Sun Fire V210 and V240 Servers
Administration Guide

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Preface

The *Sun Fire V210 and V240 Servers Administration Guide* is intended to be used by experienced system administrators. As well as general descriptive information about the Sun Fire V210 and V240 servers, it includes detailed instructions on the various server administration tasks.

To use the information in this manual you must have a working knowledge of computer network concepts and terms, and advanced knowledge of the Solaris™ operating environment.

Before You Read This Book

This book does not cover server installation and rackmounting. For detailed information on those topics, refer to the *Sun Fire V210 and V240 Servers Installation Guide.*

Before following any of the procedures described in this book, ensure you have read the *Sun Fire V210 and V240 Servers Compliance and Safety Manual.*

Using UNIX Commands

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

See one or more of the following for this information:

- *Solaris Handbook for Sun Peripherals*
- Other software documentation that you received with your system

Typographic Conventions

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

Shell Prompts

Shell	Prompt
C shell	*machine-name%*
C shell superuser	*machine-name#*
Bourne shell and Korn shell	`$`
Bourne shell and Korn shell superuser	#
ALOM shell	`sc>`
OpenBoot PROM shell	`ok`

Related Documentation

Application	Title	Part Number
Unpacking	*Sun Fire V210 and V240 Servers Quick Start Guide*	816-4824-xx
Installation	*Sun Fire V210 and V240 Servers Compliance and Safety Manual*	817-1462-xx
	Sun Fire V210 and V240 Servers Installation Guide	816-4825-xx
Lights-Out Management	*ALOM Online Help*	817-0076-xx
Latest information	*Sun Fire V210 and V240 Server Product Notes*	816-4828-xx

Read the *Sun Fire V210 and V240 Servers Compliance and Safety Guide* before performing any of the procedures documented in this manual.

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CHAPTER 1

Introduction

This chapter describes the Sun Fire V210 and V240 servers and gives an overview of their main features. It contains the sections:

- "Overview of the Servers" on page 2
- "Bezel Features" on page 4
- "Back Panel Features" on page 14
- "Optional Components" on page 18
- "System Prompts" on page 19

Overview of the Servers



FIGURE 1-1 The Sun Fire V210 Server

Sun Fire V210 Server

The Sun Fire V210 server is a commercial grade server in a 1 RU high package. It uses the UltraSPARC IIIi processor and can be configured with either one or two processors.

The Sun Fire V210 server is AC powered only. Server depth allows mounting in a standard 800mm deep rack. Storage is provided by two hot-swappable disk drives, together with an optional non hot-swappable slimline DVD drive. Built-in I/O network functionality is provided by four Gigabit ethernet channels, one ultra160SCSI multimode port, one general purpose asynchronous serial port and one serial management port, and two independent OHCI USB hubs. I/O expansion is provided via one PCI card slot, supporting both 33MHz and 66MHz cards.



FIGURE 1-2 The Sun Fire V240 Server

Sun Fire V240 Server

The Sun Fire V240 server is a commercial grade server in a 2 RU high package. It uses the UltraSPARC IIIi processor and can be configured with either one or two processors.

The Sun Fire V240 server is AC powered only. Server depth allows mounting in a standard 800mm deep rack. Storage is provided by four hot-swappable disk drives, together with an optional non hot-swappable slimline DVD drive. Built-in I/O network functionality is provided by four Gigabit ethernet channels, one ultra160SCSI multimode port, one general purpose asynchronous serial port and one serial management port, and two independent OHCI USB hubs. I/O expansion is provided via one PCI card slot supporting both 33MHz and 66MHz cards, and two PCI card slots supporting 33MHz cards.

Features

The Sun Fire V210 and V240 servers share the features listed below.

- One or two UltraSPARC™ IIIi processors

- Four DIMM slots per processor
- Four 10/100/1000Base-T Ethernet ports
- One Ultra160 SCSI port for connecting external devices
- One general purpose serial port
- One serial management port
- Two USB ports
- One 10Base-T Ethernet server management port
- PCI expansion
- DVD-ROM drive
- Hot swappable hard disk drives
- System configuration card
- Front and rear service indicators

Differences Between The Servers

TABLE 1-1 Sun Fire V210 and V240 Server: Differences

	Sun Fire V210 server	Sun Fire V240 server
Height	1 RU high	2 RU high
PCI	1x64-bit 33/66 MHz 3.3V PCI slot	1x64-bit 33/66 MHz 3.3V PCI slot 2x64-bit 33 MHz 5V PCI slots
Hard disk drive bays	Two Ultra160 SCSI	Four Ultra160 SCSI
Power supply units	Single AC	Dual redundant AC
Keyswitch	None	Behind bezel

Bezel Features

The front bezel of the Sun Fire V210 and V240 server contains the server status LEDs and a space for placing an identification label.



FIGURE 1-3 Location of Status Indicators (Sun Fire V210 Server Shown)

Server Status Indicators

The server has three LED status indicators. They are located on the front bezel, and repeated on the rear panel. A summary of the indicators is given in TABLE 1-2.

TABLE 1-2 Server Status Indicators

Indicator	LED Colour	LED State	Meaning
Activity	Green	On	The server is powered up and running the Solaris operating environment.
		Off	Either power is not present, or Solaris is not running.
Service Required	Yellow	On	The server has detected a problem and requires the attention of service personnel.
		Off	The server has no detected faults.
Locator	White	On	Identifies the server from others in a rack.

You can turn the Locator LED on and off either from the system console or the Sun Advanced Light-Out Manager (ALOM) command–line interface (CLI).

▼ To Turn The Locator LED On

- **Do one of the following:**
  - **As root, type:**

```
# /usr/sbin/locator -n
```

  - **At the** ALOM **command-line interface, type:**

```
sc> setlocator on
```

▼ To Turn The Locator LED Off

- **Do one of the following:**
  - **As root, type:**

```
# /usr/sbin/locator -f
```

  - **At the** ALOM **command-line interface, type:**

```
sc> setlocator off
```

▼ To Display Locator LED Status

- **Do one of the following:**
  - As root, type:

```
# /usr/sbin/locator
```

  - **At the** ALOM **command-line interface, type:**

```
sc> showlocator
```

Front Panel Features

Access to the front panel is by opening the bezel, which you do by rotating it forwards. It has no clips or locks to hold it closed, only the spring retention built into its hinges.

The front panel contains the following:

- On/Standby switch
- Hard disk drive
- DVD-ROM drive
- System configuration card
- Sun Fire V240 server only: keyswitch

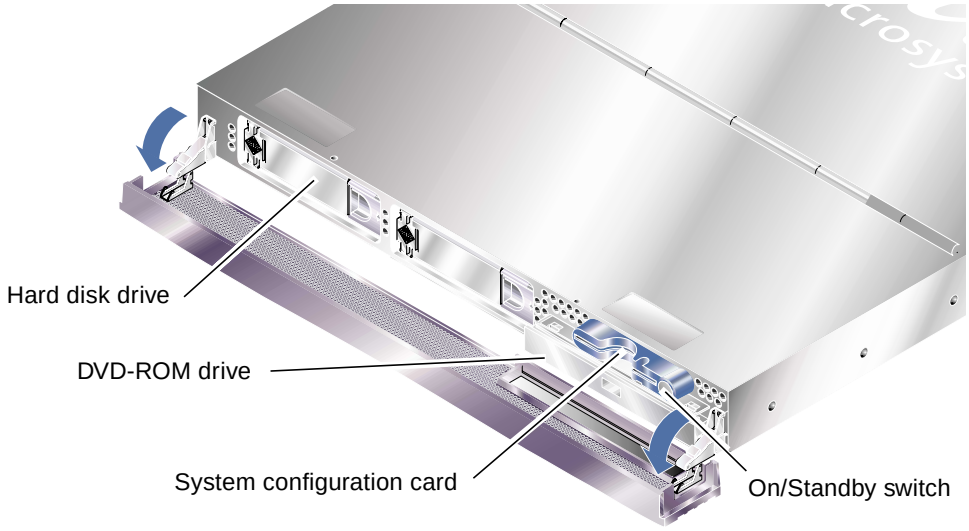


FIGURE 1-4 Location Of Front Panel Features

On/Standby Switch

Access to the On/Standby switch is by opening the front bezel. The On/Standby switch controls only the *power state* of the server, it does not *isolate* the server from its electrical power source.

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

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

The results of these actions are summarised in TABLE 1-3.

TABLE 1-3 On/Standby Switch Actions and Results

Server Power State	Press and release	Press down for more than 4 seconds
On (with Solaris running)	Software performs orderly shutdown. Server enters Standby state	Server enters Standby state directly
On (with Solaris not running)	No effect	Server enters Standby state directly
Standby	Server enters On power state	Server enters On power state

Controlling Server Power

For information on connecting the server to a power source and powering on the server, see the *Sun Fire V210 and V240 Servers Installation Guide.*

For information on controlling server power using software, see the *ALOM Online Help* which is located on the Sun Fire V210 and V240 Servers Documentation CD.

The server immediately goes into Standby mode as soon as it is connected to a power source. As long as it remains connected to the power source, the server stays in either the Standby or On power state. An explanation of the power states is given in TABLE 1-4.

TABLE 1-4 Explanation of Power States

Power State	Description
On	Server is connected to a power source and the power is enabled.
Standby	Server is connected to a power source but power is not enabled.
Off	Server is not connected to a power source. Power cable is disconnected.

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

Hard disk drives

The Sun Fire V210 server has slots for up to two hard disk drives. The Sun Fire V240 server has slots for up to four. The slots accept any Sun LVD SCSI hard disk drive conforming to the 1-inch SCA-2 form factor.

Each hard disk drive has two LED indicators associated with it. See TABLE 1-5 for a summary of what the indicators mean.

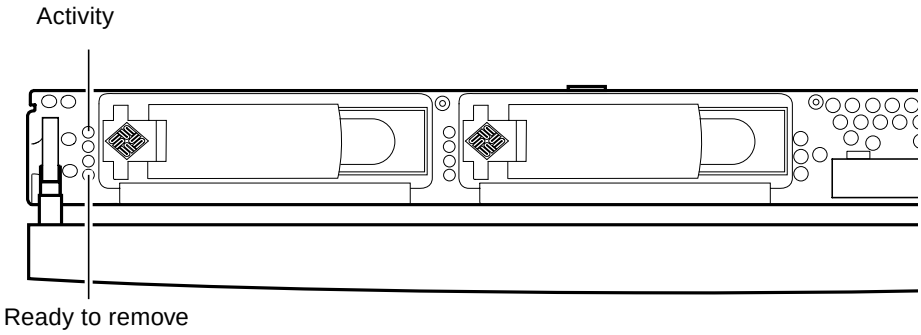


FIGURE 1-5 Location Of Hard Disk Drive Service Indicators (Sun Fire V120 Server Shown)

TABLE 1-5 Hard Disk Drive Service Indicators

Indicator	LED Colour	LED State	Component Status
Activity	Green	Flashing	Active SCSI transactions
		Off	No activity
Ready to remove	Blue	On	Ready to remove
		Off	Not ready to remove

For information on removing and replacing a hard disk drive, see “Removing and Replacing Hard Disk Drives” on page 27.

