# Sun™ Enterprise 10000™ System 336-Mhz Processor Upgrade Instructions


THE NETWORK IS THE COMPUTER™

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# Installing 336-Mhz Processor Modules into a Enterprise 10000 System

## Introduction

This document provides the service provider with the information necessary to replace 250-Mhz processor modules with 336-Mhz processor modules on a system board.

Because of processor modules must be the same speed, all domains must be power off. Additionally, the clock multiplier must be changed via the SSP.

This document contains the following sections to assist you with installing processor modules on your Enterprise 10000 system.

- Powering off a system board
- Removing a system board
- Processor module removal
- Processor module installation
- Installing a system board
- Powering on a system board
- Restoring the thermal calibration information using SSP version 3.0
- Changing the clock multiplier

# Shut Down all Domains

The following procedure is for halting the operating system on 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. **Log into the domain as root.**
4. **Open a netcon session to the domain in another window.**
5. **Notify users that the system is going down.**
6. **Halt the system 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
```

7. **Wait for the system-halted message and the OBP prompt to be displayed on the** `netcon` **console window.**
8. **Repeat on each domain before proceeding.**

# Powering Off a System Board

- **Power off all system boards by typing:**

```
ssp# power -off -all
```

Refer to `power`(1M) for more information.

# Removing a System Board

1. **Open the access door.**
2. **Remove all cables from the system board.**
3. **Unlock the handles by first lifting the locking levers that reside on each of the handles.**
4. **Use the handles to extract the system board and place it on a flat, sturdy, ESD-protected surface with the FRU side up.**

**Caution –** If the yellow LEDs are lit, do not remove the component. See “Shut Down all Domains” on page 2.”

5. **Attach a wrist strap.**
6. **Unscrew the Phillips screws from the system board cover and remove the cover.**

# Removing a Processor Module

1. **Unscrew the five 3/32-inch hex-head screws located on the compression connector.**
2. **To remove the processor module, lift up and away from obstructions and place on a flat, ESD-protected surface with the connector side up(**FIGURE 1**).**

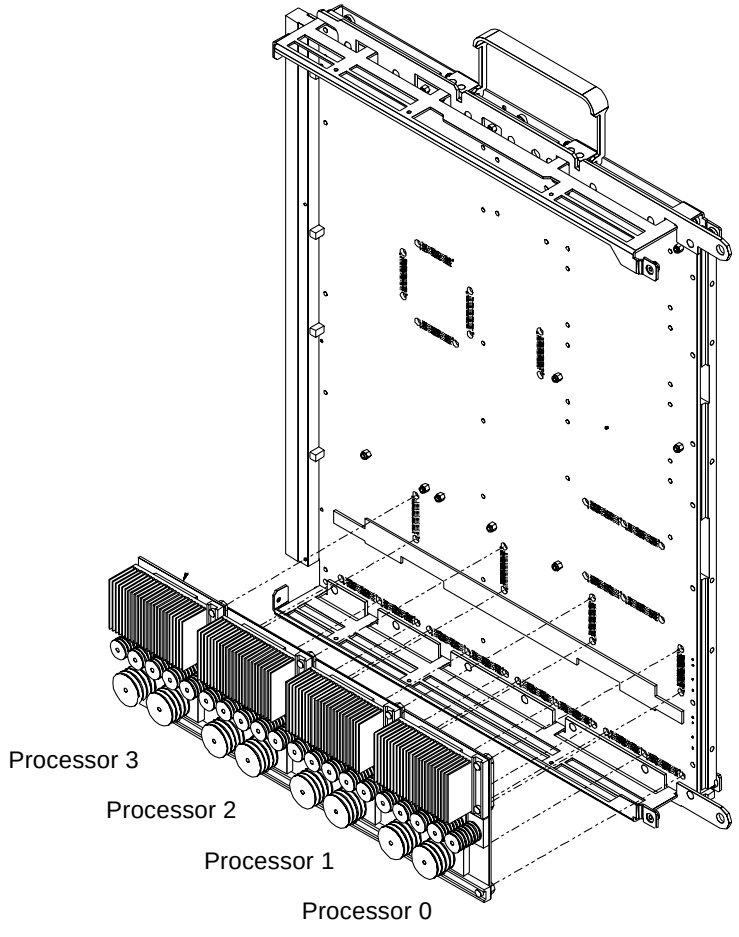


**FIGURE 1** Replacing System Board Processor Module

# Installing a Processor Module

1. **If no processor modules exist on this board, install the modules in the following order:**

   1. Processor 0
   2. Processor 2
   3. Processor 1
   4. Processor 3

   For increased processor performance, avoid populating processors 0 and 1 together and processors 2 and 3 together.

2. **Verify the new processor module speed is the same as all other processor modules that are installed or to be installed in the** *system***.**

   Mixing processors speeds in a system will cause the processors that do not match the system clock speed to fail. Refer to `sys_clock`(1M).

3. **Verify the new processor module cache size is the same as all other processor modules that are installed or 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.

4. **Remove the thin blue plastic strip from the processor board thermal pad on the system board, if present.**

   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, it should be removed permanently.

5. **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.**

6. **Align processor module compression connectors to the system board compression mating backplate.**

7. **Engage all captive connector screws clockwise using a #4-40 hex-head driver.**

8. **Tighten the captive connector screws to a low torque of 0.34 Nm (3.0 inch pounds) in the pattern noted in** FIGURE 2**.**

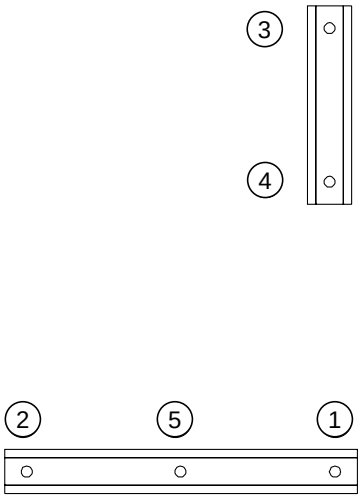


**FIGURE 2** Tightening Pattern for the Processor Module

9. **Tighten the captive connector screws to a final torque of 0.68 Nm (6.0 inch pounds) in the pattern noted in** FIGURE 2**.**

10. **Replace the system board cover and secure with Phillips screws tightening to a torque of 1.0 Nm (8.9 inch pounds),**

11. **See “Installing a System Board” on page 7 to confirm the event monitoring daemon is running prior to installing the system board.**

# 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 will be necessary to restart the event monitoring daemon by typing the following:

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

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

2. **To install a system board, 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 insertion 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.**

# Powering On a System Board

1. **Determine the amount of system power available by typing** `power`**.**

   See TABLE 1 to confirm the amount of available power is sufficient for the amount of system boards to be installed.

**TABLE 1** Power Redundancy

| Number of System Boards | Required Power Supplies for N+ 2 Power Supply or N+1 AC Input Unit Redundancy | Required 200V, 30 A single phase circuits |
|---|---|---|
| 1 | 4 | 2 |
| 2 | 4 | 2 |
| 3 | 5 | 3 |
| 4 | 5 | 3 |
| 5 | 5 | 3 |
| 6 | 6 | 3 |
| 7 | 6 | 3 |
| 8 | 6 | 3 |
| 9 | 7 | 4 |
| 10 | 7 | 4 |
| 11 | 7 | 4 |
| 12 | 7 | 4 |
| 13 | 8 | 4 |
| 14 | 8 | 4 |
| 15 | 8 | 4 |
| 16 | 8[1] | 4 |

1. If two supplies are failing, no AC module may be removed unless the two failed supplies are under the same AC module control.

2. **Turn 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.

3. **If using SSP version 3.0, restore the system boards thermal calibration data.**

   See “Restoring the Thermal Calibration Information Using SSP Version 3.0” on page 9.”

# Restoring the Thermal Calibration Information Using SSP Version 3.0

This procedure is performed automatically by SSP version 3.1.

The system boards and centerplane contain ASICs which require thermal calibration data in order for the SSP software to correctly report temperature data. The initial thermal calibration of the system boards and centerplane is done during the manufacturing process using the `thermcal`(1M) command. The resulting thermcal calibration data is then written to EEPROMs resident on the boards. Once done, the `thermcal`(1M) procedure need not be repeated.

The SSP software requires the correct thermal calibration data for each system board and centerplane resident in the system. A data file containing this information is created by the `thermcal_config`(1M) command. In order for this data file to be correct, `thermcal_config`(1M) must be executed during SSP software installation or when system boards or centerplanes are replaced, added, or moved to new slots. Failure to execute this procedure in these cases will prevent the SSP software from correctly monitoring the system's temperature.

1. **Type**:

