



Sun StorEdge™ Instant Image 3.0 Installation Guide

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Caution – *Do not* install the Sun StorEdge Version 3.0 core and data services software on servers in a Sun Cluster 3.0 environment.

- The Version 3.0 software is *not* coexistent with the Sun Cluster 3.0 environment
- The Version 3.0 software is coexistent in the Sun Cluster 2.2 environment
- The Version 3.0 core and data services software is cluster aware in the Sun Cluster 3.0 Update 1 environment and provides high availability for the Sun StorEdge data services.

Note – If you are upgrading from Instant Image Versions 2.0 or 2.0.1, please refer to “Upgrading Instant Image 2.0 or 2.0.1 to Instant Image 3.0” on page 17 for important information.

This guide describes installation procedures for the Sun StorEdge™ Instant Image 3.0 software and the Fast Write Cache software, and includes the following:

- “Instant Image Overview” on page 2
- “System Requirements” on page 4
- “Preparing for Installation” on page 5
- “Installing the Instant Image Software” on page 10
- “Configuring the Instant Image Software” on page 14
- “Backing Up and Restoring Configuration Information” on page 15
- “Upgrading Instant Image 2.0 or 2.0.1 to Instant Image 3.0” on page 17
- “Reinstalling Instant Image 3.0” on page 23
- “Sun StorEdge Fast Write Cache Software” on page 25

Instant Image Overview

The Instant Image software is a point-in-time volume copy facility for the Solaris™ operating environment. With the Instant Image software, you create a *volume pair*, a point-in-time logical volume copy (*shadow* volume) from the original logical volume (*master* volume) that you specify. Once the shadow volume is established, you can read from and write to this shadow volume and the master volume. An Instant Image *volume set* contains the master and shadow volumes with an associated *bitmap* volume, which is used to track differences between the volumes.

The Instant Image software enables you to quickly update the shadow volume from the master volume or restore the master volume from the shadow volume. The Instant Image software also supports *fast resynchronization*, which enables you to create a new point-in-time volume copy by updating the specified volume with only the changed data.

Related Documentation

Application	Title	Part Number
man pages	iiadm fwcadmin svadm dscfg pkgrm pkgask scmadmin pkgadd	N/A
Late-breaking Information	<i>Sun StorEdge Instant Image 3.0 Release Notes</i>	806-7678
System Administration	<i>Sun StorEdge Instant Image 3.0 System Administrator's Guide</i>	806-7677
Configuration	<i>Sun StorEdge Instant Image 3.0 Configuration Guide</i>	806-7676

Online Sun Documentation

A broad selection of Sun system documentation is located at:

<http://www.sun.com/products-n-solutions/hardware/docs>

A complete set of Solaris documentation and many other titles are located at:

<http://docs.sun.com>

Documentation Conventions

Typeface or Symbol	Meaning	Examples
AaBbCc123	The names of commands, files, and directories; on-screen computer output.	Edit your <code>.login</code> file. Use <code>ls -a</code> to list all files. % You have mail.
AaBbCc123	What you type, when contrasted with on-screen computer output.	% su Password:
<i>AaBbCc123</i>	Book titles, new words or terms, words to be emphasized. Command-line variable; replace with a real name or value.	Read Chapter 6 in the <i>User's Guide</i> . These are called <i>class</i> options. You <i>must</i> be <code>root</code> to do this. To delete a file, type <code>rm filename</code> .
[]	In syntax, brackets indicate that an argument is optional.	<code>scmadm [-d sec] [-r n[:n][,n]...] [-z]</code>
{ arg arg }	In syntax, braces and pipes indicate that one of the arguments must be specified.	<code>sndradm -b {phost shost}</code>

System Requirements

Hardware A CD-ROM drive connected to the host server where the Instant Image software is to be installed.

The Instant Image software is supported on server hosts using the Solaris operating environment. Hosts include but are not limited to:

- Sun Enterprise™ Server models 2X0 through 4x0
- Sun Enterprise Server models 3X00 through 10000

Disk space:

- The Instant Image software requires approximately 1 Mbyte
- Supporting packages require approximately 3 Mbytes

If you plan to export shadow volumes, you must store the shadow volume on a dual-ported drive

Software Solaris™ 7 or 8 Operating Environment or a subsequent compatible version

Sun StorEdge Core Services software CD
Sun StorEdge Instant Image software CD

Preparing for Installation

If you have not already done so, you should determine where the Sun StorEdge Data Services configuration file is to reside. You *must* run the validation script.

This section includes:

- “Creating a Response File” on page 5
- “To Run the Sun StorEdge Validation Script” on page 7
- “Bitmaps” on page 9

Creating a Response File

When you install the Sun StorEdge Core Services, the installation process prompts you for a location for the Sun StorEdge data service configuration. (All Sun StorEdge data services use this location.) You can respond during the installation (see “To Install the Instant Image Software” on page 10) or you can specify a response file, which you can create with procedures in this section, when you run the `install_core` script.

