



# Netra™ 210 Server System Administration Guide

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Sun Microsystems, Inc.  
[www.sun.com](http://www.sun.com)

Part No. 819-2749-10  
March 2006, Revision A

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# Preface

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The *Netra 210 Server System Administration Guide* provides information for the management and troubleshooting of the Netra™ 210 server. This document is written for technicians, system administrators, authorized service providers (ASPs), and users who have system administration experience.

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## How This Document Is Organized

[Chapter 1](#) describes how to perform the initial configuration of your Netra 210 server.

[Chapter 2](#) describes how to manage the Netra 210 server with ALOM.

[Chapter 3](#) provides basic troubleshooting information.

[Chapter 4](#) provides advanced troubleshooting information.

[Appendix A](#) provides an alarm relay application programming interface.

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## Using UNIX Commands

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

- Software documentation that you received with your system
- Solaris™ Operating System documentation, which is at:

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## Shell Prompts

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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	#

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## Typographic Conventions

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Typeface*	Meaning	Examples
AaBbCc123	The names of commands, files, and directories; on-screen computer output	Edit your <code>.login</code> file. Use <code>ls -a</code> to list all files. <code>% You have mail.</code>
<b>AaBbCc123</b>	What you type, when contrasted with on-screen computer output	<code>% su</code> 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> .

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\* The settings on your browser might differ from these settings.

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## Related Documentation

The documents listed as online are available at:

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

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<b>Application</b>	<b>Title</b>	<b>Part Number</b>	<b>Format</b>	<b>Location</b>
Setup	<i>Netra 210 Server Setting Up</i>	819-2752	Printed	Shipping kit
Administration	<i>Netra 210 Server System Administration Guide</i>	819-2749	PDF	Online
Service	<i>Netra 210 Server Service Manual</i>	819-2750	PDF	Online
Product Notes	<i>Netra 210 Server Product Notes</i>	819-2751	PDF	Online
Compliance	<i>Netra 210 Server Safety and Compliance Guide</i>	819-3206	PDF	Online

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## Documentation, Support, and Training

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<b>Sun Function</b>	<b>URL</b>
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*Netra 210 Server System Administration Guide*, part number 819-2749-10

# Software Configuration

This chapter discusses initial configuration of the Netra 210 server. Topics include:

- [“Software Configuration Worksheet” on page 1](#)
- [“Initial Configuration” on page 4](#)
- [“More Software Information” on page 7](#)

## Software Configuration Worksheet

Use the following worksheet to gather the information that you need to configure software on the Netra 210 server. You do not need to gather all of the information that is requested on the worksheet. You only need to collect the information that applies to your system.

**TABLE 1-1** Netra 210 Server Software Configuration Worksheet

Information Needed to Install	Description/Example	Your Answers
Network	Is the system connected to a network?	Yes/No
DHCP	Can the system use Dynamic Host Configuration Protocol (DHCP) to configure its network interfaces?	Yes/No
Host Name	Host name that you choose for the system.	
IP Address	If you are not using DHCP, supply the IP address for the system. Example: 129.200.9.1	
Subnet	If you are not using DHCP, is the system part of a subnet? If yes, what is the netmask of the subnet? Example: 255.255.0.0	Yes/No

**TABLE 1-1** Netra 210 Server Software Configuration Worksheet (*Continued*)

Information Needed to Install	Description/Example	Your Answers
IPv6	Do you want to enable IPv6 on this machine?	Yes/No
Kerberos	Do you want to configure Kerberos security on this machine? If yes, gather this information:	Yes/No
	<p style="text-align: right;">Default Realm: Administration Server: First Kerberos Key Distribution Center (KDC): (Optional) Additional KDCs:</p>	
Name Service	Which name service should this system use?	NIS+ /NIS/DNS/LDAP/ None
Domain Name	If the system uses a name service, supply the name of the domain in which the system resides.	
NIS+ and NIS	Do you want to specify a name server or let the installation program find one? If you want to specify a name server, provide the following information:	Specify one/Find one
	<p style="text-align: right;">Server's Host Name: Server's IP address:</p>	
DNS	Provide IP addresses for the DNS server. You must enter at least one IP address, but you can enter up to three addresses.  You can enter a list of domains to search when a DNS query is made:	
	<p style="text-align: right;">Server's IP Address(es):  Search Domain: Search Domain: Search Domain:</p>	
LDAP	Provide the following information about your LDAP profile:	
	<p style="text-align: right;">Profile Name: Profile Server: IP Address:</p>	
Default Router	Do you want to specify a default IP router (gateway) or let the Solaris Web Start installation program find one? If you want to specify a default router, provide the following information:	Specify one/Find one
	<p style="text-align: right;">Router IP Address:</p>	



**TABLE 1-1** Netra 210 Server Software Configuration Worksheet (*Continued*)

<b>Information Needed to Install</b>	<b>Description/Example</b>	<b>Your Answers</b>
Time Zone	How do you want to specify your default time zone?	Geographic region Offset from GMT Time zone file
Locales	For which geographic regions do you want to install support?	
Power Management	Do you want to use Power Management?	Yes/No
Proxy Server Configuration (Only available in the Solaris Web Start program)	Do you have a direct connection to the Internet or do you need to use a proxy server to gain access to the Internet?  If you use a proxy server, provide the following information:  Host: Port:	Direct connection/Proxy server
Automatic Reboot or CD/DVD Ejection	Reboot automatically after software installation? Eject CD/DVD automatically after software installation?	Yes/No Yes/No
Software Group	Which Solaris group do you want to install?	Entire plus OEM Entire Developer End user Core
Custom Package Selection	Do you want to add or remove software packages from the Solaris Software Group that you install?  <i>Note - When you select which packages to add or remove, you need to know about software dependencies and how Solaris software is packaged.</i>	
64-bit	Do you want to install support for 64-bit applications?	Yes/No
Select Disks	On which disks do you want to install the Solaris software? Example: c0t0d0	

**TABLE 1-1** Netra 210 Server Software Configuration Worksheet (*Continued*)

<b>Information Needed to Install</b>	<b>Description/Example</b>	<b>Your Answers</b>
Preserver Data	Do you want to preserve any data that exists on the disks where you are installing the Solaris software?	Yes/No
Auto-layout File Systems	Do you want the installation program to lay out file systems on your disks automatically? If yes, which file systems should be used for auto-layout? Example: / , /opt , /var If no, you must provide file system configuration information.	Yes/No
Mount Remote File Systems (only available in the Solaris SunInstall™ program)	Does this system need to access software on another file system? If yes, provide the following information about the remote file system.  Server: IP Address: Remote File System: Local Mount Point:	Yes/No

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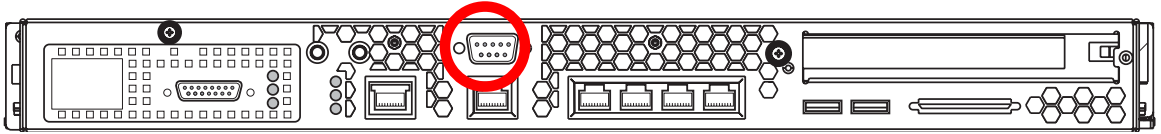
## Initial Configuration

As part of the installation process, the Netra 210 server must be configured to function on the network.

### ▼ To Perform the Initial Configuration

1. **Attach the power cables to the server, but do not power it on at this time.**
2. **Using a serial device, connect to the serial port at the rear panel.**

See [FIGURE 1-1](#).



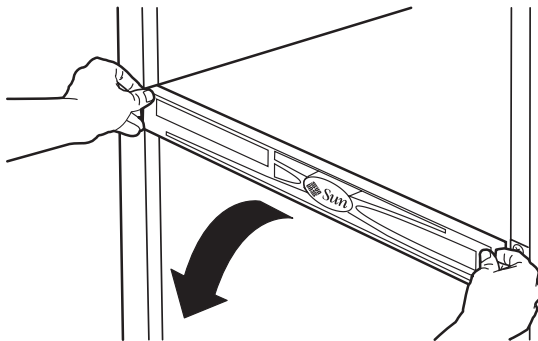
**FIGURE 1-1** Location of Serial Port

**3. Set your serial device communications parameters to the following:**

- 9600 Baud
- 8 data bits
- No parity
- 1 stop bit
- Full duplex
- No handshaking

**4. Lower the bezel.**

See [FIGURE 1-2](#).



**FIGURE 1-2** Lowering the Bezel

**5. Turn the rotary switch to the On (I) position.**

See [FIGURE 1-3](#).

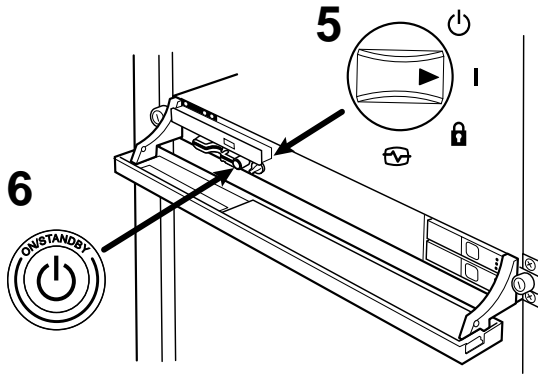


FIGURE 1-3 Rotary Switch

**6. Press the power button.**

See [FIGURE 1-3](#).

The server boots the Solaris Operating System and interactively requests the information provided in the Software Configuration Worksheet.

## ▼ To Configure With the Server Details Registered as a Name Server

---

**Note** – Follow the instructions in this section only if you have a name server installed on your network. For instructions on using a name server to automate the process of configuring the Solaris Operating System on multiple servers, refer to the *Solaris Advanced Installation Guide* that comes with the Solaris software.

---

During the boot process, you are prompted for certain information. The information you provide determines the configuration of the server.

1. Specify the type of terminal you are using to communicate with the server.
2. Specify whether you need IPv6 enabled, and then follow the instructions on the screen.
3. Specify whether you want to enable the Kerberos Security mechanism, and then follow the instructions on the screen.
4. When prompted, give a password (if any) for users logging in as superuser.

---

## More Software Information

Your Netra 210 server was shipped with the Solaris 10 Operating System cluster preinstalled. To learn more about this software, go to this URL:

<http://www.sun.com/software/preinstall>



# Advanced Lights Out Manager

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This chapter describes using Advanced Lights Out Manager (ALOM) for remote administration of your server. Topics include:

- [“Introduction to ALOM” on page 9](#)
- [“ALOM Shell Commands” on page 12](#)
- [“Basic ALOM Tasks” on page 16](#)

More information about ALOM is available in the *Sun Advanced Lights Out Manager Software User’s Guide*, 817-5481-11.

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## Introduction to ALOM

### ALOM Features

ALOM is a system controller that comes preinstalled on your server and is available as soon as you install and power on the system. Through a command-line interface, you can customize ALOM to your particular installation. Then you can monitor and control your server, either over the network or through a terminal server using the dedicated serial management port on the Netra 210 server.

# What ALOM Monitors

TABLE 2-1 lists some of the components that ALOM can monitor on the Netra 210 server.

TABLE 2-1 What ALOM Monitors

Component Monitored	Information Provided
Disk drives	Whether each slot has a drive present, and whether the drive reports OK status
Fans	Fan speed and whether the fans report OK status
CPU temperatures	Whether a CPU is present, the temperature measured at the CPU, and any thermal warning or failure conditions
System enclosure temperature	System ambient temperature, as well as any enclosure thermal warning or failure conditions
Fuses	Whether fuses have been blown
Server front panel	System rotary switch position and status of LEDs
Voltages	Whether voltages are within operating range

**Note** – While redundant power sources are desirable, if only one DC connector is supplying power to the DC-powered version of the Netra 210 server, ALOM might occasionally report the following message:

```
SC Alert: env_log_event unsupported event
```

## Using ALOM

The ALOM software is supplied ready-to-use and can support multiple users. However, only one user at a time can issue any commands that require write permissions. The other users can only issue read-only commands.

