



Sun Enterprise™ 10000 System Board Installation and Configuration Guide

For 400-MHz and 466-MHz Components

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Preface

This document provides the necessary procedures for upgrading a Sun Enterprise™ 10000 system with 400-MHz or 466-MHz processors. This document assumes that the reader is familiar with the Sun Enterprise 10000 system and its components.

How This Book Is Organized

Chapter 1 provides an overview of the tasks required to upgrade a system.

Chapter 2 provides the procedures for upgrading the system.

Chapter 3 provides the steps necessary for certifying the components and preparing them for use.

Chapter 4 provides the information for returning unused components.

Appendix A provides the criteria for determining if a system board can be dynamically deconfigured from a domain.

Using UNIX Commands

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

See one or more of the following for this information:

- AnswerBook2[™] online documentation for the Solaris[™] software environment
- 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 <code>.login</code> file. Use <code>ls -a</code> to list all files. % You have mail.
AaBbCc123	What you type, when contrasted with on-screen computer output	% su Password:
<i>AaBbCc123</i>	Book titles, new words or terms, words to be emphasized	Read Chapter 6 in the <i>User's Guide</i> . These are called <i>class</i> options. You <i>must</i> be superuser to do this.
	Command-line variable; replace with a real name or value	To delete a file, type <code>rm filename</code> .

Related Documentation

TABLE P-1 Related Documentation

Application	Title	Part Number
Software	<i>Sun Enterprise 10000 Dynamic Reconfiguration User Guide</i>	806-7616
	<i>Sun Enterprise 10000 SSP User Guide</i>	806-7613
	<i>Sun Enterprise Server Alternate Pathing User Guide</i>	805-5985
Operation	<i>Sun Enterprise 10000 System Service Manual</i>	805-2917
Installation	<i>Sun Enterprise 10000 System Hardware Installation and De-Installation Guide</i>	805-4651

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Process Overview

1.1 Tools Required

The following list represents the minimum of tools that you need to perform the upgrade procedure:

- Screwdriver, common (flat-bladed), 1/8-inch, 3/16-inch
- Screwdriver, Phillips, No. 2
- Torque driver

1.2 Software Compatibility

Note – Check to make sure that all of the latest SSP, DR, AP, and Solaris patches have been obtained from SunSolve and installed on the system. Failure to install all of the available patches can result in the unsuccessful completion of the upgrade.

- Solaris 2.5.1, or a subsequent compatible version of the operating environment, can be used. However, to upgrade to 400-MHz or 466-MHz processors on a domain-by-domain basis, the domains must be running a Solaris 2.6 or subsequent version that supports Dynamic Reconfiguration (DR) and Alternate Pathing (AP).
- It is recommended that the SSP software be upgraded to a minimum version of SSP 3.3.
- You must be running SSP 3.1.1 or a version compatible with a 400 MHz upgrade.
- You must be running SSP 3.3 or a version compatible with a 466 MHz upgrade.

- The latest SSP patches must be obtained from SunSolveSM.

1.3 Hardware Compatibility

1.3.1 System Board - Processor

TABLE 1-1 System Board - Processor Module Compatibility

System board	Part number	250 or 336-MHz processor module	400-MHz processor module	466-MHz processor module
2760A	501-4903-01	Yes	No	No
	501-4786-02			
	501-4347-10			
2761A	501-5240-01	Yes ²	Yes	Yes
	501-5240-02			
	501-5240-03 ¹			
	501-5693-02 ¹			

1. Other service options may be compatible.

2. System clock will be at reduced speed.

Note – To achieve 400-MHz operation, all system boards must be 2761As and all processors must be 400-MHz. To achieve 466-MHz operation, all system boards must be 2761As and all processors must be 466-MHz.

1.3.2 Control Board - Processor

Control Board 501-5494-01 or compatible is necessary for 466-MHz operation.

Upgrade Procedure

All processors within a Sun Enterprise 10000 must operate at the same speed. You can install 400-MHz or 466-MHz processor modules on the system boards on a domain-by-domain basis. After upgrading, the domain can resume operation, but the platform will continue to operate at the lower speed (250 MHz or 336 MHz or 400 MHz).

To operate at 400 MHz or 466 MHz, the platform must be shut down, the clock changed, and the platform tested and certified (Chapter 3).

The following procedures support the domain-by-domain upgrade process as well as a platform-wide upgrade. For a platform-wide upgrade, certain steps are skipped, as noted within the procedure.

2.1 Upgrading the SSP

1. Refer to the SSP upgrade procedure that is included either with the SSP 3.1.1 CD (minimum requirement for 400 MHz) or the SSP 3.3 CD (minimum requirement for 466MHz) or in the *Sun Enterprise 10000 System Hardware Installation and De-Installation Guide*.
2. After the SSP is upgraded, continue with Section 2.2 .

2.2 Installing the SSP Patches

1. **Verify that all of the latest SSP patches have been installed.**
Refer to the SunSolve database for the latest released patches.
2. **After the patches are installed, continue with Section 2.3 .**

Note – As noted in Section 1.2, “Software Compatibility” on page 1-1, all released patches must be installed. Failure to do this can result in the unsuccessful completion of the upgrade.

2.3 Modifying the blacklist and .postrc Files

1. **Unblacklist all blacklisted 2760A system boards and 250/336-MHz processor modules in the domain in which you are working.**

Unblacklisting system boards and processor modules enables these components to be configured into the domain during bringup. The `blacklist` files can be located in either `$$SSPVAR/etc/platform/blacklist` or relocated based on the `.postrc` file.

Other `.postrc` files may also be located in `$$SSPVAR/etc/platform_name/domain_name/.postrc`. If more than one `.postrc` files exists, refer to `hpost(1M)` and `postrc(1M)` for more information on the use of the `blacklist` and `.postrc` files.

Do this for all domains that have a personalized `.postrc` file. Refer to the *Sun Enterprise 10000 SSP User Guide*.

