SMCC Release Notes Supplement Solaris™ 2.6 5/98

Includes Additional Release Notes and End-of-Support Statements for Solaris 2.6 5/98 Running on Sun Hardware Products

THE NETWORK IS THE COMPUTER™

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Contents

CHAPTER 1

Late-Breaking News

This manual provides the following information:

- Late-breaking news (this chapter)
- End-of-support statements (chapter 2)
- Open issues (chapter 3)

This manual supplements the *SMCC Hardware Platform Guide Solaris 2.6 Hardware: 5/98* and the *Solaris 2.6 5/98 Release Notes*. These manuals are provided as hardcopy documents with the Solaris™ 2.6 5/98 software media.

The Solaris 2.6 5/98 software environment is delivered on the following CDs:

- *Solaris 2.6 5/98 Software CD* (called the *Solaris CD* throughout this manual)
- *Software Supplement for the Solaris 2.6 5/98 Operating Environment for Sun Microsystems Computer Company CD* (called the *SMCC Supplement CD* throughout this manual)
- *Solaris Documentation CD (*same CD shipped with Solaris 2.6 Hardware: 3/98*)*
- *Solaris Server Intranet Extension 1.0 CD (*same CD shipped with Solaris 2.6 Hardware: 3/98*)*

Open Issues Available on the Web

An online Web page is available that provides additional support for issues that may arrive late and cannot be printed in this release's documentation. To access this Web page, enter the following URL in your Web browser:

```
http://sunsolve.sun.com
```

If you do not have access to the Web or require further information, contact your authorized Sun support provider.

docs.sun.com Web Site

The docs.sun.com[SM] web site allows you to access Sun's technical documentation archive online. As of the Solaris 2.6 5/98 release, docs.sun.com provides all Solaris 2.6 5/98 documentation, as well as a large collection of older documentation: software and hardware. This collection will continue to expand to include non-English documentation. At the docs.sun.com web site, you can use Sun's online AnswerBook2 search capabilities to find documentation and view the book's complete text.

To visit our docs.sun.com site, enter the following URL in your Web browser:

```
http://docs.sun.com
```

Serial Port Support

SBus Systems

SBus systems (on a per platform basis) conform to the following standards for serial port operation:

- ANSI/EIA/TIA STANDARD 232-E-1991
- ANSI/EIA/TIA STANDARD 423-A-1978

All standard asynchronous data rates are supported up to 76.8-Kbits/second (with the exception of 57.6-Kbits/second) for cable lengths up to 50 feet. See listed standards for other restrictions.

All standard synchronous data rates are supported up to 64-Kbits/second for cable lengths up to 50 feet. See listed standards for other restrictions.

PCI Systems

PCI systems (on a per platform basis) conform to specific standards for serial port operation.

All standard asynchronous data rates are supported up to 460.8-Kbits/second. See listed standards for other restrictions.

All standard synchronous data rates are supported up to 384-Kbits/second with external clocks (using a synchronous modem), and supported up to 256-Kbits/second when used in loopback mode (using a null-modem cable). See listed standards for other restrictions.

For more information regarding serial port support for a specific platform, contact your authorized Sun support provider.

Fortran Compiler—Large File Support

The v4.2 (or earlier) of FORTRAN77 and v1.2 (or earlier) of Fortran 90 do not support large files. That is, you cannot access files greater than 4-Gbytes using these versions of the Fortran compiler. Support for Large Files was introduced in Solaris 2.6.

If you need this support from Fortran, you would need to sign up to the Early Access Program for the next release of the compilers.

Information about the Early Access Program can be found in:

```
http://www.sun.com/workshop
```

Information about Large File support in Fortran can be found in:

```
http://www.sun.com/workshop/performance/largefiles.html
```

CHAPTER 2

End-of-Support Products

This chapter contains a list of the end-of-support products for Solaris 2.6 5/98 and forthcoming Solaris releases.

End-of-Support Products

The following hardware and software products are discontinued in this Solaris 2.6 5/98 release. For information about previous or future End-of-Support products, refer to the *Solaris 2.6 5/98 Release Notes.* For more information, contact your authorized Sun support provider.

SPARCserver 600 Series

The SPARCsystem 630MP, SPARCsystem 670MP, and SPARCserver 690MP are no longer supported in the Solaris 2.6 release.

Note – All hardware options and supported configurations that are dependent upon the SPARCsystem 600 Series architecture are no longer supported in the Solaris 2.6 release.

Direct Xlib

Direct Xlib™ is obsolete and is not included in the Solaris 2.6 release.

Use the Sun Shared Memory Transport Extension (`SUN_SME`) with Standard Xlib for comparable Xlib performance (refer to the `Xsun` manual page for details). `SUN_SME` does not use Direct Graphics Access (DGA); therefore, it does not generate the overhead and limitations as compared to using Direct Xlib. `SUN_SME` is supported on all SMCC platforms.

SPARCstorage Array—`ssacli(1M)` Command Obsolete

The `ssacli(1M)` command is obsolete and is not included in the Solaris 2.6 release.

Use the `ssaadm(1M)` or `luxadm(1M)` command for SPARCstorage™ Array administrative management. For more information on using `ssaadm(1M)`, see *Platform Notes: Using the Standard SPARCstorage Array Software* manual in the *Solaris 2.6 5/98 on Sun Hardware AnswerBook* set.

NeWSprint and NeWSprint-Based Printers

NeWSprint™ software is not supported in the Solaris 2.6 release. With the exception of Japan and Korea, NeWSprint entered End-of-Life in June 1995. Japan and Korea have temporarily continued shipping NeWSprint because of special circumstances.

NeWSprint was used to adapt third-party printers to the Sun environment and to support printers sold by Sun. Sun printers that used NeWSprint include:

- SPARCprinter™
- SPARCprinter II
- NeWSprinter™ 20
- NeWSprinter CL+

You cannot install these printers on systems that run the Solaris 2.6 operating system.

SX Compute Acceleration in XIL

Support for SX compute acceleration in XIL™ is being discontinued and is not included in the Solaris 2.6 release. All existing XIL programs will continue to work and will invoke the new XIL 1.3 memory code instead of XIL- and SX-specific functions.

Note – XIL 1.3 supports SX systems running Solaris 2.6 and will continue to operate on systems running Solaris 2.5.1 and XIL 1.2; however, XIL 1.2 is not available for Solaris 2.6.

Future End-of-Support Products

The following products will be discontinued in releases later than Solaris 2.6. For more information, contact your authorized Sun support provider.

Graphics Devices—Discontinued Frame Buffers

The following frame buffers will no longer be supported in releases later than Solaris 2.6.

- MG1 (`bwtwo`)
- MG2 (`bwtwo`)
- CG2 (`cgtwo`)
- CG4 (`cgfour`)
- TC (`cgeight`)
- ZX (`leo`)
- TZX (`leo`)

All references to the MG1, MG2, CG2, CG4, TC, ZX, and TZX frame buffers in the *SMCC Hardware Platform Guide* will be omitted in releases greater than Solaris 2.6.

Network Devices—BEC Device and `be` Driver

The BEC device and `be` driver will no longer be supported in releases later than Solaris 2.6.

CHAPTER 3

Open Issues

This chapter contains a list of the open issues for Solaris 2.6 5/98.

sun4u Systems—Patch Required

Some sun4u diskless clients will not boot with the Solaris 2.6 5/98 operating environment if patch 105654-03 is not installed. If you have a sun4u system it is recommended you install the patch below:

```
# cd /cdrom/cdrom0/s0/Solaris_2.6/Patches/105654-03
# ./installpatch -R /export/root/<client-name> .
```

Prestoserve 2.4.2—Patch Required

The Prestoserve™ 2.4.2 release will not function properly with the Solaris 2.6 5/98 software environment if the workaround below is not implemented. Below is a partial list of some of the SMCC platforms and hardware options that may be affected:

- Ultra™ 1 Creator Model 170E
- Ultra 1 Creator3D Model 170E
- Ultra 2
- Sun™ Enterprise™ 1 Model 170E
- SunSwift™ SBus Adapter Card

If you installed Prestoserve 2.4.2 and are using a platform or hardware option listed above, you must do the following steps to provide compatibility:

1. **Edit the `/etc/system` file and add the following information:**

```
set fas:fas_enable_sbus64 = 0
```

2. **Reboot your system.**

Caution – Failure to reboot your system can corrupt data.

A Prestoserve patch (#103043-06) that automatically adds the above information to the `/etc/system` file is available. If you prefer to make this change using the Prestoserve patch, contact your authorized Sun support provider. If you edit the `/etc/system` file as described above, you do not need the Prestoserve patch.

Adobe Photoshop 3.0.1—Motif Patch

This patch (#103461-01) corrects Adobe Photoshop problems, such as menu items being grayed out in a menu list that has a toggle button in it and system crashes caused by the toggle button in Motif not using the correct graphics context for switching. To obtain this patch, contact your authorized Sun support provider.

Graphics—Warning: pm: Can’t Resume SUNW,m64 (4099203)

In some cases, such as when the window system is not running, the operating system may unsuccessfully attempt to power off the PGX frame buffer, resulting in the following error message:

```
WARNING: pm: Can’t resume SUNW,m64B
```

Workaround: This message may be safely ignored.

Graphics—Panic on Ultra 5 and Ultra 10 Systems With an M64 Frame Buffer (4086957)

Ultra 5 and Ultra 10 systems configured with an M64 frame buffer may panic when trying to `resume` using the `suspend/resume` feature. If this error occurs, you will see an error message preceded with the following text:

```
sys-suspend: trap type = 0x31
```

Workaround: If you have this configuration, save your state by exiting the editor before using the `suspend/resume` feature. Another workaround would be to turn off the suspend/resume feature using the dtpower GUI. For more information about the `suspend/resume` feature, refer to the *Using Power Management* document on the Solaris Documentation CD.

Graphics—Ultra 5 and Ultra 10 Systems May Hang on `resume` With an Elite3D Frame Buffer (4116376)

Ultra 5 and Ultra 10 systems configured with an Elite3D frame buffer may hang when trying to `resume` using the `suspend/resume` feature.

Workaround: Do not suspend and resume an Elite3D configuration.

Graphics—X Server Crash While Running PEX Applications on PGX (103566-18)

Applications using PHIGS, XGL, or PEX may cause the window system to crash on systems configured with a PGX graphics frame buffer. This is caused by bugs in the PEX library and is not specific to the PGX graphics frame buffer.

