Platform Notes: Ultra™ Enterprise™ 3000, 4000, 5000, and 6000 Servers

Solaris™ 2.5.1 Hardware: 8/97

Sun Microsystems
2550 Garcia Avenue
Mountain View, CA 94043
U.S.A. 415-960-1300

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Contents

Preface

This book describes software features that apply only to the Ultra™ Enterprise™ 3000, 4000, 5000, and 6000 family of servers..

How This Book Is Organized

This manual is divided into three chapters:

Chapter 1, “OpenBoot 3.x Commands,” provides a description of the OpenBoot 3.x commands for the Ultra Enterprise family of *x*000 servers.

Chapter 2, “Board Hot Plug Software Procedures,” describes how to perform board hot-plug procedures.

Chapter 3, “Enabling a Hardware Timer,”describes how to enable a hardware timer that will hard-reset the system if it times out.

Related Documents

For details on the options for the software features described in this book, refer also to the man pages for the Solaris 2.5.1 Hardware: 8/97 software release.

Typographic Conventions

The following table describes the typographic conventions used in this book.

TABLE P-1 Typographic Conventions

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

Shell Prompts

The following table shows the default system prompt and superuser prompt for the C shell, Bourne shell, and Korn shell.

TABLE P-2 Shell Prompts

Shell	Prompt
C shell	*machine_name*%
C shell superuser	*machine_name*#
Bourne shell and Korn shell	$
Bourne shell and Korn shell superuser	#

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Canada	1-800-873-7869	1-800-944-0661
France	0800-90-61-57	0800-90-61-58
Germany	01-30-81-61-91	01-30-81-61-92
Holland	06-022-34-45	06-022-34-46
Japan	0120-33-9096	0120-33-9097
Luxembourg	32-2-720-09-09	32-2-725-88-50
Sweden	020-79-57-26	020-79-57-27
Switzerland	0800-55-19-26	0800-55-19-27
United Kingdom	0800-89-88-88	0800-89-88-87
United States	1-800-873-7869	1-800-944-0661

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CHAPTER 1

OpenBoot 3.x Commands

This chapter describes the OpenBoot™ 3.x commands for the Ultra Enterprise 3000, 4000, 5000, and 6000 servers.

Environmental Monitoring

Use the following commands for environmental monitoring:

- `disable-environmental-monitor`
- `enable-environmental-monitor`

`disable-environmental-monitor`

Usage

```
disable-environmental-monitor ( -- )
```

Purpose

To stop monitoring power supply status, board temperatures, and board hot plug while the screen displays the `ok` prompt.

enable-environmental-monitor

Usage

`enable-environmental-monitor ( -- )`

Purpose

To start monitoring power supply status, board temperatures, and board hot plug while the screen displays the `ok` prompt.

Note – This command is enabled by default.

Messages Indicating Environmental Conditions

The following system messages indicate environmental conditions:

```
PROM NOTICE: Overtemp detected on board <n>.
PROM NOTICE: System has cooled down.
PROM WARNING: Board <n> is too hot.
PROM NOTICE: Insufficient power detected.
PROM NOTICE: Power supply restored.
PROM NOTICE: Board insert detected.
PROM NOTICE: Reset Initiated...
```

If a board temperature is above a predetermined temperature threshold for that board type, the OpenBoot PROM (OBP) initiates a reset. This results in POST disabling the faulty board.

If `Insufficient power detected` is not fixed in 30 seconds, then the OBP initiates a reset to enable POST to deconfigure the necessary boards.

If a board insert is detected, the OBP turns the reset flag on. This causes the `boot` command to reset the system and POST to attach the board to the system.

Externally Initiated Reset XIR

If a hard hang occurs on a system, use an XIR to reset and get information about the state at the time of the hard hang.

To initiate an XIR:

- **Use either the XIR button on the clock board or the remote console** XIR **sequence.**

When an XIR occurs, memory is cleared but some CPU state is saved.

To display this XIR information:

- **Type the following command at the** ok **prompt immediately after the** XIR**:**

```
ok .xir-state-all
```

The output displays information similar to the following:

```
#1 ok .xir-state-all
CPU ID#1
TL=1 TT=3
TPC=e0028688 TnPC=e0028688 TSTATE=9900001e06

CPU ID#5
TL=1 TT=3
TPC=e002755c TnPC=e0027560 TSTATE=4477001e03
```

Note – The XIR does not override the NVRAM auto-boot? variable.

Flash PROM Management

The following OpenBoot 3.x commands are used in flash PROM management:

- flash-update-system
- prom-copy
- update-proms

flash-update-system

Usage

```
flash-update-system ( -- )
```

Purpose

To download the default flash images on all the boards in the system.

Note – The default device used is the one pointed to by “net.”

