Solaris™ 8 HW 7/03 Sun™ Hardware Platform Guide

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Contents

Preface

The *Solaris 8 HW 7/03 Sun Hardware Platform Guide* contains important information about the Sun™ hardware supported by the Solaris™ 8 HW 7/03 operating environment.

This manual:

- Provides platform-specific installation instructions for the Solaris 8 HW 7/03 software
- Describes software provided on the Solaris Software Supplement CD and explains how to install product software
- Describes flash PROM update procedures necessary for some systems to run in 64-bit mode
- Describes hardware and software requirements affecting Power Management™ software

Note – For general Solaris 8 HW 7/03 operating environment installation instructions, refer to Chapter 1. For information about how to install software contained on the Solaris Software Supplement CD and information about supported hardware, refer to Chapter 3.

Where to Find Installation Information

The Solaris 8 HW 7/03 software is delivered on three CDs or a single DVD:

- Solaris 8 HW 7/03 SPARC™ Platform Edition CDs (called the Solaris CDs throughout this manual)
- Solaris Software Supplement CD (called the Supplement CD throughout this manual).

Before installing the Solaris 8 HW 7/03 software, check TABLE P-1 for listings of manuals with information that may apply to your situation and TABLE P-2 for specific installation information.

Note – All Solaris and SPARC documentation can be found on the Documentation CD. All Sun hardware-specific documentation can be found on the Supplement CD. Some co-packaged products contain documentation on their respective CDs.

TABLE P-1   Related Documentation

Title	Description
Solaris 8 SPARC Installation Instructions	Primary installation manual for this release of the Solaris operating environment from the Documentation CD
Solaris Advanced Installation Guide	Contains additional information about how to install the Solaris operating environment on server systems

TABLE P-2   Specific Installation Information

If you want to	Go to
Know more about new products and peripherals	Chapter 3 in this manual
Know about late-breaking news	1. *Solaris 8 HW 7/03 Release Notes Supplement for Sun Hardware*
	2. *Solaris 8 2/02 Release Notes*
	3. Product Notes provided with your Sun hardware platform
Begin the installation process from the Solaris CDs	1. *Solaris 8 HW 7/03 Sun Hardware Platform Guide*
	2. *Solaris 8 SPARC Installation Instructions*
Install software for your platform/peripheral from the Supplement CD	Chapter 3 in this manual
Update your flash PROM for 64-bit operation	Chapter 5 and Chapter 6 in this manual
Install an AnswerBook™ from the Supplement CD	Chapter 4 in this manual

How This Book Is Organized

This book is organized as follows:

Chapter 1 supports the *Solaris 8 Start Here* card by providing additional installation instructions on how to install or upgrade to the Solaris 8 HW 7/03 software on specific Sun platforms and hardware options.

Chapter 2 lists supported Sun hardware.

Chapter 3 describes how to install the software for Sun platforms and hardware options and describes value-added software provided to users of Sun hardware.

Chapter 4 describes the locations and formats for the documentation on the Supplement CD.

Chapter 5 describes the procedure for updating the flash PROMs for 64-bit operation on Ultra™ 1, Ultra 2, Ultra 450, and Sun Enterprise 450 systems.

Chapter 6 describes the procedure for updating the flash PROMs for 64-bit operation on Sun Enterprise™ 3x00, 4x00, 5x00, and 6x00 systems.

Chapter 7 describes the hardware and software requirements for running the Power Management software on Sun hardware.

Chapter 8 describes installation of Alternate Pathing software.

Chapter 9 describes new OpenBoot™ emergency procedures for some systems.

Chapter 10 describes installation of the Solaris 8 HW 7/03 operating environment on the Sun Fire™ 6800/4810/4800/3800 systems.

Typographic Conventions

Typeface[*]	Meaning	Examples
AaBbCc123	The names of commands, files, and directories; on-screen computer output	Edit your `.login` file. Use `ls -a` to list all files. `% 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. Replace command-line variables with real names or values.	Read Chapter 6 in the *User's Guide*. These are called *class* options. To delete a file, type **rm** *filename*.

* The settings on your browser might differ from these settings.

Accessing Sun Documentation

You can view, print, or purchase a broad selection of Sun documentation, including localized versions, at:

http://www.sun.com/documentation

Sun Welcomes Your Comments

Sun is interested in improving its documentation and welcomes your comments and suggestions. You can email your comments to Sun at:

docfeedback@sun.com

Please include the part number (817-1550-10) of your document in the subject line of your email.

Installing Software From the Solaris CD

- *"Automatic Installation of Solaris Software" on page 1*
- *"Platform Names and Groups" on page 1*
- *"32-bit Kernel—Default on 200MHz or Lower UltraSPARC Systems" on page 5*
- *"System Kernel Support" on page 6*

Note – For initial instructions on installing this Solaris release, see the *Start Here* document provided with the discs.

Automatic Installation of Solaris Software

For the Sun hardware listed in TABLE 1-1, the Solaris 8 release requires no special installation or upgrade instructions. If you plan to perform an automatic installation of the Solaris 8 HW 7/03 operating environment on your Sun hardware, refer to the *Solaris Advanced Installation Guide* for all your installation needs.

Platform Names and Groups

You need to know your system architecture (platform group), if you are performing one of the following tasks:

- Setting up a boot server on a subnet

■ Adding clients for network installation (standalone, servers, dataless, diskless)

If you are writing a custom JumpStart™ installation rules file, you need to know the platform name.

shows the platform names and groups of various Sun hardware systems

TABLE 1-1   Platform Names for Sun Systems

System	Platform Name	Platform Group
Desktop Systems		
Sun Blade™ 100	SUNW,Sun-Blade-100	sun4u
Sun Blade 150	SUNW,Sun-Blade-100	sun4u
Sun Blade 1000	SUNW,Sun-Blade-1000	sun4u
Sun Blade 1500	SUNW,Sun-Blade-1500	sun4u
Sun Blade 2000	SUNW,Sun-Blade-1000	sun4u
Sun Blade 2500	SUNW,Sun-Blade-2500	sun4u
Ultra™ 1	SUNW,Ultra-1	sun4u
Ultra 2	SUNW,Ultra-2	sun4u
Ultra 5	SUNW,Ultra-5_10	sun4u
Ultra 10	SUNW,Ultra-5_10	sun4u
Ultra 30	SUNW,Ultra-30	sun4u
Ultra 60	SUNW,Ultra-60	sun4u
Ultra 80	SUNW,Ultra-80	sun4u
Ultra 450	SUNW,Ultra-4	sun4u
SPARCstation™ 4	SUNW,SPARCstation-4	sun4m
SPARCstation 5	SUNW,SPARCstation-5	sun4m
SPARCstation 10	SUNW,SPARCstation-10	sun4m
SPARCstation 20	SUNW,SPARCstation-20	sun4m
SPARCclassic	SUNW,SPARCclassic	sun4m
SPARCstation LX	SUNW,SPARCstation-LX	sun4m
SPARCstation LX+	SUNW,SPARCstation-LX+	sun4m
Entry/Workgroup Servers		

TABLE 1-1 Platform Names for Sun Systems *(Continued)*

System	Platform Name	Platform Group
Sun Fire™ V1280	SUNW,Netra-T12	sun4u
Sun Fire V880	SUNW,Sun-Fire-880	sun4u
Sun Fire V480	SUNW,Sun-Fire-480	sun4u
Sun Fire V440	SUNW,Sun-Fire-V440	sun4u
Sun Fire 280R	SUNW,Sun-Fire-280R	sun4u
Sun Fire V250	SUNW,Sun-Fire-V250	sun4u
Sun Fire V240	SUNW,Sun-Fire-V240	sun4u
Sun Fire V210	SUNW,Sun-Fire-V210	sun4u
Sun Fire V120	SUNW,UltraAX-i2	sun4u
Sun Fire V100	SUNW,UltraAX-i2	sun4u
Sun Fire B100s	SUNW,Serverblade1	sun4u
Sun Fire B10n	SUNW,Serverblade1	sun4u
Sun Enterprise™ 420R	SUNW,Ultra-80	sun4u
Sun Enterprise 220R	SUNW,Ultra-60	sun4u
Sun Enterprise 450	SUNW,Ultra-4	sun4u
Sun Enterprise 250	SUNW,Ultra-250	sun4u
Sun Enterprise 150	SUNW,Ultra-1	sun4u
Sun Enterprise Ultra 5S	SUNW,Ultra-5_10	sun4u
Sun Enterprise Ultra 10S	SUNW,Ultra-5_10	sun4u
Sun Enterprise 2	SUNW,Ultra-2	sun4u
Sun Enterprise 1	SUNW,Ultra-1	sun4u
Mid-Range and Mid-Frame Servers		
Sun Fire 6800	SUNW,Sun-fire	sun4u
Sun Fire 4810	SUNW,Sun-fire	sun4u
Sun Fire 4800	SUNW,Sun-fire	sun4u
Sun Fire 3800	SUNW,Sun-fire	sun4u
Sun Enterprise 6500	SUNW,Ultra-Enterprise	sun4u

TABLE 1-1 Platform Names for Sun Systems *(Continued)*

System	Platform Name	Platform Group
Sun Enterprise 5500	SUNW,Ultra-Enterprise	sun4u
Sun Enterprise 4500	SUNW,Ultra-Enterprise	sun4u
Sun Enterprise 3500	SUNW,Ultra-Enterprise	sun4u
Sun Enterprise 6000	SUNW,Ultra-Enterprise	sun4u
Sun Enterprise 5000	SUNW,Ultra-Enterprise	sun4u
Sun Enterprise 4000	SUNW,Ultra-Enterprise	sun4u
Sun Enterprise 3000	SUNW,Ultra-Enterprise	sun4u
SPARCcenter™ 2000	SUNW,SPARCcenter-2000	sun4d
SPARCserver™ 1000	SUNW,SPARCserver-1000	sun4d
High End Servers		
Sun Fire 15K	SUNW,Sun-Fire-15000	sun4u
Sun Enterprise 10000	SUNW,Ultra-Enterprise	sun4u
Netra™ Servers		
Netra 20	SUNW,Netra-T4	sun4u
Netra 120	SUNW,UltraAX-i2	sun4u
Netra 240	SUNW,Netra-240	sun4u
Netra 1280	SUNW,Netra-T12	sun4u
Netra T1 AC200/DC200	SUNW,UltraAX-i2	sun4u
Netra X1	SUNW,UltraAX-i2	sun4u
Netra ct800	SUNW,UltraSPARC-IIi-Netract	sun4u
Netra ct400	SUNW,UltraSPARC-IIi-Netract	sun4u
Netra t 1400 & t 1405	SUNW,Ultra-80	sun4u
Netra t 1120 & t 1125	SUNW,Ultra-60	sun4u

TABLE 1-1 Platform Names for Sun Systems *(Continued)*

System	Platform Name	Platform Group
Netra t1 100 & t1 105	SUNW,UltraSPARC-IIi-cEngine	sun4u
Board Level Products		
Ultra AX	Ultra-1-Engine	sun4u
Ultra AXi	UltraSPRAC-IIi-Engine	sun4u
CP1400	UltraSPARC-IIi-cEngine	sun4u
CP1500	UltraSPARC-IIi-cEngine	sun4u
UltraAX-MP	UltraAX-MP	sun4u
UltraAX-MP+	UltraAX-MP	sun4u
UltraAXe	UltraAX-e	sun4u
UltraAX-e2	UltraAX-e2	sun4u
CP2020	UltraSPARCengine_CP-20	sun4u
CP2040	UltraSPARCengine_CP-40	sun4u
CP2060	UltraSPARCengine_CP-60	sun4u
CP2080	UltraSPARCengine_CP-80	sun4u

32-bit Kernel—Default on 200MHz or Lower UltraSPARC Systems

On UltraSPARC systems with 200MHz or lower processors, it is possible for a user to run a 64-bit program designed to exploit a problem that could cause a processor to stall. Since 64-bit programs cannot run on the Solaris 32-bit kernel, the Solaris 32-bit kernel is booted by default on these systems.

The code sequence that exploits the problem is very unusual, and is not likely to be generated by a compiler. Assembler code had to be specifically written to demonstrate the problem. It is highly unlikely that a legitimate handwritten assembler routine would use this code sequence.

Users willing to assume the risk that a user might accidentally or deliberately run a program that was designed to cause a processor to stall may choose to run the Solaris 64-bit kernel on these systems.

You can determine the speed of your processor(s) by typing:

```
# /usr/sbin/psrinfo -v
```

You can change the default kernel from 32-bit on a system by modifying the boot policy file. Edit the /platform/*platform-name*/boot.conf file so that it contains an uncommented line with the variable named ALLOW_64BIT_KERNEL_ON_UltraSPARC_1_CPU set to the value true as shown in the example that follows:

ALLOW_64BIT_KERNEL_ON_UltraSPARC_1_CPU=true

See boot(1M) for more information about changing the default kernel.

You may also purchase an upgrade to your system, contact your Sun representative for details.

System Kernel Support

All SPARC systems can run 32-bit applications. Systems using newer SPARC processors (that is, UltraSPARC-based systems) can boot and run a full 64-bit kernel, which allows those systems to run 32-bit and 64-bit applications concurrently.

Systems running a 64-bit kernel require 64-bit versions of drivers and other software modules that load directly into the kernel. A small number of applications may be dependent on such components and thus would require versions of these components specific to a 32-bit or 64-bit kernel. Also, 32-bit applications cannot link to 64-bit libraries and vice versa. (The Solaris 8 operating environment includes both 32-bit and 64-bit versions of system libraries.)

The following lists indicate which systems can run 64-bit as well as 32-bit applications and which systems can boot a 32-bit kernel, a 64-bit kernel, or both.

32-Bit Only Kernel/Driver Platforms:

- SPARCclassic, SPARCstation LX
- SPARCstation 4, 5, 10, 20
- SPARCserver 1000, 2000
- SPARCengine CP1200

64-bit Platforms That Can Boot a 32-Bit Kernel/Driver:

Note – These systems support 32-bit applications and drivers only when running a 32-bit kernel and support 64-bit applications and drivers only when running a 64-bit kernel.

- Ultra 1, 2, 5, 10, 30, 60, 80, 450
- Sun Enterprise 1,2,150,220R,250,420R,450
- Sun Enterprise 3000,4000,5000,6000,3500,4500,5500,6500
- Netra t1, t1120, t1125, t1400, t1405
- Ultra AX, AXi, AXdp, AXmp, AXmp+, AXe
- SPARCengine CP1400, CP1500

64-bit Platforms That Do Not Support a 32-Bit Kernel/Driver:

- Sun Blade 100, 150, 1000, 1500, 2000, 2500
- Sun Fire 280R
- Sun Fire V100, V120, V210, V240, V250, V440, V480, V880, V1280
- Sun Fire B100s, B10n
- Sun Fire 3800, 4800, 4810, 6800
- Sun Fire 15K
- Netra X1, T1, 20, 120, 240, 1280

Supported Sun Hardware

Supported Platforms

The following Sun systems are supported in the Solaris 8 HW 7/03 release:

Desktop	Entry/Workgroup Servers	Mid-Range and Mid-Frame Servers	High End Servers	Netra Servers
Sun Blade™ 100	Sun Fire™ V1280	Sun Fire 6800	Sun Fire 15K	Netra™ 20
Sun Blade 150	Sun Fire V880	Sun Fire 4810	Sun Enterprise™ 10000	Netra 120
Sun Blade 1000	Sun Fire V480	Sun Fire 4800		Netra 240
Sun Blade 1500	Sun Fire V440	Sun Fire 3800		Netra 1280
Sun Blade 2000	Sun Fire 280R	Sun Enterprise 6500		Netra T1 AC200/DC200
Sun Blade 2500	Sun Fire V250	Sun Enterprise 5500		Netra X1
Ultra™ 1	Sun Fire V240	Sun Enterprise 4500		Netra ct800
Ultra 2	Sun Fire V210	Sun Enterprise 3500		Netra ct400
Ultra 5	Sun Fire V120	Sun Enterprise 6000		Netra t 1400 and t 1405
Ultra 10	Sun Fire V100	Sun Enterprise 5000		Netra t 1120 and t 1125
Ultra 30	Sun Fire B100s	Sun Enterprise 4000		Netra t1 100 and t1 105
Ultra 60	Sun Fire B10n	Sun Enterprise 3000		

Desktop	Entry/Workgroup Servers	Mid-Range and Mid-Frame Servers	High End Servers	Netra Servers
Ultra 80	Sun Enterprise 420R	SPARCcenter™ 2000		
Ultra 450	Sun Enterprise 220R	SPARCserver™ 1000		
SPARCstation™ 4	Sun Enterprise 450			
SPARCstation 5	Sun Enterprise 250			
SPARCstation 10	Sun Enterprise 150			
SPARCstation 20	Sun Enterprise Ultra 5S			
SPARCclassic	Sun Enterprise Ultra 10S			
SPARCstation LX	Sun Enterprise 2			
SPARCstation LX+	Sun Enterprise 1			

The following Sun board level products are supported in the Solaris 8 HW 7/03 release:

- Ultra AX
- Ultra AXi
- CP1400
- CP1500
- UltraAX-MP
- UltraAX-MP+
- UltraAXe
- UltraAX-e2
- CP2020
- CP2040
- CP2060
- CP2080

Supported Graphics

The following frame buffer cards are now supported in this release:

TABLE 2-1   Supported Graphics

Frame Buffer Card	First Supported:	Driver	Config Command	For More Information:
XVR-500	Solaris 8 HW 12/02	ifb	fbconfig	*Sun XVR-500 Graphics Accelerator Installation Guide* Part # 816-3028-12
XVR-1200	Solaris 8 HW 5/03	jfb	fbconfig	*Sun XVR-1200 Graphics Accelerator Installation and User's Guide* Part # 816-7386-10
XVR-100	Solaris 8 HW 5/03	pfb	fbconfig	*Sun XVR-100 Graphics Accelerator Installation Guide* Part # 816-7560-10

Note – One frame buffer mentioned in the *Solaris Handbook for Sun Frame Buffers*, the XVR-1000, is not supported in Solaris 8 HW 12/02, Solaris 8 HW 5/03, nor in this release.

CHAPTER **3**

Installing Software from the Solaris Software Supplement CD

This chapter describes the contents of the software on the CD labeled Solaris Software Supplement CD. This CD is referred to in this document as the Supplement CD.

TABLE 3-1 lists each type of software on the Supplement CD, and whether that software is installed by default or by option.

TABLE 3-1 Solaris 8 HW 7/03 Supplement CD Content and Installation Status

Software	Version	Solaris Web Start
CDRW software	1.1	Installed by default
Java 3D™ software	1.2.1_03	Installed by default
OpenGL® software	1.3	Installed by default
PC launcher and PC file viewer software	1.0.1	Installed by default
ShowMe TV™ software	1.3	Installed by default
SunATM™ driver	5.0	Installed by default
SunFDDI™ PCI driver and SunFDDI SBus driver	3.0/7.0	Installed by default
SunForum™ software	3.1	Installed by default
SunHSI™ PCI driver and SunHSI SBus driver	3.0/3.0	Installed by default
SunVTS™ software	5.1 Patch Set 3	Installed by default
XML Library	2.4.12	Installed by default
Sun Fire B10n software	1.0	Optional
Remote System Control (RSC) for Sun Enterprise Servers	2.2	Optional
Alternate Pathing software	2.3.1	Optional
Capacity On Demand (COD) software	1.0	Optional

TABLE 3-1 Solaris 8 HW 7/03 Supplement CD Content and Installation Status

Software	Version	Solaris Web Start
Lights Out Management software	2.0	Optional
Netra™ ct Platform software	1.0	Optional
Netra t11xx Alarms software	2.0	Optional
Sun Enterprise 10000 SSP software	3.5	Optional
Sun Fire 880 FC-AL Backplane Firmware	1.0	Optional
System Management Services(SMS) software	1.2	Optional

The following table lists the versions of the software in the current Solaris 8 update release, as well as the versions in the preceding Solaris 8 releases.

TABLE 3-2   Solaris 8 Supplement CD Content

Software	Solaris 8 6/00	Solaris 8 10/00	Solaris 8 1/01	Solaris 8 4/01	Solaris 8 7/01	Solaris 8 10/01	Solaris 8 2/02	Solaris 8 HW 12/02	Solaris 8 HW 5/03	Solaris 8 HW 7/03
Alternate Pathing	2.3	2.3	2.3.1	2.3.1	2.3.1	2.3.1	2.3.1	2.3.1	2.3.1	2.3.1
CDRW	n/a	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.1
Capacity on Demand	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Java 3D	1.1.2	1.1.2	1.1.2	1.2	1.2.1	1.2.1_01	1.2.1_03	1.2.1_03	1.2.1_03	1.2.1_03
Netra ct Platform	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Netra t11xx Alarms	**n/a**	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lights Out Management	**n/a**	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
OpenGL	1.2.1	1.2.1	1.2.1	1.2.1	1.2.1	1.2.2	1.2.2	1.2.2	1.3	1.3
PC launcher, PC file viewer	1.0.1, 1.0.1	1.0.1, 1.0.1	1.0.1, 1.0.1	1.0.1, 1.0.1	1.0.1, 1.0.1	1.0.1, 1.0.1	1.0.1, 1.0.1	1.0.1, 1.0.1	1.0.1, 1.0.1	1.0.1, 1.0.1
RSC	1.0	1.0	2.0	2.1	2.1	2.2	2.2	2.2	2.2	2.2
ShowMe TV	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3
SunATM	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
SunFDDI PCI	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
SunFDDI SBus	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0

TABLE 3-2 Solaris 8 Supplement CD Content *(Continued)*

Software	Solaris 8 6/00	Solaris 8 10/00	Solaris 8 1/01	Solaris 8 4/01	Solaris 8 7/01	Solaris 8 10/01	Solaris 8 2/02	Solaris 8 HW 12/02	Solaris 8 HW 5/03	Solaris 8 HW 7/03
SunForum	3.0	3.0	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1
SunHSI PCI	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
SunHSI SBus	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
SunVTS	4.0	4.1	4.2	4.3	4.4	4.5	4.6	5.1 PS1	5.1 PS2	5.1 PS3
Sun Enterprise 10000 System Service Processor	3.3	3.3	3.4	3.4	3.4	3.5	3.5	3.5	3.5	3.5
Sun Fire B10n software	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1.0
Sun Fire 880 FC-AL Backplane Firmware 1.0	n/a	n/a	n/a	1.0	1.0	1.0	1.0	1.0	1.0	1.0
System Management Services (SMS) software	n/a	n/a	n/a	n/a	n/a	1.1	1.2	1.2	1.2	1.2
XML Library	n/a	n/a	n/a	n/a	n/a	n/a	n/a	2.4.12	2.4.12	2.4.12

Installing Supplement CD Software

There are at least two ways to install software from the Supplement CD:

- Solaris Web Start 2.0
- `pkgadd`

Before Installing Supplement CD Software

If you have installed any of the Supplement CD software from a previous release, you should remove the packages associated with that software before installing the new software.

Installing Supplement CD Software Using Solaris Web Start 2.0

You can use Solaris Web Start 2.0 to install Supplement CD software after you have installed the Solaris operating environment.

▼ To Install Supplement CD Software Using Solaris Web Start 2.0

1. **Insert the Supplement CD into your CD ROM drive.**

2. **In a shell, type:**

```
# cd /cdrom/cdrom0
# ./installer
```

3. **When the Solaris Web Start GUI is displayed, select Next.**

4. **See** TABLE 3-1 **on page 13. In the Solaris Web Start column, software is labeled "Installed by default" or "Optional".**

   a. **If you want to install all of the default installed software, click Default Install, then click Next.**

   b. **If you only want to install some of the software products, click Custom Install, then click Next. Select the software you want to install, then click Next.**

Installing Supplement CD Software on a Standalone System Using `pkgadd`

▼ To install packages for supported products from the Supplement CD using `pkgadd`

1. **Insert the Supplement CD into your CD-ROM drive.**
   The File Manager window is displayed.

2. **In a shell, become superuser using the** `su` **command and the superuser password.**

3. **Type:**

```
# /usr/sbin/pkgadd -d /cdrom/cdrom0/directory/Product package_names
```

or:

```
# cd /cdrom/cdrom0/directory/Product
# pkdadd -d . package_names
```

where *directory* is the software product directory from TABLE 3-3 and *package_names* are the package names from TABLE 3-3.

The argument to the -d option must be a full path name to a device or directory. If you do not specify the device on which the package resides, pkgadd checks the default spool directory (/var/spool/pkg). If the package is not there, installation fails.