```
% edd_cmd -x stop
```

   This stops the `edd` daemon monitoring scripts.

2. **Type:**

```
% thermcal_config
```

The `thermcal_config`(1M) command requires approximately 10 minutes to complete on a system containing 16 system boards. The `thermcal_config`(1M) command reads thermal data on every system board as well as the centerplane configured in the system, and creates a file (`thermcaldata.tcl`).

It is important to note any errors that the `thermcal_config`(1M) command encounters when performing this operation. The `$SSPVAR/adm/messages` contains additional messages related to problems the `thermcal_config`(1M) command encounters. Use the following command (in a separate window) to monitor the `messages` file:

```
% tail -f $SSPVAR/adm/messages
```

If the `thermcal_config`(1M) command encounters problems when attempting to read thermal data, you must repeat Step 2 until no errors occur.

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**Note –** If errors of this type persist (especially for the same board), it is likely that the board is not thermally calibrated. In this case, contact your service representative.

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3. **Type:**

```
% edd_cmd -x start
```

This restarts `edd` event monitoring.

# Changing the Clock Multiplier

This procedure is done when changing to different speed processor modules. To upgrade from a 250-MHz processor module to a 336-MHz processor modules, the clock multiplier must change from 3:2 to 2:1. To do this, all domains must be down and the new processors installed onto the system board.

1. **To change the multiplier value, type:**

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

This will update the `ssp_resource` file.

**Caution –** Do not run the `sys_clock` command with any of its command-line options on a running system.

2. **To check the multiplier value, type:**

```
ssp% sys_clock
```