Sun Enterprise Server Alternate Pathing 2.3 Installation and Release Notes

THE NETWORK IS THE COMPUTER™

Sun Micosystems, Inc.
901 San Antonio Road
Palo Alto, CA 94303-4900
USA 650-960-1300 FAX650 969-9131

Part No. 806-1935-10
February 2000, Revision A

Send comments about this document to: docfeedback@sun.com

Please
Recycle

Adobe PostScript

Please
Recycle

Contents

Preface

Sun Enterprise Server Alternate Pathing 2.3 Installation Guide and Release Notes provides installation instructions for the Sun Enterprise Server™ systems. These instructions are designed for an experienced system administrator with networking knowledge.

Before You Read This Book

This manual is intended for the Sun Enterprise system administrator, who has a working knowledge of UNIX® systems, particularly those based on the Solaris™ operating environment. If you do not have such knowledge, read the Solaris User and System Administrator AnswerBook™ documentation provided with this system, and consider UNIX system administration training.

How This Book Is Organized

This guide contains the following chapters:

Chapter 1 describes installation and upgrade instructions for AP 2.3.

Chapter 2 contains the release notes for AP 2.3.

Using UNIX Commands

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

See one or more of the following for this information:

- AnswerBook online documentation for the Solaris software environment, particularly those dealing with Solaris system administration
- Other software documentation that you received with your system

Typographic Conventions

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

Shell Prompts

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

Ordering Sun Documentation

Fatbrain.com, an Internet professional bookstore, stocks select product documentation fromSun Microsystems, Inc.

For a list of documents and how to order them, visit the Sun Documentation Center on Fatbrain.com at:

`http://www1.fatbrain.com/documentation/sun`

Related Documentation

Application	Title	Part Number
User	*Sun Enterprise Server Alternate Pathing 2.3 User Guide*	806-1933-10
Reference	*Sun Enterprise Server Alternate Pathing 2.3 Reference Manual*	806-1934-10
Other	*Sun Enterprise 10000 Dynamic Reconfiguration User Guide*	806-2249-10
	Sun Enterprise 6x00, 5x00, 4x00, 3x00 Dynamic Reconfiguration User Guide	806-0280-10
	Sun Enterprise 10000 Dynamic Reconfiguration Reference Manual	806-2250-10

Accessing Sun Documentation Online

The `docs.sun.com`SM web site enables you to access Sun technical documentation on the Web. You can browse the `docs.sun.com` archive or search for a specific book title or subject at:

`http://docs.sun.com`

Sun Welcomes Your Comments

We are interested in improving our documentation and welcome your comments and suggestions. You can email your comments to us at:

`docfeedback@sun.com`

Please include the part number (806-1935-10) of your document in the subject line of your email.

CHAPTER 1

Alternate Pathing 2.3 on the Sun Enterprise Servers

This chapter contains initial installation and upgrade instructions for Alternate Pathing (AP) 2.3. With the introduction of AP 2.3, 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 1-1 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 that has 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 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 will not run under software releases earlier than Solaris 2.6.

▼ 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 will be downloaded is named `ap_2_3_sparc.tar.Z`.
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:**

```
# uncompress -c ap2_3_sparc.tar.Z | tar xvf -
```

   The AP 2.3 packages are located in */download_directory*`/ap_2_3_sparc/Product` and the install and upgrade scripts are located in */download_directory*`/ap_2_3_sparc/Tools`.
7. **Proceed to “Performing an Initial Installation of AP” on page 4 or “Performing an Upgrade of AP” on page 10.**

▼ 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 installation directory is not local to your system (for example, Sun Enterprise 10000) and you are not familiar with remote installation using a CD-ROM, see "To Mount a CD-ROM" on page 3 or refer to your *Solaris System Administration Guide*.

The AP 2.3 packages are located in `/cdrom/cdrom0/Alternate_Pathing_2.3/Product`. The install and upgrade scripts are located in the `/cdrom/cdrom0/Alternate_Pathing_2.3/Tools` directory.