To install a particular product, choose the appropriate packages:

TABLE 3-3   Software and Packages

Software	Version	Directory	Packages
Validation Test Suite Software (SunVTS)	5.1 PS3	SunVTS_5.1_PS3/	SUNWvts SUNWvtsmn SUNWvtsx
XML library (required for SunVTS)	2.4.12	XML_Libraries_2.4.12/	SUNWlxml SUNWlxmlx
OpenGL Runtime Libraries	1.3	OpenGL_1.3/	SUNWafbgl SUNWafbgx SUNWffbgl SUNWffbgx SUNWifbgl SUNWifbgx SUNWglh SUNWglrt SUNWglrtu SUNWglrtx SUNWglsr SUNWglsrx SUNWglsrz

TABLE 3-3 Software and Packages *(Continued)*

Software	Version	Directory	Packages
PClauncher/PC file viewer	1.0.1/ 1.0.1	PC_launcher_1.0.1_PC_fileviewer_1.0.1/	SUNWdtpcv SUNWdtpcz SUNWdtpcp
Remote System Control Server	2.2	RSC_2.2/	SUNWrsc SUNWrscd SUNWrscj
ShowMe TV	1.3	ShowMeTV_1.3/	SUNWsmtvh SUNWsmtvr SUNWsmtvt SUNWsmtvu
SunForum	3.1	SunForum_3.1	SUNWdat SUNWdatu
SunFDDI PCI driver	3.0	SunFDDI_PCI_3.0/	SUNWpfd SUNWpfh SUNWpfm SUNWpfu
SunFDDI SBus driver	7.0	SunFDDI_SBus_7.0/	SUNWnfd SUNWnfh SUNWnfm SUNWnfu
SunHSI PCI driver	3.0	SunHSI_PCI_3.0/	SUNWhsip SUNWhsipm SUNWhsipu
SunHSI SBus driver	3.0	SunHSI_SBus_3.0/	SUNWhsis SUNWhsism SUNWhsisu
Sun Hardware AnswerBook2	1.0	Sun_Hardware_Answerbook/	SUNWabhdw
Java 3D	1.2.1_03	Java3D_1.2.1_03/	SUNWj3doc SUNWj3dem SUNWj3drt SUNWj3dut
SunATM 5.0	5.0	SunATM_5.0/	SUNWatm SUNWatma SUNWatmu

TABLE 3-3 Software and Packages *(Continued)*

Software	Version	Directory	Packages
Alternate Pathing	2.3.1	Alternate_Pathing_2.3.1/	SUNWapdoc SUNWapdv SUNWapr SUNWapu SUNWabap
Sun Enterprise 10000 SSP	3.5	System_Service_Processor_3.5/	SUNWsspue SUNWsspst SUNWsspr SUNWssppo SUNWsspop SUNWsspob SUNWsspmn SUNWsspid SUNWsspfp SUNWsspdr SUNWsspdo SUNWsspdf SUNWuessp
Sun Enterprise 10000 Capacity On Demand (COD) software and AnswerBook	1.0	Capacity_on_Demand_1.0/	SUNWcod SUNWcodbk SUNWcodmn
Netra ct Platform software	1.0	Netra_ct_Platform_1.0/	SUNW2jdrt SUNWctac SUNWcteux SUNWctevx SUNWctmgx
Netra t11xx Alarms software	2.0	Netra_t11xx_Alarms_2.0/	SUNWtsalm SUNWtsalr SUNWtsalu
Lights Out Management software	2.0	Lights_Out_Management_2.0/	SUNWlomm SUNWlomr SUNWlomu
CDRW	1.1	CDRW_1.1/	SUNWcdrw

TABLE 3-3   Software and Packages *(Continued)*

Software	Version	Directory	Packages
Sun Fire B10n software and manpages	1.0	Sun_Fire_B10n_Load_Balancing_Blade_1.0	SUNWclbut SUNWclbx.u
Sun Fire 880 FC-AL Backplane Firmware	1.0	Sun_Fire_880_FC-AL_Backplane_Firmware_1.0/	SUNWfcbpl.u
System Management Services (SMS) software	1.2	System_Management_Services_1.2	SUNWSMSdf SUNWSMSjh SUNWSMSlp SUNWSMSmn SUNWSMSob SUNWSMSod SUNWSMSop SUNWSMSpd SUNWSMSpo SUNWSMSpp SUNWSMSr SUNWSMSsu SUNWscdvr.u SUNWufrx.u SUNWufu

If a problem occurs during package installation, information about the problem is displayed, followed by this prompt:

```
Do you want to continue with this installation?
```

Respond with either yes, no, or quit.

Patch Enables Booting the Solaris 8 HW 7/03 Operating Environment from DVD-ROM Media

The Supplement CD contains a patch that enables some DVD-ROM drives installed on Sun hardware to boot from DVD-ROM media. This patch may need to be applied to your hardware before you can boot a software product supplied on DVD-ROM.

This patch updates firmware in the Toshiba 1401 DVD-ROM drive. You can find patch 111649 on the Supplement CD in this directory:

```
DVD_Firmware/Patches
```

See the README file in this directory for instructions on installing the patch. Be sure to read and follow all the cautions and warnings in this README file before you install the patch.

Patch 111649 is associated with Bug ID 4467424.

Validation Test Suite Software (SunVTS Software)

The SunVTS validation test suite is a diagnostic tool designed to test Sun hardware. By running multiple diagnostic hardware tests, the SunVTS software verifies the connectivity and functionality of most SPARC hardware controllers and devices in a 32-bit or 64-bit Solaris operating environment.

SunVTS provides an infrastructure for programmers to develop their own tests and run them using the SunVTS interface.

You can find the software for the SunVTS application on the Solaris Software Supplement CD, and the documentation in the Solaris 8 HW 7/03 on Sun Hardware AnswerBook set.

TABLE 3-4 describes the main features of the SunVTS environment.

TABLE 3-4 SunVTS Diagnostic Tool Features

Feature	Description
SunVTS kernel (vtsk)	The SunVTS kernel controls all aspects of the testing. It is a daemon designed to stay in the background, and to be used when needed. Upon starting, the SunVTS kernel probes the hardware configuration of the system under test and waits for instructions from a SunVTS user interface. During testing, the SunVTS kernel coordinates the running of individual tests, and manages all the messages (informational and error messages) sent by these tests.
SunVTS CDE user interface (vtsui)	This interface is designed to run on top of the Common Desktop Environment (CDE). This user interface provides the means to configure, run, and monitor SunVTS test sessions for local and remote hosts.
SunVTS TTY user interface (vtstty)	Because not every system has a monitor, SunVTS has a TTY interface. This ASCII menu-based interface accepts various key sequences to control the test options and the test sessions. It can be used from a terminal, a shell tool, or a remote login session through a modem.
Running an individual test from the command line	Besides being run from a SunVTS user interface, each individual hardware test can be run from a UNIX® command line. Running a test alone can be helpful to validate only one piece of hardware.
Custom test support	A SunVTS user can run third-party executable test binaries under the SunVTS environment in the way that the test, rather than the SunVTS kernel, fully controls its input argument list and output log files. A user can simply modify the .customtest file provided by SunVTS to make it loosely coupled to the environment.

SunVTS Packages

TABLE 3-5 provides a list of SunVTS packages needed to run the SunVTS diagnostic tool.

TABLE 3-5 SunVTS Packages on the Supplement CD

Includes Packages	Name	Description
SUNWvts	Validation Test Suite	SunVTS kernel, user interface (UI), tests and tools
SUNWvtsmn	Validation Test Suite Manual Pages	Manual pages for SunVTS utilities/binaries
SUNWvtsx	Validation Test Suite	64-Bit Validation Test Suite software

Installing SunVTS

See "Installing Supplement CD Software" on page 15.

Using SunVTS Software

To use SunVTS software, refer to the SunVTS documentation in the Solaris 8 HW 7/03 Answer Book Set. For new features, tests, and test enhancements for this release, refer to the *SunVTS 5.1 Patch Set 3 Documentation Supplement*. For overall test configuration modes, interfaces, and options, refer to the *SunVTS 5.1 User's Guide*. For individual test and quick reference information, refer to the *SunVTS 5.1 Test Reference Manual* and the *SunVTS Quick Reference Card*.

OpenGL Software

The Sun OpenGL software for Solaris is the Sun native implementation of the OpenGL application programming interface (API). The OpenGL API is an industry-standard, vendor-neutral graphics library. It provides a small set of low-level geometric primitives and many basic and advanced 3D rendering features, such as modeling transformations, shading, lighting, anti-aliasing, texture mapping, fog, and alpha blending.

Supported Platforms

The Sun OpenGL 1.3 software for Solaris supports the following devices:

- Creator Graphics, Creator3D Graphics, Elite3D Graphics, and Expert3D Graphics—OpenGL functionality is accelerated in hardware.
- SX, GX, GX+, TGX, TGX+, S24—OpenGL functionality is performed in software.
- All Sun SPARC systems equipped with the following frame buffers are supported on the OpenGL 1.3 software: the TCX, SX, GX, Creator, Elite3D, and Expert3D families of frame buffers. This includes Ultra desktop, Sun Enterprise, and all the legacy SPARCstation family.

Removing Old Packages

If you have older versions of the Sun OpenGL software for Solaris packages, you must use the pkgrm command to remove them.

▼ To Remove Old Packages

1. **Check to see whether any older versions of the OpenGL packages are installed using the** pkginfo **command.**

   The pkginfo | egrep -i "OpenGL" command lists any existing OpenGL packages that you have installed.

```
% pkginfo | egrep -i "OpenGL"
application SUNWffbgl     Creator Graphics (FFB) OpenGL Support
application SUNWglrt      OpenGL Runtime Libraries
application SUNWglrtu     OpenGL Platform Specific Runtime Libraries
application SUNWglwrt     OpenGL Widget Library
application SUNWafbgl     Loadable pipeline for UPA Bus Elite3D graphics
application SUNWgldoc     Solaris OpenGL Documentation and Man Pages
application SUNWglh       Solaris OpenGL Header Files
application SUNWglut      Solaris OpenGL Utilities and Example Programs
application SUNWglwh      Solaris OpenGL Widget Header Files
```

2. **To remove the packages, become superuser:**

```
% su
Password: superuser password
```

3. Run pkgrm **to remove all existing Sun OpenGL software for Solaris packages.**

```
# pkgrm SUNWglrt SUNWglh...
```

OpenGL Packages

TABLE 3-6 lists the packages that are provided with the Sun OpenGL software for Solaris.

TABLE 3-6   OpenGL Packages

Package Name	Description	Default Install Location
SUNWglh	OpenGL header files	/usr
SUNWglrt	OpenGL client-side runtime libraries	/usr/openwin/lib
SUNWglsr	OpenGL generic SPARC software renderer	/usr/openwin/lib
SUNWglrtu	OpenGL libraries specific to UltraSPARC™	/usr/openwin/platform/sun4u/lib/GL
SUNWglsrz	OpenGL UltraSPARC software renderer	/usr/openwin/platform/sun4u/lib/GL
SUNWafbgl	OpenGL device pipeline for Elite3D graphics accelerators	/usr/openwin/lib/GL/devhandlers
SUNWffbgl	OpenGL device pipeline for Creator and Creator3D graphics accelerators	/usr/openwin/lib/GL/devhandlers
SUNWifbgl	OpenGL device pipeline for Expert3D graphics accelerator	/usr/openwin/lib/GL/devhandlers
SUNWglrtx	Sun OpenGL 64-bit Runtime Libraries	/usr/openwin
SUNWglsrx	OpenGL 64-bit UltraSPARC software renderer	/usr/openwin/platform/sun4u/lib/sparcv9/GL
SUNWafbgx	OpenGL 64-bit device pipeline for Elite3D graphics accelerator	/usr/openwin/lib/sparcv9/GL/devhandlers
SUNWffbgx	OpenGL 64-bit device pipeline for Creator and Creator3D graphics accelerators	/usr/openwin/lib/sparcv9/GL/devhandlers
SUNWifbgx	OpenGL 64-bit device pipeline for Expert3D graphics accelerator	/usr/openwin/lib/sparcv9/GL/devhandlers

Installing OpenGL

See .

After Installing the Packages

After installing the packages, do the following:

▼ To Verify Package Installation

1. **Exit the window system and restart it so that the window system loads the newly installed GLX server extension.**

2. **To verify that the OpenGL libraries are installed correctly, run** `ogl_install_check`**.**

   The `ogl_install_check` test program prints the version of the OpenGL library and renderer used, and renders a rotating wheel. The program returns the following output when it is run on an UltraSPARC Creator3D:

   ```
   OpenGL Vendor:              Sun Microsystems, Inc.
   OpenGL Version:             1.3 Sun OpenGL 1.3 for Solaris
   ```

   For diagnostic purposes, the following values should be noted if Solaris OpenGL software problems are seen:

   ```
   OpenGL Renderer:            Creator 3D, VIS
   OpenGL Extension Support:   GL_EXT_texture3D
                               GL_SGI_color_table
                               GL_SUN_geometry_compression
                               GL_EXT_abgr
                               GL_EXT_rescale_normal
   OpenGL GLX Server:          Detail Status Report
        GLX:      Context is direct.
        GLX:      OpenGL Rendering in use
        GLX:      Double Buffering in use
        GLX:      Color Buffer (GLX_BUFFER_SIZE) = 24 bits
        GLX:      Depth Buffer (GLX_DEPTH_SIZE) = 28 bits
        GLX:      Stencil Buffer (GLX_STENCIL_SIZE) = 4 bits
        GLX:      RGBA (True Color/Direct Color) Visual in use
   OpenGL Library:             Detail Status Report
        Number of color bits (R/G/B/A): 8/8/8/0
        Frame Buffer Depth (GL_DEPTH_BITS):28
   ```

Unexpected Slow Local Rendering

Whenever possible, Sun OpenGL software for Solaris renders directly to the frame buffer, bypassing the X server. This is enabled by Sun's DGA mechanism for locking portions of the screen. However, a Solaris security feature only allows the user who originally logged in to the window system to use DGA to lock portions of the screen. Only owners of the window system have access to DGA.

If you notice poor performance when rendering locally, the cause may be this Solaris security feature. For example, if you start the window system, and another user at the workstation changes to that user's own environment using `su`, the application will not run via DGA even though the second user is running the application locally.

If you notice slow local rendering, run the `ogl_install_check` diagnostic program (found in `/usr/openwin/demo/GL`) to determine whether the application is running via DGA. If the OpenGL GLX server status report from the `ogl_install_check` program says that the GLX context is indirect, edit the login permissions to enable DGA access for all users.

To give all local users access to DGA, follow these steps:

▼ To Give All Local Users Access to DGA

1. **Become superuser:**

```
% su
Password: superuser password
```

2. **Edit permissions to allow world read/write access to the following devices:**

```
% chmod 666 /dev/mouse /dev/kbd /dev/sound/* /dev/fbs/*
```

This enables DGA access for all users for the duration of the current window system session (subject to X authorization, see xhost(1)).

3. **Edit the** `/etc/logindevperm` **file and change the default permissions of all devices listed in the file to** `0666` **to allow world read/write access.**

For example, in the following lines in `logindevperm`, change 0600 to 0666 so that the next time you log in and restart your window system, it will still be accessible by all users.

```
/dev/console    0600    /dev/mouse:/dev/kbd
/dev/console    0600    /dev/sound/*      # audio devices
/dev/console    0600    /dev/fbs/*        #frame buffers
```

Note that your system is no longer secure.

PC Launcher

Audience

PC launcher is designed for Solaris users who have access to Windows '98, ME, NT, or 2000 based PC environments

What is PC Launcher?

PC launcher provides you with the capability to view and edit PC files and attachments by launching the associated Windows applications and files in the PC environment. PC launcher enables you to launch attachments and files created in the Windows environment.

PC Launcher Installation Requirements

■ Software Supplement for The Solaris 8 Operating Environment HW 7/03 CD

If you don't have the Supplement CD, contact your Sun service representative.

System Requirements

Sun Workstation

- Solaris 8 HW 7/03 operating environment
- CDE 1.3
- 32 MB RAM

Network PC Environment with one of the following:

- SunPCi™ card
- Software environment
- PC Hardware with Windows '98, ME, NT, or 2000 (PCNFS™/Solstice™ Network Client)

PC Launcher Installation

SunPCi Requirements

In order for PC launcher to work, SunPCi and its host workstation must be able to ping each other by 'name'. To do this, you must have:

- IP connectivity between the two.
- Name services (whatever you happen to be using) set up on each so that you can look up the other's name and get its IP address.

Because of the network architecture of SunPCi and the way it shares Ethernet access with its host, the SunPCI and host cannot see each other on the network.

To work around this, use an IP routing system (a "real" router, another Sun system, an NT system, etc.) on the same subnet to act as a proxy router.

Note – You must have account access to the IP router you have selected, since you must add two routes to it.

For example, based on following setup:

- SunPCi IP = 10.0.0.1
- Host workstation IP = 10.0.0.2
- Router IP = 10.0.0.3

you need to do the following:

1. **On the host workstation:**

   route add 10.0.0.1 10.0.0.3 1

   Note – You can add an `/etc/rc` script to make this happen at every reboot.

   ---

2. **On the routing proxy:**

   route add 10.0.0.2 10.0.0.3 0

   route add 10.0.0.1 10.0.0.3 0 (or the equivalent)

   Caution – You must add routes to all three systems in this fashion in order for this to work. Do *NOT* assume that "standard network default routers" or anything else will provide similar functionality; they will not.

After doing this, verify that the SunPCi can ping its host by IP, and vice versa. Once that works, make sure the systems can ping each other by name; add entries to the appropriate naming services if they cannot. On UNIX, examples of naming services are `DNS` or `/etc/hosts`. Windows can use DNS or the hosts file as well. Consult your system administrator to add these entries, based on your setup. Once the systems can ping each other by name, PC launcher installs.

For further assistance with installation of SunPCi, refer to the following publications:

■ *SunPCi Installation Guide*
■ *SunPCi Release Notes*
■ *SunPCi 2.1 Windows NT Installation Guide*

Installing PC Launcher Packages

See .

Configuring PC Launcher

You configure PC launcher by specifying your setup in the three steps on the PC launcher Configuration window.

Before configuring, you must have the following:

■ A network host name and network connectivity between your Solaris and Windows environments.

- Your UNIX home directory mapped in your Windows environment.

▼ To Configure PC Launcher for PCi

1. **From the CDE Toolbar, start the Application Manager.**

2. **Click Configure PC launcher under the Desktop controls. The PC launcher Configuration window is displayed. Answer the questions in the following three steps.**

   a. **On-Board PC Emulator and SunPCI (default)**

   b. **Enter your Sun PCi's hostname (default)**

   c. **Let PC Emulator handle the file**

3. **Click OK.**

Note – PC-type documents can be opened for viewing and editing through the Sun PCi card whenever you double-click a document. If you want to do "quick" viewing, select Let Solaris handle the file and PC file viewer is invoked. For editing, use the right-mouse button and select Open In Emulator.

---

4. **From SunPCi, run** `h: \.dt\bin\win9x\intel\sdtpcactiond.exe`. **This step assumes** `h:` **is mapped to your UNIX home directory.**

▼ To Configure PC Launcher for the Software Environment

1. **From the CDE toolbar, start the Application Manager.**

2. **Click Configure PC launcher under the Desktop controls then select or enter the following:**

   a. **On-Board PC Emulator and SoftWindows.**

   b. *Hostname*

   c. **Let Solaris handle the file**

Note – PC-type documents can be opened for viewing and editing with a right-mouse double-click. If you selected "Let Solaris handle the file" when you configured PC launcher, then double-clicking on a file will launch PC file viewer.

---

3. **Click OK.**

4. **From the software environment run:**

```
h: \.dt\bin\win9x\intel\sdtpcactiond.exe
```

This step assumes `h:` is mapped to your UNIX home directory.

▼ To Configure PC Launcher for a Deskside PC

1. **From the CDE toolbar, start the Application Manager.**

2. **Click Configure PC launcher under the Desktop Applications then select or enter the following:**

   a. **Standalone PC**

   b. *Hostname*

   c. **Let the Standalone PC handle the file**

Note – PC-type documents can be opened for viewing and editing with a right-mouse double-click. If you selected Let Solaris handle the file when you configured PC launcher, then double-clicking on a file will launch PC file viewer.

---

3. **Click OK.**

4. **From Deskside PC run:**

```
h: \.dt\bin\win9x\intel\sdtpcactiond.exe
```

This step assumes `h:` is mapped to your UNIX home directory.

Using PC Launcher

The CDE front panel and CDE workspace can be populated with an icon representing the PC environment, such as SunPCi. To do this, drag and drop OpenInSunPCi from the Desktop Applications in Application Manager, onto the Front Panel.

If you did not configure PC launcher, then the first time you open PC launcher, the PC launcher Configuration window will display. This is where you will configure PC launcher. You only need to configure PC launcher once.

Working With Windows Files

Identification of many popular PC file formats in CDE allows you to select and launch them in your preferred PC environment, such as SunPCI. A right mouse click on these files gives you the three following choices in the menu:

- Open—the double-click action.
- OpenInEmulator—launches the file in your preferred hardware, such as SunPCi (or any software emulator).
- OpenInRemotePC—launches the file in a standalone networked PC.

You can drag and drop Windows shortcuts onto the front panel. You can also put shortcuts on the CDE workspace by creating a windows short cut in your UNIX home directory and using `dtfile` to drag and drop. Refer to Windows help on creating shortcuts, and CDE help to get more information on drag and drop.

▼ To Open an Application or Datafile

- **Double-click on the shortcut from the Solaris desktop.**

The associated applications must be available to you. This procedure makes the Solaris desktop act like a Windows desktop. You can keep all your relevant applications inside the Solaris CDE front panel and CDE workspace and run them by double-clicking on them.

▼ To Run Windows Binary Files

- **Double-click on the file (`exe`) and run inside the PC environment (for example, SunPCi).**

▼ To Copy and Paste Text

1. **Highlight the text you want to copy and select Copy from the Edit menu.**

2. **Click the place you want to paste the text, and select Paste from the Edit menu.**

▼ To View a File

- **Click on the file and select View.**

▼ To Search for a File

1. **Select Find/Change from the Edit menu.**

2. **Enter the filename into the Find field and click Find.**

▼ To Print Files

- **Select Print from the File menu**

  The file prints out on the PC printer.

Other Features

▼ To Display the Windows Start Menu in CDE

Using manual steps, you can get to all of the Windows Start Menu choices in the CDE Application Manager.

1. **Start Windows Explorer.**

2. **Copy** C: \Window\StartMenu\ **to** H: \.dt\appmanager**.**

3. **Start Application Manager.**

4. **Go to the desktop controls.**

5. **Click Reload Application.**

▼ To Log On to a Different Machine

- **Reconfigure PC launcher on the Configuration window.**

▼ To Reconfigure PC Launcher

- **Remove the PC's hostname in Step 2 on the PC launcher Configuration window.**

▼ Switch Between Targets

- **Change your selection in Step 1 on the PC launcher Configuration window.**

Getting Help for PC Launcher

Help for PC launcher is available through the Help menu at the bottom of the PC launcher Configuration window.

PC File Viewer

PC File Viewer

The PC file viewer software provides you with an application to view popular PC file formats such as Microsoft Word, PowerPoint, Excel, Lotus 1-2-3, and AutoCAD. Use the viewer to choose a file and to copy and paste information from the viewer to another application, such as a text editor. CDE applications will be able to identify these filetypes and launch this application by double-clicking on the icon in your mail attachment or from File Manager (dtfile).

File Formats Supported

PC file viewer supports 17 different file types:

Word Processing Formats

- Microsoft Word for Windows versions through 7.0 and Word 97
- Microsoft Windows Works versions through 4.0
- Word Perfect for Windows versions through 7.0
- AMI/AMI Professional versions through 3.1

Spreadsheet Formats

- Microsoft Excel Windows versions 2.2 through 7.0 and Excel 97
- Microsoft Excel Chart versions 2.x through 7.0
- Microsoft Windows Works versions through 4.0
- Lotus 1-2-3 Windows versions through 6.x
- Lotus 1-2-3 Chart Windows versions through 5.0
- QuattroPro for Windows versions through 7.0

Presentation Formats

- Microsoft PowerPoint versions through 7.0 and PowerPoint 97
- Corel Presentation versions through 7.0
- Freelance versions 1.0 and 2.0

Graphics Formats

- BMP—Windows
- DXF—versions through 13
- GEM—bitmap and vector

■ PIC—Lotus

PC File Viewer Limitations

PC file viewer is limited to the following products and configurations for this Solaris release:

■ SPARC architecture ONLY
■ Printing is not supported

The following limitations are related to displaying items in a supported file:

■ Charts are not supported in QuattroPro.
■ Text that is designed to be shown vertically is shown horizontally in the viewer. This vertical text may overlap adjacent cells making reading what is in them difficult.
■ Figures and footers are aligned with the anchors in the text. If font sizes on the viewing system are not identical to those on the authoring system, then anchored objects will not be at the appropriate place in the text.
■ There is limited support for incremental shading in presentation file formats
■ There is no support for drawing objects in Microsoft Word and Lotus.
■ Borders in Word Perfect and AmiPro files are not supported
■ Copy & Paste does not work for Japanese text in Microsoft Office applications.

Note – All of the above limitations also exist in the Microsoft Windows version of the product from Inso Corporation.

■ There is no support for OLE objects.
■ If a font that is used in a document is not on the system, the default system font is used and the viewed text may look different than what was seen in the authoring application.
■ If a special character is used in a document that is not in the available character set, it is replaced by an asterisk in the document as shown by the file viewer.