There are two ways to connect to ALOM:

- Use the `telnet` command to connect to ALOM through the Ethernet connection attached to the NET MGT port.
- Connect a serial device, such as an ASCII terminal or a port on a terminal server, to the SERIAL MGT port.



## ▼ To Set the Initial Password

When you first apply power to the server, ALOM automatically begins monitoring the system and displaying output to the system console using a preconfigured default account called `admin`, which has full (`cuar`) permissions. For security purposes, the administration password should be set.

### 1. Physically connect to the ALOM serial management port and establish a connection.

Communication parameters are as follows:

- 9600 Baud
- 8 data bits
- No parity
- 1 stop bit
- Full duplex
- No handshaking

### 2. Log in to the ALOM prompt. Type:

```
#.  
sc>
```

That is:

- a. Press and hold the Shift key and press the 3 key.
- b. Press the period key.
- c. Press the Return key.

The `sc>` prompt (ALOM prompt) is displayed.

### 3. Type the password command.

```
sc> password
```

### 4. Type the password and re-type the password.

The password is created and is required for all future ALOM connections.

If you do not log in before ALOM times out, ALOM reverts to the system console and displays the following message:

```
Enter #. to return to ALOM.
```

---

# ALOM Shell Commands

The following tables list some of more common ALOM shell commands and briefly describes what these commands do.

- “Configuration Commands” on page 12
- “FRU Commands” on page 13
- “Log Commands” on page 14
- “Status and Control Commands” on page 14
- “Other Commands” on page 15

Many ALOM shell commands can be executed from the Solaris command line interface, using the `scadm` command. For example:

```
# scadm loghistory
```

Refer to the `scadm` man page for more information.

## Configuration Commands

The ALOM configuration commands set or show the configuration of various aspects of the system.

**TABLE 2-2** ALOM Configuration Commands

Command	Summary	Example
<code>password</code>	Changes the login password of the current user.	<code>sc&gt; password</code>
<code>setdate mmddHHMMyyyy</code>	Sets the date and time, when the managed operating system is not running.	<code>sc&gt; setdate 091321451999</code> MON SEP 13 21:45:00 1999 UTC
<code>setdefaults [-y] [-a]</code>	Resets all ALOM configuration parameters to their default values. The <code>-y</code> option enables you to skip the confirmation question. The <code>-a</code> option resets the user information to the factory default (one admin account only).	<code>sc&gt; setdefaults -a</code>
<code>setsc parameter value</code>	Sets the specified ALOM <i>parameter</i> to the assigned <i>value</i> .	<code>sc&gt; setsc netsc_ipaddr 1.2.3.4</code>
<code>setupsc</code>	Runs the interactive configuration script. This script configures the ALOM configuration variables.	<code>sc&gt; setupsc</code>

**TABLE 2-2** ALOM Configuration Commands (*Continued*)

Command	Summary	Example
showdate	Displays the ALOM set date. The Solaris OS and ALOM time are synchronized, but ALOM time is expressed in UTC (Coordinated Universal Time) rather than local time.	sc> <b>showdate</b> MON SEP 13 21:45:00 1999 UTC
showplatform [-v]	Displays information about the host system's hardware configuration, and whether the hardware is providing service. The -v option displays verbose information about the displayed component(s).	sc> <b>showplatform</b>
showsc [-v] <i>parameter</i>	Displays the current value of a non-volatile random access memory (NVRAM) configuration <i>parameters</i> . The -v option is needed for full version information.	sc> <b>showsc sys_autorestart</b> xir
showusers [-g <i>lines</i> ]	Displays a list of users currently logged in to ALOM. The display for this command has a similar format to that of the UNIX command <i>who</i> . The -g option pauses the display after the number of lines you specify for <i>lines</i> .	sc> <b>showusers -g 10</b>
useradd <i>username</i>	Adds a user account to ALOM.	sc> <b>useradd newuser</b>
userdel [-y] <i>username</i>	Deletes a user account from ALOM. The -y option enables you to skip the confirmation question.	sc> <b>userdel newuser</b>
userpassword <i>username</i>	Sets or changes a user password.	sc> <b>userpassword newuser</b>
userperm <i>username</i> [c][u][a][r]	Sets the permission level for a user account.	sc> <b>userperm newuser cr</b>
usershow [ <i>username</i> ]	Displays a list of all user accounts, permission levels, and whether passwords are assigned.	sc> <b>usershow newuser</b>

## FRU Commands

The ALOM FRU commands can show installed FRUs.

**TABLE 2-3** ALOM FRU Commands

Command	Summary	Example
showfru	Displays information about the FRUs (field-replaceable units) in a host server.	sc> <b>showfru</b>

# Log Commands

The ALOM log commands display the console output and ALOM event buffers.

**TABLE 2-4** ALOM Log Commands

Command	Summary	Example
<code>consolehistory [-b lines] [-e lines] [-g lines] [-v] [boot run]</code>	Displays the host server console output buffers. The <code>-v</code> option displays the entire contents of the specified log.	<code>sc&gt; consolehistory boot -b 10</code>
<code>showlogs [-b lines] [-e lines] [-g lines] [-v]</code>	Displays the history of all events logged in the ALOM event buffer.	<code>sc&gt; showlogs -b 100</code>

# Status and Control Commands

The ALOM status and control commands enable you to perform typically manual tasks with the server, remotely.

**TABLE 2-5** ALOM Status and Control Commands

Command	Summary	Example
<code>bootmode [skip_diag   diag   reset_nvram   normal   bootscript="string"]</code>	Controls the host server boot method through the OpenBoot PROM firmware.	<code>sc&gt; bootmode reset_nvram</code> <code>sc&gt; reset</code>
<code>break [-y] [-c]</code>	Drops the host server from the system into OpenBoot PROM or kadb.	<code>sc&gt; break</code>
<code>console [-f]</code>	Connects to the host system console. The <code>-f</code> option forces the console write lock from one user to another.	<code>sc&gt; console</code>
<code>flashupdate [-s IPaddr -f pathname] [-v]</code>	Updates the ALOM firmware. This command downloads main and bootmon firmware images to ALOM.	<code>sc&gt; flashupdate -s 1.2.3.4 -f /usr/platform/SUNW,Netra210/lib/images/alommainfw</code>
<code>poweroff [-y] [-f]</code>	Removes the main power from the host server. The <code>-y</code> option enables you to skip the confirmation question. The <code>-f</code> option forces an immediate shutdown.	<code>sc&gt; poweroff</code>
<code>poweron [-c] [FRU]</code>	Applies the main power to the host server or a particular FRU.	<code>sc&gt; poweron HDD1</code>
<code>reset [-y] [-x] [-c]</code>	Generates a hardware reset on the host server. The <code>-x</code> option generates an XIR (externally initiated reset). The <code>-y</code> option enables you to skip the confirmation question.	<code>sc&gt; reset -x</code>

**TABLE 2-5** ALOM Status and Control Commands (*Continued*)

Command	Summary	Example
<code>setalarm critical major minor user on off</code>	Turns the alarm and associated LED on and off.	<code>sc&gt; setalarm critical on</code>
<code>setlocator on off</code>	Turns the Locator LED on the server on or off. This function is available only on host servers that have Locator LEDs.	<code>sc&gt; setlocator on</code>
<code>showenvironment</code>	Displays the environmental status of the host server. This information includes system temperatures, power supply status, front panel LED status, hard drive status, fan status, voltage and current sensor status, and rotary switch position.	<code>sc&gt; showenvironment</code>
<code>showlocator</code>	Displays the current state of the Locator LED as either on or off. This function is available only on host servers that have Locator LEDs.	<code>sc&gt; showlocator</code> Locator LED is ON
<code>shownetwork [-v]</code>	Displays the current network configuration information. The <code>-v</code> option shows additional information about your network, including information about your DHCP server.	<code>sc&gt; shownetwork</code>

## Other Commands

[TABLE 2-6](#) lists other ALOM commands.

**TABLE 2-6** Other ALOM Commands

Command	Summary	Example
<code>help</code>	Displays a list of all ALOM commands, or of a particular command, with their syntax and a brief description of how each command works.	<code>sc&gt; help poweron</code>
<code>logout</code>	Logs out from an ALOM shell session.	<code>sc&gt; logout</code>
<code>resetsc [-y]</code>	Reboots ALOM. The <code>-y</code> option enables you to skip the confirmation question.	<code>sc&gt; resetsc</code>

---

# Basic ALOM Tasks

Once you have logged in to ALOM as admin and specified the admin password, you can perform some common administrative tasks:

- [“To Reset ALOM” on page 16](#)
- [“To Switch Between the System Console and ALOM” on page 16](#)
- [“To Control the Locator LED” on page 16](#)
- [“To Reset the Host Server” on page 17](#)
- [“To View Environmental Information About the Server” on page 17](#)
- [“To Reconfigure ALOM to Use the Ethernet \(NET MGT\) Port” on page 17](#)
- [“To Add ALOM User Accounts” on page 18](#)
- [“To Remove an ALOM User Account” on page 19](#)
- [“To Log In to ALOM” on page 19](#)
- [“To Change an ALOM Password” on page 19](#)
- [“To Set Up Email Alerts” on page 20](#)
- [“To Back Up Your ALOM Configuration” on page 20](#)
- [“To Display Your ALOM Version” on page 21](#)

## ▼ To Reset ALOM

Resetting ALOM reboots the ALOM software. Reset ALOM after you have changed settings for ALOM or if ALOM stops responding for any reason.

- At the `sc>` prompt, type `resetsc`.

## ▼ To Switch Between the System Console and ALOM

- To switch from the console to the ALOM `sc>` prompt, type `#`. (pound sign-period).
- To switch from the `sc>` prompt to the console, type `console`.

## ▼ To Control the Locator LED

- To turn the LED on and off, use the `setlocator` command.
- To check the state of the LED, use the `showlocator` command.

The LED can also be controlled as superuser. See [TABLE 3-2](#) for these commands.

## ▼ To Reset the Host Server

1. Type the `poweroff` command.
2. Wait for this message to be displayed:

```
SC Alert: Host system has shut down.
```

3. Type the `poweron` command.

## ▼ To View Environmental Information About the Server

ALOM can display system temperatures, hard drive status, power supply and fan status, front panel LED status, rotary switch position, voltage and current sensors, alarm status, and so on.

- To view environmental information, use the `showenvironment` command.

## ▼ To Reconfigure ALOM to Use the Ethernet (NET MGT) Port

By default, ALOM uses the serial management port (SERIAL MGT) to communicate with a serial device. If desired, you can reconfigure ALOM to use the Ethernet network management (NET MGT) port, and then you can connect to ALOM through the `telnet` command.

---

**Note** – ALOM supports only 10-Mbit networks.

---

To configure the ALOM software to communicate using the NET MGT port, you must specify values for the network interface variables. The `setupsc` script helps you do this.

**1. Run the `setupsc` script. Type:**

```
sc> setupsc
```

The setup script starts. Answer the questions in the script. The script asks:

```
Do you wish to configure the enabled interfaces [y]?
```

**2. Type `y`.**

The script asks:

```
Should the SC network interface be enabled?
```

**3. Type `true` or press Return to enable the network interface.**

This sets a value for the `if_network` variable.

**4. Provide values for the following variables in the script:**

- `if_modem` (specify `false`)
- `netsc_dhcp` (true or false)
- `netsc_ipaddr` (IP address)
- `netsc_ipnetmask` (netmask)
- `netsc_ipgateway` (IP address)
- `netsc_tpelinktest` (true or false)

**5. When you have finished setting up the network interface variables, type Ctrl-Z to save your changes and exit the `setupsc` script.**

**6. Reset ALOM. Type:**

```
sc> resetsc
```

## ▼ To Add ALOM User Accounts

You can add a maximum of 15 unique user accounts to ALOM.