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

```
# cd /cdrom/cdrom0/Alternate_Pathing_2.3/Product
```

3. **Proceed to "Performing an Initial Installation of AP" on page 4 or "Performing an Upgrade of AP" on page 10.**

▼ To Mount a CD-ROM

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/Alternate_Pathing_2.3
```

- If `nfsd` is not running, type:

```
# /etc/init.d/nfs.server start
# share -F nfs -o ro /cdrom/Alternate_Pathing_2.3
```

4. **Log in to target machine as superuser and change directories to the source machine:**

```
# cd /net/source_machine/cdrom/Alternate_Pathing_2.3
```

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/
Alternate_Pathing_2.3 /remote_products
```

```
# cd /remote_products
```

5. **At this point you may proceed with the install, "Performing an Initial Installation of AP" on page 4 or "Performing an Upgrade of AP" on page 10.**

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 "Performing an Upgrade of AP" on page

10to install AP 2.3. That procedure uses scripts that save your current AP configuration, and then restores that configuration after you install the AP 2.3 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 will not run under software releases earlier than Solaris 2.6.

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. Once you have finished deconfiguring or if you do not have a volume manager installed, proceed to Step 1

▼ Installing AP 2.3

1. **Install the AP 2.3 domain packages on the server:**

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

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** to continue.

When this portion of the installation is complete, the AP 2.3 packages have been installed and the superuser prompt is displayed.

2. **If applicable, remove the Sun Computer Systems Supplement CD from the CD-ROM drive:.**

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

3. **Configure AP.**

   For an example of the steps you need to follow, see “Configuring AP” on page 6. Also see the *Alternate Pathing 2.3 User Guide*.

▼ Configuring AP

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

```
# apdb -c raw_disk_slice -f
```

Note – See the *Alternate Pathing 2.3 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 `pln` ports. Your ports may vary, depending on the configuration of the host.

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

```
# apinst
pln:0
    /dev/dsk/c1t0d0
    /dev/dsk/c1t1d0
    /dev/dsk/c1t2d0
    /dev/dsk/c1t3d0
    /dev/dsk/c1t4d0
    /dev/dsk/c1t5d0
pln: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 pln:0 -a pln: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. Rebuild the devices directories:

```
# drvconfig -i ap_dmd
# ls -l /devices/pseudo/ap_dmd*
...
```

As shown, you can verify the results of the `drvconfig(1M)` command by listing the contents of `/devices/pseudo/ap_dmd*`.

e. Create symbolic links from the devices directory `/devices/pseudo` to the special metadisk files in `/dev/ap/dsk` and `/dev/ap/rdsk`:

```
# apconfig -R
# ls -l /dev/ap/dsk
...
```

As shown, you can verify the results of the `apconfig(1M)` command by listing the contents of `/dev/ap/dsk` to view the symbolic links.

f. 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`.

g. 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).

Note – The following steps should be applied to all networks that you want to alternately path *except* the primary network.

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.

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.*

---

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.

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 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.**

Caution – 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, you should configure your volumes using AP metadisk paths rather than physical paths. SDS recognizes and properly installs 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 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`.
  - It is best to configure VxVM *after* you configure AP. It is beyond the scope of this document to describe how to integrate AP with an existing VxVM configuration.
  - There must be a "small amount" of free disk space at the beginning or end of the disk.

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

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

Performing an Upgrade of AP

This section provides upgrade instructions for AP 2.3 on the Sun Enterprise Servers. AP 2.0, AP 2.0.1, AP 2.1 and AP 2.2 are not supported under the Solaris 8 2/00 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_sparc/Tools` from the web or on CD-ROM in `/cdrom/cdrom0/Alternate_Pathing_2.3/Tools`.

Note – If you are upgrading to AP 2.3 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.

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 1-2 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 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 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 packages. It is possible that you will upgrade the Solaris software at the same time you upgrade to AP 2.3, since AP 2.3 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.

Furthermore, 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 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.

To Upgrade to AP 2.3

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/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`. This script also generates an executable shell script that you can use to regenerate your AP configuration. 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.

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 User Guide*.

See “Upgrading a System” in *Solaris 8 (SPARC Platform Edition) Installation Library*. 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, upgrade to AP 2.3.**

   a. Log in as superuser and type:

   If you downloaded software from the web:

```
# cd /download_directory/ap_2_3_sparc/Tools
```

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

```
# cd /cdrom/cdrom0/Alternate_Pathing_2.3/Tools
```

   b. Install the required AP 2.3 packages:

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

   c. Run the following script to restore the original AP configuration:

Note – Be sure to read “Simultaneously Upgrading AP and Solaris Software” on page 12before performing the following command.

```
# /path/Alternate_Pathing_2.3/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.

6. **If you have a third party volume manager, install and configure it according to manufacturer’s instructions now.**

Caution – If your boot disk is mirrored, make sure you specify the upgraded disk as the primary mirror.

Upgrade is now complete.