You can create a response file two ways:

- Using a text editor
- Using the `pkgask(1M)` utility

About The Configuration Location

The configuration location must be a file name or block device for the single configuration location used by all Sun StorEdge data service software you plan to install. For example, `/dev/dsk/ctl1d0s7` or `/config`.

If you select a file name, its file system *must* be the root (`/`) or `/usr` file system. If you select volume manager-controlled volume, it must be available when the Sun StorEdge data services software is started.

▼ To Use a Text Editor to Create a Response File

1. Open an ASCII file using a text editor such as `vi(1)` or `ed(1)`.
2. Enter a single line in the file:

```
FILE_LOC=response
```

where *response* is a file name or block device for the single configuration location.

3. Save and exit the ASCII file.

▼ To Use the `pkgask` Utility

1. Ensure that the Volume Manager daemon `vold(1M)` is running.
2. Insert the Sun StorEdge Core Services software CD into the CD-ROM drive that is connected to your system.
3. Use the `pkgask` utility to create a response file by typing:

```
# pkgask -d /cdrom/cdrom0/CORE -r response-file SUNWscmu
```

where *response-file* is the response file you will specify when you run the Sun StorEdge Core Services software installation process.

The `pkgask` utility prompts you as follows:

```
Do you want to specify the Sun StorEdge data services configuration  
location? [y,n,?] y
```

```
Where should the Sun StorEdge data services configuration be  
located?
```

4. Specify a file name or block device.

The utility displays the following response:

```
Response file response-file was created.
```

```
Processing of request script was successful.
```

▼ To Run the Sun StorEdge Validation Script

Note – Do not execute the `probe_script` script after you have installed Version 3.0 of the Sun SNDR, Instant Image, and SUNWnvm software. Generally, you should only run the script as part of the upgrade process from Version 2.0 to Version 3.0.

1. Log in as the root user.
2. Insert the Sun StorEdge Core Services software CD into the CD-ROM drive that is connected to your system.
3. Start the Volume Manager daemon `vold(1M)` (if needed) and run the validation script.

```
# /etc/init.d/volmgt start
# cd /cdrom/cdrom0
# ./probe_script
```

The `probe_script` script verifies the following:

- That you are the root user
- That you are running the Solaris 7 operating environment or a subsequent compatible version
- That you do not have any 2.0 data services installed

If you are the root user, the operating system is supported, and there are no packages that need to be removed, the system echoes:

```
"System is ready for 3.0 data services installation"
```

If you are not the root user or if the Solaris operating environment is not compatible, the `probe_script` returns a message that includes this information.

If any 2.0 data services are installed, the `probe_script` script lists the packages that you must remove and the order in which you must remove them with `pkgrm(1M)`.

Note – You *must* remove the packages in the order listed.

4. If the script detects that Instant Image 2.0 or 2.0.1 is currently installed on your system, perform the procedures described in “Upgrading Instant Image 2.0 or 2.0.1 to Instant Image 3.0” on page 17.

Examples of probe_script messages:

```
# ./probe_script

Pre-installed II Management packages that must be uninstalled
SUNWiimsu SUNWiimsr SUNWsvmsu SUNWsvmsr

Pre-installed II packages that must be uninstalled
SUNWii

Pre-installed CORE packages that must be uninstalled
SUNWspcsl SUNWspsv SUNWscm SUNWspuni

Installation cannot continue unless these packages
are removed.

Please use pkgrm to uninstall these packages
in the order in which they appear.
This list can be found in /tmp/pkgrmlist.05_01_01_12:27:33
```

```
=>./probe_script

WARNING : You're currently not the root user
You must be root when you execute the installation scripts.

Pre-installed II Management packages that must be uninstalled
SUNWiimsu SUNWiimsr SUNWsvmsu SUNWsvmsr

Pre-installed II packages that must be uninstalled
SUNWii

Pre-installed CORE packages that must be uninstalled
SUNWspcsl SUNWspsv SUNWscm SUNWspuni

Installation cannot continue unless these packages
are removed.

Please use pkgrm to uninstall these packages
in the order in which they appear.
This list can be found in /tmp/pkgrmlist.05_01_01_12:28:56
```

Bitmaps

The Instant Image software uses raw devices to store bitmaps. Raw devices should be stored on a disk separate from the disk that contains the data. Configure RAID (such as mirrored partitions) for these bitmap devices, and ensure that the mirrored members are not stored on the same disk as the data.

In Instant Image 3.0, a bitmap can reside only on a volume. In a Sun Cluster environment, the bitmap volume must be part of the same disk group or cluster resource group as the corresponding master or shadow data volume.

