Sun Fire™ 6800/4810/4800/3800 Systems Platform Administration Manual

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Preface

This book presents a step-by-step description of how to power on the system, customize the platform setup, and how to set up and manage domains. It explains how to create partitions and domains and how to power on and power off domains. It describes additional domain procedures, such as accessing the domain console.

This book also provides information on system controller security, explains how to perform firmware updates, and remove and replace boards and devices. Last, this book provides troubleshooting tips and a glossary of technical terms.

How This Book Is Organized

Chapter 1 describes domains and the system controller. It provides an overview of partitions and domains, redundant system components, and minimum system configurations. This chapter also provides an overview of reliability, serviceability, and availability.

Chapter 2 explains how to navigate between the platform and domain shells, between the Solaris™ operating environment and the domain shell, or between the OpenBoot™ PROM and the domain shell. This chapter also explains how to terminate a system controller session.

Chapter 3 explains how to power on and set up the system for the first time.

Chapter 4 explains how to create and start multiple domain.

Chapter 5 describes procedures involving domains, such as: adding a board to a domain, deleting a board from a domain, shutting down a domain, and powering on a domain.

Chapter 6 presents information on security.

Chapter 7 explains how to power on and power off the system. It also presents information on firmware updates, including how to update the flash PROMs, and how to update the system controller firmware.

Chapter 8 describes how to use the testboard system controller command to test CPU/Memory boards.

Chapter 9 describes the software steps necessary to remove and install a power supply and fan tray. This chapter also explains software steps you must perform before you can remove a Repeater board.

Chapter 10 provides troubleshooting information about LEDs, system faults, the system controller loghost, and procedures such as displaying diagnostic information, displaying system configuration information, recovering from a hung domain, disabling components (blacklisting), and mapping device path names to physical system devices.

Using UNIX Commands

This book assumes you are experienced with the UNIX® Operating Environment. If you are not experienced with the UNIX Operating Environment, see one or more of the following for this information:

- AnswerBook2™ online documentation for the Solaris operating environment
- *Sun Hardware Platform Guide*, which is available both hard copy and online with your operating system release, describes Sun Fire-specific Solaris operating environment information.
- *Solaris Handbook for Sun Peripherals,* which is available online in the Solaris on Sun Hardware AnswerBook on the Supplement CD of the Solaris operating environment that supports these servers
- 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.
AaBbCc123	What you type, when contrasted with on-screen computer output	% **su** Password:
AaBbCc123	Book titles, new words or terms, words to be emphasized	Read Chapter 6 in the *User's Guide.* These are called *class* options. You *must* be superuser to do this.
	Command-line variable; replace with a real name or value	To delete a file, type rm *filename*.

Shell Prompts

Shell	Prompt
C shell	*machine_name*%
C shell superuser	*machine_name*#
Bourne shell and Korn shell	$
Bourne shell and Korn shell superuser	#
Platform shell	*schostname*:SC>
Platform console	*schostname*:SC>
Domain shell	*schostname*:A> or B>, C>, D>
Domain console	ok, login:, *machine_name*%, or *machine_name*#

Related Documentation

Type of Book	Title	Part Number
Service	*Sun Fire 6800/4810/4800/3800 Systems Service Manual*	805-7363
Service	*Sun Fire 4810/4800/3800 System Cabinet Mounting Guide*	806-6781
System Controller	*Sun Fire 6800/4810/4800/3800 System Controller Command Reference Manual*	805-7372
Solaris operating environment	*Sun Hardware Platform Guide*	Varies with release

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Overview

This chapter presents a software overview for the family of mid-range servers—the Sun Fire™ 6800/4810/4800/3800 systems. The objective of this chapter is to provide you with a basic understanding of the new system features.

This chapter is not meant to be a procedural overview of what you need to do in order to set up your system. That is covered in Chapter 3.

This chapter describes:

- "Partitions" on page 2
- "Domains" on page 3
- "System Controller" on page 4
- "Redundant Components and Minimum Configurations" on page 13
- "Reliability, Availability, and Serviceability (RAS)" on page 19
- "Sun Management Center Software for the Sun Fire 6800/4810/4800/3800 Systems Software" on page 22
- "FrameManager" on page 23

The system controller software uses the term *platform* to refer to where all of the shared resources are managed and provide a central monitoring point for the system. For example, the system controller `setupplatform` command is used to configure the platform. How to use the `setupplatform` command is explained in a step-by-step procedure in "Setting Up the Platform" on page 44.

A partition is a group of Repeater boards. Each partition can have up to two domains. Because domains in the same partition share Repeater boards, the domains are not completely isolated. You configure the number of partitions with the `setupplatform` command. For more information on partitions, see "Partitions" on page 2.

You can logically group system boards (CPU/Memory boards and I/O assemblies) into domains. A domain is an instance of the Solaris operating environment that is independent of other domains. For more information on domains, see "Domains" on page 3.

Information is *not* passed between the domain and the platform.

The system controller is an embedded system on a board that connects into the centerplane of these mid-range systems. It is the focal point for platform and domain configuration and management and is the gateway to the domain consoles. The system controller is comprised of hardware and software. The system controller command line interface lets you perform tasks needed to configure the platform, configure each domain, plus many other functions. For more information on the system controller hardware and software, see "System Controller" on page 4 and "System Controller Software" on page 6.

Partitions

A partition is a group of Repeater boards. Each partition can have up to two domains. Because domains in the same partition share Repeater boards, the domains are not completely isolated.

You configure the number of partitions with the `setupplatform` command.

- If the value is set to single, the system is set up with one partition. A single partition forms one large partition using all of the Repeater boards.
- If the value is set to dual, the system is set up with two partitions. In dual partition mode, two smaller partitions are created each using one-half of the total number of Repeater boards in the system.

The Sun Fire 6800 system has a set of two Repeater boards in each partition in dual partition mode. The Sun Fire 4810/4800/3800 systems have one Repeater board in each partition in dual partition mode. In all systems in single partition mode all Repeater boards are used in the partition. For more information on Repeater boards, see "Repeater Boards" on page 18. TABLE 1-1 lists the partition and domain requirements.

TABLE 1-1   Partition and Domain Requirements

	Sun Fire 6800 System	Sun Fire 4810/4800/3800 Systems
Number of Partitions[1]	Up to 2	Up to 2
Number of Active Domains in Dual Partition Mode	Up to 4 (A, B, C, D)	Up to 2 (A, C)
Number of Active Domains in Single Partition Mode	Up to 2 (A, B)	Up to 2 (A, B)

[1] The default is single partition mode. In all systems in single partition mode, all Repeater boards are used in the partition.

Domains

With this family of mid-range systems, you can group system boards (CPU/Memory boards and I/O assemblies) into domains. A domain is an instance of the Solaris operating environment that is independent of other domains.

Domains include the following features:

- Each domain is able to run the Solaris operating environment.
- Domains do not interact with each other.
- Each domain has its own peripheral and network connections.
- Each domain has its own unique host ID and Solaris operating environment hostname.

All systems are configured at the factory with one domain (domain A).

A domain can:

- Run the Solaris operating environment
- Be in the OpenBoot PROM
- Run POST

If you run more than one domain in a partition, then the domains are not completely isolated. A failed Repeater board could affect multiple domains. For more information, see "Partitions" on page 2 and "Repeater Boards" on page 18.

You create domains using either the system controller command line interface or the Sun Management Center software for the Sun Fire 6800/4810/4800/3800 systems. How to create domains using the system controller software is described in "Creating Domains" on page 61. For instructions on how to create domains using the Sun Management Center software for the Sun Fire 6800/4810/4800/3800 systems, refer to the *Sun Management Center 3.0 Software Supplement for Sun Fire 6800/4810/4800/3800 Systems*.

The largest domain configuration is comprised of all CPU/Memory boards and I/O assemblies in the system; the smallest domain configuration is comprised of one CPU/Memory board and one I/O assembly.

An active domain (with the keyswitch set to on, diag, or secure) must have:

- Minimum of one CPU/Memory board with memory
- Minimum of one I/O assembly with one I/O card installed
- Required number of Repeater boards
- Sufficient power (power supplies are not assigned to a domain)
- Sufficient cooling (not assigned to a domain)
- System controller (not assigned to a domain)

System Controller

The system controller is an embedded system on a board that connects into the centerplane of these mid-range systems. It is the focal point for platform and domain configuration and management and is the gateway to the domain consoles.

System controller functions include:

- Managing platform and domain resources
- Monitoring the platform and domains
- Configuring domains
- Providing domain consoles
- Providing the virtual TOD (time of day) to domains
- Providing the date and time to the Solaris operating environment
- Providing the clock signal used on all boards
- Providing console security
- Performing domain initialization
- Providing a command to upgrade firmware
- Performing environmental monitoring

The system can support up to two System Controller boards. The second system controller is used primarily for clock failover.

Serial and Ethernet Ports

There are two ports on the System Controller board:

- Serial (RS-232) port —Use the serial (RS-232) port to connect directly to an ASCII terminal or to a network terminal server (NTS).
- Ethernet (RJ-45) port—Use the Ethernet port to connect to the network.

TABLE 1-2 compares the features using the serial (RS-232) port and the Ethernet (RJ-45) port on the System Controller board. The Ethernet port provides the fastest connection.

TABLE 1-2   Comparison of Features Using the Serial Port and the Ethernet Port of the System Controller Board

Capability	Serial (RS-232) Port	Ethernet Port Connection
Number of connections	One connection.	Multiple connections for the platform (maximum of sixteen connections); one connection per domain.
System logs	Remains in the system controller message queue.	The system logs are also written to `syslog` host if the log host(s) is configured.
SNMP events	Not supported.	The SNMP events are sent to the SNMP trap hosts.
Firmware upgrades	Not supported.	Using the `flashupdate` command.
Security	Secure physical location plus secure terminal server.	Password-protected access only.
Sun Management Center software for the Sun Fire 6800/4810/4800/3800 systems	Not available.	Available.

TTYa and TTYb Connections

The Sun Fire 6800 system has a built-in connector with cables from the System Controller that connect to the serial port. Use the TTYa port for the console. Use the TTYb port to connect the FrameManager. With the Sun Fire 4810/4800/3800 systems, use a Y cable to provide TTYa and TTYb connections.

Connections for Each Domain and the Platform

The system controller allows multiple connections to the platform (maximum 16), but only one connection to each domain.

System Controller Software

This section provides information on the system controller software. Topics include:

Board States

The CPU/Memory board and I/O assembly report four different board states (TABLE 1-3). All boards in the system report one of the board states.

TABLE 1-3   Board States

Available	Assigned	Active	– *(dash)
The board is not assigned to any domain. Domains can see available boards if they have proper access rights.	The board is assigned to a domain but is not active because the hardware has not been configured to use it.	The board is being used in an active domain (the keyswitch is set to on, diag, or secure). A board is active as soon as the domain is powered on. You cannot reassign an active board.	Does not apply.

Use the showboards command to display the board states. The showboards –v command displays a listing of all devices in the platform if you type the command in the platform shell. If you type the showboards command in a domain shell, the showboards command displays a listing of devices in the domain.

Refer to the *Sun Fire 6800/4810/4800/3800 System Controller Command Reference Manual* for the command syntax and descriptions of all system controller commands. For a description of the other headers in the showboards command, including board status, refer to the showboards command in the *Sun Fire 6800/4810/4800/3800 System Controller Command Reference Manual*.

CODE EXAMPLE 1-1 provides a listing of CPU/Memory boards and I/O assemblies in the platform.

CODE EXAMPLE 1-1   showboards Command for the Platform Shell

```
schostname:SC> showboards

Slot      Pwr    Component Type   State    Status    Domain
----      ---    --------------   -----    ------    ------
/N0/SB0   On     CPU Board        Active   Passed    A
/N0/SB2   On     CPU Board        Active   Passed    C
/N0/SB4   On     CPU Board        Active   Passed    D
/N0/IB6   On     PCI I/O Board    Active   Passed    A
/N0/IB7   On     PCI I/O Board    Active   Passed    C
/N0/IB8   On     PCI I/O Board    Active   Passed    D
```

CODE EXAMPLE 1-2 shows a listing of the showboards -v command.

CODE EXAMPLE 1-2 `showboards -v` Command for the Platform Shell

```
schostname:SC> showboards -v

Slot     Grd Pwr  Component Type          State       Status   Domain
----     --- ---  --------------          -----       ------   ------
SSC0     -   On   System Controller       -           Passed   -
SSC1     -   On   System Controller       -           -        -
ID0      -   On   Sun Fire 6800 Centerplane-           -        -
PS0      0   On   A152 Power Supply       -           OK       -
PS1      0   On   A152 Power Supply       -           OK       -
PS2      0   On   A152 Power Supply       -           OK       -
PS3      1   On   A152 Power Supply       -           OK       -
PS4      1   On   A152 Power Supply       -           OK       -
PS5      1   On   A152 Power Supply       -           OK       -
FT0      0,1 On   Fan Tray                Low Speed   OK       -
FT1      0,1 On   Fan Tray                Low Speed   OK       -
FT2      0,1 On   Fan Tray                Low Speed   OK       -
FT3      0,1 On   Fan Tray                Low Speed   OK       -
RP0      0   On   Repeater Board          -           OK       -
RP1      0   On   Repeater Board          -           OK       -
RP2      1   On   Repeater Board          -           OK       -
RP3      1   On   Repeater Board          -           OK       -
/N0/SB0  0   On   CPU Board               Active      Passed   A
/N0/SB1  1   On   CPU Board               Active      Passed   A
/N0/SB2  0   On   CPU Board               Active      Passed   A
/N0/SB3  1   On   CPU Board               Active      Passed   B
/N0/SB4  0   On   CPU Board               Active      Passed   C
/N0/SB5  1   On   CPU Board               Active      Passed   D
/N0/IB6  0   On   PCI I/O Board           Active      Passed   A
/N0/IB7  1   On   PCI I/O Board           Active      Passed   B
/N0/IB8  0   On   PCI I/O Board           Active      Passed   C
/N0/IB9  1   On   PCI I/O Board           Active      Passed   D
```

Platform Administration

The platform administrator configures and manages the platform and the hardware components in the system. The platform administrator can manage hardware resources across domains, including:

- Configuring the platform (network, logs, and SNMP)
- Setting passwords with the system controller `password` command
- Monitoring and controlling power to the components within a platform
- Configuring the maximum number of domains a system can support
- Logically grouping hardware to create a domain with the system controller `addboard` and `deleteboard` commands (can also be performed in a domain shell)
- Configuring domain access control for CPU/Memory boards and I/O assemblies

Platform Shell

The platform shell is the operating environment for the platform administrator and is the shell where platform tasks can be performed. The platform shell does not provide console messages.

The prompt is *schostname*:`SC>`.

Platform Console

The platform console is the connection through the serial port. It provides error and informational messages. The platform console does not show the Solaris operating environment console messages, which are displayed in the domain console. The prompt is the same as the platform shell.

System Controller Tasks Completed at System Power-On

When you power on the system, the system controller boots the system controller real time operating system and starts the system controller application.

If there was an interruption of power, additional tasks completed at system power-on include:

- Turns on components that were on previously (such as fan trays, Repeater boards, CPU/Memory boards, I/O assemblies, and power supplies)
- Restores domains that were active

Domain Administration

The domain administrator is responsible for configuring and managing the domain. The system controller enables the domain administrator to perform the following tasks:

- Create domains by logically grouping system boards together. Each domain operates independently of other domains in the system. Each domain runs its own instance of the Solaris operating environment.
- Configure domain settings
- Boot domains.

In addition, the system controller software does the following:

- Warns you of environmental problems, such as high temperatures.
- Performs automatic emergency power off. For example, the system controller software automatically powers off a domain if the temperature of a CPU within that domain rises above a certain level. Note that the system controller monitors and displays the temperatures, currents, and voltage levels of all components.
- Depending on how your configuration is set up, the system controller software can automatically reboot a domain after a problem has been detected with the Solaris operating environment.

Domain Shell

The domain shell is the operating environment for the domain administrator and is the shell where domain tasks can be performed. There are four domain shells (A – D). The domain shell prompt is *schostname*:*domainID>*

Domain Console

If the domain is active (Solaris operating environment, the OpenBoot PROM, or POST *is* running in the domain), you can access the domain console. When you connect to the domain console, you will be at one of the following modes of operation:

- Solaris operating environment console (% or # prompts)
- OpenBoot PROM (ok prompt)
- Domain will be running POST and you can view the POST output.

Domain Management Tasks

You can access the domain consoles and perform domain management tasks on the system controller. Some of the domain management tasks include (TABLE 1-4).

TABLE 1-4   Selected Domain Management Tasks

System Controller Domain Management Tasks	System Controller Commands To Use
Configuring the domain	`setupdomain`
Adding to or removing boards from a domain	`addboard`, `deleteboard`
Powering boards on and off	`poweron`, `poweroff`
Testing the CPU/Memory board	`testboard`
Setting the domain keyswitch position. The domain keyswitch can be set to the off, standby, diag, on, or secure positions.	`setkeyswitch`
Displaying the domain parameter settings for the current domain (including the current keyswitch position and status)	`showkeyswitch`, `showdomain`
Setting the date, time, and time zone. The date, time, and time zone in the domain is independent of the date, time, and time zones in other domains and the platform.	`setdate`
Displaying the date and time	`showdate`
Providing a source of environmental monitoring	`showenvironment`

Virtual Domain Keyswitches

The domain shell provides a virtual keyswitch for each domain with the `setkeyswitch` command. There are five keyswitch positions: off (default), on, standby, diag, and secure.

For information on the domain shell `setkeyswitch` settings, see "Domains and the `setkeyswitch` Command" on page 70. For a description and syntax of the `setkeyswitch` command, refer to the *Sun Fire 6800/4810/4800/3800 System Controller Command Reference Manual.*

When you change the keyswitch from an inactive setting (off, standby) to an active setting (on, diag, secure), domain sequencing begins and the following events occur:

- System boards belonging to the domain are powered on and prepared (if they are not already powered on and prepared).
- POST is run.
- All OpenBoot PROM components that did not fail POST are configured to be used in the domain.
- The domain boots the Solaris operating environment if the OpenBoot PROM `auto-boot?` parameter is set to true.

Environmental Monitoring

There are sensors that monitor temperature, voltage, and current. The system controller polls these sensors in a timely manner and makes the environmental data available. If necessary, the system controller shuts down various components to prevent damage. This may result in a domain shutting down automatically.

Loghost

The system controller has permanent storage. It stores errors, warnings, and other messages in a message buffer. The information stored in the system controller is separate from the Solaris operating environment messages. To enhance accountability, messages can be sent to a loghost. You view the system controller logged events stored in the message buffer with the system controller `showlogs` command.