2. **Copy the `.postrc` file to `.postrc.orig` in the domain in which you are working.**
3. **Modify the `.postrc` file as shown.**

This can be done by either editing the existing default or adding the lines:

```
...
level 17
...
```

4. After the `.postrc` files are edited, continue with Section 2.4 .

2.4 Dynamically Reconfiguring the System Boards

1. Determine which system boards have alternate paths configured.

See Appendix A for general guidelines. Additionally, consult with the site personnel to determine Alternate Pathing status and refer to the *Sun Enterprise Server Alternate Pathing User Guide*. If system boards cannot be dynamically reconfigured, see Section 2.5, “Shutting Down a Domain” on page 2-4.

Note – This procedure is designed to minimize the downtime for a 400-MHz or 466-MHz upgrade. However, it should be noted that some system boards may not be detachable due to system configuration.

2. Modify the `.postrc` file as shown.

This can be done by either editing the existing default or adding the lines:

```
...
skip_phase jtag_integ
...
```

The `skip_phase jtag_integ` command is used to allow 400-MHz or 466-MHz processor modules to be introduced into the system without running `autoconfig` and rebooting the SSP for each system board.



Caution – Inserting the `skip_phase jtag_integ` command into the `.postrc` file will suppress error messages that would indicate the lack of appropriate post patches for the 400-MHz or 466-MHz processors. As noted in Section 1.2, “Software Compatibility” on page 1-1, all released patches must be installed. Failure to do this can result in the unsuccessful completion of the upgrade.

3. Dynamically reconfigure the system board to be upgraded out of the domain.

Refer to the *Sun Enterprise 10000 Dynamic Reconfiguration User Guide*.

4. After the system board has been dynamically reconfigured out of the domain, continue with Section 2.6, “Powering Off a System Board” on page 2-5.

2.5 Shutting Down a Domain

The following procedure is for halting the operating system on a domain. Do not perform this procedure if the system boards are dynamically deconfigured from the domain.

1. **Log in to the SSP as user `ssp`.**
2. **When prompted for the `SUNW_HOSTNAME`, use either the platform name or the name of an existing domain.**
3. **Start a `netcon` session and log in as `root`.**
4. **Notify users that the domain is going down.**
5. **Halt the domain using the appropriate Solaris commands.**

The basic command for halting the system should be `shutdown(1M)`. Refer to the man page for options and other considerations. For example:

```
# cd /  
# shutdown -i0 -g0 -y
```

6. **Wait for the system-halted message and the OpenBoot PROM (OBP) prompt to be displayed on the `netcon` console window.**
7. **Repeat Step 1 through Step 6 on each domain that is to be shut down.**
8. **After the domain is shut down, continue with Section 2.6 .**

2.6 Powering Off a System Board

Perform this procedure on each system board as it is upgraded.

1. Use `hostview(1M)` to verify the system board is not part of a running domain.
2. Turn off a system board by using `hostview(1M)` or by typing:

```
ssp% power -off -sb x
```

Where $x = 0-15$. Refer to `power(1M)` for more information.

3. After the system board is powered off, continue with Section 2.7 .

2.7 Removing a System Board

Additional information about replacing system components can be found in the *Sun Enterprise 10000 System Service Manual*.



Caution – If the yellow LEDs are lit, do not remove the component. See Section 2.6, “Powering Off a System Board” on page 2-5.

1. Open the access door.
2. Attach a wrist strap.
3. Verify all I/O cables are properly labeled for system board location connection.
If needed, install new labels.
4. Remove all cables from the system board.
5. Unlock the handles by lifting the locking levers that reside on each of the handles.
6. Use the handles to extract the system board and place it on a flat, sturdy, ESD-protected surface with the FRU side up.
7. Remove the four Phillips screws from the system board cover and remove the cover.
8. Continue with Section 2.8 .

2.8 Configuring System Board Components

To replace a 2760A system board, you transfer all I/O and memory components to the new 2761A system board. Section 2.8.1 through Section 2.8.3 discusses configuring mezzanine boards on the system board.

- If configuring SBus components, see Section 2.8.1, “Replacing the SBus Component” on page 2-7.
- If configuring PCI components, see Section 2.8.2, “Replacing the PCI Component” on page 2-11.
- If configuring memory components, see Section 2.8.3, “Replacing the Memory Component” on page 2-17.

Then add the new 400-MHz or 466-MHz processors to the 2761A system board (Section 2.8.4).

After all components have been configured onto the system board, continue with Section 2.9, “Installing a System Board” on page 2-21.

2.8.1 Replacing the SBus Component

2.8.1.1 Removing the SBus Card and SBus I/O Module

1. Attach a wrist strap and disengage the SBus card by pulling up the handle.



Caution – The connector housing may break if the SBus card is tilted too far.

2. Lift the SBus card from the socket at an angle while guiding the faceplate out from the back panel opening.
3. Place the SBus card in an antistatic bag.
4. Remove the five Phillips screws from the I/O module.
5. Loosen the six 3/32-inch captive hex-head screws located on the compression connectors.
6. Remove the SBus I/O module.
7. Place the Sbus I/O module on a flat, ESD-protected surface or into an antistatic bag.

2.8.1.2 Installing the SBus I/O Module on the New System Board

1. Attach a wrist strap.
2. On the new system board, prior to installing the module, wipe the gold pads of the system board and the exposed contacts of the compression connector with a lint-free nonabrasive cloth.
3. Align the SBus I/O module compression connectors to the system board compression connector locations.

4. Engage all captive screws clockwise with a 3/32-inch hex-head driver.
 - a. Tighten the captive screws in the sequence shown in FIGURE 2-1 until they touch the metal plate.
 - b. Tighten each captive screw in the sequence shown in FIGURE 2-1 an additional 1/2 turn.
 - c. Tighten the captive screws to a final torque of 0.68 Nm (6.0 inch pounds) in the pattern shown in FIGURE 2-1.

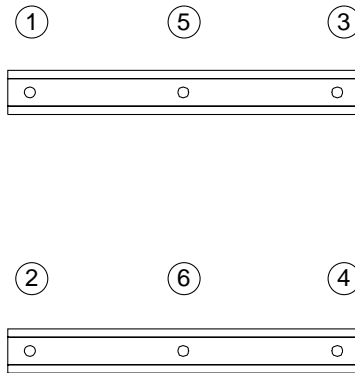


FIGURE 2-1 Tightening Pattern for the SBus I/O Module

5. **Install discrete attachment hardware through the board and into the threaded standoff of the system board.**

Later versions of the system board include discrete hardware with a captive washer. If a separate washer is used, see FIGURE 2-2 for proper orientation of cone washer.