Workaround: Install patch 103566-18 and set the `XGLNOPEX` environment variable before executing PHIGS, PEX, or XGL applications. To set the `XGLNOPEX` environment variable, do the following:

```
% setenv XGLNOPEX TRUE
```

You can obtain this patch (including installation information) on the SunSolve Web page at: `http://sunsolve.sun.com` or contact your authorized Sun support provider for details.

Graphics—PEX Does Not Operate Correctly on PGX (4007975)

Some 3-D applications may experience problems when run on a PGX framebuffer. Problems may range from incorrect rendering to window system crashes.

Workaround: Set the environment variable `XGLNOPEX` before executing any 3-D application.

```
% setenv XGLNOPEX
```

Note – It is not necessary to assign a value to this environment variable.

Graphics—Threads Created by the `leo` driver Do Not Adhere to `cpr` Callback Protocol (4052466)

Systems with the ZX graphics device (`/dev/fbs/leo`*X*) cannot be suspended. The device cannot be idled successfully, and therefore prevents the Power Management software from suspending the system.

Graphics—Upgrading to Solaris 2.6 5/98 Fails to Remove the SUNWgs Package (4095626)

When upgrading the operating environment to Solaris 2.6 5/98, the `postremove` script fails to remove the `SUNWgs` package resulting in the following error:

```
Removing package SUNWgs:
rem_minor: data file \\'/a/etc/minor_perm\\' is missing/
inaccessible.
pkgrm: ERROR: postremove script did not complete successfully

Removal of <SUNWgs> failed.
pkgrm return code = 1
```

Workaround: Manually remove the `SUNWgs` package.

```
# pkgrm SUNWgs
```

Graphics—Using `pkgadd` to Install `SUNWxglrt` Produces an Internal Error (4095652)

When using `pkgadd` to upgrade the operating environment to Solaris 2.6 5/98, the following error occurred:

```
Doing pkgadd of SUNWxglrt to /.
0 blocks
pkgadd: ERROR: unable to remove existing directory at
</a/opt/SUNWits/Graphics-sw/xgl-3.0>
Installation of <SUNWxglrt> failed (internal error) - package
partially installed.
pkgadd return code = 1
```

Workaround: Assuming you upgraded your system from a local CDROM, perform the following steps after the regular installation has completed:

1. **Become superuser.**

```
% su
% <password>
#
```

2. **Find all of the installed XGL packages.**

```
# pkginfo |egrep XGL
```

3. **Remove all of the existing XGL packages.**

```
# pgkrm SUNWxgldg SUNWxgler SUNWxglft SUNWxglh SUNWxglrt
# rm -rf /opt/SUNWits/Graphics-sw/xgl
```

4. **Change directories.**

```
# cd /cdrom/cdrom0/s0/Solaris_2.6/Product
```

5. **Install the XGL packages manually.**

```
# pkgadd -d ‘pwd‘ SUNWxgldg SUNWxgler SUNWxglft SUNWxglrt SUNWxglh
```

6. **Check the installed XGL packages.**

```
# /opt/SUNWits/Graphics-sw/xgl/demo/install_check
```

Install—The Sun Enterprise 3500 or Other Systems Configured With the Sun StorEdge A5000 May Not Boot Certain Support Media

When installing just the “End User System Support” or “Core System Support” media, the system may not boot.

Workaround: On the Sun Enterprise 3500 or other systems configured with the Sun StorEdge A5000 as the boot disk, install the system with “Entire Distribution” or “Developer System Support” media.

Fortran Compiler—`idate` Library Routine Returns Incorrect Year for the Year 2001 (4039702, 4041810)

The VMS version of the idate library routine returns the incorrect value of current year for the year 2001.

Workaround 1: Use `ar -d` to delete the current year from `libV77.a`, which fixes it for all future linkage using that particular compilation environment for all users.

Workaround 2: Use `ar -x` to extract the current year from the usual `unix f77.a` and then manually link that `.o` file into each individual build.

For more information about the Fortran Compiler and year 2001 issues, contact your authorized Sun support provider.

Booting From Partitions Greater Than 2-Gbytes (1234177)

Due to PROM limitations, all `sun4c`, `sun4d`, and `sun4m` architectures will not boot from partitions greater than 2-Gbytes. These systems will fail with the following message:

```
bootblk: can't find the boot program
```

Note – All sun4u architectures support booting from larger partitions.

One related bug (4023466) reports a problem with `re-preinstall` where the boot image for large disks creates root partitions greater than 2-Gbytes. System Administrators are cautioned not to use `re-preinstall` on sun4c, sun4d, and sun4m systems with large root disks (4-Gbytes or larger).

Sun Enterprise 250—`prtdiag` Utility Prints an Incorrect Value for Keyswitch Position (4128100)

The `prtdiag` utility prints an incorrect value for the keyswitch position on Sun Enterprise 250 systems. When the keyswitch is in the *ON* position, `prtdiag -v` prints:

```
“Keyswitch position is in OFF mode.”
```

Note – The diagnostic and locked keyswitch positions are detected correctly.

Workaround: Contact your authorized Sun support provider for the availability of a patch.

Ultra Systems—Diskless Clients or Autoclients Unable to Perform System Crash Dump Across Network (4115951)

When panics happen on Ultra systems configured with diskless clients or autoclients, the systems timeout and abort with the following message:

```
panic [cpu0]/thread=0x30033ec0: zero
syncing file systems  ... 4 done
1981 static and sysmap kernel pages
53 dynamic kernel data pages
101 kernel-pageable pages
0 segkmap kernel pages
0 segvn kernel pages
0 current user process pages
2135 total pages (2135 chunks)
dumping to vp 60324354, offset 586336
panic [cpu0]/thread=0x30037ec0: panic dump timeout
Dump Aborted.
```

Workaround: Not available.

SPARCcenter 2000 Does Not Boot Through SunSwift and Sun Quad FastEthernet SBus Adapters (4064212, 4127021)

Booting Solaris 2.6 on a SPARCcenter 2000 through either the 100BaseT SunSwift SBus adapter or the Sun Quad FastEthernet SBus adapter, causes an NFS read timeout, multiple Rx FIFO overflow messages, and causes the system to hang.

Workaround: Install a patch for the Fcode driver to increase the DMA burst size to 64 bytes, by editing the NVRAM. See procedures below.

▼ Procedure for Sunswift SBus Adapters:

1. **Run the** `show-nets` **command to get the complete device path name of the Sunswift card.**

```
ok show-nets
```

The pathname will be of the form: ....`sbi@p,q/SUNW,hme@z,8c0000`

2. **Edit the NVRAM using** `nvedit`**.**

```
ok nvedit
0: probe-all install-console banner
1: cd <device-path-of-sunswift-card>
2: 1 constant burst-32
3: 2 constant burst-64
4: ' decode-burst-size >body e ta+ token@ value j1
5: ' burst-32 j1 ['] decode-burst-size (patch
6: ' burst-64 j1 ['] decode-burst-size (patch
7: device-end
```

3. **Exit** `nvedit` **by keying in <Control-C>**

4. **Save your edits.**

```
ok nvstore
```

5. **Enable the** `nvramrc` **script.**

```
ok setenv use-nvramrc? true
```

6. **Include name fields for plug-in device Fcode.**

```
ok setenv fcode-debug? true
```

7. **Reset the system. The Sun banner is displayed.**

8. **Boot the system through the Sunswift card.**

```
ok boot <device-path-of-sunswift-card>
```

▼ Procedure for Sun Quad FastEthernet SBus Adapters:

1. **Run the** `show-nets` **command to get the complete device pathname of the Sun Quad FastEthernet channels.**

```
ok show-nets
```

The pathnames for channels 0 to 3 will be:

```
...sbi@p,q/SUNW,qfe@z,8c0000 (channel 0)
...sbi@p,q/SUNW,qfe@z,8c1000 (channel 1)
...sbi@p,q/SUNW,qfe@z,8c2000 (channel 2)
...sbi@p,q/SUNW,qfe@z,8c3000 (channel 3)
```

2. **Edit the NVRAM using** `nvedit`**.**

Note – The following script applies the patch to all channels of the Sun Quad FastEthernet SBus adapter. You may choose to skip installing the patch to channels which are not used for booting. Entries between "cd <full-path-to-qfe-channel-x>" and the next "device-end" applies the patch to that channel.

```
ok nvedit
0: probe-all install-console banner
1: cd <full-path-to-qfe-channel0>
2: 1 constant burst-32
3: 2 constant burst-64
4: ' decode-burst-size >body 8 ta+ token@  value j1
5: ' burst-32 j1 ['] decode-burst-size (patch
6: ' burst-64 j1 ['] decode-burst-size (patch
7: device-end
8: cd <full-path-to-qfe-channel1>
9: 1 constant burst-32
10: 2 constant burst-64
11: ' decode-burst-size >body 8 ta+ token@  value j1
12: ' burst-32 j1 ['] decode-burst-size (patch
13: ' burst-64 j1 ['] decode-burst-size (patch
14: device-end
15: cd <full-path-to-qfe-channel2>
16: 1 constant burst-32
17: 2 constant burst-64
18: ' decode-burst-size >body 8 ta+ token@  value j1
19: ' burst-32 j1 ['] decode-burst-size (patch
20: ' burst-64 j1 ['] decode-burst-size (patch
21: device-end
22: cd <full-path-to-qfe-channel3>
23: 1 constant burst-32
24: 2 constant burst-64
25: ' decode-burst-size >body 8 ta+ token@  value j1
26: ' burst-32 j1 ['] decode-burst-size (patch
27: ' burst-64 j1 ['] decode-burst-size (patch
28: device-end
```

3. **Exit** `nvedit` **by keying in <Control-C>.**

4. **Save your edits.**

```
ok nvstore
```

5. **Enable the** `nvramrc` **script.**

```
ok setenv use-nvramrc? true
```

6. **Include name fields for plug-in device Fcode.**

```
ok setenv fcode-debug? true
```

7. **Reset the system. The Sun banner is displayed.**

8. **Boot the system through the Sunswift card.**

```
ok boot <device-path-of-qfe-channel-used-to-boot>
```

Dynamic Reconfiguration—No Support for the Quad Ethernet Networking Device (4106428)

The Quad Ethernet networking device cannot be suspended or resumed for Dynamic Reconfiguration support in this release. This will not impact any other operations other than Dynamic Reconfiguration.