Installing PC File Viewer

See "Installing Supplement CD Software" on page 15.

Adding PC File Viewer to the CDE Front Panel

▼ **To Add PC File Viewer to the CDE Front Panel**

1. **Open File Manager (**`dtfile`**).**

2. **Go to the** `/opt/SUNWdtpcv/bin` **directory.**

   The PC file viewer icon appears there.

3. **Open the CDE front panel where you want the icon.**

   For example, the Application or File sub-folder.

4. **Drag and drop the PC file viewer icon from File Manager to InstallIcon in the selected subfolder.**

5. **Launch PC file viewer by clicking on the icon in the CDE front panel.**

   You can also promote the icon to appear on the front panel by default.

ShowMe TV 1.3 Software

ShowMe TV is a television system for local- and wide-area networks. You can use it to view and broadcast live or prerecorded video programs on your network. Here are some examples of how you can use ShowMe TV:

- Broadcast and view training courses
- Lectures
- Corporate messages
- Monitor important news events

ShowMe TV contains the following components:

- ShowMe TV Receiver
- ShowMe TV Transmitter
- ShowMe TV Address Book

ShowMe TV Packages

TABLE 3-7 lists the packages that are provided with ShowMe TV.

TABLE 3-7   ShowMe TV Packages

Package Name	Description	Default Install Location
SUNWsmtvh	Online help binaries and documentation	/opt/SUNWsmtv
SUNWsmtvr	ShowMe TV receiver application and support files	/opt/SUNWsmtv
SUNWsmtvt	ShowMe TV transmitter application and support files	/opt/SUNWsmtv
SUNWsmtvu	Support utilities	/opt/SUNWsmtv

Removing Old Packages

If you have ShowMe TV 1.1, 1.2, or 1.2.1 installed, you need to remove it before installing ShowMe TV 1.3.

● **To remove ShowMe TV 1.1, type:**

```
# pkgrm SUNWsmUt1 SUNWstv SUNWstvs
```

If you have an earlier release of ShowMe TV 1.2 installed, you need to remove it before installing any new software packages.

● **To remove ShowMe TV 1.2 or 1.2.1, type:**

```
# pkgrm SUNWsmtvt SUNWsmtvu SUNWsmtvr SUNWsmtvh
```

Installing ShowMe TV

See "Installing Supplement CD Software" on page 15.

Translated Documentation

The Supplement CD contains the *ShowMe TV User's Guide* in the following languages:

- French
- German
- Spanish
- Italian
- Swedish
- Japanese
- Korean
- Simplified Chinese
- Traditional Chinese

▼ To Access the ShowMe TV User's Guide

The `/cdrom/cdrom0/ShowMeTV1.3/Docs/UserGuide` directory on the Supplement CD contains the following files:

TABLE 3-8   ShowMe TV Translated Documents

File Name	Description
UG_en.ps	English PostScript™ file
UG_de.ps	German PostScript file
UG_fr.ps	French PostScript file
UG_es.ps	Spanish PostScript file
UG_it.ps	Italian PostScript file
UG_sv.ps	Swedish PostScript file
UG_ja.ps	Japanese PostScript file
UG_ko	Korean HTML files
UG_zh	Simplified Chinese HTML files
UG_zh_TW	Traditional Chinese HTML files

● **To view the desired PostScript manual, type the following at the command line:**

```
# imagetool filename
```

- **To print the manual, either use the File menu in Image Tool or type the following at the command line:**

```
#  lp  filename
```

- **To view the manuals in HTML format, use a Web browser and type the following in the address field:**

```
file:/cdrom/cdrom0/ShowMeTV1.3/Docs/UserGuide/directory
```

If you have copied the HTML files to a different directory, type in the path to that directory. Open the table of contents to determine which file to open.

Sun Remote System Control for Sun Servers

Sun Remote System Control (RSC) is a secure server management tool that lets you monitor and control a Sun Enterprise 250, Sun Fire 280R, Sun Fire V880, or Sun Fire V480 server over modem lines and over a network, using Solaris operating environment or Microsoft Windows clients. RSC can also notify you when server problems occur. RSC provides remote system administration for geographically distributed or physically inaccessible systems. All hardware functionality required to support RSC is already included with your Sun Enterprise 250, Sun Fire 280R, Sun Fire V880, or Sun Fire V480 server.

The Sun Remote System Control for Sun Servers software is provided on the Supplement CD. For installation information, see "Installing Supplement CD Software" on page 15. For configuration information for Remote System Control, see *Remote System Control (RSC) 2.2 User's Guide*.

To install RSC client software on a computer running the Microsoft Windows 98, Windows NT 4.0, or Windows 2000 operating environment, load the Supplement CD into the systems's CD-ROM drive. The InstallShield application starts automatically, prompts you for a directory name, and installs the RSC executable in the location that you specify.

Lights Out Management (LOM) Software

Lights Out Management (LOM) Software is a secure server management tool that lets you monitor and control select Sun Fire and Netra servers via a terminal concentrator or modem. LOM is currently supported on Sun Fire V100, Sun Fire V120, Netra T1, Netra X1, Netra t1, Netra t1400/1405 servers. LOM provides remote systems administration for geographically remote or physically inaccessible systems. All hardware functionality to support LOM operation is incorporated into the supported server platforms.

The LOM software is provided on the Supplement CD. For installation information, see "Installing Supplement CD Software" on page 15.

For configuration/operation instructions for Lights Out Management see the relevant chapter in the User Manual that came with the supported server.

SunForum

SunForum is a data conferencing product for Sun workstations. It is based on the T.120 standard, which enables your Sun system to conference over intranets and the Internet with other T.120 products, such as Microsoft NetMeeting and PictureTel LiveShare Plus, version 4.0.

SunForum includes the following features:

- View and control applications shared from other UNIX or PC machines that are based on the T.120 protocol.
- Share local Solaris applications, which can be viewed and controlled by any conference participant.
- Exchange ideas and data using the whiteboard, clipboard, chat, and file transfers.

Installing SunForum

See "Installing Supplement CD Software" on page 15.

Online Help

You can read information about SunForum online. You can access help from the Help menu located on any SunForum menu bar.

Network Adapter Drivers Included on the Supplement CD

The following software is provided on the Supplement CD contained in your Solaris 8 HW 7/03 Media Kit:

- SunFDDI PCI driver software
- SunFDDI SBus driver software
- SunHSI PCI driver software
- SunHSI SBus driver software
- SunATM 5.0 software

Note – SunFDDI supports booting from the 32-bit kernel or the 64-bit kernel. SunFDDI will attach to whichever you choose to boot from with no special user interaction.

Installing the Drivers

Note – Before installing driver software from the Supplement CD, make sure that you have already installed the adapter hardware. Refer to the appropriate Platform Notes for more information.

See .

Platform Notes for Network Adapter Drivers

Refer to the following platform notes for more information:

- *Platform Notes: Sun FDDI Adapters*
- *Platform Notes: The Sun GigabitEthernet Device Driver*

- *Platform Notes: The SunHSI/P Device Driver*
- *Platform Notes: The SunHSI/S Device Driver*
- *Platform Notes: SunATM Driver Software*
- *Platform Notes: The* `hme` *FastEthernet Device Driver*
- *Platform Notes: The* `eri` *FastEthernet Device Driver*
- *Platform Notes: Sun GigaSwift Ethernet Device Driver*
- *Platform Notes: Sun Quad FastEthernet Device Driver*

Configuring VLANs

VLANs: Virtual Local Area Networks (VLANs) are commonly used to split up groups of network users into manageable broadcast domains, to create logical segmentation of workgroups, and to enforce security policies among each logical segment. With multiple VLANs on an adapter, a server with a single adapter can have a logical presence on multiple IP subnets. By default, 512 VLANs can be defined for each VLAN-aware adapter on your server.

If your network does not require multiple VLANs, you can use the default configuration, in which case no further configuration is necessary.

VLANs can be created according to various criteria, but each VLAN must be assigned a VLAN tag or VLAN ID (VID). The VID is a 12-bit identifier between 1 and 4094 that identifies a unique VLAN. For each network interface (ce0, ce1, ce2 and so on), 512 possible VLANs can be created. Because IP subnets are commonly used, it's best to use IP subnets when setting up a VLAN network interface. This means that each VID assigned to a VLAN interface of a physical network interface will belong to different subnets.

Tagging an Ethernet frame requires the addition of a tag header to the frame. The header is inserted immediately following the Destination MAC address and the Source MAC address. The tag header consists of two bytes of Ethernet Tag Protocol Identifier (TPID, 0x8100) and two bytes of Tag Control Information (TCI). FIGURE 3-1 shows the Ethernet Tag Header format.
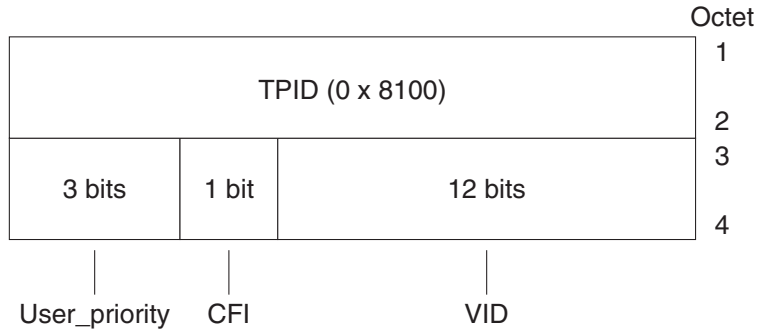
FIGURE 3-1   Ethernet Tag Header Format

▼ To Configure Static VLANs

1. **Create one hostname.ce*num* file (hostname6.ce*num* file for IPv6) for each VLAN which will be configured for each adapter on the server, using the following naming format that includes both the VID and the physical point of attachment (PPA):**

   VLAN logical PPA = <1000 * VID> + <Device PPA>
   ```
   ce123000 = 1000*123 + 0
   ```

   Example: `hostname.ce123000`

   This format limits the maximum number of PPAs (instances) you can configure to 1000 in the `/etc/path_to_inst` file.

   For example, on a server with the Sun GigabitEthernet/P 3.0 adapter having an instance of 0, that belongs to a member of two VLANs, with VID 123 and 224, you would use `ce123000` and `ce224000`, respectively, as the two VLAN PPAs.

2. **Use the** `ifconfig(1M)` **to configure a VLAN virtual device, for example:**

```
# ifconfig ce123000 plumb up
# ifconfig ce224000 plumb up
```

The output of `ifconfig -a` on a system having VLAN devices `ce123000` and `ce224000`:

```
# ifconfig -a
lo0: flags=1000849<UP,LOOPBACK,RUNNING,MULTICAST,IPv4> mtu 8232 index 1
        inet 127.0.0.1 netmask ff000000
hme0: flags=1000843<UP,BROADCAST,RUNNING,MULTICAST,IPv4> mtu 1500 index 2
        inet 129.144.131.91 netmask ffffff00 broadcast 129.144.131.255
        ether 8:0:20:a4:4f:b8
ce123000: flags=1000843<UP,BROADCAST,RUNNING,MULTICAST,IPv4> mtu 1500 index 3
        inet 199.199.123.3 netmask ffffff00 broadcast 199.199.123.255
        ether 8:0:20:a4:4f:b8
ce224000: flags=1000843<UP,BROADCAST,RUNNING,MULTICAST,IPv4> mtu 1500 index 4
        inet 199.199.224.3 netmask ffffff00 broadcast 199.199.224.255
        ether 8:0:20:a4:4f:b8
```

3. **On the switch, set VLAN tagging and set VLAN ports to coincide with the VLANs you've set up on the server. Using the examples in Step 2 , you would set up VLAN ports 123 and 224 on the switch.**

Refer to the documentation that came with your switch for specific instructions for setting VLAN tagging and ports.

Java 3D 1.2.1_03 API

The Java 3D 1.2.1_03 API is a set of classes for writing three-dimensional graphics applications and 3D applets. It gives developers high level constructs for creating and manipulating 3D geometry and for constructing the structures used in rendering that geometry. Application developers can describe very large virtual worlds using these constructs, which provide Java 3D software with enough information to render these worlds efficiently.

Installation Dependencies

- OpenGL 1.1 software or later

- JDK 1.2.1 software or later

Installing Java 3D 1.2.1_03 API

See .

Sun Enterprise 10000 SSP Software

For SSP installation and update procedures, as well as SSP release notes, see the *Sun Enterprise 10000 SSP Installation and Release Notes*, a printed copy of which is included in your media kit.

Sun Enterprise 10000 Capacity on Demand 1.0 Software

For Capacity on Demand software installation, as well as release notes, see the *Sun Enterprise 10000 Capacity on Demand 1.0 Installation Guide and Release Notes*, a printed copy of which is included in your server media kit.

Netra ct Platform Software

The Netra ct Platform 1.0 software on the Supplement CD contains the software required to support environmental monitoring, alarms (RSC software), and SNMP monitoring of the Netra ct servers.

The two current Netra ct servers are the Netra™ ct 800 and the Netra ct 400.

The software should not be installed on servers that are not Netra systems.

System Management Services (SMS) 1.2 Software

For System Management Services software installation and update procedures, as well as System Management Services release notes, see the *System Management Services (SMS) 1.2 Installation Guide and Release Notes*, a PDF copy of which is included on the Supplement CD in the Docs directory.

Installing Sun Fire 880 FC-AL Backplane Firmware

A backup image of the Sun Fire 880 FC-AL Backplane Firmware is provided on the Supplement CD. In the unlikely event that the firmware on a Sun Fire 880 FC-AL backplane becomes corrupted, you can use the backup image to flash update the system with its original firmware. The flash update procedure is performed with the `luxadm download` subcommand and is described in *Platform Notes: Using `luxadm` Software*, part of the Solaris on Sun Hardware Documentation Set on the Supplement CD.

Note – Before you can flash update the system, you must install the backup image from the Supplement CD onto the Sun Fire 880 system disk. If you use Solaris Web Start to install the Supplement CD software, the Sun Fire 880 FC-AL Backplane Firmware is not included in the default installation. To install the backup firmware, choose the Custom Install option and select the Sun Fire 880 FC-AL Backplane Firmware. For installation instructions, see "Installing Supplement CD Software" on page 15.

By default, the firmware image is installed in the following location on the Sun Fire 880 system disk:

`/usr/platform/SUNW,Sun-Fire-880/lib/images/int_fcbpl_fw`

Once the image is installed on the disk, perform the flash update procedure using the `luxadm download` subcommand with the `-f` option as descibed in *Platform Notes: Using luxadm Software.*

USBA 1.0 Framework

The `SUNWusb` and `SUNWusbx` packages of this software release (provided on the Solaris Software CD) feature a dual USB framework consisting of both the original Solaris 8 2/02 USB framework and the USBA 1.0 framework. This new framework supports devices and ports using either USB 2.0 or USB 1.x specifications.

The USBA 1.0 framework supports high speed USB 2.0 devices, is more evolved, and offers better performance than the original USBA framework. The original framework is delivered for compatibility with all USB drivers existing prior to this release. This dual framework release is supported on Sun Blade 1500 and Sun Blade 2500 systems.

Please note:

- The keyboard and mouse must be connected to an on-board USB port for use when booting the system and working with the window manager.
- While USB 2.0 devices can operate on a USB 1.x port, their performance will be significantly better when connected to a USB 2.0 port.
- USB 1.x devices connected through a USB 2.0 hub to a USB 2.0 port do not work in this release.
- Please see the hardware-specific Getting Started Guide or the installation reference documentation which came with your system for diagrams and connection information.
- For further details and release notes about the USB dual framework, please see the USB documentation at:

  `www.sun.com/desktop/whitepapers.html`

- The man pages explaining new USB functionality are installed in a different location than most Solaris man pages. For more information about these USB man pages, see "USBA 1.0 Manpages" on page 56.

Documents on the Computer Systems Supplement CD

Documents on the Supplement CD are divided into three formats:

- AnswerBook2 collections
- Man pages
- Other formats

AnswerBook2 Sets

For customers using Sun hardware, four sets of online manuals in AnswerBook2 format are provided on the Supplement CD.

Installing Solaris 8 HW 7/03 AnswerBook Sets

See "Installing Supplement CD Software" on page 15 for information about installing the Sun Computer Systems AnswerBook2 packages.

Refer to the *Solaris 8 Advanced Installation Guide* for information about installing AnswerBook sets.

Solaris 8 HW 7/03 AnswerBook Packages

The following table lists the packages that are provided for the Solaris 8 HW 7/03 AnswerBook collections.

TABLE 4-1   Solaris 8 HW 7/03 AnswerBook Packages on the Supplement CD

AnswerBook Package Location	Description
`Sun_Hardware_Answerbook/Product/SUNWabhdw`	Solaris on Sun Hardware AnswerBook collection
`System_Service_Processor_3.5/Product/SUNWuessp`	SSP AnswerBook collection
`Alternate_Pathing_2.3.1/Product/SUNWabap`	Alternate Pathing AnswerBook collection
`Capacity_on_Demand_1.0/Product/SUNWcodbk`	Capacity on Demand AnswerBook collection

Solaris 8 HW 7/03 on Sun Hardware AnswerBook Set

This AnswerBook set includes general manuals as well as Platform Notes, which are manuals that cover use of Solaris 8 HW 7/03 software with specific Sun hardware products.

This AnswerBook set includes:

Title	Contents
Solaris 8 HW 7/03 Sun Hardware Platform Guide	Contains information about installing software from the Supplement CD and other system products hardware issues.
Solaris on Sun Hardware Reference Manual Supplement	Information to help you find a compilation of manual pages provided in packages on the Supplement CD. Includes man pages that cover SunVTS software.
Solaris Handbook for Sun Peripherals	Information about installing drives and other peripherals for use with the Solaris 8 HW 7/03 software environment. Covers issues such as configuring SCSI addresses.
NFS Server Performance and Tuning Guide	Information about the performance and tuning of an NFS server.
SunVTS 5.1 User's Guide	Basic instructions on using the SunVTS diagnostic software.
SunVTS 5.1 Test Reference Manual	Information about each test provided with the SunVTS diagnostic software.

Title	Contents
SunVTS 5.1 Patch Set 3 Documentation Supplement	Supplemental information about new tests and new capabilities added to the base VTS version via a Patch Set (PS).
SunVTS Quick Reference Card	A quick reference card for the SunVTS diagnostic software.
PCI: SBus Comparison	Feature differences between SBus and PCI.
Platform Notes: The hme FastEthernet Device Driver	Information on how to configure the hme device driver for use with the Ultra Workstation series platform, Sun Enterprise servers, SunSwift SBus adapter, SunSwift PCI adapter, and PCI SunFastEthernet card.
Platform Notes: SPARCstation 10SX and 20 System Configuration Guide	Information about how to take advantage of graphics memory and acceleration features of these systems.
Platform Notes: Sun Enterprise 6000, 5000, 4000, and 3000 Systems	Sun Enterprise X000-specific OpenBoot™ commands, including those for board hot-plug operations. Also contains board hot-plug procedures, and miscellaneous related information.
Platform Notes: Sun Enterprise 250 Server	New OpenBoot commands, configuration variables, and disk drive hot-plug procedures. Also provides procedures for mapping between logical and physical device names for internal storage devices.
Platform Notes: Sun Ultra 450 Workstation and Sun Enterprise 450 Server	New OpenBoot commands, configuration variables, and disk drive hot-plug procedures. Also provides procedures for mapping between logical and physical device names for internal storage devices.
Platform Notes: Using luxadm Software	Instructions on using the luxadm administrative program with the Sun StorEdge A5000, the SPARCstorage Array, and the Sun Fire 880 internal storage array..
Platform Notes: Sun FDDI Adapters	Information about how to configure the SunFDDI driver software and use the SunFDDI network utilities.
Platform Notes: Sun GigabitEthernet Device Driver	Information on how to configure the Sun GigabitEthernet driver software.
Platform Notes: The SunHSI/S Device Driver	Describes how to configure the SunHSI SBus driver software.
Platform Notes: The SunHSI/P Device Driver	Describes how to configure the SunHSI PCI driver software.
Platform Notes: The SunATM Driver Software	Describes how to configure the SunATM driver software.
Dynamic Reconfiguration User's Guide for Sun Enterprise 6x00,5x00,4x00, 3x00 Systems	Information about how to use Dynamic Reconfiguration software features on these Sun Enterprise servers.
Platform Notes: the Sun Quad FastEthernet Device Driver	Describes how to configure the Sun Quad FastEthernet driver software.
Platform Notes: Sun GigaSwift Ethernet Device Driver	Describes how to configure the Sun GigaSwift Ethernet driver software.
Platform Notes: the eri FasEthernet Device Driver	Describes how to configure the eri FastEthernet driver software.

Title	Contents
Sun Enterprise 10000 DR Configuration Guide	Contains configutation information for Dynamic Configuration on the Sun Enterprise 10000 system.
Sun Enterprise 10000 IDN Error Messages	Describes error messages for IDN on the Sun Enterprise 10000 system.
Sun Enterprise 10000 IDN Configuration Guide	Contains configutation information for IDN on the Sun Enterprise 10000 system.
Sun Fire 880 Dynamic Reconfiguration User's Guide	Contains information about how to use Dynamic Configuration software features on the Sun Fire 880 system.

Sun Enterprise 10000 SSP AnswerBook Set

This AnswerBook set includes:

Title	Contents
Sun Enterprise 10000 SSP 3.5 User Guide	User information for Sun Enterprise 10000 System Service Processor (SSP) software
Sun Enterprise 10000 SSP 3.5 Reference Manual	Man pages for Sun Enterprise 10000 System Service Processor (SSP)
Sun Enterprise 10000 Dynamic Reconfiguration User Guide	User information for Sun Enterprise 10000 Dynamic Reconfiguration software
Sun Enterprise 10000 Dynamic Reconfiguration Reference Manual	Man pages for Sun Enterprise 10000 Dynamic Reconfiguration
Sun Enterprise 10000 InterDomain Networks User Guide	User information for Sun Enterprise 10000 InterDomain Networks (IDN) software

Alternate Pathing AnswerBook Set

This AnswerBook set includes:

Title	Contents
Sun Enterprise Server Alternate Pathing 2.3.1 User Guide	User information for Alternate Pathing software
Sun Enterprise Server Alternate Pathing 2.3.1 Reference Manual	Man pages for Alternate Pathing software

Capacity On Demand AnswerBook Set

This AnswerBook set includes:

Title	Contents
Sun Enterprise 10000 Capacity on Demand 1.0 Administrator Guide	System administrator information for Capacity on Demand on the Sun Enterprise 10000 server
Sun Enterprise 10000 Capacity on Demand 1.0 Reference Manual	Man pages for Capacity on Demand on the Sun Enterprise 10000 server

Sun Computer Systems Manual Page Packages

Manual pages for products you install using Solaris Web Start 2 will be automatically installed. If you want to install a man page for a product but do not want to install the product, you can use `pkgadd` to install the man page.

TABLE 4-2   Sun Computer Systems Manual Page Packages on the Supplement CD

Package	Name	Description
SUNWvtsmn	Validation Test Suite Manual Pages	Manual pages for SunVTS drivers/binaries
SUNWnfm	SunFDDI SBus Manual Pages	Manual pages for SunFDDI SBus
SUNWpfm	SunFDDI PCI Manual Pages	Manual pages for SunFDDI PCI
SUNWapdoc	Sun Alternate Pathing Manual Pages	Manual pages for Sun Alternate Pathing
SUNWhsism	SunHSI/S Manual Pages	Manual pages for SunHSI SBus
SUNWhsipm	SunHSI/P Manual Pages	Manual pages for SunHSI PCI
SUNWsspmn	SSP Manual Pages	Manual pages for SSP
SUNWcodmn	Capacity on Demand Manual Pages	Manual pages for COD
SUNWlomm	LOMLite Manual Pages	Manual pages for Lights Out Management
SUNWtsalm	TS91 Alarm and Monitor Manual Pages	Manual pages for TS91 Alarm and Monitor

TABLE 4-2 Sun Computer Systems Manual Page Packages on the Supplement CD

Package	Name	Description
SUNWs8hwman	Manual Page Supplement	Manual pages installed in `/usr/share/man`, covering updated software on the Solaris CD (`scadm.1m` and `bge.7d`)
SUNWs8hwman1	Manual Page Supplement	Manual pages installed in `/opt` covering updated software on the Solaris CD (USB and others)
SUNWclbut	Manual Page Supplement for Sun Fire B10n	Manual pages for the Sun Fire B10n, located in the Supplement CD directory `Sun_Fire_B10n_Load_Balancing_ Blade_1.0`

Installing Sun Computer Systems Manual Pages

This release provides instructions to use some software on the Solaris Software CD via man page files delivered on the Solaris Software Supplement CD. English language versions of these man pages are provided in packages named `SUNWs8hwman` and `SUNWs8hwman1` in the `Man_Page_Supplement/Product` directory. Other packages in that directory supply Japanese versions of the man pages.For most manual page packages listed in TABLE 4-2, see "Installing Supplement CD Software" on page 15.