The loghost can be the system with the Sun Management Center software for the Sun Fire 6800/4810/4800/3800 systems, which speeds up the log-scanning facility.

The system controller must be connected to a network in order to take advantage of the Sun Management Center software for the Sun Fire 6800/4810/4800/3800 systems software. A system with the Sun Management Center software for the Sun Fire 6800/4810/4800/3800 systems software installed on it is not required.

Redundant Components and Minimum Configurations

The Sun Fire 6800/4810/4800/3800 systems are designed to increase the availability of the system by having redundant components. The following sections discuss the redundant hardware can be installed:

- "CPU/Memory Boards" on page 13
- "I/O Assemblies" on page 14
- "Redundant Cooling" on page 15)
- "Redundant Power" on page 16
- "Repeater Boards" on page 18

CPU/Memory Boards

All systems support multiple CPU/Memory boards. Each domain must contain a minimum of one CPU/Memory board.

The maximum number of CPUs you can have on a CPU/Memory board is four. The mimimum number of CPUs that Sun Microsystems, Inc. sells on a CPU/Memory board is two. You can order a CPU/Memory board with either two CPUs or four CPUs.

TABLE 1-5 lists the maximum number of CPU/Memory boards for each system.

TABLE 1-5   Maximum Number of CPU/Memory Boards in Each System

System	Maximum Number of CPU/Memory Boards	Maximum Number of CPU Processors
Sun Fire 6800 system	6	24
Sun Fire 4810 system	3	12
Sun Fire 4800 system	3	12
Sun Fire 3800 system	2	8

There are four banks of memory on each CPU/Memory board. Each bank of memory requires a CPU. The CPU is the MMU (memory management unit). Each bank of memory has eight slots. The memory modules (DIMMs) must be populated in groups of four DIMMs. The minimum amount of memory needed in order to operate a domain are four DIMMs.

Redundant CPUs and Memory

A failed CPU or faulty memory will be isolated from the domain by the power-on self-test (POST).

The domain is operational as long as there is at least one functioning CPU that controls a minimum of one bank of memory.

I/O Assemblies

All systems support multiple I/O assemblies. Each system supports only one type of I/O assembly. The Sun Fire 3800 system supports only the CompactPCI I/O assembly. The other mid-range systems support only the PCI I/O assembly. TABLE 1-6 lists the maximum number of I/O assemblies for each system.

TABLE 1-6   Maximum Number of I/O Assemblies and I/O Slots per I/O Assembly

System	Maximum Number of I/O Assemblies	Number of Compact PCI I/O Slots	Number of PCI I/O Slots
Sun Fire 6800 system	4 (PCI only)	N/A	8 slots—6 slots for full-length PCI cards and 2 short slots for short PCI cards
Sun Fire 4810 system	2 (PCI only)	N/A	8 slots—6 slots for full-length PCI cards and 2 short slots for short PCI cards
Sun Fire 4800 system	2 (PCI only)	N/A	8 slots—6 slots for full-length PCI cards and 2 short slots for short PCI cards
Sun Fire 3800 system	2 (CompactPCI only)	6	N/A

In the PCI I/O assembly, you can install short PCI cards in any of the 6 full-length slots. The six slots for full length cards operate at 33 MHz (5V). The two slots for the short cards operate at 66 MHz (3.3V) and 33 MHz (5V).

Redundant I/O

There are two possible ways to configure I/O redundancy (TABLE 1-7):

- Redundancy across I/O assemblies
- Redundancy within I/O assemblies

TABLE 1-7   Configuring for I/O Redundancy

Ways to Configure For I/O Redundancy	Description
Redundancy across I/O assemblies	You must have two I/O assemblies in a domain with duplicate cards in each I/O assembly that are connected to the same disk or network subsystem for path redundancy.
Redundancy within I/O assemblies	You must have both I/O cards in the same I/O assembly. This does not protect against the failure of the I/O assembly.

These features are part of the Solaris operating environment, known as IP multipathing. For information on IP multipathing (IPMP), refer to the *IP Network Multipathing Administration Guide,* which is available with your Solaris operating environment release.

Redundant Cooling

All systems have redundant cooling when the maximum number of fan trays are installed. If one fan tray fails, the remaining fan trays automatically increase speed, thereby enabling the system to continue to operate.

Caution – With the minimum number of fan trays installed, you *do not* have redundant cooling.

With redundant cooling, you do not need to suspend system operation to replace a failed fan tray. You can hot-swap a fan tray while the system is running, with no interruption to the system.

TABLE 1-8 shows the minimum and maximum number of fan trays required to cool each system For location information, such as the fan tray number, refer to the labels on the system and to the *Sun Fire 6800/4810/4800/3800 Systems Service Manual*.

TABLE 1-8   Minimum and Maximum Number of Fan Trays

System	Minimum Number of Fan Trays	Maximum Number of Fan Trays
Sun Fire 6800 system	3	4
Sun Fire 4810 system	2	3
Sun Fire 4800 system	2	3
Sun Fire 3800 system	3	4

Each system has comprehensive temperature monitoring to ensure that there is no over-temperature stressing of components in the event of a cooling failure or high ambient temperature. If there is a cooling failure, the speed of the remaining operational fans increases. If necessary, the system is shut down.

Redundant Power

In order for power supplies to be redundant, you must have the required number of power supplies installed plus one additional redundant power supply for each power grid. The power is shared in the power grid. If one power supply in the power grid is defective or fails, the remaining power supplies in the same power grid are capable of delivering the maximum power required for the power grid.

If more than one power supply in a power grid fails, there will be insufficient power to support a full load.

The System Controller boards and the ID board obtains power from any power supply in the system. Fan trays can obtain power from either power grid.

TABLE 1-9 describes the minimum and redundant power supply requirements.

TABLE 1-9   Minimum and Redundant Power Supply Requirements

System	Number of Power Grids per System	Minimum Number of Power Supplies In Each Power Grid	Total Number of Supplies In Each Power Grid (Including Redundant Power Supplies)
Sun Fire 6800 system	2	2 (grid 0)	3
		2 (grid 1)	3
Sun Fire 4810 system	1	2 (grid 0)	3
Sun Fire 4800 system	1	2 (grid 0)	3
Sun Fire 3800 system	1	2 (grid 0)	3

Each power grid has power supplies assigned to the power grid. Power supplies ps0, ps1, and ps2 are assigned to power grid0. Power supplies ps3, ps4, and ps5 are assigned to power grid 1. If one power grid, such as power grid 0 fails, the remaining power grid is still operational.

TABLE 1-10 lists the components in the Sun Fire 6800 system in each power grid. If you have a Sun Fire 4810/4800/3800 system, refer to the components in grid 0, since these systems have only power grid 0.

TABLE 1-10   Sun Fire 6800 System Components in Each Power Grid

Components in the System	Grid 0	Grid 1
CPU/Memory boards	SB0, SB2, SB4	SB1, SB3, SB5
I/O assemblies	IB6, IB8	IB7, IB9
Power supplies	PS0, PS1, PS2	PS3, PS4, PS5
Repeater boards	RP0, RP2	RP1, RP3
Redundant Transfer Switch (RTS)	RTS0 (back)	RTS1 (front)

Repeater Boards

The Repeater board is a crossbar switch that connects multiple CPU/Memory boards and I/O assemblies. Having the required number of Repeater boards is mandatory for operation. There are Repeater boards in each mid-range system except for the Sun Fire 3800. In this system, the equivalent of two Repeater boards are integrated into the active centerplane.

Repeater boards are not fully redundant. If one Repeater board fails while the Solaris operating environment if running, the Solaris operating environment will fail in the affected domain(s). A domain cannot operate with the remaining boards. TABLE 1-11 lists the Repeater board assignments by each domain in the Sun Fire 6800 system.

TABLE 1-11   Repeater Board Assignments by Domains in the Sun Fire 6800 System

Partition Mode	Repeater Boards	Domains
Single partition	RP0, RP1, RP2, RP3	A, B
Dual partition	RP0, RP1	A, B
Dual partition	RP2, RP3	C, D

TABLE 1-12 lists the Repeater board assignments by each domain in the Sun Fire 4810/4800 systems.

TABLE 1-12   Repeater Board Assignments by Domains in the Sun Fire 4810/4800 Systems

Partition Mode	Repeater Boards	Domains
Single partition	RP0, RP2	A, B
Dual partition	RP0	A
Dual partition	RP2	C

If a Repeater board fails, it may be possible to change to dual partition mode in order to isolate the faulty Repeater board. For example, if your system is running in single partition mode with one domain (domain A), and Repeater board RP2 failed, changing to dual partition mode allows domain A to boot.

Reliability, Availability, and Serviceability (RAS)

Reliability, availability, and serviceability (RAS) are features of these mid-range systems. The descriptions of these features are:

- *Reliability* is the probability that a system stays operational for a specified time period when operating under normal environmental conditions. Reliability differs from availability in that reliability involves only system failure, whereas availability depends on both failure and recovery.

- *Availability,* also known as average availability, is the percentage of time that a system is available to perform its functions correctly. Availability can be measured at the system level or in the context of the availability of a service to an end client. The "system availability" is likely to impose an upper limit on the availability of any products built on top of that system.

- *Serviceability* measures the ease and effectiveness of maintenance and system repair for the product. There is no single well-defined metric, because serviceability can include both Mean Time to Repair (MTTR) and diagnosability.

The following sections provide details on RAS. For more hardware-related information on RAS, refer to the *Sun Fire 6800/4810/4800/3800 Systems Service Manual.* For RAS features that involve the Solaris operating environment, refer to the *Sun Hardware Platform Guide.*

Reliability

The software reliability features include:

- Disabling Components or Boards and Power-On Self-Test (POST)
- Disabling of Components
- Environmental Monitoring

The reliability features also improve system availability.

Disabling Components or Boards and Power-On Self-Test (POST)

The power-on self-test (POST) is part of powering on a domain. If the board or component failed testing, POST disables components or boards. The `showboards` command displays the board as either being failed or degraded. The domain, running the Solaris operating environment, is booted only with components that have passed POST testing.

Disabling of Components

The system controller provides component-level status and user-controlled disabling of components, which is also referred to as blacklisting.

You can add a faulty component to a blacklist with the `disablecomponent` command. Components in the blacklist will not be configured. You can remove a component from the blacklist with the `enablecomponent` command.

The platform blacklists supersede the domain blacklists. For example, if a component is disabled in the platform, it will always be disabled in all domains.

Blacklisting from the platform applies to all domains. Blacklisting in a domain applies only to the current domain. If you disable a component in one domain and then move the component to another domain, the component is not disabled. The `showcomponent` command displays status information about the component, including whether or not it has been disabled.

To enable a component that you previously disabled, you must enable it in the domain(s) or from the platform.

Environmental Monitoring

The system controller monitors the system's temperature, current, and voltage sensors. The system controller provides the latest environmental status information to the Solaris operating environment and Sun Management Center software for the Sun Fire 6800/4810/4800/3800 systems. If hardware needs to be powered off, the system controller notifies the Solaris operating environment to perform an emergency system shutdown on each affected domain and sends out an SNMP trap. The system controller automatically shuts down components immediately after notifying the Solaris operating environment.

Availability

The software availability features include:

- Power Failure
- System Controller Reboot

If your system has a problem with the Solaris operating environment, depending on the domain configuration, the domain can automatically be rebooted. This keeps the Solaris operating environment running as much as possible.

Power Failure

In there is a power outage, the system controller reconfigures active domains.

System Controller Reboot

The system controller can be rebooted and will start up and resume management of the system. The reboot does not disturb the currently running domain(s) running the Solaris operating environment.

Serviceability

The software serviceability features promote the efficiency and timeliness of providing routine as well as emergency service to a these systems.

LEDs

All field-replaceable units (FRUs) that are accessible from outside the system have LEDs that indicate their state. The system controller manages all the LEDs in the system, with the exception of the power supply LEDs, which are managed by the power supplies. For a discussion of LED functions, refer to the appropriate board or device chapter of the *Sun Fire 6800/4810/4800/3800 Systems Service Manual*.

Nomenclature

The system controller, the Solaris operating environment, the power-on self-test (POST), and the OpenBoot PROM error messages use FRU name identifiers that match the physical labels in the system. The only exception is the OpenBoot PROM nomenclature used for I/O devices, which use the device path names as described in "Mapping Device Path Names to Physical System Devices" on page 117, to indicate I/O devices during device probing.

System Controller Error Logging

You can configure the system controller platform and domains to log errors by using the `syslog` protocol to an external loghost. The system controller also has an internal buffer where error messages are stored. You can display the system controller logged events, stored in the system controller message buffer, by using the `showlogs` command. There is one log for the platform and one log for each of the four domains.

System Controller XIR support

The system controller `reset` command enables you to recover from a hard hung domain and extract a Solaris operating environment `core` file.

Sun Management Center Software for the Sun Fire 6800/4810/4800/3800 Systems Software

For information on the Sun Management Center software for the Sun Fire 6800/4810/4800/3800 systems, refer to the *Sun Management Center 3.0 Software Supplement for Sun Fire 6800/4810/4800/3800 Systems*, which is available online. The first Sun Fire supplement version released for these systems is the Platform Update 1 release.

FrameManager

The FrameManager is an LCD display that is located in the top right corner of the Sun Fire system cabinet. For a description of functions of the FrameManager, refer to the "FrameManager" chapter of the *Sun Fire 6800/4810/4800/3800 Systems Service Manual.*

System Controller Navigation Procedures

This chapter explains step-by-step procedures and provides illustrations for connecting to the platform and domains and navigating between the domain shell and the domain console. It also explains how to terminate a system controller session.

Topics covered in this chapter include:

Accessing the Platform Shell and Domain Shells

This section describes the following:

- "Accessing the Platform Shell" on page 26
- "Accessing a Domain" on page 29

Accessing the Platform Shell

There are two ways to access the platform shell:

- Through `telnet` (network connection)
- Through the serial port connection (platform console)

▼ To Access the Platform Shell by Using the `telnet` Command

1. **Access the system controller by typing the `telnet` command (**CODE EXAMPLE 2-1**).**

2. **At the system controller main menu, type** `0` **(or alternatively** `P` **or** `p`**) to enter the platform shell.**

   The system controller prompt for the platform shell, *schostname*`:SC>`, is displayed.

CODE EXAMPLE 2-1 Accessing the System Controller With `telnet` and Entering the Platform Shell

```
% telnet schostname
Trying xxx.xxx.xxx.xxx
Connected to schostname-sc0.
Escape character is '^]'.


System Controller schostname-sc0:

    Type 0 for Platform Shell

    Type 1 for domain A
    Type 2 for domain B
    Type 3 for domain C
    Type 4 for domain D

    Input: 0

Platform Shell

schostname:SC>
```

Note – *schostname* is the system controller host name.

▼ To Access the Platform Shell by Using the Serial Port

With the serial port, you can connect to one of three types of devices:

■ ASCII terminal
■ Network terminal server (NTS)
■ Workstation

The procedure is different for each type of device.

ASCII Terminal

1. Connect the system controller serial port to an ASCII terminal.

The system controller main menu is displayed.

2. Enter the platform shell.

You can also type P or p, instead of typing 0, to enter the platform shell.

Network Terminal Server (NTS)

1. Connect the system controller serial port to a Network Terminal Server (NTS).

2. Type the following telnet **command at the Solaris operating environment prompt:**

```
machinename% telnet NTShostname|IPaddress [port]
```

The system controller main menu is displayed.

3. Enter the platform shell.

You can also type P or p, instead of typing 0, to enter the platform shell.

Workstation

1. Connect the system controller serial port to serial port B of your workstation.

2. Type the tip hardwire **command at the Solaris operating environment prompt to connect to the system controller.**

The syntax of the tip command is:
tip {*hostname* | *device* }

See the tip man page for a complete description of the tip command.

The system controller main menu is displayed.

3. Enter the platform shell.

You can also type P or p, instead of typing 0, to enter the platform shell.

Accessing a Domain

The main way to access a domain is through `telnet` (network connection).

Note – Since the serial port connection is used for the platform console, do not use the serial port to access a domain shell.

Domain Shell

If . . .	You are connected to . . .
the Solaris operating environment or the OpenBoot PROM is not active in the domain (domain keyswitch is set to standby or off). This means the domain is *inactive.*	Domain shell. The prompt is *schostname:domainID>*. For example, schostname:`A>`.

Domain Console

If . . .	You can access . . .
the Solaris operating environment is running or the domain is in OpenBoot PROM mode. This means the domain is *active.*	Domain console (`ok`, `login`, `#`, or `%` prompts). Additionally, you can also see POST output, enter the debugger, or enter the OpenBoot PROM.
	Domain shell.

▼ To Access a Domain Shell by Using the `telnet` Command

1. **Access the system controller by typing the** `telnet` **command (**CODE EXAMPLE 2-2**).**

2. **Enter a domain. Type** 1, 2, 3, **or** 4 **(or alternatively** a, b, c, d, **or** A, B, C, D**) to enter the proper domain shell.**

   CODE EXAMPLE 2-2 displays a connection to an inactive domain. If you are accessing an active domain, you would not see the in `Domain Shell for Domain A` in the display.

   CODE EXAMPLE 2-2   Accessing the System Controller With `telnet` and Entering a Domain Shell

   ```
   % telnet schostname
   System Controller schostname-sc0:

       Type 0 for Platform Shell

       Type 1 for domain A
       Type 2 for domain B
       Type 3 for domain C
       Type 4 for domain D

   Input: 1

   Connected to Domain A

   Domain Shell for Domain A

   schostname:A>
   ```

3. **If the domain is active and the domain keyswitch is set to on, diag, or secure (you are running the Solaris operating environment, are in OpenBoot PROM mode, or are running POST), perform the following steps:**

   a. **Press and hold the CTRL key while pressing the] key, to get to the** `telnet>` **prompt.**

   b. **At the** `telnet>` **prompt type** `send break` **(**CODE EXAMPLE 2-3**).**

CODE EXAMPLE 2-3 shows a connection to domain A.

CODE EXAMPLE 2-3   Obtaining a Domain Shell From the Domain Console

```
ok Ctrl-]
telnet> send break
schostname:A>
```

System Controller Navigation

This section explains how to navigate between the:

- System controller platform
- System controller domain console
- System controller domain shell

To return to the origin shell, use the disconnect command. In a domain shell to connect to the domain console, use the resume command. To connect to a domain shell from the platform shell, use the console command.

