.

Viewing the Entire Event Log

- **Type:**

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

where *x* is the number of lines you want the screen to display before pausing, 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, the reports for the level you specify and above are displayed. 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 (see TABLE 10-2).

TABLE 10-2 LOMlite2 Severity Levels

Level	Meaning
1	Fatal event
2	Warning event
3	Information event
4	User event

The default security level is 3.

For more information about severity levels, see “Viewing the `syslogd` File” on page 86.

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 first time the server boots. Eventually the buffer can become full, but when this happens the LOMlite2 device will start again at the beginning of the buffer, over-writing the earliest events.

Viewing All Events

- To view all events from the first to the *n*th logged event, 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 display before pausing
- *y* is the severity level of the events you want to see

By default, the `loghistory` command does not pause the display.

Viewing the Last and Previous n Logged Events

- To view the last event and the previous n events, 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 display before pausing
- 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
```

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.

Setting Up LOMlite2 Privileges for Named Users

You can specify up to four named users of the LOMlite2 device on a Netra 20 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, each time you use the LOM escape sequence to display the `lom>` prompt you are 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 those that you specify will be available.

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 LOM console 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 "Introducing Lights Out Management" on page 67).
- **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 "Specifying Permissions for a Named User" on page 81.

Creating a LOMlite2 User Account

- To create a 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 (u-level) authorization to add a user (see “Permissions Available for LOMlite2 Users” on page 78). If you have not added any users, you have a-level and all other levels of authorization by default.

Specifying the Password for a LOMlite2 User Account

- To specify a user account password, 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 “Permissions Available for LOMlite2 Users” on page 78). If you have not added any users, you have a-level and all other levels of authorization by default.

Viewing Details of a LOMlite2 User Account

- To view the details of a 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 “Permissions Available for LOMlite2 Users” on page 78).

Changing Your Own User Password

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

```
lom> password
```

2. When prompted, type the current password.
3. When prompted, type the new password you want to use.
4. Type the new password again to confirm it.

Deleting a LOMlite2 User Account

- To delete a 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 (u-level) authorization to delete a user account (see “Permissions Available for LOMlite2 Users” on page 78).

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.

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:

- **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 available only the parameter or parameters you specify.

Note – If no parameters are specified, a command usage error is displayed.

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 LOM console 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 “Configuring the LOMlite2 Device” on page 82).
- **r**
This stands for “reset permission”. It enables the named user to reset the server and to power it on and off using the LOMlite2 device.

Quitting a LOMlite2 Named User Session

- To quit a named user session, type:

```
lom> logout
```

This returns you to the LOMlite2 login prompt.

Configuring the LOMlite2 Device

The LOMlite2 `set` command can take the following variables as arguments:

- `faulton`
- `faultoff`
- `alarmon`
- `alarmoff`
- `event_reporting`

The first four duplicate the functions of the commands having the same name. The last enables you to stop the LOMlite2 device from sending event reports to the LOM console port.

Note – To execute the commands described in this section, a named user must have a-level permission. For more information, see “Setting Up LOMlite2 Privileges for Named Users” on page 78.

Turning the Fault LED on

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

```
lom> faulton
```

Turning the Fault LED off

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

```
lom> faultoff
```

Setting the `alarmon` Software Flag

- Set the `alarmon n` variable by typing:

```
lom> alarmon n
```

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

Setting the `alarmoff` Software Flag

- To set the `alarmoff` configuration variable, type:

```
lom> alarmoff n
```

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

Stopping LOMlite2 Sending Event Reports to the LOM Console Port

- To set the `event-reporting` variable on, type:

```
lom> set event-reporting on
```

Note – This is the equivalent of using the `lom -E on` command from the Solaris shell.

- To set the `event-reporting` variable off, type:

```
lom> set event-reporting off
```

Note – This is the equivalent of using the `lom -E off` command from the Solaris shell.

Separating LOMlite2 From the Console on the LOM Console Port

By default, the LOMlite2 device shares the LOM console port with the console, and when it has an event report to send it takes control of the LOM console port itself, interrupting any console activity you are performing. To prevent the LOMlite2 device from interrupting the console, either turn serial event reporting off, or dedicate the LOM console port to the LOMlite2 device and use one of the serial ports for console activity (see below).

The advantages of dedicating the LOM console port to the LOMlite2 device and using a serial port as your console port include:

- Preserving the ability to power on or reset the server (from the `lom>` prompt on LOM console) even if, for any reason, you lose access to Solaris on your console port (`ttya` or `ttyb`)
- Capturing all LOMlite2 events passively on a terminal connected to the dedicated LOM console port

Note, however, that if you dedicate the LOM console 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 20 server using the serial 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 port to the console, you cannot bring up the LOMlite2 shell, which means that you cannot interrogate or reconfigure the LOMlite2 device.

- Performing binary data transfers

To perform anything other than ASCII transfers, you must use the serial port.

Dedicating the LOM console to LOMlite2

1. Set up console connections to both the LOM console port and the serial A port.
2. At the Solaris prompt, type:

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

The serial A port (ttya) is now your console port. The LOM console port remains under the control of the LOMlite2 device.

Note – You can also configure serial port B as the console by substituting `ttvb` for `ttya` in the above.

Sharing the LOM Console Port Between LOMlite2 and the Console

By default, the LOM console port is shared by the LOMlite2 device and the console. Therefore, you need only to follow the instructions in this section if you have configured the Netra 20 server using the instructions in the previous section (“Dedicating the LOM console to LOMlite2” on page 85) and you now want to share the LOM console 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 LOM console port and the serial port.
2. At the Solaris prompt, type:

```
# eeprom input-device=keyboard
# eeprom output-device=screen
# reboot
```

In the absence of a screen and keyboard, `input-device` and `output-device` default to `lom-console`, which is now shared between the LOMlite2 device and the console.

Viewing the `syslogd` File

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`, which 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.

The LOMlite2 Shell Command List

The commands you can execute from the `lom>` prompt are listed in TABLE 10-3.

TABLE 10-3 LOM Commands

Command	Effect
<code>alarmoff<i>n</i></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<i>n</i></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
<code>check</code>	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.
<code>console</code>	This command takes you out of the LOMlite2 shell and back to the <code>#</code> prompt or <code>ok</code> prompt, depending on how you invoked the LOMlite2 shell. It returns control of the serial connection to the console.
<code>environment</code>	Displays the temperature of the server and the status of the fans, power supply, over-temperature monitors, alarms, and fault LED
<code>faulton</code>	Sets the Fault LED to On
<code>faultoff</code>	Sets the Fault LED to Off
<code>help</code>	Displays the list of LOM commands
<code>loghistory</code>	Displays all the events in the LOMlite2 device's Event Log
<code>logout</code>	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.
<code>poweron</code>	Powers the server on
<code>poweroff</code>	Powers the server down to standby power mode
<code>reset</code>	Resets the Netra 20 server
<code>show model</code>	Displays the server model
<code>show hostname</code>	Displays the server name (this command is equivalent to the Solaris <code>uname -n</code> command)
<code>show eventlog</code>	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.
<code>show escape</code>	Displays the current LOMlite2 escape sequence
<code>show</code>	Displays all the information available with the <code>show</code> command
<code>useradd</code>	Adds a user to the LOMlite2 device's list of permitted users

TABLE 10-3 LOM Commands (*Continued*)

Command	Effect
userdel	Deletes a user from the LOMlite2 device's list of permitted users
usershow	Displays the details of a named user's LOMlite2 account
userpassword	Sets or changes a user's password
userperm	Sets the permission levels for a named user
version	Displays the version number of the LOMlite2 device

Operating Lights Out Management from Solaris

This chapter explains how to use the LOMlite2-specific commands available in Solaris 8 for monitoring and managing a Netra 20 server.

For an introduction to the LOMlite2 device and a description of an alternative user interface to it, see Chapter 10.

The chapter contains the following sections:

- “Monitoring the System From Solaris” on page 89
- “Configuring the LOMlite2 to Restart the Server Automatically After a Lockup” on page 95
- “Other LOM Tasks Performed From Solaris” on page 98

Monitoring the System From Solaris

To use the Lights Out Management (LOM) facilities, either remotely or locally, you need a terminal connection to the LOM console port on the Netra 20 server (see the procedure described in “Local Installation” on page 36).

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

- By executing LOMlite2 commands from the `lom>` shell prompt
For information about how to do this, see Chapter 10.
- By executing LOMlite2-specific Solaris commands from the UNIX `#` prompt
These commands are described in this chapter.

The Solaris commands described in this section, which are all available from the UNIX `#` prompt, run the `/usr/sbin/lom` utility.

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

Viewing Online LOMlite2 Documentation

- To view the manual pages for the LOMlite2 utility, type:

```
# man lom
```

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 10.

Checking the Status of the PSU LEDs (lom -L)

- To check whether the PSU LEDs are on or off, type:

```
# lom -L
LOMlite led states:
1      on      Power
2      off     Fault
3      off     Supply A
4      off     Supply B
5      on      PSU ok
6      off     PSU fail
#
```

Note – The above example is taken from an AC system, hence the Supply A and Supply B status LEDs, which relate to the DC power supply, are both reported as off.

Checking the Fans (lom -f)

- To check status of the fans, type:

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

To identify each fan, see “Fan Identification” on page 74. 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 Appendix A and the *Netra 20 Service and System Reference Manual*.

Checking the Internal Circuit Breakers (lom -v)

The `-v` option displays the status of the Netra 20 server’s internal circuit breakers. For any that have been tripped, the status will read `faulty`. The system contains two circuit breakers: one for the PSU and one for the System Configuration Card reader. If there is a problem with the circuit breakers, remove the device connected to the relevant port. When you do this, the circuit breakers will automatically reset. 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. Insert one.

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

```
# lom -v
Supply voltages:
System status flags (circuit breakers):
1                SCC status=ok
2                PSU status=ok
#
```

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 Over-temperature Sensors:
 1                status=System Temperature Sensors:
 1      Ambient 23 degC : warning 67 degC : shutdown 72 degC
 2      CPU0 enclosure 23 degC : warning 59 degC : shutdown 61 degC
 3      CPU0 die 56 degC : warning 90 degC : shutdown 95 degC
 4      CPU1 enclosure 22 degC : warning 59 degC : shutdown 61 degC
 5      CPU1 die 56 degC : warning 90 degC : shutdown 95 degC
System Over-temperature Sensors:
 1                status=ok
#
```

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=off
#
```

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 "Turning Alarms On and Off (lom -A)" on page 98).

Changing the LOMlite2 Device's Watchdog Configuration (lom -w)

For full information about enabling and using the LOMlite2's watchdog process, see "Configuring the LOMlite2 to Restart the Server Automatically After a Lockup" on page 95.

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

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

The LOMlite2 watchdog is enabled by default when Solaris boots. This means that if the watchdog does not receive a "pat" for 40 seconds, 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 "Configuring the LOMlite2 to Restart the Server Automatically After a Lockup" on page 95.**

Viewing the LOMlite 2 Configuration (`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=enabled
Automatic return to console=disabled
alarm3 mode=user controlled
firmware version=4.0
firmware checksum=f92e
product revision=1.4
product ID=Netra 20
#
```

Viewing All Component Status Data and the LOMlite2 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
```

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.

CODE EXAMPLE 11-1 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.

CODE EXAMPLE 11-1 Sample LOMlite2 Device Event Log (Oldest Event Reported First)

```
# lom -e 10
LOMlite Event Log:
+0h0m21s host reset
6/15/2001 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
#
```

Configuring the LOMlite2 to Restart the Server Automatically After a Lockup

You can configure the LOMlite2 device to restart the server automatically after a lockup. The LOMlite2 device has a watchdog process which, by default, expects to be patted every 10000 milliseconds, i.e., every 10 seconds. If it does not receive a pat after 40000 milliseconds (default)—i.e., every 40 seconds—the LOMlite2 device turns on the front and back Fault LEDs and generates a LOM event report. However, it does not automatically restart the system unless you have configured it to do so.

Configuring the LOMlite2 Watchdog to Restart the System After a Lockup

- Remove the hash (#) from the following line in the script file `/etc/rc2.d/S25lom` to enable the LOMlite2 watchdog process:

```
prionctl -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 UNIX # prompt. For more information, see “Setting the Hardware Reset Option From a Script or Command (`lom -R on`)” on page 97.

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.

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 “Stopping LOMlite2 from Sending Reports to the Lom Console Port (`lom -E off`)” on page 100. 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 watchdog process is disabled by default. To enable the watchdog process type:

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

The number 40000 on this command line indicates the watchdog’s timeout period in milliseconds; you can specify a different number. The number 10000 indicates its pat interval in milliseconds; again, you can specify a different number.

Note – Do not specify a watchdog timeout period of less than 5000 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 on` option.

- 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 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.

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

To force the LOMlite2 watchdog to trigger an automatic server restart (ASR) after a lockup, add the `-R on` option to the command in the `/etc/rc2.d/S25lom` script file. This is the script that runs the watchdog. For full instructions about how to do this, see “Configuring the LOMlite2 Watchdog to Restart the System After a Lockup” on page 96.

- 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
```

Other LOM Tasks Performed From Solaris

This section explains how to turn the alarms and Fault LEDs on and off by using the `lom` command. It also explains how to:

- Change the first character of the lom escape sequence
- Stop the LOMlite2 device from sending reports to the LOM console port
- Remove driver protection from the device driver
- Make the LOMlite2 interface backward compatible
- Upgrade the firmware on the LOMlite2 device

Turning Alarms On and Off (`lom -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.

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

- To turn the Fault LED on, type:

```
# lom -F on
```

- To turn the Fault LED off again, type:

```
# lom -F off
```

Changing the lom> Prompt Escape Sequence (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.

Stopping LOMlite2 from Sending Reports to the Lom Console Port (`lom -E off`)

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

- **To stop the LOMlite2 device from sending reports to the LOM console port, type:**

```
# lom -E off
```

By default, the LOM console 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 LOM console port to the LOMlite2 device and to use the Serial B port as your console port, see “Separating LOMlite2 From the Console on the LOM Console Port” on page 84.

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 and event reporting. 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 “Configuring the LOMlite2 to Restart the Server Automatically After a Lockup” on page 95).

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
```

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 20 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.

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.

Accessing the System

This chapter states the antistatic precautions that must be taken before working on the Netra 20 system.

The chapter contains the following sections:

- “Tools” on page 103
- “Accessibility” on page 104
- “Antistatic Precautions” on page 104
- “Front Fascia” on page 107
- “Air Filter” on page 110



Caution – The plug at the end of the AC power cord is the primary means of disconnection for the Netra 20 AC system.



Caution – To isolate the Netra 20 DC system, open all external circuit breakers.