Workaround: No current workaround. A patch will be available by release on Sun's current patch servers. Contact your authorized Sun support provider for more information.

ISDN and SunATM—Power Management Not Supported

ISDN and SunATM do not currently support the Power Management suspend and resume features. This is a known problem and is currently under investigation.

`suninstall`—Fails When System Is Configured With the Sun StorEdge A3000 (4044512)

The `suninstall` command exits and fails when run on systems configured with the Sun StorEdge A3000 product.

Workaround: If using `suninstall` or WebStart to install the operating environment, do the following *before* installing Solaris 2.6 5/98:

Note – If you are installing Solaris using a method other than `suninstall` or WebStart, you do not need to perform the steps below.

---

1. **Shut down the system.**
2. **Power down all Sun StorEdge A3000 device(s) connected to the system.**
3. **Install the Solaris 2.6 5/98 operating environment on a supported target.**
4. **Shut down the system.**
5. **Power up all Sun StorEdge A3000 device(s) connected to the system.**
6. **Reboot the system.**

Solaris Desktop Extensions

The following issues apply to the Solaris Desktop Extensions product.

Known Bugs

Some front panel customization features have been disabled by default, due to bugs 4108401, 4108405, and 4108410.

Users can turn on the menu items by doing the following:

1. **Add the following resource into your `$HOME/.Xdefaults` file:**

```
Dtwm*moveControl:       True
```

2. **Restart the window manager or log out and log back in again.**

Caution – Users who turn on this resource assume all risks. Their window manager may crash during customization, and/or they may end up with a corrupt front panel definition (missing or extra front panel controls, controls incorrectly positioned, and so on) because of the bugs mentioned below. When the front panel definitions have been corrupted, the user may need to invoke the Restore Front Panel action (thereby losing all customizations, including ones that they created on their own) to restore the front panel to a pristine state, or they can delete all `*.fp` files in the `$HOME/.dt/types/fp_dynamic*` directory.

Switching Between Locales Produces an Unreadable Workspace Menu (4105806)

After installing the Solaris Desktop Extensions and logging into your system, and in the event you switch to a different language(s) (locales), the Workspace menu may be unreadable. The problem is most severe between languages that use different character sets due to the menu being generated upon first login but not regenerated when switching locales. This problem is not specific to any one locale.

Workaround: If this problem is encountered, remove the `$HOME/.dt` directory. Log out and log back in. Shortly after a new Workspace menu will be generated.

Note – This workaround must be implemented after each language change.

Heavy Customization of the Front Panels Causes Deleted Subpanels to Reappear (4108401)

When running Solaris Desktop Extensions and performing heavy customization of the front panels, such as adding and moving icons from the left to the right, causes deleted subpanels to reappear.

Workaround: When the front panel becomes corrupted, restore the default front panel by using the Restore Front Panel feature or delete the contents in the `$HOME/.dt/fp_dynamic*` directory.

Moving Controls Across the Workspace Area When Subpanels are up Causes `dtwm` to Crash (4108405)

When running the Solaris Desktop Extensions version of `dtwm`, switching the subpanels of the front panel controls from the left to the right causes `dtwm` to crash.

Workaround: Dismiss the subpanels first before invoking the move.

Deleting the Left Hand Control After Deleting the Perfmeter Control Icon Causes `dtwm` to Crash (4108410)

When running Solaris Desktop Extensions, deleting the left hand control after deleting the perfmeter control icon from the front panel causes `dtwm` to crash.

Workaround: Not available.

Cannot Add Solaris 2.6 5/98 OS Services When Packages are Installed

The Solaris 2.6 5/98 OS Services cannot be added if the Solaris Desktop Extension packages are already installed.

Workaround: Set up the server first, then install the Solaris Desktop Extension packages on the server. Another workaround is to deselect Solaris Desktop Extensions during WebStart.

PC File Viewer Included With Solaris Desktop Extensions

PC file viewer provides you with an application to view popular Windows/NT file formats such as Word, PowerPoint, Excel, and Lotus1-2-3. The viewer allows you to view the contents of a file and to copy text from the file and paste it into another application, such as a text editor.

Font and Character Mapping Issues

The technology to view PC file formats on Solaris requires fonts used in Windows on PCs. TrueType fonts are the fonts of choice on most Windows platform. Solaris has built in support for the TrueType fonts. TrueType fonts are delivered on the Solaris 2.6 CD but are not part of end-user install of the system. A script is provided in PC file viewer packages which is in `/opt/SUNWdtpcv/bin`:

```
/opt/SUNWdtpcv/bin/install_fonts
```

To run this script just type in the above command. It will add TrueType package on your system (package SUNWi1of). Since there was a bug in Xserver related to TrueType fonts, it also installs the corresponding patch 105633-06 on your system. The script also installs a CDE startup script 1000.pcviewer in:

```
/usr/dt/config/Xsession.d
```

This sets the Xservers font path to include the TrueType fonts as well as a font required to see some symbols from Windows world.

Note – You only need to run the install_fonts script and it automatically does the install and rest of the setup.

Running the script will prompt you to insert the CD ROM for Solaris 2.6 which contains the TrueType package SUNWi1of. If you have a install server or some server that contains these packages then you can enter complete path name of the directory that contains the packages.

It will also prompt you for location of Xserver patch 105633-06 which is available on SMCC Supplement CD for Solaris 2.6 5/98. You can specify directory containing this patch if your install server already has the patch available.

▼ Running the Script as Root:

As root, run the script as follows:

```
# cd /opt/SUNWdtpcv/bin
# ./install_fonts
```

```
This script will install following packages if not already
installed
TrueType fonts package : SUNWi1of
Xserver patch package  : 105633-06
This patch is required for using TrueType with PC viewer. An
install log file can be found at: /usr/tmp/
SunSoft_PCV_install.log.<date-time>

This package is available on Solaris 2.6 CD

Enter path of package SUNWi1of : [/cdrom/cdrom0/s0/Solaris_2.6/
Product]
<press_return_if_installing_from_cdrom_ELSE_specify_path>

Installation of package SUNWi1of was succesfull
```

Similar information will be taken for Xserver patch 105633-06. After the script exits you should logout and login again to use TrueType fonts. If you do not want to logout and login again you must manually run:

```
/usr/dt/config/Xsession.d/1000.pcviewer
```

Known Bugs

The following bugs are know to exist in the PC file viewer product.

- Text Spills Over to the Next Column in a Lotus Spreadsheet (4115779)
- Word and AmiPro Files Do Not Display Bullets and Numbers When Using Lists (4126121)
- Cannot Display Japanese Word97, Excel97, and PowerPoint97 Documents (4132276)
- Draft View Mode Does Not Work When Displaying Japanese Word95 Documents (4132277)
- Japanese Word95, Excel95, and PowerPoint95 Do Not Allow for the Search of Japanese Strings (4132279)

SunVTS 2.1.3 Issues

The following issues apply to the SunVTS 2.1.3 product.

Solstice DiskSuite or Disk Management Software Users

Caution – SunVTS™ may alter the file systems of Solstice DiskSuite or Disk Management software; this can lead to data corruption in some cases.

Workaround: Solstice DiskSuite or Disk Management software users should set the system environment variable `BYPASS_FS_PROBE` to 1 before running SunVTS.

```
# BYPASS_FS_PROBE=1; export BYPASS_FS_PROBE
# ./sunvts
```

During its initialization, SunVTS will attempt to mount all disks in the system. Because some components of SDS metadisks and other Disk Management volumes or plexes will appear to be file systems, they would be mounted at this time. Setting the environment variable as described above avoids this, and prevents SunVTS from altering the file systems.

`disktest` Option Format Has Changed

The `disktest` option format has been modified. The naming convention for the selection of a disk has been changed from `disktest.xxxxxxxx` to `disktest_xxxxxxxx`. That is, `disktest.c0t0d0s0` has to be replaced by `disktest_c0t0d0s0`. Old option files referring to the disks as `disktest.xxxxxxxx` may get the following error message from the test:

```
SUNWvts.disktest.8088 02/14/97 14:24:01 disktest.1 c0t0d0
FATAL: "Couldn't get file system information on /
disktest_c0t0d0s0, errno=2"
```

Fix: Change the option file to use the new `disktest` option format.

`enatest` FATAL: Could Not Communicate With the Enclosure (4065417)

When the SunVTS `enatest` is run concurrently with the `socaltest`, the `enatest` may fail.

Workaround: Do not select `socaltest` when `enatest` is selected and vice-versa.

`socaltest` FATAL: Failed `ioctl FCIO_DIAG_XRAM` (4065420)

When the SunVTS `socaltest` is run concurrently with `enatest` and `disktest`, the `socaltest` may fail.

Workaround: Do not select `enatest` when `socaltest` is selected and vice-versa.

`vtsui`—Core Dump After Several Hours of Continuous Testing on Sun Enterprise 250 (4122066)

When running SunVTS on a Sun Enterprise 250 for an extended period of time, the vtsui (CDE) may disappear and core dump during testing.

Workaround: Use `vtsui.ol` or `vtstty` as your user interface when this occurs.

A Second `vtsk` Process Appears and Hangs the System When Running SunVTS Under Heavy Stress (4131221)

When running SunVTS in verbose mode on a system under heavy stress, a second `vtsk` process appears and hangs the system.

Workaround: Apply patch 106387-01. Refer to the SunSolve Web page listed at the front of this document for patch availability.

Closing Multiple Pop-up Windows Using the Window Manager May Cause the User Interface to Crash (4134645)

When multiple status pop-up windows are open on the SunVTS CDE GUI, closing the pop-up windows using the window manager close feature may cause the user interface to crash.

Workaround: To correct this problem, close the status pop-up windows using the close button associated with each window.

Solstice SyMON 1.6 Issues

The following information applies to the Solstice SyMON 1.6 product.

Known Bugs

The following issues are known bugs in the Solstice SyMON 1.6 product.

`sm_configd` Exits With Error Messages After Using Up Large Amounts of Virtual Memory (4132402)

The SyMON `sm_configd` process exits with error messages "no such file or directory", after using up large amounts of virtual memory. This problem only occurs on Enterprise 3x00-6x00 servers running Solaris 2.6 5/98. This bug is serious, and SyMON daemon software will refuse to configure or start on any of these systems with the bad patch installed.