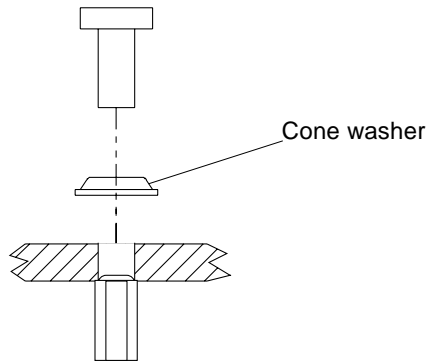


FIGURE 2-2 Cone Washer and Standoff

6. **Tighten discrete attachment hardware to a torque setting of 0.8 Nm (7.0 inch pounds).**

2.8.1.3 Installing the SBus Card

1. **Confirm the slot for installing the SBus card.**

For maximum I/O performance, avoid populating SBus 0 Slot 0 and SBus 0 Slot 1 together, as well as SBus 1 Slot 0 and SBus 1 Slot 1 together.

2. **Attach a wrist strap.**

3. **If a filler panel covers the desired SBus slot, lift the two tabs and detach the filler panel.**

4. **Remove the SBus card out of the protective packaging.**

Inspect the pins in the connector to make sure they are not bent.

5. **Guide the SBus card face plate under the springfingers and against the rear face of the personality plate.**

The I/O connectors of the SBus card should be accessible through the opening in the personality plate.

6. **To align the connector and socket, push the card toward the personality plate against the compliant EMI gasket.**



Caution – Do not rock the card onto the socket; the plastic connector housing may break.

7. **Hold the SBus card by the edges near the connector and firmly but gently press the card down until the connector is fully seated.**



Caution – Make sure filler panels are installed in each vacant slot opening. A missing filler panel can impair system cooling and FCC regulatory compliance.

8. **Confirm that filler panels (part number 340-2305) are installed in all vacant slots.**
9. **Check for blacklisted components.**

If SBus boards have been newly added to a system board, confirm the port controllers (PCs) on those system boards are not blacklisted. PCs are blacklisted at the factory when a system board does not have any SBus cards installed.

During the bring-up process, observe the list of blacklisted components. Alternatively, to retrieve the blacklist file, refer to the `blacklist(1M)` man page.

Blacklisted PCs need to be unblacklisted prior to creating a domain that would include those PCs.

In the following example, a domain is to be created using system boards 14 and 15 and the blacklist file is located at `$$SSPVAR/etc/platform_name`. Each board in this domain will have an SBus SOC (disk) and HME (network) controller. To see if the PCs have been blacklisted, type:

```
ssp% more $$SSPVAR/etc/platform_name/blacklist
pc 2.2 3.2 5.2 6.2 7.2 10.2 11.2 12.2 13.2 14.2 15.2
```

To unblacklist the PCs on system boards 14 and 15, edit the `$$SSPVAR/etc/platform_name/blacklist` file and remove 14.2 and 15.2 from the `pc` line.

2.8.2 Replacing the PCI Component

Before you can install PCI components onto a system board, that board must belong to a domain that has the Solaris 2.6 or a subsequent compatible operating environment installed and the SSP must be running version 3.1.1 or a subsequent compatible version. For information about installing Solaris, refer to documentation that shipped with the Solaris CD, which contains procedures for installing Solaris 2.6 on a new domain or upgrading a domain to the Solaris 2.6 or a subsequent compatible operating environment.

The board on which you wish to install the PCI components must also be physically removed from the system. If the system is up, and the domain to which the board belongs is running, you must remove the board logically before you do so physically. The *Sun Enterprise 10000 Dynamic Reconfiguration User Guide* tells how to do so with the DR Detach feature.

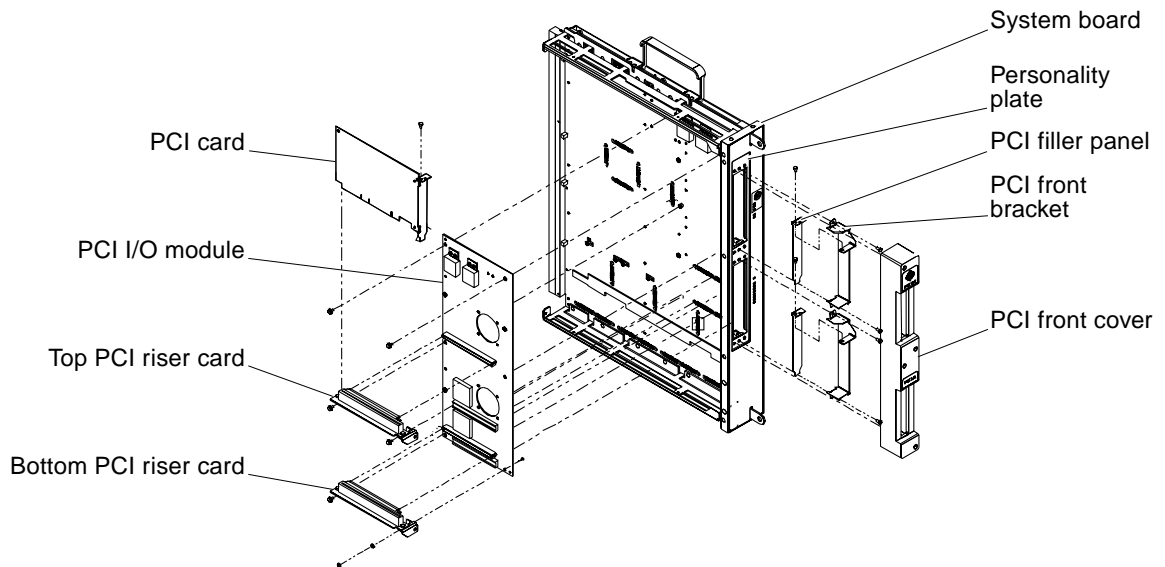


FIGURE 2-3 PCI Components

2.8.2.1 Preparing the System Boards

1. Attach a wrist strap and loosen the four captive screws on the PCI front cover and remove from the system board front plate (FIGURE 2-4).