Tools

To perform the removal and fitting procedures described in this part of the manual, you will need the following tools:

- Grounding wrist strap
- Antistatic mat

Accessibility

The following components can be accessed while the system is in the rack:

- Front fascia
- Air filter
- Hard drive units

Access to all other components requires removal of the top cover. This is a service operation and is covered in the *Netra 20 Service and System Reference Manual*



Caution – Owing to the weight of the unit, two persons are required to remove the unit from and replace it in the rack.

Antistatic Precautions



Caution – Wear an antistatic wrist strap and use an ESD-protected mat when handling components. When servicing or removing system unit components, use an antistatic wrist strap with a 10mm press stud connection and attach the antistatic wrist strap to the press stud at the rear or front of the chassis before removing the top access cover.

Attaching the Antistatic Wrist Strap

- To attach the antistatic wrist strap to the chassis, connect the strap as shown in FIGURE 12-1 or FIGURE 12-2.

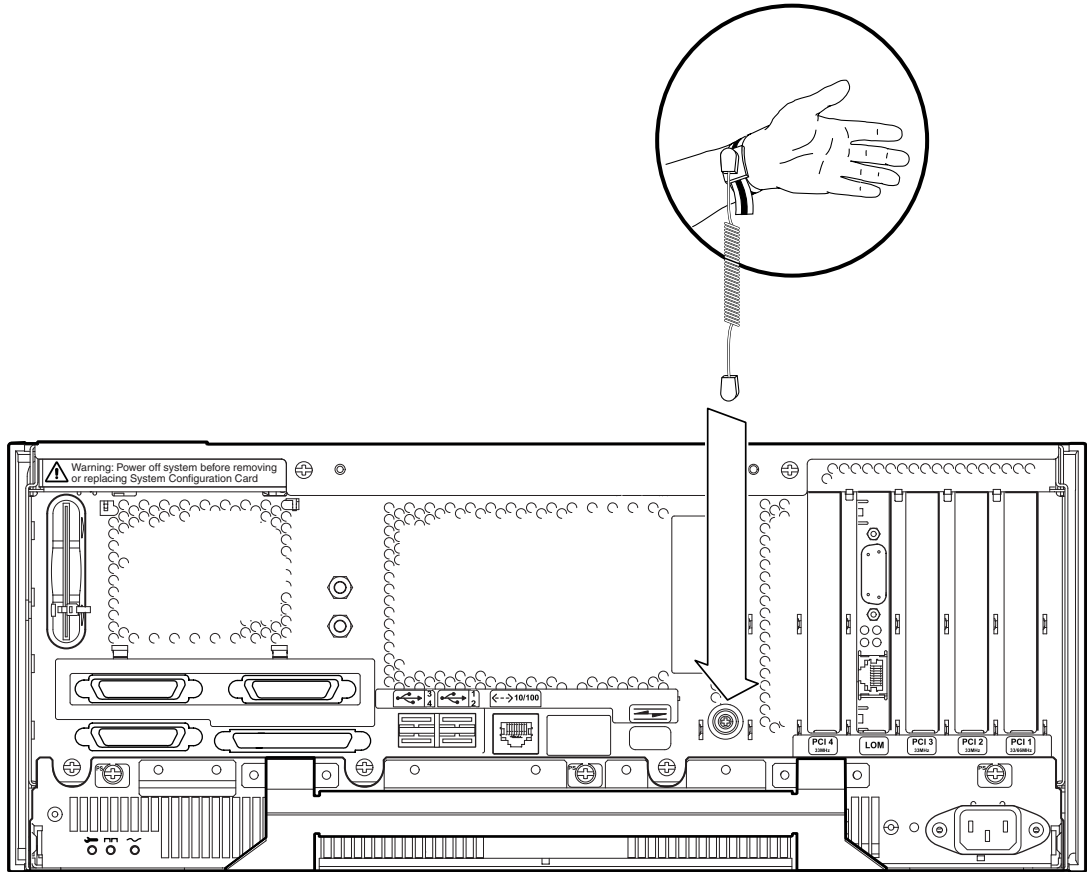


FIGURE 12-1 Attaching the Antistatic Wrist Strap to the Rear of the Chassis

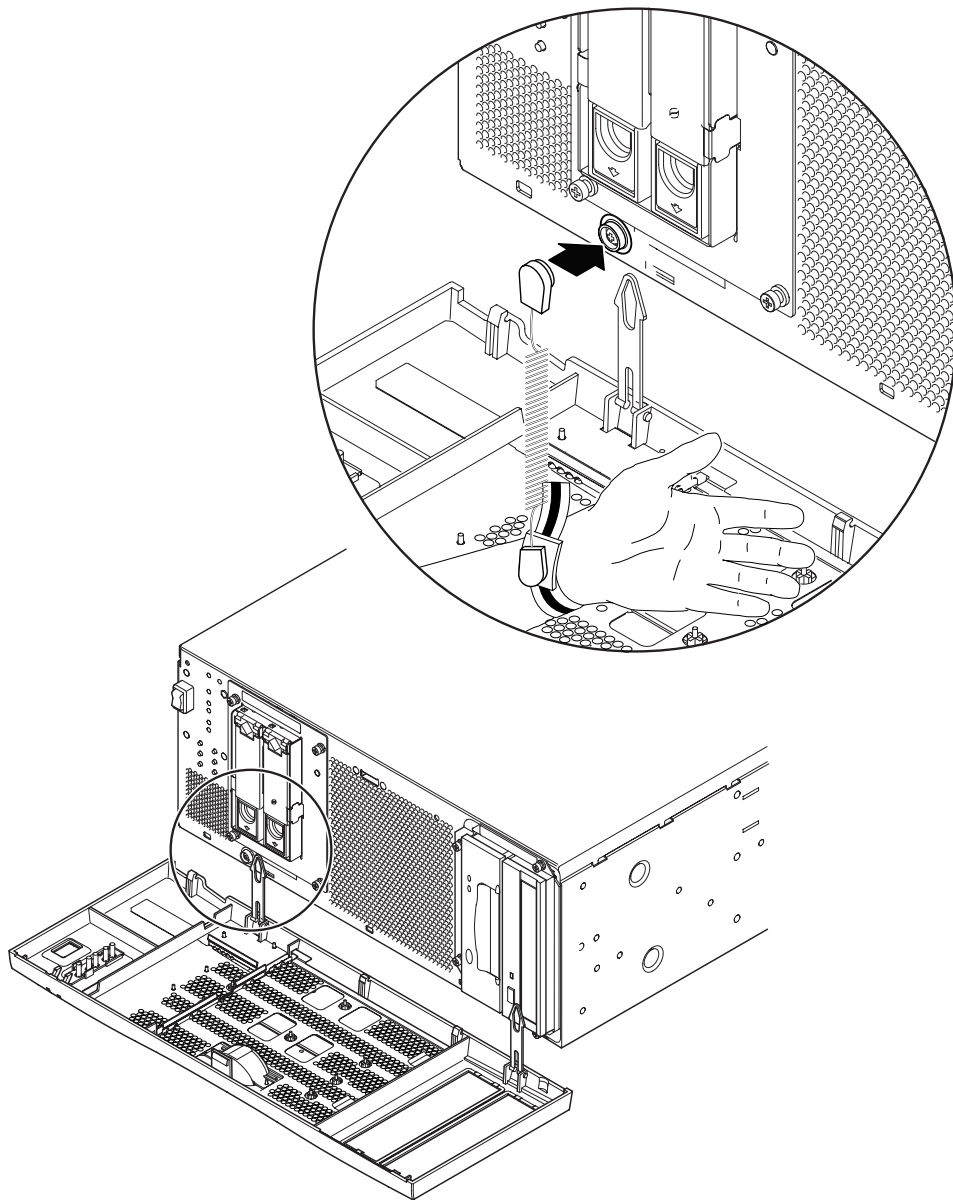


FIGURE 12-2 Attaching the Antistatic Wrist Strap to the Front of the Chassis

Front Fascia

The detachable front fascia houses the optional air filter and is fastened to the system chassis at the bottom edge by two plastic tethers. You need to detach the fascia completely only to change the filter (to avoid dust from the filter being sucked back into the system); you can carry out all other procedures by lowering the fascia and leaving the tethers attached.