The default image names are described in TABLE 1-1.

TABLE 1-1 Default Image Names

Board Type	Image File Name
CPU board PROMs	`cpu.flash`
I/O board Type 1	`io2sbus.flash`
I/O board Type 2	`io1sbus.flash`

Note – This command does not update boards in low power mode.

---

prom-copy

Usage

```
prom-copy ( src dst -- )
```

Purpose

To copy a flash PROM from board `src` to board `dst`.

update-proms

Usage

```
update-proms (--)
```

Purpose

To synchronize the latest copy of each type of PROM on all other boards of the same type.

This command copies the latest version of each type of PROM (CPU and I/O boards) on all other boards of the same type. This results in all boards of the same type having the latest (same) PROM.

POST Status Display

show-post-results

Usage

```
show-post-results (--)
```

Purpose

To display POST results at the ok prompt. The output looks similar to this:

```
ok show-post-results

Slot  0 - Status=Okay, Type: CPU/Memory

 Cpu0=P    Cpu0-OK=P   FailCode=0   Cpu1=Not    x              x
 AC=P      FHC=P       SRAM=P       PROM=P      LabCon=Not     Ovtemp=Not
 Bank0=0   Bank1=0     DTag0=P      DTag1=P     JTAG=P         CntrPl=P
  DC=ff
```

```
Slot  1 - Status=Okay, Type: IO board Type 1

 Sysio0=P    Sysio1=P  FEPS=P         FEPSFC=0   SOC=P
 Sbus0=P     Sbus1=P   Sbus2=P
 AC=P        FHC=P     SRAM=***       PROM=P     LabCon=Not Ovtemp=Not
 TODC=P      JTAG=P    CntrPl=P       DC=ff


Slot  3 - Status=Okay, Type: IO board Type 2

 Sysio0=P   Sysio1=P   FEPS=P     FEPSFC=0   SOC=P       FFB=P
 Sbus0=P    Sbus2=P
 AC=P        FHC=P     SRAM=***   PROM=P     LabCon=Not   Ovtemp=Not
 TODC=P      JTAG=P    CntrPl=P   DC=ff


Slot  6 - Status=Low Power Mode, Type: IO board Type 1

 Sysio0=P   Sysio1=P   FEPS=P     FEPSFC=0   SOC=P
 Sbus0=P    Sbus1=P    Sbus2=P
 AC=P       FHC=P      SRAM=***   PROM=P     LabCon=Not Ovtemp=Not
 TODC=P     JTAG=P     CntrPl=P   DC=ff


Slot 16 - Status=Fail, Type: Clock

 Clock=P   Serial=P    KbdMse=P   PPS-DC=P   DCReg0=P  DCReg1=P
 AC=P      ACFan=P     KeyFan=P   PSFail=0   Ovtemp=Not TODC=P   RKFan=P


 P = Present or Passed
 *** = Failed Component
 Not = Not present
ok
```

TABLE 1-1 and TABLE 1-2 describe the output.

TABLE 1-2 CPU/Memory Board

Abbreviation	Description
Cpu0/Cpu1	CPU modules on the board
CPU{0,1}-OK	CPU module status
FailCode	Failure code (valid only if CPU failed)
AC	Address controller
FHC	Fire hose controller
SRAM	Static RAM
FPROM	Flash PROM
LabCon	Lab console
Ovtemp	Over temperature
Bank0	Bank0 status (a bit indicates a missing or failed SIMM)
Bank1	Bank1 status (a bit indicates a missing or failed SIMM)
DTag0	DTags0 status
DTag1	DTags1 status
JTAG	Jtag status
CntrPl	Centerplane status
DC	Data controllers (0 bit indicates a failed DC)

TABLE 1-3 I/O Board

Abbreviation	Description
Sysio0	SysIO 0 status
Sysio1	SysIO 1 status
FEPS	Onboard FEPS chip
FEPSFC	FEPS fail code (valid only if failed)
SOC	Onboard SOC status
FFB	FFB card status
Sbus0	SBus0 slot status
Sbus1	SBus1 slot status
Sbus2	SBus2 slot status

TABLE 1-3 I/O Board *(Continued)*

Abbreviation	Description
AC	Address controller
FHC	Fire hose controller
SRAM	Static RAM
FPROM	Flash PROMs
LabCon	Lab console
Ovtemp	Over temperature
TODC	Time-of-day clock
JTAG	JTAG status
CntrPl	Centerplane status
DC	Data controllers (0 bit indicates a failed DC)

TABLE 1-4 Disk Board

Hardware Device	Description
Disk0	Disk0 ID (valid only if disk present)
Disk1	Disk1 ID (valid only if disk present)
Disk0P	Disk0 present
Disk1P	Disk1 present
VDDOK	SCSI VDD status
Fan	Fan fail status
JTAG	JTAG status