Workaround: To fix this problem you should install revision 4 or later of patch 106183. This patch is included on the Supplement CD accompanying the Solaris 2.6 5/98 release, in the directory:

```
Patches/106183-04
```

This patch is also available through your authorized Sun support provider or the SunSolve Web page listed at the front of this document.

You can install the patch by following the instructions in the following file:

```
README.106183-04
```

Solstice SyMON Agents May Trigger Invalid Messages on Sun Enterprise 3x00-6x00 Systems Running Dynamic Reconfiguration Operations (4128904)

When performing Dynamic Reconfiguration operations on a Sun Enterprise 3x00-6x00 system, SyMON agents may trigger invalid events such as "SyMON not responding" or "Logscand not responding." These events are normally closed when the SyMON agents get reattached. These events may take a long time to close or never get closed at all. The agents are actually up and running fine.

Workaround: Restart `sm_symond` and `sm_egd` on the Event Viewer host.

```
# /opt/SUNWsymon/sbin/sm_control start
```

You may need to restart `sm_symond` and `sm_egd` more than once if the Event Viewer is red with no open events.

Solstice SyMON Displays Extra SIMMs on Some Sun Enterprise System Boards (4100260)

Solstice SyMON displays extra SIMMs on some Sun Enterprise system boards. This is not a SyMON bug.

Workaround: If you experience this problem, refer to the SunSolve Web page listed at the front of this document for patch availability. The patch ID will be listed in the patch database under the bug ID 4100260. For more information, contact your authorized Sun support provider.

Sun StorEdge A5000 Disks Cannot Be Hotplugged Using the `luxadm` Command (4087379, 4089679, 4082520, 4088426)

You cannot hotplug a Sun StorEdge A5000 disk using the `luxadm` command while Solstice SyMON 1.6 is running on the monitored server. The following errors may result:

- Using the `luxadm` utility's `insert_device` or `remove_device` commands to hotplug Sun StorEdge A5000 disks results in incorrect information displaying in both the physical and logical views. This results because `luxadm` may leave the Sun StorEdge A5000 disks in an indeterminate state and `/dev/rdsk` entries for offlined disks can remain.
- The logical view of the Sun StorEdge A5000 incorrectly displays two leaf nodes for the offlined disk (one with an instance number and the other without an instance number). The physical view incorrectly shows the image of the Sun StorEdge A5000 disk even when the Sun StorEdge A5000 disk has been removed from the disk slot.
- The Kernel Data Catalog is not updated when Sun StorEdge A5000 disks are hotplugged. In the process of offlining the Sun StorEdge A5000 disks, using the `luxadm` command results in incorrect information on your display:

```
luxadm: could not offline device: May be busy
```

  To confirm that the Sun StorEdge A5000 disk has actually been offlined, view the Sun StorEdge A5000's Front Panel Module and `luxadm`.

Workaround: Before you hotplug a Sun StorEdge A5000 disk using the `luxadm(1M)`command, stop Solstice SyMON 1.6 server agents on the monitored server. Refer to Chapter 2 of the *Solstice SyMON 1.6 User's Guide* for more information.

Sun StorEdge A5000 Issues

The following issues apply to the Sun StorEdge A5000 product.

Note – The Sun StorEdge A5000 naming convention has replaced the Sun Enterprise Network Array naming convention that was used in earlier Solaris releases.

`luxadm`: Reports “Open Failed” When IB Is on Multiple Loops (4069883)

`Running luxadm disp` on a host system configured with multiple paths to the enclosure reports that the drives on one backplane are available while the drives on the other backplane are not available, resulting in the following message:

```
"Open Failed"
```

This occurs when a single connection is made to an IB and the box is configured as a single loop.

Workaround: For patch information, refer to the SunSolve Web page at:

```
http://sunsolve.sun.com
```

When `remove_dev subcmd` Fails It Does Not Restore the Device's Original State (4066322)

Executing `remove_device` fails to online the Sun StorEdge A5000 disks when the enclosure is not physically removed or disconnected from the host system.

The enclosure's original state should be restored if the enclosure is not disconnected from the host system or if the `remove_device` command fails to remove the device.

Workaround: Use the `luxadm power_on` <*enclosure name*> command to spin up all the disks in the enclosure. For patch information, refer to the SunSolve Web page at:

```
http://sunsolve.sun.com
```

In Multipath Configurations, Seagate Disk Reservation Is Not Consistent (4064114)

In Dual Port Sun StorEdge A5000 configurations, Sun StorEdge A5000 disks that are reserved from one IB may not appear as being reserved from all the logical paths pointing to another IB.

Workaround: For patch information, refer to the SunSolve Web page at:

```
http://sunsolve.sun.com
```

Drive Hang During Heavy I/O and Loop-initialization Simultaneously (4066718)

During heavy I/O to a set of drives, if loop-initialization is forced on either port, one or more drives may hang the loop. If `loop-init` and I/O are on the same loop, the failure is more prominent. A power cycle is necessary to take the drive out of that state.

Workaround: For patch information, refer to the SunSolve Web page at:

```
http://sunsolve.sun.com
```

Sun MediaCenter One Issues

The following issues apply to the Sun MediaCenter One™ product.

Documentation Errata—Sun MediaCenter One Software Guide

- On page 1-8 of the *Sun MediaCenter One Software Guide*, the statement that the Sun MediaCenter One software includes a video server MIB is incorrect. The Sun MediaCenter Classic software includes an SNMP MIB; the Sun MediaCenter One software does not.
- The example commands on page 2-8 of the *Software Guide* are in error. The `SMChotjava` script does not accept any command line arguments. The `SMCplayer` script accepts arguments with syntax different from that shown on page 2-8. The example should read:

```
% /opt/SUNWsmsjc/bin/SMCplayer -host smc_server -title spartacus
```

Note the server name `smc_server` is an example.

Troubleshooting Sun MediaCenter Java Client Software

For troubleshooting problems with the Sun MediaCenter Java client software, add the following items:

- If the client applet is not loading, set your `CLASSPATH` to `/usr/java` before invoking one of the client scripts (such as `SMCplayer`).
- On occasion, `mpx`, the process for MpegExpert, dies, causing the video to go blank on your display. If this occurs, click on the stop button, then click on start. This action restarts `mpx`.

If you experience poor video and/or audio quality, you may not have sufficient, uninterrupted bandwidth between your machine and the video server. Also, one or more routers between your machine and the video server can introduce latencies that disrupt video quality. Ideally, you are on the same subnet as the server. Also, for video delivery, switched Ethernet is far superior to shared.

In some networks, obtaining satisfactory video quality over a shared Ethernet, especially if there are intervening routers, is nearly impossible.

Sun MediaCenter Java Client—Prevents Suspension When Playing Video

The Solaris Power Management feature does not suspend operation because of inactivity on a machine on which the Sun MediaCenter Java Client is playing a video. If the Java client is not playing a video, it has no effect on the Power Management feature.

Sun Enterprise 250 Server Issues

The following issues apply to the Sun Enterprise 250 server product.

Documentation Errata—SMCC Information Library Solaris 2.6 Hardware: 5/98

The "Supported Hardware" section of the *SMCC Information Library Solaris 2.6 Hardware: 5/98* failed to mention support for the Sun Enterprise 250 server.

This Solaris 2.6 5/98 release supports the Sun Enterprise 250 server. Table 3-1 through Table 3-3 show the supported hardware options that are compatible with the Sun Enterprise 250 server for this Solaris 2.6 5/98 release.

Note – After publication of this document, additional combinations of hardware may be identified as supported by this Solaris release. If a combination of hardware isn't specifically listed in this section as being supported, contact your authorized Sun support provider to verify support.

CD-ROM Drive Support

TABLE 3-1 CD-ROM Drive Support for the Sun Enterprise 250 Server

	Host Adapters				Enclosures			
	Embedded	SunSwift PCI	Dual Se UltraSCSI PCI		Internal	Desktop storage pack	SPARC storage UniPack	Sun StorEdge FlexiPack
SunCD 4	◆						◆	
		◆					◆	
			◆				◆	
SunCD12	◆				◆		◆	◆
		◆					◆	◆
			◆				◆	◆

Tape Drive Support

TABLE 3-2 Tape Drive Support for the Sun Enterprise 250 Server

	Host Adapters				Enclosures							
	Embedded	SunSwift PCI	Dual Se UltraSCSI PCI		Internal	Desktop storage pack	External storage module	Desktop storage module	Library	SPARC storage UniPack	Sun StorEdge FlexiPack	Multi-tape backup tray
150MB QIC	◆					◆						
		◆				◆						
2.5GB QIC	◆				◆					◆		
		◆								◆		
			◆							◆		
4-8GB 4mm	◆				◆					◆	◆	
		◆								◆	◆	
			◆							◆	◆	

TABLE 3-2 Tape Drive Support for the Sun Enterprise 250 Server *(Continued)*

	Host Adapters			Enclosures								
	Embedded	SunSwift PCI	Dual Se UltraSCSI PCI	Internal	Desktop storage pack	External storage module	Desktop storage module	Library	SPARC storage UniPack	Sun StorEdge FlexiPack	Multi-tape backup tray
12-24GB 4mm	◆			◆					◆	◆	
		◆							◆	◆	
			◆						◆	◆	
7-14GB 8mm	◆			◆	◆			◆	◆	◆	◆
		◆			◆			◆	◆	◆	◆
			◆						◆	◆	
10GB 8mm	◆				◆						
		◆			◆						
5GB 4mm	◆				◆		◆				◆
		◆			◆		◆				◆
20GB 4mm AL	◆						◆				
		◆					◆				
0.5” DLT AL	◆									◆	◆
		◆								◆	◆
20-40GB 8mm	◆							◆	◆	◆	
		◆						◆	◆	◆	
			◆					◆	◆	◆	
144GB 4mm AL	◆									◆	◆
		◆								◆	◆
			◆							◆	

3.5-inch SCSI Disk Drive Support

TABLE 3-3 3.5-inch SCSI Disk Drive Support for the Sun Enterprise 250

	Host Adapters					Enclosures					
	Embedded	SunSwift PCI	Dual SE UltraSCSI PCI	Dual Differential UltraSCSI PCI		Internal	Desktop storage pack	Multi-disk pack	SPARC storage UniPack	SPARC Multipack-6 slot	SPARC Multipack-12 slot
424MB	◆						◆				
		◆					◆				
535MB	◆						◆				
		◆					◆				
1.05GB	◆						◆	◆	◆		
		◆					◆	◆	◆		
			◆						◆		
2.1GB 5400 rpm	◆						◆	◆			
		◆					◆	◆			
			◆								
2.1GB 7200 rpm	◆					◆		◆	◆		◆
		◆						◆	◆		◆
			◆						◆		◆
4.2 GB 5400 rpm	◆							◆	◆	◆	
		◆						◆	◆	◆	
			◆						◆	◆	
				◆							
4.2GB 7200 rpm	◆					◆		◆	◆		◆
		◆						◆	◆		◆
			◆						◆		◆
				◆							
9.1GB 5400 rpm	◆										
		◆									
			◆								
9.1 GB 7200 rpm	◆					◆			◆	◆	
		◆							◆	◆	
			◆						◆	◆	
				◆							

Sun Enterprise 10000 Issues

Release notes and other technical information in this section apply only to Sun™ Enterprise™ 10000 servers.