Note – Version 2.0 bitmap files must be converted to Version 3.0 bitmap volumes. See “To Convert Version 2.0 Bitmap Files into Version 3.0 Bitmap Volumes” on page 18.

Bitmap Volume Size Requirements

An Instant Image bitmap volume’s size is based on the size of the master volume and the type of volume set being created (independent, full-sized dependent, or compact dependent) as follows:

- For independent or full-sized shadow dependent volume sets:
 - 8 Kbytes per 1 Gbyte of master volume size (rounded-up to the nearest whole Gigabyte), plus an additional 24 Kbytes for overhead.
For example, to shadow a 3-Gbyte master volume, the bitmap size must be $(3 \times 8 \text{ Kbytes}) + 24 \text{ Kbytes}$, or 48 Kbytes in size.
- For compact dependent shadow volume sets:
 - 256 Kbytes per 1 Gbyte of master volume size (rounded up to the nearest whole Gbyte), plus 8 Kbytes per 1 Gbyte of master volume (rounded up to the nearest whole Gbyte), plus an additional 24 Kbytes for overhead.
For example, to shadow a 3-Gbyte master volume, the bitmap size must be $(3 \times 256 \text{ Kbytes}) + (3 \times 8 \text{ Kbytes}) + 24 \text{ Kbytes}$, or 816 Kbytes in size.

If you enable a volume set with a bitmap that is too large, the volume set is created even though space may be wasted. If you enable a volume set with a bitmap that is too small, the enable command fails with an error message.

Installing the Instant Image Software

You should install all data services at the same time, but if you must install another data service at a later time, see “Installing the Sun StorEdge Software at Different Times” on page 13.

Before you start the installation, be sure you have run the Sun StorEdge validation probe_script described in “To Run the Sun StorEdge Validation Script” on page 7.



Caution – Versions 2.0 and 2.0.1 of the Sun StorEdge data services software are not compatible with Version 3.0. The data services software might include versions 2.0 or 2.0.1 of the following products:

- Instant Image
- Sun StorEdge Target Emulation
- Sun SNDR
- Fast Write Cache

For example, you cannot use Instant Image 2.0 with Sun SNDR 3.0. If you plan to install or upgrade to a Version 3.0 data service, you must first uninstall all Version 2.0 and 2.0.1 data services software.

▼ To Install the Instant Image Software

1. Log in as the root user.

You can install this software in either the single-user or multiuser state.

2. Insert the Sun StorEdge Core Services software CD into the CD-ROM drive that is connected to your system.

3. Start the Volume Manager daemon `vold(1M)` (if needed) and install the Sun StorEdge Core Services software using one of the following two methods.

Note – If you are installing more than one Sun StorEdge data service, you only need to start the Volume Manager daemon and install the Core Services software once. Do not start the daemon and install the Core Services software more than once.

- **Method 1:** To install the Sun StorEdge Core Services software without using a response file, type:

```
# /etc/init.d/volmgt start
# cd /cdrom/cdrom0
# ./install_core
```

The Core Services software packages begin to install. When the following prompt is displayed, proceed to Step 4.

```
Do you want to specify the Sun StorEdge data services configuration
location? [y,n,?]
```

- **Method 2:** To install Sun StorEdge Core Services software using a response file (see “Creating a Response File” on page 5), type:

```
# /etc/init.d/volmgt start
# cd /cdrom/cdrom0
# ./install_core response-file
```

where *response-file* is the file you created using the procedures in “Creating a Response File” on page 5. Proceed to Step 6.

4. For a first-time installation, respond by typing *y*.

The Core Services software prompts you as follows:

```
Where should the Sun StorEdge data service configuration be
located?
```

5. Enter a file name or block device for the single configuration location used by all Sun StorEdge data services software you plan to install.

For example, `/dev/dsk/c1t1d0s7` or `/config`

Note – If you select a file name, its file system *must* be the root (`/`) or `/usr` file system. If you select a volume manager-controlled volume, it must be available when the Sun StorEdge data services software is started.

6. If your system contains Fast Write Cache NVRAM boards and you want to use them, type:

```
# ./install_fw
```

7. Remove the Sun StorEdge Core Services software CD from the CD-ROM drive:

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

8. Insert the Instant Image CD and install the Instant Image software.

```
# cd /cdrom/cdrom0/  
# ./install_ii
```

The packages begin to install.

9. Remove the Instant Image software CD from the CD-ROM drive.

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

10. Complete the installation by doing one of the following:

- If you are installing other data services, eject the Instant Image software CD and continue installing those data services.
- If you are installing this data service at a later date than the original installation, see “Installing the Sun StorEdge Software at Different Times” on page 13.
- If you are installing only the Instant Image software or if this is the last data service you are installing, eject the CD and reboot the system. *You only need to reboot your system once, after you have installed all Sun StorEdge data software products.*

```
# cd /  
# eject cdrom  
# /etc/shutdown -y -g 0 -i 6
```


Installing the Sun StorEdge Software at Different Times

IF you have performed one of the following installation sequences:

- Installed the Sun StorEdge Core Services Version 3.0 software and have rebooted
- Installed the Core Services and one or more Version 3.0 data service software package and have rebooted

THEN you must reboot your server as described in the following text after you install another Version 3.0 software package. This situation also applies if you want to add data services software at a later date.