**1. Create an ALOM user account. Type:**

```
sc> useradd username
```



2. Assign a password to this account. Type:

```
sc> userpassword username
New password:
Re-enter new password:
```

3. Assign permissions to this account. Type:

```
sc> userperm username cuar
```

Where *cuar* represents the *cuar* permissions.

4. To verify accounts and their permissions, use the `usershow` command.

## ▼ To Remove an ALOM User Account

- To delete an ALOM user account, type:

```
sc> userdel username
```

---

**Note** – You cannot delete the default admin account from ALOM.

---

## ▼ To Log In to ALOM

1. Establish a connection with ALOM.
2. When the connection is established, type #. (pound sign-period) to escape from the system console.
3. Type in your ALOM login name and password.

## ▼ To Change an ALOM Password

- To change your password, use the `password` command.
- To change a user account password, use the `userpassword username` command.

## ▼ To Set Up Email Alerts

---

**Note** – You can configure email alerts for up to eight users. You can configure each email address to receive its own severity level of alert.

---

1. Ensure that ALOM is set up to use the Ethernet network management port (NET MGT), and that the network interface variables are configured.

See [“To Reconfigure ALOM to Use the Ethernet \(NET MGT\) Port”](#) on page 17.

2. Configure email alerts and mail host. Type:

```
sc> setsc if_emailalerts true
sc> setsc mgt_mailhost ipaddress1,...
```

3. Configure each alert recipient. Type:

```
sc> setsc mgt_mailalert emailaddress alertlevel
```

Where:

- *emailaddress* is in the form of emailusername@maildomain
- *alertlevel* is 1 for critical, 2 for major, and 3 for minor

4. Repeat [Step 3](#) for each alert recipient.

ALOM email alerts are displayed in the following format:

```
$HOSTID $EVENT $TIME $CUSTOMERINFO $HOSTNAME message
```

## ▼ To Back Up Your ALOM Configuration

You should periodically create a backup file on a remote system that records ALOM configuration settings.

- As superuser, open a terminal window and type:

```
# /usr/platform/SUNW,Netra210/sbin/scadm show > remote-filename
# /usr/platform/SUNW,Netra210/sbin/scadm usershow > remote-filename
```

Use a meaningful file name that includes the name of the server that ALOM controls. Later, you can refer to this file to restore the settings, if necessary.

## ▼ To Display Your ALOM Version

- To display your ALOM version, type:

```
sc> showsc version  
Advanced Lights Out Manager v1.6
```



# Basic Troubleshooting

---

This chapter discusses the basic tools that can indicate a problem with the Netra 210 server. Topics include:

- [“Status Indicators” on page 23](#)
- [“NVRAM Parameters” on page 30](#)
- [“Using FMA” on page 32](#)
- [“Troubleshooting Commands” on page 33](#)

---

## Status Indicators

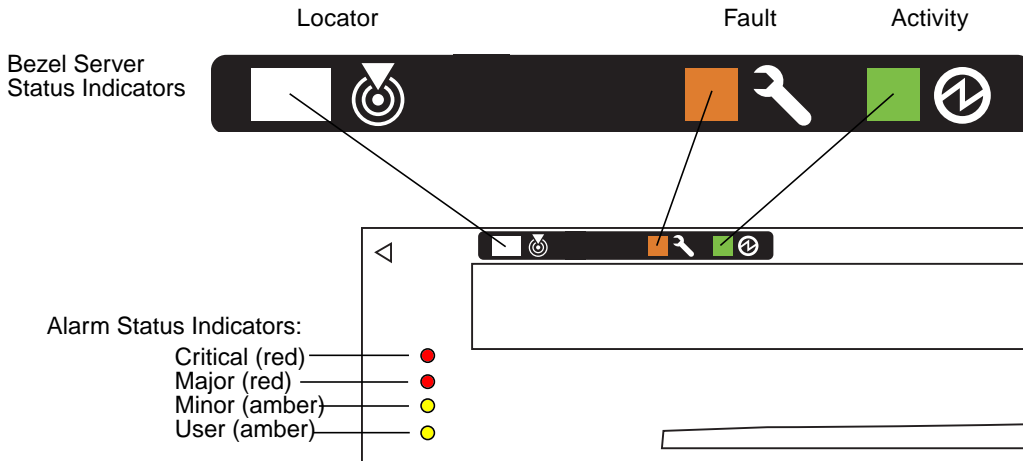
The system has LED indicators associated with the server itself and with various components. The server status indicators are located on the bezel and repeated on the back panel. The components with LED indicators to convey status are the dry contact alarm card, power supply units, Ethernet port, and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

The topics in this section include:

- [“Bezel Server Status Indicators” on page 23](#)
- [“Alarm Status Indicators” on page 25](#)
- [“Hard Drive Status Indicators” on page 26](#)
- [“Power Supply Status Indicators” on page 27](#)
- [“Rear Panel Server Status Indicators” on page 28](#)
- [“Ethernet Network Status Indicators” on page 29](#)

## Bezel Server Status Indicators

[FIGURE 3-1](#) shows the location of the bezel indicators, and [TABLE 3-1](#) provides information about the server status indicators.



**FIGURE 3-1** Location of the Bezel Server Status and Alarm Indicators

**TABLE 3-1** Bezel Server Status Indicators

Indicator	LED Color	LED State	Component Status
Locator	White	On	Server is identified with the superuser locator or ALOM setlocator command.
		Off	Normal state
Fault	Amber	On	The server has detected a problem and requires the attention of service personnel.
		Off	The server has no detected faults.
Activity	Green	On	The server is powered up and running the Solaris Operating System.
		Off	Either power is not present or the Solaris software is not running.

You can check the status and turn the Locator LED on and off from either the superuser or ALOM prompt. [TABLE 3-2](#) lists the commands.

**TABLE 3-2** Locator LED Commands

Prompt	Status	Turn On	Turn Off
Superuser	# /usr/sbin/locator	# /usr/sbin/locator -n	# /usr/sbin/locator -f
ALOM	sc> showlocator	sc> setlocator on	sc> setlocator off

# Alarm Status Indicators

The dry contact alarm card has four LED status indicators that are supported by ALOM. They are located vertically on the bezel (FIGURE 3-1). Information on the alarm indicators and dry contact alarm states is provided in TABLE 3-3. For more information on alarm indicators, see the *Sun Advanced Lights Out Manager Software User's Guide* (part number 817-3174).

**TABLE 3-3** Alarm Indicators and Dry Contact Alarm States

Indicator and Relay Labels	Indicator Color	Application or Server State	Condition or Action	Activity Indicator State	Alarm Indicator State	Relay NC <sup>§</sup> State	Relay NO <sup>**</sup> State	Comments
Critical (Alarm0)	Red	Server state (Power on or off and Solaris OS functional or not functional)	No power input	Off	Off	Closed	Open	Default state
			System power off	Off	Off <sup>‡</sup>	Closed	Open	Input power connected
			System power turns on; Solaris OS not fully loaded	Off	Off <sup>‡</sup>	Closed	Open	Transient state
			Solaris OS successfully loaded	On	Off	Open	Closed	Normal operating state
			Watchdog timeout	Off	On	Closed	Open	Transient state, reboot Solaris OS
			Solaris OS shutdown initiated by user*	Off	Off <sup>‡</sup>	Closed	Open	Transient state
			Lost input power	Off	Off	Closed	Open	Default state
		System power shutdown by user	Off	Off <sup>‡</sup>	Closed	Open	Transient state	
		Application state	User sets critical alarm to on <sup>†</sup>	--	On	Closed	Open	Critical fault detected
			User sets critical alarm to off <sup>†</sup>	--	Off	Open	Closed	Critical fault cleared

**TABLE 3-3** Alarm Indicators and Dry Contact Alarm States (Continued)

Indicator and Relay Labels	Indicator Color	Application or Server State	Condition or Action	Activity Indicator State	Alarm Indicator State	Relay NC <sup>§</sup> State	Relay NO <sup>**</sup> State	Comments
Major (Alarm1)	Red	Application state	User sets major alarm to on <sup>†</sup>	--	On	Open	Closed	Major fault detected
			User sets major alarm to off <sup>†</sup>	--	Off	Closed	Open	Major fault cleared
Minor (Alarm2)	Amber	Application state	User sets minor alarm to on <sup>†</sup>	--	On	Open	Closed	Minor fault detected
			User sets minor alarm to off <sup>†</sup>	--	Off	Closed	Open	Minor fault cleared
User (Alarm3)	Amber	Application state	User sets user alarm to on <sup>†</sup>	--	On	Open	Closed	User fault detected
			User sets user alarm to off <sup>†</sup>	--	Off	Closed	Open	User fault cleared

\* The user can shut down the system using commands such as `init0` and `init6`. This does not include the system power shut down.

† Based on a determination of the fault conditions, the user can turn the alarm on using the Solaris platform alarm API or ALOM CLI.

‡ The implementation of this alarm indicator state is subject to change.

§ NC state is the normally closed state. This state represents the default mode of the relay contacts in the normally closed state.

\*\* NO state is the normally open state. This state represents the default mode of the relay contacts in the normally open state.

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

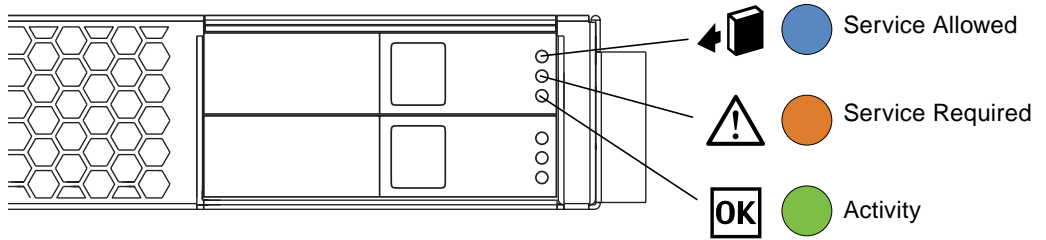
```
SC Alert: CRITICAL ALARM is set
```

In certain instances when the critical alarm is set, the associated alarm indicator is not lit. This implementation is subject to change in future releases.

## Hard Drive Status Indicators

The hard drive indicators can be seen on the right side when the bezel is down. [FIGURE 3-2](#) shows the location of the indicators, and [TABLE 3-4](#) provides information about these indicators.





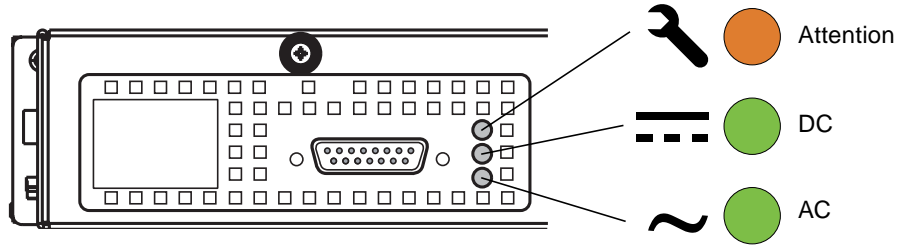
**FIGURE 3-2** Hard Drive Status Indicators

**TABLE 3-4** Hard Drive Status Indicators

Indicator	LED Color	LED State	Component Status
Service Allowed	Blue	On	Hard drive can be safely removed.
		Off	Hard drive is not ready for removal. Do not remove the hard drive.
Service Required	Amber	On	The hard drive has a fault and requires attention.
		Off	Normal state.
Activity	Green	Flashing	Disk activity
		Off	No disk activity

## Power Supply Status Indicators

The power supply status indicators are located on the power supply, at the rear panel. [FIGURE 3-3](#) shows the location of the indicators, and [TABLE 3-5](#) provides information about these indicators.