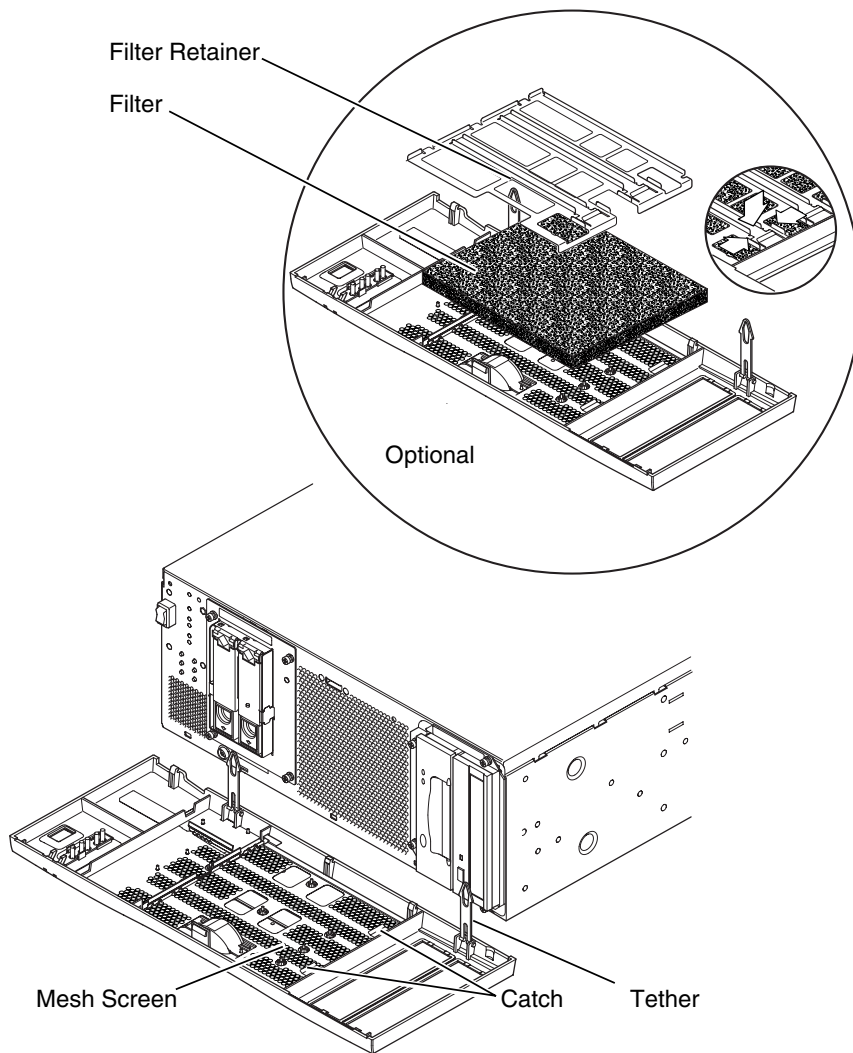


FIGURE 12-3 Front Fascia and Filter

Removing the Front Fascia

Caution – Exercise care when opening the fascia. You must detach the plastic locating pegs on the bottom edge of the fascia before lowering it.

1. Pull the fascia away from the top of the chassis not more than 2.5cm (1in.) using the finger hold in the middle of the fascia.
2. Lift the fascia forward and off the locating pegs on the bottom edge of the fascia.
3. Swing the fascia forward and down so that it hangs on the two plastic tethers.

Detaching the Fascia Tethers

4. Squeeze together the sides of each plastic tether and pull it from the system chassis.
5. Similarly, squeeze together the sides of the tether to detach each locating pin in turn from the retainers on the fascia.

Fitting the Front Fascia

Follow Step 1 through Step 5 if you are refitting the tethers to the fascia, otherwise start at Step 6.

1. Insert one side of the locating pin on the tether in the retainer on the fascia.
2. Squeeze the sides of the tether together to insert the other locating pin.
3. Repeat Step 1 and Step 2 for the other tether.
4. Insert the other end of one of the tether in the corresponding slot in system chassis.
If the tether is a tight fit, squeeze the sides of the tether together.
5. Repeat Step 4 for the other tether.
6. Swing the fascia up until it is nearly vertical and insert the locating pegs on the bottom of the fascia in the slots on the system chassis.

Caution – Do not swing the fascia forward once you have inserted the locating pegs or they may break.

7. Press the top of the fascia forward until the catch on the fascia clicks into place on the system chassis.

Air Filter

If required, you can replace the black mesh screen located behind the front fascia with the optional foam air filter and metal retainer supplied with the system (see FIGURE 12-3). Clean or replace the filter regularly to maintain the airflow through the system.

Caution – To ensure that dust is not sucked into the system when you replace the filter, remove the fascia completely from the system before proceeding.

Removing and Fitting the Mesh Screen

- 1. Detach the front fascia and place it on a workbench away from the immediate vicinity of the system.**
See “Removing the Front Fascia” on page 108.
- 2. Press the two catches on the mesh screen and lift that side away from the fascia.**
- 3. Carefully disengage the two tabs at the other side from the fascia and lift out the screen.**
Take care that you do not damage the plastic locating lugs when you detach the screen.
- 4. Continue with Step a or Step b, as required.**
 - a. Replace with a foam filter and retainer as described in Step 4 through Step 6 in “Replacing the Filter” on page 111.**
 - b. Continue from the following step to replace the screen.**
- 5. Insert the locating tabs one side of the mesh screen into the corresponding slots on the fascia.**
- 6. Carefully swing the other side down until the catches on the screen engage with the fascia.**
- 7. Re-attach the fascia to the system chassis.**
See “Fitting the Front Fascia” on page 109.

Replacing the Filter

1. **If you have not already removed the front fascia, detach it and place it on a workbench away from the immediate vicinity of the system.**

See "Removing the Front Fascia" on page 108.

2. **Release the two clips securing the filter retainer and lift it from the fascia.**

3. **Remove the filter and carefully dispose of it.**

4. **Clean the fascia to remove any remaining dust.**

5. **Insert a new filter and secure it with the retainer.**

6. **Re-attach the fascia to the system chassis.**

See "Fitting the Front Fascia" on page 109.

Removing Disk Drives

This chapter contains procedures for removing and installing an FC-AL hard disk drive.

The chapter contains the following sections:

- “Overview” on page 113
- “Hot Swapping a Disk Drive” on page 115
- “Changing a Disk Drive (Non Hot Swap)” on page 118



Caution – The plug at the end of the AC power cord is the primary means of disconnection for the Netra 20 AC system.



Caution – To isolate the Netra 20 DC system, open all external circuit breakers.