General Issues

This section contains general issues that involve Solaris 2.6 5/98 on the Enterprise 10000 server. You should read this section before you attempt to install or configure Solaris 2.6 5/98.

`wscons(7D)` Facility

For the Sun Enterprise 10000, the `netcon(1M)` facility supersedes the SunOS™ `wscons(7D)` facility. Do not use the `wscons(7D)` facility in conjunction with `netcon(1M)`. The `wscons(7D)` facility is useful for systems that have directly attached consoles (frame buffers and keyboards), which the Enterprise 10000 does not have. For more information, refer to `netcon(1M)` in the *Sun Enterprise 10000 SSP Reference Manual* and `cvc(7)` in the *Solaris Reference for SMCC-Specific Software*.

XNTP and NTP

A Sun Enterprise 10000 domain that runs Solaris 2.5.1 must have the XNTP version of Network Time Protocol (NTP) software installed. The XNTP version was provided with Enterprise 10000 systems that shipped with Solaris 2.5.1. Beginning with the Solaris 2.6 release, Sun Microsystems includes a different version of NTP software, and this newer version must be used on domains running Solaris 2.6. The two versions of NTP are compatible; the differences between them are the location of the NTP configuration files and their support for Solaris 2.5.1 or 2.6.

Because the System Service Processor (SSP) software, versions 3.0 and 3.1, is supported only on SSP units running Solaris 2.5.1, the SSP and a domain with Solaris 2.6 5/98 will have different versions of the NTP software. The following table explains which NTP version is compatible on the SSP and which version is compatible on a given domain.

TABLE 3-4 XNTP and NTP Support

XNTP	NTP
Domains running Solaris 2.5.1	Domains running Solaris 2.6
SSP 3.0	SSP 3.2 (not available at time of this printing)
SSP 3.1	

Note – SSP 3.0 and 3.1 can monitor and control domains that use XNTP or NTP.

Solaris 2.6 5/98 and the SSP

If you are installing Solaris 2.6 5/98 on a domain or upgrading a domain's current Solaris operating environment, you must have SSP 3.1 installed on the SSP. SSP 3.0 does not support Solaris 2.6 5/98 on a domain.

Known Bugs

The following Enterprise 10000-specific bugs are known to exist in the Solaris 2.6 5/98 release.

Need Positive Indication of Boot Progress (4017963)

After `bringup(1M)` has transferred control to OBP and the boot loader has loaded the kernel image, several minutes may pass with no Console output while the kernel initializes the system. The amount of time kernel initialization takes is directly proportional to the amount of physical memory.

Workaround: A domain should take approximately the same amount of time to boot each time it is booted, as long as the domain's configuration remains the same. If you notice that the boot takes an abnormal amount of time, you can use the `check_host(1M)` command to determine if the domain is up. Refer to the `check_host(1M)` man page for more information.

`gettimeofday` Sometimes Gives the Wrong `tv_usec` (4126459)

In rare circumstances, the `gettimeofday(3C)` library routine passes a value greater than 1,000,000 in the microsecond (`tv_sec`) field and returns a zero, indicating success, whether or not it is successful.

Workaround: None

Informix XPS Won't Come Up if `enable_grp_ism` is Enabled (4126596)

Informix XPS fails to start if `enable_grp_ism` is enabled, and it sends an insufficient resident shared memory error to the Console window.

Workaround: Leave `enable_grp_ism` set to `0x0`, which is the default value in Solaris 2.6.

`cvcd` Sometimes Doesn't Start Up Properly (4128047)

`cvcd` may not start up properly on a net boot.

Workaround: Exit the `suninstall` utility; go to a shell, and kill the `cvcd` process. Restart the `cvcd` process, and return to the installation.

AP Reboot Fails if Multiple Boot Disks are Set Up in the Boot-Device OBP Variable (4128740)

During the installation of the Solaris operating environment, the `suninstall` utility may put a default boot-device alias in the boot-device OpenBoot™ PROM (OBP) variable. You must remove multiple boot-device aliases before you attempt an AP reboot.

Workaround: If you use the `suninstall` utility, check the boot-device variable for multiple aliases and remove all of the entries except for the domain's default boot-device alias. For instructions on how to remove boot-device aliases, refer to page 54 in the section "Alternate Pathing 2.1 on the Sun Enterprise 10000."

NTP Configuration Instructions for Solaris 2.6 (4130698)

For Solaris 2.6 5/98, Sun introduces NTP to Sun Enterprise 10000 domains. The SSP must have SSP 3.1 installed to support domains running Solaris 2.6 5/98; however, SSP 3.1 runs only on SSP units that have Solaris 2.5.1, or earlier, and XNTP installed. The two NTP versions are compatible, except in respect to where the NTP files reside, what operating version they support, and how they support that version. Users should see no problems due to the XNTP and NTP differences. For more information on NTP and XNTP, refer to the *Network Time Protocol User's Guide*.

Although the `suninstall` utility installs the `SUNWntp` packages, it does not remove the `SUNWxntp` packages. The instructions for removing the `SUNWxntp` packages are included in the *SMCC Hardware Platform Guide Solaris 2.6 Hardware: 5/98*. However, the NTP configuration instructions were unavailable at print-time for that document. Perform the following steps to configure the `ntp.conf` file, which resides at `/etc/inet/ntp.conf`.

1. Log in to the domain as superuser.
2. Open the `ntp.conf` file in your text editor.
3. Edit the file so that it resembles the following example:

```
# example Starfire domain /etc/inet/ntp.conf
# configuration file ntp.conf
# for Solaris 2.6
# substitute actual ssp name for <ssp-name>

server <ssp-name> prefer
# we can always fall back to the local clock.
server 127.127.1.0
fudge 127.127.1.0 stratum 9

# Other ntp files.
driftfile /etc/inet/ntp.drift

# Encryption:
disable auth
controlkey 1
requestkey 1
authdelay 0.000793

# precision declaration
precision -18              # clock reading precision (1 usec)
```

4. Reboot the domain.

Each domain should use the SSP as its source for time, and the SSP should use at least two other sources, besides its internal clock, to avoid a single point of failure in case the SSP's clock fails. For more information about NTP commands, refer to the following man pages:

- `ntp_adjtime(2)` — Adjusts local clock parameters.
- `ntp_gettime(2)` — Gets local clock values.
- `ntpdate(1M)` — Set the date and time by using `ntp`.
- `ntpq(1M)` — Standard NTP query program
- `ntptrace(1M)` — Traces a chain of NTP hosts back to their time source.
- `xntpd(1M)` — The NTP daemon

Solaris 2.6 5/98 Installation of SMCC Supplement CD Packages Incorrectly Refers to `SUNWuesab` (4133506)

The AnswerBooks that were in the `SUNWuesab` package have been moved to the `SUNWabhdw` package, and the `SUNWuesab` package has been removed from the SMCC CD Supplement CD.

Workaround: Do not attempt to install the `SUNWuesab` package. If you do, an error message appears. You can safely ignore the message.

Hardware Platform Guide Instructions Missing `share(1M)` Command (4135085)

The instructions for setting up the SSP as a boot server in the *SMCC Hardware Platform Guide Solaris 2.6 Hardware: 5/98* are missing a step to share the CD across the net. The step was in the Hardware Platform Guide for Solaris 2.6 HW3 Beta, but it was taken out after it was incorrectly marked as not needed during a review of the document. The step will be put back into the Hardware Platform Guide for Solaris 2.7.

Workaround: To set up the SSP as a boot server, you must perform the following step *before* you exit the superuser level:

```
ssp# share -F nfs -o ro,anon=0 /cdrom/cdrom0/s0
```

Solaris Patches

No Solaris patches need to be installed when you are installing a fresh copy of Solaris 2.6 5/98 or when you are upgrading your current Solaris operating environment.

Dynamic Reconfiguration on the Sun Enterprise 10000

Release notes and other technical information in this section apply only to Sun Enterprise 10000 Dynamic Reconfiguration (DR).

General Issues

This section contains general issues that involve DR on the Enterprise 10000 server. You should read this section before you attempt to install or configure DR.

`dr-max-mem` Utility

The way `dr-max-mem` is used has changed since the previous release. Please see the appropriate section of the *Sun Enterprise 10000 Dynamic Reconfiguration User's Guide* for a detailed description of this important OBP variable.

DR and SunFDDI

If your Enterprise 10000 server contains any SunFDDI™ SBus Adapter 5.0 interfaces and you plan to use DR, you must install Sun Patch 104572-05 or later. You can obtain this patch at `http://sunsolve.corp.sun.com`.

DR and the Sun StorEdge A3000

Dynamic Reconfiguration of Sun™ StorEdge™ A3000 arrays on the Enterprise 10000 running Solaris 2.6 requires RAID Manager 6.01.00, or later, for correct operation.

DR and the Sun StorEdge A5000

DR will be supported on systems configured with Sun StorEdge A5000 devices and the latest StorEdge A5000 patch. Contact your service provider for more information on how to obtain the patch. Or, go to SunSolve at the following URL:

```
http://sunsolve2.Sun.COM/sunsolve/Enterprise-dr
```

Known Bugs

This section contains the known bugs in the Sun Enterprise 10000 DR feature of the Solaris 2.6 5/98 release.

A Swap Space Shortage that Occurs During DR Detach Can Hang the System (4010906)

A sudden decrease in the amount of memory available to a system can cause severe memory shortages and result in a hung system. The system prevents new processes from being created if not enough swap space (disk or `swapfs`) is available; however, the removal of memory when free swap space is low may result in memory being over-committed. This may cause the system to be very sluggish or to hang. (This bug is related to BugID 4028250 on page 44 and BugID 4131381 on page 49.)