DVD-ROM Drive

The Sun Fire V210 and V240 server contains a bay to accept an optional slimline ATAPI DVD-ROM drive. The bay is located on the front panel and is accessed by opening the bezel.

For information on DVD-ROM drive installation, see “Removing And Replacing The DVD-ROM Drive” on page 32.

System Configuration Card (SCC)

The system configuration card is housed in a slot behind the front bezel, next to the On / Standby switch (see FIGURE 1-4). The card contains unique network identity information, including the MAC address and hostid (known as the idprom), and the OpenBoot™ PROM configuration (also known as nvram).

The server attempts to access the SCC while booting.

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

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

For more information, see “Swapping the System Configuration Card Between Servers” on page 25.

TABLE 1-6 OBP Configuration Parameters Stored On The System Configuration Card

Parameter	Default	Description
`diag-passes`	`1`	Defines the number of times self-test method(s) are performed
`loca-mac-address?`	`true`	If `true`, network drivers use their own MAC address, not the server’s
`fcode-debug?`	`false`	If `true`, include name fields for plug-in device FCodes
`ttyb-rts-dtr-off`	`true`	If `true`, operating system does not assert ttyb and RTS and DTR
`ttyb-ignore-cd`	`false`	If `true`, operating system ignores carrier-detect on ttyb
`ttya-rts-dtr-off`	`true`	
`ttya-ignore-cd`		If `true`, operating system ignores carrier-detect on ttya

TABLE 1-6 OBP Configuration Parameters Stored On The System Configuration Card

Parameter	Default	Description
silent-mode?	false	Suppress all messages if true and diag-switch? is false
scsi-initiator-id	7	scsi-id of the scsi controller
oem-logo?	false	If true, use custom OEM logo, otherwise, use Sun logo
oem-banner?	false	If true, use custom OEM banner
ansi-terminal?	true	
screen-#columns	80	Sets number of columns on screen
screen-#rows	34	Sets number of rows on screen
ttya-mode	9600,8,n,1,-	ttya (baud rate, #bits, parity, #stop, handshake)
ttyb-mode	9600,8,n,1,-	ttyb (baud rate, #bits, parity, #stop, handshake)
output-device	ttya	Power-on output device
input-device	ttya	Power-on input device
load-base	16384	Address
auto-boot?	true	If true, boot automatically after power on or reset
boot-command	boot	Action following a boot command
diag-file	none	File from which to boot if diag-switch? is true
diag-device	net	Device to boot from if diag-switch? is true
boot-file	none	File to boot if diag-switch? is false
boot-device	disk net	Device(s) from which to boot if diag-switch? is false
use-nvramrc?	false	If true, execute commands in NVRAMRC during server start-up
nvramrc	none	Command script to execute if use-nvramrc? is true
security-mode	none	Firmware security level (options: none, command, or full)
security-password	none	Firmware security password if security-mode is not none (never displayed) - *do not set this directly*

TABLE 1-6 OBP Configuration Parameters Stored On The System Configuration Card

Parameter	Default	Description
`security-#badlogins`	`none`	Number of incorrect security password attempts
`diag-script`	`none`	
`diag-level`	`max`	Defines how diagnostic tests are run (options are `off`, `min`, `med`, `max`)
`diag-switch?`	`false`	If `true`: • Run in diagnostic mode • After a `boot` request, boot `diag-file` from `diag-device` If `false`: • Run in non diagnostic mode • Following a `boot` request, boot `boot-file` from `boot-device`
`error-reset-recovery`	`boot`	Command to execute following a system reset generated by an error
`pcia-probe-list`		Identifies number and order in which pci slots are probed

Keyswitch (Sun Fire V240 server only)

The Sun Fire V240 server has a keyswitch that provides control over the following aspects of the server's operation:

- Power state
- Security level
- Diagnostics level

Located behind the front bezel, it is a rotary switch with four positions, operated by a key supplied with the server. The key is shipped in a clip on the back of the bezel.

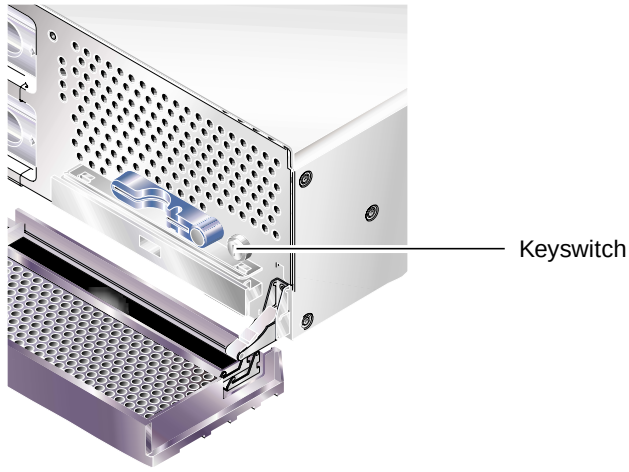


FIGURE 1-6 Location Of The Keyswitch (Sun Fire V240 Server Only)

The keyswitch has four positions, each of which forces the server into a different mode of behaviour. The key has an integral pointer, which you need to tell accurately which position the keyswitch is in. For a description of the behaviour forced by each keyswitch position, see TABLE 1-7.

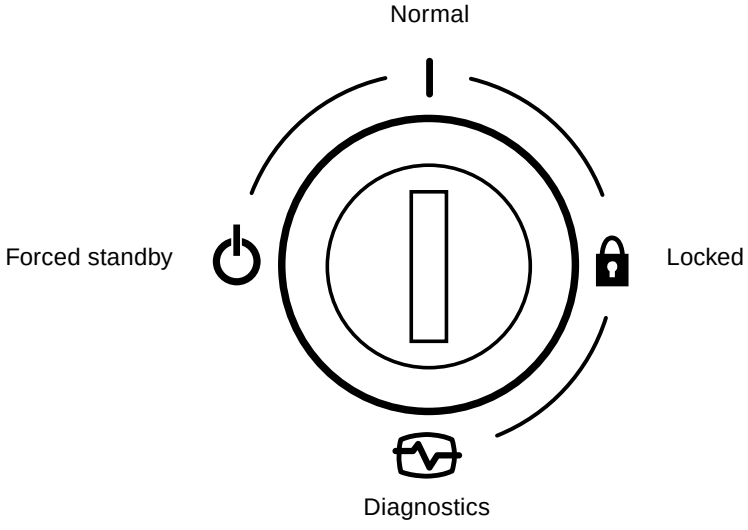


FIGURE 1-7 Keyswitch Positions (Sun Fire V240 Server Only)

Keyswitch positions and the behaviours they force are given in TABLE 1-7.

TABLE 1-7 Keyswitch Position and Server Behaviours

Keyswitch position	Forced Server Behaviour
Normal	Normal operation
Diagnostics	Full POST during system boot
Locked	Disable on/standby switch Write-protect ALOM Flash PROM Write-protect OBP/POST Flash PROM Disable suspension to OBP/Kadb
Forced Standby	Force server into Standby mode Disable on/standby switch Disable remote power control Write-protect ALOM Flash PROM

Back Panel Features

The server's I/O ports and power inlets are on the back panel.

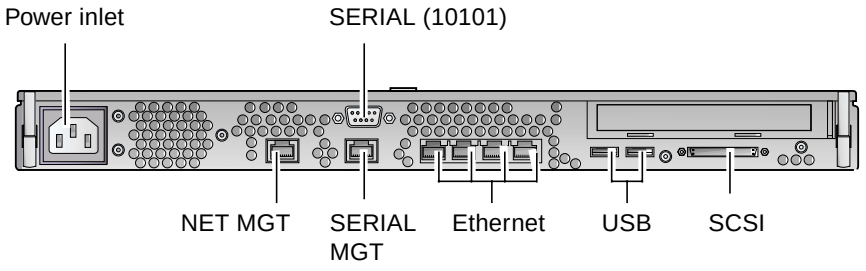


FIGURE 1-8 I/O Ports On A Sun Fire V210 Server

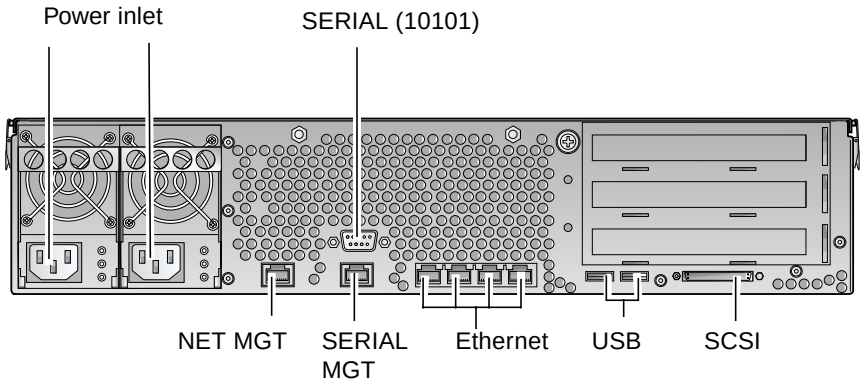


FIGURE 1-9 I/O Ports On A Sun Fire V240 Server

I/O Ports

The I/O ports on the rear of the Sun Fire V210 and V240 are arranged as shown in FIGURE 1-8 and FIGURE 1-9. For more information on the I/O ports, refer to the *Sun Fire V210 and V240 Server Installation Guide.*

Network Status Indicators

Each network connector has two status indicators.

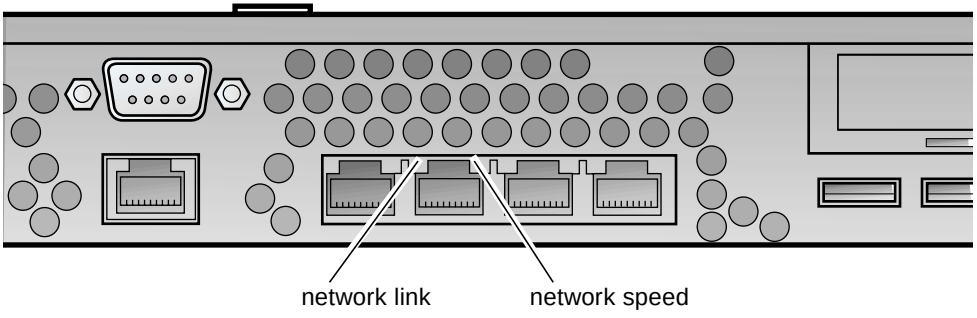


FIGURE 1-10 Location Of Network Status Indicators

The network status indicators convey:

- Network link
- Network speed (does not apply to the NET MGT port)

For a summary of what the *network link* indicators mean, see TABLE 1-8.

TABLE 1-8 Network Link Indicators

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

For a summary of what the network speed indicators mean, see TABLE 1-9.