Overview

The following procedure is concerned with the physical removal and replacement of a hard disk drive as

- A non hot swap device
- A hot swap device

From an operational point of view, whether a disk can be considered to be a hot swap device and can be removed without shutting down Solaris depends on how the disk drives are configured in the operating environment.

The disk is a hot swap device if:

- The disk is not a root disk.

or if both of the following statements are true:

- The disk is a root disk.
- The disk is mirrored or RAID-5 protected.

In other words, if the disk is a root disk and is not mirrored, you must treat it as a non hot swap device.

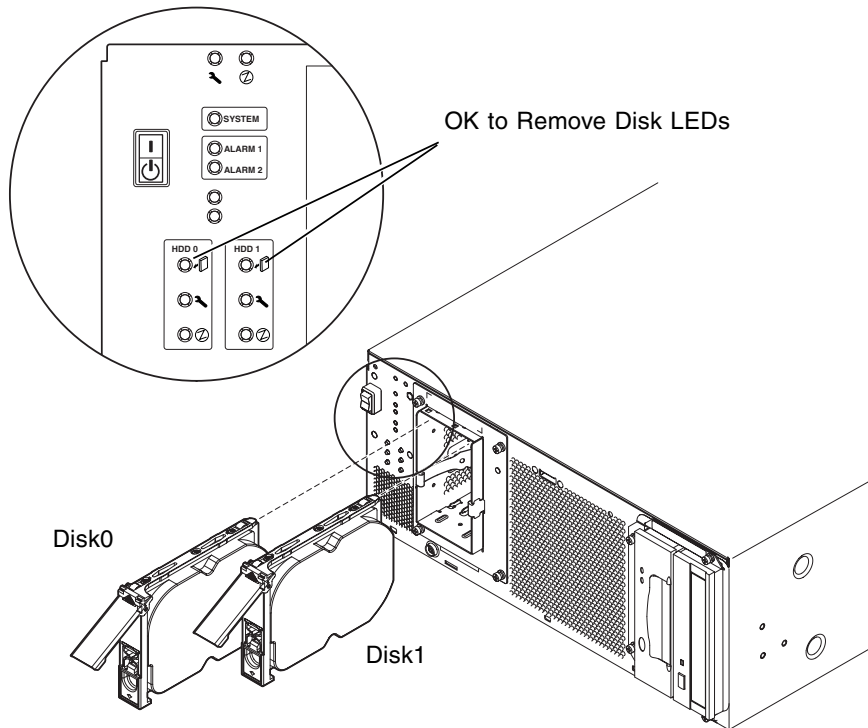


FIGURE 13-1 FC-AL Disk Drives

Hot Swapping a Disk Drive

Preparation

Before proceeding to remove a hard disk drive, carry out the following:

1. **Lower the front fascia.**

See “Removing the Front Fascia” on page 108.

2. **Use the World Wide Number (WWN) or Target ID to identify the disk.**

```
# ls -als /dev/rdisk/*  
  
2 lrwxrwxrws 1 root root 74 May 10 11:16 /dev/rdisk/c0t1d0s0 ->  
../..../devices/pci@8,600000/SUNW,qlc@4/fp@0,0/ssd@w2100002307652252,0:a,raw  
[truncated for clarity]  
2 lrwxrwxrws 1 root root 74 May 10 11:16 /dev/rdisk/c0t2d0s1 ->  
../..../devices/pci@8,600000/SUNW,qlc@4/fp@0,0/ssd@w2100002307653317,0:a,raw  
[truncated for clarity]
```

- For internal FC-AL disks:

Target ID Number = Disk Bay Number

- For external FC-AL disks:

Target ID = (Multipack ID x 8) + Drive Bay Number

3. **Identify the disk to be removed and the bay in which it is installed.**

4. **Identify all volumes or applications using the drive.**

- If the volumes are mirrored or RAID 5-protected, you can replace the drive without taking down the volume.
- Otherwise stop all I/O activity on the disk drive using the appropriate commands for the particular application.

Removing a Disk Drive

1. Carry out the steps listed in “Preparation” on page 115.
2. Isolate the drive from the operating environment.

Caution – Ensure that no file systems are mounted on the device and back up all data before proceeding.

Logically remove the drive from the FC-AL bus by typing:

```
# luxadm remove_device /dev/rdisk/c1t1d0s2
The list of devices which will be removed is:
1: Device /dev/rdisk/c1t1d0s2

Please enter q to Quit or <Return> to Continue:

Stopping: /dev/rdisk/c1t1d0s2....Done
Offlining: /dev/rdisk/c1t1d0s2....Done

Hit <Return> after removing the device(s)
```

3. Ensure that the OK to Remove Disk LED is lit, then push the disk drive latch downwards to release the drive handle.
4. Using the drive handle, ease the drive from the drive bay until you feel the drive connector disengage from the FC-AL backplane connector.
5. Holding the disk by the handle, slide the disk drive out of the bay.
Support the weight of the drive with your other hand to avoid unnecessary pressure on the drive handle.
6. Place the disk drive on an antistatic mat.

Installing a Disk Drive

1. Logically add the drive to the FC-AL bus by typing:

```
# luxadm insert_device
The list of devices which will be inserted is:
1: Device /dev/rdisk/clt2d0s2

Please enter q to Quit or <Return> to Continue:

Stopping: /dev/rdisk/clt1dos2....Done
Offlining: /dev/rdisk/cccl1t1dos2....Done

Hit <Return> after insertion of the device(s)
```

2. If necessary, lower the front fascia.

See “Removing the Front Fascia” on page 108.

3. Align the disk drive with the slot in the drive bay.

4. Slide the disk drive into the drive bay until it makes contact with the FC-AL backplane connector.

Do not force it home.

5. Lock the drive in the bay by pressing on the drive handle until the drive latch closes.

This action engages the drive with the FC-AL backplane connector.

6. Refit the front fascia.

See “Fitting the Front Fascia” on page 109.

7. Press <Return> to answer the last line of Step 1.

Changing a Disk Drive (Non Hot Swap)

This section describes how to change an unmirrored root disk drive.

Preparation

Before proceeding to remove a hard disk drive, carry out the following:

1. Use the World Wide Number (WWN) or Target ID to identify the disk.

```
# ls -als /dev/rdisk/*

2 lrwxrwxrws 1 root root 74 May 10 11:16 /dev/rdisk/c0t1d0s0 ->
  ../../devices/pci@8,600000/SUNW,qlc@4/fp@0,0/ssd@w2100002307652252,0:a,raw
[truncated for clarity]
2 lrwxrwxrws 1 root root 74 May 10 11:16 /dev/rdisk/c0t2d0s1 ->
  ../../devices/pci@8,600000/SUNW,qlc@4/fp@0,0/ssd@w2100002307653317,0:a,raw
[truncated for clarity]
```

- For internal FC-AL disks:
Target ID Number = Disk Bay Number
 - For external FC-AL disks:
Target ID = (Multipack ID x 8) + Drive Bay Number
2. Lower the front fascia.
See “Removing the Front Fascia” on page 108.
 3. Identify the disk to be removed and the bay in which it is installed.
 4. If the system is running, shut it down and remove the power.
 5. Initiate antistatic precautions.
See “Antistatic Precautions” on page 104.

Removing an Unmirrored Root Disk

1. Perform the steps listed in “Preparation” on page 118.
2. Push the disk drive latch downwards to release the drive handle.