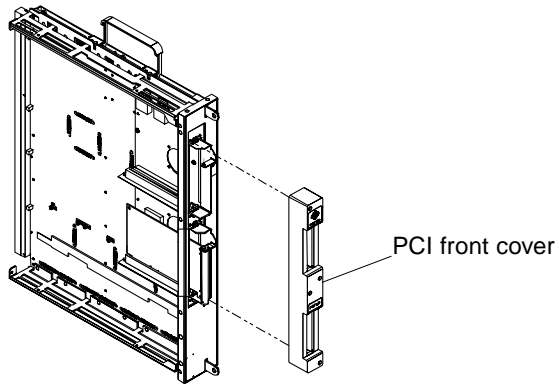


FIGURE 2-4 PCI Front Cover

2. Remove the PCI retention screw from the top flange of the PCI card, then disengage the card from the riser card and remove it from the system board assembly (FIGURE 2-5).

Place the PCI card in an antistatic bag.

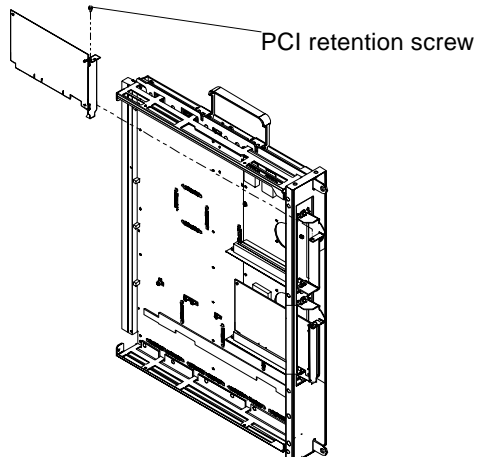


FIGURE 2-5 PCI Card

3. Remove the PCI retention screw from the top flange of the PCI filler panel and remove it from the system board assembly (FIGURE 2-6).

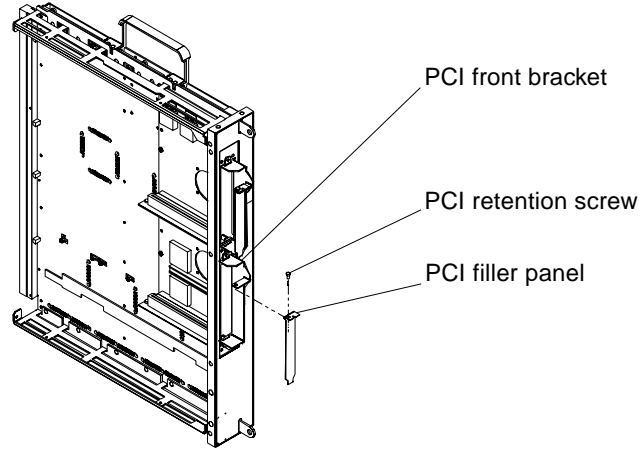


FIGURE 2-6 PCI Filler Panel

4. Remove the five Phillips screws from the I/O module (FIGURE 2-7).
5. Loosen the six captive 3/32-inch hex-head screws located on the compression connectors (FIGURE 2-7).
6. Remove the PCI I/O module (FIGURE 2-7).
Place it on a flat, ESD-protected surface.

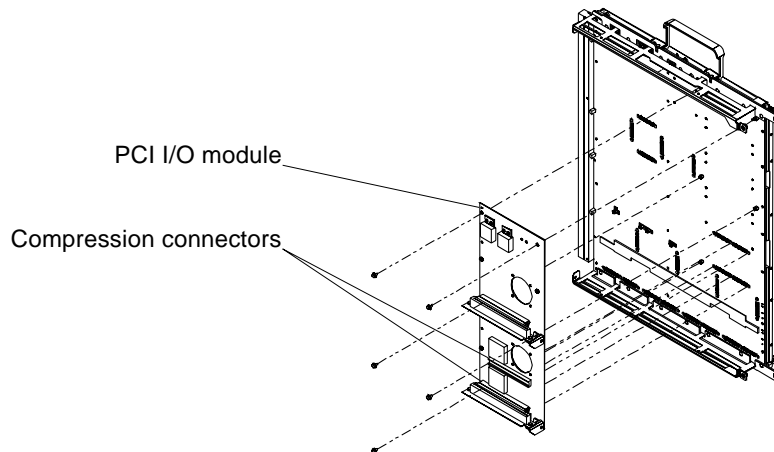


FIGURE 2-7 Replacing the PCI I/O Module

7. If the new system board is configured for SBus, remove the PCI personality plate from the old system board.

a. Remove the attachment screws that secure the PCI personality plate (FIGURE 2-8).

Compress the personality plate against the EMI gasket to align the screw holes. Sustain this force to relieve the stress on the screws threads and remove the three attachment screws as noted in FIGURE 2-8.

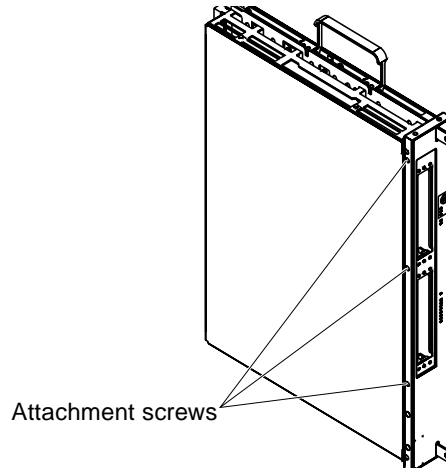


FIGURE 2-8 Removing the Face Plate

b. Locate the angled flanges on the personality plate (FIGURE 2-9).