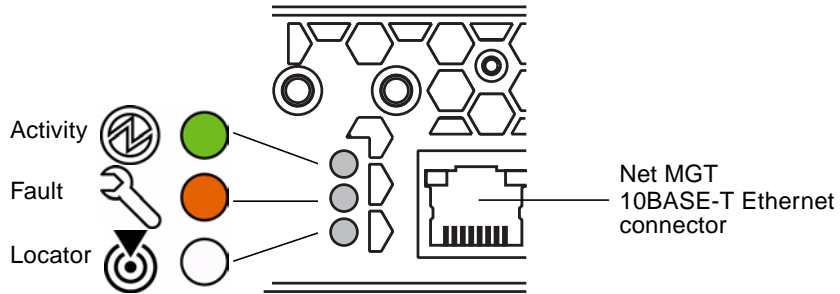
**FIGURE 3-3** Power Supply Status Indicators

**TABLE 3-5** Power Supply Status Indicators

Indicator	LED Color	LED State	Component Status
Attention	Amber	On	Power supply has shut down as a result of overvoltage, undervoltage, or unknown fault.
		Flashing	Power supply has shut down as a result of overcurrent or overtemperature.
		Off	No faults detected.
DC Output	Green	On	Output voltage is within normal range.
		Off	Output voltage failure or power supply is off.
AC Input (DC Input)	Green	On	Input voltage is satisfactory (one or both inputs for DC).
		Off	Input voltage failure or voltage is too low for operation.

## Rear Panel Server Status Indicators

The rear panel server status indicators are located between the power supply and the Gigabit Ethernet connector on the rear panel. [FIGURE 3-4](#) shows the server status indicators adjacent to the Net MGT port, and [TABLE 3-6](#) provides information about these indicators.



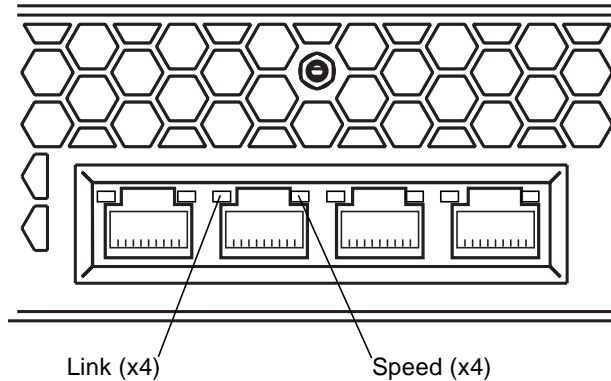
**FIGURE 3-4** Rear Panel Server Status Indicators

**TABLE 3-6** Rear Panel Server Status Indicators

Indicator	LED Color	LED State	Component Status
Activity	Green	On	The server is powered up and running the Solaris Operating System.
		Off	Either power is not present or the Solaris software is not running.
Fault	Amber	On	The server has detected a problem and requires the attention of service personnel.
		Off	The server has no detected faults.
Locator	White	On	Server is identified with the <code>locator</code> or <code>ALOM setlocator</code> command.
		Off	Normal state.

## Ethernet Network Status Indicators

[FIGURE 3-5](#) shows the location of the Ethernet network status indicators, and [TABLE 3-7](#) provides information about these indicators.



**FIGURE 3-5** Ethernet Network Status Indicators

**TABLE 3-7** Ethernet Network Status Indicators

Indicator	LED Color	LED State	Component Status
Link	Green	On	Link established
		Flashing	Transferring data
		Off	Link down
Speed	Green	On	High speed
		Off	Low speed

## NVRAM Parameters

The following table lists the default NVRAM parameters. If you are having server configuration problems, verify that your NVRAM values are the same as this list.

Variable Name	Default Value
asr-policy	normal
test-args	
diag-passes	1
local-mac-address?	true
fcode-debug?	false

scsi-initiator-id	7
oem-logo	
oem-logo?	false
oem-banner	
oem-banner?	false
ansi-terminal?	true
screen-#columns	80
screen-#rows	34
ttyb-rts-dtr-off	false
ttyb-ignore-cd	true
ttya-rts-dtr-off	false
ttya-ignore-cd	true
ttyb-mode	9600,8,n,1,-
ttya-mode	9600,8,n,1,-
output-device	ttya
input-device	ttya
auto-boot-on-error?	false
error-reset-recovery	sync
load-base	16384
auto-boot?	true
network-boot-arguments	
boot-command	boot
diag-file	
diag-device	net
boot-file	
boot-device	disk net
use-nvramrc?	false
nvramrc	
security-mode	No default
security-password	
security-#badlogins	No default
verbosity	normal
diag-trigger	error-reset power-on-res ...
service-mode?	false
diag-script	normal
diag-level	max
diag-switch?	false

---

# Using FMA

Within the release of the Solaris 10 system software, Sun Microsystems has implemented a diagnostics tool called the Fault Management Architecture (FMA). The FMA daemon monitors the status of various system components and reports if a fault has occurred. The report contains an identifier, which when submitted at the FMA web site, returns an explanation for the fault and a possible solution.

TABLE 3-8 provides a simplified decision table and instructions how to use FMA.

TABLE 3-8 Simplified FMA Usage

SITUATION / TASK / QUESTION		YES? Go to:	NO? Go to:
<b>Problem fault indicated.</b>			
Step 1	Are remote services being used?	Step 2	Step 3
Step 2	Is the system connected to Sun?	Step 11	Step 3
Step 3	Is the Solaris 10 operating environment running?	Step 4	Step 12
Step 4	Check the console or <code>/var/adm/messages</code> file for recent messages.		
Step 5	Is the message an <code>fmadm</code> message?	Step 6	Step 12
Step 6	Type <code>fmddump</code> in a terminal window.		
Step 7	Is there a message with a message ID?	Step 8	Step 12
Step 8	Open a web browser to: <code>http://www.sun.com/msg</code>		
Step 9	Type the message ID into the field and click Lookup.		
Step 10	Perform the instructions for your next steps which are provided on the screen. Done		
Step 11	Service call is automatically initiated. A Sun Service representative will contact you. Done		
Step 12	Use other troubleshooting tools. See <a href="#">“Troubleshooting Commands” on page 33</a> or <a href="#">“Advanced Troubleshooting” on page 55</a> . Done		

---

# Troubleshooting Commands

This section discusses superuser commands that assist in troubleshooting problems with the Netra 210 server. Commands discussed are:

- “iostat Command” on page 33
- “prtdiag Command” on page 35
- “prtconf Command” on page 40
- “netstat Command” on page 43
- “ping Command” on page 45
- “ps Command” on page 47
- “prstat Command” on page 49
- “prtfdu Command” on page 51
- “psrinfo Command” on page 52
- “showrev Command” on page 53

Most of these commands are located in the `/usr/bin` or `/usr/sbin` directories.

## iostat Command

The `iostat` command iteratively reports terminal, drive, and tape I/O activity, as well as CPU utilization.

## Options

TABLE 3-9 describes options for the `iostat` command and how those options can help troubleshoot the Netra 210 server.

**TABLE 3-9** Options for `iostat`

Option	Description	How It Can Help
No option	Reports status of local I/O devices.	A quick three-line output of device status.
-c	Reports the percentage of time the system has spent in user mode, in system mode, waiting for I/O, and idling.	A quick report of CPU status.
-e	Displays device error summary statistics. The total errors, hard errors, soft errors, and transport errors are displayed.	Provides a short table with accumulated errors. Identifies suspect I/O devices.

**TABLE 3-9** Options for `iostat` (Continued)

Option	Description	How It Can Help
-E	Displays all device error statistics.	Provides information about devices: manufacturer, model number, serial number, size, and errors.
-n	Displays device names in descriptive format.	Descriptive format helps identify devices.
-x	For each drive, reports extended drive statistics. The output is in tabular form.	Similar to the -e option, but provides rate information. This helps identify poor performance of internal devices and other I/O devices across the network.

## Examples

The following examples show output for the `iostat` command and its options.

```
# iostat
  tty          dad0          sd0          nfs1          nfs2          cpu
tin tout kps tps serv kps tps serv kps tps serv kps tps serv us sy wt id
  0    5 128 15   6    0  0  0    0  0  0    50  3  9    2  8  4 86
```

```
# iostat -c
      cpu
us sy wt id
  2  7  4 87
```

```
# iostat -e
      ---- errors ---
device  s/w h/w trn tot
dad0    0  0  0  0
sd0     0  2  0  2
nfs1    0  0  0  0
nfs2    0  0  0  0
nfs3    0  0  0  0
nfs4    0  0  0  0
nfs5    0  0  0  0
```



```
# iostat -x
                extended device statistics
device      r/s    w/s   kr/s   kw/s wait actv  svc_t  %w  %b
dad0        12.3   0.9  106.6   3.7  0.0  0.1   5.9   1   4
sd0          0.0   0.0   0.0    0.0  0.0  0.0   0.0   0   0
nfs1         0.0   0.0   0.0    0.0  0.0  0.0   0.0   0   0
nfs2         1.2   1.1   20.9   21.2  0.0  0.0   9.3   0   2
nfs3         0.2   0.0   0.9    0.0  0.0  0.0   2.5   0   0
nfs4         0.0   0.0   0.0    0.0  0.0  0.0   0.0   0   0
nfs5         1.5   0.0   30.2   0.0  0.0  0.1  38.6   0   4
```

```
# iostat -En
clt0d0          Soft Errors: 2 Hard Errors: 48 Transport Errors: 0
Vendor: TSSTcorp Product: CD/DVDW TS-L532A Revision: TM31 Serial No:
Size: 0.00GB <0 bytes>
Media Error: 36 Device Not Ready: 0 No Device: 12 Recoverable: 0
Illegal Request: 2 Predictive Failure Analysis: 0
c0tld0          Soft Errors: 0 Hard Errors: 0 Transport Errors: 0
Vendor: SEAGATE Product: ST973401LSUN72G Revision: 0156 Serial No:
04391013AM
Size: 73.40GB <73400057856 bytes>
Media Error: 0 Device Not Ready: 0 No Device: 0 Recoverable: 0
Illegal Request: 0 Predictive Failure Analysis: 0
```

## prtdiag Command

The `prtdiag` command displays configuration and diagnostic information for a system. The diagnostic information identifies any failed component in the system.

The `prtdiag` command is located in the `/usr/platform/platform-name/sbin/` directory.

---

**Note** – The `prtdiag` command might indicate a slot number different than that identified elsewhere in this manual. This is normal.

---

## Options

[TABLE 3-10](#) describes options for the `prtdiag` command and how those options can help troubleshoot the Netra 210 server.

**TABLE 3-10** Options for `prtdiag`

Option	Description	How It Can Help
No option	Lists system components.	Identifies CPU timing and PCI cards installed.
-v	Verbose mode. Displays the time of the most recent AC power failure, the most recent hardware fatal error information, and (if applicable) environmental status.	Provides the same information as no option. Additionally, lists fan status, temperatures, ASIC, and PROM revisions.