3. Using the drive handle, ease the drive from the drive bay until you feel the drive connector disengage from the FC-AL backplane connector.
4. Holding the disk by the handle, slide the disk drive out of the bay.
Support the weight of the drive with your other hand to avoid unnecessary pressure on the drive handle.
5. Place the disk drive on an antistatic mat.

Installing an Unmirrored Root Disk

1. Perform the steps listed in “Preparation” on page 118, as required.
2. Align the disk drive with the slot in the drive bay.
3. Slide the disk drive into the drive bay until it makes contact with the FC-AL backplane connector.
Do not force it home.
4. Lock the drive in the bay by pressing on the drive handle until the drive latch closes.
This action engages the drive with the FC-AL backplane connector.
5. Refit the front fascia.
See “Fitting the Front Fascia” on page 109.
6. Power on the system and perform a reconfiguration boot by typing:

```
ok boot -r
```


PART **III** Appendices

Illustrated Parts List

This appendix lists the authorized replaceable parts for the Netra 20 system unit. FIGURE A-1 is an exploded view of the system unit with numerical references that correlate to the replaceable components listed in TABLE A-1 and TABLE A-2. A brief description of each listed component is also given and, where appropriate, a reference to the section in this manual containing the replacement procedure.

The part numbers listed in TABLE A-1 and TABLE A-2 were correct at the time of publication of this manual, but are subject to change without notice. Consult your authorized Sun sales representative or service provider to confirm a part number before ordering the replacement part.

Note – There are no user-serviceable parts within the system chassis. With the exception of the front fascia, air filter and hard disk drive, which can be accessed without removing the chassis lid, only qualified Sun service personnel may fit, remove or change the components listed in TABLE A-1 and TABLE A-2.

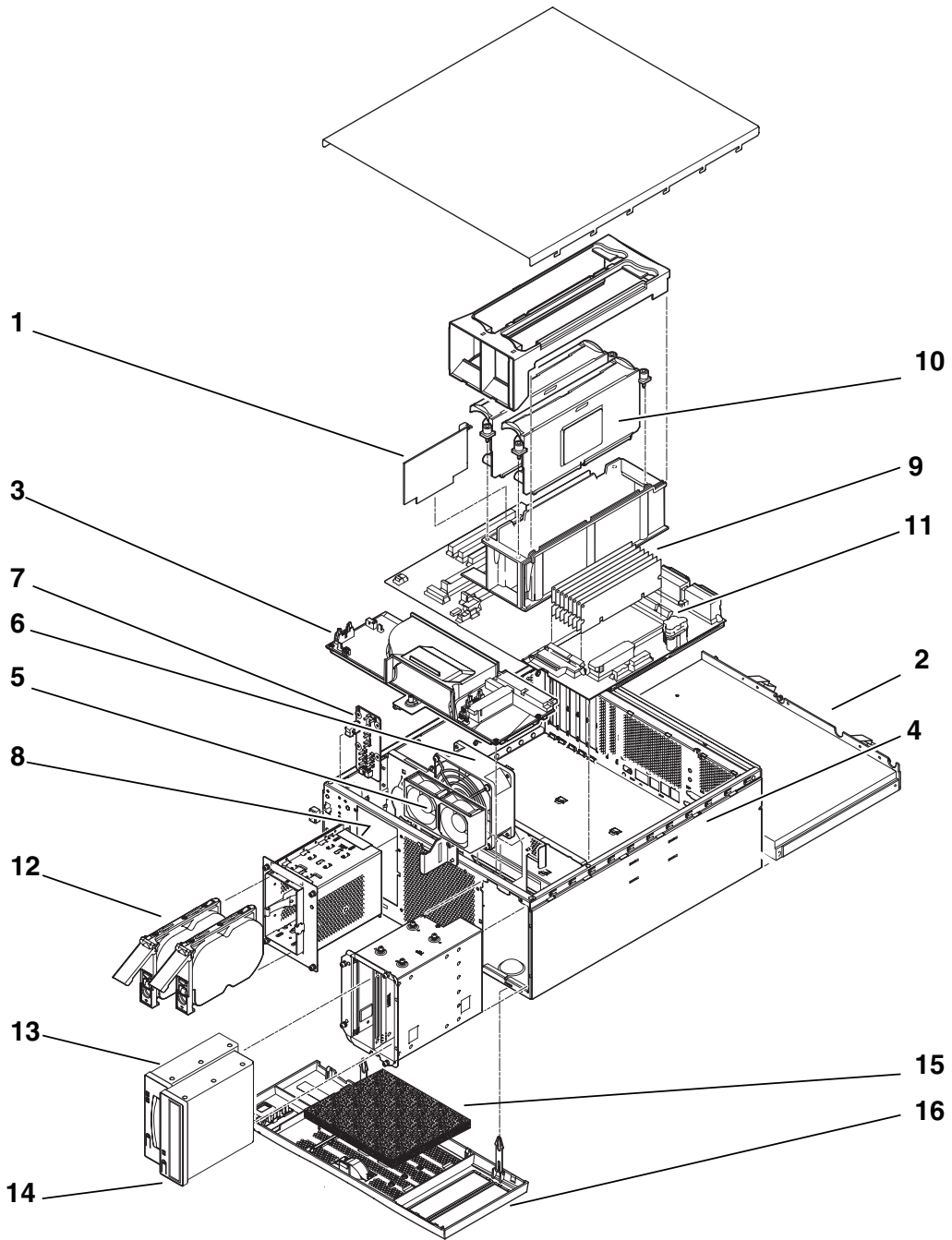


FIGURE A-1 Exploded View of the Netra 20 System Unit

TABLE A-1 Netra 20 Field Replaceable Units

Ref	FRU Number	Description
1	#501-5893	LOMlite2 Module (900 MHz processor)
1	#501-6543	LOMlite 2 Module (1.2 GHz processor)
2	#300-1496	AC PSU
2	#300-1497	DC PSU
3	#540-4795	Power Distribution Board (PDB)
4	#501-5965	System Configuration Card Reader (SCCR)
5	#540-5023	Fan Assembly, 80 mm(PSU)
6	#370-4360	Fan Assembly, 127 mm(CPU)
7	#501-5915	LED Card and Switch Assembly
8	#540-4794	FC-AL Backplane
10	#501-6002	Processor, 900 MHz
10	#501-6485 ^{1, 2}	Processor, 1.2 GHz
9	#501-6230	Motherboard
11	#501-5401 ¹	1 Gbyte memory expansion, 4 x 256 Mbyte (900 MHz only)
11	#501-5030 ¹	2 Gbyte memory expansion, 4 x 512 Mbyte (900 MHz only)
11	#501-5031 ¹	4 Gbyte memory expansion, 4 x 1 Gbyte (900 MHz and 1.2 GHz)
11	501-6175	1 Gbyte memory expansion, 4 x 256 Mbyte (1.2 GHz only)
11	501-6714	2 Gbyte memory expansion, 4 x 512 Mbyte (1.2 GHz only)
12	#501-5698 ¹	FC-AL Disk Drive, 36 Gbyte NEBS-compliant (900 MHz only)
12	#501-5694 ¹	FC-AL Disk Drive, 73 Gbyte NEBS-compliant (900 MHz and 1.2 GHz)
13	#390-0028 ¹	DDS-4 DAT Drive
14	#390-0025 ¹	DVD Drive
Not shown	#370-5155	System Configuration Card
Not shown	#501-5656 ¹	PCI Card, 10/100BaseT Fast/Wide UltraSCSI
Not shown	#501-5019 ¹	PCI Card, 10BaseT FastEthernet
Not shown	#375-0006 ¹	PCI Card, Dual Differential SCSI
Not shown	#370-2728 ¹	PCI Card, HSI/P 2.0
Not shown	#375-0100 ¹	PCI Card, SAI/P 3.0

