Introduction:

This Installation TOI serves as a brief introduction to a new Sun Fire Server. Upon completion of the installation of a Sun Fire Server, this TOI should be given to the customer. Note that it is not intended as a replacement for the official Sun documentation for Sun Fire Servers. In the event that there is a conflict between this TOI and the Sun Fire documentation, the Sun Fire documentation shall take precedence.

It is strongly recommended that anyone administering a Sun Fire Server receive official training on the Sun Fire Server product line from Sun or other authorized training facilities.

An overview of the Sun Fire product documentation can be found in the "**Sun Fire System Getting Started**" document. Sun documentation on the Sun Fire Server line can be found at the following URL:

> http://www.sun.com/products−n−solutions/hardware/docs/Servers/Midrange_Servers/Sun_Fire_6438x/index.html

Contents

Hardware Overview:

The Sun Fire Servers are built upon several different Field Replaceable Units (FRUs). The following is a brief description of the major FRUs.

- **RTU & RTS**

    If your Sun Fire Server is installed in a Sun Fire cabinet then it will be connected to the cabinet's RTU(s). The RTUs and RTSs work together to provide A/C power to the Server. A/C power comes into the RTS. The RTU takes A/C power from its active RTS and routes it to the A/C inputs on the Server. The Sun Fire 3800/4810/4800 require a minimum of one RTU in the Sun Fire cabinet. The Sun Fire 6800 requires a minimum of two RTU's in the Sun Fire cabinet.

    Each RTU can have up to two RTS's installed. When two RTSs are installed in an RTU, one RTS is active and the other is a standby. If power is lost to the active RTS, the RTU switches over to the standby RTS to get its power. When two RTSs are installed in an RTU, those RTSs must be plugged into different A/C power sources. It is highly undesirable to have both RTSs experiencing identical (potentially bad) power conditions simultaneously.

- **Power Supply**

    The Sun Fire 3800/4800/4810 each have three power supplies. The Sun Fire 6800 has six power supplies. The power supply converts A/C input power into DC power to be used by the system.

- **Fan Tray**

    The Sun Fire Servers have between two and four fan trays to provide cooling to the system.

- **CPU/Memory Board**

    The Sun Fire Servers have between two and six CPU/Memory boards. Each CPU/Memory board can have up to four CPUs. Each CPU can have up to 8GB of RAM. Memory installed on a CPU/Memory board cannot be used unless the CPU adjacent to that memory bank is present and operational (i.e. it passes POST). On the other hand, CPUs on the CPU/Memory board can be used regardless of the presence of memory in the adjacent memory bank(s).

- **I/O Assembly**

    Sun Fire Servers have have either two or four I/O assemblies. The Sun Fire 4800/4810/6800 support both normal PCI I/O assemblies and Compact PCI (cPCI) I/O assemblies. On these systems, the PCI I/O assembly can hold up to eight (8) PCI cards. The Sun Fire 3800 only supports the six (6) slot cPCI I/O assembly. The Sun Fire 3800 does not support any PCI I/O assemblies.

- **Sun Fireplane Switch (aka Repeater Board in some documentation)**

    The Sun Fire 4800/4810 each have two Fireplane Switches while the Sun Fire 6800 has four Fireplane Switches. The functionality for two Fireplane Switches is built–in to the centerplane on the Sun Fire 3800. These switches are the core of the crossbar address and data connectivity between the CPU/Memory boards and the I/O assemblies.

- **System Controller (SC)**

  Each Sun Fire Server can have two System Controller boards. The SC is an embedded system which provides configuration, logging and monitoring services for the Server. The SC also provides date and time services to the domains and, in turn, to Solaris.

Refer to the "**Sun Fire 6800/4810/4800/3800 Systems Overview**" for more details.

Terminology Overview:

The following are some important terms necessary to the understanding of your new Sun Fire Server.

- **Segment (aka Partition in some documentation)**

  Each Sun Fire Server can be configured to have two segments. Each segment is logically isolated from the other. When configured into two segments, each segment gets half of the data bandwidth for the system. Each segment still has the full address bandwidth. Segments are numbered 0 and 1.

- **Domain**

  A domain is a collection of CPU/Memory boards and I/O assemblies. Each domain runs one copy or instance of Solaris. There can be up to two domains per segment. The maximum number of domains in a system is limited by the number of available I/O assemblies. The Sun Fire 3800/4800/4810 can each have up to two domains. The Sun Fire 6800 can have up to four domains. When two domains are configured within a segment, each domain gets half of the address bandwidth for that segment. Domains are named A, B, C or D.

