



# Sun StorEdge™ Instant Image Version 3.0.1 Installation Guide

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Adobe PostScript

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# Preface

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This book describes the requirements, considerations, and procedures for the Sun StorEdge™ Instant Image Version 3.0.1 software.

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## How This Book Is Organized

“[Installation](#)” on [page 1](#) describes the installation procedures for the software and includes preparation instructions for the system as well as instructions for dealing with SUNWnvm software.

“[Appendix A: Sun StorEdge Fast Write Cache Software](#)” on [page 27](#) describes installation instructions for SUNWnvm software and also Sun Fast Write Cache software.

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# Using UNIX Commands

This document might 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:

- *Solaris Handbook for Sun Peripherals*
  - AnswerBook2™ online documentation for the Solaris™ operating environment
  - 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 <code>.login</code> file. Use <code>ls -a</code> to list all files. % You have mail.
<b>AaBbCc123</b>	What you type, when contrasted with on-screen computer output.	% <b>su</b> 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>

---

# Shell Prompts

Shell	Prompt
C shell	<i>machine-name%</i>
C shell superuser	<i>machine-name#</i>
Bourne shell and Korn shell	\$
Bourne shell and Korn shell superuser	#

---

# Related Documentation

Application	Title	Part Number
man pages	iiadm(1M)	N/A
	fwcadm(1M)	
	svadm(1M)	
	dscfg(1M)	
	pkgrm(1M)	
	pkgask(1M)	
	scmadm(1M)	
	pkgadd(1M)	
Release	<i>Sun StorEdge Instant Image 3.0.1 Release Notes</i>	806-7678
Installation and User	<i>Sun StorEdge Instant Image 3.0.1 Installation Guide</i>	806-7675
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
Sun Cluster Release	<i>Sun Cluster 3.0 U1 Software and Sun StorEdge Services 3.0 Software Release Notes Supplement</i>	816-2136
Sun Cluster Usage	<i>Sun Cluster 3.0 U1 Software and Sun StorEdge Services 3.0 Software Integration Guide</i>	816-1544

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

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# Installation

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This chapter describes installation and preparation instructions for the Sun StorEdge™ Instant Image Version 3.0.1 software and the SUNWnvm software. This section includes the following main topics:

- [“Overview” on page 2](#)
- [“Quick Start” on page 5](#)
- [“Running the Validation Script” on page 7](#)
- [“Choosing a Configuration Location” on page 9](#)
- [“Removing Earlier Versions of Sun StorEdge Instant Image Software” on page 11](#)
- [“Installing the Sun StorEdge Instant Image 3.0.1 Software” on page 15](#)
- [“Installing the Sun StorEdge Software at Different Times” on page 18](#)
- [“Reinstalling Sun StorEdge Instant Image Version 3.0.1” on page 19](#)
- [“Converting Bitmaps” on page 21](#)
- [“Backing Up and Restoring Configuration Information” on page 22](#)
- [“Adding the iiadm Command PATH and Man Page MANPATH to Your Shell Environment” on page 24](#)

[“Appendix A: Sun StorEdge Fast Write Cache Software” on page 27](#) describes installation instructions for SUNWnvm software and also for Sun StorEdge Fast Write Cache software.

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# Overview

The Sun StorEdge Instant Image software is a point-in-time volume copy facility for the Solaris™ operating environment. With the software, you create a *volume set* that contains a *master* volume and a *shadow* volume with an associated *bitmap* volume. The bitmap volume tracks differences between the master and shadow volumes. Once the shadow volume is established as a point-in-time copy of the master volume, you can read from and write to this shadow volume and the master volume.

The software supports *fast resynchronization*, which enables you to create a new point-in-time copy by updating the specified volume with only the changed data.

## System Requirements

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**Note** – If you have the Version 3.0 software installed and you have installed patches 111945-xx, 111946-xx, 111947-xx, and 111948-xx, then you do not need to load the Sun StorEdge Version 3.0.1 software.

---

These system requirements are for nonclustered environments. If you plan to install Sun StorEdge Instant Image Version 3.0.1 in a Sun Cluster 3.0 Update 1 (also known as Sun Cluster 3.0 07/01 release) environment, refer to *Sun Cluster 3.0 U1 Software and Sun StorEdge Services 3.0 Software Integration Guide* for more information.