FIGURE 2-1 shows how to navigate between the platform shell, the domain shell, the domain console by using the console and disconnect commands. FIGURE 2-1 also illustrates how to connect to both the domain shell and platform shell from the Solaris operating environment by using the telnet command.
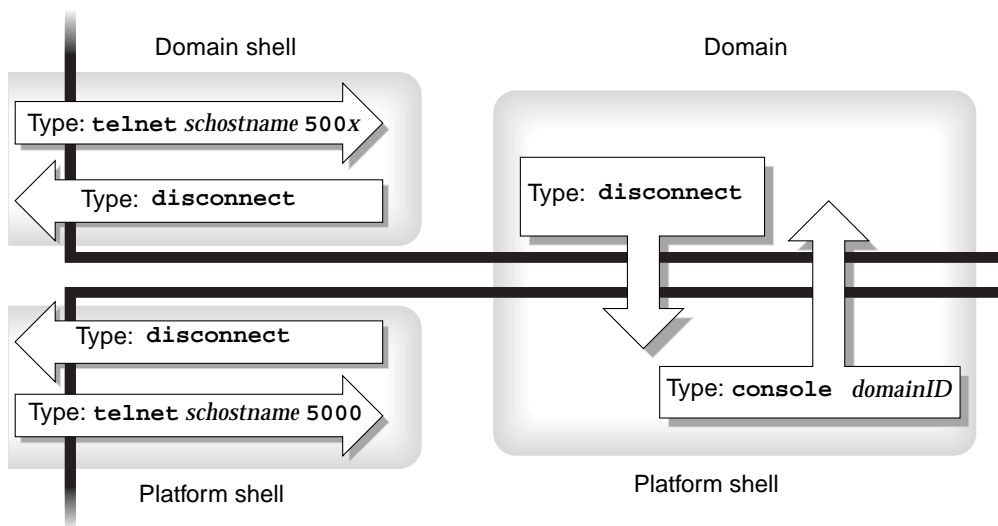
FIGURE 2-1 Navigating Between the Platform Shell and the Domain Shell and Vice Versa

---

Note – You can also use the telnet command without the port number, as described in CODE EXAMPLE 2-1 and CODE EXAMPLE 2-2.

---

where:

In the telnet command in FIGURE 2-1, 5000 is the platform shell.

x is:

- 1 for domain A
- 2 for domain B
- 3 for domain C
- 4 for domain D

In the console command, *domainID* is a, b, c, or d.

Note – By typing telnet *schostname* 500*x*, you *directly* enter the platform shell or one of the domain shells or the domain console. You will bypass the system controller main menu.

FIGURE 2-2 illustrates how to navigate between the Solaris operating environment, the OpenBoot PROM, and the domain shell. FIGURE 2-2 assumes that the Solaris operating environment is running.
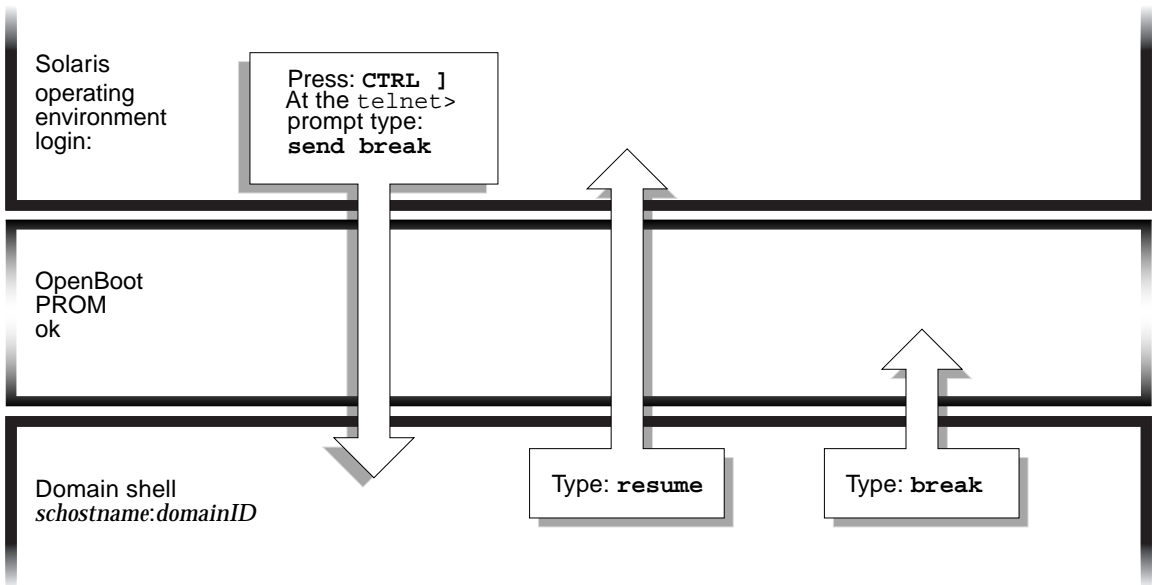
FIGURE 2-2   Navigating Between the Domain Shell, the OpenBoot PROM, and the Solaris Operating Environment

Caution – Note that in FIGURE 2-2 typing the break command suspends the Solaris operating environment.

FIGURE 2-3 illustrates how to navigate between the OpenBoot PROM and the domain shell. This figure assumes that the Solaris operating environment is *not* running.
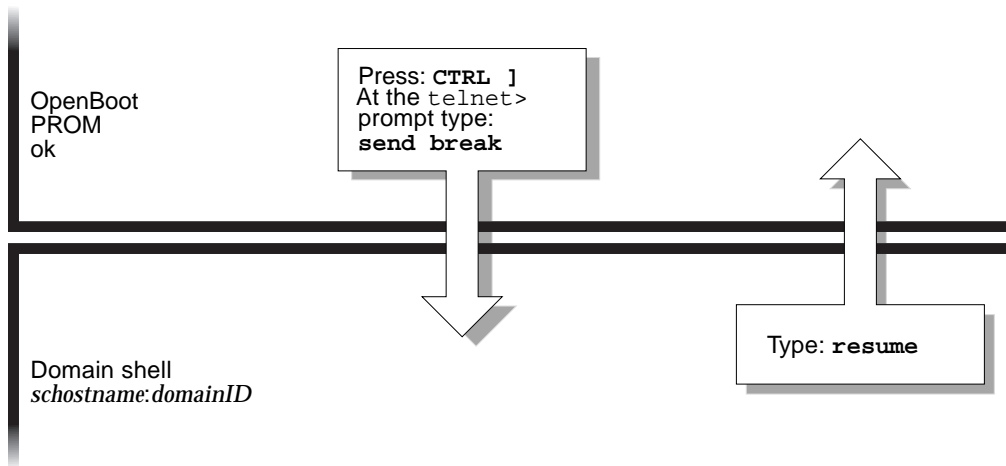
FIGURE 2-3   Navigating Between the OpenBoot PROM and the Domain Shell

When you enter a domain console, you are connected with the Solaris operating environment console. If either POST or the OpenBoot PROM is running, you are connected with either the POST or the OpenBoot PROM output.

▼ To Enter the Domain Console From the Domain Shell If the Domain Is Inactive

● **Type** setkeyswitch on **in the domain shell.**

```
schostname:A> setkeyswitch on
```

The domain console is only available when the domain is active. To make the domain active, you must turn the keyswitch on. You will be automatically switched from the domain shell to the domain console.

This action powers on and initializes the domain. The domain will go through POST and then the OpenBoot PROM. If the OpenBoot PROM auto-boot? parameter is set to true, the Solaris operating environment will boot.

▼ To Enter the Domain Shell From the Domain Console

1. **Press and hold the CTRL key while pressing the] key, to display to the** `telnet>` **prompt (**CODE EXAMPLE 2-4**).**

2. **Type** `send break` **at the** `telnet` **prompt.**

   The *schostname:*`A>` (or `B>`, `C>`, `D>`) prompt is displayed.

   CODE EXAMPLE 2-4   Obtaining a Domain Shell From the Domain Console

   ```
   ok Ctrl-]
   telnet> send break
   schostname:A>
   ```

▼ To Get Back to the Domain Console From the Domain Shell

1. **Type** `resume`**.**

   ```
   schostname:A> resume
   ```

2. **Press the Enter key to get a prompt.**

   If the domain is not active, (the Solaris operating environment or the OpenBoot PROM is *not* running), the system controller stays in the domain shell.

   ```
   Domain A is not active.
   schostname:A>
   ```

▼ To Enter a Domain From the Platform Shell

Note – This example shows entering an inactive domain.

- **Type:**

```
schostname:SC> console a

Connected to Domain A

Domain Shell for Domain A

schostname:A>
```

If the OpenBoot PROM is running, you are returned to the domain A console. If the virtual keyswitch is set to off or standby, you are returned to the domain A shell.

Note – To enter a different domain, type the proper *domainID* b, c, or d, instead of typing a.

▼ To Terminate a Session with telnet If You Are Connected to the Ethernet Port

- **Type the** disconnect **command at the domain shell prompt.**

```
schostname:A> disconnect
Connection closed by foreign host.
machine_name_prompt%
```

Your system controller session terminates.

▼ To Terminate a Session with `tip` If You Are Connected to the Serial Port

If you are connected to the System Controller board with the serial port, use the `disconnect` command to terminate the system controller session. Then use a `tip` (Transfer Internet Protocol) command to terminate your `tip` session.

1. **Type** `disconnect` **to disconnect from the system controller session.**

2. **At the Solaris operating environment prompt, type** `~.` **to terminate your** `tip` **session.**

```
schostname:A> disconnect
Connection closed by foreign host.
machine_name_prompt% ~.
```

Your system controller session terminates.

System Power On and Setup

The objective of this chapter is to enable you to power on your system for the first time and perform software setup procedures using the system controller command line interface. For instructions on how to subsequently power on your system, see "To Power On the System" on page 83.

Note – When you are setting up your system for the first time, it is strongly suggested that you bring up the one domain set up for you, domain A, by booting the Solaris operating environment before creating additional domains. To create additional domains, see Chapter 4.

This chapter contains the following topics:

FIGURE 3-1 is a flowchart summarizing the major steps you must perform to power on and set up the system, which are explained in step-by-step procedures in this chapter.
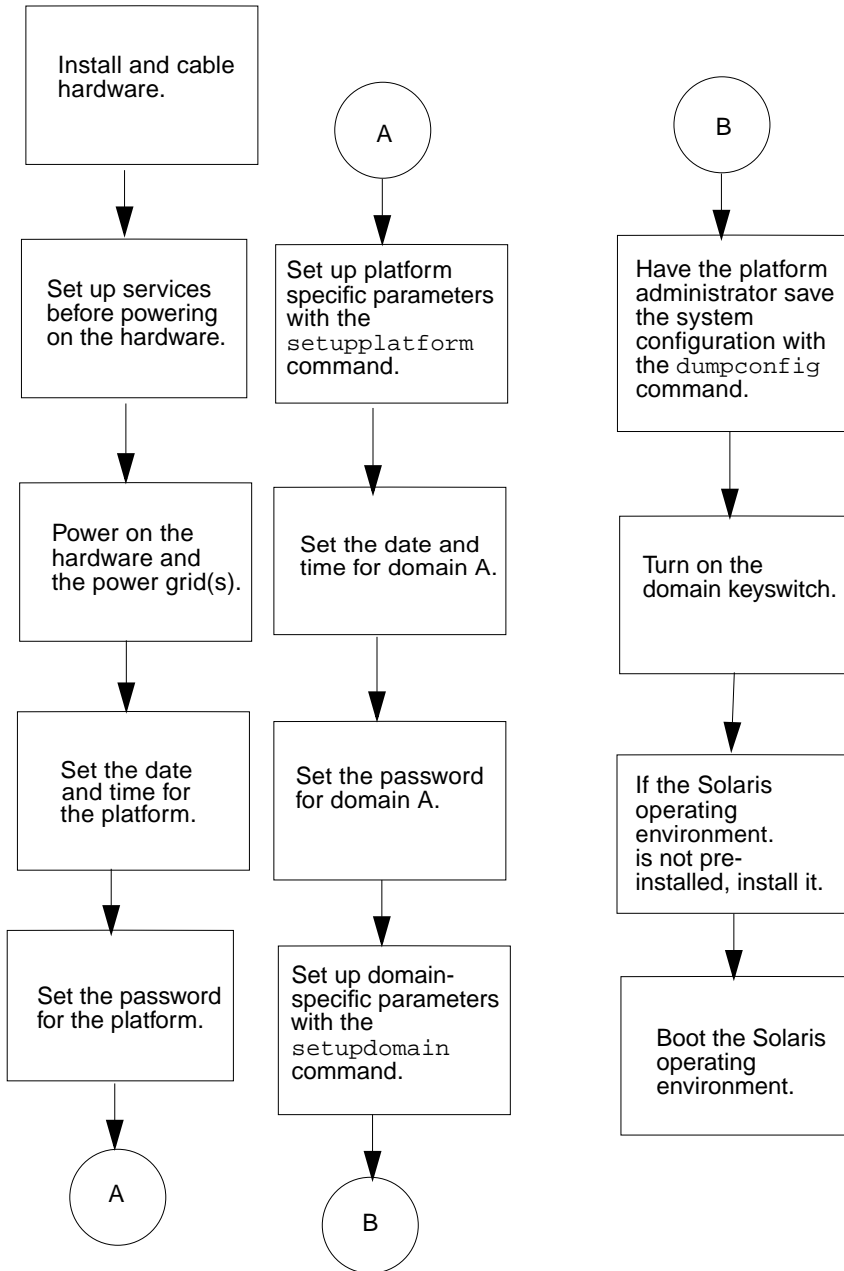
FIGURE 3-1 Flowchart of Power On and System Setup Steps

Installing, Cabling, and Powering on the Hardware

1. **Install and cable the hardware.**

   See the installation guide for your system.

2. **Connect a terminal to your system using the serial port.**

   Refer to the installation guide for your system.

3. **When you set up the terminal, set the ASCII terminal to the same baud rate as the serial port.**

   The default serial port settings for the System Controller board are:

   - 9600 baud
   - 8 data bits
   - No parity
   - 1 stop bit

   Because this is the platform console connection, log messages are displayed.

Setting Up Additional Services Before System Power-On

- **Before you power on the system for the first time, set up the services described in** TABLE 3-1**.**

TABLE 3-1 Services That Should Be Set Up Before System Power On

Service	Description
DNS services	The system controller uses DNS to simplify communication with other systems.
Sun Management Center software for the Sun Fire 6800/ 4810/4800/3800 systems*	Manage and monitor your system by using the Sun Management Center software for the Sun Fire 6800/4810/4800/3800 systems. It is strongly suggested that you use this software to manage and monitor your system.
Network Terminal Server (NTS)	In order to get access to the system controller console, the Network Terminal Server should be secured; a password should be used to help manage multiple serial connections.
Boot/install server*	Allows you to install the Solaris operating environment from a network server instead of using a CD-ROM.
Loghost*	The loghost system is used to collect system controller messages.
Power source	At the minimum, power cords should be on separate circuit breakers.

* It is not necessary to have the loghost set up before you install and boot the Solaris operating environment. You can install the Sun Management Center software for the Sun Fire 6800/4810/4800/3800 systems after you boot your system for the first time. Because you can install from a CD-ROM, it is not necessary to have a boot/install server set up before system power on.

Powering On the Hardware

● **Complete the hardware power-on steps detailed and illustrated in the installation guide for your system.**

Powering On the Power Grids

1. Access the system controller and connect to the system controller main menu.

See "Accessing the Platform Shell and Domain Shells" on page 26.

2. From the system controller main menu, type `0` **(or alternatively** `P` **or** `p`**) to enter the platform shell.**

See "Accessing the Platform Shell" on page 26.

3. Power on the power grid(s).

- If you have a Sun Fire 6800 system, you must power on power grid 0 and power grid 1.

```
schostname:SC> poweron grid0 grid1
```

The `poweron grid`*x* command powers on power supplies in that power grid. TABLE 3-2 lists the board numbers for each power grid.

TABLE 3-2   System Board Numbers in Relation to Power Grid 0 and Power Grid 1 for the Sun Fire 6800 System

Board Numbers	Power Grid
`SB0`, `SB2`, `SB4`, `IB6`,`IB8`, `RP0`, `RP1`, `PS0`, `PS1`, `PS2`	Power grid 0
`SB1`, `SB3`, `SB5`, `IB7`,`IB9`, `RP2`, `RP3`, `PS3`, `PS4`, `PS5`	Power grid 1

- If you have a Sun Fire 4810/4800/3800 system, there is only one power grid, grid 0.

```
schostname:SC> poweron grid0
```

The `poweron grid0` system controller command powers on power supplies in power grid 0. Also, the fan trays power on automatically when the grid is powered on.

Setting Up the Platform

After powering on the power grids, set up your system using the `setdate`, `setupplatform`, and `password` commands described in this chapter.

The system is configured with one domain, domain A. Before you add additional domains, it is strongly suggested that you boot the Solaris operating environment in domain A to verify that the domain is operational. Then proceed to Chapter 4, which explains how to create additional domains with the system controller `addboard` command.

This section contains the following topics:

- "To Set the Date and Time for the Platform" on page 44
- "To Set Up the Password for the Platform" on page 46
- "To Configure Platform Parameters" on page 46

▼ To Set the Date and Time for the Platform

Note – If your time zone area is using daylight or summer time, this is set automatically.

The platform and each of the four domains have separate and independent dates and times.

● **Set the date, time, and time zone for the platform, using the** `setdate` **command from the platform shell:**

For complete command syntax, refer to the *Sun Fire 6800/4810/4800/3800 System Controller Command Reference Manual*.

The following example shows setting the time zone to Eastern standard time (EST), using time zone abbreviations and the date and time to Thursday, April 20, 2001 at 18 hours, 15 minutes, and 10 seconds:

```
schostname:SC> setdate -t EST 042018152001.10
Thu Apr 20 18:15:10 EST 2001
```

TABLE 3-3 shows the time zone abbreviations, the time zone name, and the offset from Greenwich mean time (GMT).