## Examples

The following examples show output for the `prtdiag` command and its options.

```

# /usr/platform/sun4u/sbin/prtdiag
System Configuration: Sun Microsystems sun4u Netra 210
System clock frequency: 167 MHZ
Memory size: 1GB

===== CPUs =====
CPU   Freq      E$      CPU              CPU              Status      Location
----  -
0     1336 MHz  1MB     SUNW,UltraSPARC-IIIi  3.3           on-line     MB/P0

===== IO Devices =====
Bus   Freq      Slot +  Name +
Type  MHz       Status Path              Model
----  -
pci   66        MB     pci108e,1648 (network)
      okay    /pci@lf,700000/network@2

pci   66        MB     pci108e,1648 (network)
      okay    /pci@lf,700000/network
.
.
.
pci   66        PCI0   pci100b,35 (network)      SUNW,pci-qge
      okay    /pci/pci/pci/network

pci   66        PCI0   pci100b,35 (network)      SUNW,pci-qge
      okay    /pci/pci/pci/network

===== Memory Configuration =====
Segment Table:
-----
Base Address      Size      Interleave Factor  Contains
-----
0x0                1GB          1                BankIDs 0

Bank Table:
-----
Physical Location
ID      ControllerID  GroupID  Size      Interleave Way
-----
0        0              0        1GB       0

Memory Module Groups:
-----
ControllerID  GroupID  Labels      Status
-----
0              0        MB/P0/B0/D0
0              0        MB/P0/B0/D1

```

```

# /usr/platform/sun4u/sbin/prtdiag -v
System Configuration: Sun Microsystems   sun4u Netra 210
System clock frequency: 167 MHz
Memory size: 1GB
===== CPUs =====
CPU  Freq      E$      CPU      CPU      Status   Location
----  ----      -
0    1336 MHz  1MB     SUNW,UltraSPARC-IIIi  3.3    on-line  MB/P0

===== IO Devices =====
Bus  Freq      Slot +  Name +
Type MHz      Status Path      Model
----  ----      -
pci   66        MB      pci108e,1648 (network)
              okay   /pci@1f,700000/network@2
pci   66        MB      pci108e,1648 (network)
              okay   /pci@1f,700000/network
...
pci   66        PCI0    pci100b,35 (network)      SUNW,pci-qge
              okay   /pci/pci/pci/network
pci   66        PCI0    pci100b,35 (network)      SUNW,pci-qge
              okay   /pci/pci/pci/network

===== Memory Configuration =====
Segment Table:
-----
Base Address      Size      Interleave Factor  Contains
-----
0x0                1GB          1          BankIDs 0
Bank Table:
-----
Physical Location
ID      ControllerID  GroupID  Size      Interleave Way
-----
0        0              0        1GB       0
Memory Module Groups:
-----
ControllerID  GroupID  Labels      Status
-----
0              0        MB/P0/B0/D0
0              0        MB/P0/B0/D1

===== Environmental Status =====
Fan Status:
-----
Location      Sensor      Status
-----
F0            RS          okay
F1            RS          okay
F2            RS          okay
F3            RS          okay
PS0           F4          okay
PS0           F5          okay

```

```
PS0          FF_FAN          okay
```

```
-----  
Temperature sensors:
```

```
-----  
Location      Sensor      Status  
-----  
MB/P0         T_CORE     okay  
SASPCI        SAS_CONTROLLER okay  
MB            T_ENC      okay  
PS0           FF_OT       okay  
-----
```

```
Current sensors:
```

```
-----  
Location      Sensor      Status  
-----  
MB            FF_SCSI     okay  
PS0           FF_OC       okay  
-----
```

```
Voltage sensors:
```

```
-----  
Location      Sensor      Status  
-----  
MB/P0         V_CORE     okay  
MB            V_VTT      okay  
MB            V_GBE_+2V5 okay  
MB            V_GBE_CORE okay  
MB            V_VCCTM    okay  
MB            V_+2V5     okay  
MB            V_+1V5     okay  
MB/BAT        V_BAT      okay  
PS0           P_PWR      okay  
MB            FF_POK     okay  
PS0           FF_UV      okay  
PS0           FF_OV      okay  
-----
```

```
Keyswitch:
```

```
-----  
Location      Keyswitch  State  
-----  
MB            SYSCTRL    NORMAL  
-----
```

```
Led State:
```

```
-----  
Location      Led          State      Color  
-----  
MB            ACT          on         green  
MB            SERVICE    off        amber  
MB            LOCATE     off        white  
PS0           ACT          on         green  
PS0           SERVICE    off        amber  
HDD0          SERVICE    off        amber  
HDD0          OK2RM      off        blue  
HDD1          SERVICE    off        amber  
HDD1          OK2RM      off        blue  
-----
```

```

MB          CRITICAL          off          red
MB          MAJOR              off          red
MB          MINOR              off          amber
MB          USER               off          amber
===== FRU Operational Status =====
-----
Fru Operational Status:
-----
Location      Status
-----
MB/SC         okay
PS0           okay
HDD1         present
===== HW Revisions =====
ASIC Revisions:
-----
Path          Device          Status        Revision
-----
/pci@1f,700000 pci108e,a801    okay          4
/pci@1e,600000 pci108e,a801    okay          4
/pci@1c,600000 pci108e,a801    okay          4
/pci          pci108e,a801    okay          4
System PROM revisions:
-----
OBP 4.18.3 2005/08/03 14:20 Sun Fire V210/V240,Netra 210/240
OBDIAG 4.18.0 2005/08/03 14:30

```

## prtconf Command

Similar to the `show-devs` command run at the `ok` prompt, the `prtconf` command displays the devices that are configured for the Netra 210 server.

The `prtconf` command identifies hardware that is recognized by the Solaris Operating System. If hardware is not suspected to be bad, yet software applications are having trouble with the hardware, the `prtconf` command can indicate if the Solaris software recognizes the hardware, and if a driver for the hardware is loaded.

## Options

TABLE 3-11 describes options for the `prtconf` command and how those options can help troubleshoot the Netra 210 server.

TABLE 3-11 Options for `prtconf`

Option	Description	How It Can Help
No option	Displays the device tree of devices recognized by the operating system.	If a hardware device is recognized, then it is probably functioning properly. If the message “(driver not attached)” is displayed for the device or for a sub-device, then the driver for the device is corrupt or missing.
-D	Similar to the output of no option, however the device driver is listed.	Informs you of the driver needed or used by the operating system to enable the device.
-p	Similar to the output of no option, yet is abbreviated.	Does not report a “(driver not attached)” message, only a quick view of the devices.
-V	Displays the version and date of the OpenBoot™ PROM firmware.	Provides a quick check of firmware version.

## Examples

The following examples show output for the `prtconf` command and its options.

```
# prtconf
System Configuration: Sun Microsystems sun4u
Memory size: 1024 Megabytes
System Peripherals (Software Nodes):

SUNW,Netra-210
  scsi_vhci, instance #0
  packages (driver not attached)
    SUNW,builtin-drivers (driver not attached)
    deblocker (driver not attached)
    disk-label (driver not attached)
    terminal-emulator (driver not attached)
    dropins (driver not attached)
    kbd-translator (driver not attached)
    obp-tftp (driver not attached)
    SUNW,i2c-ram-device (driver not attached)
    SUNW,fru-device (driver not attached)
    SUNW,asr (driver not attached)
    ufs-file-system (driver not attached)
  chosen (driver not attached)
  openprom (driver not attached)
    client-services (driver not attached)
  options, instance #0
  aliases (driver not attached)
  memory (driver not attached)
  virtual-memory (driver not attached)
  SUNW,UltraSPARC-IIIi (driver not attached)
  memory-controller, instance #0
  pci, instance #0
    network, instance #0
    network (driver not attached)
  pci, instance #1
    isa, instance #0
      flashprom (driver not attached)
      rtc (driver not attached)
      i2c, instance #0
        i2c-bridge (driver not attached)
        i2c-bridge (driver not attached)
        motherboard-fru-prom, instance #0
        chassis-fru-prom, instance #1
        alarm-fru-prom, instance #2
        sas-pci-fru-prom, instance #3
        power-supply-fru-prom, instance #4
        dvd-if-fru-prom, instance #5
        dimm-spd, instance #6
        dimm-spd, instance #7
        rsrcrtc (driver not attached)
        nvram (driver not attached)
```



```

# prtconf -D
System Configuration: Sun Microsystems sun4u
Memory size: 1024 Megabytes
System Peripherals (Software Nodes):

SUNW,Netra-210 (driver name: rootnex)
    scsi_vhci, instance #0 (driver name: scsi_vhci)
    packages
        SUNW,builtin-drivers
    . . .
SUNW,UltraSPARC-IIIi (driver name: us)
    memory-controller, instance #0 (driver name: mc-us3i)
    pci, instance #0 (driver name: pcisch)
        network, instance #0 (driver name: bge)
        network (driver name: bge)
    pci, instance #1 (driver name: pcisch)
        isa, instance #0 (driver name: ebus)
            flashprom
            rtc
            i2c, instance #0 (driver name: pcf8584)
                i2c-bridge
                i2c-bridge
            motherboard-fru-prom, instance #0 (driver name: seeprom)
            chassis-fru-prom, instance #1 (driver name: seeprom)
    . . .

```

## netstat Command

The netstat command displays the network status.

### Options

[TABLE 3-12](#) describes options for the netstat command and how those options can help troubleshoot the Netra 210 server.

**TABLE 3-12** Options for netstat

Option	Description	How It Can Help
-i	Displays the interface state, including packets in or out, error in or out, collisions, and queue.	Provides a quick overview of the system's network status.

**TABLE 3-12** Options for netstat (*Continued*)

Option	Description	How It Can Help
-i <i>interval</i>	Providing a trailing number with the -i option repeats the netstat command every <i>interval</i> seconds.	Helps identify intermittent or long duration network events. By piping netstat output to a file, overnight activity can be viewed all at once.
-p	Displays the media table.	Provides MAC address for hosts on the subnet.
-r	Displays the routing table.	Provides routing information.
-n	Replaces host names with IP addresses.	Used when an IP address is more helpful than a host name.

## Examples

The following examples show output for the netstat command and its options.

```
# netstat -i 1
      input  bge0      output
packets errs  packets errs  colls  input (Total)  output
packets errs  packets errs  colls  packets errs  packets errs  colls
32703  0    23906  0    0    35527  0    26730  0    0
 3     0     0     0    0     5     0     2     0    0
 3     0     0     0    0     5     0     2     0    0
 5     0     0     0    0     7     0     2     0    0
 4     0     0     0    0     6     0     2     0    0
 3     0     0     0    0     5     0     2     0    0
 3     0     0     0    0     5     0     2     0    0
. . .
```

```
# netstat -p
```

```
Net to Media Table: IPv4
```

Device	IP Address	Mask	Flags	Phys Addr
bge0	phatair-46	255.255.255.255		08:00:20:92:4a:47
bge0	ns-umpk27-02-46	255.255.255.255		08:00:20:93:fb:99
bge0	moreair-46	255.255.255.255		08:00:20:8a:e5:03
bge0	fermpk28a-46	255.255.255.255		00:00:0c:07:ac:2e
bge0	fermpk28as-46	255.255.255.255		00:50:e2:61:d8:00
bge0	kayakr	255.255.255.255		08:00:20:d1:83:c7
bge0	matlock	255.255.255.255	SP	00:03:ba:27:01:48
bge0	toronto2	255.255.255.255		08:00:20:b6:15:b5
bge0	tucknott	255.255.255.255		08:00:20:7c:f5:94
bge0	mpk28-lobby	255.255.255.255		08:00:20:a6:d5:c8
bge0	d-mpk28-46-245	255.255.255.255		00:10:60:24:0e:00
bge0	224.0.0.0	240.0.0.0	SM	01:00:5e:00:00:00

```
# netstat -r
```

```
Routing Table: IPv4
```

Destination	Gateway	Flags	Ref	Use	Interface
mpk28-046-n	matlock	U	1	6	bge0
224.0.0.0	matlock	U	1	0	bge0
default	fermpk28a-46	UG	1	22	
localhost	localhost	UH	25	3018	lo0

## ping Command

The `ping` command sends ICMP ECHO\_REQUEST packets to network hosts. Depending upon how the `ping` command is configured, the output displayed can identify troublesome network links or nodes. The destination host is specified in the variable *hostname*.

# Options

TABLE 3-13 describes options for the ping command and how those options can help troubleshoot the Netra 210 server.

TABLE 3-13 Options for ping

Option	Description	How It Can Help
<i>hostname</i>	The probe packet is sent to <i>hostname</i> and returned.	Verifies that a host is active on the network.
-g <i>gateway</i>	Forces the probe packet to route through a specified gateway.	By identifying different routes to the target host, those individual routes can be tested for quality.
-i <i>interface</i>	Designates which interface to send and receive the probe packet through.	Enables a simple check of secondary network interfaces.
-n	Replaces host names with IP addresses.	Used when an address is more beneficial than a host name.
-s	Pings continuously in one second intervals. Ctrl-C aborts. Upon abort, statistics are displayed.	Helps identify intermittent or long-duration network events. By piping ping output to file, activity overnight can be viewed all at once.
-svR	Displays the route the probe packet followed in one second intervals.	Indicates probe packet route and number of hops. Comparing multiple routes can identify bottlenecks.