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<b>Hardware</b>	A CD-ROM drive connected to the host server where the Sun StorEdge Instant Image Version 3.0.1 software is to be installed.
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The Sun StorEdge Instant Image Version 3.0.1 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
- Sun Fire™ server models 3800, 4800, 4810, and 6800

<b>Disk Space</b>	<ul style="list-style-type: none"><li>• The Sun StorEdge Instant Image Version 3.0.1 software requires approximately 1 Mbyte of disk space</li><li>• Supporting packages require approximately 3 Mbytes of disk space</li><li>• The Sun StorEdge configuration location requires approximately 500 Kbytes of disk space</li></ul>
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If you plan to export shadow volumes, you must store the shadow volume on a dual-ported drive.

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Operating Environment and Software	Patches Required
Solaris 2.6 05/98	105181-28 – kernel super patch
Solaris 7 8/99 (also known as Update 3)	None
Solaris 7 11/99 (Update 4)	
Solaris 8	None
Solaris 8 6/00 (also known as Update 1)	
Solaris 8 10/00 (Update 2)	
Solaris 8 01/01 (Update 3)	
Solaris 8 04/01 (Update 4)	
Sun StorEdge Version 3.0.1 data services software, including the Sun StorEdge core services and one or both of the Sun StorEdge Instant Image and Sun StorEdge Network Data Replicator (Sun SNDR) Version 3.0.1 software.	111945-xx Storage Cache Manager 111946-xx Storage Volume Driver 111947-xx Sun StorEdge Instant Image 111948-xx Sun SNDR (if you also install Sun SNDR software)

## Bitmaps

The Sun StorEdge Instant Image Version 3.0.1 software uses raw volumes to store bitmaps. Raw volumes should be stored on a disk separate from the disk that contains the master and shadow volumes. Configure RAID (such as mirrored partitions) for these bitmap volumes, and ensure that the mirrored members are not stored on the same disk as the master and shadow volumes.

In the Sun StorEdge Instant Image Version 3.0.1 software, a bitmap can reside only on a volume, not in a file. 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** – Bitmap files (allowed in Sun StorEdge Instant Image Version 2.0) must be converted to bitmap volumes (for use in Sun StorEdge Instant Image Version 3.0 and above). See [“To Convert Bitmap Files into Bitmap Volumes” on page 21](#).

---

## Bitmap Volume Size Requirements

A bitmap volume's size is based on the size of the master volume and the type of volume set being created (independent, dependent, or compact dependent).

- For independent or shadow dependent volume sets:
  - 8 Kbytes per 1 Gbyte of master volume size (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  $(3 \times 8 \text{ Kbytes}) + 24 \text{ Kbytes}$ , or 48 Kbytes in size.
- For compact dependent shadow volume sets:
  - 264 Kbytes per 1 Gbyte of master volume size (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  $(3 \times 264 \text{ Kbytes}) + 24 \text{ Kbytes}$ , 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.

---

# Quick Start

Use one of the following sets of instructions for a quick installation guide.

## New Installation

If your installation does not involve upgrading from an earlier version of the Sun StorEdge data services software, follow these steps.

Step	Procedure
1. Run the validation probe_script	<a href="#">“Running the Validation Script” on page 7</a>
2. Choose a configuration location	<a href="#">“Choosing a Configuration Location” on page 9</a>
3. Install the software	<a href="#">“Installing the Sun StorEdge Instant Image 3.0.1 Software” on page 15</a>
4. Backup your configuration	<a href="#">“Backing Up and Restoring Configuration Information” on page 22</a>
5. Setting up the variables	<a href="#">“Adding the iiadm Command PATH and Man Page MANPATH to Your Shell Environment” on page 24</a>

# Upgrade Installation

If your installation is upgrading an existing Sun StorEdge data services installation, follow these steps.

Step	Procedure
1. Run the validation probe_script	<a href="#">“Running the Validation Script” on page 7</a>
2. Choose a configuration location	<a href="#">“Choosing a Configuration Location” on page 9</a>
3. Save your current configuration	<a href="#">“Saving Your Current Configuration” on page 10</a>
4. Remove earlier versions	<a href="#">“Removing Earlier Versions of Sun StorEdge Instant Image Software” on page 11</a>
5. Install the software	<a href="#">“Installing the Sun StorEdge Instant Image 3.0.1 Software” on page 15</a>
6. Convert bitmap files to volumes	<a href="#">“Converting Bitmaps” on page 21</a>
7. Backup your configuration	<a href="#">“Backing Up and Restoring Configuration Information” on page 22</a>
8. Setting up the variables	<a href="#">“Adding the iiaadm Command PATH and Man Page MANPATH to Your Shell Environment” on page 24</a>

## Installing Software at Different Times

You can install additional Sun StorEdge Version 3.0.1 data services software at a later date. See [“Installing the Sun StorEdge Software at Different Times” on page 18](#).