Workaround: Before you detach system boards with memory, you should assess the runtime characteristics of the domain to determine if enough memory resources will remain after the board detach to continue to efficiently process the workload on the domain. Use the `swap(1M)` and `vmstat(1M)` commands to determine if the system is currently paging or swapping and if enough swap space will remain after the board detach. If the domain is already experiencing memory pressure (that is, `vmstat(1M)` shows significant paging activity), you should consider deferring the board detach operation.

DR Memory Detaches Can Cause System to Hang Waiting for Memory (4028250)

A sudden decrease in the amount of memory available to a system can cause severe memory shortages and result in a hung system. The system prevents new processes from being created if not enough swap space (disk or `swapfs`) is available; however, the removal of memory when free swap space is low may result in memory being over-committed. This may cause the system to be very sluggish or to hang. (This bug is related to BugID 4010906 on page 44 and BugID 4131381 on page 49.)

Workaround: Before you detach system boards with memory, you should assess the runtime characteristics of the domain to determine if enough memory resources will remain after the board detach to continue to efficiently process the workload on the domain.

Use the swap(1M) and vmstat(1M) commands to determine if the system is currently paging or swapping and if enough swap space will remain after the board detach. If the domain is already experiencing memory pressure (that is, vmstat(1M) shows significant paging activity), you should consider deferring the board detach operation.

DR Abort Detach May Not Resume All Detached Disks (4010910)

If a DR detach operation fails to detach an sd device and the controller has sd devices that have already been detached, the abort-detach operation does not resume (that is, re-attach) those devices that have already been detached. This situation rarely occurs. The most likely time for it to happen is if the disk drive firmware is locked up.

Workaround: None

dr_daemon Does Not Find Veritas Device Usage (4011123)

Veritas software usage of disks is not displayed by DR applications in their device-usage displays.

Workaround: None

SUNWcsr: On Upgrading From 2.5.1HW8/97 to 2.6, Duplicate Majors in name_to_major (4067860)

The i.nametomajor script in the SUNWcsr package incorrectly creates duplicate major numbers in the /etc/name_to_major file during an upgrade from Solaris 2.5.1 to Solaris 2.6 5/98. The duplicate entries cause the kernel to overwrite the first instance of the major number in the kernel's devnames table, preventing the drivers from being bound during the reconfiguration boot. This problem does not occur during a fresh-install.

Workaround: If you are upgrading from Solaris 2.5.1 to Solaris 2.6 5/98, you must perform the following steps *before* you attempt the upgrade:

1. Boot the Solaris 2.5.1 disk and log in as superuser on the domain.
2. Use the pkgrm(1M) command to remove the SUNWdrr package.
3. Open the /etc/rem_name_to_major file and remove the dr driver line.

If only one entry exist in the `rem_name_to_major` file, you should remove the file entirely.

If you have already performed the upgrade, you must perform the following steps to use DR:

1. Boot the upgraded Solaris 2.6 5/98 disk.
2. Log in as superuser on the domain.
3. Use the `rem_drv(1M)` command to remove the DR driver:

```
domain_name# rem_drv dr
```

   This command may report that the DR driver is not installed. You can safely ignore this message.

4. Open the `/etc/name_to_major` file and remove the `dr` line if one exists.
5. Open the `/etc/rem_name_to_major` file and remove the `dr` driver line.

   If only one entry exist in the `rem_name_to_major` file, you should remove the file entirely.

6. Open the `/etc/minor_perm` file and remove the `dr` line if one exists.
7. Use the `add_drv(1M)` command to add the DR driver:

```
domain_name# add_drv -m '0 600 root sys' /platform/sun4u1/kernel/drv/dr
```

`socal`, `sf`: Needs to Support DETACH/SUSPEND/RESUME (4083412)

The Sun StorEdge A5000 disk array will be DR compliant with the latest StorEdge A5000 patch.

Workaround: Contact your service provider for more information on how to obtain the patch. Or, go to SunSolve at the following URL:

```
http://sunsolve2.Sun.COM/sunsolve/Enterprise-dr
```

Bad Trap Panic During DR Detach With Patch 103640-14 Installed (4095049)

During DR operations, applications that use the PROM monitor configuration interface, `openprom(7d)`, should not be executed. One example of such a command is `prtdiag(1M)`. Running such a command can cause the domain operating system to panic.

Workaround: None

`disks(1M)` Command Preens Controller Entries and Corrupts the Sun StorEdge A3000 Device Tree (4096048)

The Solaris `disks(1M)` command preens or deletes symbolic link entries when disk devices are no longer present in an Enterprise 10000 domain. If you have dynamically reconfigured the devices so that they are no longer present, the Symbios-managed device tree and the Solaris-managed device tree can become inconsistent.

Workaround: You must obtain the proper patch from SunSolve or from your service representative. This patch contains fixes that ensure persistent node names under the Solaris operating environment when StorEdge A3000 devices are dynamically reconfigured out of a given Enterprise 10000 domain. The patch ensures that when the same array is brought back into the domain, it inherits the same node name it originally had, thereby maintaining data availability without having to modify system mount points or user application configurations. You must ensure that you do not perform reconfiguration reboot operations (`boot -r`) in a domain when A3000 devices are present on the system boards.

`drstress` Runs Failing at `detach_finished` Command (4127543)

During extreme stress testing of DR, two domain-hang conditions have been encountered. First, during the final stage of the attach process, the domain becomes unresponsive. Second, during the final stage of the detach process, the domain encountered an arbstop condition. (This bug is related to BugID 4128192.)

Workaround: None

`drstress` Test of s297hw3_07 Hangs Domain During `complete_attach` (4128192)

During extreme stress testing of DR, two domain-hang conditions have been encountered. First, during the final stage of the attach process, the domain becomes unresponsive. Second, during the final stage of the detach process, the domain encountered an arbstop condition. (This bug is related to BugID 4127543.)

Workaround: None

`dr_cpu_detach_func` Failed to Take a Processor Offline During a DR Detach Operation (4128765)

This is a generic condition that is not specific to DR. If a kernel thread is bound to a processor, and that thread is active for long periods of time, the processor will refuse to be offlined. This bug describes a condition in which the bound thread would not complete, leaving the processor incapable of being offlined without a domain reboot.

Workaround: If a processor refuses to be offlined, you will need to perform a domain reboot. The reboot should cause the processor to be blacklisted if it is not operating properly.

Getting a Hang On the Drain Process Running DR Stress Test (4128833)

After a drain operation, DR attempts to lock each page of memory on the board being detached before it returns control of the domain to the system. If a device driver has mistakenly locked a page permanently, the drain operation and the DR application on the SSP will hang. If this occurs, killing the application on the domain which is using the locked pages will cause the drain to return to normal operation. Unfortunately, no utility exists to identify the application using the pages. The domain will continue to function normally during this condition.

Workaround: None

Running Stress Tests on Solaris 2.6 5/98 Caused the System to Hang (4131381)

A sudden decrease in the amount of memory available to a system can cause severe memory shortages and result in a hung system. The system prevents new processes from being created if not enough swap space (disk or `swapfs`) is available; however, the removal of memory when free swap space is low may result in memory being over-committed. This may cause the system to be very sluggish or to hang. (This bug is related to BugID 4028250 on page 44 and BugID 4010906 on page 44.)

BugID 4131381 may be related to BugID 4134357 (page 50). The stress test exerts extreme memory pressure on the system, causing a sudden lack of swap space, which caused the system to become unresponsive.

Workaround: Before you detach system boards with memory, you should assess the runtime characteristics of the domain to determine if enough memory resources will remain after the board detach to continue to efficiently process the workload on the domain. Use the `swap(1M)` and `vmstat(1M)` commands to determine if the system is currently paging or swapping and if enough swap space will remain after the board detach. If the domain is already experiencing memory pressure (that is, `vmstat(1M)` shows significant paging activity), you should consider deferring the board detach operation.

`dr_daemon` Core Dumps With Solaris 2.6 5/98 Release (4131197)

This bug has appeared in two different failure modes. The first is in `add_ap_meta_devices`, which only occurs on AP configurations. The second is in `find_net_entries`.

Workaround: If the DR applications `drview(1M)` or `dr(1M)` encounter an RPC failure indication during a DR operation, simply exit the DR application and restart it. You will be able to continue the DR operation from the point at which it encountered the failure.

DR Operations With `mem_board_interleave_ok` Cause Problems (4133607)

DR does not support memory interleaving, which is activated by placing the `mem_board_interleave_ok` keyword in the `postrc(4)` file on the SSP. If interleaving is enabled, non-graceful attach and detach failures will occur.

Workaround: Do not enable memory interleave on domains in which you plan to use dynamic reconfiguration.

`availrmem` is Not Being Reduced During Sun Enterprise 10000 Memory Detach (4134357)

When you detach a system board with memory, the `availrmem` kernel value is not being reduced correctly, causing the `swap -s` command to report more available swap space than is actually present.

Workaround: None

Sun StorEdge A3000 Patch Has Been Changed (4135366)

The installation instructions for the Enterprise 10000 in the SMCC Hardware Platform Guide Solaris 2.6 Hardware: 5/98 mention that you need patch T106249-01. This patch does not work with Enterprise 10000 DR, so a new patch has been created. The patch will be available though SunSolve.

Workaround: Contact your service provider to obtain a copy of the patch.

Bugs Fixed

The following important bugs have been fixed since the last release of DR. This list does not include minor bugs, nor does it include those bugs that were fixed in patches.

DR panics during detach when `dr-max-mem` set is high (4090750)

DR Patches

No DR patches need to be installed for this release.

DR and Inter-Domain Networks

The Inter-Domain Network (IDN) software is not supported in this release. However, IDN messages may appear during DR detach operations. If you see any IDN-related messages you can safely ignore them.

DR and SSP

Enterprise 10000 domains running any version of Solaris 2.6 can be controlled by SSP units running SSP 3.1. However, the SSP unit itself must be running Solaris 2.5.1. SSP 3.1 will not work if it is loaded on an SSP unit that is running Solaris 2.6.

Because the SSP software is updated on a different schedule than the Solaris operating environment, it is packaged and shipped separately in the SSP Media Kit. Refer to the SSP release notes, which are included in the SSP Media Kit, for issues involving the SSP software.