CHAPTER 2

AP 2.3 on Sun Enterprise Servers Release Notes

AP 2.3 on Sun Enterprise Servers

This section contains the release notes for Alternate Pathing (AP) 2.3 on Sun Enterprise 3x00, 4x00, 5x00, 6x00 and 10000 servers.

Note – AP 2.3 is the first release of AP that supports the Solaris 8 operating environment.

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 AP 2.3 User Guide* in the Solaris 8 on Sun Hardware Collection AnswerBook2™.

Installation Issues

If you are upgrading from Solaris 2.6 or Solaris 7 software to Solaris 8 software and have AP 2.1 or AP 2.2 on your system, you must upgrade to AP 2.3. Because most systems have a volume manager installed we have included references to them.

Note – AP 2.3 installation is Solaris operating environment specific. If you have already installed AP 2.3 on your system and choose to upgrade your operating system at a later date, you must follow the upgrade procedure to remove the AP 2.3 software using `pkgrm` and re-install AP 2.3.

This section contains an overview of the entire upgrade process, which requires you to use several sections from different publications. You should ensure that you have the following publications before you start the upgrade:

- *Solaris 8 Beta Release Notes Supplement for Sun Hardware* (available in printed form in your Solaris 8 Media Kit)
- *Solaris 8 Sun Hardware Platform Guide*, (available in printed form in your Solaris 8 Media Kit or in AnswerBook2 format on the Sun Hardware Supplements CD)
- *Sun Enterprise Server Alternate Pathing 2.3 User Guide* (available in AnswerBook2 format on the Sun Hardware Supplements CD in your Solaris 8 Media Kit)
- Your Volume Manager User Guide
- Your Volume Manager Installation and Product Notes

Note – Before attempting an upgrade, verify that your volume manager supports the Solaris 8 2/00 software.

Caution – You must follow the sequence given here to successfully complete the upgrade.

In general, you will perform the following tasks:

- Deconfigure your volume manager
- Remove the previous version of AP.
- Upgrade to the Solaris 8 operating environment.
- Install AP 2.3.
- Install and reconfigure your volume manager

Specifically, you must perform the following tasks:

1. Read “Performing an Upgrade of AP” in the *Solaris 8 2/00 Sun Hardware Platform Guide*.
2. Commit any uncommitted AP metadevices (see Step 1 in “To Upgrade AP” in the *Solaris 8 2/00 Sun Hardware Platform Guide*).
3. Deconfigure your volume manager using the documentation provided by the specific vendor.

Note – 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 – When the volume manager has been deconfigured and 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.

4. Remove the current AP configuration using “Remove the current AP configuration.” on page 14.
5. Upgrade to Solaris 8 using “Upgrade the Solaris operating environment (if applicable) now.” on page 14.
6. Upgrade to AP 2.3 using “When the Solaris software upgrade process is completely finished, upgrade to AP 2.3.” on page 15.
7. Install your volume manager according to your manufacturer’s instructions.

General Issues

This section contains general issues that involve AP on Sun Enterprise servers. Read this section before you attempt to install or configure AP.

Note – If you are upgrading to AP 2.3 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.

Supported Devices

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

- SPARCstorage™ Arrays recognized by AP using the `pln(soc)` controllers
- Sun™ StorEdge™ A5000 recognized by AP using `sf(socal)` controllers
- Sun™ StorEdge™ T300 recognized by AP using `sf(socal)` controllers
- SunFastEthernet™ 2.0 (`hme`)
- SunFDDI/S™ 6.0 (`nf`) SAS (Single-Attach Station) and DAS (Dual-Attach Station)
- SCSI-2/Buffered Ethernet FSBE/S and DSBE/S (`le`)
- Quad Ethernet (`qe`)
- Sun™ Quad FastEthernet™ (`qfe`)

- Sun Gigabit Ethernet 2.0 (ge)

The following table lists which devices are supported in which releases:

TABLE 2-1 AP Support Matrix

AP Version	Solaris Release	NICs									Disk Controllers	Storage Products
		ge	hme	le	nf	bf	hi	qe	qfe	vge		
2.0	2.5.1		X	X	X	X	X	X	X		pln / soc	SSA
2.0.1	2.5.1		X	X	X	X	X	X	X		pln / soc, sf / socal	SSA, A5000
2.1	2.6	X	X	X	X			X	X	X	pln / soc, sf / soc	SSA, A5000
2.2	7	X	X	X	X			X	X		pln / soc, sf / socal,	SSA, A5000
2.3	2.6,	X	X	X	X			X	X	X	pln / soc, sf / socal	SSA, A5000,
	7,	X	X	X	X			X	X		pln / soc, sf / socal,	SSA, A5000, T300§
	8	X	X	X	X				X		pln / soc, sf / socal,	SSA, A5000, T300§
§ - AP 2.3 has not been optimized for T300 support in this release. See “Sun StorEdge T300” on page 21.												