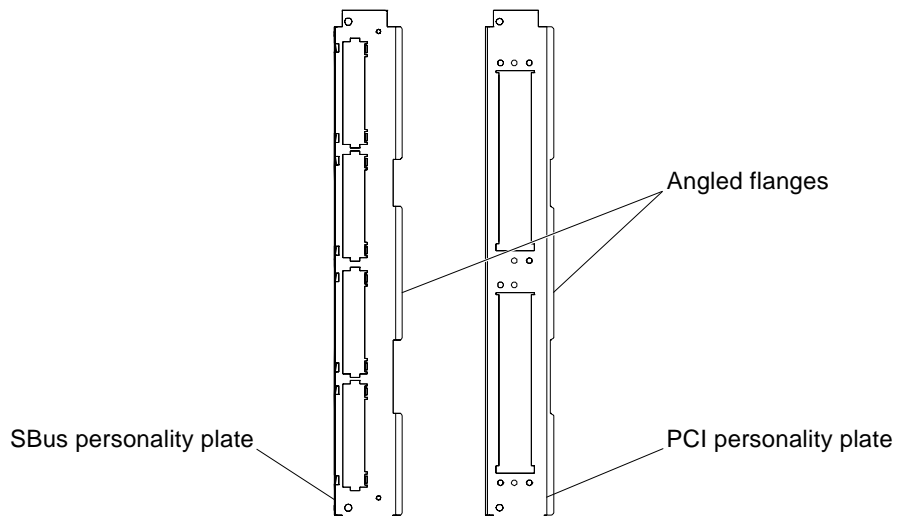


FIGURE 2-9 Personality Plates

- c. **On the new system board, align the angled flange to the notch of the front stiffener and swing the personality plate into place against the EMI gasket (FIGURE 2-10).**

Do not place the personality plate between the EMI gasket and face plate.

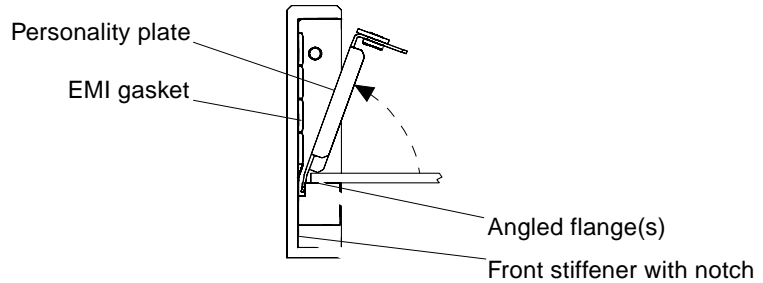


FIGURE 2-10 Installing a Personality Plate—Top View

- d. **Compress the personality plate against the EMI gasket to align the screw hole.**

Sustain this force to relieve the stress on the screws threads and install the three attachment screws.

2.8.2.2 Installing the PCI Components

1. **Attach a wrist strap.**
2. **Prior to installing the I/O module, wipe the gold pads of the system board and the exposed contacts of the compression connector with a lint-free non-abrasive cloth.**
3. **Align the PCI I/O module compression connectors to the system board compression connector locations.**
4. **Align the standoffs on the system board with the I/O module.**

5. Engage all captive screws clockwise with a 3/32-inch hex-head driver.
 - a. Tighten the captive screws in the sequence shown in FIGURE 2-11 until they touch the metal plate.
 - b. Tighten each captive screw in the sequence shown in FIGURE 2-11 an additional 1/2 turn.
 - c. Tighten the captive screws to a final torque of 0.68 Nm (6.0 inch pounds) in the pattern shown in FIGURE 2-11.

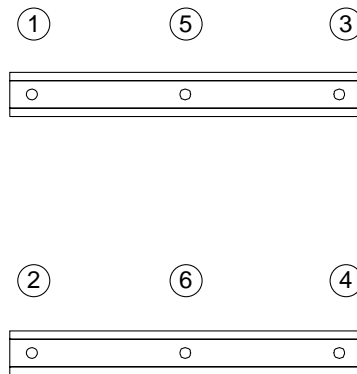


FIGURE 2-11 Tightening Pattern for the PCI I/O Module

6. Install discrete attachment hardware through the board and into the threaded standoff of the system board.

See FIGURE 2-12 for proper orientation of separate cone washer.

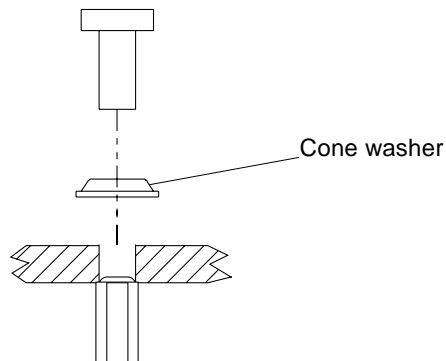


FIGURE 2-12 Cone Washer and Standoff

7. **Tighten discrete attachment hardware to a torque setting of 0.7 - 0.8 Nm (6.0 - 7.0 inch pounds).**
8. **Based on the previous configuration, determine the slot for installing the PCI card (FIGURE 2-13).**

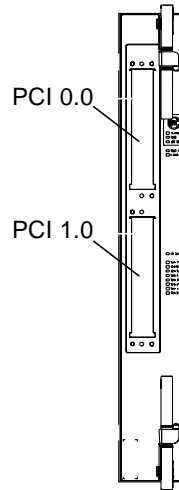


FIGURE 2-13 PCI Slot Numbering

9. **Take the PCI card out of the protective packaging.**
Inspect the connector to make sure it is not damaged.
10. **Confirm the installed riser card is the correct voltage for the PCI card to be installed.**
PCI cards and riser cards are available in multiple voltages. Inspect the keyed connector on the PCI card to confirm that it will properly mate with the riser connector. If not, obtain and install the correct riser card.
11. **Guide the PCI card from behind the system board face plate, through the opening, and place the PCI card edge into the mating connector (FIGURE 2-5).**
12. **Install the PCI front cover (FIGURE 2-4).**

2.8.3 Replacing the Memory Component

1. **Attach a wrist strap and remove the eight Phillips screws from the memory module.**

2. Loosen the ten 3/32-inch hex-head captive screws located on the compression connector.
3. Lift the memory module straight out and place on a flat, ESD-protected surface.
4. On the new system board, prior to installing the module, wipe the gold pads of the system board and the exposed contacts of the compression connector with a lint-free non-abrasive cloth.
5. Align the memory module compression connectors to the system board compression connectors.
6. Engage all captive connector screws clockwise with a 3/32-inch hex-head driver.
 - a. Tighten the captive connector screws in the sequence shown in FIGURE 2-14 until they touch the metal plate.
 - b. Tighten each captive connector screw in the sequence shown in FIGURE 2-14 an additional 1/2 turn.
 - c. Tighten the captive connector screws to a final torque of 0.68 Nm (6.0 inch pounds) in the pattern shown in FIGURE 2-14.