TABLE 1-9 Network Speed Indicators

LED Colour	LED State	Network Speed Status
Green	On	The network link is established and running at its maximum supported speed.
	Off	• If the network activity indicator is on, the network link is established but not running at its maximum supported speed. • If the network activity indicator is off, network link is not established.

USB Ports

The server has two USB ports for attaching supported USB devices.

The ports are USB1.1 compliant. They support device speeds of 1.5 Mbit/s and 12 Mbit/s, and a 5V supply is available at each connector to power the external device.

External SCSI Port

The SCSI port is a mulitmode Ultra 160SCSI interface. To operate at Ultra 160SCSI speeds, it must be in LVD mode. If a single-ended device is connected to the server, it automatically switches to single-ended mode.

Power Supply Unit (PSU)

The Sun Fire V210 server has one PSU and two associated status indicators. A summary of the function of the indicators is given in TABLE 1-10.

TABLE 1-10 Power Supply Unit Indicators

LED Colour	LED State	Component Status
Green	On	Power is present and PSU is active.
	Off	Either power is not present, or the PSU has shut down due to an internal protection event.
Amber	On	The PSU has shut down due to an internal protection event and requires service attention.
	Off	The PSU is operating normally.

The Sun Fire V240 server has dual redundant PSUs. This server has an additional LED indicator which tells you when a power supply unit is ready to be removed with the server running. (The Sun Fire V210 server has a single PSU and does not support this function.)

A summary of the function of this indicator is given in TABLE 1-11.

TABLE 1-11 Power Supply Unit Ready To Remove Indicator (Sun Fire V240 only)

LED Colour	LED State	Component Status
Blue	On	PSU is ready to be removed.
	Off	The PSU *is not* ready for removal.



Caution – As long as an AC power cord remains connected to the server, potentially dangerous voltages could be present within the server.

Optional Components

The following table lists the optional components that are available for the Sun Fire V210 and V240 server.

TABLE 1-12 Optional Components

Component	Description	Order Number
Storage disk	36 GB 10000 RPM 1-inch SCSI	X5244A
Memory	256 MB	X7402A
	512 MB	X7403A
	1 GB	X7404A
SSL daughter card		X7405A
Removable media	Slimline internal DVD-ROM drive	X7410A
Rackmount kit	24-inch	X6967A
PCI Cards	High Speed Serial Interface	X1155A
	Cauldron	X2222A
	PGX 64 8/24-bit colour graphics PCI Adapter Frame Buffer	X3768A
	Jasper LVD 160 HBA	X6758A
	ISP 2200F Sun Single Loop PCI FC-AL Host Adapter	X6799A
	Dual channel Differential Ultrawide SCSI PCI Adapter	X6541A
	SunFastEthernet FE/P	X1033A
	Sun Quad FastEthernet QFE/P	X1034A
	Gigabit Ethernet 2.0 GBE/P	X1141A
	PGX-128 Colour Graphics Card	X3769A
	Sun Dual Loop PCI FC-AL 2GB Host Adapter	X6768A
	SunFastEthernet	X1032A
	10/100/1000 Ethernet-Cat5 PCI66 Adapter	X1150A
	Gigabit Ethernet-Fiber PCI66 Adapter	X1151A
	Sun PCI Pro	X2132A

System Prompts

The following default server prompts are used by the Sun Fire V210 and V240 servers:

- ok—OpenBoot PROM (OBP) prompt
- sc—Advanced Lights-Out Manager (ALOM) prompt
- #—Solaris superuser (Bourne and Korn shell)

FIGURE 1-11 shows the relationship between the three prompts and how to change from one to the other.

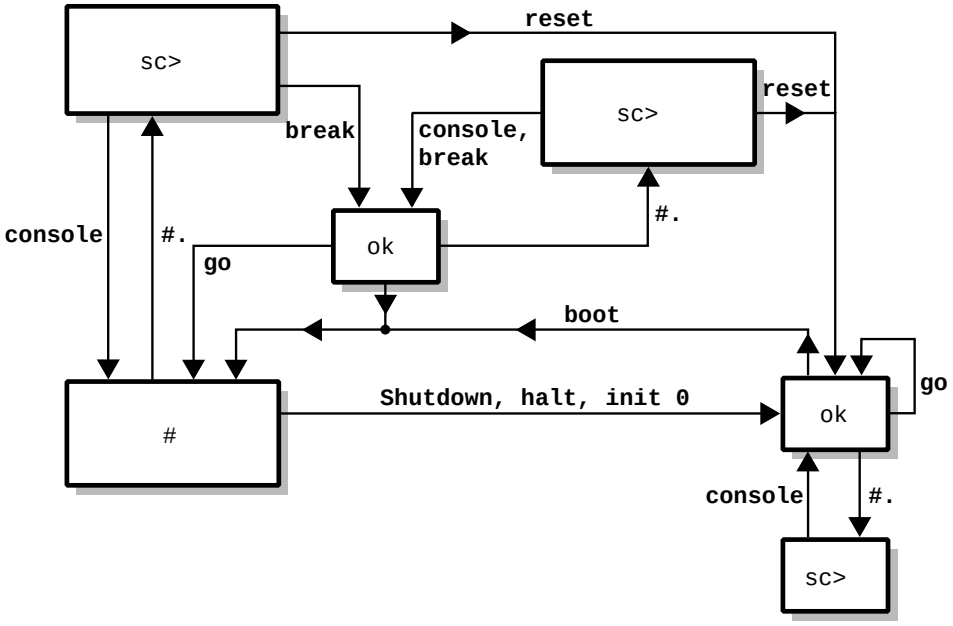


FIGURE 1-11 System Prompt Flow Diagram

CHAPTER 2

Removing and Replacing Components

This chapter tells you how to remove and replace the components that are located behind the server's front bezel. The procedures documented in this chapter do not require the attention of qualified service personnel.



Caution – Read the section, "Avoiding Electrostatic Discharge" on page 22, and wear a properly grounded antistatic strap, before you carry out any of the procedures in this section.

The chapter contains the following sections:

- "Replaceable Components" on page 22
- "Avoiding Electrostatic Discharge" on page 22
- "Swapping the System Configuration Card Between Servers" on page 25
- "Removing and Replacing Hard Disk Drives" on page 27
- "Removing And Replacing The DVD-ROM Drive" on page 32

Replaceable Components

Open the bezel down to access these components:

- System Configuration Card
- Hard disk drives
- DVD-ROM drive

Note – Access to any other component requires the removal of the server's lid, and involves procedures that must be carried out by trained personnel only.

Avoiding Electrostatic Discharge

▼ To Avoid Electrostatic Discharge While Working On The Front Panel

1. **Attach one end of the antistatic wrist strap to your wrist.**
2. **Attach the other end to a grounding stud on the rack or cabinet.**

▼ To Open The Front Bezel

1. **Ensure that you are properly grounded.**

   See "To Avoid Electrostatic Discharge While Working On The Front Panel" on page 22.

2. **Open the bezel by rotating it down on its hinges.**

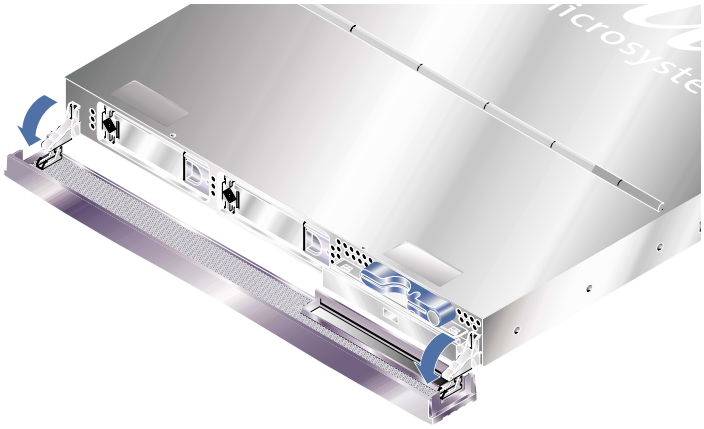


FIGURE 2-1 Opening The Bezel on a Sun Fire V210 Server



FIGURE 2-2 Opening The Bezel on a Sun Fire V210 Server

Note – Always grip the bezel at both ends to open it. Do not attempt to open it using a single point of grip.

Controlling Server Power

Before you remove or replace a system configuration card or DVD-ROM drive, the server must be powered down.

For detailed information on controlling server power with software, refer to the *ALOM Online Documentation* which is contained on the Sun Fire V210 and V240 Servers Documentation CD.

▼ To Power On Using the On/Standby Switch



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

1. **Connect the server to an AC power source.**

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

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

   Read the documentation supplied with the device for specific instructions.

3. **Open the front bezel.**

4. **Sun Fire V240 only: insert the system key into the keyswitch and set it to the Normal or Diagnostics position.**

5. **Press the On/Standby switch.**

6. **Sun Fire V240 only:**

   a. **Turn the key switch to the Locked position.**

      This prevents anyone from accidentally powering off the system.

   b. **Remove the system key from the keyswitch and store it in the clip on the back of the bezel.**

7. **Close the front bezel.**

▼ To Power Off Using The On/Standby Switch

Note – Applications running on the Solaris operating environment can be adversely affected by a poorly executed system shutdown. Make sure you have gracefully shut down any applications before powering off the system.

---

1. **Notify users that the system will be powered down.**
2. **Back up the system files and data, if necessary.**
3. **Sun Fire V240 only: ensure that the keyswitch is in the Normal or Diagnostics position.**
4. **Press and release the On/Standby switch behind the front bezel.**

   The system begins an orderly software system shutdown.

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

---

5. **Wait for the front panel green LED to go out.**
6. **Sun Fire V240 only: remove the system key from the keyswitch and store it in the clip on the back of the front bezel.**
7. **Close the front bezel.**

Swapping the System Configuration Card Between Servers

▼ To Swap the System Configuration Card Between Servers

1. **Power down both servers.**

   See “Controlling Server Power” on page 24.

2. **Open the front bezel on both servers.**

   See “To Open The Front Bezel” on page 22.

3. **Remove the cable ties that secure the system configuration cards, and remove the cards.**

4. **Insert the system configuration card from the old server into the new one.**

5. **Replace the cable tie on the new system.**

6. **Power on the new system.**

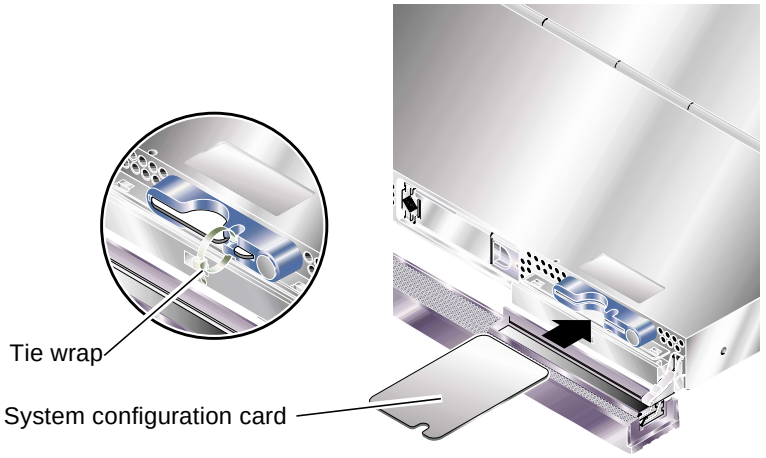


FIGURE 2-3 Inserting a System Configuration Card (Sun Fire V210 Server Shown)



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



Caution – Do not handle the system configuration card unless you need to transfer it to another system. If you need to handle it for this reason, avoid contact with the gold terminals on the underside of the card.