Refer to the "**Sun Fire 6800/4810/4800/3800 Systems Overview**" for more details.

Navigating the SC Shells:

It is strongly recommended that all connections to the SC be through the network port. However, initial configuration of the SC must be performed using the serial port. When first connecting to the SC via either the serial port or the network port, you will be presented with the following menu:

```
System Controller 'sc0':

    Type  0  for Platform Shell

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

    Input: 0

Platform Shell

sc0: SC>
```

As in this example, you can type '0' to enter the platform shell. You could also type 'p' or 'P' to accomplish the same thing. Once the system has been configured at the platform shell via "setupplatform", you can enter a domain shell by typing the following:

```
sc0: SC>  console a
Connected to Domain A
Domain Shell for Domain A
sc0:A>
```

At the domain shell, you can use the "setupdomain" command to configure the domain. From the domain shell, you can return to the platform shell (if you entered the domain shell using "console") by typing "disconnect" and pressing the <enter> key twice.

```
sc0:A> disconnect <---- (press <enter> twice)
Connection closed.
sc0:SC>
```
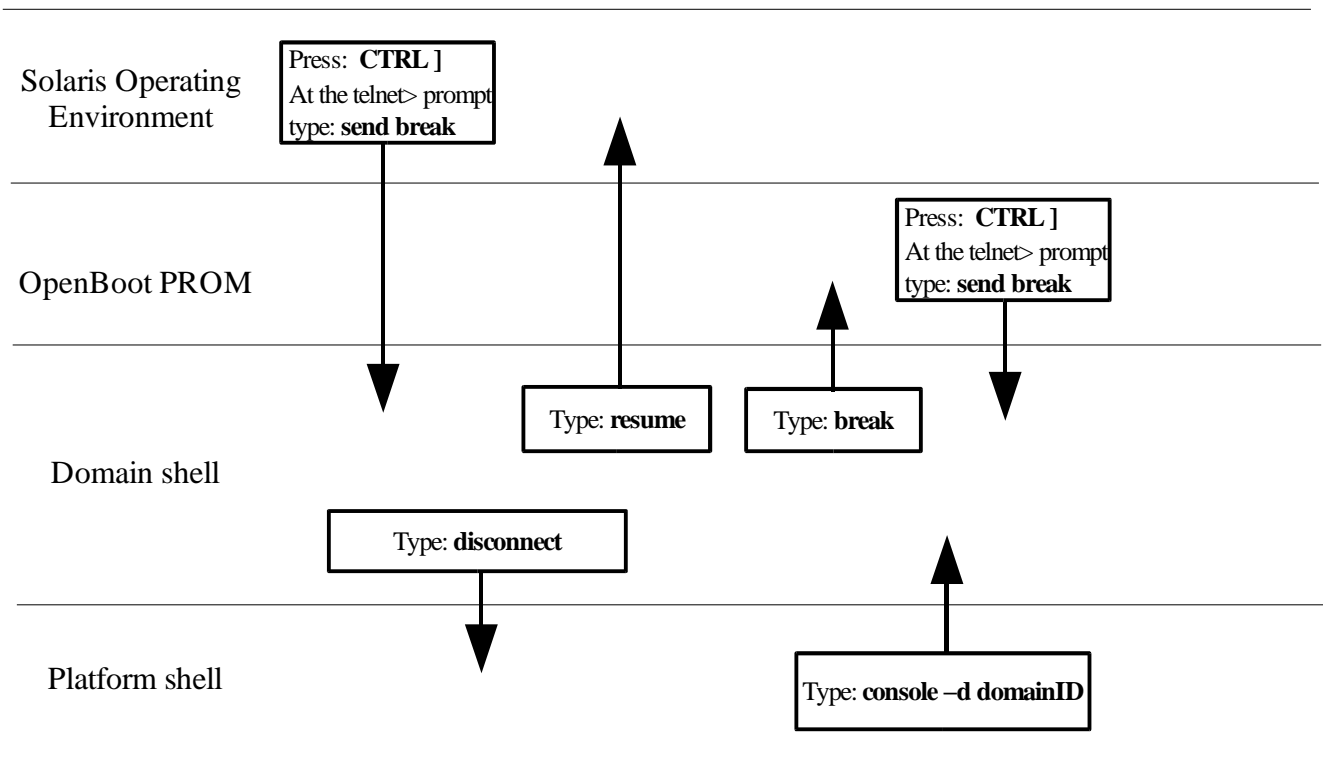
Similarly, you can exit the platform shell with the "disconnect" command as well.