In this release, the man page supplement package `SUNWs8hwman` includes files that explain `scadm (1M)` and `bge (7d)`. These man pages are installed by default in the same `/usr/share/man` directory as the man pages installed from the `SUNWman` package on the Solaris Software CD.

Note – Installation of these man page packages might fail if the `/usr/share` directory on your system is automounted. In that case, ignore error messages related to this man page set during installation. If you wish to install the man pages later, use this command:
pkgadd –d . SUNWs8hwman

The other man page supplement package, `SUNWs8hwman1`, installs additional man pages into the `/opt/SUNWs8hwman1/man` directory. Some of these man pages are newer, more complete versions of man pages already in the `/usr/share/man` directory. To be sure you are reading the newest man pages, include the `/opt/SUNWs8hwman1/man` directory prior to `/usr/share/man` in your system's `MANPATH` list of directories.

There are three ways of making the manpages in /opt/SUNWs8hwman1/man accessible:

- Copy them from the /opt/SUNWs8hwman1/man directory tree to the /usr/man tree:

```
# cp -r /opt/SUNWs8hwman1/man /usr/man
```

   Note that this overwrites some of the original USB manpages in /usr/man.

- Specify the /opt/SUNWs8hwman1/man directory tree in the MANPATH before /usr/man:

```
ksh:      export MANPATH=/opt/SUNWs8hwman1/man:$MANPATH
csh:      setenv MANPATH /opt/SUNWs8hwman1/man:$MANPATH
sh:       MANPATH=/opt/SUNWs8hwman1/man:$MANPATH ; export MANPATH
```

- Specify the /opt/SUNWs8hwman1/man directory tree using the -M option to man(1). For example:

```
# man -M /opt/SUNWs8hwman1/man filename
```

This command looks in the /opt/SUNWs8hwman1/man manpage tree when searching for the desired manpage.

Note – This third method is only temporary, for reading a man page one time, whereas the first two methods are permanent.

Using Sun Computer Systems Manual Pages

To view the man pages you have installed, use the man command as you would for the man pages installed as part of the Solaris operating environment installation. These additional man pages are also available in the *Solaris on Sun Hardware Reference Manual Supplement* in the Solaris 8 HW 7/03 on Sun Hardware AnswerBook set.

USBA 1.0 Manpages

The manpages covering the dual USB framework are delivered in a package separate from other manpages (`SUNWs8hwman1` instead of `SUNWman`).

The USB manpages in `/usr/man` are part of the Solaris 8 2/02 documentation set, and as such cover only the original USBA framework. The USB manpages in `/opt/SUNWs8hwman1/man` cover both the USBA 1.0 and original frameworks. For information on installing the `SUNWs8hwman1` package, see "Installing Sun Computer Systems Manual Pages" on page 54.

Other Documents on the Computer Systems Supplement CD

The following table lists the documents on the Computer Systems Supplement CD that are not part of AnswerBook sets and are not man pages:

HTML, PDF, PostScript, and Other Formats

TABLE 4-3 HTML, PDF, PostScript, and Other Documents on the Supplement CD

Path	Comment
`Docs/README/README_en.html`	Readme file for Solaris 8 HW 7/03 Sun Computer Systems Supplement CD
`Docs/HWPG/HWPG_en.pdf`	*Solaris 8 HW 7/03 Sun Hardware Platform Guide* (also available in hardcopy and AnswerBook form)
`Docs/VTS_PS3_DOC_SUPP/VTS_PS3_DOC_SUPP_en.pdf`	*SunVTS 5.1 Patch Set 3 Documentation Supplement*
`Docs/SSP_RN/SSP_RN_en.pdf`	*Sun Enterprise 10000 SSP 3.5 Installation Guide and Release Notes*
`Docs/COD_RN/COD_RN_en.pdf`	*Sun Enterprise 10000 Capacity on Demand 1.0 Installation Guide and Release Notes*
`Docs/SMS_RN/SMS_RN_en.pdf`	*System Management Services (SMS) 1.2 Installation Guide and Release Notes*
`Docs/FBH/FBH_en.pdf`	*Solaris Handbook for Sun Frame Buffers* (includes information about the XVR-500 frame buffer)
`Docs/REFMAN_SUPP/REFMAN_SUPP_en.pdf`	*Solaris on Sun Hardware Reference Manual Supplement*
`Docs/DMFE/DMFE_en.ps`	*Platform Notes: The dmfe Fast Ethernet Device Driver*
`Docs/SUN_FIRE_DR_UG/SUN_FIRE_DR_UG_en.ps`	*Sun Fire 6800, 4810, 4800, and 3800 Systems Dynamic Configuration User Guide*
`ShowMeTV_1.3/Docs/UserGuide/UG_en.ps`	*ShowMe TV™ 1.3 User's Guide*
`SunForum_3.1/Docs/sunforumUG.ps`	*SunForum™ User's Guide*
`RSC_2.2/Product/SUNWrscd`	*Remote System Control 2.2 User Guide* Note: This document is installed from a package as part of the RSC software installation.
`System_Management_Services_1.2/Docs/816-3285-10.pdf`	*Sun Fire 15K Software Overview Guide*
`System_Management_Services_1.2/Docs/816-2527-10.pdf`	*System Management Services (SMS) 1.2 Administrator Guide*
`System_Management_Services_1.2/Docs/816-2528-10.pdf`	*System Management Services (SMS) 1.2 Reference Manual*

> **Note –** The _en indicates an English language document. Other languages may be indicated, depending on locale.

Updating the Flash PROM on the Ultra 1, Ultra 2, Ultra 450, and Sun Enterprise 450 Systems

This chapter describes how to update the flash PROM on the Ultra™ 1, Ultra 2, Ultra 450, and the Sun™ Enterprise™ 450 systems.

Some systems require a higher level of OpenBoot™ firmware in the flash PROM to run the 64-bit mode of the Solaris™ 8 operating environment. The OpenBoot firmware is contained within a single flash PROM for the Ultra 1, Ultra 2, Ultra 450, and the Sun Enterprise 450 systems.

Note – Only those systems identified in this chapter and the following chapter need the flash PROM upgrade.

The flash PROM devices, which contain OpenBoot, are electrically erasable and writable devices. This means that the firmware can be updated without removing the flash PROM from the system board.

Determining If the Flash PROM Needs Updating

Only sun4u systems that can run the 64-bit mode of the Solaris 8 HW 7/03 operating environment might need the flash PROM update. Systems that can only run the 32-bit mode (such as those in the sun4c, sun4d, and sun4m platform groups) do not require updated firmware to run Solaris 8 HW 7/03 software.

> **Note –** If the Solaris 8 HW 7/03 operating environment notified you that the flash PROM in your system needs updating, skip the steps in the procedure "To Determine If Your System Requires a Flash PROM Update" on page 60 and go directly to "Updating the Flash PROM" on page 61.

▼ To Determine If Your System Requires a Flash PROM Update

1. **Determine the architecture type of your system.**

```
%  uname -m
```

TABLE 5-1 Determining the System Architecture

If your system architecture type is . . .	Then . . .
• sun4u	Go to Step 2.
• sun4c, sun4d, sun4m	You do not need a flash PROM update. Do not proceed further.

2. **Determine the system type of your system.**

```
%  uname -i
```

TABLE 5-2 Determining the System Type

If your system type is one of the following systems. . .	Then . . .
SUNW, Ultra-1 SUNW, Ultra-2 SUNW, Ultra-4 SUNW, Ultra-Enterprise	Go to Step 3 for each system type.
Not in the above list	You do not need a flash PROM update. Do not proceed further.

3. **Determine the version level of the firmware in your system. Type:**

```
%  prtconf -V
```

TABLE 5-3   Determining the Firmware Version Level

If your system type is . . .	And you see a number lower than . . .	Then . . .	Otherwise . . .
SUNW, Ultra-1	3.11.1	Proceed to "Updating the Flash PROM" on page 61.	You do not need a flash PROM update. Do not proceed further.
SUNW, Ultra-2	3.11.2	Proceed to "Updating the Flash PROM" on page 61.	You do not need a flash PROM update. Do not proceed further.
SUNW, Ultra-4	3.7.107	Proceed to "Updating the Flash PROM" on page 61.	You do not need a flash PROM update. Do not proceed further.
SUNW, Ultra-Enterprise	3.2.16	Proceed to "Updating the Flash PROM" on page 61.	You do not need a flash PROM update. Do not proceed further.

Updating the Flash PROM

This section describes the following:

- Capturing configuration variable settings
- Installing the Solaris 8 HW 7/03 operating environment
- Making the flash PROM write-enabled
- Steps to perform before updating the flash PROM
- Updating the flash PROM

Note – For step-by-step instructions, follow the procedures beginning with "To Capture the Configuration Variable Settings" on page 62.

After installing the Solaris 8 HW 7/03 operating environment on your hardware, set the write-protect/enable flash PROM jumper to the write-enable position (Sun Ultra 1 and Ultra 2 systems) before you attempt to update the firmware in the flash PROM. To change the write protection state of the Sun Enterprise 450 system, turn the external front panel keyswitch.

Refer to the recovery procedure covered later in this chapter if there is a power interruption during the update process.

Return the write-protect/enable jumper (Sun Ultra 1 and Ultra 2 systems) to the write-protect position after updating the firmware in the flash PROM.

When your system has been updated to the proper firmware revision, you can run the Solaris 8 HW 7/03 software in 64-bit mode.

Capturing Configuration Variable Settings

While the Solaris operating environment is still running, capture the NVRAM configuration variable settings *before* you install the Solaris 8 HW 7/03 operating environment or begin the flash PROM update process. This will enable you to restore customized settings if there is a problem during the flash PROM upgrade.

▼ To Capture the Configuration Variable Settings

1. **Using the** `eeprom` **utility, capture the system's configuration variable settings in a file. The** *filename* **is any file name you choose.**

   ```
   % eeprom > filename
   ```

   Note – If you have custom values installed in `oem-logo` or `keymap`, those values cannot be displayed or printed properly by the `eeprom` utility because the contents contain binary information. If it is necessary to restore these values after a power loss, you should determine the original method by which these values were placed into NVRAM and use that method to restore the values.

2. **Print out the values captured by the** `eeprom` **command. Type the following:**

   ```
   lp filename
   ```

   You must have a printed copy of the configuration values before you install the Solaris 8 HW 7/03 operating environment and begin to update the flash PROM.

▼ To Install the Solaris 8 HW 7/03 Operating Environment

● **Install the Solaris 8 HW 7/03 operating environment on your system.**

   Refer to the *Solaris 8 Advanced Installation Guide* shipped in your Solaris 8 HW 7/03 media kit. As the Solaris 8 HW 7/03 operating environment is installed, you will be notified whether the flash PROM in your system needs updating. Installing this Solaris release will provide the software that can upgrade your system's flash PROM to the required level.

Making the Flash PROM Write-Enabled

Before you update the OpenBoot firmware contained in the flash PROM, you must set a jumper to the write-enable position (Sun Ultra 1 and Ultra 2 systems) or set the front panel keyswitch to the proper position (Sun Enterprise 450 system and the Sun Ultra 450 workstation).

The Sun Ultra 1 and Ultra 2 systems, which do not have a front panel keyswitch, are equipped with jumpers on their motherboards that allow the flash PROM to be either write-protected or write-enabled. The default position is for the flash PROM to be write-protected. To update the flash PROM, you must change the jumper to the write-enable position.

▼ Sun Ultra 1 and Ultra 2 Systems: To Change the Jumper to the Write-Enable Position

1. **Shut down the system. Type the following:**

```
% su
Type your superuser password
# init 0
System shutdown messages
```

2. **Power off the system unit.**

   Refer to the installation guide or service manual for your system.

3. **Remove the system access cover.**

   Refer to the installation guide or service manual for your system for this procedure.

4. **Use proper grounding procedures such as wearing a wrist strap to avoid electrostatically damaging system components.**

5. **Locate the flash PROM J2003 write-protect/enable jumper on the motherboard in your system:**
   - See if you have a Sun Ultra 1 system.
   - See if you have a Sun Ultra 2 system.

Note – You may have to remove a plug-in card if the card is covering the flash PROM jumper. Refer to the service manual for your system to remove the card.
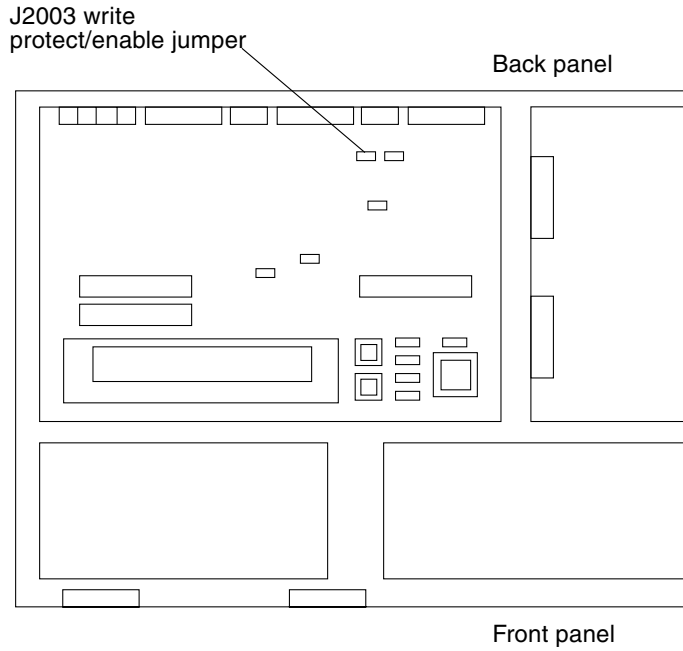
FIGURE 5-1 Sun Ultra 1 Series Write-Protect/Enable Jumper Location on Motherboard
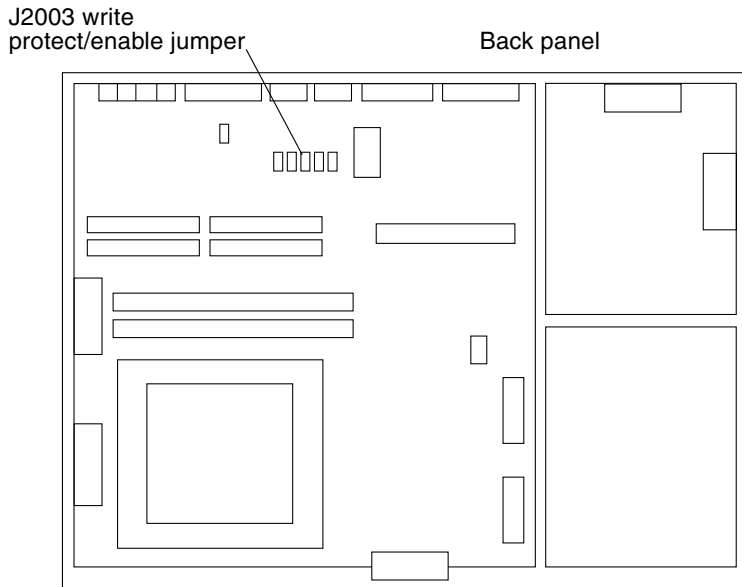
FIGURE 5-2 Sun Ultra 2 System Write-Protect/Enable Jumper Location on Motherboard

6. **Set the J2003 write-protect/enable jumper to pins 2 and 3 (write enabled) using needlenose pliers (see FIGURE 5-3). Pin 1 is noted by an asterisk (*).**
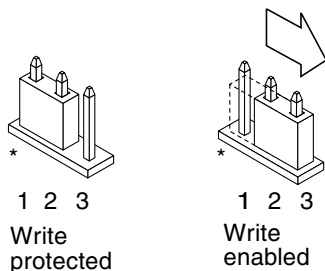
FIGURE 5-3   Setting the Write-Protect/Enable Jumper to the Write-Enable Position

TABLE 5-4   Jumper Setting

Jumper	Pins 1 + 2 Jumpered	Pins 2 + 3 Jumpered	Default Jumper on Pins	Name
J2003	Write-protect	Write-enable	1 + 2	Write-protect/enable

7. **If you removed a plug-in card from the system before changing the jumper, replace the card now.**

8. **Remove your wrist strap and replace the system access cover.**

9. **Go to "Before Updating the Flash PROM" on page 66.**

Sun Enterprise 450 System and the Sun Ultra 450 Workstation: Disabling Write Protection

For the Sun Enterprise 450 system and the Sun Ultra 450 workstation you do not have to change jumper pins. Instead, you move the keyswitch to allow the flash PROM to be write-enabled.

When the switch is set to the Locked position (FIGURE 5-4), the flash PROM is write-protected. When the switch is set to the On or Diagnostics position, the flash PROM is write-enabled.

▼ To Write Enable the Flash PROM on the Sun Enterprise 450 System and the Sun Ultra 450 Workstation

● **Turn the keyswitch to the On or Diagnostics position (FIGURE 5-4) before updating the flash PROM.**

Note – Disabling write-protection the Sun Enterprise 450 system or the Ultra 450 workstation assumes that the write-protect/enable jumper was set in the default position (enabled). If you previously changed the write-protect/enable jumper to be write protected, perform the steps to make the flash PROM write enabled in "Location of Flash PROM Jumpers in Sun Enterprise 450 System and the Ultra 450 Workstation" on page 77. You must change the jumper to be write enabled before continuing with the flash PROM update procedure.
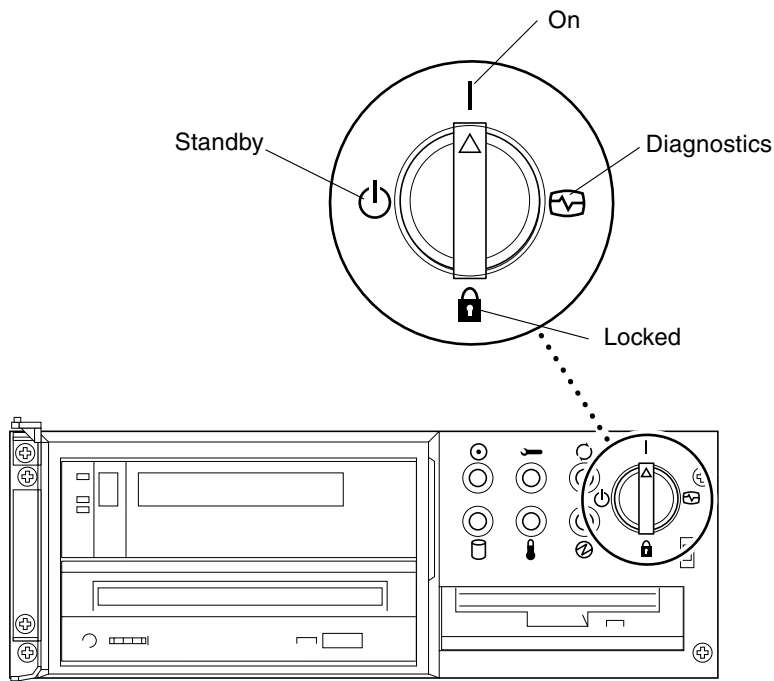
FIGURE 5-4   Sun Enterprise 450 and Sun Ultra 450 Keyswitch Location

Before Updating the Flash PROM

Before you begin updating the flash PROM, please note the following.

Caution – Do not interrupt power during flash PROM updating. When you are using the update routine, do not remove or insert system boards.

> **Note –** If power is interrupted during flash PROM updating, follow the power interruption recovery procedures covered later in this chapter.

▼ To Update the Flash PROM

1. **If you shut down your system to set the write-enable jumper (Ultra 1, Ultra 2 systems), turn the system on so it can boot.**

2. **Bring the system down to single user mode. Type the following:**

```
% su
Type your superuser password
# init S
```

3. **Execute the flash PROM update script by typing the following:**

```
/bin/sh /usr/platform/sun4u/lib/prom/'/usr/bin/uname -i'
```

4. **When the flash update process begins, it displays the current, available OpenBoot firmware revisions.**

   Type yes to the question about updating the firmware in the system flash PROM.

Note – If the NVRAM configuration variable `use-nvramrc?` is set to true, the update script resets `use-nvramrc?` to false. You will only see the message about the `use-nvramrc?` variable if `use-nvramrc?` is set to true. This is rarely the case.

```
Current System Flash PROM Revision:
-----------------------------------
OBP 3.5.2 1997/01/06 17:40

Available System Flash PROM Revision:
-------------------------------------
OBP 3.11.1 1997/12/03 15:44

NOTE: The system will be rebooted (reset) after the firmware has
 been updated.

Do you wish to update the firmware in the system Flash PROM?
yes/no :yes

The NVRAM variable 'use-nvramrc?' was 'true'. This program will
 reset it to the default value 'false'. This is being done because
 the contents of the NVRAM variable 'nvramrc' may or may not be
 appropriate for use with the new firmware. Do not change the value
 of 'use-nvramrc?' until you evaluate the contents of 'nvramrc'.
```

5. Next, the update script asks you if you want to continue. Type yes.

```
Are you sure that you wish to continue? yes/no :yes

**IMPORTANT**  If the power fails during the firmware update that
 is about to take place, it is possible that the customized values
 in the NVRAM configuration variables will revert back to their
 *default values* once the system power is restored. *If* this
 event occurs then it could have a significant effect on the
 behavior of the system after power is restored. Following is a
 list of the system's NVRAM configuration variables which have
 default values and have been customized. You may wish to write
 this information down so that the values may be restored after
 recovery from a power loss.

Name: sbus-probe-list
Default: 01
Current: 10
Name: nvramrc
Default: <null>
Current: ." This is a sample message which indicates that nvramrc
 has been modified." cr
```

If any of the NVRAM configuration variables have been customized, the update
displays both the default value and the current value.

Note – After the update, you may want to evaluate if the customized values displayed on the previous screen need to be modified.

The script automatically boots the machine and displays the following message:

```
Erasing the top half of the Flash PROM.
Programming OBP into the top half of the Flash PROM.
Verifying OBP in the top half of the Flash PROM.

Erasing the bottom half of the Flash PROM.
Programming OBP into the bottom half of Flash PROM.
Verifying OBP in the bottom half of the Flash PROM.

Erasing the top half of the Flash PROM.
Programming POST into the top half of Flash PROM.
Verifying POST in the top half of the Flash PROM.

The system's Flash PROM firmware has been updated.

Please wait while the system is rebooted . . .
```
The system's reboot messages are displayed.
```
........................................................
NOTICE: 64-bit OS installed, but the 32-bit OS is the default for
the processor on this system.

See boot(1M) for more information.
Booting the 32-bit OS/
```

6. **Become root and change the default kernel from 32-bit to 64-bit by editing the /platform/platform-name/boot.conf file.**

```
# cd /platform/sun4u/
# ls
boot.conf   cprboot    cprbooter  kadb       kernel     ufsboot
# vi boot.conf
```

Uncomment the line ALLOW_64BIT_KERNEL_ON_UltraSPARC_1_CPU=true.

7. **If you have a Sun Ultra 1 or Ultra 2 system, change the jumper back to the write-protect position.**

   a. **Allow the system to boot so you can become superuser.**

   b. **Halt the system by typing** `init 0` **at the superuser prompt.**

c. **Power off the system.**

d. **Open the system unit (refer to the installation or service manual for your system).**

e. **Attach a wrist strap properly (refer to the installation or service manual for your system).**

f. **Reset the J2003 write-enable/protect jumper to the write-protect position. In the write-protect position pins 1 and 2 are jumpered (see** FIGURE 5-1**,** FIGURE 5-2**,** FIGURE 5-5**, and** TABLE 5-4**). You may need to remove a plug-in card from the system before resetting the jumper if the card is covering the jumper. Pin 1 is noted by an asterisk (*).**

Write
enabled
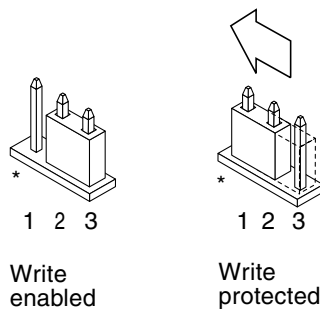
Write
protected

FIGURE 5-5   Moving the Write-Protect/Enable Jumper Back to the Write-Protect Position

g. **If you removed a plug-in card from the system before changing the jumper, replace the card now.**

h. **Remove your wrist strap and replace the system access cover.**

i. **Turn the power on to the system.**

8. **If you have a Sun Enterprise 450 system or a Sun Ultra 450 workstation, turn the keyswitch to the Standby position, wait a few seconds, and then power on again.**

This power-cycling flushes any old firmware code out of system memory.

Recovering From a Power Failure During the Flash PROM Update

If the power was lost during the flash PROM update, complete the power interruption recovery procedure for your system.

Sun Ultra 1 and Ultra 2 Systems, Sun Enterprise 450 System, Sun Ultra 450 Workstation

If power to your system was interrupted during updating of the flash PROM, complete the following steps:

1. **Turn the power switch to the Standby position to prevent power surge to the system when power is restored.**

2. **After power is restored to the system location, return the power switch to the On position.**

   After power is restored, one of the following two recovery scenarios should happen on your system. Follow the instructions described for the appropriate scenario.