For example, if you:

- Install the Core Services software
- Install the Instant Image software

Then you reboot your server. If, after rebooting, you want to:

- Install the Sun SNDR software

You must:

- Reboot your server as follows after installing the Sun SNDR software:

```
# touch /reconfigure
# /etc/shutdown -y -g 0 -i 6
```

Configuring the Instant Image Software

The Instant Image 3.0 software supports only volume-based bitmaps. Do not use file-based bitmaps. See “To Convert Version 2.0 Bitmap Files into Version 3.0 Bitmap Volumes” on page 18 if you are upgrading from Instant Image 2.0 to Instant Image 3.0.

General Configuration Steps

1. Choose volumes to use as the master and shadow volumes.
2. Create a bitmap volume (file-based bitmaps are not supported).
3. Enable the volume group using the `/usr/opt/SUNWesm/sbin/iiadm` command. See `iiadm(1M)` and the *Sun StorEdge Instant Image 3.0 System Administrator's Guide* for more information.

Performing an enable operation using `iiadm` adds the volume group to Storage Volume (SV) driver control and to the Sun StorEdge configuration; the volume group is now configured for use.

Configuration Considerations

- You cannot make a shadow volume copy of the root device (`/`) or `/usr` file system.
- The bitmap volume cannot be located on the shadow volume. Place the bitmap volume in the root (`/`) or `/usr` file system. However, you may place it in any directory that you do not plan to unmount. Make sure the bitmap volume is on a mirrored volume.

Backing Up and Restoring Configuration Information

You use the `dscfg` command to back up and restore the data services configuration. Make this backup so that in the event of the failure of the volume where the configuration resides, you can restore the configuration from this backup.

▼ To Back Up Configuration Information

Back up your configuration information after you have set up an initial configuration and after you change your configuration by adding and deleting volumes.

- Write the configuration information to an ASCII file.

```
# /usr/opt/SUNWscm/sbin/dscfg -l > ascii-output-file
```

▼ To Restore Configuration Information



Caution – All Sun StorEdge data services information is deleted when you perform this restore procedure. Ensure that no data services software is in use when you perform this restore procedure. In a clustered environment, ensure that no node is using the data services software.

1. Initialize the configuration file.

All data services information will be lost. The command prompts you to confirm the action before any action is taken.

```
# /usr/opt/SUNWscm/sbin/dscfg -i
```

2. Load the configuration file parsing rules for the ASCII file.

```
# /usr/opt/SUNWscm/sbin/dscfg -i -p /etc/opt/SUNWesm/pconfig
```

3. Add the configuration file you created in “To Back Up Configuration Information” on page 15.

```
# /usr/opt/SUNWscm/sbin/dscfg -a ascii-output-file
```



Note – If the original configuration location becomes corrupted, you can change it using the `dscfg -s full-path` command. *Use this command only if the location becomes corrupted.*

Upgrading Instant Image 2.0 or 2.0.1 to Instant Image 3.0

For additional information, read the `pkgadd(1M)`, `pkgask(1M)`, and `pkgrm(1M)` man pages.

This section contains the following procedures to upgrade the Sun Instant Image Versions 2.0 and 2.0.1 software to Version 3.0:

- “Creating a Configuration File From Versions 2.0 or 2.0.1” on page 17
- “To Convert Version 2.0 Bitmap Files into Version 3.0 Bitmap Volumes” on page 18
- “To Remove Instant Image 2.0 or 2.0.1” on page 19
- “To Upgrade to Instant Image 3.0” on page 22



Caution – Versions 2.0 and 2.0.1 of the Sun StorEdge data services software are not compatible with Version 3.0. The data services software might include versions 2.0 or 2.0.1 of the following products:

Instant Image
Sun StorEdge Target Emulation
Sun SNDR
Fast Write Cache

For example, you cannot use Instant Image 2.0 with Sun SNDR 3.0. If you plan to install or upgrade to a Version 3.0 data service, you must first uninstall all Version 2.0 and 2.0.1 data services software.

Creating a Configuration File From Versions 2.0 or 2.0.1

Unlike Sun SNDR 2.0, Instant Image 2.0 and 2.0.1 do not have a configuration file. With Instant Image 3.0, you can keep using the same volumes that you used with Instant Image 2.0 and 2.0.1. (2.0.1 is a combination of Instant Image 2.0 and Sun StorEdge Target Emulation 1.2.)