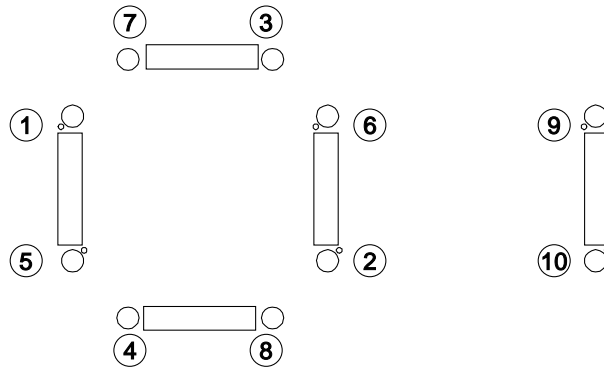


FIGURE 2-14 Tightening Pattern for the Memory Module

7. **Install discrete attachment hardware through the cone washer and into the board and standoff (FIGURE 2-15).**

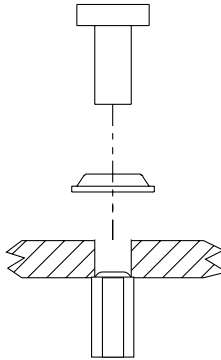


FIGURE 2-15 Cone Washer and Standoff

8. **Tighten discrete attachment hardware to a torque setting of 0.8 Nm (7.0 inch pounds).**

2.8.4 Replacing the Processor Component

1. **Attach a wrist strap and loosen the five 3/32-inch hex-head screws located on the compression connector.**
2. **Lift the processor module up and away from obstructions and place it on a flat, ESD-protected surface.**
3. **Verify the new processor module is 400 MHz or 466 MHz.**
4. **Verify the new processor module cache size is the same as all other processor modules that are to be installed on the *system board*.**

Mixing cache sizes on a system board will result in the larger caches sizes being limited to the size of the smallest. If possible, move dissimilar processor modules to another system board.

5. **On the system board, if present, remove the thin blue plastic strip from the processor board thermal pad on the system board.**

This blue plastic strip covers a white thermal pad that provides thermal relief for the cache on the processor module. When a processor module is installed, the blue plastic strip should be removed permanently.

6. **Prior to installing the module, wipe the gold pads of the system board and the exposed contacts of the compression connector with a lint-free non-abrasive cloth.**

7. Align processor module compression connectors to the system board compression connectors.
8. Engage all captive screws clockwise with a 3/32-inch hex-head driver.
 - a. Tighten the captive screws in the sequence shown in FIGURE 2-16 until they touch the metal plate.
 - b. Tighten each captive screw in the sequence shown in FIGURE 2-16 an additional 1/2 turn.
 - c. Tighten the captive screws to a final torque of 0.68 Nm (6.0 inch pounds) in the pattern shown in FIGURE 2-16.

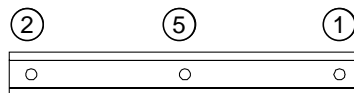
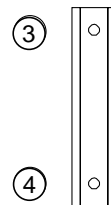


FIGURE 2-16 Tightening Pattern for the Processor Module

9. Replace the system board cover and secure with four Phillips screws tightening to a torque of 0.8 Nm (7.1 inch pounds).

2.9 Installing a System Board

1. To confirm the event monitoring daemon is running, type:

```
ssp% edd_cmd
```

The returned message should show `State = started-monitoring`. If not, it is necessary to restart the event monitoring daemon by typing:

```
ssp% edd_cmd -x start
```

Refer to `edd(1M)` and `edd_cmd(1M)` for additional information.

2. To install a system board, attach a wrist strap and firmly grasp the board by the handles and position it onto the card cage rail.
3. With the handles extended, slide the board into the slot until it begins to mate with the centerplane connector.
4. Apply firm pressure to the face plate to engage the board with the centerplane connector.
5. Use the handles to fully seat the board.
6. Lock the handles by sliding the locking levers into position until they are fully nested with the handles.
7. After the system board has been installed, continue with Section 2.10 .

2.10 Powering On a System Board

1. Power on a system board by using `hostview(1M)` or by typing:

```
ssp% power -on -sb x
```

Where $x = 0-15$. Refer to `power(1M)` for more information.

2. Bring the system board back into the domain.

- If the domain is still running:

- a. If the system board was dynamically deconfigured, reconfigure the board back into the domain.

Refer to the *Sun Enterprise 10000 Dynamic Reconfiguration User Guide*.

- b. Refer to Section 2.4, “Dynamically Reconfiguring the System Boards” on page 2-3 for all remaining system boards in the domain.

- c. After all of the system boards have been upgraded, and the system is available for testing, continue with Chapter 3.

If complete testing and margining is to be deferred until a later time, the domain can be turned over to the customer using the current system speed.

- If the domain was shutdown:

- a. See Section 2.6, “Powering Off a System Board” on page 2-5 for all remaining system boards in the domain.

- b. After all of the system boards have been upgraded, continue with Section 2.11 .

2.11 Bringing Up a Domain That Was Shut Down

Note – Do not perform this procedure if the system boards can be dynamically reconfigured into the domain.

1. **Log in to the SSP as `ssp`.**

When prompted for the `SUNW_HOSTNAME`, use the name of the domain to be started.

2. **From the same SSP window, run POST by typing:**

```
ssp% bringup -A on -164
```

Answer `y` if prompted to configure centerplane. The `bringup` process can take up to 180 minutes depending on system configuration. Refer to the `bringup(1M)` or `hpost(1M)` man page for more detail.