TABLE 1-5 Clock Board

Abbreviation	Description
Clock	Clock running
Serial	Serial port
KBytes	Keyboard mouse status
PPS-DC	Peripheral PS OK (all DC levels OK)
AC	AC power status
ACFan	AC box fan status
KeyFan	KeySwitch fan status

TABLE 1-5 Clock Board *(Continued)*

Abbreviation	Description
PSFail	Power supply fail status (bit position indicates which ps failure)
Ovtemp	Over temperature
TODC	Time-of-day clock
V5-P	Peripheral 5V
V12-P	Peripheral 12V
V5-Aux	Auxiliary 5V
V5P-PC	Peripheral 5V precharge
V12-PC	Peripheral 12V precharge
V3-PC	System 3.3V precharge
V5-PC	System 5.0V precharge
RKFan	Rack fan status
3.3V	Clock board 3.3 V
5.0V	Clock board 5.0 V

TOD Clock Management

This section describes the following commands related to time-of-day (TOD) clock management, which includes NVRAM:

- `copy-clock-tod-to-io-boards`
- `copy-io-board-tod-to-clock-tod`

`copy-clock-tod-to-io-boards`

Usage

`copy-clock-tod-to-io-boards`

Purpose

To copy the contents of the clock board NVRAM and the contents of the TOD clock to all good I/O boards in the system.

This occurs automatically if all of the following conditions are true:

- There is a functioning clock board in the system.
- Its contents match that of at least one I/O board in the system.

`copy-io-board-tod-to-clock-tod`

Usage

```
copy-io-board-tod-to-clock-tod ( src -- )
```

Purpose

To update the contents of a clock board (probably new) with the contents from one of the backup I/O board copies.

Note – This may have to be done if the clock board was replaced and the user wants to restore its original NVRAM.

Specific NVRAM Variables

This section describes the following NVRAM variables:

- `configuration-policy`
- `disabled-board-list`
- `disabled-memory-list`
- `memory-interleave`
- `sbus-probe-default`
- `sbus-specific-probe`

configuration-policy

Variable Name	Value	Default Value
configuration-policy	component	component

This variable determines the configuration policy. When a faulty component is detected, the value options are as follows:

Hardware Device	Description
Component (default)	Disable only what failed.
System	Stop the system in POST if any component failed tests.
Board	Disable the entire board that contains the failed component.

disabled-board-list

Note – The master board (the CPU board in the lowest slot) will not be disabled if it is put in the `disabled-board-list`. The operating system displays a warning as follows: `WARNING: Disabled board 0 was really active`

This is a list of boards that are not to be used by the system. These boards are put in low power mode on the next reset and remain there until they are removed from this list on the following reset.

For example, to reset a list to null, type:

```
ok set-default disabled-board-list
```

disabled-memory-list

This command lists the boards with memory on them that will not be used. This variable takes effect on the next reset or power on. For both of the above variables, the list is a sequence of any number of boards 0 through 9 and a through f.

A valid example is:

```
setenv disabled-board-list 45       (disable boards in slots 4 and 5)
setenv disabled-board-list 7af      (disable boards in slots 7 and 10)
```

To reset a list to null, type:

```
ok set-default disabled-memory-list
```

memory-interleave

Variable Name	Value	Default Value
memory-interleave	max	max

This variable determines how the memory on various boards is to be interleaved. The default value is maximum interleaving. When it is set to “min,” no interleaving is required. This takes effect on the next reset or power on.

sbus-probe-default

Variable Name	Value
sbus-probe-default	d3120

This variable defines the SBus device probe order on an I/O board per SBus, where:

d	On-board SOC
3	On-board FEPS
0-2	SBus slots 0, 1, and 2

The device probe order on a Type 1 I/O board is as follows, since the five SBus devices are divided between two SBuses:

`lo sbus`	`d, 1, 2`
`hi sbus`	`3,0`

However, on a Type 2 I/O board, since there is only 1 SBus, the probe order is:

lo sbus	absent	(UPA/FFB Port in its place)
hi sbus	d, 3, 2, 0	(no slot 1)

To change the default probe order to 123d0, type:

```
ok setenv sbus-probe-default 123d0
```

Remember that this changes the default probe order for all boards in the system. You can also use this to skip over an SBus slot, but don't include it in the list of devices to probe. To change the probe order for a specific board, use the `sbus-specific-probe` variable.

sbus-specific-probe

Variable Name	Value
`sbus-specific-probe`	1:d120

This variable controls the SBus probe order on a given list of boards. To set the probe order as 320 on I/O board 4, type:

```
ok setenv sbus-specific-probe 4:320
```

The number preceding the colon (:) is the slot number; the numbers following it are the SBus device numbers in the desired probe order. All unlisted I/O boards in the system use the default probe order as defined by the `sbus-default-probe` NVRAM variable.