Removing and Replacing Hard Disk Drives



Caution – The server and hard disk drives contain electronic parts that are extremely sensitive to static electricity. Wear a grounded antistatic wrist strap when you carry out this procedure.

Removing A Hard Disk Drive

The hard disk drives are hot-pluggable modules. If more than one is fitted, you can install or remove a hard disk drive without powering off the server or removing it from the rack.

However, you do need to make sure that no system or application software is using a hard disk drive when you remove it.

Note – If you intend to remove a hard disk drive with Solaris running, follow the instructions in “Removing a SCSI Hard Disk Drive With Solaris Running” on page 30 before performing the steps below.

1. **Open the front bezel.**

   See “To Open The Front Bezel” on page 22.

2. **Check that the blue indicator LED is lit on the hard disk drive.**

   The blue LED comes on when the hard disk drive is ready to remove.

3. **Slide the catch at the front of the hard disk drive to the right.**

   This releases the handle on the front of the hard disk drive.

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

Installing A Hard Disk Drive

Caution – The server and hard disk drives contain electronic parts that are extremely sensitive to static electricity. Wear a grounded antistatic wrist strap when you carry out this procedure.

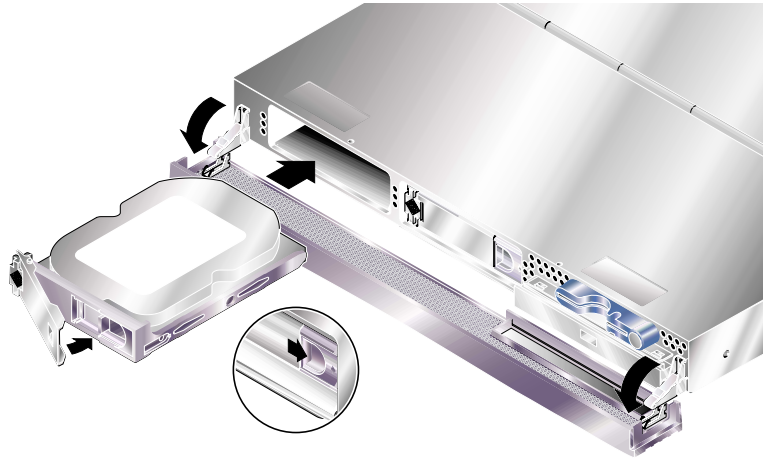


FIGURE 2-4 Inserting a Hard Disk Drive (Sun Fire V210 Server Shown)

5. **Slide the catch on the front of the hard disk to the right.**

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

6. **Slide the hard disk drive into its bay at the front of the server.**

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

7. **Push the metal lever until the disk drive clicks into place.**

8. **Close the bezel.**

   If you have installed a hard disk drive with Solaris running, now perform the steps in “Installing a SCSI Hard Disk Drive With Solaris Running” on page 29.

Installing a SCSI Hard Disk Drive With Solaris Running

Before performing the instructions in this section, install the Hard Disk Drive by following the instructions in “Installing A Hard Disk Drive” on page 28.

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

1. **With the new Hard Disk Drive physically installed in the drive bay, log into the system as root and run the `format` command to make the disk visible to the Operating System.**

   Type the following command. (The sample output below is from a system containing two Hard Disk Drives.)

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

AVAILABLE DISK SELECTIONS:
       0. c0t0d0 <SUN36G cyl 24427 alt 2 hd 27 sec 107>
          /pci@1f,0/pci@1/scsi@8/sd@0,0
       1. c0t1d0 <SUN36G cyl 24427 alt 2 hd 27 sec 107>
          /pci@1f,0/pci@1/scsi@8/sd@1,0
```

2. **Get the label of the new Hard Disk Drive (this appears in the `Ap_Id` column of the sample output).**

   Type:

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

   In the sample output above, the new disk is Disk 1.

3. **Connect the new disk logically to the Operating System.**

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

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

4. **Confirm that the disk is now connected and configured.**

   Type:

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

   The disk is now available to be mounted for operation.

Removing a SCSI Hard Disk Drive With Solaris Running

If you are removing a Hard Disk Drive while the Operating System is still running, you must remove the drive logically from the Operating System before removing it physically. Follow the instructions in this section, then remove the Hard Disk Drive physically by following the instructions in “Removing A Hard Disk Drive” on page 27.

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

1. **Check that the Hard Disk Drive you want to remove is visible to the Operating System.**

   Type:

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

AVAILABLE DISK SELECTIONS:
       0. c0t0d0 <SUN36G cyl 24427 alt 2 hd 27 sec 107>
          /pci@1f,0/pci@1/scsi@8/sd@0,0
       1. c0t1d0 <SUN36G cyl 24427 alt 2 hd 27 sec 107>
          /pci@1f,0/pci@1/scsi@8/sd@1,0
```

2. **Get the correct** `Ap_Id` **label for the Hard Disk Drive that you want to remove.**

   Type:

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

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

---

3. **Unconfigure the Hard Disk Drive that you intend to remove.**

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

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

4. **Check that the device is now "unconfigured".**

   Type:

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

5. **Confirm that the Hard Disk Drive you want to remove from the server is no longer visible to the Operating System.**

   Type the following:

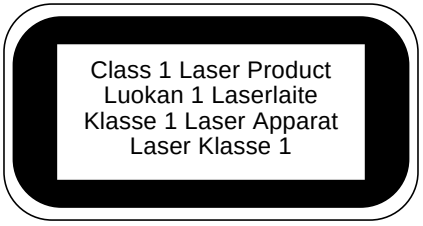
```
# format
Searching for disks...done

AVAILABLE DISK SELECTIONS:
       0. c0t0d0 <SUN36G cyl 24427 alt 2 hd 27 sec 107>
          /pci@1f,0/pci@1/scsi@8/sd@0,0
```

6. **It is now safe to remove the Hard Disk Drive from the server without shutting down the Operating System.**

Removing And Replacing The DVD-ROM Drive

The DVD-ROM drive is not hot-swappable. The server must be powered down, and the power cable removed from the back panel, before you remove or insert a DVD-ROM drive.





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

▼ To Replace The DVD-ROM Drive

1. **Power down the server.**

   See “Controlling Server Power” on page 24.

2. **Open the bezel.**

   See “To Open The Front Bezel” on page 22.

3. **Unclip the catches that fasten the DVD-ROM drive to the chassis.**

   See FIGURE 2-5.

4. **Pull the DVD-ROM drive towards you until it is free of its connectors and out of the chassis.**

5. **Insert the new DVD-ROM drive.**

6. **Press it home firmly until the clips engage with the server’s chassis.**

7. **Close the bezel.**

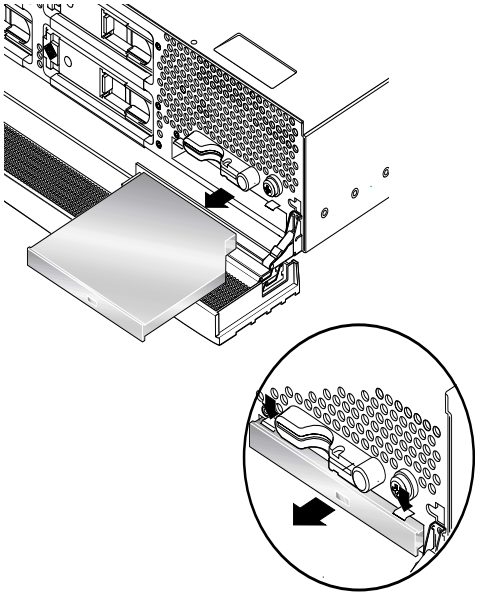


FIGURE 2-5 Removing a DVD-ROM Drive (Sun Fire V240 Shown)

Sun Fire V240 Server: Removing and Replacing a Power Supply Unit

The Sun Fire V240 server has dual-redundant power supplies. You can swap one power supply while the other is still running.

The Sun Fire V210 server has a single power supply. Swapping it requires the attention of qualified service personnel. Refer to the Sun Fire V210 and V240 Servers Parts Replacement Manual which is contained on the Sun Fire V210 and V240 Servers Documentation CD.

▼ To Remove a Power Supply Unit

1. **At the ALOM prompt, type:**

```
sc> removefru -y PSx
```

   Where *x* is the power supply unit identifier, 0 or 1.

   When the blue ok to remove LED lights on the back of the power supply unit, remove it.

2. **Pull down on the PSU lever.**
3. **Withdraw the PSU from the server's chassis.**

▼ To Replace a Power Supply Unit

1. **Slide the PSU into the back of the server until it stops.**

   Do not push the PSU lever closed until the PSU is all the way in.

2. **Press the PSU lever until it clicks home.**

   This engages the PSU with the power distribution board inside the server.

3. **At the ALOM prompt, type**:

```
sc> poweron PSx
```

Where *x* is the power supply unit identifier, 0 or 1.

CHAPTER 3

Sun™ Advanced Lights-Out Manager

This chapter gives an overview of the Sun Advanced Lights-Out Manager (ALOM) software. The chapter contains:

- "Sun™ Advanced Lights-Out Manager 1.0 (ALOM)" on page 38
- "ALOM Management Ports" on page 39
- "Setting the admin Password" on page 39
- "Basic ALOM Functions" on page 40

Sun™ Advanced Lights-Out Manager 1.0 (ALOM)

Both the Sun Fire V210 server and the Sun Fire V240 server are shipped with Sun™ Advanced Lights Out Manager (ALOM) 1.0 installed. The system console is directed to ALOM by default and is configured to show server console information on startup.

ALOM enables you to monitor and control your server over either a serial connection (using the SERIAL MGT port), or Ethernet connection (using the NET MGT port). For information on configuring an Ethernet connection, refer to the *ALOM Online Help*.

Note – The ALOM serial port, labelled SERIAL MGT, is for server management only. If you need a general purpose serial port, use the serial port labeled 10101.

ALOM can be configured to send email notification of hardware failures and other events related to the server or to ALOM.

The ALOM circuitry uses standby power from the server. This means that:

- ALOM is active as soon as the server is connected to a power source, and until power is removed by unplugging the power cable.
- ALOM firmware and software continue to be effective when the server operating system goes offline.

See TABLE 3-1 for a list of the components monitered by ALOM and the information it provides for each.