SSP Patches

For this release of DR, only one SSP patch is needed. The following patch is located at `/cdrom/supp_sol_2_6_598_smcc/Patches` on the SMCC Supplement CD. It updates `libdr.so` and is required for DR on Solaris 2.6 5/98.

Patch-ID# 105682-03

Description: `libdr patch`

BugIDs fixed with this patch: 4086074 4093896 4117528 4125295 4129465

This patch requires a reboot of the SSP system after the patch is installed.

Getting "Flusher Thread" Hang During DR Drain with Official -20 KU Patch (4136544)

A very small window in the code, which synchronizes DR with I/O to Intimate Shared Memory (ISM), can lead to a hung system. The window exists only if both DR and ISM are enabled. The hang may be a result of a DR Detach operation in which the system will continue to operate, but the detach operation hangs and cannot be aborted. The hang may also be the result of the DR "cage" growing (this is a normal function that can occur at any time if DR is enabled). If it occurs in this manner, the entire system may ultimately hang.

Workaround: In both situations, you must reboot the system to correct the hung system. To avoid this problem, disable either DR or ISM by using one of the following methods:

- To disable DR, set the OBP variable `dr-max-mem` to 0.
- To disable ISM, set the relevant database variables (for example, in the Oracle(R) or Informix start-up files) to the appropriate values, or set `ism_off` to 1 in the `/etc/system` file.

Alternate Pathing 2.1 on the Sun Enterprise 10000

Alternate Pathing (AP) 2.1 is supported on Enterprise 10000 domains running Solaris 2.6 5/98 and on the SSP with the appropriate patch installed.

Caution – Solaris 2.6 5/98 does not support AP 2.0.

AP enables you to define and control alternate physical paths to peripheral devices, adding increased availability and a level of fault recovery to your server. If a physical path to a device becomes unavailable, an alternate path can be used. For more information, see the *Sun Enterprise Server Alternate Pathing 2.1 User's Guide* in the *Solaris 2.6 Hardware: 5/98 on Sun Hardware AnswerBook*.

AP works only with networks, dual-ported SPARCstorage™ Array drives, and Sun StorEdge A5000 devices, and is compatible with Veritas VxVM (versions 2.3 and 2.4) and Solstice™ DiskSuite™ 3.0. (For a list of supported devices, see section "Supported Devices" on page 52.) This release of AP is *not* compatible with Solstice DiskSuite 4.0.

Note – Veritas 2.5 DMP is incompatible with AP. Veritas 2.5 DMP checks for AP metadevices, and bars installation of itself if it finds them. This compatibility problem will be addressed in the Veritas 3.2 timeframe.

General Issues

This section contains general issues that involve AP on the Enterprise 10000 server. You should read this section before you attempt to install or configure AP.

Supported Devices

The following devices are supported by the AP software on Sun Enterprise servers:

- SPARCstorage™ Arrays recognized by AP using the `pln` ports
- Sun StorEdge A5000 recognized by AP using `sf`
- SunFastEthernet™ 2.0 (`hme`)
- SunFDDI™ 5.0 (`nf`) SAS and DAS
- SCSI-2/Buffered Ethernet FSBE/S and DSBE/S (`le`)

- Quad Ethernet (qe)
- Sun™ Quad FastEthernet™ (qfe)
- The system network Console

Sun StorEdge A3000

The Sun StorEdge A3000 supports failover capabilities that are similar to those provided by AP. Because of this, AP does not support the Sun StorEdge A3000. See that product's documentation for more information about its failover support.

Known Bugs

The following bugs are known to exist in AP 2.1.

Domain Panics When There are No AP Databases, but Metadevice Entries Still Exist in `/etc/vfstab` (4126897)

If you remove all of the AP databases, but you leave the references to the AP metadevices in `/etc/vfstab`, the domain will panic when you try to boot it.

Workaround: Ensure that you remove any `/etc/vfstab` references to AP metadevices if you remove all of the AP databases.

AP-Disk Autofailover Hangs on Simultaneous Multi-Pathgroup Failures (4126743)

AP auto-switching hangs if the following conditions exist:

1. The system is operating with multiple disk-pathgroups, and AP database files are configured on one of the pathgroups.
2. Catastrophic controller failures occur on multiple pathgroups, with the final failure occurring on the pathgroup which contains the AP database files. The final failure must occur within 30 seconds (for SSA controllers) prior to the completion of the automatic switching for the previous failure.

Workaround: None

Getting Invalid Messages on Boot With Solaris 2.6 and AP 2.1 (4108369)

The power management subsystem does not know how to parse AP metadevices.

Workaround: You can safely ignore these messages.

AP Reboot Fails if Multiple Boot Disks are Set Up in the Boot-Device OBP Variable (4128740)

Although the OpenBoot™ PROM (OBP) `nvram` variable `boot-device` can have more than one default entry by design, multiple default entries could defeat the auto-reboot interaction between AP, OBP, and the Event Detection Daemon (EDD). If OBP detects a missing controller or disk indicated by the first default device in the boot-device variable, OBP will automatically switch to the next default entry. If the next entry is bootable, OBP will boot that device. If the next entry is not bootable, OBP will stop at the `ok` prompt. The system then waits for the EDD to detect the boot failure and to prompt AP to perform a bring-up by using the name of the alternate boot-path. If the alternate boot-path does not exist for the next default boot-path in the boot-device variable, then AP will fail to initiate another automatic bring-up; hence, the use of AP for automatic reboot on boot failures will fail. The system will be stopped at the `ok` prompt.

Currently, OBP gets multiple default boot-device entries from either user interaction or from the `suninstall` utility. Sun Microsystems recommends that you put and maintain *only* one default boot-device entry for any Enterprise 10000 domain. During the installation of the Solaris operating environment, the `suninstall` utility may put a default boot-device alias in the variable. You must remove multiple boot-device aliases before you attempt an AP reboot.

Workaround: Set up and maintain only one boot-device alias in the boot-device variable. If you use the `suninstall` utility, check the boot-device variable for multiple aliases and remove them if they exist.

If you are at the `ok` prompt, perform these steps:

1. Use the OBP `setenv` command to set the default boot-device alias to the correct device.

```
ok setenv boot-device boot_device_alias
```

Where *boot_device_alias* corresponds to the correct default boot-device alias.

2. If `diag-switch?` is set to true, use the OBP `setenv` command to set the `diag-device` variable to the correct device.

```
ok setenv diag-device boot_device_alias
```

Note – If `diag-switch?` is set to true, OBP uses `diag-device` and `diag-file` as the default boot parameters. If `diag-switch?` is false, OBP uses `boot-device` and `boot-file` as the default boot parameters.

If you are at the domain prompt, perform the following steps:

1. Log in as superuser on the domain.
2. Use the `eeprom(1M)` command to set OBP's boot-device variable:

```
domain_name# eeprom boot-device=boot_device_alias
```

AP Does Not Support Kernel-Level, Multithread Async I/O (4129650)

AP does not provide kernel-level, multithreaded, asynchronous I/O entry-points. This may negatively affect performance when asynchronous I/O defaults to the library level.

Workaround: None

AP Patches

No AP patches need to be installed when you are upgrading the AP software.

Documentation Errata

If you are planning to perform a fresh-install of AP, use one of the following commands when you add the AP packages.

a. For the Enterprise 10000, use the following command:

```
domain_name# pkgadd -d /cdrom/Product SUNWapdoc SUNWapu SUNWapr
```

b. For Enterprise 3x00, 4x00, 5x00, and 6x00 servers, use the `/cdrom0` mount point:

```
# pkgadd -d /cdrom/cdrom0/Product SUNWapdoc SUNWapu SUNWapr
```

Alternate Pathing 2.1 on the Sun Enterprise 3x00, 4x00, 5x00, and 6x00 Servers

This release introduces Alternate Pathing to the Sun Enterprise 3x00, 4x00, 5x00, and 6x00 server line. AP 2.1 is supported on Enterprise servers running Solaris 2.6 5/98.

Caution – Solaris 2.6 5/98 does not support AP 2.0.

AP enables you to define and control alternate physical paths to peripheral devices, adding increased availability and a level of fault recovery to your server. If a physical path to a device becomes unavailable, an alternate path can be used. For more information, see the *Sun Enterprise Server Alternate Pathing 2.1 User's Guide* in the *Solaris 2.6 Hardware: 5/98 on Sun Hardware AnswerBook*.

AP works only with networks, dual-ported SPARCstorage™ Array drives, and Sun StorEdge A5000 devices, and is compatible with Veritas VxVM (versions 2.3 and 2.4) and Solstice™ DiskSuite™ 3.0. (For a list of supported devices, see section "Supported Devices" on page 57.) This release of AP is *not* compatible with Solstice DiskSuite 4.0.

Note – Veritas 2.5 DMP is incompatible with AP. Veritas 2.5 DMP checks for AP metadevices, and bars installation of itself if it finds them. This compatibility problem will be addressed in the Veritas 3.2 timeframe.

General Issues

This section contains general issues that involve AP on Enterprise 3x00, 4x00, 5x00, and 6x00 servers. You should read the section before you attempt to install or configure AP.

Supported Devices

The following devices are supported by the AP software on Sun Enterprise servers:

- SPARCstorage™ Arrays recognized by AP using the `pln` ports
- Sun StorEdge A5000 recognized by AP using `sf`
- SunFastEthernet™ 2.0 (`hme`)
- SunFDDI™ 5.0 (`nf`) SAS and DAS
- SCSI-2/Buffered Ethernet FSBE/S and DSBE/S (`le`)
- Quad Ethernet (`qe`)
- Sun™ Quad FastEthernet™ (`qfe`)
- The system network Console

Sun StorEdge A3000

The Sun StorEdge A3000 supports failover capabilities that are similar to those provided by AP. Because of this, AP does not support the Sun StorEdge A3000. See that product's documentation for more information about its failover support.

Known Bugs

The following bugs are known to exist in AP 2.1.

Domain Panics When There are No AP Databases, but Metadevice Entries Still Exist in `/etc/vfstab` (4126897)

If you remove all of the AP databases, but you leave the references to the AP metadevices in `/etc/vfstab`, the domain will panic when you try to boot it.

Workaround: Ensure that you remove any `/etc/vfstab` references to AP metadevices if you remove all of the AP databases.