Note – To create a configuration file that Sun StorEdge Instant Image software Version 3.0 can use, enter the following command as the root user *before* you remove old versions

```
# /usr/opt/SUNWesm/sbin/iiadm -i all > /etc/opt/SUNWesm/iiadm.out
```

During installation, the output of the `iiadm -a all` command is converted to the 3.0 format, to be used by Sun StorEdge Instant Image 3.0.

▼ To Convert Version 2.0 Bitmap Files into Version 3.0 Bitmap Volumes

1. List all Instant Image pairs and bitmaps.

```
# /usr/opt/SUNWesm/sbin/iiadm -i
```

2. For each bitmap name use the following command to determine if it is a file:

```
# file bitmap name
```

If a bitmap is ASCII text, then it is a file and it needs to be converted to a volume.

3. Determine each new bitmap volume for every bitmap file that needs to be converted. (Note: the volume must be the same size or greater than the file)
4. Suspend the Data Services with the `-s all` command option.

```
# /usr/opt/SUNWesm/sbin/iiadm -s all
```

5. Perform the following command for each bitmap file:

```
# /usr/opt/SUNWesm/sbin/iicpbmp bitmapfile bitmapvolume
```

6. When done with all bitmaps, resume the Data Services with the `-r` command option.

```
# /usr/opt/SUNWesm/sbin/iiadm -r all
```

▼ To Remove Instant Image 2.0 or 2.0.1

1. Log in as the root user.
2. Run the `probe_script` described in “To Run the Sun StorEdge Validation Script” on page 7, which lists the packages you must remove and the order in which to remove them.
3. Stop the Instant Image and supported Sun StorEdge data services software.

```
# /usr/opt/SUNWesm/sbin/esm_orderly stop
```

4. Remove the Sun StorEdge software-specific patches using `patchrm(1M)`.
 - For the Solaris 7 operating environment, remove the following patches in the order listed:

109977- <i>nn</i>	Sun StorEdge Instant Image software patch
109624- <i>nn</i>	Sun StorEdge Instant Image software patch
109969- <i>nn</i>	Sun StorEdge Core Services software patch

where *nn* specifies the patch revision.

- For the Solaris 8 operating environment, remove the following patches in the order listed:

109978- <i>nn</i>	Sun StorEdge Instant Image software patch
109624- <i>nn</i>	Sun StorEdge Instant Image software patch
109970- <i>nn</i>	Sun StorEdge Core Services software patch

where *nn* specifies the patch revision.

If `patchrm(1M)` fails to remove the -06 patch revision level of the patches with the following error, you can ignore the error and continue:

```
Patch patch-06 is not installed or is invalid
```

where *patch* is the patch number.

5. Remove the localized packages.

Remove any localized Sun StorEdge data services packages that are loaded. If you are using only English packages, skip this step.

a. For the French locale, type:

```
# pkgrm SUNWfrii
```

b. For the Japanese locale, type:

```
# pkgrm SUNWjaii
```

c. For the Chinese locale, type:

```
# pkgrm SUNWcii
```

6. Remove the Instant Image software-related Management Services software.

Remove the packages in the order shown.

```
# pkgrm SUNWiimsu SUNWiimsr SUNWsvmsu SUNWsvmsr
```

7. Remove the Sun StorEdge Instant Image software package.

```
# pkgrm SUNWii
```

8. If you installed Instant Image software Version 2.0.1, remove the Sun StorEdge Target Emulation software Version 1.2.

```
# pkgrm SUNWsftm SUNWte
```

9. If you have any other data services 2.0 products installed, remove those packages (for instructions, refer to the Sun SNDR installation guide or Appendix A of this guide for Fast Write Cache).

10. Remove the Sun StorEdge Core Services software if no other Sun StorEdge data services software resides on the system.

```
# pkgrm SUNWspcsl SUNWspsv SUNWscm SUNWspuni
```


11. Remove the Sun StorEdge Management Services software packages.

Note – Do not remove these packages and software if you have the Sun StorEdge Component Manager software installed on your system and you plan to use it.

```
# pkgrm SUNWmjhlp SUNWmjmai SUNWmjacf
```

a. For the French locale, type:

```
# pkgrm SUNWfresm
```

b. For the Japanese locale, type:

```
# pkgrm SUNWjeesm
```

c. For the Chinese locale, type:

```
# pkgrm SUNWcesm
```

d. Additional packages to remove:

```
# pkgrm SUNWesmru SUNWesmrt
```

e. For the French locale, type:

```
# pkgrm SUNWfrdae
```

f. For the Japanese locale, type:

```
# pkgrm SUNWjadae
```

g. For the Chinese locale, type:

```
# pkgrm SUNWcdae
```

h. Remove:

```
# pkgrm SUNWdaert SUNWesm
```

12. Reboot your server.

```
# shutdown -y -i 6 -g 0
```

▼ To Upgrade to Instant Image 3.0

- 1. Remove earlier versions of Instant Image software according to procedures in “To Remove Instant Image 2.0 or 2.0.1” on page 19.**
- 2. Log in as the root user.**
- 3. Insert the Instant Image software CD into the CD-ROM drive.**
Make sure that Volume Manager is running and the CD-ROM drive is mounted according to the procedures described in “Installing the Instant Image Software” on page 10.
- 4. Install the packages according to the procedures described in “Installing the Instant Image Software” on page 10.**
- 5. Reboot the server.**

```
# shutdown -y -i 6 -g 0
```