If you enter the domain shell while the domain is running either OBP or Solaris, you will immediately be connected to the "console" for the domain, which means you will be at the OBP prompt or at the Solaris console. You will not go directly to the domain shell as demonstrated above. To get from the OBP prompt or the Solaris console back to the domain shell, you must send a break. If you're connected to the SC via serial line (e.g. via "tip") you can use the "~#" sequence. If you're connected to the SC via the network port (i.e. via "telnet"), the you can use the escape sequence followed by "send break". For example:

```
ok     <----- (type ctrl-] to escape to telnet menu)
telnet> send break
sc0:A>
```

Note that this break signal is not the same as the traditional stop−A signal which will stop Solaris. To send a stop−A to Solaris running in a domain, use the "break" command from the domain shell itself.

The following diagram will help you picture the interaction between Solaris, OBP, the Domain shells and the Platform shells.

Solaris Operating Environment

Press: **CTRL]**
At the telnet> prompt
type: **send break**

OpenBoot PROM

Press: **CTRL]**
At the telnet> prompt
type: **send break**

Type: **resume**   Type: **break**

Domain shell

Type: **disconnect**

Platform shell

Type: **console –d domainID**

Refer to Chapter 2 in the "**Sun Fire 6800/4810/4800/3800 Systems Platform Administration Guide**" for more details.

Sun Fire Server Power:

If your Sun Fire Server is in a Sun Fire Rack, then AC power is provided by the RTU (Sun Fire 6800s require two RTUs). If you have a Sun Fire 4800 that is not in a rack, then skip the steps which involve the RTU, RTS or FrameManager. To power on your Sun Fire Server, perform the following steps:

- Power on any expansion cabinets (refer to appropriate documentation)
- Power on all RTS switches
- Power on the A/C input switches
- If your Server is in a Sun Fire cabinet, turn on the FrameManager key in the upper left corner of the cabinet.

Now that you have applied power to the platform, the System Controller (SC) has booted and is in control of the system. Connect to the SC through the serial port (via tip or an attached NTS) or preferably through the network port (via telnet). Enter '0' to enter the platform shell, then perform the following command(s):

- poweron grid0
- poweron grid1 *(if the Server is a Sun Fire 6800)*

The Server is now ready to have the Domains powered on and booted.

In order to power off the Sun Fire Server, reverse the order of the above steps. After shutting down Solaris and using "setkeyswitch" to turn off the domain(s), follow these steps from the platform shell:

- poweroff grid1 *(if the Server is a Sun Fire 6800)*
- poweroff grid0

If the server is in a Sun Fire cabinet, turn off the FrameManager key in the upper left corner of the cabinet. Then do the following:

- Power off the A/C input power switches
- Power off the RTS power switches

Do not disconnect the power cable(s) from the system unless you are moving the Server. The power cable(s) provide a connection to the electrical ground that must be maintained for safety while the Server is undergoing maintenance.

Refer to the appropriate "**Sun Fire System Installation Guide**" for your Server for more details.

Creating a Domain:

When your Sun Fire Server was installed, the first domain should have been configured by the installation service provider. If you wish to configure another domain, and you have the necessary resources (i.e. at least one CPU/Memory board and at least one I/O Assembly), one way to do so is by using the following steps from the platform shell. Let's assume the new domain will be named C.

```
sc0:SC> showboards
```

Slot	Pwr	Component Type	State	Status	Domain
/N0/SB0	Off	CPU Board	Assigned	Not tested	A
SB2	Off	CPU Board	Available	Not tested	Isolated
/N0/IB6	Off	PCI I/O Board	Assigned	Not tested	A
IB8	Off	PCI I/O Board	Available	Not tested	Isolated

```
sc0:SC> addboard −d c sb2 ib8
sc0:SC> showboards
```

Slot	Pwr	Component Type	State	Status	Domain
/N0/SB0	Off	CPU Board	Assigned	Not tested	A
/N0/SB2	Off	CPU Board	Assigned	Not tested	C
/N0/IB6	Off	PCI I/O Board	Assigned	Not tested	A
/N0/IB8	Off	PCI I/O Board	Assigned	Not tested	C

```
sc0:SC> console c
sc0:C> setupdomain
```

Domain Boot Parameters
−−−−−−−−−−−−−−−−−−−−−−
diag−level [default]:	<−− Leave as default
verbosity−level [min]:	<−− Leave as default or set to off. Errors will be printed regardless of setting.
error−level [max]:	<−− Leave as default
interleave−scope [within−board]:	<−− Leave as default
interleave−mode [optimal]:	<−− Leave as default
reboot−on−error [false]:	<−− Leave as default
OBP.use−nvramrc? [<OBP default>]:	<−− Configure as needed
OBP.auto−boot? [<OBP default>]:	<−− Configure as needed
OBP.error−reset−recovery [sync]:	<−− Leave as default

```
Loghosts
————————
Loghost [ ]:  <my−loghost−IP−address>

SNMP
————
Domain Description [ ]:
Domain Contact [ ]:
The SNMP agent is disabled.

sc0:C>
```

Refer to Chapter 4 in the "**Sun Fire 6800/4810/4800/3800 Systems Platform Administration Guide"** for more details.