## Examples

The following examples show output for the ping command and its options.

```
# ping -s teddybear
PING teddybear: 56 data bytes
64 bytes from teddybear (192.146.77.140): icmp_seq=0. time=1.
ms
64 bytes from teddybear (192.146.77.140): icmp_seq=1. time=0.
ms
64 bytes from teddybear (192.146.77.140): icmp_seq=2. time=0.
ms
^C
----teddybear PING Statistics----
3 packets transmitted, 3 packets received, 0% packet loss
round-trip (ms)  min/avg/max = 0/0/1
```

```
# ping -svR teddybear
PING teddybear: 56 data bytes
64 bytes from teddybear (192.146.77.140): icmp_seq=0. time=2. ms
  IP options: <record route> smuscampk27s02-r01 (192.146.5.123),
smuscampk14s19-r02-v516 (192.146.5.90), rmpk16a-077 (192.146.77.2),
teddybear (192.146.77.140), smuscampk16s02-r01 (192.146.5.83),
smuscampk11s10-r02-v827 (192.146.5.137), fermpk28ap-46 (192.146.46.2),
matlock (192.146.46.111), (End of record)
^C
----teddybear PING Statistics----
1 packets transmitted, 1 packets received, 0% packet loss
round-trip (ms)  min/avg/max = 2/2/2
```

## ps Command

The `ps` command lists the status of system processes. Using options and rearranging the command output can assist in determining the Netra 210 server resource allocation.

## Options

[TABLE 3-14](#) describes options for the `ps` command and how those options can help troubleshoot the Netra 210 server.

**TABLE 3-14** Options for `ps`

Option	Description	How It Can Help
-e	Displays information for every process.	Identifies the process ID and the executable.
-f	Generates a full listing.	Provides the following process information: user ID, parent process ID, system time when executed, and the path to the executable.
-o <i>format,...</i>	Allows configurable output. The <code>pid</code> , <code>pcpu</code> , <code>pmem</code> , and <code>comm</code> formats display process ID, percent CPU consumption, percent memory consumption, and the responsible executable, respectively.	Provides only the most important information. Knowing the percentage of resource consumption helps identify processes that are affecting system performance and might be hung.

## Examples

The following examples show output for the `ps` command and its options.

```
# ps -ef
  UID      PID    PPID  C   STIME TTY      TIME CMD
  root      0        0  0 10:06:30 ?        0:18 sched
  root      1        0  0 10:06:32 ?        0:00 /etc/init -
  root      2        0  0 10:06:32 ?        0:00 pageout
  root      3        0  0 10:06:32 ?        0:00 fsflush
  root 100311    1  0 10:06:50 ?        0:00 /usr/lib/saf/sac -t 300
. . .
```

```
# ps -eo pcpu,pid,comm|sort -rn
1.4 100317 /usr/openwin/bin/Xsun
0.9 100460 dtwm
0.1 100677 ps
0.1 100600 ksh
0.1 100591 /usr/dt/bin/dtterm
0.1 100462 /usr/dt/bin/sdtperfmeter
0.1 100333 mibiisa
%CPU  PID COMMAND
0.0 100652 /bin/csh
. . .
```

```
# ps -eo pmem,pid,comm|sort -rn
14.2 100317 /usr/openwin/bin/Xsun
4.4 100524 /net/dickens/fmsgml60/bin/sunxm.s5.sparc/makersgml
1.8 100460 dtwm
1.1 100591 /usr/dt/bin/dtterm
1.0 100650 /usr/dt/bin/dtterm
1.0 100494 /usr/dt/bin/dtterm
1.0 100462 /usr/dt/bin/sdtperfmeter
1.0 100453 /usr/dt/bin/dtsession
0.8 100452 /usr/dt/bin/ttsession
. . .
```

---

**Note** – When using `sort` with the `-r` option, the column headings appear at the point where the value in the first column is equal to zero.

---

# prstat Command

The `prstat` command iteratively examines all active processes on the system and reports statistics based on the selected output mode and sort order. The `prstat` command provides output similar to the `ps` command.

## Options

TABLE 3-15 describes options for the `prstat` command and how those options can help troubleshoot the Netra 210 server.

TABLE 3-15 Options for `prstat`

Option	Description	How It Can Help
No option	Displays a sorted list of the top processes which are consuming the most CPU resources. List is limited to the height of the terminal window and the total number of processes. Output is automatically updated every five seconds. Ctrl-C aborts.	Output identifies process ID, user ID, memory used, state, CPU consumption, and command name. By default, the list is sorted by CPU consumption.
<code>-n number</code>	Limits the output to the specified <i>number</i> of lines.	Limits the amount of data displayed and identifies primary resource consumers.
<code>-s key</code>	Permits sorting the list by <i>key</i> parameter.	Useful keys are <code>cpu</code> (default), <code>time</code> , and <code>size</code> .
<code>-v</code>	Verbose mode.	Displays additional parameters.

## Examples

The following examples show output for the `prstat` command and its options.

```
# prstat
  PID USERNAME  SIZE  RSS STATE  PRI NICE   TIME  CPU PROCESS/NLWP
100688 root        1760K 1376K cpu0    59  0   0:00.00 0.1% prstat/1
100524 mm39236     28M   21M sleep   48  0   0:00.25 0.1% maker6X.exe/1
100317 root         28M   69M sleep   59  0   0:00.25 0.1% Xsun/1
100591 mm39236     7584K 5416K sleep   59  0   0:00.02 0.1% dtterm/1
100333 root        2448K 2152K sleep   58  0   0:00.00 0.0% mibiisa/12
100236 root        2232K 1832K sleep   58  0   0:00.00 0.0% lp/1
100600 root        1872K 1432K run     37  0   0:00.00 0.0% ksh/1
. . .
100403 mm39236     1832K 1368K sleep   59  0   0:00.00 0.0% csh/1
100311 root         1800K 1232K sleep   58  0   0:00.00 0.0% sac/1
Total: 65 processes, 159 lwps, load averages: 0.01, 0.02, 0.04
```

```
# prstat -n 5 -s size
  PID USERNAME  SIZE  RSS STATE  PRI NICE   TIME  CPU PROCESS/NLWP
100524 mm39236     28M   21M sleep   48  0   0:00.26 0.3% maker6X.exe/1
100317 root         28M   69M sleep   59  0   0:00.26 0.7% Xsun/1
100460 mm39236     11M  8760K sleep   59  0   0:00.03 0.0% dtwm/8
100453 mm39236     8664K 4928K sleep   48  0   0:00.00 0.0% dtsession/4
100591 mm39236     7616K 5448K sleep   49  0   0:00.02 0.1% dtterm/1
Total: 65 processes, 159 lwps, load averages: 0.03, 0.02, 0.04
```

```
# prstat -n 5 -v
  PID USERNAME  USR  SYS  TRP  TFL  DFL  LCK  SLP  LAT  VCX  ICX  SCL  SIG  PROCESS/NLWP
100692 root         31   62  -   -   -   -   31  -   0  463  57K   0  prstat/1
100524 mm39236     0.6  0.3  -   -   -   -   99  -   89  114   2K   0  maker6X.exe/1
100317 root         0.3  0.5  -   -   -   -   99  -   288  45   2K  108  Xsun/1
100591 mm39236     0.1  0.0  -   -   -   -  100  -   52   9  230   0  dtterm/1
100236 root         0.0  0.0  -   -   -   -  100  -    5   0   52   0  lp/1
Total: 65 processes, 159 lwps, load averages: 0.02, 0.02, 0.03
```



# prtfriu Command

The `prtfriu` command is used to obtain FRU ID data from the system or domain. Its output is that of a tree structure, echoing the path in the FRU tree to each container. The `prtfriu` command provides output similar to the `prtconf` command.

## Options

TABLE 3-16 describes options for the `prtfriu` command and how those options can help troubleshoot the Netra 210 server.

TABLE 3-16 Options for `prtfriu`

Option	Description	How It Can Help
No option	Displays the FRU tree hierarchy and all of the FRU ID container data.	Verbose listing provides FRU and container data within the FRU tree hierarchy. Identifies FRU location within the hierarchy.
<code>-c</code>	Prints only the containers and their data. Does not include the FRU tree hierarchy.	Easier to visually find a FRU component.

## Examples

The following example shows a portion of the output for the `prtfriu -c` command.

```
# prtfriu -c
/frutree/chassis/MB?Label=MB/system-board (container)
  SEGMENT: SD
    /ManR
      /ManR/UNIX_Stamp32: Thu Jan 13 17:33:23 CST 2005
      /ManR/Fru_Description: FRUID, INSTR, M'BD, 2X1.5GHZ, CPU
      /ManR/Manufacture_Loc: Hsinchu, Taiwan
      /ManR/Sun_Part_No: 3753227
      /ManR/Sun_Serial_No: 003595
      /ManR/Vendor_Name: Mitac International
      /ManR/Initial_HW_Dash_Level: 02
      /ManR/Initial_HW_Rev_Level: 02
      /ManR/Fru_Shortname: MOTHERBOARD
      /SpecPartNo: 885-0316-03
    /frutree/chassis/MB?Label=MB/system-board/P0?Label=P0/cpu/B0?Label=
    B0/bank/D0?Label=D0/mem-module (container)
    . . .
```

# psrinfo Command

The `psrinfo` command displays information about processors; both physical and virtual.

## Options

[TABLE 3-16](#) describes options for the `psrinfo` command and how those options can help troubleshoot the Netra 210 server.

**TABLE 3-17** Options for `psrinfo`

Option	Description	How It Can Help
No option	Displays the status and uptime of each processor.	Identifies which processors are functional, and which are not.
-v	Displays additional information about the processors, including: processor type, floating point unit type, and clock speed.	Identifies the characteristics of the processors.
-p	Displays the number of processors.	When combined with the -v option, this option provides even more information than the -v option alone.

## Examples

The following examples show output for the `psrinfo` command and its options.

```
# psrinfo
0      on-line   since 05/31/2005 11:03:39
```

```
# psrinfo -pv
The physical processor has 1 virtual processor (0)
UltraSPARC-IIIi (portid 0 impl 0x16 ver 0x33 clock 1336 MHz)
```

# showrev Command

The `showrev` command displays revision information for the current hardware and software. The `showrev` command provides output similar to the `.version` command.

## Options

TABLE 3-16 describes options for the `showrev` command and how those options can help troubleshoot the Netra 210 server.

TABLE 3-18 Options for `showrev`

Option	Description	How It Can Help
No option	Displays system software information.	Helps to verify versions of installed system software.
-p	Displays installed patch information.	Identifies installed patches.

## Examples

The following examples show output for the `showrev` command and its options.

```
# showrev
Hostname: atqa125
Hostid: 83ad1bfb
Release: 5.10
Kernel architecture: sun4u
Application architecture: sparc
Hardware provider: Sun_Microsystems
Domain: austincampus.Central.Sun.COM
Kernel version: SunOS 5.10 Generic_118835-02
```

```
# showrev -p
Patch: 116298-08 Obsoletes: Requires: Incompatibles: Packages: SUNWxsrt, SUNWxrgrt, SUNWxrprt,
SUNWjxap
Patch: 116302-02 Obsoletes: Requires: Incompatibles: Packages: SUNWxrprt
Patch: 113886-27 Obsoletes: Requires: Incompatibles: Packages: SUNWglrt, SUNWgldoc, SUNWglh,
SUNWglrtu, SUNWglrsz, SUNWgldp, SUNWglsr
Patch: 113887-27 Obsoletes: Requires: Incompatibles: Packages: SUNWglrtx, SUNWglrsx, SUNWgldpx
```



# Advanced Troubleshooting

---

This chapter describes the following diagnostics tools available for advanced troubleshooting:

- “ok Prompt” on page 55
- “Automatic System Recovery” on page 56
- “OpenBoot PROM Utilities” on page 58
- “OpenBoot Diagnostics” on page 63
- “Power-On Self-Test” on page 66

---

## ok Prompt

Advanced troubleshooting tasks require using the system at a basic operating level. At this state, the operating system is not loaded and the commands typed at the console interact with the OpenBoot firmware.