Multiple boards can be defined by this variable as follows:

```
ok setenv sbus-specific-probe 4:320 6:d3210 7:0123d
```

CHAPTER 2

Board Hot Plug Software Procedures

This chapter explains how to use the board hot plug capability. For command information and examples, see Chapter 1, “OpenBoot 3.x Commands.”.

Disabled System Board

A system board can become disabled (not used by the operating system) in three ways:

- A self-test detects a failure and disables the board.
- The board is disabled manually using `disabled-board-list`. In this case, the operator tells the system not to use the board. For example:

```
ok setenv disabled-board-list 72
```

  The above command disables boards in slots seven and two. See “disabled-board-list” on page 11” for more information.

- The board was inserted while the operating system was running.

▼ To Swap Out a Disabled Board

1. **Make sure that the board is disabled (not in use by the operating system, power light off).**
2. **Remove the disabled board.**

Caution – If the yellow light is on, use `prtdiag` to determine the cause before installing a new board.

3. **Install a new board.**
   a. **Verify that system precharge is OK.**
   b. **Verify that hot plug is available.**
4. **Reboot the system.**

Activated System Board

The system board is activated when the following three conditions are met:

- The board is in place during system startup.
- The slot has not been disabled by `disabled-board-list`.
- The board passes self-test.

▼ To Swap Out an Activated Board

1. **Halt the system.**
2. **Power off the system.**
3. **Remove and replace the board.**
4. **Reboot the system.**

Disabling Hardware

By using the `configuration-policy` command, you can disable

- Component—Disables only the failing component.
- Board—-Disables the board if any component on it fails.
- System—Stops the system at the POST menu if there is a failure.

Examples:

```
ok setenv configuration-policy board
```

or

```
# eeprom "configuration-policy board"
```

▼ To Disable a Defective Board

If you suspect a board is defective and want to request that the system disable the board, perform the following procedure.

1. **Use the `setenv` command at the `ok` prompt or the `eeprom` command at the `#` prompt to prohibit the system from using the board. Examples:**

```
ok setenv disable-board-list 3
```

or

```
# eeprom "disable-board-list"=3
```

where 3 = slot 3.

2. **Reboot the system.**
3. **Remove the unused board and insert a new board.**

4. **Clear the** `disabled-board-list`**.**

   See “disabled-board-list” on page 11 for more information.

5. **Reboot the system.**

CHAPTER 3

Enabling a Hardware Timer

This chapter explains how to do the following:

- Enable a hardware timer that will reset the system if it times out
- Display system configuration and diagnostic information
- Reset and power cycle the system from a remote console

Hardware Watchdog

The Ultra Enterprise *x*000 family of servers provide the ability to enable a hardware timer that will hard-reset the system if it times out. To enable the use of this feature, `watchdog_enable` must be set to `1` in `/etc/system`.

History Log Option of `prtdiag`(1M)

- **To display system configuration and diagnostic information, use the `prtdiag`(1M) command.**

  The `-l` option of `prtdiag`(1M) logs its output to `syslogd`(1M) only if failures or errors exist in the system.

Resetting and Power Cycling the System From a Remote Console

You can reset the system or power cycle from the remote console under these conditions:

- The console must be connected to port A on the clock board.
- The key switch must be in either the On or Diagnostic setting. If it is in the Secure or Off position, the remote key sequences and button resets are ignored.
- Security features (such as OpenBoot `security-mode`) are disabled.
- Type slowly, no faster than 0.5 seconds and no slower than 5 seconds between characters.

TABLE 3-1 lists the remote console commands, which are useful for resetting the system under general conditions. The remote `XIR` reset command is useful in software development and debugging. For a discussion of this command, see “Externally Initiated Reset XIR” on page 3” in Chapter 1.

TABLE 3-1 Remote Console Commands

Command	Keyboard Key Sequence
Remote power off/on	Return Return ~ Control-Shift-p
Remote system reset	Return Return ~ Control-Shift-r
Remote XIR (CPU) reset	Return Return ~ Control-Shift-x

Key:
Return = ASCII 0d hexadecimal
~ = ASCII 7e hexadecimal
Control-Shift-p = 10 hexadecimal
Control-Shift-r = 12 hexadecimal
Control-Shift-x = 18 hexadecimal

Note – The remote console logic circuit continues to receive power, even if you have commanded system power off.

Since the remote console logic looks for certain patterns on the `ttya` line in the hardware that can be used to reset the machine, it is important that only authorized personnel have access to the `ttya` serial port..