Domain Power and OBP:

Power for the CPU/Memory boards and the I/O assemblies on the Sun Fire Server is typically controlled using the "setkeyswitch" command at either the platform shell or the domain shell. More advanced features make use of the "poweron" and "poweroff" commands for CPU/Memory boards and I/O assemblies.

To power on and start up a domain you must first connect to the domain console on the SC, preferably over the network via "telnet". When the connection is made to the SC, select the menu option for the appropriate domain. At the domain shell, do the following:

•   setkeyswitch on

After entering this command, you'll see the system POST for the hardware configured into the domain. Use the "showkeyswitch" command from either the domain shell or the platform shell to view the status of the keyswitch.

When the POST is complete, the domain will stop at OBP or continue to boot Solaris depending on several settings. The first setting is the normal OBP "auto−boot?" variable. This behaves just like it does on other Sun servers. The second setting is "OBP.auto−boot?" setting on the SC. This variable is set from the domain shell using the "setupdomain" command. The setting of this variable overrides the OBP "auto−boot?" variable.

OBP on a Sun Fire Server behaves much like it does on other Sun servers. There is a new device path scheme for the Sun Fire Server family. See the "Device Paths" section of this document for more information.

To power off the domain, begin by shutting down Solaris. When you reach the "ok" prompt, return to the domain shell as described in the section "Navigating the SC Shells" later in this document. At the domain shell enter the command:

•   setkeyswitch off

When this is complete, the CPU/Memory boards and I/O assemblies configured into the domain will be powered off. To power off the entire server, see the section "Sun Fire Server Power" in this document.

Refer to Chapter 5 in the "**Sun Fire 6800/4810/4800/3800 Systems Platform Administration Guide"** for more details.

Device Paths:

The Sun Fire Server family has a new device path scheme. This new scheme incorporates a new concept called an Agent ID (AID). AIDs are assigned to either CPUs or the I/O bridge chips (called "Schizo") in the I/O Assemblies.

The memory controllers in Sun Fire Servers are embedded in the UltraSPARC III CPUs, which means that they share the same AID. The device tree entries for a CPU and its associated memory controller would be:

      /ssm@0,0/SUNW,UltraSPARC–III@b,0   <––– CPU AID 'b', offset '0'
      /ssm@0,0/SUNW,memory–controller@b,400000 <––– Memory AID 'b', offset '400000'

For easy reference, the following contains the CPU and memory controller AIDs and their locations within the system.

CPU/Memory Board AID Assignments

CPU/Memory Board	CPU 0 AID	CPU 1 AID	CPU 2 AID	CPU 3 AID
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)

Each I/O Assembly has two Schizo chips numbered 0 and 1. The Schizo AIDs are listed in the following table.

I/O Assembly AID Assignments

I/O Assembly	Schizo 0 AID	Schizo 1 AID
IB6	24 (18)	25 (19)
IB7	26 (1A)	27 (1B)
IB8	28 (1C)	29 (1D)
IB9	30 (1E)	31 (1F)

For easy reference, the following are the assignments of device paths to I/O Assembly slots. Where the device path says "AID0", substitute the appropriate hexadecimal Schizo 0 AID from the I/O Assembly table above. Similarly, where the device path says "AID1", substitute the appropriate hexadecimal Schizo 1 AID from the same I/O Assembly used in the first substitution.

8−slot PCI I/O Assembly (4800/4810/6800)

Slot	Device Path	Notes
0	/ssm@0,0/pci@AID0,700000/pci@1	Short 33 Mhz
1	/ssm@0,0/pci@AID0,700000/pci@2	Short 33 Mhz
2	/ssm@0,0/pci@AID0,700000/pci@3	33 Mhz
3	/ssm@0,0/pci@AID0,600000/pci@1	66 Mhz
4	/ssm@0,0/pci@AID1,700000/pci@1	33 Mhz
5	/ssm@0,0/pci@AID1,700000/pci@2	33 Mhz
6	/ssm@0,0/pci@AID1,700000/pci@3	33 Mhz
7	/ssm@0,0/pci@AID1,600000/pci@1	66 Mhz

6−slot cPCI I/O Assembly (3800)