TABLE 3-3 Time Zone Abbreviations, Time Zone Name, and Offsets From Greenwich Mean Time

Time Zone Abbreviation	Time Zone Name	Offset From Greenwich Mean Time (GMT)
ACT	Australian central time	GMT+9.5
AET	Australian eastern time	GMT+10
AGT	Argentina standard time	GMT-3
ART	Arabic (Egypt) standard time	GMT+2
AST	Alaska standard time	GMT-9
BET	Brazil eastern time	GMT-3
BST	Bangladesh standard time	GMT+6
CAT	Central African time	GMT+2
CNT	Canada Newfoundland time	GMT-3.5
CST	Central standard time	GMT-6
CTT	China Taiwan time	GMT+8
EAT	Eastern African time	GMT+3
ECT	European central time	GMT+1
EET	Eastern European time	GMT+2
EST	Eastern standard time	GMT-5
HST	Hawaii standard time	GMT-10
IET	Indiana eastern standard time	GMT-5
IST	India standard time	GMT+5.5
JST	Japan standard time	GMT+9
MET	Middle East time	GMT+3.5
MIT	Midway Islands time	GMT-11
MST	Mountain standard time	GMT-7
NET	Near East time	GMT+4
NST	New Zealand standard time	GMT+12
PLT	Pakistan Lahore time	GMT+5
PNT	Phoenix standard time	GMT-7
PRT	Puerto Rico and U. S. Virgin Islands time	GMT-4

Time Zone Abbreviation	Time Zone Name	Offset From Greenwich Mean Time (GMT)
PST	Pacific standard time	GMT-8
SST	Solomon standard time	GMT+11
UTC	Universal Time Coordinated	GMT+0
VST	Vietnam standard time	GMT+7

▼ To Set Up the Password for the Platform

1. **From the platform shell, type the system controller** `password` **command
   (**CODE EXAMPLE 3-1**).**

2. **At the** `Enter new password:` **prompt, type in your password.**

3. **At the** `Enter new password again:` **prompt, re-type in your password.**

CODE EXAMPLE 3-1   `password` Command Example With No Password Set

```
schostname:SC> password
Enter new password:
Enter new password again:
schostname:SC>
```

▼ To Configure Platform Parameters

1. **From the platform shell type** `setupplatform`**:**

```
schostname:SC> setupplatform
```

Note – If you press the Return key after each parameter, the current value will not
be changed.

TABLE 3-4 describes the `setupplatform` parameter values.

TABLE 3-4   `setupplatform` Parameter Values

Parameter	Description
`Is the System Controller on a Network?`	Determines if the network interface is configured. If the answer is no, leave all network parameters unconfigured.
`Use DHCP or static network settings?` (Network parameter)	• `DHCP` means the network settings are retrieved from a DHCP server. • `Static` means the network settings will be manually configured. If you select the static setting, you will be asked for the following network parameters.
`Hostname` (Network parameter)	The human readable network identity for this system controller.
`IP address` (Network parameter)	The network identity used by computers.
`Netmask` (Network parameter)	For this value, specify how much of the address should be reserved for subdividing networks into subnetworks. Must be specified in dot-notation. For example `255.255.255.0`.
`Gateway` (Network parameter)	IP address of the gateway (router).
`DNS Domain` (Network parameter)	Domain name. For example, *xxx*.*xxx*.`com`.
`Primary DNS Server` (Network parameter)	IP address of the primary DNS server.
`Secondary DNS Server` (Network parameter)	IP address of the secondary DNS server.
`Loghost`	The name or IP address of the loghost for the platform. The format is *loghost*:[*facility*] where: *facility is* `local`*x* (*x* = `0-7`). Errors, warnings, and notices will be logged to this system.
`SNMP Agent`	Enables or disables the SNMP agent.
`Platform Description`	Platform model name (default).
`Platform Contact`	The name of the person who is responsible for this system. This name will be used by SNMP. Note that if SNMP is not going to be enabled, this field is informational only.
`Platform Location`	Location of the system. This information will be used by SNMP. Note that if SNMP is not going to be enabled, this field is informational only.
`Trap Hosts`	Name or IP address of the SNMP trap host.
`Public Community String`	Authentication string for SNMP readers. The default is P-public.

TABLE 3-4   setupplatform Parameter Values *(Continued)*

Parameter	Description
Private Community String	Authentication string for SNMP readers and writers. The default is P-private.
ACL for Domain A	Default value is to have all slots assigned to all domains. • Prefixing a slot name with -d deletes the slot from ACLs of this domain. • Typing a prefix of -a (add) adds a slot. • Typing a dash (-) deletes all entries. • Typing a + (plus sign) adds all.
ACL for Domain B	See the description for ACL for Domain A.
ACL for Domain C	See the description for ACL for Domain A.
ACL for Domain D	See the description for ACL for Domain A.
SC POST diag level	The system controller diag level can be set to: off, min, or max.
off	Only system controller initialization code is run. No testing is done. This is a very fast pass through POST.
min	All system controller components are tested with few tests and test patterns.
max	All system controller components are tested with all tests and test patterns.
Partition mode	The two options are single and dual (single is the default). For a description of partition mode, refer to the "Partitions" on page 2.

CODE EXAMPLE 3-2 shows an example of the setupplatform command.

CODE EXAMPLE 3-2   Output From setupplatform Command

```
schostname:SC> setupplatform

Network Configuration
--------------------
Is the System Controller on a network? [yes]
Network settings? [DHCP]:static
Hostname []:
IP Address []:
Netmask []:
Gateway []:
DNS Domain []:
```

CODE EXAMPLE 3-2 Output From `setupplatform` Command *(Continued)*

```
Primary DNS Server []:
Secondary DNS Server []:

Loghost [ ]:

SNMP
----
Platform Description [Sun Fire 6800]:
Platform Contact [ ]:
Platform Location [ ]:
Enable SNMP Agent? [no]:
Trap Hosts [( )]:
Public Community String [P-public]:
Private Community String [P-private]:

ACLs
----
ACL for domain A [SB0 SB1 SB2 SB3 SB4 SB5 IB6 IB7 IB8 IB9 ]:
ACL for domain B [SB0 SB1 SB2 SB3 SB4 SB5 IB6 IB7 IB8 IB9 ]:
ACL for domain C [SB0 SB1 SB2 SB3 SB4 SB5 IB6 IB7 IB8 IB9 ]:
ACL for domain D [SB0 SB1 SB2 SB3 SB4 SB5 IB6 IB7 IB8 IB9 ]:

SC POST
-------
SC POST diag level [min]:

Partition Mode
--------------
Configure platform for single or dual partition mode? [single]:
```

Use the information in TABLE 3-4 as a guide for the information you need to enter for each parameter value entry.

2. **If you have a second System Controller board installed do the following:**

   a. **If you want to use the** `static` **setting on the second System Controller board (if installed) use** `setupplatform` **on the second System Controller board.**

   b. **Set up the password on the second System Controller board with the** `password` **command.**

Setting Up Domain A

In order to set upa domain you must complete the procedures:

- "To Access the Domain Shell From the Platform Shell" on page 50
- "To Set the Date and Time for Domain A" on page 50
- "To Set Up the Password for Domain A" on page 51
- "To Configure Domain-Specific Parameters" on page 51

▼ To Access the Domain Shell From the Platform Shell

● **From the platform shell prompt, to enter domain A, type** `console a`**.**

```
schostname:SC> console a
```

▼ To Set the Date and Time for Domain A

● **Type the system controller** `setdate` **command in the domain A to set the date and time for the domain.**

Because you can have up to four domains, you must eventually set the date and time for *each* domain using the system controller `setdate` command. To start, just set the date and time for domain A.

For command syntax, refer to the *Sun Fire 6800/4810/4800/3800 System Controller Command Reference Manual* and "To Set the Date and Time for the Platform" on page 44, which sets the date for the platform. You set the date for a domain the same way you set the date and time for the platform.

Although you can set different dates and times in the platform and each domain, to ease the interpretation of error messages and logs, it is suggested to have identical dates.

For examples using the setdate command, see "To Set the Date and Time for the Platform" on page 44.

▼ To Set Up the Password for Domain A

1. **From the domain A shell, type the password command (**CODE EXAMPLE 3-3**).**

2. **At the** `Enter new password`**: prompt, type your password.**

3. **At the** `Enter new password:` `again:` **prompt, re-type your password (**CODE EXAMPLE 3-3**.).**

CODE EXAMPLE 3-3 `password` Command Example For a Domain With No Password Set

```
schostname:A> password
Enter new password:
Enter new password again:
schostname:A>
```

▼ To Configure Domain-Specific Parameters

Note – You configure each domain separately.

1. **From the domain A shell, type the** `setupdomain` **command:**

```
schostname:A> setupdomain
```

TABLE 3-5 lists the `setupdomain` parameter values.

TABLE 3-5 Parameter Values for the `setupdomain` Command

Parameter	Value	Description
diag-level		The domain diag-level can be set to:
	init	Only system board initialization code is run. No testing is done. This is a very fast pass through POST.
	quick	All system board components are tested with few tests and few test patterns.
	default (default value)	All system board components are tested with all tests and test patterns, except for memory and Ecache modules. Note that max and default are the same definition.

TABLE 3-5   Parameter Values for the `setupdomain` Command *(Continued)*

Parameter	Value	Description
	max	All system board components are tested with all tests and test patterns, except for memory and Ecache modules. Note that max and default are the same definition.
	mem1	Runs all tests at the default level plus more exhaustive DRAM and SRAM test algorithms. Memory and Ecache modules, all locations are tested with multiple patterns. More extensive, time-consuming algorithms are not run at this level.
	mem2	This is the same as mem1 with the addition of a DRAM test that does explicit compare operations of the DRAM data.
verbosity-level	off	Only status messages are displayed.
	min (default value)	Test names and status messages are displayed.
	max	Subtest trace messages are displayed.
error- level	off	No error messages are displayed.
	min	The failing test name is displayed.
	max (default value)	All relevant error status is displayed.
interleave-scope	within-board (default value)	The memory banks on a system board will be interleaved with each other.
	across-boards	The memory will be interleaved on all memory banks across all of the boards in the domain.
interleave-mode	optimal (default value)	The memory is mixed-size interleaving in order to gain optimal performance.
	fixed	The memory is fixed-size interleaving.
	off	There is no memory interleaving.
reboot-on-error	false (default value)	The domain will be paused when there is an error.
	true	The domain will be rebooted when there is an error.
OBP.use-nvramrc?		This parameter is the same as the OpenBoot PROM `nvramrc?` parameter. This parameter is used by the OpenBoot PROM to determine if the OpenBoot PROM needs to execute the script stored in the OpenBoot PROM configuration variable `nvramrc` at system startup.
	true	The OpenBoot PROM executes the script stored in `nvramrc`.

TABLE 3-5 Parameter Values for the `setupdomain` Command *(Continued)*

Parameter	Value	Description
	false (default value)	The OpenBoot PROM does not execute the script stored in `nvramrc`.
OBP.auto-boot?		Controls booting of the Solaris operating environment.
	true (default value)	The domain boots automatically after POST has run.
	false	You will obtain the OpenBoot PROM `ok>` prompt after POST runs, from which you must type a `boot` command to boot the Solaris operating environment.
OBP.error-reset-recovery		Controls the behavior of the domain after an externally initiated reset (XIR). This parameter is the same the OpenBoot PROM configuration variable `error-reset-recovery`. The OpenBoot PROM takes the appropriate action, according to its setting, after an error reset when the Solaris operating environment is running.
	sync (default value)	The OpenBoot PROM invokes `sync`. A core file is generated. If the invocation returns, the OpenBoot PROM performs a reboot.
	none	The OpenBoot PROM prints a message describing the reset trap that triggered the error reset and passes control to the OpenBoot PROM .
	boot	The OpenBoot PROM firmware reboots the domain. A core file is not generated. Rebooting a domain occurs using the OpenBoot PROM settings for `diag-device` or `boot-device`, depending on the value of the OpenBoot PROM configuration variable `diag-switch?`
		If `diag-switch?` is set to true, the device names in `diag-device` will be the default for boot. If `diag-switch?` is set to false, the device names in `boot-device` will be the default for boot.
Log Host		*The name of the IP address* of the loghost for this domain. The format is *loghost*:[*facility*] *where: facility is* local*x* (*x* = 0-7).
Domain Description		Enter a brief description for this domain. For example, its function.
Domain Contact		Enter the name of the primary domain administrator.

TABLE 3-5 Parameter Values for the `setupdomain` Command *(Continued)*

Parameter	Value	Description
Trap Hosts		Enter the name or the IP address of the SNMP trap host for this domain.
Public Community String		Authentication string for SNMP readers. The default value is A-public, B-public, and so on.
		Note—Make sure that the value in this field is the same as the Sun Management Center value for public community string.
Private Community String		Authentication string for readers and writers. The default value is A-private, B-private, and so on.
		Note—Make sure that the value in this field is the same as the Sun Management Center value for private community string.

CODE EXAMPLE 3-4 provides an example of how to set up domain-specific parameter values for the domain shell. Current values are displayed in square brackets ([ ]). If a value is not specified, it retains the current value.

CODE EXAMPLE 3-4   Variables for the `setupdomain` Command

```
schostname:A> setupdomain

Domain Boot Parameters
----------------
diag-level [default]:
verbosity-level [min]:
error-level [max]:
interleave-scope [within-board]:
interleave-mode [optimal]:
reboot-on-error [false]:
OBP.use-nvramrc? [<OBP default>]:
OBP.auto-boot? [<OBP default>]:
OBP.error-reset-recovery [<OBP default>]:

Log hosts
---------
Loghost [ ]:

SNMP
-----
Domain Description[]:
Domain Contact[]:
```

CODE EXAMPLE 3-4   Variables for the `setupdomain` Command *(Continued)*

```
Trap Hosts [ ]:
Public Community String [ ]:
Private Community String [ ]:
```

2. **See** TABLE 3-6**, which describes the next steps you need to perform.**

TABLE 3-6   Steps in Setting up Domains Including the `dumpconfig` Command

If you are setting up one domain . . .	If you are setting up more than one domain . . .
Continue with the procedures in this chapter.	• Install and boot the Solaris operating environment on domain A as described in "To Install and Boot the Solaris Operating Environment" on page 58.
	• Go to Chapter 4 to set up additional domains.
	• After all of the domains are set up and before you start each additional domain you set up, have the platform administrator run the `dumpconfig` command. See "To Use the `dumpconfig` Command to Save the Current Platform and Domain Configurations to a Server" on page 56.

Saving the Current Configuration to a Server

This section describes how to use the `dumpconfig` command, which must be run by the platform administrator, to save the current configuration to a server.

▼ To Use the `dumpconfig` Command to Save the Current Platform and Domain Configurations to a Server

---

Note – **At this point, domain configuration is complete. Notify the platform administrator that the next step in setting up your system is to save the configuration. This must be done in the platform shell and only the platform administrator can perform this function**.

Note – *Do not* save the configuration to a domain on this system running the Solaris operating environment. This is because the domain will be unavailable when the system is restored.

Caution – Failure to use `dumpconfig` to save the platform and domain configurations to a server will not allow you to restore the platform and domain configurations to the replacement system controller (if the current system controller fails).

After you make any platform or domain configuration changes or add any new hardware to the system, you must execute the `dumpconfig` command to save the latest platform and domain configuration.

---

1. **Type the system controller** `dumpconfig` **command from the platform shell to save the present system controller configuration to a server. Type:**

   schostname:SC> **dumpconfig -f** *url*

   where:

   `-f` specifies the URL, which can only be `ftp`. For example:

   `ftp://`*userid*:*password*@*host*/*path*

   `ftp://`*host*/*path*

   For a complete description of this command, refer to the *Sun Fire 6800/4810/4800/ 3800 System Controller Command Reference Manual.*

2. **Each time you change the platform and domain configurations, you should invoke the** `dumpconfig` **command again from the platform shell.**

   This is necessary in order to save the latest platform and domain configurations. You can never be sure when there might be a problem with the System Controller board and a replacement System Controller board will need to be installed.

   Run the `dumpconfig` command again after configuration changes are made to the system controller. For example, after using the following system controller commands:

   - `setupdomain`
   - `setupplatform`
   - `setdate`
   - `addboard`
   - `deleteboard`
   - `enablecomponent`
   - `disablecomponent`
   - `password`

   or whenever you change the hardware configuration. By running this command again, the new platform and domain configurations are saved to a server.

   You will need the latest platform and domain configuration, that you saved with the `dumpconfig` command, to restore to a replacement System Controller board.

   For more explanations of how to save new platform and domain configurations with the `dumpconfig` command and restore the platform and domain configurations with the `restoreconfig` command, refer to:

   - *Sun Fire 6800/4810/4800/3800 System Controller Command Reference Manual*
   - "Using the System Controller `dumpconfig` Command to Save the Platform and Domain Configurations" on page 89

- "Using the System Controller `restoreconfig` Command To Restore Platform and Domain Configurations" on page 91

An example of typing the `dumpconfig` command and the output you will see is shown in CODE EXAMPLE 3-5.

CODE EXAMPLE 3-5   Example of the `dumpconfig` Command

```
schostname:SC> dumpconfig -f ftp://host/path
Created: ftp://host/path/schostname.nvci
Created: ftp://host/path_/schostname.tod
```

Caution – Remember to first use the `dumpconfig` command to save the configuration after setting up your system for the first time.

Each time you change the platform or domain configurations or add hardware to your system, have the platform administrator perform the `dumpconfig` command again because you need to save the latest configuration. Failure to save the latest configuration with the `dumpconfig` command will result in not being able to restore your system's latest configuration with `restoreconfig`.

Installing and Booting the Solaris Operating Environment

▼ To Install and Boot the Solaris Operating Environment

1. **Install the Solaris operating environment, if it is not preinstalled.**

   Refer to your installation documentation, which is available with your Solaris operating environment release.

2. **Access the domain A shell.**

   See "Accessing a Domain" on page 29.

3. **Turn the domain A keyswitch to the on position. Type** `setkeyswitch on`.

   The `setkeyswitch on` command powers on the domain. The OpenBoot PROM `auto-boot?` parameter is set to false by default. The Solaris Operating Environment will not boot automatically and you will get the OpenBoot PROM `ok` prompt.

   ```
   schostname:A> setkeyswitch on
   <POST messages displayed here  .  .  .
   .  .  .
   .  .  .
   ok
   ```

4. **At the** `ok` **prompt, boot the Solaris operating environment by typing the OpenBoot PROM** `boot` **command:**

   ```
   ok boot [device]
   ```

   For the optional *device* parameter, see the OpenBoot PROM `devalias` command, which displays the predefined aliases.

   After the Solaris operating environment is booted, the `login:` prompt is displayed.

   ```
   login:
   ```

CHAPTER **4**

Creating and Starting Multiple Domains

This chapter explains how to create additional domains and how to start the domain.

Note – The system is shipped from the factory configured with one domain, domain A, so all system boards are assigned to domain A.

Creating Domains

This section explains how to set up two or more domains. Each domain operates independently. Domains may share Repeater boards. TABLE 4-1 explains how domains share Repeater boards in single partition mode and dual partition mode.

TABLE 4-1   Domains Sharing Repeater Boards in Single and Dual Partition Modes

Partition Mode	Sun Fire 6800 System	Sun Fire 4810/4800/3800 Systems
Single	Domains A and B share all Repeater boards. Domains C and D are not able to run.	Domains A and B share all Repeater boards. Domains C and D are not able to run.
Dual	Domains A and B share Repeater boards RP0 and RP1.	Domain A uses Repeater board RP0.
	Domains C and D share Repeater boards RP2 and RP3.	Domain C uses Repeater board RP2.