3. **After the domain has been brought up, see Section 2.3, “Modifying the blacklist and `.postrc` Files” on page 2-2 for all remaining domains.**
4. **If all domains have been upgraded, and the system is available for testing, continue with Chapter 3.**

If complete testing and margining is to be deferred until a later time, the domain can be turned over to the customer using the current system speed.

Testing and Certification of the System

Prior to testing and certifying the platform, all system boards must be upgraded with 400-MHz or 466-MHz processors and all system boards must be powered on.

This procedure requires that the system clock be changed and the system boards be tested on a system-wide level.

Note – This chapter requires all domains to be shut down.

3.1 Shutting Down a Domain

1. **Log in to the SSP as user `ssp`.**
2. **When prompted for the `SUNW_HOSTNAME`, use either the platform name or the name of an existing domain.**
3. **Start a `netcon` session and log in as `root`.**
4. **Notify users that the domain is going down.**
5. **Halt the domain using the appropriate Solaris commands.**

The basic command for halting the system should be `shutdown(1M)`. Refer to the man page for options and other considerations. For example:

```
# cd /  
# shutdown -i0 -g0 -y
```

6. Wait for the system-halted message and the OBP prompt to be displayed on the `netcon` console window.
7. Repeat this procedure for all of the domains in the system.
8. After all domains are shut down, continue with Section 3.2 for a 466-MHz processor upgrade, or continue with Section 3.3 for a 400-MHz upgrade.

3.2 Installing a Control Board

1. Replace Control Board 0 following the compatibility guidelines in Section 1.3, “Hardware Compatibility” on page 1-2, and the procedures outlined in the *Sun Enterprise 10000 System Service Manual*.
2. Repeat Step 1 for Control Board 1 (if present).
3. After the control board upgrade is complete, continue with Section 3.3 .

3.3 Modifying the `.postrc` File

1. If the boards were dynamically reconfigured, modify the `.postrc` file to remove the `skip_phase jtag_integ` entry and add a `proc_freq_check_percent off` entry.:

```
...  
proc_freq_check_percent off  
...
```

Do this for *all* `.postrc` files that were edited.

The `proc_freq_check_percent off` command prevents `hpost` from failing during Section 3.6, “Testing the System” on page 3-4.

2. Run the `autoconfig` command on the SSP by typing:

```
ssp% autoconfig
```

3. Reboot the SSP as suggested by the `autoconfig` command.

4. After the SSP is rebooted:

- For a 250/336-MHz to 400MHz upgrade, continue with Section 3.4 .
- For a 400-MHz to 466-MHz upgrade, continue with Section 3.8, “Setting the Clock Multiplier and Frequency” on page 3-7 .

3.4 Changing the Clock Multiplier and Frequency for Testing

For testing purposes, this procedure sets the clock to a higher-than-normal speed to assist with the certification of all components that were introduced into the system.



Caution – Do not run the `sys_clock` command with any of its command-line options on a running system. By itself, the `sys_clock` command provides the current system clock speed. When options are used in conjunction with the `sys_clock` command, modifications are made that can crash a running system.

1. Change the multiplier value by typing:

```
ssp% sys_clock -p two-to-one -s -i 102000000
```

2. Check the multiplier value by typing:

```
ssp% sys_clock
```

3. The output should be similar to the following response:

```
Current Clock Frequencies:
-----
Interconnect: 102.03 Mhz
Processor:    408.20 Mhz

Targeted Clock Frequencies:
-----
Interconnect: 102.00 Mhz
Proc Clock Ratio: two-to-one
```

4. After the clock multiplier is set, continue with Section 3.5 .

3.5 Bringing Up the Platform for Test and Verification

1. **Log in to the SSP as user `ssp`.**

When prompted for the `SUNW_HOSTNAME`, use the name of the domain to be tested.

2. **From the same SSP window, run POST by typing:**

```
ssp% bringup -A off
```

Answer `y` when prompted to configure centerplane. The `bringup` process can take up to 180 minutes depending on system configuration. Refer to the `bringup(1M)` or `hpost(1M)` man page for more detail.

3. **Repeat Step 1 and Step 2 for all of the domains in the system.**
4. **After the domain has been brought up, continue with Section 3.6 .**

3.6 Testing the System

SunVTS™ can test the overall functionality of all parts (processor and I/O) of the system. While an overnight SunVTS run is considered ideal, anywhere between 4 to 24 hours is appropriate as a system test.

It is desirable to test the system under a single domain. However, if this is not possible, the following steps are required on each domain.

1. **Log in to an SSP window as user `ssp` and type:**

```
ssp% domain_switch test_domain
ssp% xhost +
```

2. **Start SunVTS by logging in to the domain as `root`.**

- For Solaris 2.5.1:

```
# csh
# setenv DISPLAY ssp_hostname:0.0
# setenv LD_LIBRARY_PATH /usr/openwin/lib
# setenv OPENWINHOME /usr/openwin
# /opt/SUNWvts/bin/sunvts -l
```

- For Solaris 2.6, Solaris 7, and Solaris 8:

```
# csh
# setenv DISPLAY ssp_hostname:0.0
# /opt/SUNWvts/bin/sunvts
```

If SunVTS fails to initialize, you may need to install the SunVTS packages. See your Solaris installation instructions and SunVTS AnswerBook2 documentation for more information.

3. **Display the SunVTS window and check the devices shown in the control panel against the devices you know to be physically present in the system.**



Caution – Be careful to leave unselected, disk devices that may contain customer data or non-UFS file systems.

Refer to the “control panel” section of the SunVTS documentation if there is a discrepancy.

Starting SunVTS often serves as a quick check for most hardware devices. If you have just installed a device and reconfigured your machine accordingly, the SunVTS test for that device can confirm proper installation.

Likewise, if SunVTS fails to display a device that you know is physically present in your system, there is a problem, and you should recheck your installation carefully.