TABLE 3-1 What ALOM Monitors

Component	Information
Hard disk drives	Presence and status
System and CPU fans	Speed and status
CPUs	Presence, temperature and any thermal warning or failure conditions
Power supplies	Presence and status
System temperature	Ambient temperature and any thermal warning or failure conditions

TABLE 3-1 What ALOM Monitors

Component	Information
Server front panel	Keyswitch position and LED status
Voltage	Status and thresholds
SCSI and USB circuit breakers	Status

ALOM Management Ports

The default management port is labeled SERIAL MGT. This port uses an RJ-45 connector and is for server management *only*—it supports only ASCII connections to an external console. Use this port when you first begin to operate the server.

Another serial port—labeled 10101— is available for general purpose serial data transfer. This port uses a DB-9 connector. For information on pinouts, refer to the Sun Fire V210 and V240 Server Installation Guide.

In addition, the server has one 10Base-T Ethernet management domain interface, labelled NET MGT. To use this port, ALOM configuration is required. For information, see the *ALOM Online Help* which is included on the *Sun Fire V210 and V240 Server Documentation CD*.

Setting the `admin` Password

When you switch to the ALOM prompt after initial poweron, you will be logged in as the admin user and prompted to set a password. You must set this password in order to execute certain commands.

- **If you are prompted to do so, set a password for the admin user.**

  The password must:

  - contain at least two alphabetic characters
  - contain at least one numeric or one special character
  - be at least six characters long

  Once the password is set, the admin user has full permissions and can execute all ALOM CLI commands.

Basic ALOM Functions

This section covers some basic ALOM functions. For comprehensive documentation, refer to the *ALOM Online Help* which is included on the *Sun Fire V210 and V240 Server Documentation CD*.

▼ To Switch To The ALOM Prompt

1. **Type the default keystroke sequence:**

```
# #.
```

Note – When you switch to the ALOM prompt, you will be logged in with the userid “admin”. See “Setting the admin Password” on page 39.

▼ To Switch To The Server Console Prompt

1. **Type:**

```
sc> console
```

More than one ALOM user can be connected to the server console stream at a time, but only one user is permitted to type input characters to the console.

If another user is logged on and has write capability, you will see the message below after issuing the `console` command:

```
sc> Console session already in use. [view mode]
```

To take console write capability away from another user, type:

```
sc> console -f
```

CHAPTER 4

Sun Management Center

This chapter describes SunMC. The chapter contains the sections:

- "Sun Management Center" on page 42
- "Hardware Diagnostic Suite" on page 44

Sun Management Center

Sun Management Center software provides enterprise-wide monitoring of Sun servers and workstations, including their subsystems, components, and peripheral devices. The system being monitored must be up and running, and you need to install all the proper software components on various systems in your network.

Sun Management Center lets you monitor the following on the Sun Fire V210 and V240 server.

TABLE 4-1 What Sun Management Center Monitors

Item Monitored	What Sun Management Center Monitors
Disk drives	Status
Fans	Status
CPUs	Temperature and any thermal warning or failure conditions
Power supply	Status
System temperature	Temperature and any thermal warning or failure conditions

How Sun Management Center Works

The Sun Management Center consists of three components:

- Agent
- Server
- Monitor

You install *agents* on systems to be monitored. The agents collect system status information from log files, device trees, and platform-specific sources, and report that data to the server component.

The *server* component maintains a large database of status information for a wide range of Sun platforms. This database is updated frequently, and includes information about boards, tapes, power supplies, and disks as well as operating system parameters like load, resource usage, and disk space. You can create alarm thresholds and be notified when these are exceeded.

The *monitor* components present the collected data to you in a standard format. Sun Management Center software provides both a standalone Java application and a Web browser-based interface. The Java interface affords physical and logical views of the system for highly-intuitable monitoring.

Other Sun Management Center Features

Sun Management Center software provides you with additional tools, which can operate with management utilities made by other companies.

The tools are an informal tracking mechanism and the optional add-on, Hardware Diagnostics Suite.

Informal Tracking

Sun Management Center agent software must be loaded on any system you want to monitor. However, the product lets you informally track a supported platform even when the agent software has not been installed on it. In this case, you do not have full monitoring capability, but you can add the system to your browser, have Sun Management Center periodically check whether it is up and running, and notify you if it goes out of commission.

Hardware Diagnostic Suite

The *Hardware Diagnostic Suite* is a package which you can purchase as an add-on to Sun Management Center. The suite lets you exercise a system while it is still up and running in a production environment. See “Hardware Diagnostic Suite” on page 44 for more information.

Interoperability With Third-Party Monitoring Tools

If you administer a heterogeneous network and use a third-party network-based system monitoring or management tool, you may be able to take advantage of Sun Management Center software’s support for Tivoli Enterprise Console, BMC Patrol, and HP Openview.

Using Sun Management Center

Sun Management Center software is aimed at system administrators who have large data centers to monitor or other installations that have many computer platforms to monitor. If you administer a smaller installation, you need to weigh Sun Management Center software’s benefits against the requirement of maintaining a significant database (typically over 700 Mbytes) of system status information.

The servers to be monitored must be running , Sun Management Center relies on the Solaris operating environment for its operation.

For detailed instructions, see the *Sun Management Center Software User's Guide.*

Obtaining the Latest Information

For the latest information about this product, go to the Sun Management Center Web site: `http://www.sun.com/sunmanagementcenter`.

Hardware Diagnostic Suite

The Sun Management Center features an optional Hardware Diagnostic Suite, which you can purchase as an add-on. The Hardware Diagnostic Suite is designed to exercise a production system by running tests sequentially.

Sequential testing means the Hardware Diagnostic Suite has a low impact on the system. Unlike SunVTS, which stresses a system by consuming its resources with many parallel tests (see "SunVTS" on page 48), the Hardware Diagnostic Suite lets the server run other applications while testing proceeds.

When to Run Hardware Diagnostic Suite

The best use of the Hardware Diagnostic Suite is to disclose a suspected or intermittent problem with a non-critical part on an otherwise functioning machine. Examples might include questionable disk drives or memory modules on a machine that has ample or redundant disk and memory resources.

In cases like these, the Hardware Diagnostic Suite runs unobtrusively until it identifies the source of the problem. The machine under test can be kept in production mode until and unless it must be shut down for repair. If the faulty part is hot-pluggable or hot-swappable, the entire diagnose-and-repair cycle can be completed with minimal impact to system users.

Requirements for Using Hardware Diagnostic Suite

Since it is a part of Sun Management Center, you can only run Hardware Diagnostic Suite if you have set up your data center to run Sun Management Center. This means you have to dedicate a master server to run the Sun Management Center server software that supports Sun Management Center software's database of

platform status information. In addition, you must install and set up Sun Management Center agent software on the systems to be monitored. Finally, you need to install the console portion of Sun Management Center software, which serves as your interface to the Hardware Diagnostic Suite.

Instructions for setting up Sun Management Center, as well as for using the Hardware Diagnostic Suite, can be found in the *Sun Management Center Software User's Guide*.

CHAPTER 5

Sun VTS

This chapter describes SunVTS. The chapter contains the following sections:

- "SunVTS" on page 48

SunVTS

SunVTS is a software suite that performs system and subsystem stress testing. You can view and control a SunVTS session over a network. Using a remote machine, you can view the progress of a testing session, change testing options, and control all testing features of another machine on the network.

You can run SunVTS software in three different test modes:

- *Connection mode* verifies the presence of device controllers on all subsystems. This typically takes no more than a few minutes and is a good way to "sanity check" system connections.
- *Functional mode* exercises only the specific subsystems you choose. This is the default mode.
- *Auto Config mode* automatically detects all subsystems and exercises them in one of two ways:
  - *Confidence testing* – performs one pass of tests on all subsystems, and then stops. For typical system configurations, this requires one or two hours.
  - *Comprehensive testing* – tests all subsystems repeatedly for up to 24 hours.

Since SunVTS software can run many tests in parallel and consume many system resources, you should take care when using it on a production system. If you are stress-testing a system using SunVTS software's Comprehensive test mode, do not run anything else on that system at the same time.

A server must be running the Solaris operating environment for SunVTS software to be able to test it. Since SunVTS software packages are optional, they may not be installed on your system. See "To Find Out Whether SunVTS Is Installed" on page 50 for instructions.

SunVTS Software and Security

During SunVTS software installation, you must choose between Basic or Sun Enterprise Authentication Mechanism (SEAM) security. Basic security uses a local security file in the SunVTS installation directory to limit the users, groups, and hosts permitted to use SunVTS software. SEAM security is based on the standard network authentication protocol Kerberos and provides secure user authentication, data integrity and privacy for transactions over networks.

If your site uses SEAM security, you must have the SEAM client and server software installed in your networked environment and configured properly in both Solaris and SunVTS software. If your site does not use SEAM security, do not choose the SEAM option during SunVTS software installation.

If you enable the wrong security scheme during installation, or if you improperly configure the security scheme you choose, you may find yourself unable to run SunVTS tests. For more information, see the *SunVTS User's Guide* and the instructions accompanying the SEAM software.

Using SunVTS

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

- command line interface
- serial (tty) interface

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

TABLE 5-1 SunVTS Tests

SunVTS Test	Description
cputest	Tests the CPU
disktest	Tests the local disk drives
dvdtest	Tests the DVD-ROM drive
fputest	Tests the floating-point unit
nettest	Tests the Ethernet hardware on the system board and the networking hardware on any optional PCI cards
netlbtest	Performs a loopback test to check that the Ethernet adapter can send and receive packets
pmem	Tests the physical memory (read only)
sutest	Tests the server's on-board serial ports
vmem	Tests the virtual memory (a combination of the swap partition and the physical memory)

TABLE 5-1 SunVTS Tests

SunVTS Test	Description
env6test	Tests the environmental devices
sshtest	Tests ALOM hardware devices
i2c2test	Tests I2C devices for correct operation

▼ To Find Out Whether SunVTS Is Installed

- **Type:**

```
# pkginfo -l SUNWvts
```

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

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

```
ERROR: information for “SUNWvts” was not found
```

Installing SunVTS

By default, SunVTS is not installed on the Sun Fire V210 and V240 servers. However, it is available on the software supplement CD supplied with Solaris. For information about downloading it from this CD, refer to the *Sun Hardware Platform Guide* for the release of Solaris you are using.

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

Viewing SunVTS Documentation

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

For further information, you can also consult the following SunVTS documents:

- *SunVTS User’s Guide* describes how to install, configure, and run the SunVTS diagnostic software.

- *SunVTS Quick Reference Card* provides an overview of how to use the SunVTS CDE interface.
- *SunVTS Test Reference Manual* provides details about each individual SunVTS test.

CHAPTER 6

Diagnostics

This chapter describes the diagnostics tools available to the Sun Fire V210 and V240 servers. The chapter contains the sections:

- "Overview Of Diagnostic Tools" on page 54
- "Sun™ Advanced Lights-Out Manager" on page 55
- "Status Indicators" on page 56
- "POST Diagnostics" on page 56
- "OpenBoot Diagnostics" on page 59
- "OpenBoot Commands" on page 63
- "Operating Environment Diagnostic Tools" on page 67
- "Recent Diagnostic Test Results" on page 76
- "OpenBoot Configuration Variables" on page 76
- "Additional Diagnostic Tests for Specific Devices" on page 78
- "Automatic Server Restart" on page 80
- "Automatic System Recovery (ASR)" on page 81

Overview Of Diagnostic Tools

Sun provides a range of diagnostic tools for use with the Sun Fire V210 and V240 server.