AP-Disk Autofailover Hangs On Simultaneous Multi-Pathgroup Failures (4126743)

AP auto-switching hangs if the following conditions exist:

1. The system is operating with multiple disk-pathgroups, and AP database files are configured on one of the pathgroups.

2. Catastrophic controller failures occur on multiple pathgroups, with the final failure occurring on the pathgroup which contains the AP database files. The final failure must occur within 30 seconds (for SSA controllers) prior to the completion of the automatic switching for the previous failure.

Workaround: None

Getting Invalid Messages on Boot With Solaris 2.6 and AP 2.1 (4108369)

The power management subsystem does not know how to parse AP metadevices.

Workaround: You can safely ignore these messages.

AP Does Not Support Kernel-Level, Multithread Async I/O (4129650)

AP does not provide kernel-level, multithreaded, asynchronous I/O entry-points. This may negatively affect performance when asynchronous I/O defaults to the library level.

Workaround: None

AP Patches

AP is new to the Sun Enterprise 3x00, 4x00, 5x00, and 6x00 servers, so no AP patches need to be installed.

Documentation Errata

If you are planning to perform a fresh-install of AP, use one of the following commands when you add the AP packages.

a. For the Enterprise 10000, use the following command:

```
domain_name# pkgadd -d /cdrom/Product SUNWapdoc SUNWapu SUNWapr
```

b. For Enterprise 3x00, 4x00, 5x00, and 6x00 servers, use the `/cdrom0` mount point:

```
# pkgadd -d /cdrom/cdrom0/Product SUNWapdoc SUNWapu SUNWapr
```

Dynamic Reconfiguration of Sun Enterprise 3*x*00, 4*x*00, 5*x*00, and 6*x*00 Servers

These release notes provide the latest information on Dynamic Reconfiguration (DR) functionality for Sun™ Enterprise™ 6500, 6000, 5500, 5000, 4500, 4000, 3500, and 3000 systems running Solaris 2.6 5/98.

For complete information on Sun Enterprise Server Dynamic Reconfiguration for Sun Enterprise 3*x*00, 4*x*00, 5*x*00, and 6*x*00 servers, refer to *Dynamic Reconfiguration User's Guide For Sun Enterprise 3x00/4x00/5x00/6x00 Systems*.

For Solaris 2.6 5/98 on Sun Enterprise 3*x*00, 4*x*00, 5*x*00, and 6*x*00 servers, DR functionality is limited to some types of I/O boards and does not include CPU/Memory boards.

Supported Hardware

Before proceeding, ensure the system has Dynamic Reconfiguration capabilities. If you see the following message on your console or in your console logs, the hardware is of an older design and not suitable for Dynamic Reconfiguration.

```
Hot Plug not supported in this system
```

Supported I/O boards are listed in the section for *Solaris2.6 HW3* on the web site:

```
http://sunsolve2.Sun.COM/sunsolve/Enterprise-dr
```

The supported hardware includes type 1 Sun Enterprise I/O boards (SBus I/O boards with 3 SBus slots)

At the present time, the following I/O option and driver combinations support DR in Solaris 2.6 5/98. Refer to the web site for updates to this list.

TABLE 3-5 I/O Options and Drivers That Support DR

Option	Driver
SBUS Sunswift	isp/sd, hme
SWIS/S	isp/sd
DWIS/S	isp/sd
Ultra DWIS/S	fas/sd
25 MB/s Fiber Channel Controller	soc/pln/ssd
SBUS Sun Fast Ethernet	fas/sd,hme
SBUS Quad Fast Ethernet	qfe
TurboGX/TurboGX Plus	
DSBE/S	esp/sd, le

At the present time, the following I/O option and driver combinations support DR suspend and resume in Solaris 2.6 5/98, but do not support DR attach/detach. Refer to the web site for updates to this list.

TABLE 3-6 I/O Options and Drivers That Support Suspend/Resume Only

Option	Driver
FSBE/S	esp/sd, le
PCI Sunswift	isp/sd, hme
PCI Sun Fast Ethernet	fas/sd,hme
PCI Quad Fast Ethernet	qfe
Creator (FFB)	
Creator 3D (FFB2)	

At the present time, the following I/O board types support DR attach and detach. Refer to the web site for updates to this list.

TABLE 3-7 Supported Board Types

Type	Comments
Type 1, SBus	Dual SBus circuits, 3 SBus card slots, SOC
Type 4, SBus+	Dual SBus circuits, 3 SBus card slots, SOC+ (requires A5000 patch, refer to the web site for the patch number)

Limitations

The following limitations are known at this time. Refer to the web site for updates to this list.

- An I/O board in slot 1 is essential to system operation and is intentionally not detachable.
- Hot-plugging multiple boards and connect/configure all of them together may lead to a hang and this will prevent further DR operations (bugid 4130728).
- Overlapping DR operations may lead to system hang (bugid 4128893, 4132047).
- The central I/O board removal is not allowed. (bugid 4112730). The central I/O board provides the electrical path to devices on the clock board, and is normally the lowest-numbered working I/O board.
- DR attach of a "disabled-at-boot" board after replacing its power supply is not allowed (bugid 4120760).
- Cannot unconfigure board at slot 15: operation fails (4101093).

Unsupported Hardware

At this time the following option and driver combinations do not support DR. Refer to the web site for updates to this list.

TABLE 3-8 Unsupported Hardware

Device	Driver	Bug ID
FSBE/S	esp/sd, le	4099749
Quad Ethernet	qe	4106428
SBUS HSI/S	hsi	4099635

TABLE 3-8 Unsupported Hardware *(Continued)*

Device	Driver	Bug ID
PCI HSI/S	hsi	4099635, 4122455
SunATM-155/MFiber	ba	1230593
PCI SunATM-155/MFiber	ba	4124768, 1230593, 4122455
SunFDDI 5.0 (SAS)	nf pf	4124764
SBUS 100 MB/s FC-AL Controller	socal/sf/ssd	4083412
A5000		4083412

At this time the following I/O option and driver combinations have not yet been tested. Refer to the web site for updates to this list.

TABLE 3-9 Untested Options and Drivers

Option	Driver
SunATM-622/MFiber	ba
PCI SunATM-622/MFiber	ba
SunFDDI 4.0 (SAS)	nf pf
SunISDN	isppp

At the present time, the following I/O board types do not support DR. Refer to the web site for updates to this list.

TABLE 3-10 Supported Board Types

Type	Comments	Bug ID
Type 2, UPA and SBus	UPA and SBus circuits, 2 SBus card slots and 1 UPA card slot	4113611
Type 3, PCI	2 PCI card slots	4122455
Type 5, Graphics+	UPA and SBus circuits, 2 SBus card slots and 1 UPA card slot	4113611

Firmware

To perform Dynamic Reconfiguration operations your machine may require a firmware update. If an update is needed, the following message will appear during boot:

```
Firmware does not support Dynamic Reconfiguration
```

All other DR firmware functionality remains the same.

Your machine must be running CPU OBP version 3.2.15 or later.

To see your current PROM revision, enter `.version` and `banner` at the `ok` prompt. Your display may be similar to the following:

```
ok .version
Slot  0 - CPU/Memory   OBP   3.2.15 1998/04/20  POST  3.9.3  1998/04/16
Slot  1 - I/O Type 1   FCODE 1.8.3  1997/11/14  iPOST 3.4.6  1998/04/16
Slot  2 - CPU/Memory   OBP   3.2.15 1998/04/20  POST  3.9.3  1998/04/16
Slot  4 - I/O Type 1   FCODE 1.8.3  1997/11/14  iPOST 3.4.6  1998/04/16
Slot  6 - I/O Type 3   FCODE 1.8.7  1997/05/09  iPOST 3.0.2  1997/05/01
Slot  7 - I/O Type 3   FCODE 1.8.7  1997/05/09  iPOST 3.0.2  1997/05/01
{5} ok banner
8-slot Sun Enterprise 4000/5000, No Keyboard
OpenBoot 3.2.15, 1024 MB memory installed, Serial #9039599.
Ethernet address 8:0:20:89:ee:ef, Host ID: 8089eeef.
```

To update your firmware, refer to the web site:

```
http://sunsolve2.Sun.COM/sunsolve/Enterprise-dr
```

Here you will find information on the following:

- How to download the DR capable PROM
- How to upgrade the PROM

Known Bugs

Bug List on the Internet

For the current list of DR software bugs, refer to the web site:

```
http://sunsolve2.Sun.COM/sunsolve/Enterprise-dr
```

Current Bugs

The following bugs are known at this time. Refer to the web site for late-breaking information.

4101093

Cannot unconfigure board at slot 15: operation fails. Applies to 16-slot card cages in Sun Enterprise 6500 and 6000 systems.

4112730

In Sun Enterprise 6500, 6000, 5500, 5000, 4500, 4000, 3500, and 3000 systems the “central” I/O board cannot be removed under Dynamic Reconfiguration. (The central I/O board provides the electrical path to devices on the clock board, and is normally the lowest-numbered working I/O board.)

4113611

The connection for type 2 and type 5 I/O boards involves a lengthy delay. For this reason type 2 and type 5 I/O boards are not yet supported.

4114345

DR operations on a type 2 or type 5 board with an FFB option card may result in a FATAL reset.

4118330

AP path may be inaccesible when switching to a board immediately after the board has been configured by DR.

Workaround: Allow sufficient time for a DR attach process to complete before making an AP switch. To verify that the process had finished, use `prtvtoc(1M)` to check the availability of a disk in the switching path.

4120760

DR attach of a “disabled-at-boot” after replacing its power supply is not allowed.

Workaround: physically remove and than replace the board.

4122455

The kernel may panic while a PCI I/O board is being reattached.

4128893

Overlapping DR operations may hang the system.

4130728

If several hot-plugged boards are removed/replaced at the same time, and if you attempt to connect/configure them together, DR operations may hang.

Workaround: perform DR operatons on a single board at a time.

4132047

Overlapping DR operations may hang the system.]

4132116

`vxvm` version 2.5 conflicts with DR for Sun Enterprise 3x00, 4x00, 5x00, and 6x00 systems. Adding `vxvm` 2.5 to a DR system and bringing a disk under `vx` control does not allow a DR disconnect to occur due to layered open. Adding vxvm 2.5 to a system that has a SPARCstorage Array that was previously under vx control will not allow a disconnect to occur on the board(s) connected to that SPARCstorage Array.

Workaround: use `vxdisk` offline to release the disks from vx control.