4. **Set the following options:**

- Threshold Max System Errors = 0
- Test Execution Max Errors = 0
- Number of Instances: set to total memory size in GBytes/2 GBytes
- Set SunVTS options to concentrate on CPU and memory tests

5. Click the Start button.

Or, if you have enabled the Auto Start option from the Set SunVTS Options menu and saved an options file, you can start SunVTS by typing:

```
# /opt/SUNWvts/bin/sunvts -l -o
```

6. Monitor the status of SunVTS. Verify that the system is running and that no test failures are occurring.

7. If more than one domain exists, repeat Step 2 through Step 6 for each domain to be tested.

Tests should be run for a minimum of four hours on each domain.

After successful completion of SunVTS, the system is certified for 400-MHz operation.

8. After the system is tested, continue with Section 3.7 .

3.7 Shutting Down a Domain

1. Log in to the SSP as user `ssp`.

2. When prompted for the `SUNW_HOSTNAME`, use either the platform name or the name of an existing domain.

3. Start a `netcon` session and log in as `root`.

4. Notify users that the domain is going down.

5. Halt the domain using the appropriate Solaris commands.

The basic command for halting the system should be `shutdown(1M)`. Refer to the man page for options and other considerations. For example:

```
# cd /  
# shutdown -i0 -g0 -y
```

6. Wait for the system-halted message and the OBP prompt to be displayed on the `netcon` console window.

7. Repeat this procedure for all of the domains in the system.

8. After all domains are shut down, continue with Section 3.8 .

3.8 Setting the Clock Multiplier and Frequency

This procedure is done when changing to different speed processor modules. To upgrade from a lower-speed processor module to a 400-MHz processor module, the clock multiplier must change to 2:1. To upgrade from a lower-speed processor module to a 466-MHz processor module, the clock multiplier must change to 5:2. To do this, all domains must be shut down and the new processors installed onto the system board.



Caution – Do not run the `sys_clock` command with any of its command-line options on a running system. By itself, the `sys_clock` command provides the current system clock speed. When options are used in conjunction with the `sys_clock` command, modifications are made that can crash a running system.

1. Change the multiplier value by typing:

- For 400-MHz use the following command:

```
ssp% sys_clock -p two-to-one -s -i 10000000
```

- For 466-MHz use the following command:

```
ssp% sys_clock -p five-to-two -s -i 93000000
```

This will update the `ssp_resource` file.

2. Check the multiplier value by typing:

```
ssp% sys_clock
```

- For 400-MHz the output should be similar to the following response:

```
Current Clock Frequencies:
-----
Interconnect: 99.95 Mhz
Processor:    399.85 Mhz
JTAG:         5.00 Mhz

Targeted Clock Frequencies:
-----
Interconnect: 100.00 Mhz
Proc Clock Ratio: two-to-one
JTAG:         5.00 Mhz
```

- For 466-MHz the output should be similar to the following response:

```
Current Clock Frequencies:
-----
Interconnect: 93.25 Mhz
Processor:    466.12 Mhz
JTAG:         5.18 Mhz

Targeted Clock Frequencies:
-----
Interconnect: 93.00 Mhz
Proc Clock Ratio: five-to-two
JTAG:         5.00 Mhz
```

3. After the clock multiple is set, continue with Section 3.9 .

3.9 Restoring the hpost Level

1. **Copy the `.postrc.orig` file to `.postrc`.**
Do this for *all* `.postrc` files that were edited.
2. **After the `hpost` level is restored, see Section 3.10, “Bringing Up a Domain That Was Shutdown” on page 3-9.**

3.10 Bringing Up a Domain That Was Shutdown

If complete testing and margining is to be deferred until a later time, the domain can be turned over to the customer using the current system speed.

1. **Log in to the SSP as `ssp`.**
When prompted for the `SUNW_HOSTNAME`, use the name of the domain to be started.
2. **From the same SSP window, run POST by typing:**

```
ssp% bringup -A on -164
```

Answer `y` when prompted to configure centerplane. The `bringup` process can take up to 180 minutes depending on system configuration. Refer to the `bringup(1M)` or `hpost(1M)` man page for more detail.

3. **Repeat Step 1 and Step 2 for all domains in the system.**
4. **After the upgrade is completed, continue with Chapter 4.**

Finishing the Installation

4.1 Using the RMA Procedure

Return the parts in the Sun Enterprise 10000 that are replaced by this upgrade procedure to Sun Microsystems, Inc. Refer to the Material Return Matrix, located in the Return Material Authorization(RMA) kit, part number 850-6081 for a list of parts to be returned.

Note – It is the customer’s responsibility to make sure replaced parts are placed in ESD approved packaging in a manner that ensures an undamaged and expedient return.

- 1. Pack the exchanged returnable parts in appropriate shipping boxes.**
- 2. Label the boxes “Box 1 of *n*,” “Box 2 of *n*,” and so forth.**
- 3. Attach the RMA (Return Materials Authorization) label to Box 1 of *n*. The RMA label is located in the RMA kit, part number 850-6081.**
- 4. Ship equipment returns to Sun Microsystems according to the country specific instructions included in the RMA kit.**

4.2 Post-Installation Checklist

Use the following checklist to confirm the installation is complete.

- Does the `sys_clock` command confirm that the system is running at 100/400 MHz for 400-MHz or 93/466 MHz for a 466 MHz system?
- Did SunVTS complete successfully on all system boards?
- Have all `.postrc` files been restored to their original configuration?
- Are all domains up and running?
- Has all remaining material been packaged for RMA return?

The system is now upgraded, certified, and ready for use by the customer.

Determining Dynamic Reconfigurability

Consider the following criteria to determine if a system board can be dynamically reconfigured from a domain.

1. The domains must be running a Solaris 2.6 or a subsequent compatible operating environment that supports DR and AP, and all operating system patches must be installed.
2. The SSP must be running SSP 3.1.1 or a subsequent compatible version and all patches must be installed.
3. AP 2.1 or subsequent compatible version must be used.
4. All DR patches must be installed.
5. All I/O devices must be under AP control or the system can continue to operate with the non-AP devices offline.
6. Alternate paths must be physically located on a different system board.
7. The system boot and console network and other I/O devices have AP applied and are DR safe.

If an Oracle, Sybase, or Informix database is in use, and in Intimate Shared Memory (ISM) mode, memory is required to be at least 50% free to start the upgrade. Confirm the memory usage with the `vmstat` command.

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