SunFDDI and Gigabit Ethernet Devices

AP 2.3 validation tests were performed on SunFDDI/S (revision 6.0) and Gigabit Ethernet (revision 2.0). If you install either of these devices, you must use the revision level that was tested, unless a higher revision level exists. In addition, you must install all of the available patches for these devices. Refer to `http://www.sunsolve.sun.com` for more information about the patches.

Sun StorEdge A3000

The Sun StorEdge A3000 supports failover capabilities that are similar to those provided by AP 2.3. Because of this, AP 2.3 does not support the Sun StorEdge A3000. See that product's documentation for more information about its failover support.

Sun StorEdge A5000

AP 2.3 supports the Sun StorEdge A5000 for this release.

Sun StorEdge A7000

AP 2.3 does not support the Sun StorEdge A7000 for this release.

Sun StorEdge T300

AP 2.3 supports the Sun StorEdge T300 with standard AP active/passive I/O distribution algorithms for this release.

Software Compatibility

The following lists includes the possible combinations of AP and Solaris software you can install on a Sun Enterprise server.

- Solaris 8 with AP 2.3 and DR
- Solaris 7 with AP 2.3 and DR
- Solaris 7 with AP 2.2 and DR
- Solaris 2.6 with AP 2.3 and DR
- Solaris 2.6 with AP 2.1 and DR
- Solaris 2.5.1 with AP 2.0.1 and DR (Sun Enterprise 10000 server only)
- Solaris 2.5.1 with AP 2.0 and DR (Sun Enterprise 10000 server only)

Dynamic Reconfiguration (DR) Issues

The DR Attach operation can complete without the controller being immediately accessible to AP. You must verify that the physical device is present before switching to the new controller using `apconfig`.

A Sun Enterprise 10000 Server running the Solaris 2.6 operating environment requires Patch 106284-02 for AP 2.3 to run correctly with the `dr_daemon`.

Boot Disk Issues

AP 2.3 provides support for only one alternately pathed boot disk plus a mirror disk per domain.

In order to fix inconsistencies in boot recovery behavior device aliases for the boot disk are not supported.

Boot recovery is architecture generic in AP 2.3. Boot recovery works on Sunfire as well as Starfire platforms.

AP Documentation Locations

Documentation for AP 2.0 and 2.0.1 can be found in their respective collections under Hardware -> Enterprise Servers at `docs.sun.com`.

AP 2.1 and 2.2, however are in the Hardware -> Solaris on Sun Hardware Answerbook collection at `docs.sun.com`.

AP 2.3 is in it's own collection under Hardware -> Enterprise Servers.

Known Bugs/RFEs

The following Bugs/RFEs are known to exist in the FCS version of AP 2.3:

SunBugID 4297640 - BAD TRAP panic with mether_rarp with AP network switching.

SunBugID 4304418 - Starfire panics after removing network drivers rebooting - AP databs not updated.

SunRFEID 4265982 - an immediate switch of path using AP after DR configure forces it into a 'T' state.

SunRFEID 4276330 - AP handling for individual target failure, FC hubs/fabric, and daisy chaining.

SunRFEID 4297492 - hang on e3500 with mirrored internal disk pull out with ap and sds.

Fixed Bugs

This section contains the synopses and Sun BugID number of the more important bugs that have been fixed since the AP 2.2 release (Solaris 7 11/99). This list does not include all of the fixed bugs.

SunBugID 4166261 - manual ap switch of `hme` meta device loses communication.

SunBugID 4166249 - manual ap switch of `qfe` meta device loses communication.

SunBugID 4171297 - `ap_ioctl` operation panics 64-bit kernel when performing DR drain.

SunBugID 4174503 - AP network with HME switches to device with bad cable, but does not switch back.

SunBugID 4176249 - domain hung on offlining cpu.

SunBugID 4211884 - gigabit ethernet fails to communicate after ap switch.

SunBugID 44162900 - mount an ap metadevice panics.

Other Bugs

This section contains the synopses and Sun BugID number of the more important bugs that have been discovered regarding AP 2.3 and the Solaris 8 operating system. This list does not include all bugs.

SunBugID 1267410 - upgrade fails on system with metadevice in `vfstab`. (`suninstall`).