Scenario 1—System Recovers After Power Restoration

If your system attempts to autoboot after power is restored, you *must* complete the flash PROM updating process.

Scenario 2—System Does Not Recover After Power Restoration

If your system does not boot, run diagnostics, or return to the PROM monitor's ok prompt after power is restored, complete the following steps:

1. **If the update was being run via a serial port and the system also has a frame buffer and keyboard installed, or if the system has a keyboard and more than one frame buffer installed:**

   a. **Connect a monitor to each frame buffer.**

   b. **Confirm that output has been redirected to one of the frame buffers.**

   - The NVRAM configuration variables *might* have been modified because of the firmware update just before power was lost. If this happened, then the system output was possibly redirected to a device other than the one originally used to display it. This could only have happened if a keyboard was connected to the system.

   - If there is no keyboard connected to the system and the NVRAM configuration variables are set to their default values, then system input and output are directed to serial port A.

2. **If output cannot be found on any of the installed frame buffers or serial port A, set the boot control jumper to boot from the half of the PROM that is not currently selected. See** FIGURE 5-1 **on page 64,** FIGURE 5-2**,** FIGURE 5-6**, and** FIGURE 5-7**. An asterisk (*) on the main logic board notes the location of pin 1.**

   ■ If the jumper is set for high-half booting, move it to low-half booting (pins 2 and 3 jumpered). See FIGURE 5-6.

   ■ If the jumper is set for low-half booting, move it to high-half booting (pins 1 and 2 jumpered). See FIGURE 5-6.

TABLE 5-5   Boot Control Jumper

System	Jumper	Pins 1 + 2 Jumpered	Pins 2 + 3 Jumpered	Default Jumper on Pins	Name
Ultra 1, 2	J2204	High-half booting	Low-half booting	2 + 3	Boot control
Sun Enterprise 450 or Sun Ultra 450 workstation	J5501	High-half booting	Low-half booting	2 + 3	Boot control
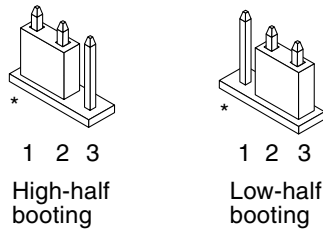
FIGURE 5-6   Setting the Boot Control Jumper to Low-Half Booting or High-Half Booting

3. **Power on the system unit.**

   ■ If the system recovers, complete the programming process by rebooting.

   ■ If the system does not recover, repeat Step 1 and Step 2 a second time.

4. **If the system *still* does not recover, contact your Sun service provider or local Sun service Authorized Service Provider.**

Restoring NVRAM Configuration Variables

If for any reason, the flash PROM update process did not complete successfully, for example if you lost power, you may have to restore `diag-switch?` to its default value of false and restore any customized values to the other NVRAM configuration variables.

Note – Use the steps in this section only if for any reason your NVRAM configuration variables were not reset to their customized values or if `diag-switch?` was not set to its proper value.

---

1. **Reboot the system by typing `reboot` at the prompt.**

   If `diag-switch?` was set to true and the system is power cycled, diagnostics will be run. Running diagnostics could take several minutes. Also, the system will attempt to boot from the network once the diagnostics have completed running.

Note – Other NVRAM variables may be reset to their default values, which could affect the system in other ways. For example, if you ran the flash PROM update through the serial port and the system still has its keyboard plugged in, you will no longer get any response from the serial port connection. The firmware will be waiting for input from the keyboard.

---

2. **As the system boots, go to the `ok` prompt by one of the following methods.**

   a. **Press Stop-a from the keyboard.**

   b. **If you are running on a terminal and connected to serial port A of the system, press the Break key.**

   c. **If you are connected to serial port A via telnet connection send a Break sequence by pressing the Control and] keys simultaneously. This returns you to the telnet command line. Type `send brk` at the telnet command line.**

   d. **If you are connected to serial port A via a tip connection, send a Break sequence by typing the characters ~# in quick succession.**

3. **Reset the configuration variables default value to the current value (see the values you captured with the** `eeprom` **command in** "To Capture the Configuration Variable Settings" on page 62 **and the values you wrote down earlier in this procedure in** Step 1**). At the** `ok` **prompt, type the following for** *each* **configuration variable:**

```
ok setenv variablename currentvalue
```

For example:

```
ok setenv auto-boot? false
```

The `setenv` command resets each configuration variable you entered to the current value.

4. **If the OpenBoot** `diag-switch?` **variable was set to** `true` **(**`false` **is the default). and the system is power cycled, diagnostics will run. Also, when you boot the system, the system will attempt to boot from the network. Unless you had** `diag-switch?` **set to true before the flash PROM update, set** `diag-switch?` **to** `false`**, the default value:**

```
ok setenv diag-switch? false
```

5. **If the** `use-nvramrc?` **configuration variable was set to true before the flash PROM update, as part of the update the** `use-nvramrc?` **variable was set to false because the contents of the NVRAM configuration variable** `nvramrc` **may or may not be appropriate for use with the new firmware. If you want to change the** `use-nvramrc?` **variable back to true, evaluate the contents of** `nvramrc` **first with** `printenv nvramrc` **then change the** `use-nvramrc?` **configuration variable back to true with the** `setenv use-nvramrc? true` **command.**

6. **Make sure that other configuration variables are set properly.**

   a. **Use the** `printenv` **OpenBoot command to display the NVRAM configuration variables and their settings.**

   b. **At the PROM monitor's** `ok` **prompt, you can use OpenBoot commands to restore the values of the configuration variables. Refer to the** *OpenBoot 3.x Command Reference Manual*. **You can also use the** `eeprom` **utility as superuser in the Solaris operating environment. See the** `eeprom` **man page description for more information.**

7. **If you have a Sun Enterprise 450 or an Ultra 450, turn the keyswitch to the Standby position, wait a few seconds, and then power on again. If you have an Ultra 1 or Ultra 2 system, type** `reset-all`**.**

   If you set the `auto-boot?` NVRAM configuration variable to `true`, and the `boot-device` variable contains the device or device alias where the Solaris 8 HW 7/03 operating environment was installed, then the system will boot the Solaris 8 HW 7/03 operating environment.

Error Messages

Most of the error messages were documented within the flash PROM update procedure. This section contains error messages that were not part of the flash PROM update procedure.

Retained Page/mmap Failure

If you see an error message similar to the following, just after the flash update program logs on `Flash Update 2.0: Program and system initialization in progress... eeprom:(attach) No retained page found in device tree` then the update will fail with the following message if the Flash PROM Update is attempted:

```
Do you wish to update the firmware in the system Flash PROM? yes/no
: yes
eeprom:(mmap) on retained page failed: no retained page found
Flash Update: MMAP call failed.
: No such device or address
```

If this error occurs, issue a `reboot` command at the superuser prompt and allow the system to return to the Flash PROM Update inquiry WITHOUT INTERRUPTION. Attempt the flash PROM Update once again by completing the steps in the section "To Update the Flash PROM" on page 67. If the reboot was uninterrupted and the flash PROM Update fails a second time for the same reason, contact your Authorized Service Provider.

Location of Flash PROM Jumpers in Sun Enterprise 450 System and the Ultra 450 Workstation

The flash PROM update procedure for the Sun Enterprise 450 and the Ultra 450 systems assumes that the write-protect/enable jumper was set in the default position (enabled). In order to update the flash PROM, you must move the write-protect/enable jumper to the write-enable position.

Three jumpers on the main logic board affect flash PROM operation. FIGURE 5-7 shows the jumper locations, and TABLE 5-6 describes their functions.
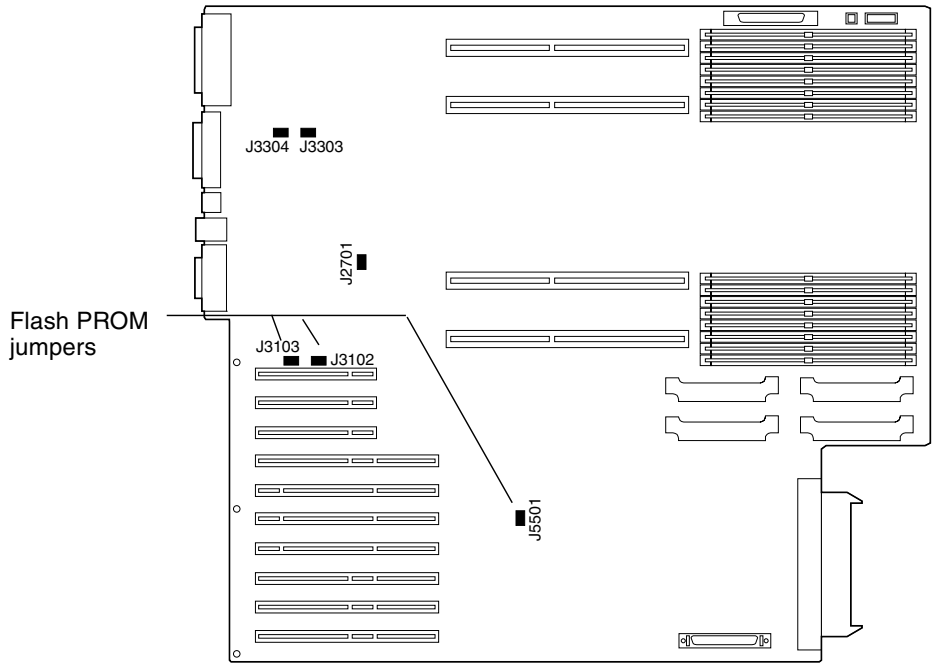
Flash PROM jumpers

FIGURE 5-7 Flash PROM Jumpers on the Sun Enterprise 450 System and the Sun Ultra 450 Workstation

TABLE 5-6 Sun Enterprose 450 and Ultra 450 Flash PROM Jumper Settings

Jumper	Pins 1 + 2 Jumpered	Pins 2 + 3 Jumpered	Default on Pins	Signal Controlled
J3102	Flash PROM	Not to be used	1 + 2	FLASH PROM SEL
J3103	Write-protect	Write-enable	2 + 3	FLASH PROM PROG ENABLE
J5501	High-half booting	Low-half booting	2 + 3	XOR LOGIC SET

Make sure that the write-protect/write-enable jumper is set to the write-enable position, pins 2 and 3 jumpered (see FIGURE 5-8). Pin 1 is noted by an asterisk (*).
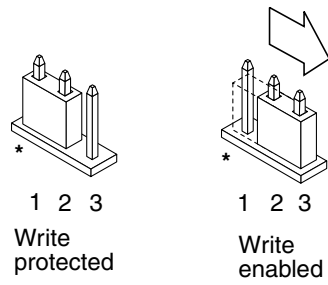
FIGURE 5-8 Setting the J3103 Write Protect/Enable Jumper on the Sun Enterprise 450 or Ultra 450

Updating the Flash PROM on the Sun Enterprise 3*x*00, 4*x*00, 5*x*00, and 6*x*00 Systems

The steps in this chapter describe how to update the flash PROMs in your Sun Enterprise 3*x*00, 4*x*00, 5*x*00, or 6*x*00 system.

Some systems require higher level of OpenBoot™ firmware in the flash PROM to run the 64-bit mode of the Solaris™ 8 operating environment. The OpenBoot firmware is contained in several PROMs that are located on several different boards.

The flash PROM devices, which contain OpenBoot, are electrically erasable and writable devices. This means that the firmware can be updated without removing the flash PROM from the system board. This Solaris 8 HW 7/03 kit includes the routines and instructions you need to update the flash PROM in your system.

Determining If the Flash PROM Needs Updating

Note – If your system is an Ultra™ Enterprise™ 10000, you do not need to do this update because the Ultra Enterprise 10000 does not have a flash PROM.

Only sun4u systems that can run the 64-bit mode of the Solaris 8 HW 7/03 operating environment might need the flash PROM update. Systems that can only run the 32-bit mode (such as those in the sun4c, sun4d, and sun4m platform groups) do not require updated firmware to run Solaris 8 HW 7/03 software.

Note – If the Solaris 8 HW 7/03 operating environment notified you that the flash PROM in your system needs updating, skip the steps in the procedure "To Determine If Your System Requires a Flash PROM Update" on page 82 and go directly to "Updating the Flash PROM" on page 83.

▼ To Determine If Your System Requires a Flash PROM Update

1. **Determine the architecture type of your system.**

```
% uname -m
```

TABLE 6-1 Determining the System Architecture

If your system architecture type is . . .	Then . . .
• sun4u	Go to Step 2.
• sun4c, sun4d, sun4m	You do not need a flash PROM update. Do not proceed further.

2. **Determine the system type of your system.**

```
% uname -i
```

TABLE 6-2 Determining the System Type

If your system type is one of the following systems. . .	Then . . .
SUNW, Ultra-1 SUNW, Ultra-2 SUNW, Ultra-4	Go to Chapter 5 "Updating the Flash PROM on the Ultra 1, Ultra 2, Ultra 450, and Sun Enterprise 450 Systems"
SUNW, Ultra-Enterprise	Go to Step 3.
Not in the above list	You do not need a flash PROM update. Do not proceed further.

3. **Determine the version level of the firmware in your system. Type** `prtconf -V` **(upper case V).**

```
% prtconf -V
```

TABLE 6-3

If your system type is . . .	And you see a number lower than . . .	Then . . .	Otherwise . . .
SUNW, Ultra-Enterprise	3.2.24	Proceed to "Updating the Flash PROM" on page 83.	You do not need a flash PROM update. Do not proceed further.
SUNW, Ultra-1	3.11.1	Proceed to Chapter 5.	You do not need a flash PROM update. Do not proceed further.
SUNW, Ultra-2	3.11.2	Proceed to Chapter 5.	You do not need a flash PROM update. Do not proceed further.
SUNW, Ultra-4	3.7.107	Proceed to Chapter 5.	You do not need a flash PROM update. Do not proceed further.

Updating the Flash PROM

This section describes the following:

- Flash PROM update process
- Capturing NVRAM configuration variable settings
- Making the flash PROM write-enabled
- Steps to perform before updating the flash PROM
- Updating the flash PROM

Flash PROM Update Process

Note – For step-by-step instructions, follow the procedures beginning with "Capturing Configuration Variable Settings" on page 84.

After installing the Solaris 8 HW 7/03 operating environment, make sure that the external front panel keyswitch is set to the On or Diagnostics position.

Take note of screen messages, during the flash PROM update, that report configuration variables that may be reset to their default values. When the update is complete and after you either reset the system or power cycle the system, revise the configuration variables as needed to restore your preferences.

Refer to the recovery procedure covered later in this chapter if there is a power interruption during the update process.

When your system has been updated to the proper firmware revision, you can run Solaris 8 HW 7/03 software in 64-bit mode.

Capturing Configuration Variable Settings

While the Solaris operating environment is still running, capture the NVRAM configuration variable settings *before* you install the Solaris 8 HW 7/03 operating environment or begin the flash PROM update process.

As part of the flash PROM update, your NVRAM configuration variables might change to the default values. To ensure that you can change the default values back to the values you customized, you need to save the current state of the NVRAM configuration variables using the eeprom command.

▼ To Capture the Configuration Variable Settings

1. **Using the** eeprom **utility, capture the system's configuration variable settings in a file. Type** eeprom > *filename*. **The** *filename* **is any file name you choose.**

```
% eeprom > filename
```

Note – If you have custom values installed in oem-logo or keymap, those values cannot be displayed or printed properly by the eeprom utility because the contents contain binary information. If it is necessary to restore these values after a power loss, you should determine the original method by which these values were placed into NVRAM and use that method to restore the values.

2. **Print out the values captured by the** `eeprom` **command. You must have a printed copy of the configuration values before you install the Solaris 8 HW 7/03 operating environment and begin to update the flash PROM. Type the following:**

```
lp filename
```

▼ To Install the Solaris 8 HW 7/03 Operating Environment

● **Install the Solaris 8 HW 7/03 operating environment on your system.**

Refer to the *Solaris 8 Advanced Installation Guide* which is in your Solaris 8 HW 7/03 media kit. As the Solaris 8 HW 7/03 operating environment is installed, you will be notified whether the flash PROM in your system needs updating. Installing this Solaris release will provide the software that can upgrade your system's flash PROM to the required level.

Making the Flash PROM Write-Enabled

Before you update the OpenBoot firmware, which is contained in the flash PROM, you must set the front panel keyswitch to the proper position to allow the flash PROM to be write-enabled.

When the switch is set to the Locked position (FIGURE 6-1), the flash PROM is write-protected. When the switch is set to the On position or to the Diagnostics position, the flash PROM is write-enabled.

FIGURE 6-1 shows the keyswitch positions on a 16-slot Sun Enterprise 6000 system. The server systems described in this section have the same keyswitch positions.

▼ To Write Enable the Flash PROM

● **Turn the keyswitch to the On or Diagnostics position (**FIGURE 6-1**) before updating the flash PROM.**

Note – Disabling write-protection on servers assumes that the system's write-protect/enable jumpers were set in the default position (enabled). If you previously removed the write-protect/enable jumper, perform the steps to make the flash PROM write enabled in "Location of Flash PROM Jumpers in Sun Enterprise Server Systems" on page 95.
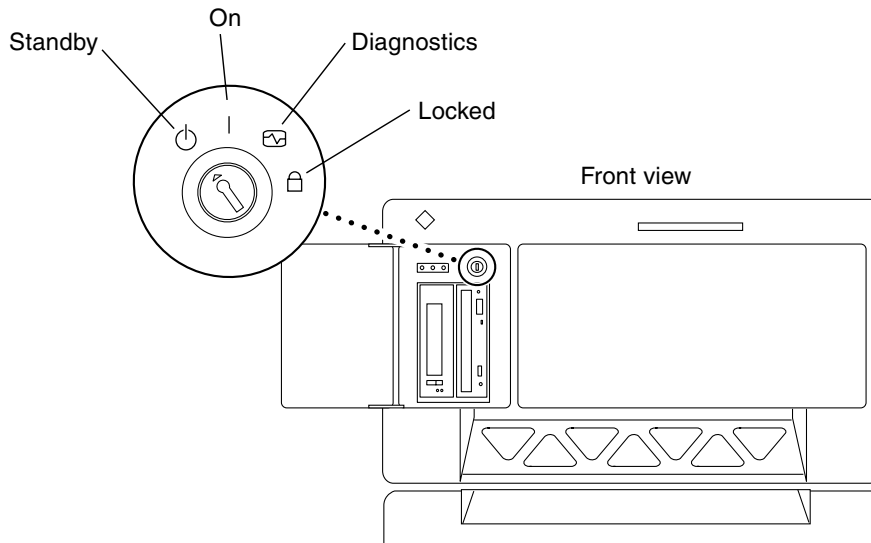
FIGURE 6-1 Sun Enterprise 6*x*00, 5*x*00, 4*x*00, 3*x*00 Keyswitch Locations

Before Updating the Flash PROM

Before you begin updating the flash PROM, please note the following cautions.

Caution – Do not interrupt power during flash PROM updating. When you are using the update routine, do not remove or insert system boards.

Caution – The flash update may cause default NVRAM values to overwrite customized NVRAM variables. Be sure to record the custom and default values displayed so that you can restore them after you perform the flash PROM update.

Note – If power is interrupted during flash PROM updating, follow the power interruption recovery procedures covered later in this chapter.

Running the Flash PROM Update Script Manually

The flash PROM update script is typically run at bootup. You can also run the flash PROM update script manually by doing the following:

1. Bring the system down to single user mode. Type the following:

```
% su
Type your superuser password
# init S
```

2. Execute the flash PROM update script by typing the following:

```
/bin/sh /usr/platform/sun4u/lib/prom/`/usr/bin/uname -i`
```

Follow the step-by-step instructions when running the script in the section "To Update the Flash PROM". Begin with Step 2 (do not execute the reboot command).

▼ To Update the Flash PROM

1. Reboot your system. Type reboot **at the superuser prompt.**

```
# reboot
```

2. **If your flash PROM needs to be updated, the flash PROM update script displays the following message:**

```
This system has older firmware.  Although the current firmware is
 fully capable of running the 32-bit packages, you will not be able
 to run the 64-bit packages installed on this system until you
 update the system flash PROM.

This system ships with flash PROM write-protect jumpers in the
 "write enabled" position.  Unless the jumpers on this system have
 been changed, there is no need to change them in order to run the
 system flash PROM update.

The front panel keyswitch on this system must NOT be in the
 "SECURE" position while the system flash PROM update is running.
  Please check the keyswitch position before answering the next
 question.

See the Hardware Platform Guide for more information.

Please answer the next question within 90 seconds, or press the
 ENTER key to disable the timer.

Would you like to run the system flash PROM update now?
(By default the system flash PROM update will not be run now.)
yes or no? [y,n] y
Extracting files
Loading flashprom driver
```

3. **When the flash update process begins, it displays the current and available system board PROM revisions.**

```
Current System Board PROM Revisions:
------------------------------------
Board  0: CPU/Memory OBP  3.2.16 1998/06/08 16:58 POST  3.9.4 1998/06/09 16:25
Board  2: CPU/Memory OBP  3.2.16 1998/06/08 16:58 POST  3.9.4 1998/06/09 16:25
Board  4: CPU/Memory OBP  3.2.16 1998/06/08 16:58 POST  3.9.4 1998/06/09 16:25
Board  6: CPU/Memory OBP  3.2.16 1998/06/08 16:58 POST  3.9.4 1998/06/09 16:25
Board  1: I/O Type 2 FCODE 1.8.3  1997/11/14 12:41 iPOST 3.4.6 1998/04/16 14:22
Board  3: I/O Type 5 FCODE 1.8.7  1997/12/08 15:39 iPOST 3.4.6 1998/04/16 14:22
Board  7: I/O Type 5 FCODE 1.8.7  1997/12/08 15:39 iPOST 3.4.6 1998/04/16 14:22

Available 'Update' Revisions:
------------------------------------
CPU/Memory OBP  3.2.16 1998/06/08 16:58 POST  3.9.4 1998/06/09 16:25
I/O Type 1 FCODE 1.8.3  1997/11/14 12:41 iPOST 3.4.6 1998/04/16 14:22
I/O Type 2 FCODE 1.8.3  1997/11/14 12:41 iPOST 3.4.6 1998/04/16 14:22
I/O Type 3 FCODE 1.8.7  1997/05/09 11:18 iPOST 3.0.2 1997/05/01 10:56
I/O Type 4 FCODE 1.8.7  1997/12/08 15:39 iPOST 3.4.6 1998/04/16 14:22
I/O Type 5 FCODE 1.8.7  1997/12/08 15:39 iPOST 3.4.6 1998/04/16 14:22
```

4. **If any of the NVRAM configuration variables have been customized, the update displays both the default value and the customized (current) value.**

```
Verifying Checksums: Okay

Do you wish to flash update your firmware? y/[n] : y
**IMPORTANT**  As a consequence of the firmware upgrade that is
 about to take place, it is very possible that the customized
 values in the configuration variables will revert to their
 *default values* upon the next system power-cycle or soft-reset.
 If this happens, it could have a significant effect on the
 behavior of the system after the power-cycle or soft-reset.
Following is a list of the system's NVRAM configuration variables
 which have been customized (i.e. they are different than the
 default values).
You may wish to write down the values of the indicated
 configuration variables so that they may be restored (if
 necessary) after the next power-cycle or soft-reset.
Name: auto-boot?
Default: true
Current: false

Name: boot-file
Default: <null>
Current: kadb -d
```

5. **Take note of the variables and values for current settings.**

   Either write down the current values or mark up the eeprom output you captured in "To Capture the Configuration Variable Settings" on page 84 so that you know which NVRAM configuration variables will need to be changed from their default values after the flash PROM update.

6. **If the keyswitch is set to the locked position, you will see the following error message..**

```
FPROM Write Protected: Check Write Enable Jumper or Front Panel
Key Switch.
```

   Make the flash PROM write-enabled by turning the keyswitch to the On or Diagnostics position then type reboot at the # prompt

7. **The update then prompts you if you want to continue. Make sure that you have turned the keyswitch to the On or Diagnostics position then type y. The flash PROMs are updated.**

```
Are you sure that you wish to continue? y/[n] : y

Updating Board 0: Type 'cpu' (PromID=1a4)
1 Erasing            ............................... Done.
1 Verifying Erase    ............................... Done.
1 Programming        ............................... Done.
1 Verifying Program .............................. Done.

Updating Board 1: Type 'upa-sbus' (PromID=1a4)
1 Erasing            ............................... Done.
1 Verifying Erase    ............................... Done.
1 Programming        ............................... Done.
1 Verifying Program .............................. Done.

Updating Board 4: Type 'dual-pci' (PromID=1a4)
1 Erasing            ............................... Done.
1 Verifying Erase    ............................... Done.
1 Programming        ............................... Done.
1 Verifying Program .............................. Done.

Updating Board 6: Type 'dual-pci' (PromID=1a4)
1 Erasing            ............................... Done.
1 Verifying Erase    ............................... Done.
1 Programming        ............................... Done.
1 Verifying Program .............................. Done.

Unloading flashprom driver

The new firmware will not take effect until the system is power-
cycled.
```

8. **After the flash PROMs are updated, the system asks if you would like to halt the system. Type yes.**

```
Do you wish to halt the system now? yes or no? yes

The system's shutdown messages are displayed.

Program terminated
ok
```

Note – If you answered no to the question on halting the system, the installation will continue but the updated firmware will not become effective until the next system reboot. The NVRAM configuration variables are changed to default values at the next system reboot. If you customized NVRAM configuration variables you must change the values back to their customized settings.