### ▼ To Obtain the ok Prompt

- As superuser, open a terminal window and at the command line, type:

```
# init 0
```

The operating system is brought down and control is transferred to the OpenBoot firmware.

---

# Automatic System Recovery

Automatic System Recovery (ASR) consists of self-test features and an auto-configuring capability to detect failed hardware components and unconfigure them. By enabling this, the server is able to resume operating after certain nonfatal hardware faults or failures have occurred.

If a component is monitored by ASR and the server is capable of operating without it, the server automatically reboots if that component should develop a fault or fail. This prevents a faulty hardware component from keeping the entire system down or causing the system to fail repeatedly.

If a fault is detected during the power-on sequence, the faulty component is disabled. If the system remains capable of functioning, the boot sequence continues.

To support this degraded boot capability, the OpenBoot firmware uses the 1275 Client Interface (by means of the device tree) to mark a device as either *failed* or *disabled*, by creating an appropriate status property in the device tree node. The Solaris Operating System does not activate a driver for any subsystem marked as failed or disabled.

As long as a failed component is electrically dormant (not causing random bus errors or signal noise, for example), the system reboots automatically and resumes operation while a service call is made.

Once a *failed* or *disabled* device is replaced with a new one, the OpenBoot firmware automatically modifies the status of the device upon reboot.

---

**Note** – ASR is not enabled until you activate it. See [“To Enable ASR” on page 58](#).

---

## Autoboot Options

The `auto-boot?` setting controls whether or not the firmware automatically boots the operating system after each reset. The default setting is `true`.

The `auto-boot-on-error?` setting controls whether the system attempts a degraded boot when a subsystem failure is detected. The default setting for `auto-boot-on-error?` is `false`. Both the `auto-boot?` and `auto-boot-on-error?` settings must be set to `true` to enable an automatic degraded boot.

## ▼ To Enable Automatic Degraded Boot

### 1. Obtain the `ok` prompt.

See [“To Obtain the `ok` Prompt” on page 55](#).

### 2. Type:

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

---

**Note** – The system does not attempt a degraded boot in response to any fatal non-recoverable error, even if degraded booting is enabled. For examples of fatal non-recoverable errors, see [“Error Handling Summary” on page 57](#).

---

## Error Handling Summary

Error handling during the power-on sequence falls into one of the following three cases:

- If no errors are detected by POST or OpenBoot diagnostics, the system attempts to boot if `auto-boot?` is `true`.
- If only nonfatal errors are detected by POST or OpenBoot diagnostics, the system attempts to boot if `auto-boot?` is `true` and `auto-boot-on-error?` is `true`.

---

**Note** – If POST or OpenBoot diagnostics detects a nonfatal error associated with the normal boot device, the OpenBoot firmware automatically unconfigures the failed device and tries the next-in-line boot device, as specified by the `boot-device` configuration variable.

---

- If a fatal error is detected by POST or OpenBoot diagnostics, the system does not boot regardless of the settings of `auto-boot?` or `auto-boot-on-error?` Fatal nonrecoverable errors include the following:
  - All CPUs failed
  - All logical memory banks failed
  - Flash RAM cyclical redundancy check (CRC) failure
  - Critical field-replaceable unit (FRU) PROM configuration data failure
  - Critical application-specific integrated circuit (ASIC) failure

## ▼ To Enable ASR

1. Obtain the `ok` prompt.

See [“To Obtain the ok Prompt” on page 55](#).

2. Configure the system for ASR. Type:

```
ok setenv diag-switch? true
ok setenv auto-boot? true
ok setenv auto-boot-on-error? true
```

3. Enable ASR. Type:

```
ok reset-all
```

The system permanently stores the parameter changes and boots automatically.

## ▼ To Disable ASR

1. Obtain the `ok` prompt.

See [“To Obtain the ok Prompt” on page 55](#).

2. Unconfigure diagnostic modes. Type:

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

3. Disable ASR. Type:

```
ok reset-all
```

The system permanently stores the parameter changes and boots automatically.

---

# OpenBoot PROM Utilities

In an idle state, OpenBoot PROM can provide information from basic utilities:

- [“show-devs Utility” on page 59](#)



- “watch-net Utility” on page 60
- “probe-scsi Utility” on page 60
- “probe-ide Utility” on page 61
- “banner Utility” on page 61
- “watch-clock Utility” on page 62
- “date Utility” on page 62
- “.version Utility” on page 62

---

**Note** – In the example outputs provided in this chapter, {0} and {1} indicate which CPU (CPU0 or CPU1 respectively) of a dual CPU Netra 210 server is responding with the ok prompt.

---

## show-devs Utility

The show-devs utility displays the devices installed in the Netra 210 server recognized by the OpenBoot PROM. For example:

```
{1} ok show-devs
/pci@1d,700000
/pci@1c,600000
/pci@1e,600000
/pci@1f,700000
/memory-controller@0,0
/SUNW,UltraSPARC-IIIi@0,0
/virtual-memory
/memory@m0,0
/aliases
/options
/openprom
. . .
/packages/kbd-translator
/packages/dropins
/packages/terminal-emulator
/packages/disk-label
/packages/deblocker
/packages/SUNW,builtin-drivers
```

The {1} indicates that CPU1 is responding with the ok prompt. If an installed device is missing from the list, check the slot or cable connections of the suspect device.

## watch-net Utility

The watch-net utility displays packet activity on the primary network connection. For example:

```
{1} ok watch-net
100 Mbps FDX Link up
Looking for Ethernet Packets.
'.' is a Good Packet. 'X' is a Bad Packet.
Type any key to stop.
.....
```

- If no periods (.) are displayed, then no network activity is detected. Check the Ethernet cable.
- If Xs are displayed, then the network connection has too many collisions or packets are being corrupted or dropped. Check the overall network status.

## probe-scsi Utility

The probe-scsi utility displays the manufacturer and model of devices attached to the SCSI bus. For example:

```
{1} ok probe-scsi
This command may hang the system if a Stop-A or halt command
has been executed. Please type reset-all to reset the system
before executing this command.
Do you wish to continue? (y/n) y

MPT Version 1.05, Firmware Version 0.02.24.00

Target 1
  Unit 0   Disk      SEAGATE ST973401LSUN72G 0156   143374739 Blocks, 73 GB
  SASAddress 5c5000000411bc1  PhyNum 1
```

If no information regarding an installed device is displayed, check the cable connections inside of the Netra 210 server chassis.

## probe-ide Utility

The probe-ide utility displays the manufacturer and model of devices attached to the IDE buses. For example:

```
{1} ok probe-ide
This command may hang the system if a Stop-A or halt command
has been executed. Please type reset-all to reset the system
before executing this command.
Do you wish to continue? (y/n) y
Device 0 ( Primary Master )
    Removable ATAPI Model: TSSTcorpCD/DVDW TS-L532A

Device 1 ( Primary Slave )
    Not Present

Device 2 ( Secondary Master )
    Not Present

Device 3 ( Secondary Slave )
    Not Present
```

If no information regarding an installed device is displayed, check the cable connections inside of the Netra 210 server chassis.

## banner Utility

The banner utility displays the banner seen during system startup. The banner includes:

- System model
- Firmware version
- Installed memory
- Serial number
- Ethernet address
- Host ID

For example:

```
{1} ok banner
Netra 210, No Keyboard
Copyright 2005 Sun Microsystems, Inc. All rights reserved.
OpenBoot 4.18.3, 1024 MB memory installed, Serial #61676539.
Ethernet address 0:3:ba:ad:1b:fb, Host ID: 83ad1bfb.
```

If the banner displays information that is suspect, there might be a problem with the memory, NVRAM, or the system board flash PROM.

## watch-clock Utility

The `watch-clock` utility displays a seconds counter updated in one second intervals. For example:

```
{1} ok watch-clock
Watching the 'seconds' register of the real time clock chip.
It should be 'ticking' once a second.
Type any key to stop.
14
```

If the seconds values do not change, or are longer or shorter than one second in duration, there is a problem with the real-time clock chip on the system board.

## date Utility

The `date` utility displays the current date and time stored in the real-time clock. For example:

```
{1} ok date
09/17/2005 02:42:56 GMT
```

If the real-time clock loses accuracy or the date or time is incorrect after a power cycle, replace the battery.

## .version Utility

The `.version` utility displays the current version of the following installed items:

- Release package
- OpenBoot PROM
- OpenBoot Diagnostics
- POST

For example:

```
{1} ok .version
Release 4.18.3   created 2005/08/03 14:20
OBP 4.18.3 2005/08/03 14:20 Sun Fire V210/V240,Netra 210/240
OBDIAG 4.18.0 2005/08/03 14:30
POST 4.18.3 2005/08/03 14:40
```

---

## OpenBoot Diagnostics

Within the OpenBoot PROM software is a suite of tests which can help you diagnose problems with the system board components and system interfaces to peripherals. The OpenBoot Diagnostics tests are generalized and function at a low level. They help you narrow down a problem to a specific component. Topics covered in this section include:

- [“To Start OpenBoot Diagnostics” on page 63](#)
- [“OBdiag menu” on page 64](#)
- [“To Initiate a Test” on page 65](#)
- [“OpenBoot Diagnostics Tests” on page 65](#)

### ▼ To Start OpenBoot Diagnostics

OpenBoot Diagnostics is started either from the console of the system under test or remotely through a Tip connection.

**1. Obtain the ok prompt.**

See [“To Obtain the ok Prompt” on page 55](#).

**2. Set the auto-boot? property to false and reset the system. Type:**

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

The system restarts and the ok prompt is displayed again.

### 3. Set the `diag-switch?` property to `true` and start OpenBoot Diagnostics. Type:

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

## OBDiag menu

Once started, OpenBoot Diagnostics polls the system for device nodes. If a PCI card component is IEEE 1275 compliant, then its connection can be tested. If the device has a self-test, its function can be verified. When the poll is finished, OpenBoot Diagnostics displays an interactive menu for the tests. For example:

```
o b d i a g
-----
| 1 LSILogic,sas@1      | 2 flashprom@2,0      | 3 i2c@0,320          |
| 4 ide@d               | 5 network@0          | 6 network@1          |
| 7 network@2           | 8 network@2          | 9 network@2          |
| 10 network@2,1        | 11 network@2,1       | 12 network@3         |
| 13 rmc-comm@0,3e8     | 14 rtc@0,70          | 15 scsi@2            |
| 16 scsi@2,1           | 17 serial@0,2e8      | 18 serial@0,3f8      |
|-----|-----|-----|
| Commands: test test-all except help what setenv set-default exit |
|-----|-----|-----|
| diag-passes=1 diag-level=max test-args=                             |
|-----|-----|-----|
obdiag>
```

The diagnostics displayed are dynamic. If a device node is not recognized, it is not listed in the menu.

OpenBoot Diagnostics is configurable. For the simplest testing, set the parameters as follows:

```
obdiag> setenv diag-passes 1
obdiag> setenv diag-level max
obdiag> setenv test-args verbose,subtests
```

These settings are stored permanently in the NVRAM `test-args` parameter.

---

**Note** – The `help` command provides information for configuring OpenBoot Diagnostics.

---

## ▼ To Initiate a Test

- **Select a test by typing `test` and the diagnostic's corresponding number listed in the menu and pressing Return.**

Using the previous example:

```
obdiag> test 4
```

This example initiates the diagnostics of the IDE interface.