Slot	Device Path	Notes
0	/ssm@0,0/pci@AID0,600000/pci@1	66 Mhz
1	/ssm@0,0/pci@AID1,600000/pci@1	66 Mhz
2	/ssm@0,0/pci@AID0,700000/pci@1	33 Mhz
3	/ssm@0,0/pci@AID0,700000/pci@2	33 Mhz
4	/ssm@0,0/pci@AID1,700000/pci@1	33 Mhz
5	/ssm@0,0/pci@AID1,700000/pci@2	33 Mhz

Let's look at an example. Let's assume we're looking at an 8−slot PCI I/O Assembly installed in the slot for IB6. The AIDs for IB6 are 18 and 19 for AID0 and AID1 respectively. Therefore, the device paths for slot 0 and slot 7 would be:

        slot 0   /ssm@0,0/pci@18,700000/pci@1
        slot 7   /ssm@0,0/pci@19,600000/pci@1

Refer to Chapter 10 in the "**Sun Fire 6800/4810/4800/3800 Systems Platform Administration Guide"** for more details.

Security:

Each shell on the SC has a password associated with it. This allows the administrator of a domain to administer and reboot that domain without allowing access to the other domains on the system.

Use the "password" command at the appropriate shell to set or change the password. Passwords should be set on all the shells to prevent unauthorized tampering with the server.

Additionally, access to the network or serial ports on the SC can be used to compromise the Server. Appropriate precautions should be taken when configuring the network and serial lines in order to prevent unauthorized access to the SC.

Refer to Chapter 6 in the "**Sun Fire 6800/4810/4800/3800 Systems Platform Administration Guide"** for more details.

Backups:

Once the Sun Fire Server has been configured, a backup of the configuration settings should be created. On the SC platform shell, use the dumpconfig command to save a copy of the hardware configuration including the domain and platform shell passwords.

After restoring from a saved configuration using the "restoreconfig" command, be sure to set the date in the platform and domain shells using the "setdate" command.

Refer to Chapter 7 in the "**Sun Fire 6800/4810/4800/3800 Systems Platform Administration Guide"** for more details.

System Controller Command Overview:

The following is the list of commands available from the SC's platform shell.

Platform Shell Commands:

addboard.....................assign a board to a domain
connections................show connections to the system controller or a domain
console.......................connect to a domain shell/console
deleteboard.................delete a board from a domain
disablecomponent.......add a component to the blacklist (effective after next "setkeyswitch on")
disconnect..................disconnect this connection or a specified connection
dumpconfig................save the system controller configuration to a server (via ftp)
enablecomponent.......delete a component from the blacklist (effective after next "setkey on")
flashupdate.................update flash prom images
help...........................show help for a command or list commands
history........................show shell command history
password....................change platform or domain password
poweroff.....................turn components off
poweron......................turn components on
reboot.........................reboot the system controller
reset...........................reset the other system controller
restoreconfig...............restore the system controller configuration from a server (via ftp)
setdate........................set the date and time for the platform
setdefaults..................set default configuration values
setkeyswitch...............set the keyswitch position for a domain
setupplatform.............configure the platform and SC information
showboards................show board information
showcomponent.........show state of a component
showdate...................show the current date and time for the platform
showenvironment.......show environment sensors
showframe.................show frame information
showkeyswitch...........show the keyswitch positions
showlogs...................show the logs
showplatform.............show the status of domain and platform configuration
showsc.......................show system controller uptime, version, and configuration
testboard....................test a board

Domain Shell Commands:

addboard......................assign a board to a domain
break...........................send break to the domain console (i.e. Stop–A)
connections................show connections to the domain
deleteboard.................delete a board from a domain
disablecomponent ......add a component to the blacklist
disconnect..................disconnect this connection
enablecomponent.......delete a component from the blacklist
help............................show help for a command or list commands
history........................show shell command history
password....................change domain password
poweroff.....................turn components off
poweron......................turn components on
reset...........................reset the domain
resume........................return to domain console
setdate........................set the date and time for the domain
setdefaults..................set default configuration values
setkeyswitch...............set the keyswitch position
setupdomain...............configure the domain
showboards ....show board information
showcomponent.........show state of a component
showdate....................show the current date and time for the domain
showdomain..............show domain configuration
showenvironment.......show environment sensors
showkeyswitch...........show the keyswitch position
showlogs....................show the logs
testboard.....................test a board

Refer to the "**Sun Fire 6800/4810/4800/3800 System Controller Command Reference Manual"** for more details.

Created by ES ACTS. Email comments and suggestions for improvements to EIS@germany.sun.com