9. **Turn the keyswitch to the Standby position.**

10. **Turn the power on to the system. As the system boots, diagnostics will be run at boot up because the OpenBoot** `diag-switch?` **was set to** `true` **in the flash PROM update procedure. Running diagnostics could take several minutes.**

Note – Other NVRAM variables may be reset to their default values, which could affect the system in other ways. For example, if you ran the flash PROM update through the serial port and the system still has its keyboard plugged in, you will no longer get any response from the serial port connection. The firmware will be waiting for input from the keyboard. TABLE 6-4, which follows, describes the workarounds for NVRAM settings.

11. **As the system boots, go to the** `ok` **prompt by one of the following methods.**

    a. **Press Stop-a from the keyboard.**

    b. **If you are running on a terminal and connected to serial port A of the system, press the Break key.**

    c. **If you are connected to serial port A via telnet connection send a Break sequence by pressing the Control and] keys simultaneously. This returns you to the telnet command line. Type** `send brk` **at the telnet command line.**

    d. **If you are connected to serial port A via a tip connection, send a Break sequence by typing the characters ~# in quick succession.**

12. **Reset the configuration variables default value to the current value (see the values you captured with the** eeprom **command in "To Capture the Configuration Variable Settings" on page 84 and the values you wrote down earlier in this procedure in Step 1). At the** ok **prompt, type the following for** *each* **configuration variable:**

```
ok setenv variablename currentvalue
```

For example:

```
ok setenv auto-boot? false
```

The setenv command resets each configuration variable you entered to the current value.

13. **When you updated the flash PROM, the OpenBoot** diag-switch? **variable was also set to** true**. With** diag-switch? **set to true, diagnostics will run when you reboot the system. If you don't want diagnostics to be run at boot up, set** diag-switch? **to false with the** setenv diag-switch? false **command.**

14. **Make sure that other configuration variables are set properly.** TABLE 6-4 **describes what might occur if you did not have the default NVRAM configuration variables set before the flash PROM update.**

   a. **Use the** printenv **OpenBoot command to display the NVRAM configuration variables and their settings.**

   b. **Use the** setenv **OpenBoot command to restore the NVRAM configuration variables to the customized values except for the** nvramrc **configuration variable.**

c. **For the** `nvramrc` **configuration variable refer to** **for how to restore the configuration variable to the customized settings. For additional information on the NVRAM configuration variables, refer to the** *OpenBoot 3.x Command Reference Manual.*

TABLE 6-4

Variable Name	Default Value	Description
output-device	screen	If output-device is not set to the default value before the flash PROM update, then it is possible that the output device may be other than what you anticipate.
input-device	keyboard	If input-device is not set to the default value before the flash PROM update, then it is possible that the input device may be other than what you anticipate.
ttyb-mode	9600,8,n,1,-	If you are running anything from the serial ports A or B with port settings other than what is default (baud rate, number of bits, parity, number of stop bits, handshake), then those communications lines may not function after the flash PROM update.
ttya-mode	9600,8,n,1,-	If you are running anything from the serial ports A or B with port settings other than what is default (baud rate, number of bits, parity, number of stop bits, handshake), then those communications lines may not function after the flash PROM update.
boot-command	boot	If there are any custom flags to boot, then the system may not boot as anticipated after the flash PROM update.
auto-boot?	true	The system may attempt to autoboot after the first reset or power cycle following the flash PROM update. With auto-boot? set to false, the system will not autoboot.
diag-switch?	true	After you reboot or power cycle the system after the flash PROM update, the diag-switch? may be set to true. With diag-switch? set to true, diagnostics will be run at boot up. Also, the system may attempt to boot from a different device than was booted prior to the flash PROM update.
diag-device	disk	If you had diag-switch? set to true before the update then this is the device that would probably have been booted. This device might not be the boot device after the flash PROM update.
diag-file	Empty string	If you were booting a customized kernel file before the update, and diag-switch? was set to true after the flash PROM update, the customized kernel file might not be booted after the flash PROM update.

TABLE 6-4 *(Continued)*

Variable Name	Default Value	Description
boot-file	Empty string	If you were booting a customized kernel file before the flash PROM update, and diag-switch? was false (default), the customized kernel file might not be booted after the flash PROM update.
boot-device	disk net	If you had a different sequence of boot-devices specified, after the flash PROM update an incorrect device might be booted.
use-nvramrc?	false	If you had customized commands in the nvramrc, and use-nvramrc? was set to true, then those customized commands might not be used after the flash PROM update.
nvramrc	Empty	If you had customized commands in the nvramrc, then those customized commands might be lost after the flash PROM update. Do not use setenv to change the nvramrc variable. Instead use nvedit and nvstore. If you know that the nvramrc variable contains a firmware patch which is no longer compatible with the newly programmed firmware, do not change the nvramrc variable to its previously customized value.
oem-logo?	false	If oem-logo? was true before the flash PROM update, the oem-logo might be lost after the update, and oem-logo? might be set to false.
oem-banner?	false	If oem-banner? was true before the flash PROM update, the oem-banner might be lost after the flash PROM update, and oem-banner? might be set to false.

15. **Turn the keyswitch to the Standby position, wait a few seconds, and then power on again.**

   This power-cycling flushes any old firmware code out of system memory.

   If you set the auto-boot? NVRAM configuration variable to true, and the boot-device variable contains the device or device alias where the Solaris 8 HW 7/03 operating environment was installed, then the system will boot the Solaris 8 HW 7/03 operating environment. This concludes the flash PROM update procedure.

Location of Flash PROM Jumpers in Sun Enterprise Server Systems

If you previously removed the write-protect/enable jumper, you must reinstall it in order to successfully perform the flash PROM update procedure.

Sun Enterprise 3*x*00, 4*x*00, 5*x*00, and 6*x*000 systems have a jumper on the clock board, P0601, which controls if the flash PROM can or cannot be updated.

- With the jumper P0601 *installed*, *all* the flash PROM *can* be updated.
- With the jumper P0601 *removed*, *all* the flash PROM *cannot* be updated.

If you previously removed jumper P0601, you must reinstall it before you can complete the flash PROM update procedure.

> **Caution –** The clock board is not hot-pluggable. Do not remove the clock board until the system has been halted and powered off.

Installing the P0601 Jumper

To install the P0601 jumper, follow these steps:

1. **Halt the system, then turn the keyswitch to the Standby position.**

2. **Remove the clock board from the system (see** FIGURE 6-2**).**
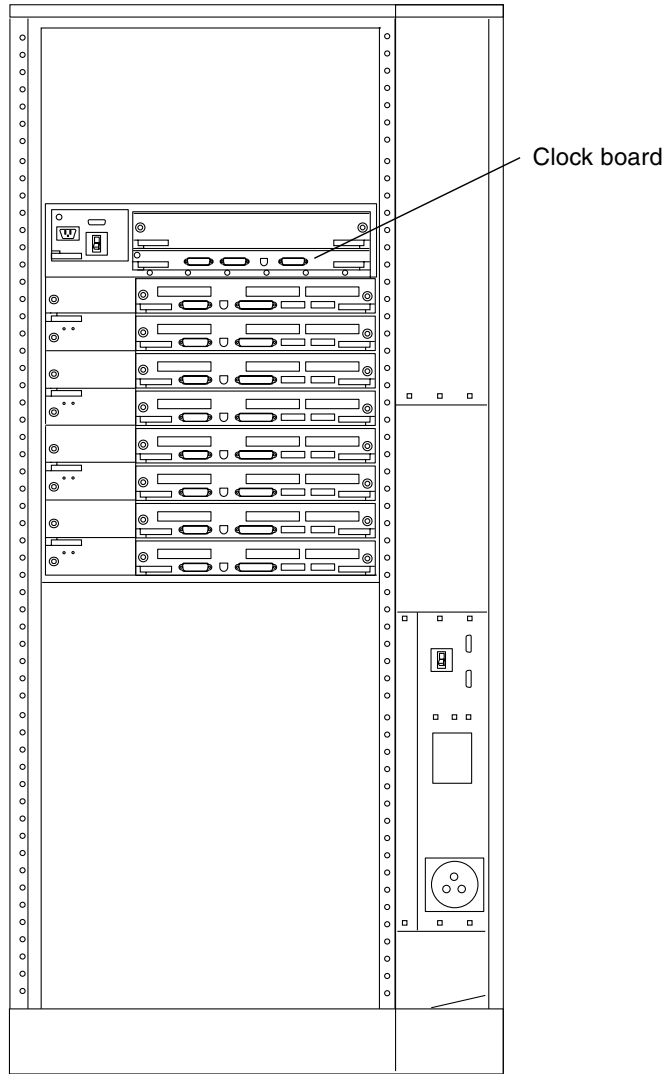
FIGURE 6-2   Rear View of the Sun Enterprise 6000 System

Note – FIGURE 6-2 shows a 16-slot system. Systems also come in 4-, 5-, and 8-slot configurations.

3. **Locate the P0601 jumper location (**FIGURE 6-3**) on the clock board.**
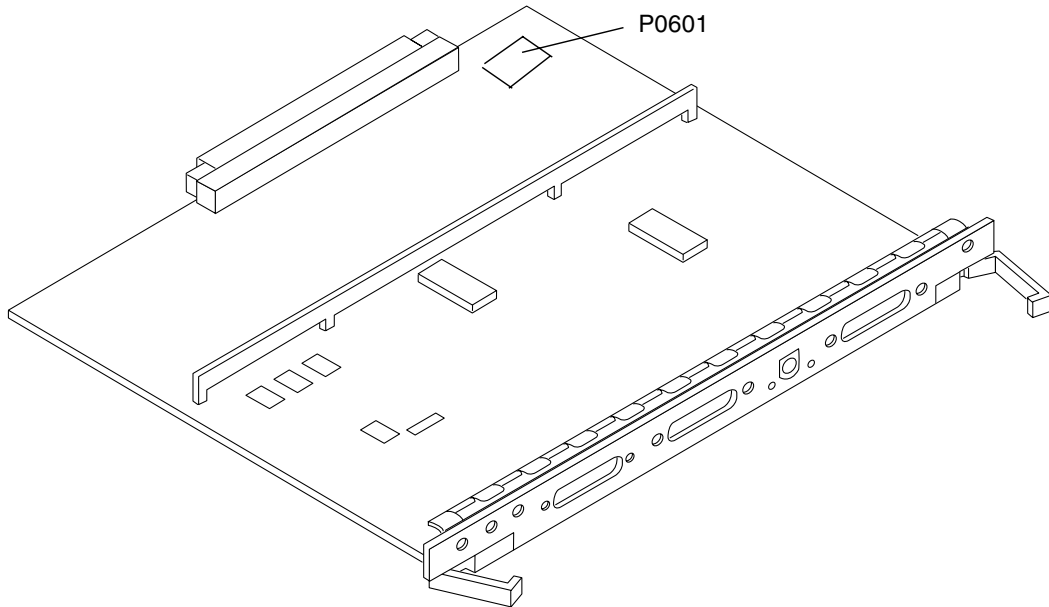
FIGURE 6-3   Clock Board and Jumper P0601 Jumper Location

4. **Insert the P0601 jumper on the clock board.**

5. **Replace the clock board in the system.**

   Refer to Chapter 6 in your reference manual for the detailed procedure.

6. **Turn the keyswitch to the On or Diagnostics position.**

Recovering From a Power Failure During the Flash PROM Update

If the power was lost during the flash PROM update, complete the power interruption recovery procedure for your system.

Sun Enterprise 3x00, 4x00, 5x00, and 6x00 Systems

There are three scenarios for the Sun Enterprise 3x00, 4x00, 5x00, and 6x00 systems:

- Completing the update of the flash PROM
- Recovering a one-board system after power interruption
- Recovering a multi-board system after power interruption

▼ To Complete the Update of the Flash PROM

If power was interrupted during the flash PROM update procedure, it is possible that one or more system boards were not updated successfully. You must become superuser and complete the flash PROM update.

● **At the # prompt, type the following:**

```
# /bin/sh /usr/platform/sun4u/lib/prom/`uname -i`
```

▼ To Recover a One-Board System After Power Interruption

● **Call your Sun service provider or local Sun service Authorized Service Provider.**

▼ To Recover a Multi-Board System After Power Interruption

Only one board is updated at any given time in the flash PROM updating process. If there is a power interruption to the system while the flash PROMs are being updated, only one board will have its flash PROMs in an inconsistent state.

Note – Power interruption during updating of the flash PROMs aborts the updating at the point of the power interruption. Turn the keyswitch to the Standby position (FIGURE 6-1 on page 86) to prevent power surge to the system when power is restored.

The following recovery procedure requires another board of the same type with an uncorrupted PROM image (if you are updating an "I/O Type 1" board, you must use another "I/O Type 1" board). In the following code examples, the flash PROM on board 3 recovers by copying the flash PROM image from board 0.

1. **Connect a null modem cable to port A and to either a terminal or a Sun™ Workstation™.**

2. **Set the serial port at 9600 bps, 8-bit word, no parity, and 1 stop bit.**

3. **Remove the board that was being programmed when the power went out.**

4. **Turn the keyswitch to the On position (**FIGURE 6-1 **on page 86).**

The system responds with the message:

```
Hardware Power ON
```

5. **Wait 15 seconds and type** s **on the keyboard terminal or the tip window connected to the serial port.**

The system responds:

```
0,0>
*** Toggle Stop POST Flag = 1 ***
```

This message shows that POST (power-on self-test) has recorded your request to stop after testing is completed.

When POST stops, it will display the following options menu:

```
0,0>Extended POST Menus
0,0>Select one of the following functions
0,0>    '0'      Return
0,0>    '1'      Reset
0,0>    '2'      Peek/Poke device
0,0>    '3'      Environmental Status
0,0>    '4'      Test Menus
0,0>    '5'      State Dump
0,0>    '6'      Frequency Margining
0,0>    '7'      Display System Summary
0,0>    '8'      Display Fatal Reset Info
0,0>    '9'      Scan System Board Ring
0,0>    'a'      Set Memory Test Megs
0,0>    'b'      Print SIMM Info
0,0>    'c'      Focus CPU
0,0>    'd'      CPU State
0,0>    'f'      fcopy
0,0>    'g'      System Power Off
0,0>    'h'      Bounce Patterns
0,0>    'i'      Focus I/O Board
0,0>
```

6. **Type** f **to select** fcopy.

```
Command ==> f
0,0>Flash PROM Copy Menu
0,0>Select one of the following functions
0,0>      '0'          Return
0,0>      '1'          Copy
0,0>      '2'          Verify
0,0>      '3'          Display Version
0,0>      '4'          Activate System Board
0,0>


Command ==>
```

7. **Without powering off the system, plug in the board with the corrupted flash PROM. Be sure its power LED is lit.**

8. **Type** 4 **to select** Activate System Board.

   The system prompts you to enter the board number in hexadecimal notation from 0 through 9 and "a" through "f". In the example below, board 3 is entered as the board to be activated.

```
Command ==> 4
0,0>Input board number in hex ('0' thru '9' and 'a' thru 'f')
?3
0,0>
0,0>Flash PROM Copy Menu
0,0>      '0'          Return
0,0>      '1'          Copy
0,0>      '2'          Verify
0,0>      '3'          Display Version
0,0>      '4'          Activate System Board
0,0>


Command ==>
```

9. **Type** 1 **to select** `Copy`**. Respond to the prompts for source (where to copy from) and destination (where to copy to) board numbers in hexadecimal notation.**

   In the example below, board 0 is entered as the source and board 3 is entered as the destination:

```
Command ==> 1
0,0>Input board number in hex ('0' thru '9' and 'a' thru 'f')
0,0>
from board? 0
to board? 3
0,0>    Mfg code 04, Dev code a4
0,0>Erasing prom at 000001cc.f8000000
0,0>Copy prom at 000001c0.f8000000 to prom at 000001cc.f8000000
0,0>..............................
0
```

10. **Type** 3 **to select** `Display Version`**.**

    The system responds by showing all PROM versions in the system.

```
Command ==> 3
0,0>Slot 0 CPU/Memory  OBP    3.2.1 1996/3/11 09:57 POST   3.0.1
1996/3/11 18:38
0,0>Slot 1 IO Type 1   FCODE  1.6.0 1996/1/23 13:44 iPOST  1.1.4
1996/3/05 04:06
```

11. **Turn the keyswitch to the Standby position (**FIGURE 6-1**). Wait 15 seconds.**

12. **Complete the procedure "To Update the Flash PROM" on page 87 to reattempt the flash PROM update process.**

Power Management on Sun Hardware

The United States Environmental Protection Agency has the Energy Star® guidelines for computer products to encourage the use of energy-efficient computer systems and to reduce air pollution associated with energy generation.

To meet these guidelines, Sun Microsystems, Inc. designs hardware to use power efficiently; also, it provides Power Management™ software with which to configure the power management settings. In order to reduce power consumption, your Sun workstation and devices are capable of entering a lower-power state when they have been inactive for a period of time.

This section supplements the *Using Power Management* manual in the Solaris 8 User Collection.

Supported Platforms and System Distinctions

Power Management software supports the sun4m and sun4u platform groups. Software features and defaults may vary between the two platform groups. Refer to *Using Power Management* in the Solaris 8 User AnswerBook set for more information when you identify the platform group that applies to your system.

Note – Power Management does not support the sun4c and sun4d platform groups.

TABLE 7-1   Platform Names and Groups Supported by Power Management

Sun System Name	Platform Name	Platform Group
SPARCstation 4	SUNW, SPARCstation-4	sun4m
SPARCstation 5	SUNW, SPARCstation-5	sun4m
SPARCstation 10	SUNW, SPARCstation-10	sun4m
SPARCstation 10SX	SUNW, SPARCstation-10, SX	sun4m
SPARCstation 20	SUNW, SPARCstation-20	sun4m
SPARCstation LX	SUNW, SPARCstation-LX	sun4m
SPARCstation LX+	SUNW, SPARCstation-LX+	sun4m
SPARCclassic	SUNW, SPARCclassic	sun4m
SPARCclassic X	SUNW, SPARCclassic-X	sun4m
Ultra 1 (all models)	SUNW, Ultra-1	sun4u
Ultra 5	SUNW, Ultra-5	sun4u
Ultra 10	SUNW, Ultra-10	sun4u
Ultra 30	SUNW, Ultra-30	sun4u
Ultra 60	SUNW, Ultra-60	sun4u
Ultra 450	SUNW, Ultra-4	sun4u
Ultra 2 Creator (all models)	SUNW, Ultra-2	sun4u
Sun Enterprise 1 Model 140	SUNW, Ultra-1	sun4u
Sun Enterprise 1 Model 170	SUNW, Ultra-1	sun4u
Sun Enterprise 1 Model 170E	SUNW, Ultra-1	sun4u
Sun Enterprise 2 Model 1300	SUNW, Ultra-2	sun4u
Sun Enterprise 2 Model 2300	SUNW, Ultra-2	sun4u
Sun Blade 100	SUNW,Sun-Blade-100	sun4u
Sun Blade 150	SUNW,Sun-Blade-100	sun4u
Sun Blade 1000	SUNW,Sun-Blade-1000	sun4u
Sun Blade 1500	SUNW,Sun-Blade-1500	sun4u
Sun Blade 2000	SUNW,Sun-Blade-1000	sun4u
Sun Blade 2500	SUNW,Sun-Blade-2500	sun4u

System Architecture Distinctions and Default Settings

The SPARC architecture of a workstation determines which Power Management features are available. To determine your system's architecture, see TABLE 7-1. The default behavior in Power Management functions varies on systems, as described in TABLE 7-2.

TABLE 7-2   Power Management Features in Different SPARC Architectures

Power Management Features	sun4m	sun4u (Energy Star 2.0)	sun4u (Energy Star 3.0)	Servers
Display PM Available	Yes	Yes	Yes	Yes
Display PM by Default	Yes	Yes	Yes	Yes
Device PM Available	No	No	Yes	No
Device PM by Default	N/A	N/A	Yes	N/A
Suspend-Resume Available	Yes	Yes	Yes	No
Suspend-Resume by Default	No	Yes	No	N/A
AutoShutDown Available	No	Yes	Yes	No
AutoWakeup by Default	N/A	Yes	No	N/A

SPARCstation 4 Issues

This section describes a workaround to a limitation of the SPARCstation 4 when used with Power Management.

The AC accessory outlet on the SPARCstation 4 system is an unswitched outlet. The AC power switch does not control power flowing through the accessory outlet. If you connect a monitor to the accessory outlet, you cannot turn it off using the system unit power switch. Similarly, if you use Power Management software, the software cannot turn off the monitor automatically. To conserve energy, consider using an Energy Star-compliant monitor. Sun offers a variety of Energy Star-

compliant monitors in its standard SPARCstation 4 system configurations. This information does not apply to SPARCserver 4 configurations. The SPARCserver 4 includes a switched accessory outlet.

Alternate Pathing 2.3.1 on the Sun Enterprise servers

This chapter contains initial installation and upgrade instructions for Alternate Pathing (AP) 2.3.1. With the introduction of AP 2.3.1, both the initial install instructions and the upgrade instructions now apply to the Sun Enterprise™ 3x00, 4x00, 5x00, 6x00 and 10000 servers.

Preparing to Install or Upgrade

The AP packages require approximately 2.7 megabytes of disk space on the server. The following table lists the total size of the AP software by file system.

TABLE 8-1   AP Software Approximate File System Sizes

File System	Size
/usr	317 Kbytes
/	1.3 Mbytes
/etc	13 Kbytes
/kernel	1528 Kbytes
/sbin	1481 Kbytes

AP requires that an entire disk partition with at least 300 Kbytes be dedicated to each database copy. For more detailed information on partitioning for the AP databases, see Chapter 2, "Alternate Pathing Database" in the *Alternate Pathing 2.3.1 User Guide*.

The installation instructions in this section assume that your system is running the Solaris 2.6, Solaris 7 or Solaris 8 operating environment. AP 2.3.1 will not run under software releases earlier than Solaris 2.6 environment.

▼ To Install or Upgrade From the Web

1. **Using your web browser, go to** `http://www.sun.com/servers/sw/`

2. **Click the Enterprise Alternate Pathing (AP) link.**

3. **Click the** `Click here to download` **link.**

   The file that is then downloaded is named `ap_2_3_1_sparc.zip`.

4. **Log in as superuser.**

5. **Change directory to the location where you downloaded the software:**

   ```
   # cd /download_directory
   ```

6. **Extract the downloaded file by typing:**

   ```
   # unzip -v ap2_3_1_sparc.zip
   ```

   The AP 2.3.1 packages are located in
   /*download_directory*/`ap_2_3_1_sparc/Product` and the install and upgrade
   scripts are located in
   /*download_directory*/`ap_2_3_1_sparc/Tools`.

7. **Proceed to "Performing an Initial Installation of AP" on page 110 or "Before Performing an Upgrade of AP" on page 121.**

▼ To Install or Upgrade From a CD-ROM

1. **Insert the "Software Supplement for the Solaris 8 Operating Environment" CD-ROM into the CD-ROM drive.**

   Allow time for the volume manager to mount the CD-ROM.

> **Note –** If your CD-ROM is not local to your system (for example, on a Sun Enterprise 10000) and you are not familiar with remote installation using a CD-ROM, see "To Mount a CD-ROM over NFS™" on page 109 or refer to your *Solaris System Administration Guide*.