## OpenBoot Diagnostics Tests

The [TABLE 4-1](#) lists each OpenBoot Diagnostics test, its description, and what an error in the test result might mean.

**TABLE 4-1** OpenBoot Diagnostics Test Usage

OpenBoot Diagnostics Test	Description	What Error Results Might Mean
<code>LSILogic,sas@1</code>	Checks the SAS board.	SAS board is not properly seated into slot. Reseat the SAS board in the slot or replace it.
<code>flashprom@2,0</code>	Checks headers and checksums.	Problem with the flash PROM on the system board. Check the system board and replace if necessary.
<code>i2c@0,320</code>	Checks for the presence of the I <sup>2</sup> C devices and memory PROMs.	Problem on the I <sup>2</sup> C bus or controller, system board SEEPROM, DIMM SEEPROM, or system board clock generator. Check the DIMM memory or the system board.
<code>ide@d</code>	Checks the IDE controller and provides the identity of devices attached to the IDE bus.	Problem with the hard drive, optical drive, IDE cables, or I/O subsystem chip.
<code>network@0 - network@3</code>	Tests the network controller chip.	Problem with the network or Gigabit Ethernet controller on system board.
<code>rmc-comm@0,3e8</code>	Checks the ALOM support circuits.	Problem with the serial or network management chips and circuitry on the system board.

TABLE 4-1 OpenBoot Diagnostics Test Usage (*Continued*)

OpenBoot Diagnostics Test	Description	What Error Results Might Mean
rtc@0,70	Tests the real-time clock.	Problem with the battery or the M5819 chip. Check the battery or system board.
scsi@2 scsi@2,1	Tests the SCSI host controllers.	Problem with the external SCSI device or the LSA0725 chip. Check the SCSI connection at the rear panel, the external SCSI device and its cabling, or the system board.
serial@0,2e8 serial@0,3f8	Tests the secondary or primary serial port at different baud rates.	Problem with the item connected to the serial port or I/O subsystem chip. If the problem is not the item, check the system board.

## Power-On Self-Test

The power-on self-test (POST) provides testing of system board components. Output of the test is viewed in real-time from a Tip connection. Topics discussed in this section include:

- [“post Command” on page 66](#)
- [“Diagnostic Levels” on page 67](#)
- [“Output Verbosity” on page 67](#)
- [“To Set Up for POST” on page 68](#)
- [“POST Messages” on page 69](#)

### post Command

The `post` command enables you to override NVRAM settings and execute POST on-demand with different diagnostic levels and output verbosity. For example:

```
ok post level verbosity
```

where:

- *level* is `off`, `min`, `max`, or `menus`
- *verbosity* is `none`, `min`, `normal`, `max`, or `debug`

If no diagnostic level or output verbosity is provided, then the `post` command uses the NVRAM settings for `diag-level` and `verbosity`.



# Diagnostic Levels

TABLE 4-2 summarizes the tests performed at off, min, max, and menus diagnostic levels.

TABLE 4-2 Test Performed at off, min, max, and menus Diagnostic Levels

off Level	min Level	max Level	menus Level
No testing performed.	<ul style="list-style-type: none"><li>• Initialize critical CPU resources</li><li>• CPU tests</li><li>• CPU I<sup>2</sup>C tests</li><li>• CPU memory</li><li>• CPU pin checks</li><li>• Internal cache tests</li><li>• CPU memory scrub</li><li>• I/O bridge chip tests</li></ul>	Same as min level, but with additional full memory tests.	Interactive testing of all major test groups. User configures the tests performed.

# Output Verbosity

TABLE 4-3 describes the output seen when output verbosity is set to none, min, normal, max, and debug.

TABLE 4-3 Output Seen at none, min, normal, max, and debug Output Verbosity

none Verbosity	min Verbosity	normal Verbosity	max Verbosity	debug Verbosity
No output is displayed.	Only the following text is displayed: Executing Power On Self Test	<ul style="list-style-type: none"><li>• Build information is displayed.</li><li>• Test groups are indicated.</li></ul>	Most steps of POST are identified.	Every step of POST is identified in detail.

**Note** – The output at max verbosity is similar to the output in previous versions of POST.

**Note** – During POST testing, you can cycle through none, min, normal, max, and debug verbosity by pressing the Ctrl-V keys.

## ▼ To Set Up for POST

To execute POST and view its output, perform the following:

1. Obtain the `ok` prompt on the system to execute POST.

See [“To Obtain the ok Prompt” on page 55](#).

2. Set the baud rate. Type:

```
ok setenv ttya-mode 9600,8,n,1,-
```

3. Disable diagnostics and automatic boot. Type:

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

4. Make a Tip connection with a serial device using the parameters listed in [TABLE 4-4](#).

**TABLE 4-4** Serial Terminal Communication Parameters

Parameter	Value
Baud	9600
Data bits	8
Parity	None
Stop bits	1
Handshaking	None
Duplex	Full

5. Press the return key on the serial device a few times to synchronize the handshaking between the two systems.

The `ok` prompt appears on the serial device.

6. Type the `post` command on the serial device.

For example:

```
ok post min max
```

POST is executed.

While POST runs, the Locator and Service system LEDs flash. They return to their previous state after POST ends.

---

**Note** – POST execution can be aborted by pressing the Ctrl-X keys of the serial device. POST then returns control to the OpenBoot PROM.

---

## POST Messages

POST has three categories of messages as described in [TABLE 4-5](#):

**TABLE 4-5** POST Messages

Message Type	Description	Example
Error	When an error occurs during POST, an error message is displayed. The error message is bounded by the text <code>ERROR</code> and <code>END_ERROR</code> . Several error messages might be displayed at different times of the POST process for any single error condition.	<pre>0&gt;ERROR: TEST = Probe and Setup Memory 0&gt;H/W under test = CPU0 Memory 0&gt;Repair Instructions: Replace items in order listed by 'H/W under test' above 0&gt;MSG = ERROR:  miscompare on mem test!                 Address: 00000000.00000000                 Expected: a5a5a5a5.a5a5a5a5                 Observed: a5a6a5a5.a5a5a5a5 0&gt;END_ERROR</pre>
Warning	Warning messages have a structure similar to error messages, however the messages are bounded by the text <code>WARNING</code> and <code>END_WARNING</code> . Warning messages do not contain a Repair Instructions line.	<pre>0&gt;WARNING: TEST = Probe and Setup Memory 0&gt;H/W under test = CPU0 Memory 0&gt;MSG = DIMM size does not match for dimm set 0, Dimm0=00000000.40000000, Dimm1= 00000000.20000000 0&gt;END_WARNING</pre>
Info	Info messages are simple and are only preceded by the text <code>INFO</code> . Info messages provide noncritical facts.	<pre>0&gt;Probe and Setup Memory 0&gt;INFO: 1024MB Bank 0, Dimm Type X4 0&gt;INFO: 1024MB Bank 1, Dimm Type X4 0&gt;INFO: 1024MB Bank 2, Dimm Type X4 0&gt;INFO: 1024MB Bank 3, Dimm Type X4</pre>

To see a summary of the most recent POST results, from the `ok` prompt, type:

```
ok show-post-results
```



# Alarm Relay Output Application Programming Interface

This appendix provides a sample program that illustrates how to get or set the status of the alarms. The application can use the `LOMIOCALSTATE ioctl` function to obtain the status of each alarm and the `LOMIOCALCTL ioctl` function to set the alarms individually. For more details on the alarm indicators, see [“Alarm Status Indicators” on page 25](#).

## CODE EXAMPLE A-1 Example Program to get and set Status of the Alarms

```
#include <sys/types.h>
#include <string.h>
#include <stdlib.h>
#include <sys/unistd.h>
#include <fcntl.h>
#include "lom_io.h"

#define ALARM_INVALID    -1
#define LOM_DEVICE      "/dev/lom"

static void usage();
static void get_alarm(const char *alarm);
static int set_alarm(const char *alarm, const char *alarmval);
static int parse_alarm(const char *alarm);
static int lom_ioctl(int ioc, char *buf);
static char *get_alarmval(int state);
static void get_alarmvals();

main(int argc, char *argv[])
{
    if (argc < 3) {
        usage();
        if (argc == 1)
```

**CODE EXAMPLE A-1** Example Program to get and set Status of the Alarms (*Continued*)

```
        get_alarmvals();
        exit(1);
    }

    if (strcmp(argv[1], "get") == 0) {
        if (argc != 3) {
            usage();
            exit (1);
        }
        get_alarm(argv[2]);
    }
    else
    if (strcmp(argv[1], "set") == 0) {
        if (argc != 4) {
            usage();
            exit (1);
        }
        set_alarm(argv[2], argv[3]);
    } else {
        usage();
        exit (1);
    }
}

static void
usage()
{
    printf("usage: alarm [get|set] [crit|major|minor|user] [on|off]\n");
}

static void
get_alarm(const char *alarm)
{
    ts_aldata_t    ald;
    int altype = parse_alarm(alarm);
    char *val;

    if (altype == ALARM_INVALID) {
        usage();
        exit (1);
    }

    ald.alarm_no = altype;
    ald.alarm_state = ALARM_OFF;

    lom_ioctl(LOMIOCALSTATE, (char *)&ald);
}
```

**CODE EXAMPLE A-1** Example Program to get and set Status of the Alarms (*Continued*)

```
        if ((ald.alarm_state != ALARM_OFF) &&
            (ald.alarm_state != ALARM_ON)) {
            printf("Invalid value returned: %d\n", ald.alarm_state);
            exit(1);
        }

        printf("ALARM.%s = %s\n", alarm, get_alarmval(ald.alarm_state));
    }

static int
set_alarm(const char *alarm, const char *alarmstate)
{
    ts_aldata_t    ald;
    int alarmval = ALARM_OFF, altype = parse_alarm(alarm);

    if (altype == ALARM_INVALID) {
        usage();
        exit (1);
    }

    if (strcmp(alarmstate, "on") == 0)
        alarmval = ALARM_ON;
    else
    if (strcmp(alarmstate, "off") == 0)
        alarmval = ALARM_OFF;
    else {
        usage();
        exit (1);
    }

    ald.alarm_no = altype;
    ald.alarm_state = alarmval;

    if (lom_ioctl(LOMIOCALCTL, (char *)&ald) != 0) {
        printf("Setting ALARM.%s to %s failed\n", alarm, alarmstate);
        return (1);
    } else {
        printf("Setting ALARM.%s successfully set to %s\n", alarm,
alarmstate);
        return (1);
    }
}

static int
parse_alarm(const char *alarm)
{
    int altype;
```

**CODE EXAMPLE A-1** Example Program to get and set Status of the Alarms (*Continued*)

```
    if (strcmp(alarm, "crit") == 0)
        altype = ALARM_CRITICAL;
    else
    if (strcmp(alarm, "major") == 0)
        altype = ALARM_MAJOR;
    else
    if (strcmp(alarm, "minor") == 0)
        altype = ALARM_MINOR;
    else
    if (strcmp(alarm, "user") == 0)
        altype = ALARM_USER;
    else {
        printf("invalid alarm value: %s\n", alarm);
        altype = ALARM_INVALID;
    }

    return (altype);
}

static int
lom_ioctl(int ioc, char *buf)
{
    int fd, ret;

    fd = open(LOM_DEVICE, O_RDWR);

    if (fd == -1) {
        printf("Error opening device: %s\n", LOM_DEVICE);
        exit (1);
    }

    ret = ioctl(fd, ioc, (void *)buf);

    close (fd);

    return (ret);
}

static char *
get_alarmval(int state)
{
    if (state == ALARM_OFF)
        return ("off");
    else
    if (state == ALARM_ON)
```



**CODE EXAMPLE A-1** Example Program to get and set Status of the Alarms (*Continued*)

```
        return ("on");
    else
        return (NULL);
}
static void
get_alarmvals()
{
    get_alarm("crit");
    get_alarm("major");
    get_alarm("minor");
    get_alarm("user");
}
```



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