The number of domains you can set up varies with the system you have. TABLE 1-1 in Chapter 1 lists the partition and domain requirements. For more information on how to set the partition mode with the setupplatform command, see "To Configure Platform Parameters" on page 46.

▼ To Create Another Domain

Note – This procedure assumes that all boards, CPU/Memory boards, and I/O assemblies have been assigned to domain A (default configuration).

It is strongly suggested that you use domain C with two partitions (dual partition mode) for your second domain. It provides better isolation (complete isolation of Repeater boards) and also better performance.

Note – All active domains must have a minimum of one CPU/Memory board and one I/O assembly.

1. **Enter a domain console.**

See "Accessing the Platform Shell and Domain Shells" on page 26.

Note – Perform steps 2 through 5 only if the Solaris operating environment is running.

2. **From the domain console, as root, halt the Solaris operating environment for the domain you will be removing boards from.**

Refer to the *Sun Hardware Platform Guide*, which is available with your Solaris operating environment release.

You must halt the Solaris operating environment in order to:

- Use boards from an active domain
- Change partition mode

3. **At the ok prompt, press and hold the CTRL key while pressing the] key to get to the telnet> prompt.**

4. **At the** `telnet>` **prompt, type** `send break`**.**

```
ok CTRL ]
telnet> send break
schostname:A>
```

The domain shell prompt is displayed.

5. **In the domain shell, turn the keyswitch off.**

   You can check the state of the keyswitch by typing the `showkeyswitch` command.

```
schostname:A> setkeyswitch off
```

6. **From the platform shell, type the** `deleteboard` **command to unassign the boards you want to move from one domain to another.**

   The syntax of the `deleteboard` command is `deleteboard` *board_name*. The *board_name* value is `sb0` – `sb5` for CPU/Memory boards and `ib6` – `ib9` for I/O assemblies. For example:

```
schostname:SC> deleteboard ib8 sb2
```

7. **Add the boards to the new domain with the** `addboard` **command.**

   The syntax of the addboard command is:
   `addboard -d` *domainID board_name* [*board_name . . .*]

   where:

   `-d` *domainID* is c if you have two partitions and is b if you have one partition.

   board_name is `sb0` through `sb5` (CPU/Memory board) or `ib6` through `ib9` (I/O assembly).

   - If you have one partition, to add `ib8` and `sb2` to domain B, type:

```
schostname:SC> addboard -d b ib8 sb2
```

Note – In order for a domain to be active, the domain must contain a CPU/Memory board and an I/O assembly.

■ If you have two partitions, to add `ib8` and `sb2` to domain C, type:

```
schostname:SC> addboard -d c ib8 sb2
```

8. **Set the date and time for the domain.**

   You set the date and time for the second domain in exactly the same way you set the date and time for domain A. For examples of the `setdate` command, see "To Set the Date and Time for the Platform" on page 44.

9. **Set a password for the second domain.**

   a. **Access the domain that needs a password to be set (domain B or C).**

   See "Accessing the Platform Shell and Domain Shells" on page 26.

   b. **Type the system controller** `password` **command (**CODE EXAMPLE 4-1**).**

   c. **At the** `Enter new password`**: prompt, type your password.**

   d. **At the** `Enter new password again:` **prompt, re-type your password.**

   CODE EXAMPLE 4-1   `password` Command Example With No Password Set

```
schostname:C> password
Enter new password:
Enter new password again:
schostname:C>
```

10. **Configure domain-specific parameters for the new domain with the** `setupdomain` **command.**

    You configure domain-specific parameters for each domain separately. For more details, tables, and code examples, see "To Configure Domain-Specific Parameters" on page 51.

11. **When you are through creating all domains, have the platform administrator save the state of the configuration with the** `dumpconfig` **command.**

    Proceed to "Saving the Current Configuration to a Server" on page 56. Then come back to this section.

12. **Start the domain after all domains have been created. Go to the section "To Start the Domain" on page 66.**

Special Considerations When Creating a Third Domain on the Sun Fire 6800 System

You create three domains in exactly the same way that you create two domains, however it is imperative for the platform to be configured as "dual partition." If the platform is configured as "single partition," halt the Solaris operating environment for all active domains before changing partition mode.

1. **Decide which domain needs higher performance. Add the third domain to the partition that requires the lowest performance.**

   For example, here are some best-practice guidelines to follow (see TABLE 4-2).

   TABLE 4-2 Guidelines for Creating Three Domains on the Sun Fire 6800 System

Description	Domain IDs
Use these domain IDs if domain A requires higher performance and more hardware isolation	A, C, D
Use these domain IDs if domain C requires higher performance and more hardware isolation	A, B, C

   TABLE 4-3 lists the partitions, domains, and Repeater boards in the Sun Fire 6800 system.

   TABLE 4-3 Partitions, Domains, and Repeater Boards in the Sun Fire 6800 System in Dual Partition Mode

Partition	Domains	Repeater Boards
Partition 0	A, B	RP0, RP1
Partition 1	C, D	RP2, RP3

2. **Go to the procedure ""To Create Another Domain" on page 62 to create the third domain.**

   CODE EXAMPLE 4-2 shows an example of the output of the `showboards` command with three domains—A, C, and D set up.

   CODE EXAMPLE 4-2 Output of the `showboards` for Three Domains

   ```
   schostname:SC> showboards

   Slot      Pwr   Component Type   State     Status    Domain
   ----      ---   --------------   -----     ------    ------
   /N0/SB0   On    CPU Board        Active    Passed    A
   ```

```
/N0/SB2   On     CPU Board          Active          Passed        C
/N0/SB4   On     CPU Board          Active          Passed        D
/N0/IB6   On     PCI I/O Board      Active          Passed        A
/N0/IB7   On     PCI I/O Board      Active          Passed        C
/N0/IB8   On     PCI I/O Board      Active          Passed        D
```

▼ To Start the Domain

Note – After you have created all domains, have the platform administrator save the state of the configuration using the `dumpconfig` command.

1. Connect to the domain shell you just created (or want to start).

See "Accessing a Domain" on page 29.

2. From the domain shell turn the keyswitch on.

```
schostname:C> setkeyswitch on
```

You want to be at the OpenBoot PROM `ok` prompt. See FIGURE 2-3 in Chapter 2.

3. From the `ok` prompt, type a `boot` command:

```
ok boot [device]
```

where:

device, which is optional, is boot device information contained in the OpenBoot PROM `devalias` command.

After the Solaris operating environment is booted, the `login:` prompt is displayed.

```
login:
```

4. Log in to the Solaris operating environment.

5. From the Solaris operating environment prompt, enter the domain shell.

See FIGURE 2-2.

6. Power on and boot the Solaris operating environment in other domains.

There are various ways to enter another domain. This depends upon how you are connected. For an overview of system controller navigation, see Chapter 2.

One way of accessing a second domain is to go back to the platform shell with the `disconnect` command. From the platform shell, type the `console` *domainID* command to enter a new domain.

For example, if you are in domain B and want to go to domain D, type the following sequence of system controller commands:

```
schostname:B> disconnect
schostname:SC> console d
schostname:D>
```

Domain Procedures After the Domain Has Been Created

This chapter explains how to perform procedures, primarily involving the system controller command line interface involving domains. This chapter includes the following topics:

- "Domains and the `setkeyswitch` Command" on page 70
- "Hard Hung Domain" on page 72
- "Disabling Components in a Domain" on page 73
- "Displaying Domain Configurations for the Current Domain and Other Domain Information" on page 73

If you need to set up more than one domain, see Chapter 4 for how to create additional domains and start up the domains.

Domains

You can logically group boards into domains that act as separate systems capable of running the Solaris operating environment and running independently of other domains.

If you are not changing the partition mode, you can create or delete domains without interrupting the operation of other domains. A domain must have at least one CPU/Memory board and one I/O assembly. A domain should have its own disk from which it can be brought up, as well as an interface for that disk. Domains do not interact with each other.

For information on domains and required number of Repeater boards, see "Repeater Boards" on page 18.

You can use domains for many purposes:

- You can test a new operating system version or set up a development and testing environment in a domain. In this way, if problems occur, other domains will not be affected.
- You can run a large job over the weekend in one domain.
- You can run two different servers in the same system.

You can create a domain out of any group of system boards that meets the following conditions:

- The boards are present and not in use in another domain.
- The boards have sufficient memory to support the domain. The system is operational as long as there is at least one functioning CPU with a minimum of one bank of memory.

Domains and the `setkeyswitch` Command

Each domain in the system has its own virtual keyswitch as controlled by the `setkeyswitch` command. There are five keyswitch positions, as described in TABLE 5-1.

TABLE 5-1   `setkeyswitch` Values and Descriptions

Value	Description
off	Changes the board state of all the boards belonging to a domain to the Assigned board status and places the boards in low-power mode, which enables you to remove the boards from the system. It will take approximately 30 seconds before the board is cooled down and in a safe state to remove it. The domain will not be initialized at system power-on.
standby	Changes the board state of all the boards belonging to a domain to the Assigned board state and turns on boards. The domain will not be initialized at system power-on, but the boards that comprise the domain will be powered on.
on	Active board state. Powers on and initializes the domain. The system controller brings the domain into the OpenBoot PROM through POST. If the OpenBoot PROM has `auto-boot?` set to `true`, then the Solaris operating environment boots automatically.
diag	Active board state. Similar to the `setkeyswitch on` command except that the POST verbose mode is set to on and the POST diagnostic level is set to maximum.
secure	Active board state. Similar to the `setkeyswitch on` command except that the `break` command and the `reset` commands are ignored. CPU/Memory board and I/O assembly flash PROM updates are not allowed.

▼ To Power On a Domain in the Domain Shell

● **Set the keyswitch to** `on`, `diag`, `or secure` **using the system controller** `setkeyswitch` **command in the domain shell of the domain you want to power on.**

▼ To Shut Down a Domain from the Domain Shell

1. **Enter the domain console of the domain you want to shut down.**

   Refer to "System Controller Navigation" on page 31.

   From the domain console, if the Solaris operating environment is booted you will see the `%`, `#`, or `login:` prompts.

2. **From the domain console, as root halt the Solaris operating environment.**

   Refer to the *Sun Hardware Platform Guide*, which is available with your Solaris operating environment release.

3. **Enter the domain shell from the domain console.**

   See FIGURE 2-1 and FIGURE 2-2.

4. **In the domain shell, type the** `setkeyswitch off` **system controller command:**

   ```
   schostname:A> setkeyswitch off
   ```

   If you need to completely power off the system, see "Powering Off and On the System" on page 81.

▼ To Delete Boards From a Domain

Note – When you delete a board from a domain, the domain must not be active.

Remove a board from a domain by using the `deleteboard` command. The syntax of the `deleteboard` command is
`deleteboard` *board_name* [*board_name* . . .].

1. **Enter the domain shell for the proper domain. or enter the platform shell**

   See "Accessing the Platform Shell and Domain Shells" on page 26.

2. **Type the** `showboards` **command to list the boards in the domain.**

CODE EXAMPLE 5-1   `showboards` Example

```
schostname:SC> showboards

Slot      Pwr   Component Type   State     Status    Domain
----      ---   --------------   -----     ------    ------
/N0/SB0   On    CPU Board        Active    Passed    A
/N0/SB2   On    CPU Board        Active    Passed    C
/N0/SB4   On    CPU Board        Active    Passed    D
/N0/IB6   On    PCI I/O Board    Active    Passed    A
/N0/IB7   On    PCI I/O Board    Active    Passed    C
/N0/IB8   On    PCI I/O Board    Active    Passed    D
```

3. **Using the** `showboards` **display, unassign the proper board from the domain with the** `deleteboard` **command.**

The CPU/Memory board or I/O assembly must be in the Assigned board state as displayed with the `showboards` command.

For example:

```
schostname:A> deleteboard sb2
```

Hard Hung Domain

If you cannot log into the Solaris operating environment, and typing the `break` command did not force control of the domain back to the OpenBoot PROM `ok` prompt, the domain could be paused due to an error or the domain in the domain shell is hard hung.

You can get the status of the platform and the domain with the following commands:

- `showplatform -p status` (from the platform shell)]
- `showdomain -p status` (from the domain shell)

For a step-by-step procedure for what to do when the domain is hung, see "Hard Hung Domain" on page 113.

Disabling Components in a Domain

To disable components in a domain using the system controller software, see "Disabling Components" on page 115. Disabling components in the domain, which is also referred to as blacklisting, provides lists of system board components that will not be tested and will not be configured into the Solaris operating environment.

To disable components in a domain using the Solaris operating environment, see the *Sun Hardware Platform Guide*, which is available with your operating system release.

Blacklisting a component or device can be used if you believe it might be failing intermittently or is failing only after the system is booted.

Displaying Domain Configurations for the Current Domain and Other Domain Information

The `showdomain` command, available only in one of the domain shells, enables you to display the domain configurations for the current domain. For more information on this command, refer to the *Sun Fire 6800/4810/4800/3800 System Controller Command Reference Manual*.

You display a listing of boards in the domain along with the board status, board state, and domain assignment with the `showboards` command. With the system controller `showenvironment` command, you can display the environment sensors values and status.

Security

This chapter lists the major security threats, provides important information about the system controller, explains password requirements for the platform and the domains and describes domain separation requirements.

This chapter contains the following topics:

- "Security Threats" on page 75
- "Changing Passwords for the Platform and the Domain" on page 76
- "To Set the Password for a Domain" on page 77

Security Threats

Some of the threats regarding host break-ins that can be imposed are:

- Unauthorized system controller access
- Unauthorized domain access
- Unauthorized administrator workstation access
- Unauthorized user workstation access

Caution – It is important to remember that access to the system controller can shut down all or part of the system, including active domains running the Solaris operating environment. Also, hardware and software configuration can be changed.

Changing Passwords for the Platform and the Domain

Make sure that you know who has access to the system controller. Anyone who has that access can control the system.

When you set up your system for the first time, make sure that you set the platform password and a different domain password for each domain (even if the domain is not used) to increase isolation between domains. How to set these passwords for both the platform and each domain in the next section.

Continue to change these passwords on a regular basis. There are separate passwords for the platform and for each domain. The `password` command, which is available from the platform shell and the domain shell, sets the password.

▼ To Set the Password for the Platform

1. **Enter the system controller platform shell.**

2. **Set the password for the platform by typing the** `password` **command** (CODE EXAMPLE 6-1**).**

   Before you can change the password, the password command confirms you current password (if you have one) and then prompt for the new password. Then, you retype your new password again. The change does not affect access to the currently active session. Following is a example of setting a password, which does not have a password set.

   CODE EXAMPLE 6-1 `password` Command Example In the Platform Shell With No Password Set

   ```
   schostname:SC> password
   Enter new password:
   Enter new password again:
   schostname:SC>
   ```

   Note – If you want to change a password for a domain in the platform shell use the following syntax: `password [domainID]`. For example, to set the password for domain B, type: `password B`.

▼ To Set the Password for a Domain

1. **Enter one of the the system controller domain shells you want to set the password for.**

2. **Set the password for a domain by typing the** `password` **command**
   (CODE EXAMPLE 6-2*).*

   where:

   domainID is a, b, c, or d.

   Before you can change the password, the password command confirms you current password (if you have one) and then prompt for the new password. Then, you retype your new password again. The change does not affect access to the currently active session. Following is a example of setting a password, which does not have a password set.

   CODE EXAMPLE 6-2   `password` Command Example With No Password Set

   ```
   schostname:B> password
   Enter new password:
   Enter new password again:
   schostname:B>
   ```

Saving the Current Configuration

The system controller has two commands which save and restore the current configuration:

- `dumpconfig` saves the current configuration
- `restoreconfig` restores the latest saved configuration

After you set up your system for the first time, when you change the configuration of the platform or of any domain, or any time you add hardware to your system, you must use the `dumpconfig` command to save the current configuration. If the system controller fails, you can use the `restoreconfig` command to restore the latest saved configuration to the other system controller.

For details on how to use these two commands, refer to the *Sun Fire 6800/4810/4800/3800 System Controller Command Reference Manual.* For a step-by-step procedure on how to use the `dumpconfig` command, refer to Chapter 3. For a step-by-step procedure on how to use the `restoreconfig` command, refer to Chapter 7.

Domain Separation

The domain separation requirement is based on allocating computing resources to a specific domain. These mid-range systems enforce domain separation, which prevents users of one domain, who only have access to the Solaris operating environment running in that domain, from accessing or modifying the data of another domain.

This security policy enforcement is performed by the software (FIGURE 6-1). In this figure, a domain user, is a person who is using the Solaris operating environment and does not have access to the system controller. The domain administrator is responsible for configuring the domain, maintaining domain operations, and in general overseeing the domain. As this figure shows the domain administrator has access to the domain console and domain shell for the domain the administrator is responsible for.