The AP 2.3.1 packages are located in:

```
/cdrom/cdrom0/Alternate_Pathing_2.3.1/Product
```

The install and upgrade scripts are located in:

```
/cdrom/cdrom0/Alternate_Pathing_2.3.1/Tools
```

2. **Become superuser and** cd **to the** Product **installation directory:**

```
# cd /cdrom/cdrom0/Alternate_Pathing_2.3.1/Product
```

3. **Proceed to "Performing an Initial Installation of AP" on page 110 or "Before Performing an Upgrade of AP" on page 121.**

▼ To Mount a CD-ROM over NFS™

1. **Log in as superuser and verify that the volume manager is running on your machine:**

```
# ps -ef | grep vold
```

2. **If you see an entry containing** /usr/sbin/vold**, volume manager is running on your system.**
   - If volume manager is running, skip to Step 3.
   - If volume manager is not running on your system, type:

```
# /etc/init.d/volmgt start
```

3. **Check to see if NFS is running on your system:**

```
# ps -ef | grep nfsd
```

- If you see an entry containing `/usr/lib/nfs/nfsd` then `nfsd` is running on your system. Type:

```
# share -F nfs -o ro /cdrom/cdrom0/Alternate_Pathing_2.3.1
```

- If `nfsd` is not running, type:

```
# /etc/init.d/nfs.server start
# share -F nfs -o ro /cdrom/cdrom0/Alternate_Pathing_2.3.1
```

4. **Log in to target machine as superuser and** `cd` **to the source machine:**

```
# cd /net/source_machine/cdrom/cdrom0/Alternate_Pathing_2.3.1
```

If you cannot change to that directory and you do not have automounter on your network, create a mount point on the target machine and mount the `Product` directory:

```
# mkdir /remote_products
# /usr/sbin/mount -F nfs -r
source_machine:/cdrom/cdrom0/Alternate_Pathing_2.3.1 /remote_products
# cd /remote_products
```

5. **At this point you may proceed with the install, "Performing an Initial Installation of AP" on page 110 or "Before Performing an Upgrade of AP" on page 121.**

Once you have completed installation you can `umount` the CD-ROM using:

```
# umount source_machine/cdrom
```

Performing an Initial Installation of AP

The initial installation instructions in this section are for environments where AP is not currently installed and configured. If any version of AP is currently installed and configured, you can use the instructions in "Before Performing an Upgrade of AP" on page 121 to install AP 2.3.1. That procedure uses scripts that save your current AP configuration, and then restores that configuration after you install the AP 2.3.1 packages.

The installation instructions in this section assume that your system is running the Solaris 2.6, Solaris 7 or Solaris 8 operating environment. AP 2.3.1 will not run under software releases earlier than the Solaris 2.6 environment.

Note – AP 2.3.1 software installation is based on your operating environment. If, at a later date, you upgrade your Solaris operating environment, you must re-install AP 2.3.1 following the AP 2.3.1 upgrade procedure. See "Before Performing an Upgrade of AP" on page 121. For information on performing a simultaneous upgrade, see "Simultaneously Upgrading AP and Solaris Software" on page 123.

---

ssd Patch

AP 2.3.1 requires an ssd(7D) patch. AP 2.3.1 installation checks for the presence of this patch. If the patch is not present then, depending on your configuration, the following message maybe displayed:

```
Alternate Pathing Subsystem Drivers
(sparc) 2.3.1,REV=2000.05.09.11.28
Copyright 2000 Sun Microsystems, Inc. All rights reserved.
## Executing checkinstall script.
Determining patch requirements...
Verifying required patches are installed...
Required patches not installed: 109524-01
###
### Patch verification failed.
### Alternate Pathing 2.3.1 requires this package.
### You MUST apply the required patches before
### proceeding.
###
###   PACKAGE INSTALLATION FAILED.
###
checkinstall script suspends
Installation of <SUNWapdv> was suspended (administration).
No changes were made to the system.
```

The required patches are as follows:

- Patch 105356-15 for Solaris 2.6,
- Patch 107458-09 for Solaris 7
- Patch 109524-01 for Solaris 8

You can obtain these patches from SunSolve at: http://sunsolve.sun.com.

You can use Web Start to install the AP 2.3.1 software and optionally the AP 2.3.1 AnswerBook2 collection or you can manually install the AP and AnswerBook packages using pkgadd.

To manually install AP 2.3.1 proceed to "To Manually Install AP 2.3.1" on page 113. To manually install the AP 2.3.1 AnswerBook see "To Install the AP 2.3.1 AnswerBook2 Collection" on page 120.

If you have a third party volume manager installed on your system, you must deconfigure it, according to your vendor's instructions, before installing AP 2.3.1. Once you have finished deconfiguring or if you do not have a volume manager installed, proceed to "To Install AP 2.3.1 Using Web Start" on page 112 for the Web Start procedure or "To Manually Install AP 2.3.1" on page 113 for the manual procedure.

▼ To Install AP 2.3.1 Using Web Start

You can use Web Start to perform a fresh install from CD-ROM or from files you have downloaded from the Web.

1. Log in as superuser.

2. Set the DISPLAY **environment variable.**

For sh(1) or ksh(1), type:

```
# DISPLAY=hostname:0
# export DISPLAY
```

Where *hostname* is the host name of the machine used to graphically display Web Start.

3. Change directory to the location of the AP 2.3.1 package:

■ If you downloaded software from the Web:

```
# cd /download_directory/ap_2_3_1_sparc/Product
```

■ If you are installing the upgrade from the CD-ROM:

```
# cd /cdrom/cdrom0/Alternate_Pathing_2.3.1/Product
```

4. Begin Web Start by typing:

```
# ./installer
```

5. **Select Custom Install, then select the Alternate Pathing 2.3.1 software and optionally the Alternate Pathing 2.3.1 AnswerBook2 product.**

With custom installation, only the products that you select are installed.

Note – You can install the packages in any order you wish but you must install them all. Package installation depends on the ssd patch being present. See "ssd Patch" on page 111 for more information

---

6. **Verify that you have sufficient disk space to cover the requirements displayed on the Ready to Install dialog.**

7. **Click the Install Now button.**

Wait until the installation is complete and the Installation Summary dialog is displayed.

Note – If your Sun Enterprise server is not configured to support a particular feature or device that is supported by Alternate Pathing, simply adding AP to your server will not enable it to use that feature or device.

---

8. **Configure AP.**

For an example of the steps you need to follow, see "To Configure AP" on page 10. Also see the *Alternate Pathing 2.3.1 User Guide*.

Note – If you are using IPv6, your /etc/hostname files will have the name /etc/hostname6.*xxx*. While the content of the IPv6 files is different than IPv4, as far as AP installation is concerned, the /etc/hostname6.*xxx* files can be treated in exactly the same manner as the /etc/hostname.*xxx* files. For more information on IPv6 refer to *System Administration Guide, Volume 3.*

▼ To Manually Install AP 2.3.1

1. **Log in as superuser.**

2. **Change directory to the location of the AP 2.3.1 package:**
   - If you downloaded software from the Web:

   ```
   # cd /download_directory/ap_2_3_1_sparc/Product
   ```

- If you are installing the upgrade from the CD-ROM:

```
# cd /cdrom/cdrom0/Alternate_Pathing_2.3.1/Product
```

3. **Install the AP 2.3.1 domain packages on the server:**

```
# pkgadd -d . SUNWapdoc SUNWapdv SUNWapr SUNWapu
```

Note – You can install the packages in any order you wish but you must install them all. Package installation depends on the ssd patch being present. See "ssd Patch" on page 111 for more information

The software briefly displays copyright, trademark, and license information for each package, then displays messages about pkgadd(1M) actions taken to install the package, including a list of the files and directories being installed. Depending on your configuration, the following messages may be displayed:

```
This package contains scripts which will be executed
with superuser permission during the process of installing this
package.

Do you want to continue with the installation of this
package [y,n,?]
```

Type **y** at each successive prompt to continue.

When this portion of the installation is complete, the AP 2.3.1 packages have been installed and the superuser prompt is displayed.

Note – If your Sun Enterprise server is not configured to support a particular feature or device that is supported by Alternate Pathing, simply adding AP to your server will not enable it to use that feature or device.

4. **Remove the Sun Computer Systems Supplement CD from the CD-ROM drive, if applicable:**

```
# cd /
# eject cdrom
```

5. **Configure AP.**

For an example of the steps you need to follow, see "To Configure AP" on page 10. Also see the *Alternate Pathing 2.3.1 User Guide*.

Note – If you are using IPv6, your /etc/hostname files will have the name /etc/hostname6.*xxx*. While the content of the IPv6 files is different than IPv4, as far as AP installation is concerned, the /etc/hostname6.*xxx* files can be treated in exactly the same manner as the /etc/hostname.*xxx* files. For more information on IPv6 refer to *System Administration Guide, Volume 3.*

▼ To Configure AP

1. **Create three to five AP databases:**

```
# apdb -c raw_disk_slice
```

Note – See the *Alternate Pathing 2.3.1 User Guide* for information on disk partitions for the AP database.

---

2. **Create the AP metadisks.**

You must know the configuration of the host hardware so that you know which two ports are connected to the same disk array. The following steps use sf ports. Your ports may vary, depending on the configuration of the host.

a. **Display all of the ports and their disk device nodes:**

```
# apinst
sf:0
        /dev/dsk/c1t0d0
        /dev/dsk/c1t1d0
        /dev/dsk/c1t2d0
        /dev/dsk/c1t3d0
        /dev/dsk/c1t4d0
        /dev/dsk/c1t5d0
sf:1
        /dev/dsk/c2t0d0
        /dev/dsk/c2t1d0
        /dev/dsk/c2t2d0
        /dev/dsk/c2t3d0
        /dev/dsk/c2t4d0
        /dev/dsk/c2t5d0
```

b. Create an uncommitted disk pathgroup:

```
# apdisk -c -p sf:0 -a sf:1
# apconfig -S -u
```

where:

−c causes the pathgroup to be created

−p designates the primary path

−a designates the alternate path

You can verify the results by using apconfig(1M) as shown above.

c. Commit the database entries:

```
# apdb -C
```

As shown, you can verify the results of that command by using apconfig -S.

d. If you are placing the boot disk under AP control, use apboot(1M) **to define the new AP boot device:**

```
# apboot metadisk_name
```

The apboot(1M) command modifies the /etc/vfstab file and the /etc/system file. The *metadisk_name* must be in the form: mcxtxdx.

e. Modify any references that use a physical device node (that is, a path that begins with /dev/dsk **or** /dev/rdsk**) to use the corresponding metadisk device node (that is, a path that begins with** /dev/ap/dsk **or** /dev/ap/rdsk**).**

If a partition is mounted under a physical path, unmount and remount it under the metadisk path using umount and mount respectively.

Examine /etc/vfstab for any physical devices that should be changed to AP metadevices. If necessary, edit /etc/vfstab to make the necessary modifications.

Caution – You must be a knowledgeable system administrator to edit /etc/vfstab. If you do not configure your file systems properly in /etc/vfstab, it is possible that you can lose data and/or leave the server unbootable.

3. Create AP metanetworks (for nonprimary networks).

a. **Create the network pathgroup:**

```
# apnet -c -a network_interface -a network_interface
# apconfig -N -u
...
```

As shown, you can verify the results of the apnet(1M) command by using apconfig(1M).

b. **Commit the network pathgroup entries in the database.**

```
# apdb -C
```

You can verify the results of the apdb(1M) command by using the apconfig(1M) command with the –N option.

c. **Remove all direct usage of both members of the network pathgroups.**

If the physical interface is currently plumbed, and it is not the interface that you will be using as you run commands to configure the metanetwork, you can unplumb the physical interface by using the ifconfig(1M) command.

d. **Create an** /etc/hostname.mether*x* **(for example,** hostname.mether0**) file for any metanetworks that you want to configure when the server is rebooted.**

4. **Create the AP metanetwork for the primary network.**

a. **View the contents of the** /etc/nodename **and** /etc/hostname.*xxxxx* **files (for example,** hostname.hme0**) to verify that the interface name is the same.**

> **Note –** If you are using `IPv6`, your `/etc/hostname` files will have the name `/etc/hostname6.`*xxx*. While the content of the `IPv6` files is different than `IPv4`, as far as AP installation is concerned, the `/etc/hostname6.`*xxx* files can be treated in exactly the same manner as the `/etc/hostname.`*xxx* files. For more information on IPv6 refer to *System Administration Guide, Volume 3.*

b. Create the primary network pathgroup:

```
# apnet -c -a network_interface1 -a network_interface2
```

where:

-c creates the new primary network pathgroup

-a designates the first alternate network path

-a designates the second alternate network path

c. Commit the network pathgroup entry in the database:

```
# apdb -C
# apconfig -N
```

As shown, you can verify the results of the apdb(1M) command by using apconfig(1M).

d. Rename the `/etc/hostname.`*xxxx* **file to** `/etc/hostname.mether`*x* **to configure the network when you reboot the server.**

For example:

```
# mv hostname.hme0 hostname.mether0
```

5. **If you plan to use a volume manager, such as Solstice DiskSuite™ (SDS) or VERITAS Volume Manager™ (VxVM) configure the volume manager according to the vendor's instructions.**

> **Note –** Make sure that your volume manager is supported under your version of the Solaris operating environment (either version 2.6, version 7, or version 8).

■ SDS Issues

If you want to build your SDS volumes on top of AP, configure your volumes using AP metadisk paths rather than physical paths. SDS recognizes and properly installs on existing AP metadevices with no special action required.

- VxVM Issues

  If you want to build your VxVM volumes on top of AP, configure your volumes using AP metadisk paths rather than physical paths. VxVM recognizes and properly installs on existing AP metadevices with no special action required.

  VxVM can encapsulate both nonboot disks and boot disks that are configured as AP metadevices. VxVM can encapsulate AP databases without any impact on AP. Note, however, that the standard VxVM requirements for encapsulation apply:

  - There must be an `s2` slice that represents the entire disk.
  - There must be two free partitions. The partition requirement may necessitate giving up an AP database, which is often placed in slice `s4`.
  - There must be a "small amount" of free disk space at the beginning or end of the disk.

  Software installation of VxDMP and AP are mutually exclusive. You can only install one or the other. VxDMP does not work with DR.

6. **Reboot the server (if necessary).**

   If you just rebooted the server after configuring a volume manager, this step is unnecessary.

Installing the AP 2.3.1 AnswerBook2 Collection

This section explains how to manually install the AP 2.3.1 AnswerBook2 document collection using the standard installation utility, `pkgadd`.

AP 2.3.1 AnswerBook2 Collection

Before you can install the AP 2.3.1 AnswerBook2 document collection, you must have the AnswerBook2 server software installed. For instructions on installing the AnswerBook2 server software, see "Installing and Administering an AnswerBook2 Server" in the AnswerBook2 Help Collection on `docs.sun.com`. The server software can be obtained from the following sources:

- The Documentation CD for Solaris 7 and Solaris 8 environments
- The Web (`http://www.sun.com/software/ab2/index.html`)

▼ To Install the AP 2.3.1 AnswerBook2 Collection

1. **Log in as superuser on the machine where the AP 2.3.1 AnswerBook2 collection is to be installed.**

2. **If you have a previous version of the SUNWabap package installed, remove it using the** pkgrm **command:**

```
# pkgrm SUNWabap
```

3. **Change directory to the location of the AP 2.3.1 AnswerBook package:**
   - If you downloaded software from the Web:

```
# cd /download_directory/ap_2_3_1_sparc/Product
```

   - If you are installing the upgrade from the CD-ROM:

```
# cd /cdrom/cdrom0/Alternate_Pathing_2.3.1/Product
```

4. **Add the SUNWabap package by typing:**

```
# pkgadd -d . SUNWabap
```

5. **When you are requested to select an installation option, type 2 (heavy installation):**

```
Select an installation option: 2
```

6. **When you are asked to specify the parent path for the AnswerBook2 collection, type the path to the directory in which you want to put the AP 2.3.1 AnswerBook2.**

   It is suggested that you install the AP AnswerBook2 Collection in /opt.

```
Specify the parent path of this AnswerBook2 Collection directory: /opt
```

7. Type `y` **at the following prompt:**

```
This package contains scripts which will be executed with super-user
permission during the process of installing this package.

Do you want to continue with the installation of <SUNWabap> [y,n,?] y
```

A message indicates that the SUNWabap package was successfully installed.

For instructions on launching the AnswerBook2 viewer and viewing document collections, see "Viewing Online Documentation Using the AnswerBook2 System" in the AnswerBook2 Help Collection on `docs.sun.com`.

Before Performing an Upgrade of AP

This section provides information and recommendations concerning an upgrade to AP 2.3.1 on the Sun Enterprise servers.

AP 2.0, 2.0.1, 2.1 and 2.2 are not supported under the Solaris 8 10/00 operating environment.

The upgrade process involves:

- Saving your current configuration
- Deconfiguring AP
- Removing the earlier version of AP
- Installing a set of core AP packages
- Restoring your AP configuration

Scripts are provided to simplify this process in */download_directory*/`ap_2_3_1_sparc/Tools` from the web or on CD-ROM in `/cdrom/cdrom0/Alternate_Pathing_2.3.1/Tools`.

Note – If you are upgrading to AP 2.3.1 on *all* Sun Enterprise 10000 domains, then you can safely remove the `SUNWapssp` package software from the SSP workstation using `pkgrm`. If, however, any domain will remain at an earlier version of AP, then you must *not* remove the AP software on the SSP workstation. In either case, leaving AP software on SSP workstations will have *no* effect on AP 2.3.1.

Installation of the packages requires approximately 2.7 megabytes of disk space. The following table lists the total size of the AP software by file system.

TABLE 8-2 AP Software File System Sizes

File System	Size
/usr	317 Kbytes
/	1.3 Mbytes
/etc	13 Kbytes
/kernel	1528 Kbytes
/sbin	1481 Kbytes

Note – When partitioning the hard drive during the Solaris software installation, you must dedicate an entire disk partition with at least 300 Kbytes to each database copy. For more detailed information on partitioning for the AP databases, see Chapter 2, "Alternate Pathing Database" in the *Alternate Pathing 2.3.1 User Guide*.

Backing Up Your Server

Always back up an existing server before you upgrade any software. The safest backup to perform is a level 0 dump (ufsdump(1M)) of the file systems connected to the server being upgraded. If you do not have an established backup procedure, see the *System Administration Guide*.

You do not need to back out installed patches before you perform the upgrade.

Note – If you wish to add or remove any hardware included in an AP path group, do so either *before* you begin the upgrade process or *after* you have completed it. In general, avoid changing your hardware in ways that result in controller renumbering.

Uncommitted AP Database Entries

Before you run ap_upgrade_begin, commit any uncommitted entries in the AP database. Any metadevices that were created but not committed are not preserved during the upgrade. Similarly, any metadevices that were deleted but not committed will continue to exist after the upgrade.

Checking Other Software Documentation

Check the documentation of other software you are running, such as disk volume managers, before you use the upgrade option in the suninstall utility. There may be additional instructions you need to follow to preserve existing configurations. Also, be sure to check the release notes for AP and any volume managers you are using.

Simultaneously Upgrading AP and Solaris Software

The AP upgrade procedures in this section use two scripts, ap_upgrade_begin and ap_upgrade_finish. The first script saves your current AP configuration. The second script restores that exact configuration after you install the AP 2.3.1 packages. It is possible that you will upgrade the Solaris software at the same time you upgrade to AP 2.3.1, since AP 2.3.1 supports Solaris 2.6, Solaris 7, and Solaris 8. Because the AP configuration is restored exactly as it was before you upgraded the Solaris operating environment, you need to be aware of the issues described in the following sections.

AP Database Partitions

The AP upgrade scripts attempt to recreate the AP databases in the same partitions that they occupied before the upgrade of the Solaris operating environment. Note, however, that Solaris 7 and Solaris 8 require more disk space than earlier versions of the Solaris operating environment. Because of this, you can choose to modify the boot disk partitioning scheme during suninstall. Do *not* modify the AP database partitions. If you are upgrading from Solaris 7 to Solaris 8 operating environment this will not be an issue. If, however, you are upgrading from an earlier version of Solaris and you place file systems in all partitions that were previously used for AP databases, ap_upgrade_finish is not able to recreate any databases and the upgrade process fails.

Caution – If you place a file system in *any* partition that was previously used for an AP database, and if for some reason that file system is not mounted at the time you run ap_upgrade_finish, that file system is overwritten by a copy of the AP database.

Root Disk Partitions

The AP upgrade facility assumes that the partitioning of the root disk (the disk containing the / (root) partition) is not modified during the upgrade. Solaris 7 and Solaris 8 software require more disk space than earlier versions. One way to acquire the additional space is to repartition the original disk or to split the root disk into two disks using standard commands prior to the Solaris upgrade. If you need to repartition the root disk, do so *before* performing the AP 2.3.1 upgrade procedure.

If there is insufficient space when you run `suninstall`, you have the option to modify the disk partitioning layout to acquire more space. However, during `suninstall`, you must not relocate the / (root) or /usr partitions to another disk as this will cause the AP upgrade script to fail.

ssd Patch

AP 2.3.1 requires an `ssd`(7D) patch. AP 2.3.1 installation checks for the presence of this patch.

The required patches are as follows:

- Patch 105356-15 for Solaris 2.6,
- Patch 107458-09 for Solaris 7
- Patch 109524-01 for Solaris 8

You can obtain these patches from SunSolve at: `http://sunsolve.sun.com`.

Performing an Upgrade of AP

The upgrade installation instructions in this section are for environments where AP is currently installed and configured.

Note – If your Sun Enterprise server is not configured to support a particular feature or device that is supported by Alternate Pathing, simply adding AP to your server will not enable it to use that feature or device.

The installation instructions in this section assume that your system is running the Solaris 2.6, Solaris 7 or Solaris 8 operating environment. AP 2.3.1 will not run under software releases earlier than Solaris 2.6 environment.

> **Note –** AP 2.3.1 software installation is based on your operating environment. If, at a later date, you upgrade your Solaris operating environment, you must re-install AP 2.3.1 following this AP 2.3.1 upgrade procedure. See "Before Performing an Upgrade of AP" on page 121. For information on simultaneous upgrade, see "Simultaneously Upgrading AP and Solaris Software" on page 123.

▼ To Upgrade to AP 2.3.1

1. If necessary, log in as superuser and commit any uncommitted entries in the AP database:

```
# apdb -C
```

2. Terminate any processes that directly or indirectly access AP metadevices.

If you have a third party volume manager installed on your system, deconfigure it now using the documentation provided by the specific vendor.

With regard to AP, no additional steps need to be taken to do this other than those recommended by the manufacturer to deconfigure the volume manager.

> **Caution –** Once the volume manager has been deconfigured, if you are instructed to install the new OS, stop at that point and remove your previous version of AP. Do *not* install Solaris 8 software at this time.

You do not need to be concerned if your mounted ufs file systems or TCP/IP networks are using AP metadevices.

The ap_upgrade_begin script, which you will run later in this procedure, and the subsequent reboot will cause the ufs file systems and any swap devices configured in /etc/vfstab to use physical paths rather than AP metadevices.

Likewise, ap_upgrade_begin will also take care of renaming any TCP/IP network interfaces (/etc/hostname.*xxxx*) that may be using AP metadevices.

> **Note –** This is true for any ufs file system configured in vfstab or any network configured with /etc/hostname.*xxxx* files.

3. Remove the current AP configuration.

a. **Log in to the server as superuser and run the following script to deconfigure AP (and save the AP configuration so that it can be restored later):**

```
# /path/Alternate_Pathing_2.3.1/Tools/ap_upgrade_begin
...
ap_upgrade_begin complete. (State saved in /var/tmp/apstate.) Now
 you can safely remove the old AP packages, upgrade Solaris if
 necessary, and install new AP packages. Run the ap_upgrade_finish
 script when you're done to restore the AP configuration. Please
 read the upgrade directions in the Sun Enterprise Server Alternate
 Pathing 2.3 Installation and Release Notes for specific details.
```

This script saves the current AP configuration information in the file /var/tmp/apstate. You may examine the /var/tmp/apstate file if you wish, but do not modify or remove it. Doing so can compromise the upgrade procedure.

b. **Remove the packages** SUNWapdoc, SUNWapr, SUNWapu, SUNWabap **and** SUNWapdv **(if applicable) by using the** pkgrm(1M) **command.**

c. **If you are *not* upgrading your Solaris operating environment, reboot before proceeding to Step 6.**

4. **Upgrade the Solaris operating environment (if applicable) now.**

Note – You *must* upgrade the Solaris operating environment if you are running a version prior to Solaris 2.6.

/!\ **Caution –** Make sure you upgrade the correct slice. If you were previously using a volume manager to mirror the boot disk, and if you were also using AP to alternately path each boot disk mirror, then there are four physical paths that were previously potential paths to the boot disk (two alternate paths for each boot disk mirror). Now that both AP and the volume manager have been deconfigured, examine /etc/vfstab to determine the physical path that corresponds to the root (/) file system. When you run suninstall, specify that path as the disk to upgrade. Later, when you restore your volume manager, be sure to designate that disk as the primary mirror. See your volume manager documentation for information on determining which physical slice is used when booting.

> **Note –** When partitioning the hard drive during the Solaris software installation, you must dedicate an entire disk partition that has at least 300 Kbytes to each database copy. For more detailed information on partitioning for the AP databases, see Chapter 2, "Alternate Pathing Database" in the *Alternate Pathing 2.3.1 User Guide*.

See "Upgrading a System" in *Solaris 8 Advanced Installation Guide*. Note that you must choose the upgrade option to perform an upgrade of the Solaris operating environment.

5. **When the Solaris software upgrade process is completely finished, install the correct** `ssd` **patch.**

> **Note –** If you have *not* upgraded the Solaris operating environment or you did *not* reboot as part of the upgrade or Step 3, do so now.