Diagnostic tools are summarized in TABLE 6-1.

TABLE 6-1 Summary of Diagnostic Tools

Diagnostic Tool	Type	What It Does	Accessibility and Availability	Remote Capability
ALOM	Hardware and Software	Monitors environmental conditions, performs basic fault isolation, and provides remote console access	Can function on standby power and without operating system	Designed for remote access
LEDs	Hardware	Indicate status of overall system and particular components	Accessed from system chassis. Available anytime power is available	Local, but can be viewed via ALOM
POST	Firmware	Tests core components of system	Runs automatically on startup. Available when the operating system is not running	Local, but can be viewed via ALOM
OpenBoot Diagnostics	Firmware	Tests system components, focusing on peripherals and I/O devices	Runs automatically or interactively. Available when the operating system is not running	Local, but can be viewed via ALOM
OpenBoot commands	Firmware	Display various kinds of system information	Available when the operating system is not running	Local, but can be accessed via ALOM
Solaris commands	Software	Display various kinds of system information	Requires operating system	Local, but can be accessed via ALOM

TABLE 6-1 Summary of Diagnostic Tools *(Continued)*

Diagnostic Tool	Type	What It Does	Accessibility and Availability	Remote Capability
SunVTS	Software	Exercises and stresses the system, running tests in parallel	Requires operating system. Optional package may need to be installed	View and control over network
Sun Management Center	Software	Monitors both hardware environmental conditions and software performance of multiple machines. Generates alerts for various conditions	Requires operating system to be running on both monitored and master servers. Requires a dedicated database on the master server	Designed for remote access
Hardware Diagnostic Suite	Software	Exercises an operational system by running sequential tests. Also reports failed FRUs	Separately purchased optional add-on to Sun Management Center. Requires operating system and Sun Management Center	Designed for remote access

Sun™ Advanced Lights-Out Manager

Both the Sun Fire V210 server and the Sun Fire V240 server are shipped with Sun™ Advanced Lights Out Manager (ALOM) pre-installed.

ALOM enables you to monitor and control your server over either a serial connection (using the SERIAL MGT port), or Ethernet connection (using the NET MGT port).

ALOM can send email notification of hardware failures or other server events.

The ALOM circuitry uses standby power from the server. This means that:

- ALOM is active as soon as the server is connected to a power source, and until power is removed by unplugging the power cable.
- ALOM continues to be effective when the server operating system goes offline.

See TABLE 6-2 for a list of the components monitered by ALOM and the information it provides for each.

TABLE 6-2 What ALOM Monitors

Item Monitored	What ALOM Reveals
Hard disk drives	Presence and status
System and CPU fans	Speed and status
CPUs	Presence, temperature and any thermal warning or failure conditions
Power supplies	Presence and status
System temperature	Ambient temperature and any thermal warning or failure conditions
Server front panel	Keyswitch position and LED status
Voltages	Status and thresholds
SCSI and USB circuit breakers	

For more information, see the *ALOM Online Help* which is included on the *Sun Fire V210 and V240 Server Documentation CD.*

Status Indicators

For a summary of the server's LED status indicators , see "Server Status Indicators" on page 5.

POST Diagnostics

POST is a firmware program that is useful in determining if a portion of the system has failed. POST verifies the core functionality of the system, including the CPU module(s), motherboard, memory, and some on-board I/O devices, and generates messages that can be useful in determining the nature of a hardware failure. POST can be run even if the system is unable to boot.

POST detects most system faults and is located in the motherboard OpenBoot™ PROM. POST can be set to run by the OpenBoot program at power up by setting two environment variables, the `diag-switch?` and the `diag-level` flag, which are stored on the system configuration card.

POST runs automatically when the system power is applied, or following an automatic system reset, if all of the following conditions apply:

- `diag-switch?` is set to `true` (default is `false`)
- `diag-level` is set to `min`, `max` or `menus` (default is `min`)
- `post-trigger` matches the class of reset (default is `power-on-reset`)

If `diag-level` is set to `min` or `max`, POST performs an abbreviated or extended test, respectively.

If `diag-level` is set to `menus`, a menu of all the tests executed at power up is displayed.

POST diagnostic and error message reports are displayed on a console.

▼ To Start POST Diagnostics

1. **Go to the `OK` prompt.**
2. **Type**:

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

3. **Type**:

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

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

4. **Type**:

```
ok reset-all
```

The system runs POST diagnostics if `post-trigger` is set to *user-reset*. Status and error messages are displayed in the console window. If POST detects an error, it displays an error message describing the failure.

5. **When you have finished running POST, restore the value of** `diag-switch?` **to** `false` **by typing:**

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

Resetting `diag-switch?` to `false` minimizes boot time.

Controlling POST Diagnostics

You control POST diagnostics (and other aspects of the boot process) by setting OpenBoot configuration variables. Changes to OpenBoot configuration variables generally take effect only after the machine is restarted. TABLE 6-3 lists the most important and useful of these variables. You can find instructions for changing OpenBoot configuration variables in "To View And Set OpenBoot Configuration Variables" on page 77.

TABLE 6-3 OpenBoot Configuration Variables

OpenBoot Configuration Variable	Description and Keywords
`auto-boot`	Determines whether the operating system automatically starts up. Default is `true`. • `true`—Operating system automatically starts once firmware tests finish. • `false`—System remains at `ok` prompt until you type `boot`.
`diag-level`	Determines the level or type of diagnostics executed. Default is `min`. • `off`—No testing. • `min`—Only basic tests are run. • `max`—More extensive tests may be run, depending on the device.
`diag-script`	Determines which devices are tested by OpenBoot Diagnostics. Default is `none`. • none—No devices are tested. • `normal`—On-board (centerplane-based) devices that have self-tests are tested. • `all`—All devices that have self-tests are tested.
`diag-switch?`	Toggles the system in and out of diagnostic mode. Default is `false`. • `true`—Diagnostic mode: POST diagnostics and OpenBoot Diagnostics tests may run. • `false`—Default mode: Do not run POST or OpenBoot Diagnostics tests.

TABLE 6-3 OpenBoot Configuration Variables *(Continued)*

OpenBoot Configuration Variable	Description and Keywords
`post-trigger`	Specifies the class of reset event that causes power-on self-tests (or OpenBoot Diagnostics tests) to run. These variables can accept single keywords as well as combinations of the first three keywords separated by spaces. For details, see "To View And Set OpenBoot Configuration Variables" on page 77.
`obdiag-trigger`	• `error-reset`—A reset caused by certain non-recoverable hardware error conditions. In general, an error reset occurs when a hardware problem corrupts system state data and the machine becomes "confused." Examples include CPU and system watchdog resets, fatal errors, and certain CPU reset events (default). • `power-on-reset`—A reset caused by pressing the Power button (default). • `user-reset`—A reset initiated by the user or the operating system. • `all-resets`—Any kind of system reset. • `none`—No power-on self-tests (or OpenBoot Diagnostics tests) run.
`input-device`	Selects where console input is taken from. Default is `ttya`. • `ttya`—From built-in SERIAL MGT port. • `ttyb`—From built-in general purpose serial port (10101) • `keyboard`—From attached keyboard that is part of a graphics terminal.
`output-device`	Selects where diagnostic and other console output is displayed. Default is `ttya`. • `ttya`—To built-in SERIAL MGT port. • `ttyb`—To built-in general purpose serial port (10101) • `screen`—To attached screen that is part of a graphics terminal.[1]

1 – POST messages cannot be displayed on a graphics terminal. They are sent to `ttya` even when `output-device` is set to `screen`.

Note – These variables affect OpenBoot Diagnostics tests as well as POST diagnostics.

Once POST diagnostics have finished running, POST reports back to the OpenBoot firmware the status of each test it has run. Control then reverts back to the OpenBoot firmware code.

If POST diagnostics do not uncover a fault, and your server still does not start up, run OpenBoot Diagnostics tests.

OpenBoot Diagnostics

Like POST diagnostics, OpenBoot Diagnostics code is firmware-based and resides in the Boot PROM.

▼ To Start OpenBoot Diagnostics

1. **Type:**

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

2. **Type:**

```
ok obdiag
```

This command displays the OpenBoot Diagnostics menu. See TABLE 6-4.

TABLE 6-4 Sample `obdiag` Menu

obdiag		
1 i2c@0,320 4 network@2,1 7 scsi@2,1 10 usb@a	2 ide@d 5 rtc@0,70 8 serial@0,2e8 11 usb@b	3 network@2 6 scsi@2 9 serial@0,3f8 12 flashprom@2,0
Commands: test test-all except help what setenv versions printenvs exit		

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

---

3. **Type:**

```
obdiag> test n
```

Where *n* represents the number corresponding to the test you want to run.

A summary of the tests is available. At the `obdiag>` prompt, type:

```
obdiag> help
```

Controlling OpenBoot Diagnostics Tests

Most of the OpenBoot configuration variables you use to control POST (see TABLE 6-3 on page 58) also affect OpenBoot Diagnostics tests.

- Use the `diag-level` variable to control the OpenBoot Diagnostics testing level.
- Use `test-args` to customize how the tests run.

  By default, `test-args` is set to contain an empty string. You can modify `test-args` using one or more of the reserved keywords shown in TABLE 6-5.

TABLE 6-5 Keywords for the `test-args` OpenBoot Configuration Variable

Keyword	What It Does
`bist`	Invokes built-in self-test (BIST) on external and peripheral devices
`debug`	Displays all debug messages
`iopath`	Verifies bus / interconnect integrity
`loopback`	Exercises external loopback path for the device
`media`	Verifies external and peripheral device media accessibility
`restore`	Attempts to restore original state of the device if the previous execution of the test failed
`silent`	Displays only errors rather than the status of each test
`subtests`	Displays main test and each subtest that is called
`verbose`	Displays detailed messages of status of all tests
`callers=`*N*	Displays backtrace of *N* callers when an error occurs • `callers=0` - displays backtrace of all callers before the error
`errors=`*N*	Continues executing the test until *N* errors are encountered • `errors=0` - displays all error reports without terminating testing

If you want to make multiple customizations to the OpenBoot Diagnostics testing, you can set `test-args` to a comma-separated list of keywords, as in this example:

```
ok setenv test-args debug,loopback,media
```

The `test` and `test-all` Commands

You can also run OpenBoot Diagnostics tests directly from the `ok` prompt. To do this, type the `test` command, followed by the full hardware path of the device (or set of devices) to be tested. For example:

```
ok test /pci@x,y/SUNW,qlc@2
```

Note – Knowing how to construct an appropriate hardware device path requires precise knowledge of the hardware architecture of the Sun Fire V210 and V240 system.

To customize an individual test, you can use `test-args` as follows:

```
ok test /usb@1,3:test-args={verbose,debug}
```

This affects only the current test without changing the value of the `test-args` OpenBoot configuration variable.