TABLE A-1 Netra 20 Field Replaceable Units (Continued)

Ref	FRU Number	Description
Not shown	#501-3028 ¹	PCI Card, ATM-155MMF P/4.0
Not shown	#501-3027 ¹	PCI Card, ATM-155-UTP P/4.0
Not shown	#501-5406 ¹	PCI Card, Quad Fast Ethernet II
Not shown	#501-5373 ¹	PCI Card, Gigabit Ethernet P/2.0
Not shown	#501-5901 ¹	PCI Card, Gigabit Ethernet MMF P/3.0
Not shown	#501-5902 ¹	PCI Card, Gigabit Ethernet UTP P/3.0
Not shown	#501-5727 ¹	PCI Card, Dual Ethernet, Dual SCSI
Not shown	#375-3089 ¹	PCI Card, SSL Crypto, SCA1000
Not shown	#375-3019 ¹	PCI Card, Single FC Network Adaptor
Not shown	#370-3057 ¹	PCI Card, Dual Ultra-3 Differential SCSI
Not shown	#375-3069 ¹	PCI Card, XVR-500 IFBLite+
Not shown	#375-0005 ¹	PCI Card, Dual Channel SE UltraSCSI
Not shown	#375-3030 ¹	PCI Card, Dual FC Adapter
Not shown	#560-2631	Cable Kit, Power
Not Shown	#560-2632	Cable Kit, Data
Not Shown	#530-3032	Power Cable

1. Also available as an X-Option.

2. Must be ordered with the appropriate LOMlite2 Module.

TABLE A-2 Netra 20 Optional Components

Ref	Part Number	Description
10	X7310A ¹	Processor, 1.2 GHz
10	X7009A	Processor, 900 MHz
1	X7087A	LOMlite 2 Module (1.2 GHz processor)
11	X7053A	1 Gbyte Memory Expansion 4 x 256 Mbyte DIMMs (900 MHz only)
11	X7051A	2 Gbyte Memory Expansion 4 x 512 Mbyte DIMMS (900 MHz only)
11	X7052A	4 Gbyte Memory Expansion 4 x 1 Gbyte DIMMS (900 MHz and 1.2 GHz)

TABLE A-2 Netra 20 Optional Components (Continued)

Ref	Part Number	Description
11	X7061A	1 Gbyte memory expansion, 4 x 256 Mbyte (1.2 GHz only)
11	X7062A	2 Gbyte memory expansion, 4 x 512 Mbyte (1.2 GHz only)
12	X6819A	FC-AL Disk Drive, 36 Gbyte NEBS-compliant (900 MHz only)
12	X6855A	FC-AL Disk Drive, 73 Gbyte NEBS-compliant (900 MHz and 1.2 GHz)
13	X6295A	DDS-4 DAT Drive
14	X6168A	DVD-R Drive (10x)
Not shown	X1032A	PCI Card, 10/100BaseT Fast/Wide UltraSCSI
Not shown	X1033A	PCI Card, 10BaseT FastEthernet
Not shown	X6541A	PCI Card, Dual Differential SCSI
Not shown	X1155A	PCI Card, HSI/P 2.0
Not shown	X2156A	PCI Card, SAI/P 3.0
Not shown	X1157A	PCI Card, ATM-155MMF P/4.0
Not shown	X1158A	PCI Card, ATM-155UTP P/4.0
Not shown	X1034A	PCI Card, Quad Fast Ethernet
Not shown	X1141A	PCI Card, Gigabit Ethernet P/2.0
Not shown	X1150A	PCI Card, Gigabit Ethernet UTP P/3.0
Not shown	X1151A	PCI Card, Gigabit Ethernet MMF P/3.0
Not shown	X6799A	PCI Card, Single FC Network Adaptor
Not shown	X6540A	PCI Card, Dual Channel SE UltraSCSI
Not shown	X2222A	PCI Card, Dual Ethernet, Dual SCSI
Not shown	X6762A	PCI Card, SSL Crypto, SCA1000
Not shown	X6758A	PCI Card, Dual Ultra-3 Differential SCSI
Not shown	X3685A	PCI Card, XVR-500 IFBLite+
15	X7216A	Foam Filter Pack (10)
Not shown	X6727A	PCI Card, Dual FC Adapter
16	X7217A	Front Fascia Bezel Kit

1. Must be ordered with the appropriate LOMlite2 Module.

Memory Configuration

This appendix describes the memory configurations available for the Netra 20 system

Note – The information was correct at the time of printing but you should contact your Sun sales representative for the latest information.

The system supports up to eight Dual-Inline Memory Modules (DIMMs), which are available in the following sizes:

- 256 Mbyte
- 512 Mbyte
- 1.0 Gbyte

There are two memory groups, each comprising four slots (marked 0 and 1 on the motherboard). For a configuration to be valid, all four slots of at least one memory group must be filled with DIMMs of the same size. Either group can be used if a single group is filled, and different size DIMMs can be used in each group provided that all the DIMMs in a single group are of the same size.

The system therefore supports configuration from 1 to 8 Gbyte, as shown in TABLE B-1.

For details of the procedures for removing and installing memory modules, refer to the *Netra 20 Service and System Reference Manual*.

TABLE B-1 Valid Memory Configurations

Total Configured Memory Density	Even Bank 0 DIMMs	Odd Bank 1 DIMMs	Interleaving
1.0 Gbyte	256 Mbyte	empty	2-way/4-way
1.0 Gbyte	empty	256 Mbyte	2-way
2.0 Gbyte	256 Mbyte	256 Mbyte	2-way/4-way
	512 Mbyte	empty	2-way
	empty	512 Mbyte	2-way
3.0 Gbyte	512 Mbyte	256 Mbyte	2-way
	256 Mbyte	512 Mbyte	2-way
4.0 Gbyte	512Mbyte	512 Mbyte	2-way/4-way
	1 Gbyte	empty	2-way
	empty	1 Gbyte	2-way
5.0 Gbyte	1 Gbyte	256 Mbyte	2-way
	256 Mbyte	1 Gbyte	2-way
6.0 Gbyte	1 Gbyte	512 Mbyte	2-way
	512 Mbyte	1 Gbyte	2-way
8.0 Gbyte	1 Gbyte	1 Gbyte	2-way/4-way

Connecting to the Netra 20 Server

This appendix describes how to connect a terminal and other equipment to the external ports on your Netra 20 server.

The appendix contains the following sections:

- “Connecting to the LOM Serial Port” on page 131
 - “Connecting to the Serial Ports” on page 132
 - “POST Output” on page 133
-

Connecting to the LOM Serial Port

The LOM serial port is the default console port. To connect a terminal to the LOM serial (RJ45) port you require one of the following:

- RJ-45 (male) to DB-25 (male) cable, wired as shown in TABLE C-1
- CAT5 Ethernet cable RJ45 (male) to RJ45 (male), part no. 530-2961, and an RJ45 (female) to DB-25 (male) adaptor, part no. 530-2889, wired as shown in TABLE C-1

TABLE C-1 LOM Serial Port Adaptor Pinouts

RJ-45 (LOM Port)	Signal	DB-25 (Terminal)
1	RTS/CTS	5
2	DTR/DSR	6
3	TXD/RXD	3
4	REF/GND	N/C or GND
5	REF/GND	N/C or GND

TABLE C-1 LOM Serial Port Adaptor Pinouts (*Continued*)

RJ-45 (LOM Port)	Signal	DB-25 (Terminal)
6	RXD/TXD	2
7	DSR/DTR	20
8	CTS/RTS	4

To communicate with your Netra 20 server, connect the cable from serial port A on your terminal to the LOM serial port on the Netra 20 server.