Also note in FIGURE 6-1 that the platform administrator has access to the platform shell and the platform console. If the platform administrators knows the domain passwords or if domain passwords are not set, the platform administrator also has access to domain shells and consoles.
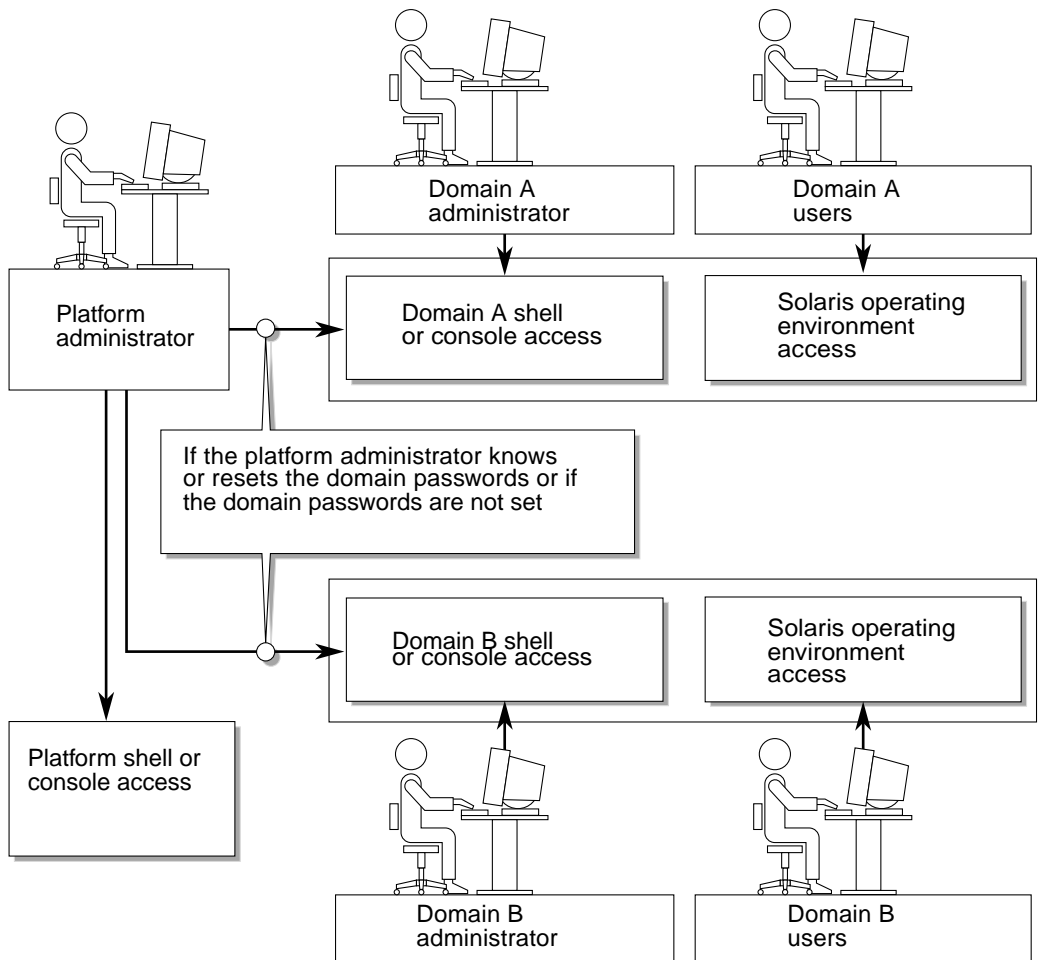
FIGURE 6-1 System With Domain Separation

The following are security items to consider in each domain:

- Make sure that all passwords are within acceptable security guidelines. For example, each domain and the platform should have a unique password. Also, it is strongly suggested to change your passwords for the platform and each domain shell on a regular basis.

- Disable direct root logins.

- Scrutinize log files on a regular basis for any irregularities. For more information on these log files, refer to the *Sun Hardware Platform Guide* and/or the *Release Notes* for the operating environment installed on your system.

Maintenance

This chapter explains how to perform the following procedures:

- "Powering Off and On the System" on page 81
- "Upgrading the Flash PROMs" on page 85
- "Using the System Controller `dumpconfig` Command to Save the Platform and Domain Configurations" on page 89
- "Using the System Controller `restoreconfig` Command To Restore Platform and Domain Configurations" on page 91

Powering Off and On the System

To power off the system, you must halt the Solaris operating environment in each domain and power off each domain.

Note – Before you begin this procedure, make sure you have access to the following books, which you will also need in order to complete this procedure.

- *Sun Fire 6800/4810/4800/3800 Systems Service Manual*
- *Sun Hardware Platform Guide*

▼ To Power Off the System

1. **Enter the domain console you want to power off.**

    Refer to Chapter 2.

2. **Log in as root and halt the Solaris operating environment.**

    Refer to the *Sun Hardware Platform Guide*, which is available with your Solaris operating environment release.

    You should see the OpenBoot PROM `ok` prompt.

3. **At the `ok` prompt, press and hold the CTRL key while pressing the] key to get to the `telnet>` prompt. At the `telnet>` prompt, type `send break`.**

    ```
    ok CTRL ]
    telnet> send break
    schostname:A>
    ```

    The domain shell prompt is displayed.

4. **Turn the domain keyswitch to the off position with the `setkeyswitch off` command.**

    ```
    schostname:A> setkeyswitch off
    ```

5. **Disconnect from the session. Type the `disconnect` command..**

    ```
    schostname:A> disconnect
    ```

6. **Connect to another domain console you want to power off. Complete Step 1 through Step 4 for each domain you want to power off.**

    To access the domain you want to power off, see "Accessing a Domain" on page 29.

7. **Access the platform shell.**

    See "Accessing the Platform Shell" on page 26.

8. **Power off the power grid(s).**

    Powering off the power grids powers off the power supplies. Complete the following substeps.

a. **If you have a Sun Fire 6800 system, you must power off both power grids.**

If you do not have a Sun Fire 6800 system, go to Step b.

```
schostname:SC> poweroff grid0 grid1
```

Go to Step 9.

b. **If you have a Sun Fire 4810/4800/3800 system, there is only one power grid, grid 0. Power off power grid 0 by typing:**

```
schostname:SC> poweroff grid0
```

9. **Complete the steps to power off the hardware in your system.**

Refer to the "Powering Off and On" chapter of the *Sun Fire 6800/4810/4800/3800 Systems Service Manual* for step-by-step instructions.

▼ To Power On the System

1. **Power on the hardware.**

Refer to the "Powering Off and On" chapter of the *Sun Fire 6800/4810/4800/3800 Systems Service Manual.*

2. **Access the system controller platform shell.**

See "Accessing the Platform Shell" on page 26.

3. **If you have a Sun Fire 6800 system, power on power grid 0 and power grid 1. Type:**

```
schostname:SC> poweron grid0 grid1
```

The poweron grid command powers on power supplies. Go to Step 5.

4. **If you have a Sun Fire 4810/4800/3800 system, there is only one power grid, grid 0. Power on power grid 0 by typing:**

```
schostname:SC> poweron grid0
```

The poweron grid0 command powers on power supplies.

5. **Access the domain shell for the domain you want to boot.**

   "Accessing a Domain" on page 29.

6. **Boot the domain.**

   a. **Boot the domain with the system controller** `setkeyswitch on` **command.**

   ```
   schostname:A> setkeyswitch on
   ```

   This command turns the domain on and boots the Solaris operating environment
   if the OpenBoot PROM `auto-boot?` parameter is set to true and the
   `boot-device` parameter is set to the proper boot device. Go to Step 7.

   If the Solaris operating environment did not boot automatically, continue with the
   Step b. The Solaris operating environment will not boot automatically if the
   OpenBoot PROM `auto-boot?` parameter is set to false. You will see the `ok`
   prompt.

   b. **At the** `ok` **prompt, type the** `boot` **command to boot the Solaris operating
   environment.**

   ```
   ok boot [device]
   ```

   where:

   the optional *device* parameter you type is obtained from the OpenBoot PROM
   `devalias` command.

   After the Solaris operating environment is booted, the `login:` prompt is
   displayed.

   ```
   login:
   ```

7. **To boot another domain, access another domain.**

   For more information on accessing domains, see Chapter 2.

8. **Repeat Step 6 to boot the domain.**

Upgrading the Flash PROMs

> **Note –** Before you begin reading and performing the procedures in this section, refer to the *Release Notes for the Sun Fire 6800/4810/4800/3800 Systems*. The *Release Notes* explain what should be upgraded with flashupdate.

The flashupdate command updates the flash PROMs in the system controller and the system boards (CPU/Memory boards and I/O assemblies). There are no flash PROMs on the Repeater boards. This command is available in the platform shell only.

The source flash image can be on a server or another board of the same type.

For a complete description of this command, refer to the *Sun Fire 6800/4810/4800/3800 System Controller Command Reference Manual*. For explanations of how to use this command, see "To Execute the flashupdate Command" on page 85.

▼ To Execute the flashupdate Command

- **When you upgrade the flash PROMs, if you are upgrading the** scapp, **CPU/Memory board, and I/O assembly PROMs, use the** showboards -p proms **command to ensure compatibility.**

  The output of this command shows your the version number of each device. Currently, there is no method to determine compatibility between the scapp and rtos.

  The syntax of the flashupdate command is:

```
schostname:SC> flashupdate [-y|-n] -f url all|systemboards|scapp|rtos|domainID
```

or

```
schostname:SC> flashupdate [-y|-n] -f url board [ board . . . ]
```

or

```
schostname:SC> flashupdate [-y|-n] -u
```

or

```
schostname:SC> flashupdate [-y|-n] -c source_board destination_board
```

where:

-y does not prompt for confirmation.

-n does not execute this command if confirmation is required.

-f specifies a URL as the source of the flash images. This option requires a network connection. Use this option to install new firmware.

url is the URL of the directory containing the flash images. The URL prefix is no longer supported. You must specify the full URL,

where:

url is:

ftp://*hostname*/*path*

ftp://[*userid*:*password*@]*hostname*/*path* (if a password is set up)

http://*hostname*/*path*

http://[*userid*:*password*@]*hostname*/*path* (if a password is set up)

board is the board name.

-c specifies a board as the source of flash images. Use this option to update replacement boards.

- *source_board* is the source board for the flash images.
- *destination_board* is the destination board for the flash images.

-u automatically updates all of the boards (from the board with the highest revision). Use this option to update replacement boards.

all updates the system controller and all system boards (CPU/Memory boards and I/O assemblies). This option does not update the system controller real time operating system (RTOS).

scapp updates the current system controller. Updating the system controller reboots the system controller. To update the other system controller, you must run the flashupdate command from the other system controller. Use showsc to determine which system controller is active.

systemboards are all CPU/Memory boards and I/O assemblies.

rtos updates the real time operating system for the system controller. This action reboots the system controller.

domainID (a, b, c, or d) is the domain where the flash PROMs on the board will be updated. The *domainID* is a, b, c, or d. All of the boards assigned to this domain with power will be updated.

-h displays help for this command.

⚠ **Caution –** Under normal circumstances, the flashupdate command will complete successfully. However, if the flashupdate command is terminated abnormally (such as a power failure, a failed network connection, and so on), the system controller goes into single user mode.

For instructions on single user mode, refer to the flashupdate command in the *Sun Fire 6800/4810/4800/3800 System Controller Command Reference Manual*.

flashupdate Command—Examples

⚠ **Caution –** Do not interrupt the flashupdate update operations.

Caution – Before you perform the flashupdate operation, check all versions of what you are updating using the showboards -p proms command. If this is not done, the domains may crash or the system controller would fail to reboot normally.

Note – Use the platform console to monitor the flashupdate operations.

Note – For the flashupdate all, flashupdate all rtos, flashupdate scapp, and the flashupdate rtos commands, all of these commands cause the system controller to reboot twice—one time to upgrade and one time to boot the new firmware.

■ To update the flash PROMs on the system controller and all CPU/Memory boards and I/O assemblies, make sure that all boards and assemblies are powered on. If a board or assembly is powered off, the flashupdate operation will fail. Type:

```
schostname:SC> flashupdate -f ftp://host/path all
```

This command reboots the active system controller.

■ To update the flash PROMs on all CPU/Memory boards, I/O assemblies, and the system controller real time operating system (rtos), type:

```
schostname:SC> flashupdate -f ftp://host/path all rtos
```

This command reboots the system controller.

■ To update the flash PROMs on the system controller, which also reboots the system controller, type:

```
schostname:SC> flashupdate -f ftp://host/path scapp
```

This command reboots the system controller.

You *cannot* update the firmware on both system controllers (only the active system controller). When the other system controller takes over from the previously active system controller, you must update the firmware in the newly active system controller, by following the example in the previous code box.

■ To update the active System Controller board and the system controller real time operating system (rtos), It is strongly suggested that when you update either scapp or rtos that you perform it from the platform console or watch the console output. Type:

```
schostname:SC> flashupdate -f ftp://host/path scapp rtos
```

This command reboots the system controller.

■ To upgrade the flash PROMs on all CPU/Memory boards and I/O assemblies (system boards), make sure that all boards and assemblies are powered on. If a board or assembly is powered off, the flashupdate operation will fail. Type:

```
schostname:SC> flashupdate -f ftp://host/path systemboards
```

The new flash PROMs for the CPU/Memory boards and I/O assemblies will be used after you turn the keyswitch on. This takes advantage of new features and bug fixes.

■ To upgrade the flash PROMs on CPU/Memory board 4 (SB4), type:

```
schostname:SC> flashupdate -f ftp://host/path sb4
```

The new flash PROMs for the CPU/Memory board will be used after you turn the keyswitch on. This takes advantage of new features and bug fixes.

■ To upgrade the flash PROMs on I/O assembly 8 (`IB8`), type:

```
schostname:SC> flashupdate -f ftp://host/path ib8
```

The new flash PROMs for the I/O assembly will be used after you turn the keyswitch on. This takes advantage of new features and bug fixes.

■ To update the system controller real time operating system (`rtos`), type:

```
schostname:SC> flashupdate -f ftp://host/path rtos
```

This command reboots the system controller.

Using the System Controller `dumpconfig` Command to Save the Platform and Domain Configurations

After you make any changes to the platform and domain configurations or install any new hardware, you must type the `dumpconfig` command again, which saves the current platform and domain configurations to a server. If your System Controller board becomes defective, you cannot type the `dumpconfig` at that time because the System Controller board is not operating properly.

▼ To Save the Current System Controller Configuration With the `dumpconfig` Command

Note – The host name you enter must be a complete host name (not a partial one).

Do not save the configuration to a domain running the Solaris operating environment. This is because the domain will be unavailable when the system is restored.

Note – The directory specified in the URL path must have write permission, including user access. Also, make sure that the data files are present in the URL.

You will need the latest platform and domain configuration that you saved with the `dumpconfig` command in order to restore the correct platform and domain configuration to the replacement System Controller board.

Caution – Run this command when you change platform or domain configurations. For more information, see the following bulleted list of system controller commands that change the configuration. Also, run this command whenever you change the hardware configuration.

Invoking this command is *very important* because if the System Controller board fails and you did not use this command to save the platform and domain configurations, you will have to manually reconfigure the platform and the domains.

● **Type the system controller** `dumpconfig` **command from the platform shell to save the present platform and domain configurations to a server.**

```
schostname:SC> dumpconfig -f url
```

This command saves the *schostname*.`nvci` and *schostname*.`tod` data files.

where:

`-f` specifies the URL, which can only be `ftp`. For example:

   `ftp://`*userid*`:`*password@host*`/`*path*
   `ftp://`*host*`/`*path*

Run the `dumpconfig` command again after configuration changes are made to the system controller, for example with the following system controller commands:

■ `setupdomain`
■ `setupplatform`
■ `setdate`
■ `addboard`
■ `deleteboard`
■ `enablecomponent`
■ `disablecomponent`
■ `password`
■ `setkeyswitch`

or whenever you change the hardware configuration. By running again this command, the new platform and domain configurations are saved to a server.

This command is intended to be used as part of the procedure in replacing a failed System Controller board. You *should not* use this command to revert to an old configuration. The `showplatform`, `showdomain`, and `showboards` system controller commands display all of the configuration and can be used as a reference.

If you need to replace the System Controller board, this configuration information can be used to restore the platform and domain configurations to the replacement System Controller board.

Example

An example of the `dumpconfig` command and its output is shown in CODE EXAMPLE 7-1.

CODE EXAMPLE 7-1   Example of the `dumpconfig` Command

```
schostname:SC> dumpconfig -f ftp://hostname/path_name
Created: ftp://host/path/schostname.nvci
Created: ftp://host/path/schostname.tod
```

Using the System Controller `restoreconfig` Command To Restore Platform and Domain Configurations

In order to restore the latest platform and domain configurations on the replacement System Controller board, you must have invoked the `dumpconfig` system controller command, which saved the latest system platform and domain configurations.

⚠ **Caution –** If you did not follow the procedures in this book and typed the `dumpconfig` command before the System Controller board became defective or failed, contact your Sun service provider for more information.

▼ To Replace the Current System Controller Configuration With the `restoreconfig` Command

1. **Maker sure that you invoked the `dumpconfig` command while the system controller was operational.**

   This command saved the platform and domain configurations.

2. **Halt the Solaris operating environment in each domain and power off each domain.**

   For more information, see "Powering Off and On the System" on page 81.

3. **Enter the platform shell.**

   See "Accessing the Platform Shell" on page 26.

4. **Type the system controller `restoreconfig` command from the platform shell to restore the platform and domain configurations from a server:**

   ```
   schostname:SC> restoreconfig [-y|-n] -f url
   ```

   where:

   `-y` does not prompt for confirmation.

   `-n` does not execute this command is confirmation is required.

   `-f` specifies a URL to restore from.

      url is the directory containing the data files. The supported protocols are `ftp` and `http`. For example:

         `ftp://`*userid*`:`*password@host*`/`*path*

         `ftp://`*host*`/`*path*

         `http://`*userid*`:`*password@host*`/`*path*

         `http://`*host*`/`*path*

   After the platform and domain configurations are restored, the system controller is rebooted.

5. **Set the date and time for the platform and for each domain using the `setdate` command.**

6. **Check the state of each domain. Each domain should be restored to its state when the configuration was stored.**

   For example, if a domain was active, the domain should be activated immediately.

Example

CODE EXAMPLE 7-2 shows an example of the `restoreconfig` command with the required `-f` option.

CODE EXAMPLE 7-2   `restoreconfig` Example

```
schostname:SC> restoreconfig -f ftp://host/path

The system controller will be rebooted when the restore is complete. The date
will need to be set in the platform and each domain.

Do you want to restore the system controller configuration now [no]? yes

Retrieving: ftp://host/path/schostname.nvci
Retrieving: ftp://host/path/schostname.tod
Verifying data
NVCI has been restored
TOD has been restored

Restore complete. The system controller is being rebooted.
The date will need to be set in the platform and each domain.

Software Reset . . .
```

For complete information on this command, refer to the *Sun Fire 6800/4810/4800/3800 System Controller Command Reference Manual*.

Testing CPU/Memory Boards and I/O Assemblies

This chapter describes how to use the system controller `testboard` command to test the CPU/Memory board. This chapter also describes how to test an I/O assembly.

Testing a CPU/Memory Board

Use the `testboard` system controller command to test the CPU/Memory board name you specify. This command is available in both the platform shell and the domain shells. The board state must be either Available or Assigned and the board must be on. To display the board state, use the `showboards -v` command.

`testboard` Command Syntax

The syntax is:

```
testboard [-fs] board_name
testboard -h
```

where:

- `-h` displays help for this command.
- `-f` forces the test to run on the board.
- `-s` prints the port status.
- *board_name* for the CPU/Memory board is `sb0 – sb5`.

`testboard` Command Platform Shell and Domain Shell— Example

To test CPU/Memory board, `sb0`, from a domain A shell type:

```
schostname:A> testboard sb0
```

Testing an I/O Assembly

In order to test an I/O assembly you need to have a spare domain that is not running the Solaris operating environment. Follow these steps:

1. **Enter the domain shell of a spare domain (A-D) that is NOT running the Solaris operating environment and that has** *at least* **one CPU/Memory board.**

   See "Accessing a Domain" on page 29.