You can test all the devices in the device tree with the `test-all` command:

```
ok test-all
```

If you specify a path argument to `test-all`, then only the specified device and its children are tested. The following example shows the command to test the USB bus and all devices with self-tests that are connected to the USB bus:

```
ok test-all /pci@9,700000/usb@1,3
```

What OpenBoot Diagnostics Error Messages Tell You

OpenBoot Diagnostics error results are reported in a tabular format that contains a short summary of the problem, the hardware device affected, the subtest that failed, and other diagnostic information. CODE EXAMPLE 6-1 displays a sample OpenBoot Diagnostics error message.

```
Testing /pci@1e,600000/isa@7/flashprom@2,0

    ERROR   : There is no POST in this FLASHPROM or POST header is
unrecognized
    DEVICE  : /pci@1e,600000/isa@7/flashprom@2,0
    SUBTEST : selftest:crc-subtest
    MACHINE : Sun Fire V210
    SERIAL# : 51347798
    DATE    : 03/05/2003 15:17:31  GMT
    CONTR0LS: diag-level=max test-args=errors=1

Error: /pci@1e,600000/isa@7/flashprom@2,0 selftest failed, return code = 1
Selftest at /pci@1e,600000/isa@7/flashprom@2,0 (errors=1) .............
failed
Pass:1 (of 1) Errors:1 (of 1) Tests Failed:1 Elapsed Time: 0:0:0:1
```

CODE EXAMPLE 6-1 OpenBoot Diagnostics Error Message

OpenBoot Commands

OpenBoot commands are commands you type from the `ok` prompt. OpenBoot commands which can provide useful diagnostic information are:

- `probe-scsi` and `probe-scsi-all`
- `probe-ide`
- `show-devs`

`probe-scsi` and `probe-scsi-all`

The `probe-scsi` and `probe-scsi-all` commands diagnose problems with the SCSI devices.



Caution – If you used the `halt` command or the Stop-A key sequence to reach the `ok` prompt, then issuing the `probe-scsi` or `probe-scsi-all` command can hang the system.

The `probe-scsi` command communicates with all SCSI devices connected to on-board SCSI controllers. The `probe-scsi-all` command additionally accesses devices connected to any host adapters installed in PCI slots.

For any SCSI device that is connected and active, the `probe-scsi` and `probe-scsi-all` commands display its loop ID, host adapter, logical unit number, unique World Wide Name (WWN), and a device description that includes type and manufacturer.

The following is sample output from the `probe-scsi` command.

```
{1} ok probe-scsi
Target 0
  Unit 0   Disk     SEAGATE ST336605LSUN36G 0238
Target 1
  Unit 0   Disk     SEAGATE ST336605LSUN36G 0238
Target 2
  Unit 0   Disk     SEAGATE ST336605LSUN36G 0238
Target 3
  Unit 0   Disk     SEAGATE ST336605LSUN36G 0238
```

CODE EXAMPLE 6-2 `sample probe-scsi` Command Output

The following is sample output from the `probe-scsi-all` command.

```
{1} ok probe-scsi-all
/pci@1c,600000/scsi@2,1
Target 4
  Unit 0   Removable Read Only device    TOSHIBA
XM6201TASUN32XCD1103

/pci@1c,600000/scsi@2
Target 0
  Unit 0   Disk     SEAGATE ST336605LSUN36G 0238
Target 1
  Unit 0   Disk     SEAGATE ST336605LSUN36G 0238
Target 2
  Unit 0   Disk     SEAGATE ST336605LSUN36G 0238
Target 3
  Unit 0   Disk     SEAGATE ST336605LSUN36G 0238
```

CODE EXAMPLE 6-3 sample `probe-scsi-all` Command Output

probe-ide

The `probe-ide` command communicates with all Integrated Drive Electronics (IDE) devices connected to the IDE bus. This is the internal system bus for media devices such as the DVD drive.



Caution – If you used the `halt` command or the Stop-A key sequence to reach the `ok` prompt, then issuing the `probe-ide` command can hang the system.

The following is sample output from the `probe-ide` command.

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

  Device 1  ( Primary Slave )
         Not Present

  Device 2  ( Secondary Master )
         Not Present

  Device 3  ( Secondary Slave )
         Not Present
```

CODE EXAMPLE 6-4 sample `probe-ide` Command Output

show-devs *Command*

The show-devs command lists the hardware device paths for each device in the firmware device tree. CODE EXAMPLE 6-5 shows some sample output.

```
/pci@1d,700000
/pci@1c,600000
/pci@1e,600000
/pci@1f,700000
/memory-controller@1,0
/SUNW,UltraSPARC-IIIi@1,0
/memory-controller@0,0
/SUNW,UltraSPARC-IIIi@0,0
/virtual-memory
/memory@m0,0
/aliases
/options
/openprom
/chosen
/packages@0,320//packages/terminal-emulator
/packages/disk-label
/packages/deblocker
/packages/SUNW,builtin-drivers ...
```

CODE EXAMPLE 6-5 show-devs Command Output (truncated)

▼ To Run OpenBoot Commands

1. **Halt the system to reach the** ok **prompt.**

   How you do this depends on the system's condition. If possible, you should warn users before you shut the system down.

2. **Type the appropriate command at the console prompt.**

Operating Environment Diagnostic Tools

If a system passes OpenBoot Diagnostics tests, it normally attempts to boot its multiuser operating environment. For most Sun systems, this means the Solaris operating environment. Once the server is running in multiuser mode, you have access to the software-based diagnostic tools, SunVTS and Sun Management Center. These tools allow you to monitor the server, exercise it, and isolate faults.

Note – If you set the `auto-boot` OpenBoot configuration variable to `false`, the operating system does *not* boot following completion of the firmware-based tests.

In addition to the tools mentioned above, you can refer to error and system message log files, and Solaris system information commands.

Error and System Message Log Files

Error and other system messages are saved in the `/var/adm/messages` file. Messages are logged to this file from many sources, including the operating system, the environmental control subsystem, and various software applications.

Solaris System Information Commands

The following Solaris commands display data that you can use when assessing the condition of a Sun Fire V210 and V240 server:

- `prtconf`
- `prtdiag`
- `prtfru`
- `psrinfo`
- `showrev`

This section describes the information these commands give you. More information on using these commands is contained in the appropriate man page.

prtconf

The `prtconf` command displays the Solaris device tree. This tree includes all the devices probed by OpenBoot firmware, as well as additional devices, like individual disks, that only the operating environment software "knows" about. The output of `prtconf` also includes the total amount of system memory. CODE EXAMPLE 6-6 shows an excerpt of `prtconf` output (truncated to save space).

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

SUNW,Sun-Fire-V240
    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)
        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
    SUNW,UltraSPARC-IIIi (driver not attached)
    memory-controller, instance #1 ...
```

CODE EXAMPLE 6-6 `prtconf` Command Output (truncated)

The `prtconf` command's `-p` option produces output similar to the OpenBoot `show-devs` command. This output lists only those devices compiled by the system firmware.

prtdiag

The `prtdiag` command displays a table of diagnostic information that summarizes the status of system components.

The display format used by the `prtdiag` command can vary depending on what version of the Solaris operating environment is running on your system. Following is an excerpt of some of the output produced by `prtdiag` on a healthy Sun Fire

V240 server running Solaris 8, PSR1.

```
# prtdiag
System Configuration: Sun Microsystems  sun4u Sun Fire V240
System clock frequency: 160 MHZ
Memory size: 1GB

================================== CPUs ==================================
                     E$          CPU     CPU       Temperature         Fan
       CPU  Freq     Size        Impl.   Mask     Die    Ambient   Speed   Unit
       ---  --------  ----------  ------  ----  --------  --------  -----   ----
     MB/P0   960 MHz  1MB         US-IIIi   2.0     -      -
     MB/P1   960 MHz  1MB         US-IIIi   2.0     -      -

================================ IO Devices ================================
     Bus   Freq
Brd  Type  MHz   Slot        Name                          Model
---  ----  ----  ----------  ----------------------------  --------------------
 0   pci    66            2  network-SUNW,bge (network)
 0   pci    66            2  scsi-pci1000,21.1 (scsi-2)
 0   pci    66            2  scsi-pci1000,21.1 (scsi-2)
 0   pci    66            2  network-SUNW,bge (network)
 0   pci    33            7  isa/serial-su16550 (serial)
 0   pci    33            7  isa/serial-su16550 (serial)
 0   pci    33            7  isa/rmc-comm-rmc_comm (seria+
 0   pci    33           13  ide-pci10b9,5229.c4 (ide)

========================== Memory Configuration ==========================
Segment Table:
------------------------------------------------------------------------
Base Address       Size       Interleave Factor  Contains
------------------------------------------------------------------------
0x0                512MB             1           GroupID 0
0x1000000000       512MB             1           GroupID 0

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

Memory Module Groups:
------------------------------------------------
ControllerID   GroupID  Labels
------------------------------------------------
1              0        MB/P1/B0/D0,MB/P1/B0/D1
```

CODE EXAMPLE 6-7 `prtdiag` Command Output

In addition to the information in CODE EXAMPLE 6-7, `prtdiag` with the verbose option (`-v`) also reports on front panel status, disk status, fan status, power supplies, hardware revisions, and system temperatures.

```
System Temperatures (Celsius):
------------------------------
Device     Temperature        Status
---------------------------------------
CPU0             59             OK
CPU2             64             OK
DBP0             22             OK
```

CODE EXAMPLE 6-8 `prtdiag` Verbose Output

In the event of an overtemperature condition, `prtdiag` reports an error in the Status column.

```
System Temperatures (Celsius):
------------------------------
Device     Temperature        Status
---------------------------------------
CPU0       62                 OK
CPU1       102                ERROR
```

CODE EXAMPLE 6-9 `prtdiag` Overtemperature Indication Output

Similarly, if there is a failure of a particular component, `prtdiag` reports a fault in the appropriate Status column.

```
Fan Status:
-----------

Bank             RPM    Status
----            -----   ------
CPU0             4166   [NO_FAULT]
CPU1             0000   [FAULT]
```

CODE EXAMPLE 6-10 `prtdiag` Fault Indication Output

prtfru

The Sun Fire V210 and V240 system maintains a hierarchical list of all FRUs in the system, as well as specific information about various FRUs.