- 1. Power on your terminal and open a window.**
- 2. Connect your Netra 20 server to the mains power supply.**
The `lom>` prompt is displayed on the terminal.
- 3. Power on the server by pressing the ON switch until the server starts to power up and wait for the `ok` prompt to appear on the terminal.**

Connecting to the Serial Ports

You can also use the Netra 20 serial ports A and B (`ttya` and `ttyb`) as a console port. You require one of the following:

- DB-25 male to DB-25 (male) crossover cable wired as shown in TABLE C-2
- DB-25 (male) to DB-25 (male) straight through cable with a crossover adaptor wired as shown in TABLE C-2

TABLE C-2 Netra 20 Serial Port Crossover Adaptor Pinouts

DB-25 (Netra 20)	Signal	DB-25 (Terminal)
1		1
2	RXD/TXD	3
3	TXD/RXD	2
4	RTS/CTS	5
5	CTS/RTS	4
6	DSR/DTR	20
7	GND/GND	7

TABLE C-2 Netra 20 Serial Port Crossover Adaptor Pinouts (*Continued*)

DB-25 (Netra 20)	Signal	DB-25 (Terminal)
8	DCD/DTR	20
20	DTR/DSR	6
20	DTR/DCD	8

You must also configure the Netra 20 serial port as the input and output device:

```
ok setenv input-device ttya  
ok setenv output-device ttya
```

Note – Tip hardware usually defaults to serial port B (ttyb).

POST Output

To obtain POST output you must set configuration variable `diag-switch?` to `true`, either from the `ok` prompt:

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

or from the shell prompt:

```
# eeeprom diag-switch?=true
```

You should also set `auto-boot?` to `false` since, using the default settings, the system attempts to boot from the net when `diag-switch?` is `true`.

To run POST, power cycle the system; a reset is not sufficient.

By default, the POST output is directed to the LOM console port, which shares LOM event reporting with normal console activity. To direct POST output to the `ttya`, set the configuration variable `diag-out-console` to `true`, either from the `ok` prompt or the shell prompt, as described above.

Glossary

- address** (1) A number used by the system software to identify a storage location. (2) In networking, a unique code that identifies a node to the network.
- ASIC** Application-specific integrated circuit
- Asynchronous** An operation that is not synchronized with the timing of any other part of the system.
- boot** To load the system software into memory and start it running.
- boot PROM** In Sun workstations, the boot PROM contains a PROM monitor program, a command interpreter used for booting, resetting, low-level configuring, and simple testing.
- DAT** Digital audio tape
- DIMM** Dual in-line memory module. A small printed circuit card that contains dynamic random-access memory chips.
- DMA** Direct memory address
- DRAM** Dynamic random-access memory. Read/write dynamic memory in which the data can be read or written in approximately the same amount of time for any memory location.
- DTAG** Dual tag or data tag
- DVD** Digital video disk
- EEPROM** Electrically erasable programmable read only memory
- EMI** Electromagnetic interference. Electrical characteristic that directly or indirectly contributes to a degradation in performance of an electronic system.
- ESD** Electrostatic discharge
- Ethernet** A type of local area network that enables real-time communication between network devices, connected directly together through cables. A widely implemented network from which the IEEE 802.3 standard for contention

networks was developed, Ethernet uses a bus topology (configuration) and relies on the form of access known as CSMA/CD to regulate traffic on the main communication line. Network nodes are connected by coaxial cable (in either of two varieties) or by twisted-pair wiring. See also **10BASE-T**, and **100BASE-T**.

FC-AL	Fiber channel arbitrated loop
FIFO	First-in, first-out
flash PROM	A type of programmable read-only memory (PROM) that can be reprogrammed by a voltage pulse. See also PROM .
FRU	Field-replaceable unit
Gbyte	Gigabyte, 10^9 bytes
HSI	High speed serial interface
I/O	Input/output
Kbyte	Kilobyte, 10^3 bytes
LED	Light-emitting diode
LOMlite2	Lights Out Management
MBps	Megabyte per second
Mbps	Megabit per second
Mbyte	Megabyte, one million bytes
MHz	Megahertz
Network	A configuration of data processing devices and software connected together for information exchange.
NG-DIMM	Next generation dual inline memory module
Node	An addressable point on a network. Each node in a Sun network has a different name. A node can connect a computing system, a terminal, or various other peripheral devices to the network.
ns	Nanosecond, 10^{-9} seconds
NVRAM	Nonvolatile random-access memory. A type of RAM that retains information when power is removed from the system. In Sun systems, contains the system hostID number and Ethernet address. In Netra 20 systems, this information is stored on the system configuration card.
OBP	OpenBoot PROM. A routine that tests the network controller, diskette drive system, memory, cache, system clock, network monitoring, and control registers.

PCI bus	Peripheral component interconnect bus. A high-performance 32 or 64 bit-wide bus with multiplexed address and data lines.
PCIO	PCI-to-EBus/Ethernet controller. An ASIC that bridges the PCI bus to the EBus, enabling communication between the PCI bus and all miscellaneous I/O functions, as well as the connection to slower on-board functions.
Peripheral assembly	Removable media assembly. Can include a card reader, CD-ROM drive, DVD-ROM drive, 4-mm tape drive, a diskette drive, and any other 3.5-inch device.
PID	Process ID
POR	Power on reset
POST	Power on self-test. A series of tests that verify that system board components are operating properly. Initialized at system power-on or when the system is rebooted
PROM	Programmable Read-Only Memory. A type of read-only memory (ROM) that allows data to be written into the device with hardware device called a PROM programmer. After the PROM has been programmed, it is dedicated to that data and cannot be reprogrammed.
QFE	Quad fast Ethernet
RAID	Redundant array of inexpensive disks
SAI	Serial asynchronous interface
SBus	Serial bus
SCC	System configuration card
SCCR	System configuration card reader
SCSI	Small computer system interface
SLVM	Sun Logical Volume Manager
SRAM	Static random access memory
STP	Shielded twisted-pair
SunVTS	Validation Test Suite, a diagnostic application designed to test hardware.
Synchronization	The action of forcing certain points in the execution sequences of two or more asynchronous processes to coincide in time.
TIP	A connection that enables a remote shell window to be used as a terminal to display test data from a system.
TPE	Twisted-pair Ethernet
UTP	Unshielded twisted-pair

10BASE-T An evolution of Ethernet technology that succeeded 10BASE5 and 10BASE2 as the most popular method of physical network implementation. A 10BASE-T network has a data transfer rate of 10 megabits per second and uses unshielded twisted-pair wiring with RJ-45 modular telephone plugs and sockets.

100BASE-T Also known as Fast Ethernet, an Ethernet technology that supports a data transfer rate of 100 megabits per second over special grades of twisted-pair wiring. 100BASE-T uses the same protocol as 10BASE-T. There are three subsets of the 100BASE-T technology: 100BASE-TX defines digital transmission over two pairs of shielded twisted-pair wire. 100BASE-T4 defines digital transmission over four pairs of unshielded twisted-pair wire. 100BASE-TX defines digital transmission over fiber-optic cable.

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