Reinstalling Instant Image 3.0

Perform the following procedures on each server where you plan to reinstall the Sun Instant Image Version 3.0 software.

Note – For additional information, read the `pkgadd(1M)`, `pkgask(1M)`, and `pkgrm(1M)` man pages.

▼ To Reinstall Instant Image 3.0

See “Installing the Sun StorEdge Software at Different Times” on page 13 if you are adding a Sun StorEdge data service to an existing 3.0 installation.

1. **Log in as the root user.**
2. **Back up your Sun StorEdge data services information as described in “Backing Up and Restoring Configuration Information” on page 15.**
3. **Disable the Instant Image software and ensure that it is disabled.**

```
# /usr/opt/SUNWesm/sbin/iiadm -d shadowvol  
# /usr/opt/SUNWesm/sbin/iiadm -i
```

4. **Remove the Instant Image software package.**

```
# pkgrm SUNWii
```

5. **Remove the Sun StorEdge Core Services software packages.**

```
# pkgrm SUNWspsvu SUNWspsvr SUNWscmu SUNWscmr
```

6. **Reboot the server.**

```
# shutdown -y -i 6 -g 0
```

7. When the server completes its startup process, log in as root and install the packages according to the procedures described in “Installing the Instant Image Software” on page 10.

Note – If you want to keep the previously designated configuration location, answer n to the prompt: Do you want to specify the Sun StorEdge data services configuration location? [y,n,?]

8. If you answered y to the question in Step 7, restore the Sun StorEdge data services information as described in “Backing Up and Restoring Configuration Information” on page 15.
9. Reboot the server.

```
# shutdown -y -i 6 -g 0
```

Sun StorEdge Fast Write Cache Software

This appendix describes how to remove the Sun StorEdge Fast Write Cache (Sun FWC) Version 2.0 software and install the `SUNWnvm` Version 3.0 software package available on the Sun StorEdge Core Services CD.

The `SUNWnvm` Version 3.0 Package and the Sun FWC Version 2.0 Product

The Version 2.0 and Version 3.0 Sun StorEdge data services are binary incompatible. If your system includes Version 2.0 of the Sun StorEdge Instant Image software (including Instant Image 2.0.1 with STE 1.2), Sun SNDR software, or Sun StorEdge Fast Write Cache, you must remove them before installing Version 3.0 Sun StorEdge data services.

For example, you cannot use the Sun StorEdge Fast Write Cache product Version 2.0 with the Sun SNDR software Version 3.0. When you plan to install or upgrade to a Version 3.0 data service, you must uninstall all Version 2.0 and 2.01 data services.

However, the Sun StorEdge Core Services Version 3.0 CD contains the Sun StorEdge `SUNWnvm` Version 3.0 software package. This package is intended for those users whose systems include Version 2.0 of the Sun FWC hardware and software product and who wish to continue using the Sun FWC product.

Differences Between the SUNWnvm Version 3.0 and Sun FWC Version 2.0 Software Packages

- You can use the Sun FWC Version 2.0 software in the Solaris 2.6 operating environment and subsequent compatible versions. You can use the SUNWnvm Version 3.0 software in the Solaris 7 operating environment and subsequent compatible versions.
- The Sun FWC Version 2.0 software includes a graphical user interface to administer its features and the SUNWnvm Version 3.0 software package does not. Use the command line interface `fwcadm` and `scmadm` utilities to administer the SUNWnvm Version 3.0 features. The *Sun StorEdge Fast Write Cache 2.0 System Administrator's Guide*, part number 806-2064, describes the `fwcadm` utility. See the `scmadm` man page.
- The Sun FWC Version 2.0 software includes a cache parameter configuration file named `/etc/opt/SUNWscm/sd.cf`. The Version 3.0 software package does not. Use the `fwcadm` and `scmadm` utilities to change configuration parameters.

Preparing to Upgrade the Sun FWC Version 2.0 Software

Note – Read the `pkgadm(1M)` and `pkgask(1M)` man pages.

TABLE 1 shows the general steps to upgrade the Sun FWC Version 2.0 software to the Version 3.0 software.