AP 2.3.1 installation checks for the presence of an `ssd` patch. If the patch is not present then, depending on your configuration, the following message maybe displayed:

```
Alternate Pathing Subsystem Drivers
(sparc) 2.3.1,REV=2000.05.09.11.28
Copyright 2000 Sun Microsystems, Inc. All rights reserved.
## Executing checkinstall script.
Determining patch requirements...
Verifying required patches are installed...
Required patches not installed: 109524-01
###
### Patch verification failed.
### Alternate Pathing 2.3.1 requires this package.
### You MUST apply the required patches before
### proceeding.
###
###   PACKAGE INSTALLATION FAILED.
###
checkinstall script suspends
Installation of <SUNWapdv> was suspended (administration).
No changes were made to the system.
```

See Section "ssd Patch" on page 8111 for the required patches if you have not already done so.

6. **Upgrade to AP 2.3.1**

   a. **Log in as superuser and type:**

■ If you downloaded software from the web:

```
# cd /download_directory/ap_2_3_1_sparc/Tools
```

■ If you are installing the upgrade from the CD-ROM:

```
# cd /cdrom/cdrom0/Alternate_Pathing_2.3.1/Tools
```

b. Install the required AP 2.3.1 packages:

```
# pkgadd -d . SUNWapdoc SUNWapdv SUNWapr SUNWapu
```

Note – You can install the packages in any order you wish but you must install them all. Package installation depends on the ssd(7D) patch being present. See "ssd Patch" on page 111 for more information.

c. Run the following script to restore the original AP configuration:

Note – Be sure to read "Simultaneously Upgrading AP and Solaris Software" on page 123before performing the following command.

```
# /path/Alternate_Pathing_2.3.1.1/Tools/ap_upgrade_finish
...
ap_upgrade_finish complete. (State saved in /var/tmp/apstate.) Now
 you can upgrade and configure any volume managers or other
 software to use AP metadevices. Please read the upgrade directions
 in the Sun Enterprise Server Alternate Pathing 2.3 Installation
 and Release Notes for specific details.
```

d. Reboot.

7. If you have a third party volume manager, install and configure it according to manufacturer's instructions now.

Note – If your boot disk is mirrored, make sure you specify the upgraded disk as the primary mirror.

Upgrade is now complete.

OpenBoot Emergency Procedures

The introduction of USB keyboards with the newest Sun desktop systems has made it necessary to change some of the OpenBoot™ emergency procedures. Specifically, the Stop-N, Stop-D, and Stop-F commands that are available on systems with standard (non-USB) keyboards are not supported on systems that have USB keyboards. The following sections describe the OpenBoot emergency procedures for systems with standard keyboards and for newer systems with USB keyboards.

OpenBoot Emergency Procedures for Systems with Standard (non-USB) Keyboards

When issuing any of these commands, press the keys immediately after turning on the power to your system, and hold the keys down for a few seconds until the keyboard LEDs flash.

Command	Description
Stop	Bypass POST. This command does not depend on security mode. (Note: Some systems bypass POST as a default. In such cases, use Stop-D to start POST).
Stop-A	Abort.
Stop-D	Enter the diagnostic mode (set `diag-switch?` to `true`).
Stop-F	Enter Forth on TTYA instead of probing. Use `fexit` to continue with the initialization sequence. Useful if hardware is broken.
Stop-N	Reset NVRAM contents to default values.

OpenBoot Emergency Procedures for Systems with USB Keyboards

The following paragraphs describe how to perform the functions of the Stop commands on systems that have USB keyboards.

Stop-A

Stop-A (Abort) works the same as it does on systems with standard keyboards, except that it does not work during the first few seconds after the machine is reset.

Stop-N Equivalent

1. **After turning on the power to your system, wait until the front panel power button LED begins to blink and you hear an audible beep.**

2. **Quickly press the front panel power button twice (similar to the way you would double-click a mouse).**

   A screen similar to the following is displayed to indicate that you have successfully reset the NVRAM contents to the default values:

```
Sun Blade 1000 (2 X UltraSPARC-III) , Keyboard Present

OpenBoot 4.0, 256 MB memory installed, Serial #12134241.

Ethernet address 8:0:20:b9:27:61, Host ID: 80b92761.




Safe NVRAM mode, the following nvram configuration variables have

been overridden:

  'diag-switch?' is true
```

```
   'use-nvramrc?' is false

   'input-device', 'output-device' are defaulted

   'ttya-mode', 'ttyb-mode' are defaulted



These changes are temporary and the original values will be
restored

after the next hardware or software reset.



ok
```

Note that some NVRAM configuration parameters are reset to their defaults. They include parameters that are more likely to cause problems, such as TTYA settings. These NVRAM settings are only reset to the defaults for this power cycle. If you do nothing other than reset the machine at this point, the values are not permanently changed. Only settings that you change manually at this point become permanent. All other customized NVRAM settings are retained.

Typing **set-defaults** discards any customized NVRAM values and permanently restores the default settings for all NVRAM configuration parameters.

Note – Once the power button LED stops blinking and stays lit, pressing the power button again will power off the system.

Stop-F Functionality

The Stop-F functionality is not available in systems with USB keyboards.

Stop-D Functionality

The Stop-D (diags) key sequence is not supported on systems with USB keyboards, however, the Stop-D functionality can be closely emulated by using the power button double-tap (see Stop-N Functionality), since this temporarily sets `diag-switch?` to `true`. If you want the diagnostic mode turned on permanently, type:

```
ok setenv diag-switch? true
```

Commands for the Sun Fire 6800/4810/4800/3800 Systems

This section describes the Solaris operating environment specific information for this family of mid-range systems:

- Sun Fire 6800 system
- Sun Fire 4810 system
- Sun Fire 4800 system
- Sun Fire 3800 system

This section covers the following topics:

Installing, Booting, and Halting the Solaris Operating Environment

To install and boot the Solaris operating environment for the first time, refer to the "System Power On and Setup" chapter of the *Sun Fire 6800/4810/4800/3800 Systems Platform Administration Manual*.

After you have installed the Solaris operating environment, to power on one of the Sun Fire 6800/48104800/3800 systems, which includes booting the Solaris operating environment, refer to the "Maintenance" chapter of the *Sun Fire 6800/4810/4800/3800 Systems Platform Administration Manual.*

▼ To Halt the Solaris Operating Environment

1. **Enter the system controller domain console for the domain you want to halt.**

   Refer to the chapter "System Controller Navigation" in the *Sun Fire 6800/4810/4800/3800 Systems Platform Administration Manual*, which is shipped with your system.

2. **From the domain console, as superuser, halt the Solaris operating environment for each domain, by typing** init 0.

```
root# init 0
ok
```

Solaris Operating Environment Software

IP Multipathing (IPMP) Software

The Solaris operating environment implementation of IPMP provides the following features(TABLE 10-1).

TABLE 10-1 IPMP Features

Feature	Description
Failure detection	Ability to detect when a network adaptor has failed and automatically switches over network access to an alternate network adaptor. This assumes that you have configured an alternate network adapter.
Repair detection	Ability to detect when a network adaptor that failed previously has been repaired and automatically switches back (failback) the network access from an alternate network adaptor. This assumes that you have enabled failbacks.
Outbound load spreading	Outbound network packets are spread across multiple network adaptors without affecting the ordering of packets in order to achieve higher throughput. Load spreading occurs only when the network traffic is flowing to multiple destinations using multiple connections.

The IP Network Multipathing (IPMP) software provides three important features:

- If your system is configured with an alternate network adapter, then it can failover from one network path to another.
- It can also failback to the original network adapter, after it is repaired.
- The IP Network Multipathing software also spreads out the outbound network load between the two network adapters, to achieve higher throughput. Load spreading only occurs when the outbound network traffic is flowing to multiple destinations using multiple connections.

For more information on IP network multipathing (IPMP), refer to the *IP Network Multipathing Administration Guide*, which is available with your Solaris operating environment release. The *IP Network Multipathing Administration Guide* explains basic IPMP features and network configuration details. This book is available online with your Solaris operating environment release.

Security

For security information on the Solaris operating environment, refer to the following books and articles:

- *SunSHIELD Basic Security Module Guide (*Solaris 8 System Administrator Collection*)*
- *System Administration Guide*, Volume 8 (*Solaris 8 System Administrator Collection*)
- Solaris security toolkit articles available online at:

`http://www.sun.com/blueprints`

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

The Sun Management Center software for the Sun Fire 6800/4810/4800/3800 systems is the graphical user interface for managing these mid-range systems.

To optimize the effectiveness of the Sun Management Center software for the Sun Fire 6800/4810/4800/3800 systems, you must install it on a separate system. The Sun Management Center software for the Sun Fire 6800/4810/4800/3800 systems has the capability to logically group domains and the system controller into a single manageable object, to simplify operations.

The Sun Management Center software for the Sun Fire 6800/4810/4800/3800 systems, once configured, is also the recipient of SNMP traps and events.

To use the Sun Management Center software for the Sun Fire 6800/4810/4800/3800 systems, you must attach the System Controller board to a network. With a network connection, you can view both the command line interface and the graphical user interface. To attach the System Controller board Ethernet port, refer to the installation documentation that was shipped with your system.

For instructions on how to use the Sun Management Center software for the Sun Fire 6800/4810/4800/3800 systems, refer to the *Sun Management Center 3.0 Software Supplement for Sun Fire 6800/4810/4800/3800 Systems*, which is available online.

`syslog` Loghost

For information on how to set up the `syslog` loghost using the system controller software, refer to the chapter "System Power On and Setup" of the *Sun Fire 6800/4810/4800/3800 Systems Platform Administration Manual.* This is part of the system controller `setupplatform` system controller command, which is run when you set up the platform.

For more details on the `setupplatform` command, refer to the `setupplatform` command in the *Sun Fire 6800/4810/4800/3800 System Controller Command Reference Manual* and to the chapter "System Power On and Setup" in the *Sun Fire 6800/4810/4800/3800 Systems Platform Administration Manual*. Both of these books are available in both hardcopy and online with your Sun Fire 6800/4810/4800/3800 system.

Displaying System Configuration Information

To display system configuration parameters, use the following Solaris operating environment commands:

`prtconf` Command

The Solaris operating environment `prtconf` command prints the system configuration information. The output includes:

- Total amount of memory
- Configuration of the system peripherals formatted as a device tree

This command has many options. For the command syntax, options, and examples, see the `prtconf` man page.

`prtdiag` Command

The Solaris operating environment `prtdiag` (1M) command displays the following information to the domain of your Sun Fire 6800/4810/4800/3800 system:

- Configuration
- Diagnostic
- Total amount of memory (similar to the `prtconf` command)

`sysdef` Command

The Solaris operating environment `sysdef` utility outputs the current system definition in tabular form. It lists:

- All hardware devices
- Pseudo devices
- System devices
- Loadable modules
- Values of selected kernel tunable parameters

This command generates the output by analyzing the named bootable operating system file (*namelist*) and extracting configuration information from it. The default system *namelist* is `/dev/kmem`.

For command syntax, options, and examples, see the `sysdef` man page.

`format` Command

The Solaris operating environment utility, `format`, which is used to format drives, can also be used to display both logical and physical device names. For command syntax, options, and examples see the `format` man page.

Localized Packages on the Supplement CD

Japanese Localized Packages

TABLE A-1   Japanese Localized Packages

Software Product	Package Name	Description
SunForum	SUNWjadat	Japanese (ja-EUC) SunForum
	SUNWjpdat	Japanese (ja-PCK) SunForum
Alternate Pathing	SUNWjaap	Japanese localization for Alternate Pathing
	SUNWjabap	Japanese AnswerBook for Alternate Pathing
	SUNWjeapd	Japanese manual pages for Alternate Pathing
	SUNWjpapd	Japanese (PCK) manual pages for Alternate Pathing
	SUNWjuapd	Japanese (UTF-8) manual pages for Alternate Pathing
Remote System Control	SUNWjersc	Japanese (EUC) Remote System Control
	SUNWjrscd	Japanese (EUC) Remote System Control User Guide

Software Product	Package Name	Description
	SUNWjrscj	Japanese (EUC) Remote System Control GUI
ShowMe TV	SUNWjasmt	ShowMe TV Japanese (ja-EUC) localization files
	SUNWjpsmt	ShowMe TV Japanese (ja-PCK) localization files
	SUNWjusmt	ShowMe TV Japanese (ja-UTF8) localization files
PC launcher	SUNWjdpcv	Japanese (Common) PC launcher help
	SUNWjepcp	Japanese (EUC) PC launcher message
	SUNWjppcp	Japanese (PCK) PC launcher message
	SUNWjupcp	Japanese (UTF-8) PC launcher message
PC file viewer	SUNWjepcv	Japanese (EUC) PC File Format Viewer
	SUNWjepcz	Japanese (EUC) PC File Formats support in CDE
	SUNWjppcv	Japanese (PCK) PC File Format Viewer
	SUNWjppcz	Japanese (PCK) PC File Formats support in CDE
	SUNWjupcv	Japanese (UTF-8) PC File Format Viewer
	SUNWjupcz	Japanese (UTF-8) PC File Formats support in CDE
SunFDDI	SUNWjenfm	Japanese (EUC) SunFDDI SBus Man Pages
	SUNWjepfm	Japanese (EUC) SunFDDI PCI Man Pages
	SUNWjpnfm	Japanese (PCK) SunFDDI SBus Man Pages
	SUNWjppfm	Japanese (PCK) SunFDDI PCI Man Pages
	SUNWjunfm	Japanese (UTF-8) SunFDDI SBus Man Pages
	SUNWjupfm	Japanese (UTF-8) SunFDDI PCI Man Pages
SunVTS	SUNWjpvtm	Japanese (PCK) SunVTS Man Pages

TABLE A-1 Japanese Localized Packages *(Continued)*

Software Product	Package Name	Description
	SUNWjuvtm	Japanese (UTF-8) SunVTS Man Pages
	SUNWjvtsm	Japanese (EUC) SunVTS Man Pages
AnswerBook	SUNWahwja	Solaris 8 on Sun Hardware Collection - Japanese
Capacity on Demand	SUNWjcodb	Japanese AnswerBook for Capacity on Demand
Sun Enterprise 10000 SSP	SUNWjassp	Japanese AnswerBook for Sun Enterprise 10000 SSP
CDRW	SUNWjcdrw	Japanese (EUC) Manual Page and Message for CDRW
Netra ct	SUNWjecte	Japanese (EUC) manual pages and messages for Netra ct Platform Software
Lights Out Management (LOM)	SUNWjlomu	Japanese localization (EUC) for LOMlite utilities
Manual Page Supplement	SUNWjes8hwman	Japanese (EUC) Manual Page Supplement
	SUNWjps8hwman	Japanese (PCK) Manual Page Supplement
	SUNWjus8hwman	Japanese (UTF-8) Manual Page Supplement
Manual Page Supplement	SUNWjes8hwman1	Japanese (EUC) Solaris 8 HW Platform Specific Additions Online Manual Page Updates
	SUNWjps8hwman1	Japanese (PCK) Solaris 8 HW Platform Specific Additions Online Manual Page Updates
	SUNWjus8hwman1	Japanese (UTF-8) Solaris 8 HW Platform Specific Additions Online Manual Page Updates
Sun Fire B10n	SUNWjeclbut	Japanese (EUC) Manual Pages for Sun Fire B10n
	SUNWjpclbut	Japanese (PCK) Manual Pages for Sun Fire B10n
	SUNWjuclbut	Japanese (UTF-8) Manual Pages for Sun Fire B10n

German Localized Packages

TABLE A-2   German Localized Packages

Software Product	Package Name	Description
SunForum	SUNWdedat	German SunForum
PC launcher	SUNWdepcp	PC launcher German messages
PC file viewer	SUNWdepcv	PC File Viewer German messages
	SUNWdepcz	PC File Viewer German help and icons
Remote System Control	SUNWdersc	German Remote System Control
	SUNWdrscd	German Remote System Control User Guide
	SUNWdrscj	German Remote System Control GUI
ShowMe TV	SUNWdesmt	ShowMe TV German localization files
AnswerBook	SUNWAhwde	Solaris 8 on Sun Hardware Collection - German
Netra ct	SUNWdecte	German (EUC) localization for Netra ct
CDRW	SUNWdcdrw	German (EUC) localization for CDRW utility
Lights Out Management (LOM)	SUNWdlomu	German localization for LOMlite utilities

Italian Localized Packages

TABLE A-3   Italian Localized Packages

Software Product	Package Name	Description
SunForum	SUNWitdat	Italian SunForum
PC launcher	SUNWitpcp	PC launcher Italian messages
PC file viewer	SUNWitpcv	PC File Viewer Italian messages
	SUNWitpcz	PC File Viewer Italain help and icons

TABLE A-3 Italian Localized Packages *(Continued)*

Software Product	Package Name	Description
Remote System Control	SUNWitrsc	Italian Remote System Control
	SUNWirscd	Italian Remote System Control User Guide
	SUNWirscj	Italian Remote System Control GUI
ShowMe TV	SUNWitsmt	ShowMe TV Italian localization files
AnswerBook	SUNWAhwit	Solaris 8 on Sun Hardware Collection - Italian
Netra ct	SUNWitcte	Italian (EUC) localization for Netra ct
CDRW	SUNWicdrw	Italian localization for CDRW utility
Lights Out Management (LOM)	SUNWilomu	Italian localization for LOMlite utilities

French Localized Packages

TABLE A-4   French Localized Packages

Software Product	Package Name	Description
SunForum	SUNWfrdat	French SunForum
PC launcher	SUNWfrpcp	PC launcher French messages
PC file viewer	SUNWfrpcv	PC File Viewer French messages
	SUNWfrpcz	PC File Viewer French help and icons
Remote System Control	SUNWfrrsc	French Remote System Control
	SUNWfrscd	French Remote System Control User Guide
	SUNWfrscj	French Remote System Control GUI
ShowMe TV	SUNWfrsmt	ShowMe TV French localization files
AnswerBook	SUNWAhwfr	Solaris 8 on Sun Hardware Collection - French
Netra ct	SUNWfrcte	French (EUC) localization for Netra ct
CDRW	SUNWfcdrw	French localization for CDRW utility
Alternate Pathing	SUNWfabap	French Alternate Pathing collection
Lights Out Management (LOM)	SUNWflomu	French localization for LOMlite utilities

Spanish Localized Packages

TABLE A-5   Spanish Localized Packages

Software Product	Package Name	Description
SunForum	SUNWesdat	Spanish SunForum
PC launcher	SUNWespcp	PC launcher Spanish messages
PC file viewer	SUNWespcv	PC File Viewer Spanish messages
	SUNWespcz	PC File Viewer Spanish help and icons

TABLE A-5   Spanish Localized Packages *(Continued)*

Software Product	Package Name	Description
Remote System Control	SUNWesrsc	Spanish Remote System Control
	SUNWerscd	Spanish Remote System Control User Guide
	SUNWerscj	Spanish Remote System Control GUI
ShowMe TV	SUNWessmt	ShowMe TV Spanish localization files
AnswerBook	SUNWAhwes	Solaris 8 on Sun Hardware Collection - Spanish
Netra ct	SUNWescte	Spanish (EUC) localization for Netra ct
CDRW	SUNWecdrw	Spanish localization for CDRW utility
Lights Out Management (LOM)	SUNWelomu	Spanish localization for LOMlite utilities

Swedish Localized Packages

TABLE A-6   Swedish Localized Packages

Software Product	Package Name	Description
SunForum	SUNWsvdat	Swedish SunForum
PC launcher	SUNWsvpcp	PC launcher Swedish messages
PC file viewer	SUNWsvpcv	PC File Viewer Swedish messages
	SUNWsvpcz	PC File Viewer Swedish help and icons
Remote System Control	SUNWsvrsc	Swedish Remote System Control
	SUNWsrscd	Swedish Remote System Control User Guide
	SUNWsrscj	Swedish Remote System Control GUI
ShowMe TV	SUNWsvsmt	ShowMe TV Swedish localization files
AnswerBook	SUNWAhwsv	Solaris 8 on Sun Hardware Collection - Swedish
Netra ct	SUNWsvcte	Swedish (EUC) localization for Netra ct
CDRW	SUNWscdrw	Swedish localization for CDRW utility
Lights Out Management (LOM)	SUNWslomu	Swedish localization for LOMlite utilities

Traditional Chinese Localized Packages

TABLE A-7   Traditional Chinese Localized Packages

Software Product	Package Name	Description
SunForum	SUNW5dat	Traditional Chinese (zh_TW-BIG5) SunForum
	SUNWhdat	Traditional Chinese (zh_TW-EUC) SunForum
PC launcher	SUNW5pcp	PC launcher Traditional Chinese (zh_TW-BIG5) messages
	SUNWhcpcp	PC launcher Traditional Chinese (common) messages

TABLE A-7   Traditional Chinese Localized Packages *(Continued)*

Software Product	Package Name	Description
	SUNWhdpcp	PC launcher Traditional Chinese (zh_TW-EUC) messages
PC file viewer	SUNW5pcv	PC File Viewer Traditional Chinese (zh_TW-BIG5) messages
	SUNW5pcz	PC File Viewer Traditional Chinese (zh_TW-BIG5) help and icons
	SUNWhcpcv	PC File Viewer Traditional Chinese (common) messages
	SUNWhdpcv	PC File Viewer Traditional Chinese (zh_TW-EUC) messages
	SUNWhdpcz	PC File Viewer Traditional Chinese (zh_TW-EUC) help and icons
Remote System Control	SUNWhrsc	Traditional Chinese (EUC) Remote System Control
	SUNWhrscd	Traditional Chinese (EUC) Remote System Control User Guide
	SUNWhrscj	Traditional Chinese (EUC) Remote System Control GUI
ShowMe TV	SUNW5smt	ShowMe TV Traditional Chinese (zh_TW-Big5) localization files
	SUNWhsmt	Traditional Chinese (zh_TW-EUC) localization files for ShowMe TV
Netra ct	SUNWhcte	Traditional Chinese (EUC) localization for Netra ct
CDRW	SUNWhcdrw	Traditional Chinese (EUC) localization for CDRW utility
Lights Out Management (LOM)	SUNWhlomu	Traditional Cninese localization (EUC) for LOMlite utilities

Simplified Chinese Localized Packages

TABLE A-8 Simplified Chinese Localized Packages

Software Products	Packaage Name	Description
SunForum	SUNWcdat	Simplified Chinese (zh-EUC) SunForum
PC launcher	SUNWccpcp	PC launcher SimplifiedChinese (common) messages
	SUNWcdpcp	PC launcher SimplifiedChinese (zh-EUC) messages
	SUNWgpcp	PC launcher SimplifiedChinese (zh-GBK) messages
PC file viewer	SUNWccpcv	PC file viewer Simplified Chinese (common) messages
	SUNWcdpcv	PC file viewer Simplified Chinese (zh-EUC) messages
	SUNWcdpcz	PC file viewer Simplified Chinese (zh-EUC) help and icons
	SUNWgpcv	PC file viewer Simplified Chinese (zh-GBK) messages
	SUNWgpcz	PC file viewer Simplified Chinese (zh-GBK) help and icons
Remote System Control	SUNWcrsc	Simplified Chinese (EUC) Remote System Control
	SUNWcrscd	Simplified Chinese (EUC) Remote System Control User Guide
	SUNWcrscj	Simplified Chinese (EUC) Remote System Control GUI
ShowMe TV	SUNWcsmt	ShowMe TV Simplified Chinese (zh-EUC) localization files
	SUNWgsmt	ShowMe TV Simplified Chinese (zh-GBK) localization files

TABLE A-8 Simplified Chinese Localized Packages *(Continued)*

Software Products	Packaage Name	Description
Netra ct	SUNWccte	Simplified Chinese (EUC) localization for Netra ct
CDRW	SUNWccdrw	Simplified Chinese (EUC) localization for CDRW utility
Lights Out Management (LOM)	SUNWclomu	Simplified Chinese localization (EUC) for LOMlite utilities

Korean Localized Packages

TABLE A-9 Korean Localized Packages

Software Product	Package Name	Description
SunForum	SUNWkodat	Korean SunForum
PC launcher	SUNWkcpcp	PC launcher Korean (common) messages
	SUNWkdpcp	PC launcher Korean (ko) messages
	SUNWkupcp	PC launcher Korean (ko.UTF-8) messages
PC file viewer	SUNWkcpcv	PC file viewer Korean (common) messages
	SUNWkdpcv	PC file viewer Korean (ko) messages
	SUNWkdpcz	PC file viewer Korean (ko) help and icons
	SUNWkupcv	PC file viewer Korean (ko.UTF-8) messages
	SUNWkupcz	PC file viewer Korean (ko.UTF-8) help and icons
Remote System Control	SUNWkrsc	Korean (EUC) Remote System Control
	SUNWkrscd	Korean (EUC) Remote System Control User Guide
	SUNWkrscj	Korean (EUC) Remote System Control GUI
ShowMe TV	SUNWkosmt	ShowMe TV Korean (ko-EUC) localization files
	SUNWkusmt	ShowMe TV Korean (ko-UTF-8) localization files
Netra ct	SUNWkocte	Korean (EUC) localization for Netra ct
CDRW	SUNWkcdrw	Korean (EUC) localization for CDRW utility
Lights Out Management (LOM)	SUNWklomu	Korean localization (EUC) for LOMlite utilities

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