2. **In the spare domain shell, add the I/O assembly to the domain with tho** `addboard` **command.**

   This example shows typing the `addboard` command to domain B.

```
schostname:B> addboard ibx
```

   where:

   x is 6, 7, 8, or 9.

3. **Set the virtual keyswitch in the spare domain to on. Type:**

   POST is run on the domain when you turn the virtual keyswitch to on.

```
schostname:B> setkeyswitch on
.
.
ok
```

   If you see the ok prompt, you know that the I/O assembly is functioning properly.

Removing and Replacing Boards and Devices

This chapter discusses the software steps to remove and replace the following boards, assemblies, and devices:

- "CPU/Memory Board, I/O Assembly, or CompactPCI Card" on page 97
- "Repeater Board" on page 100
- "System Controller Board" on page 102
- "Power Supply" on page 105
- "Fan Tray" on page 106

To remove and install the FrameManager or ID board, refer to the *Sun Fire 6800/ 4810/4800/3800 Systems Service Manual.*

CPU/Memory Board, I/O Assembly, or CompactPCI Card

This section describes the software steps needed in order to remove and replace a CPU/Memory board, I/O assembly, or CompactPCI card. Before you begin this procedure, make sure you have the *Sun Fire 6800/4810/4800/3800 Systems Service Manual* handy since you will need it for hardware removal and installation steps. You will also need the *Sun Hardware Platform Guide*, which is both a hard copy and an online book available with your Solaris operating system release. This book describes how to halt the Solaris operating environment.

▼ To Remove and Replace a CPU/Memory Board, I/O Assembly, or CompactPCI Card

1. **Enter the domain console that contains the board, card, or assembly you want to remove and replace.**

   See Chapter 2.

2. **Halt the Solaris operating environment in the domain containing the board, card, or assembly you want to remove.**

   Refer to the Sun Fire 6800/4810/4800/3800 System Operating Environment Commands chapter in the *Sun Hardware Platform Guide*, which is available with your operating system release.

   You should see the OpenBoot PROM `ok` prompt.

3. **At the `ok` prompt, press and hold the CTRL key while pressing the] key to get to the `telnet>` prompt. At the `telnet>` prompt, type `send break`.**

   ```
   ok CTRL ]
   telnet> send break
   schostname:A>
   ```

   The domain shell prompt is displayed.

4. **Turn the domain keyswitch to the off position with the `setkeyswitch off` command.**

   ```
   schostname:A> setkeyswitch off
   ```

   When you type the `setkeyswitch off` command, the state of all the boards, card, and assemblies in the domain are changed, which allow you to remove the board, card, or assembly from the domain.

5. **Remove the CPU/Memory board, card, or I/O assembly from the domain.**

   Refer to the *Sun Fire 6800/4810/4800/3800 Systems Service Manual*.

6. **Replace the CPU/Memory board, card, or I/O assembly into the domain.**

   Refer to the *Sun Fire 6800/4810/4800/3800 Systems Service Manual*.

7. **From the domain shell, turn the domain keyswitch to the on position with the** `setkeyswitch on` **command.**

```
schostname:A> setkeyswitch on
```

This command turns the domain on and boots the Solaris operating environment if the OpenBoot PROM `auto-boot?` or the system controller `setupdomain` `OBP.auto-boot?` parameter is set to true and the OpenBoot PROM `boot-device` parameter is set to the proper boot device. If the Solaris operating environment did not boot automatically, continue with the Step 8.

The Solaris operating environment will not boot automatically if the OpenBoot PROM `auto-boot?` parameter is set to false. You will see the `ok` prompt. If the appropriate OpenBoot PROM parameters are not set up to take you to the `login:` prompt, you will see the `ok` prompt.

For more information on these OpenBoot PROM parameters, refer to the Sun Fire 6800/4810/4800/3800 System Operating Environment Commands chapter in the *Sun Hardware Platform Guide,* which is available with your operating system release. For information on the or the `setupdomain OBP.auto-boot?` parameter, refer to the `setupdomain` command, in "To Configure Domain-Specific Parameters" on page 51.

8. **At the** `ok` **prompt, type the** `boot` **command:**

```
ok boot [device]
```

For the optional *device*, use the OpenBoot PROM `devalias` command at the `ok` prompt to see the predefined aliases.

After the Solaris Operating Environment is booted, the `login:` prompt is displayed.

```
login:
```

Repeater Board

This section discusses the software steps needed to remove and replace a Repeater board.

▼ To Remove and Replace a Repeater Board

You must halt and power off the domains that the Repeater board is connected to.

⚠ **Caution –** Be sure you are properly grounded before you remove and replace the Repeater board.

1. **Determine which domains are active by typing the** `showplatform -p status` **system controller command from the platform shell.**

2. **Determine which Repeater boards are connected to each domain (**TABLE 9-1**).**

TABLE 9-1   Repeater Boards and Domains

System	Partition Mode	Repeater Board Names	Domain IDs
Sun Fire 6800 system	Single partition	RP0, RP1, RP2, PR3	A, B
	Dual partition	RP0, RP2	A, B
		RP1, RP3	C, D
Sun Fire 4810 system	Single partition	RP0, RP2	A, B
	Dual partition	RP0	A. B
		RP2	C. D
Sun Fire 4800 system	Single partition	RP0, RP2	A, B
	Dual partition	RP0	A. B
		RP2	C. D
Sun Fire 3800 system	Equivalent of two Repeater boards integrated into the active centerplane		

3. **Complete the steps to halt the Solaris operating environment in each domain the Repeater board is connected to and power off each domain.**

   See "Powering Off and On the System" on page 81.

4. **Power off the Repeater board with the** `poweroff` **command.**

   ```
   schostname:SC> poweroff board_name
   ```

   board_name is the name of the Repeater board (`RP0`, `RP1`, `RP2`, or `RP3`).

5. **Remove and replace the Repeater board.**

   Refer to the *Sun Fire 6800/4810/4800/3800 Systems Service Manual*.

6. **Access the domain you want to power on.**

   See "Accessing a Domain" on page 29.

7. **Boot the domain with the** `setkeyswitch on` **command.**

   When you boot the domain, the Repeater boards power on automatically.

   ```
   schostname:A> setkeyswitch on
   ```

   ■ If you set the OpenBoot PROM `auto-boot?` parameter to true and the `boot-device` parameter is set to the proper boot device, the Solaris operating environment will boot automatically and you will get the `login:` prompt. Go to Step 9.

   ■ If you set the OpenBoot PROM `auto-boot?` parameter to false, the Solaris operating environment will not boot automatically and you will get the OpenBoot PROM `ok` prompt. From the `ok` prompt, type a `boot` command as described in the next step.

8. **From the OpenBoot PROM** `ok` **prompt, type a** `boot` **command:**

   ```
   ok boot [device]
   ```

   where:

   device, which is optional, is derived from the OpenBoot PROM `devalias` command.

9. **Access another domain you want to power on.**

   Refer to Chapter 2.

10. **Repeat Step 7 and Step 8 to boot the domain**

    The Repeater boards connected to the domain will power on automatically.

System Controller Board

This section discusses how to remove and replace a System Controller board.

▼ To Remove and Replace the System Controller Board

In order to remove a defective System Controller board and replace the defective System Controller board with the other System Controller board, follow these steps:

Note – Invoking this command is *very important* because if the System Controller board fails and you did not use this command to save the platform and domain configurations, you will have to manually reconfigure the platform and the domains.

---

1. **For each active domain, halt the Solaris operating environment in the domain. Use the `telnet`, `rsh`, `rlogin` commands to connect to the domain console and halt the Solaris operating environment.**

Caution – Since you do not have access to the console, you will not be able to determine when the operating environment is completely halted. Using your best judgement, wait a while until you can best judge that the operating environment is halted.

---

2. **Turn off the system completely. Be sure to power off the circuit breakers and the power supply switches for the Sun Fire 3800 system. Make sure you power off all the hardware components to the system.**

   Refer to the "Powering Off and On" chapter in the *Sun Fire 6800/4810/4800/3800 Systems Service Manual.*

3. **Remove the defective System Controller board and replace the new System Controller board.**

   Refer to the "System Controller Board" chapter in the *Sun Fire 6800/4810/4800/3800 Systems Service Manual.*

4. **Power on *only* the RTUs, AC input boxes, and the power supply switches (in the Sun Fire 3800 system), since this system does note have an AC input box.**

   Refer to the "Powering Off and On" chapter in the *Sun Fire 6800/4810/4800/3800 Systems Service Manual.* When this hardware is powered on, the system controller will automatically power on.

5. **Type the system controller** `restoreconfig` **command to restore the platform and domain configurations from a server.**

Note – You must have saved the latest platform and domain configurations of your system with the `dumpconfig` command in order to restore the latest platform and domain configurations with the `restoreconfig` command.

Caution – When you insert a new system controller into the system, it is set to the default values of the `setupplatform` command. It is set to DHCP, which means the system controller will use DHCP to get to its network settings.

If DHCP is not available (there is a 60-second timeout waiting period), then the system controller will boot and the network (`setupplatform -p net`) will need to be configured before you can type the `restoreconfig` command.

CODE EXAMPLE 9-1 shows what you type at the platform shell and the output you will see:

CODE EXAMPLE 9-1 `restoreconfig` Example

```
schostname:SC> restoreconfig -f url://[userid:password@host/path

The system controller will be rebooted when the restore is complete.
The date will need to be set in the platform and each domain.

Do you want to restore the system controller configuration now? [no] yes

Retrieving: ftp://host/path/schostname.nvci
Retrieving: ftp://host/path/schostname.tod
Verifying data
NVCI has been restored
TOD has been restored

Restore complete. The system controller is being rebooted.
The date will need to be set in the platform and each domain.

Software Reset . . .
```

where:

-f specifies a URL to restore from.

url is the directory containing the data files. The supported protocols are ftp and http. For example:

ftp://[*userid:password@*]*host*/*path*

http://[*userid:password@*]*host*/*path*

There are a few more options to this command (-h, -y, and -n). For complete command description and syntax, refer to the *Sun Fire 6800/4810/4800/3800 System Controller Command Reference Manual*.

6. **Check the date and time for the platform and each domain. Type the** showdate **command in the platform shell and in each domain shell.**

7. **If needed, set the date and time for the platform and for each domain.**

   ■ To set the date for the platform shell, see "To Set the Date and Time for the Platform" on page 44.

   ■ To set the date for each domain shell, see "To Set the Date and Time for Domain A" on page 50.

8. **Check the configuration for the platform. Type** showplatform **at the platform shell.**

9. **Check the configuration for each domain. Type** showdomain **in each domain shell.**

10. **Power on the power grids and boot the Solaris operating environment in each domain you want powered on.**

    Complete Step 2 through Step 8 in "To Power On the System" on page 83.

Power Supply

This section discusses the system controller commands needed in order to remove and replace a power supply while the power is on.

▼ To Remove and Replace a Power Supply

Note – Before you begin this procedure, make sure you have the *Sun Fire 6800/4810/ 4800/3800 Systems Service Manual* handy. You will need this book for help with hardware removal and installation steps. Also, make sure you have a power supply filler panel or a replacement power supply, before you begin.

---

1. **Verify the state of the amber Removal LED (↵▯).**
   - If this LED is on, you do not need to power off the power supply. Go to Step 4.
   - If the LED is off, go to Step 2.

2. **Access the system controller platform shell.**

   See "Accessing the Platform Shell and Domain Shells" on page 26.

3. **Power off the appropriate power supply with the** poweroff **command.**

   ```
   schostname:SC> poweroff psx
   <Board display should show the power supply in slot x powered off>
   ```

   where:

   x is the slot number, 0 – 5.

   The green Activated LED on the power supply (⏻) will be off and the Removal LED (↵▯) will be on.

4. **Complete the hardware removal steps.**

   Refer to the *Sun Fire 6800/4810/4800/3800 Systems Service Manual.*

5. **Immediately complete the power supply installation steps.**

   Refer to the *Sun Fire 6800/4810/4800/3800 Systems Service Manual.*

6. **For all systems, if any power supply in the same power grid is on when you insert the power supply, the power supply powers on automatically.**

   With some systems, the power supplies have power cords and/or power switches. The power cord must be connected to the power outlet and the power supply switch must be turned on in order for the power supply to power on automatically.

7. **Make sure that the green Activated LED (⊘) on the power supply is on.**

   The Activated LED on the power supply will be green a few seconds after inserting it. If the green Activated LED is not lit:
   - Check to see if the power supply is seated properly.
   - Check if the power supply switch (on the Sun Fire 3800 system) is turned on, the power cord inserted, and that the circuit has power.
   - Type the `showboards -v` command and make sure that the power supply is turned on.

Fan Tray

This section discusses the system controller commands needed in order to remove and replace a fan tray while the power is on.

▼ To Remove and Replace a Fan Tray

Note – Before you begin this procedure, make sure you have the *Sun Fire 6800/4810/4800/3800 Systems Service Manual* handy. You will need it for help with hardware removal and installation steps. Also, make sure you have a replacement fan tray or filler panel before you begin.

1. **Access the system controller shell.**

   See "Accessing the Platform Shell and Domain Shells" on page 26.

2. **Power off the fan tray you want to remove.**

   ```
   schostname:SC> poweroff ftx
   ```

   where:

   x is the slot number, 0 – 3. If you don't know the slot number, use the `showboards -v` command.

3. **Verify that the green Activated LED ( ) is off and that the Removal LED ( ) is on.**

4. **Remove the fan tray from the system.**

   Refer to the *Sun Fire 6800/4810/4800/3800 Systems Service Manual.*

5. **Immediately install a filler panel or a replacement fan tray.**

   Refer to the *Sun Fire 6800/4810/4800/3800 Systems Service Manual.* The fan tray powers on automatically.

6. **If a power grid is powered on, you do not need to power on the fan tray with the system controller software.**

   The fan tray powers on automatically.

Troubleshooting

This chapter provides troubleshooting information for a system administrator. The chapter describes the following topics:

System Faults

An internal fault is any condition that is considered to be unacceptable for normal system operation. When the system has a fault, the Fault LED (➤━) will turn on. For descriptions of the LEDs, see "System Faults" on page 109. You must take immediate action to eliminate an internal fault.

LEDs

If your system is in a system cabinet, there are system LEDs on the FrameManager, at the top of the Sun Fire system cabinet. The Sun Fire 4800 system has LEDs built in, which are similar to the FrameManager LEDs. Also there are LEDs on each system board, fan tray, and power supply. For descriptions of the board, I/O assembly, fan tray and power supply LEDs, and FrameManager LEDs refer to the appropriate board, device, or FrameManager chapter of the *Sun Fire 6800/4810/4800/3800 Systems Service Manual*.

Resetting the System Controller

This section discusses how to reset the system controller software.

▼ To Reset the System Controller Software

If the system controller software hangs:

● **Reset the system controller by pressing the reset button on the board with the tip of a pen** (FIGURE 10-1**).**

Reset button
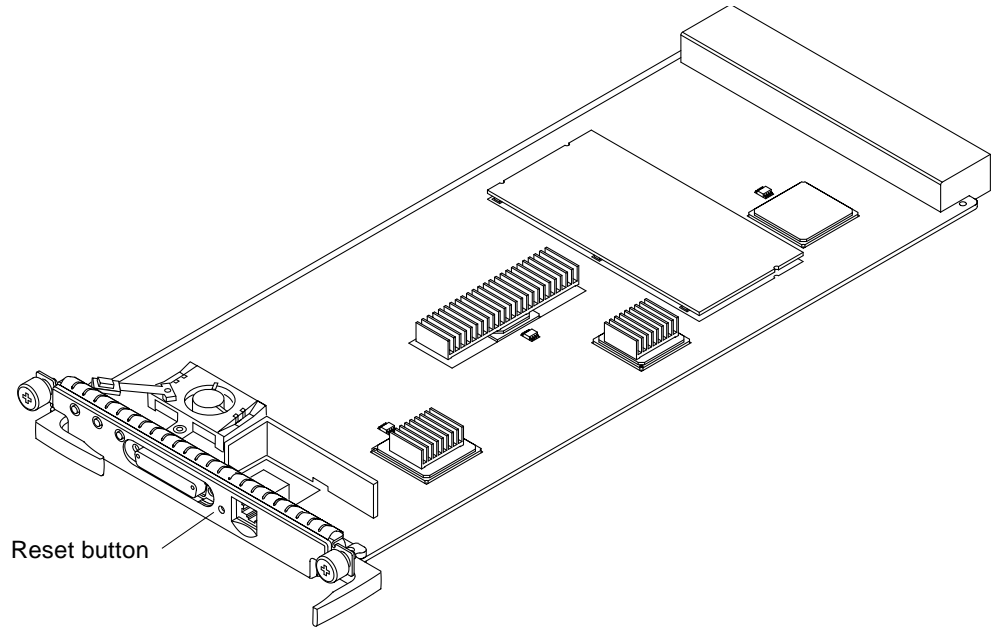
FIGURE 10-1 Resetting the System Controller

Note – You can also use the system controller `reset` command in the platform shell to reset the opposite system controller (`ssc1` if you are using `ssc0` or `ssc0` if you are using `ssc1`. For instructions and command syntax, refer to the *Sun Fire 6800/4810/4800/3800 System Controller Command Reference Manual.*

System Controller Loghosts

You can use the `setupplatform -p` *loghost* command to output platform messages to the loghost. Use the `setupdomain -d` *loghost* command to output domain messages to the loghost. There is a loghost for the platform and for each domain.

For complete information and command syntax, refer to the *Sun Fire 6800/4810/4800/3800 System Controller Command Reference Manual.*

Solaris Operating Environment Loghost

For information on the Solaris operating environment loghost, including how to redirect error messages, refer to the *Sun Hardware Platform Guide*, which is available with your Solaris operating environment release.

Displaying Diagnostic Information

For information on displaying diagnostic information, refer to the *Sun Hardware Platform Guide*, which is available with your Solaris operating environment release.

Displaying System Configuration Information

To display system configuration parameters, refer to the *Sun Hardware Platform Guide*, which is available with your Solaris operating environment release.

Assisting Sun Service Personnel

The following procedure, "To Assist Sun Service Personnel to Determine the Causes of Your Failure" on page 113 lists the actions you must take to help Sun service personnel determine the causes of your failure.

▼ To Assist Sun Service Personnel to Determine the Causes of Your Failure

● **Provide the following information to Sun service personnel so that they can help you determine the causes of your failure:**

  ■ The system controller log files, if the system controller has a log host. The system controller log files are necessary because they contain more information than the `showlogs` system controller command. Also, with the system controller log files, the Sun service personnel is able to obtain a history of the system, which can help during troubleshooting.