The `prtfru` command can display this hierarchical list, as well as data contained in the serial electrically-erasable programmable read-only memory (SEEPROM) devices located on many FRUs. CODE EXAMPLE 6-11 shows an excerpt of a hierarchical list of FRUs generated by the `prtfru` command with the `-l` option.

```
# prtfru -l
/frutree
/frutree/chassis (fru)
/frutree/chassis/MB?Label=MB
/frutree/chassis/MB?Label=MB/system-board (container)
/frutree/chassis/MB?Label=MB/system-board/SC?Label=SC
/frutree/chassis/MB?Label=MB/system-board/SC?Label=SC/sc (fru)
/frutree/chassis/MB?Label=MB/system-board/BAT?Label=BAT
/frutree/chassis/MB?Label=MB/system-board/BAT?Label=BAT/battery
(fru)
/frutree/chassis/MB?Label=MB/system-board/P0?Label=P0
/frutree/chassis/MB?Label=MB/system-board/P0?Label=P0/cpu (fru)
/frutree/chassis/MB?Label=MB/system-board/P0?Label=
P0/cpu/F0?Label=F0
```

CODE EXAMPLE 6-11 `prtfru -l` Command Output (truncated)

CODE EXAMPLE 6-12 shows an excerpt of SEEPROM data generated by the `prtfru` command with the `-c` option.

```
# prtfru -c
/frutree/chassis/MB?Label=MB/system-board (container)
   SEGMENT: SD
      /SpecPartNo: 885-0092-02
      /ManR
     /ManR/UNIX_Timestamp32: Wednesday April 10 11:34:49 BST 2002
      /ManR/Fru_Description: FRUID,INSTR,M'BD,0CPU,0MB,ENXU
      /ManR/Manufacture_Loc: HsinChu, Taiwan
      /ManR/Sun_Part_No: 3753107
      /ManR/Sun_Serial_No: abcdef
      /ManR/Vendor_Name: Mitac International
      /ManR/Initial_HW_Dash_Level: 02
      /ManR/Initial_HW_Rev_Level: 01
```

CODE EXAMPLE 6-12 `prtfru -c` Command Output

Data displayed by the prtfru command varies depending on the type of FRU. In general, it includes:

- FRU description
- Manufacturer name and location
- Part number and serial number
- Hardware revision levels

psrinfo

The psrinfo command displays the date and time each CPU came online. With the verbose (-v) option, the command displays additional information about the CPUs, including their clock speed. The following is sample output from the psrinfo command with the -v option.

```
# psrinfo -v
Status of processor 0 as of: 09/20/02 11:35:49
  Processor has been on-line since 09/20/02 11:30:53.
  The sparcv9 processor operates at 960 MHz,
        and has a sparcv9 floating point processor.
Status of processor 1 as of: 09/20/02 11:35:49
  Processor has been on-line since 09/20/02 11:30:52.
  The sparcv9 processor operates at 960 MHz,
        and has a sparcv9 floating point processor.
```

CODE EXAMPLE 6-13 psrinfo -v Command Output

showrev

The showrev command displays revision information for the current hardware and software. CODE EXAMPLE 6-14 shows sample output of the showrev command.

```
# showrev
Hostname: griffith
Hostid: 830f8192
Release: 5.8
Kernel architecture: sun4u
Application architecture: sparc
Hardware provider: Sun_Microsystems
Domain:
Kernel version: SunOS 5.8 Generic 108528-16 August 2002
```

CODE EXAMPLE 6-14 showrev Command Output

When used with the `-p` option, this command displays installed patches. CODE EXAMPLE 6-15 shows a partial sample output from the `showrev` command with the `-p` option.

```
Patch: 109729-01 Obsoletes:  Requires:  Incompatibles:  Packages: SUNWcsu
Patch: 109783-01 Obsoletes:  Requires:  Incompatibles:  Packages: SUNWcsu
Patch: 109807-01 Obsoletes:  Requires:  Incompatibles:  Packages: SUNWcsu
Patch: 109809-01 Obsoletes:  Requires:  Incompatibles:  Packages: SUNWcsu
Patch: 110905-01 Obsoletes:  Requires:  Incompatibles:  Packages: SUNWcsu
Patch: 110910-01 Obsoletes:  Requires:  Incompatibles:  Packages: SUNWcsu
Patch: 110914-01 Obsoletes:  Requires:  Incompatibles:  Packages: SUNWcsu
Patch: 108964-04 Obsoletes:  Requires:  Incompatibles:  Packages: SUNWcsr
```

CODE EXAMPLE 6-15 `showrev -p` Command Output

▼ To Run Solaris System Information Commands

1. **Decide what kind of system information you want to display.**

   For more information, see “Solaris System Information Commands” on page 67.

2. **Type the appropriate command at a console prompt.**

   See TABLE 6-6 for a summary of the commands.

TABLE 6-6 Using Solaris Information Display Commands

Command	What It Displays	What to Type	Notes
`prtconf`	System configuration information	`/usr/sbin/prtconf`	—
`prtdiag`	Diagnostic and configuration information	`/usr/platform/sun4u/sbin/prtdiag`	Use the `-v` option for additional detail.
`prtfru`	FRU hierarchy and SEEPROM memory contents	`/usr/sbin/prtfru`	Use the `-l` option to display hierarchy. Use the `-c` option to display SEEPROM data.
`psrinfo`	Date and time each CPU came online; processor clock speed	`/usr/sbin/psrinfo`	Use the `-v` option to obtain clock speed and other data.
`showrev`	Hardware and software revision information	`/usr/bin/showrev`	Use the `-p` option to show software patches.

Recent Diagnostic Test Results

Summaries of the results from the most recent power-on self-test (POST) and OpenBoot Diagnostics tests are saved across power cycles.

▼ To View Recent Test Results

1. **Go to the** ok **prompt.**
2. **Do either of the following:**

- **To see a summary of the most recent POST results, type:**

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

- **To see a summary of the most recent OpenBoot Diagnostics test results, type:**

```
ok show-obdiag-results
```

This produces a system-dependent list of hardware components, along with an indication of which components passed and which failed POST or OpenBoot Diagnostics tests.

OpenBoot Configuration Variables

Switches and diagnostic configuration variables stored in the IDPROM determine how and when power-on self-test (POST) diagnostics and OpenBoot Diagnostics tests are performed. This section explains how to access and modify OpenBoot configuration variables. For a list of important OpenBoot configuration variables, see TABLE 6-3.

Changes to OpenBoot configuration variables usually take effect upon the next reboot.

▼ To View And Set OpenBoot Configuration Variables

1. **Halt the server to reach the** `ok` **prompt.**

- **To display the current values of all OpenBoot configuration variables, use the** `printenv` **command.**

  The following example shows a short excerpt of this command's output.

```
ok printenv
Variable Name         Value                          Default Value

diag-level            min                             min
diag-switch?          false                           false
```

- **To set or change the value of an OpenBoot configuration variable, use the** `setenv` **command:**

```
ok setenv diag-level max
diag-level =         max
```

- **To set OpenBoot configuration variables that accept multiple keywords, separate keywords with a space.**

Additional Diagnostic Tests for Specific Devices

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

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

FIGURE 6-1 `probe-scsi` Output Message

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

The `probe-scsi-all` command transmits an inquiry to all SCSI devices connected to both the system's internal and its external SCSI interfaces. FIGURE 6-2 shows sample output from a server with no externally connected SCSI devices but containing two 36 GB Hard Disk Drives, both of them active.

FIGURE 6-2 `probe-scsi-all` Output Message

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

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

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

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

FIGURE 6-3 probe-ide Output Message

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

 Device 1  ( Primary Slave )
       Not Present

 Device 2  ( Secondary Master )
       Not Present

 Device 3  ( Secondary Slave )
       Not Present
```

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

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

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

FIGURE 6-4 `watch-net` Diagnostic Output Message

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

FIGURE 6-5 `watch-net-all` Diagnostic Output Message

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

Automatic Server Restart

Note – Automatic Server Restart is not the same as Automatic System Recovery (ASR), which the Sun Fire V210 and V240 servers also support.

Automatic Server Restart is a component of ALOM. It monitors the Solaris operating environment while it is running and, by default, syncs the filesystems and restarts the server if it hangs.

ALOM uses a watchdog process to monitor the kernel *only*. ALOM will not restart the server if a process hangs and the kernel is still running. The ALOM watchdog parameters for the watchdog patting interval and watchdog timeout are not user configurable.

If the kernel hangs and the watchdog times out, ALOM reports and logs the event and performs one of three user configurable actions.

- xir: this is the default action and will cause the server to sync the filesystems and restart. In the event of the sync hanging, ALOM will fallback to a hard reset after 15 minutes.
- Reset: this is a hard reset and results in a rapid system recovery but diagnostic data regarding the hang is not stored, and filesystem damage may result.
- None - this will result in the system being left in the hung state indefinitely after the watchdog timeout has been reported.

For more information, see the `sys_autorestart` section of the *ALOM Online Help* that is contained on the *Sun Fire V210 and V240 Server Documentation CD*.

Automatic System Recovery (ASR)

Note – Automatic System Recovery (ASR) is not the same as Automatic Server Restart, which the Sun Fire V210 and V240 servers also support.

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

If a component is one that is monitored by ASR, and the server is capable of operating without it, the server will automatically reboot if that component should develop a fault or fail.

ASR monitors the following components:

- Memory modules

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.

If a fault occurs on a running server, and it is possible for the server to run without the failed component, the server automatically reboots. This prevents a faulty hardware component from keeping the entire system down or causing the system to crash repeatedly.

To support such a degraded boot capability, the OpenBoot firmware uses the 1275 Client Interface (via 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 environment will not activate a driver for any subsystem so marked.

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

Note – ASR is not enabled until you activate it.

Auto-Boot 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 will attempt a degraded boot when a subsystem failure is detected. Both the `auto-boot?` and `auto-boot-on-error?` settings must be set to `true` to enable an automatic degraded boot.

- **To set the switches, type:**

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

Note – The default setting for `auto-boot-on-error?` is `false`. Therefore, the system will not attempt a degraded boot unless you change this setting to `true`. In addition, the system will 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 82.

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 non-fatal 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 non-fatal 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 will not boot regardless of the settings of `auto-boot?` or `auto-boot-on-error?`. Fatal non-recoverable 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

Reset Scenarios

Three OpenBoot configuration variables, `diag-switch?`, `obdiag-trigger`, and `post-trigger`, control how the system runs firmware diagnostics in response to system reset events.

The standard system reset protocol bypasses POST and OpenBoot Diagnostics unless `diag-switch?` is set to `true`. The default setting for this variable is `false`. Because ASR relies on firmware diagnostics to detect faulty devices, `diag-switch?` must be set to `true` for ASR to run. For instructions, see "To Enable ASR" on page 83.

To control which reset events, if any, automatically initiate firmware diagnostics, use `obdiag-trigger` and `post-trigger`. For detailed explanations of these variables and their uses, see "Controlling POST Diagnostics" on page 58 and "Controlling OpenBoot Diagnostics Tests" on page 61.

▼ To Enable ASR

1. **At the system `ok` prompt, type:**

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

2. **Set the** `obdiag-trigger` **variable to** `power-on-reset`**,** `error-reset`**, or** `user-reset`**. For example, type:**

```
ok setenv obdiag-trigger user-reset
```

3. **Type:**

```
ok reset-all
```

The system permanently stores the parameter changes and boots automatically if the OpenBoot variable `auto-boot?` is set to `true` (its default value).

Note – To store parameter changes, you can also power cycle the system using the front panel Power button.

▼ To Disable ASR

1. **At the system** `ok` **prompt, type:**

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

2. **Type:**

```
ok reset-all
```

The system permanently stores the parameter change.

Note – To store parameter changes, you can also power cycle the system using the front panel Power button.

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