TABLE 1 Sun FWC Upgrade Steps Summary

1. Perform an orderly shutdown of any Version 2.0 and 2.0.1 Sun StorEdge data services software.
 2. Execute the validation script `probe_script` described in “To Run the Sun StorEdge Validation Script” on page 7.
 3. Remove any related patches.
 4. Remove Sun FWC Version 2.0 Management Services software.
 5. Remove the Sun FWC Version 2.0 software.
 6. Remove the Sun StorEdge Core Services Version 2.0 software packages.
 7. Remove the Sun StorEdge Java and Management Services 2.0 software packages.
 8. Install the Sun StorEdge Core Services (if needed) and `SUNWnvm` Version 3.0 software packages.
 9. Reboot your server.
-

The `/etc/opt/SUNWscm/sd.cf` Configuration File

The Sun StorEdge Core Services software installation process converts the information in the Sun FWC Version 2.0 configuration file `/etc/opt/SUNWscm/sd.cf` and adds it to the Sun StorEdge data services Version 3.0 configuration. The storage device cache is then enabled with the parameters that were specified in the `sd.cf` file.

Removing the Sun FWC Version 2.0 Software

Note – The `probe_script` described in “To Run the Sun StorEdge Validation Script” on page 7 lists the packages you must remove before upgrading and the order in which to remove them when you use `pkgrm(1M)`. You must remove the packages in the order listed.

When uninstalling, the order in which you remove packages matters.

Note – You might have already removed the Core and Management Services software and patches if you upgraded the Instant Image and Sun SNDR Version 2.0 software to Version 3.0.

▼ To Remove the Sun FWC Version 2.0 Software



Caution – Do not execute the `probe_script` script after you have installed Version 3.0 of the Sun SNDR, Instant Image, and `SUNWnvm` software. Generally, you should only run the script as part of the upgrade process from Version 2.0 to Version 3.0.

1. Log on as the root user.
2. Stop the Sun FWC Version 2.0 software and management services.

```
# /usr/opt/SUNWesm/bin/esm_orderly stop
```

3. Execute the validation script `probe_script` described in “To Run the Sun StorEdge Validation Script” on page 7.

Run this script to generate a list of the recommended Version 2.0 software packages to remove.

4. Remove the Sun FWC 2.0 Fast Write Cache and data services patches using patchrm(1M).

- **For all Solaris operating environments**, remove the following patch:

109628- <i>nn</i>	Sun StorEdge Fast Write Cache software patch
-------------------	--

where *nn* specifies the patch revision.

- **For the Solaris 7 operating environment**, remove the following patches in the order listed:

109973- <i>nn</i>	Sun StorEdge Fast Write Cache software patch
109969- <i>nn</i>	Sun StorEdge Core Services software patch

where *nn* specifies the patch revision.

- **For the Solaris 8 operating environment**, remove the following patches in the order listed:

109974- <i>nn</i>	Sun StorEdge Fast Write Cache software patch
109970- <i>nn</i>	Sun StorEdge Core Services software patch

where *nn* specifies the patch revision.

If `patchrm(1M)` fails to remove the -06 patch revision level of the patches with the following error, you can ignore the error and continue.
Patch *patch*-06 is not installed or is invalid

where *patch* is the patch number.

5. Remove any supporting packages for your locale.

- a. For the French locale, enter:**

```
# pkgrm SUNWfmscm
```

- b. For the Japanese locale, enter:**

```
# pkgrm SUNWjmscm
```

c. For the Chinese locale, enter:

```
# pkgrm SUNWcmscm
```

6. Remove the Sun FWC Version 2.0 Management Services packages.

```
# pkgrm SUNWmscmr SUNWmscmu
```

7. Remove the Sun FWC Version 2.0 package.

```
# pkgrm SUNWnvm
```

8. If this is the last Sun StorEdge Version 2.0 or 2.0.1 data service software package you are removing, remove the Core Services packages.

If this is not the last Version 2.0 or 2.0.1 package you are removing, skip this step.

```
# pkgrm SUNWspcsl SUNWspsv SUNWscm SUNWspuni
```

9. If this is the last Sun StorEdge Version 2.0 or 2.0.1 data service software package you are removing, remove the Sun StorEdge Management Services supporting packages.

If this is not the last Version 2.0 or 2.0.1 package you are removing, skip this step.