  ■ A verbatim transcript of all output written to the domain console leading up to the failure. Also include any output printed subsequent to user actions. If the transcript does not show certain user actions, in a separate file include comments on what actions prompted particular messages.

  ■ A copy of the domain log file from `/var/adm/messages` from the time leading up to the failure.

  ■ The following system controller command output from the platform shell:

    ■ `showsc -v` command
    ■ `showplatform -v` command
    ■ `showplatform -v -d` *domainID* command
    ■ `showboards -v` command
    ■ `showlogs -v` command
    ■ `showlogs -v -d` *domainID* command

Hard Hung Domain

If you cannot log into the Solaris operating environment, and typing the `break` command from the domain shell did not force control of the domain back to the OpenBoot PROM `ok` prompt or the debugger, then the domain is hard hung.

Use the `reset` system controller command, available in the domain shell, to recover a hard hung domain. The `reset` command causes the Solaris operating environment to be terminated in the domain.

Caution – When the Solaris operating environment is terminated, data in memory might not be flushed to disk. This could cause a loss or corruption of the application file system data. Before the Solaris operating environment is terminated, this action requires confirmation from you.

▼ To Recover a Hard Hung Domain

1. **Complete the steps in "To Assist Sun Service Personnel to Determine the Causes of Your Failure" on page 113.**

2. **Access the domain shell for the domain that is hard hung.**

   See "Accessing a Domain" on page 29.

3. **Type the** `reset` **command to force control of the domain back to the OpenBoot PROM. The** `reset` **command sends an externally initiated reset (XIR) to the domain and collects data for debugging the hardware.**

   ```
   schostname:A> reset
   ```

   Note – An error is displayed if the virtual keyswitch is set in the `keyswitch` `secure` position. You cannot type the `reset` command or the `send break` command while the keyswitch is set to secure.

4. **This step depends on the setting of the Open Boot PROM** `error-reset-recovery` **configuration variable.**

   Note – When you set up domain specific variables with `setupdomain`, the `error-reset-recovery` configuration variable was a variable that was set up with `setupdomain`. This variable is actually an OpenBoot PROM variable that was incorporated into the `setupdomain` command for you.

   For complete details on the OpenBoot PROM `error-reset-recovery` configuration variable, refer to the OpenBoot PROM documentation, which is available with the Solaris operating environment online documentation.

   - If the `error-reset-recovery` configuration variable is set to `none`, the domain returns immediately to the OpenBoot PROM. When the OpenBoot PROM takes control, it takes actions based on the setting of the OpenBoot PROM `error-reset-recovery` configuration variable. You can type any OpenBoot PROM command from the `ok` prompt, including rebooting the Solaris operating environment with the `boot` command. Also, you can force a core file with the `sync` command. The actions that can be configured by this variable might mean that the domain will not return to the `ok` prompt.

   - If the `error-reset-recovery` configuration variable is *not* set to `none`, the OpenBoot PROM will automatically take recovery actions.

■ If the `error-reset-recovery` configuration variable is set to `sync` (default), the domain generates a Solaris operating environment `core` file and reboots the domain.

■ If the OpenBoot PROM `error-reset-recovery` configuration variable is set to `boot`, the domain is rebooted.

5. **If the previous actions fail to reboot the domain, use the** `setkeyswitch` **command to force the domain off and reboot the domain.**

   a. **Change the keyswitch to an inactive setting by typing** `setkeyswitch off` **or** `setkeyswitch standby`**.**

   b. **Change the keyswitch to an active setting by typing one of the following** `setkeyswitch` **commands:** `setkeyswitch on`**,** `setkeyswitch diag`**, or** `setkeyswitch secure`**.**

Note – If you do not obtain a `core` file when you change the keyswitch setting from an inactive to and active setting, you will lose troubleshooting data.

Disabling Components

The system controller supports the blacklisting feature, which allows you to disable components on a board (TABLE 10-1).

TABLE 10-1 Blacklisting Component Names

System Component	Component Subsystem	Component Name
CPU system		*board_name/ port/ physical_bank/ logical_bank*
	CPU/Memory boards (*board_name*)	SB0, SB1, SB2, SB3, SB4, SB5
	Ports on the CPU/Memory board	P0, P1, P2, P3
	Physical memory banks on CPU/Memory boards	B0, B1

TABLE 10-1 Blacklisting Component Names *(Continued)*

System Component	Component Subsystem	Component Name
	Logical banks on CPU/Memory boards	L0, L1, L2, L3
I/O assembly system		*board_name/port/bus* or *board_name/card*
	I/O assemblies (*board_name*)	IB6, IB7, IB8, IB9
	Ports on the I/O assembly	P0, P1
	Buses on the I/O assembly	B0, B1
	I/O cards in the I/O assemblies	C0, C1, C2, C3, C4, C5, C6, C7 (the number of I/O cards in the I/O assembly varies with the I/O assembly type).

Blacklisting provides lists of system board components that will not be tested and will not be configured into the Solaris operating environment. The blacklists are stored in nonvolatile memory.

Blacklist a component or device if you believe it might be failing intermittently or is failing. Troubleshoot a device you believe is having problems.

There are three system controller commands for blacklisting:

- `disablecomponent`
- `enablecomponent`
- `showcomponent`

The `disablecomponent` and `enablecomponent` commands only update the blacklists. They do not directly affect the state of the currently configured system boards.

The updated lists will take effect when you do one the following:

- Reboot the domain.
- Transition a domain from an inactive state (`off` or `standby`) to an active state (`on`, `diag`, or `secure`).
- Reset the domain. This should only be done when the domain is hung. For information on how to reset a domain, see "Hard Hung Domain" on page 113.

Note – Blacklisting components in the platform shell and a domain shell are treated differently.

If you blacklist a component from the platform shell and then move the component to another domain, the component is still blacklisted. However, if you blacklist a component in a domain shell and then move the component to a different domain, the component is no longer blacklisted.

Mapping Device Path Names to Physical System Devices

The physical address represents a physical characteristic that is unique to the device. Examples of physical addresses include the bus address and the slot number. The slot number indicates where the device is installed.

You reference a physical device by the node identifier—Agent ID (AID). The AID ranges from 0 to 31 in decimal notation (0 to 1f in hexadecimal). In the device path beginning with ssm@0,0 the first number, 0, is the node ID.

CPU/Memory Mapping

CPU/Memory board and memory agent IDs (AIDs) range from 0 to 23 in decimal notation (1 to 17 in hexadecimal). Depending on the platform type, a system can have up to six CPU/Memory boards.

Each CPU/Memory board can have either two or four CPU processors, depending on your configuration. Each CPU/Memory board has up to four banks of memory. Each bank of memory is controlled by one memory management unit (MMU), which is the CPU processor.

The following code example shows a device tree entry for a CPU processor and its associated memory:

```
/ssm@0,0/SUNW/UltraSPARC-III@b,0 /ssm@0,0/SUNW/memory-controller@b,400000
```

where:

in `b,0`

- b is the CPU processor agent identifier (AID)
- 0 is the CPU processor register

in `b,400000`

- b is the memory agent identifier (AID)
- 400000 is the memory controller register

There are up to four CPU instances, P0 – P3, on each CPU/Memory board. CPU processors with agent IDs 0–3 reside on board name SB0, 4–7 on board name SB1, 8–11 on board name SB2, and so on (TABLE 10-2).

TABLE 10-2   CPU Processor and Memory Agent ID Assignment

CPU/Memory Board Name	Agent IDs On Each CPU/Memory Board			
	P0	**P1**	**P2**	**P3**
SB0	0 (0)	1 (1)	2 (2)	3 (3)
SB1	4 (4)	5 (5)	6 (6)	7 (7)
SB2	8 (8)	9 (9)	10 (a)	11 (b)
SB3	12 (c)	13 (d)	14 (e)	15 (f)
SB4	16 (10)	17 (11)	18 (12)	19 (13)
SB5	20 (14)	21 (15)	22 (16)	23 (17)

The first number in the columns of agent IDs is a decimal number. The number or letter in parentheses is in hexidecimal notation.

I/O Assembly Mapping

TABLE 10-3 lists the types of I/O assemblies, the number of slots each I/O assembly has, and the systems the I/O assembly types are supported on.

TABLE 10-3   I/O Assembly Type and Number of Slots per I/O Assembly by System Type

I/O Assembly Type	Number of Slots Per I/O Assembly	System Name(s)
PCI	8	Sun Fire 6800/4810/4800 systems
CompactPCI	6	Sun Fire 3800 system

TABLE 10-4 lists the number of I/O assemblies per system and the I/O assembly name.

TABLE 10-4   Number and Name of I/O Assemblies per System

System Name(s)	Number of I/O Assemblies	I/O Assembly Name
Sun Fire 6800 system	4	IB6–IB9
Sun Fire 4810 system	2	IB6 and IB8
Sun Fire 4800 system	2	IB6 and IB8
Sun Fire 3800 system	2	IB6 and IB8

Each I/O assembly hosts two I/O controllers:

- I/O controller 0
- I/O controller 1

When mapping the I/O device tree entry to a physical component in the system, you must consider up to five nodes in the device tree:

- Node identifier (ID)
- ID controller agent ID (AID)
- Bus offset
- PCI or CompactPCI slot
- Device instance

TABLE 10-5 lists the AIDs for the two I/O controllers in each I/O assembly.

TABLE 10-5 I/O Controller Agent ID Assignments

Slot Number	I/O Assembly Name	Odd I/O Controller AID	Even I/O controller AID
6	IB6	25 (19)	24 (18)
7	IB7	27 (1b)	26 (1a)
8	IB8	29 (1d)	28 (1c)
9	IB9	31 (1f)	30 (1e)

The first number in the column is a decimal number. The number (or a number and letter combination) in parentheses is in hexidecimal notation.

Each I/O controller has two bus sides: A and B.

- Bus A is referenced by offset 600000.
- Bus B is referenced by offset 700000.

The board slots located in the I/O assembly are referenced by the device number.

PCI I/O Assembly

This section describes the PCI I/O assembly slot assignments and provides an example of the device path.

The following code example gives a breakdown of a device tree entry for a SCSI disk:

```
/ssm@0,0/pci@19,700000/pci@3/SUNW,isptwo@4/sd@5,0
```

Note – The numbers in the device path are hexadecimal.

where:

in `19,700000`

- 19 is the I/O controller agent identifier (AID)
- 700000 is the bus offset

in `pci@3`

- 3 is the device number

`isptwo` is the SCSI host adapter

in `sd@5,0`

- 5 is the SCSI target number for the disk
- 0 is the logic unit number (LUN)

TABLE 10-6 PCI I/O Assembly 8-Slot Assignment

Even/Odd I/O Controller	Bus Offset	Device Number	Slot Assignment
0	700000	1	Slot 0—I/O controller 0, Bus B
0	700000	2	Slot 1—I/O controller 0, Bus B
0	700000	3	Slot 2—I/O controller 0, Bus B
0	600000	1	Slot 3—I/O controller 0, Bus A
1	700000	1	Slot 4—I/O controller 1, Bus B
1	700000	2	Slot 5—I/O controller 1, Bus B
1	700000	3	Slot 6—I/O controller 1, Bus B
1	600000	1	Slot 7—I/O controller 1, Bus A

PCI I/O Assembly

This section describes the PCI I/O assembly slot assignments and provides an example of the device path.

TABLE 10-7 lists, in hexidecimal notation, the slot number, I/O assembly name, device path of each I/O assembly, the I/O controller number, and the bus.

TABLE 10-7 8-Slot PCI I/O Assembly Device Map

I/O Assembly Name	Slot Number	Device Path	I/O Controller Number	Bus
IB9	7	/ssm@0,0/pci@1f,600000/pci@1	1	A
IB8	7	/ssm@0,0/pci@1d,600000/pci@1	1	A
IB7	7	/ssm@0,0/pci@1b,600000/pci@1	1	A
IB6	7	/ssm@0,0/pci@19,600000/pci@1	1	A
IB9	6	/ssm@0,0/pci@1f,700000/pci@3	1	B
IB8	6	/ssm@0,0/pci@1d,700000/pci@3	1	B
IB7	6	/ssm@0,0/pci@1b,700000/pci@3	1	B
IB6	6	/ssm@0,0/pci@19,700000/pci@3	1	B

TABLE 10-7   8-Slot PCI I/O Assembly Device Map   *(Continued)*

I/O Assembly Name	Slot Number	Device Path	I/O Controller Number	Bus
IB9	5	/ssm@0,0/pci@1f,700000/pci@2	1	B
IB8	5	/ssm@0,0/pci@1d,700000/pci@2	1	B
IB7	5	/ssm@0,0/pci@1b,700000/pci@2	1	B
IB6	5	/ssm@0,0/pci@19,700000/pci@2	1	B
IB9	4	/ssm@0,0/pci@1f,700000/pci@1	1	B
IB8	4	/ssm@0,0/pci@1d,700000/pci@1	1	B
IB7	4	/ssm@0,0/pci@1b,700000/pci@1	1	B
IB6	4	/ssm@0,0/pci@19,700000/pci@1	1	B
IB9	3	/ssm@0,0/pci@1e,600000/pci@1	0	A
IB8	3	/ssm@0,0/pci@1c,600000/pci@1	0	A
IB7	3	/ssm@0,0/pci@1a,600000/pci@1	0	A
IB6	3	/ssm@0,0/pci@18,600000/pci@1	0	A
IB9	2	/ssm@0,0/pci@1e,700000/pci@3	0	B
IB8	2	/ssm@0,0/pci@1c,700000/pci@3	0	B
IB7	2	/ssm@0,0/pci@1a,700000/pci@3	0	B
IB6	2	/ssm@0,0/pci@18,700000/pci@3	0	B
IB9	1	/ssm@0,0/pci@1e,700000/pci@2	0	B
IB8	1	/ssm@0,0/pci@1c,700000/pci@2	0	B
IB7	1	/ssm@0,0/pci@1a,700000/pci@2	0	B
IB6	1	/ssm@0,0/pci@18,700000/pci@2	0	B
IB9	0	/ssm@0,0/pci@1e,700000/pci@1	0	B
IB8	0	/ssm@0,0/pci@1c,700000/pci@1	0	B
IB7	0	/ssm@0,0/pci@1a,700000/pci@1	0	B
IB6	0	/ssm@0,0/pci@18,700000/pci@1	0	B

In TABLE 10-7, note the following:

- `600000` is the bus offset and indicates bus A.
- `700000` is the bus offset and indicates bus B.
- `pci@3` is the device number, which means it is the third device on the bus.

CompactPCI I/O Assembly

This section describes the CompactPCI I/O assembly slot assignments and provides an example for the 6-slot I/O assembly device path.

CompactPCI I/O Assembly Slot Assignments

In this code example is the breakdown of the device tree for the CompactPCI I/O assembly, `ib8`.

```
/ssm@0,0/pci@1c,700000/pci@1/SUNW,isptwo@4
```

where:

in `pci@1c,700000`

- `c` is the I/O controller agent identifier (AID)
- `700000` is the bus offset

in `pci@1`

- `1` is the device number

`isptwo` is the SCSI host adapter

TABLE 10-8 lists the 6-slot CompactPCI I/O Assembly slot assignments.

TABLE 10-8   CompactPCI 6-Slot I/O Assembly Slot Assignments for the Sun Fire 3800 System

Even/Odd I/O Controller	Bus Offset	Device Number	Slot Assignment
0	600000	1	Slot 0—I/O controller 0, Bus A
1	600000	1	Slot 1—I/O controller 1, Bus A
0	700000	1	Slot 2— I/O controller 0, Bus B
0	700000	2	Slot 3— I/O controller 0, Bus B
1	700000	1	Slot 4—I/O controller 1, Bus B
1	700000	2	Slot 5—I/O controller 1, Bus B

6-Slot CompactPCI I/O Assembly Device Map

TABLE 10-9 lists, in hexidecimal notation, the slot number, I/O assembly name, device path of each I/O assembly, the I/O controller number, and the bus.

TABLE 10-9   6-Slot CompactPCI I/O Assembly Device Map

I/O Assembly Name	Slot Number	Device Path	I/O Controller Number	Bus
IB8	5	/ssm@0,0/pci@1d,700000/pci@2	1	B
IB6	5	/ssm@0,0/pci@19,700000/pci@2	1	B
IB8	4	/ssm@0,0/pci@1d,700000/pci@1	1	B
IB6	4	/ssm@0,0/pci@19,700000/pci@1	1	B
IB8	3	/ssm@0,0/pci@1c,700000/pci@2	0	B
IB6	3	/ssm@0,0/pci@18,700000/pci@2	0	B
IB8	2	/ssm@0,0/pci@1c,700000/pci@1	0	B
IB6	2	/ssm@0,0/pci@18,700000/pci@1	0	B
IB8	1	/ssm@0,0/pci@1d,600000/pci@1	1	A
IB6	1	/ssm@0,0/pci@19,600000/pci@1	1	A
IB8	0	/ssm@0,0/pci@1c,600000/pci@1	0	A
IB6	0	/ssm@0,0/pci@18,600000/pci@1	0	A

In TABLE 10-9, note the following:

- `600000` is the bus offset and indicates bus A.
- `700000` is the bus offset and indicates bus B.
- `pci@1` is the device number, which means it is the first device on the bus.

Glossary

ACL — Access Control List. In order to assign a board to a domain with the `addboard` command, the board name must be listed in the Access Control List (ACL). The ACL is checked when a domain makes an `addboard` or a `testboard` request on that board. On the Sun Fire 3800 system, all power supplies have switches on them to power them on. These power supplies must be listed in the ACL.

active board state — When the board state is active, the slot has hardware installed in it. The hardware is being used by the domain to which it was assigned. Active boards cannot be reassigned.

assigned board state — When a board state is assigned, the slot belongs to a domain but the hardware is not necessarily tested and configured for use. The slot can be given up by the domain administrator or reassigned by the platform administrator.

available board state — When a board state is available, the slot is not assigned to any particular domain.

domain — A logical grouping of system boards. Domains do not interact with each other. A domain can run its own copy of the Solaris operating environment and has its own host ID.

domain administrator — The domain administrator manages the domain.

partition — A physical and logical separation of Repeater boards. You can set up the system with one partition or two partitions using the system controller `setupplatform` command. Partitions do not share Repeater boards.

platform administrator — The platform administrator manages hardware resources across domains.

port — A board connector.

RTS — Redundant transfer switch

RTU — Redundant transfer unit

SNMP agent — Simple Network Management Protocol agent. Enables or disables the SNMP agent.

Sun Management Center software for the Sun Fire 6800/4810/4800/ 3800 systems   A graphical user interface that monitors your system.

system controller software   The application that performs all of the system controller configuration functions.

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