Note – Do not remove these packages if you have the Sun StorEdge Component Manager software installed on your system and you plan to use it.

```
# pkgrm SUNWmjhlp SUNWmjmai SUNWmjacf locale1 SUNWesmru SUNWesmrt  
locale2 SUNWdaert SUNWesm
```

where *locale1* and *locale2* are packages installed for your locale:

<i>locale1</i>	French — SUNWfresm
	Japanese — SUNWjeesm
	Chinese — SUNWcesm

<i>locale2</i>	French — SUNWfrdae
	Japanese — SUNWjadae
	Chinese — SUNWcdae

10. (Optional) Remove the Sun StorEdge data service persistence files.

```
# rm /var/opt/SUNWesm/m*/persistence/*
```

11. If this is the last Version 2.0 or 2.0.1 data service that you are removing, reboot the system now.

```
# /etc/shutdown -y -i 6 -g 0
```

Installing the SUNWnvm Version 3.0 Software

The following procedures describe how to install the SUNWnvm Version 3.0 software. The procedures assume you have already installed other data service related packages such as the Sun StorEdge Core Services, Sun SNDR, and Instant Image Version 3.0 software.

Note – See “Installing the Sun StorEdge Software at Different Times” on page 13.

To Install the SUNWnvm Version 3.0 Software

1. Log on as the root user.

You can install this software in single user or multiuser state.

2. Insert the Sun StorEdge Core Services software CD into the CD-ROM drive that is connected to your system.

3. Start the Volume Manager daemon vold(1M) (if needed) and install the SUNWnvm software.

Note – This procedure assumes that you have already installed the Sun StorEdge Core Services software (see “To Install the Instant Image Software” on page 10). If you are installing more than one Sun StorEdge data service, you only need to start the Volume Manager daemon and install the Core Services software once. Do not start the daemon and install the Core Services software more than once.

```
# /etc/init.d/volmgt start
# cd /cdrom/cdrom0
# ./install_fw
```

4. Complete the installation.

- If you are installing other data services, eject the CD and continue installing those data services.

- If you are installing only the SUNWnvm Version 3.0 software or if this is the last data service you are installing, eject the CD and reboot the system. *You only need to reboot your system once, after you have installed all Sun StorEdge data software products.*

```
# cd /  
# eject cdrom  
# /etc/shutdown -y -g 0 -i 6
```

- See also “Installing the Sun StorEdge Software at Different Times” on page 13.

The `fwcadm` Administrative Utility

Note – See the `fwcadm` man page. The *Sun StorEdge Fast Write Cache 2.0 System Administrator's Guide*, part number 806-2064, describes the `fwcadm` utility in more detail.

`fwcadm` is the administration command for the cache, NVRAM card, and the Storage Volume (SV) driver. `fwcadm` must be specified with one of the following parameters:

- `cache` - enables and disables the cache, displays cache statistics, destages cache, clears the offline state of a failed disk device, or reidentifies the specified new or replaced disk device.
- `nvrाम` - displays the status of the NVRAM boards.
- `volume` - enables and disables the SV driver for specified disk devices, displays status, and dynamically reconfigures the system.

Syntax

Note – (See the `-S` option in the `scmadm` man page for a description of the `-M`, `-d`, `-e`, `-l`, and `-z` options.)

```
fwcadm cache { purge | sync | redevid } diskname
fwcadm cache { -d | -e }
fwcadm cache -s [-M] [-d time] [-l file] [-r[range]] [-z]
```

```
fwcadm nvrाम -s
```

```
fwcadm volume -s [-C tag]
fwcadm volume -d {diskname | -f config-file} [-C tag]
fwcadm volume -e {diskname | -f config-file} [-C tag]
fwcadm volume -r {diskname | -f config-file} [-C tag]
```

cache Options

Option	Description
cache -d	Disables the cache.
cache -e	Enables the storage device cache.
cache -s	Displays cache statistics. Press the t key to toggle between two screens. The first screen shows general statistics about the data cache, and the second screen displays total counts.
cache purge <i>diskname</i>	Discards the failed blocks and clears the offline state of the failed device.
cache sync <i>diskname</i>	Destages the failed blocks and clears the offline state of the device.
cache redev id <i>diskname</i>	Allows the re-identification of a replaced physical disk. This option is necessary only if pinned data exists for the device. (Pinned data is data on the NVRAM card that has not been flushed to disk.)

nvrām Options

Option	Description
nvrām -s	Displays the status of the NVRAM cards.

volume Options

Option	Description
volume -d	Disables the specified SV device, or devices specified in the configuration file (-f <i>config-file</i>).
volume -e	Enables the specified SV devices.
volume -r	Reconfigures the SV subsystem. It compares the contents of the configuration file to the state of the running system, and then enables and disables devices to reconfigure the running system as specified in the configuration file (-f <i>config-file</i>).
volume -s [-C <i>tag</i>]	Displays the current state of the SV subsystem.
<i>diskname</i>	Specifies the disk device to operate on.
-f <i>config-file</i>	Specifies a configuration file containing a list of SV disk devices.
-C <i>tag</i>	On a clustered node, limits operations to only those volumes belonging to the cluster resource group or disk group name, specified by <i>tag</i> . This option is illegal on a system that is not clustered. The special <i>tag local</i> can be used to limit operations to only those volumes which cannot switchover to other nodes in the cluster.