## Reinstallation

If you are reinstalling the Sun StorEdge Instant Image Version 3.0.1 software, see [“Reinstalling Sun StorEdge Instant Image Version 3.0.1” on page 19](#).

---

# Running the Validation Script

Before installing the Sun StorEdge Instant Image Version 3.0.1 software, you must run the validation script called `probe_script`. This script checks your system and prepares a list of any tasks that you must perform before installing the software.



---

**Caution** – *The Version 3.0.1 software is not cluster aware or coexistent with the initial release of the Sun Cluster 3.0 software. Do not install or try to use the Sun StorEdge Version 3.0.1 core and services software on servers in an environment containing the initial release of the Sun Cluster 3.0 software.*

---

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**Note** – The Sun StorEdge Version 3.0.1 services software is binary incompatible with the Sun StorEdge data services software Versions 1.x, Version 2.0, and Version 2.01. You *must* remove any of these earlier versions, as instructed in this guide, prior to installing the Version 3.0.1 version.

---

The `probe_script` inspects your system and verifies the following:

- That you are the root user
- That you are running a compatible Solaris operating environment
- That you do not have any Version 2.0 or Version 2.01 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 displays:

```
"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 Version 2.0 or Version 2.0.1 data services are installed, the validation 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.

---

## ▼ To Run probe\_script

---

**Note** – Do not execute the validation script *after* you have installed Version 3.0.1 of the Sun SNDR, Sun StorEdge Instant Image, and SUNWnvm software.

---

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 `probe_script`.

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

If you are not the root user, this message is displayed:

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

If your version of Solaris is incorrect, this message is displayed:

```
Warning: The version of Solaris currently running is not among the
supported versions for this product.
Supported versions are: Solaris 2.5, Solaris 7, and Solaris 8.
```

If earlier versions of Sun StorEdge data services exist, messages like the following are displayed:

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

4. If the script detects that earlier versions are currently installed and you would like to save and re-use your current configuration, perform the procedures described in **[“Saving Your Current Configuration” on page 10.](#)**
5. If the script detects that earlier versions are currently installed on your system, perform the procedures described in **[“Removing Earlier Versions of Sun StorEdge Instant Image Software” on page 11.](#)**



---

# Choosing a Configuration Location

Before installing the Sun StorEdge Instant Image Version 3.0.1 software, you should decide on the location of the Sun StorEdge data services configuration. Doing this will save you time during the installation.

## ▼ To Choose a Configuration Location

1. **Choose a location that is either a file name on `/` or `/usr`, or a block device. This location is the single configuration location used by all Sun StorEdge data services software.**

The configuration location must be writable by the root user, for example, `/config` or `/dev/dsk/c1t1d0s7`. If you select a volume manager-controlled volume, it must be available when the Sun StorEdge data services software is started.



---

**Caution** – When selecting a volume to be used as the configuration location, ensure that the volume does not contain disk label private areas (for example, slice 2 on a Solaris operating environment-formatted volume). The disk label region is contained in the first sectors of cylinder 0 of a disk. The safest method is to ensure that cylinder 0 is not part of any logical volume that is replicated (except for volumes under Veritas Volume Manager control, where cylinder 0 can be part of a logical volume that is replicated).

---

2. **Note the location you have chosen so that you can enter it when the installation asks you where you want to locate the data services configuration.**

---

# Saving Your Current Configuration

---

**Note** – If this is an upgrade, save your current configuration for use with the new software.

---

Follow this procedure to save your current configuration for use with Sun StorEdge Instant Image Version 3.0.1.

## ▼ To Save Your Current Configuration

- 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 Version 3.0.1 format, to be used by Sun StorEdge Instant Image Version 3.0.1.

---

# Removing Earlier Versions of Sun StorEdge Instant Image Software

## ▼ To Remove Sun StorEdge Instant Image Version 2.0 or Version 2.01

1. Log in as the root user.
2. If you have not already done so, run the `probe_script` described in [“Running the Validation Script” on page 7](#), which lists the packages you must remove and the order in which to remove them.
3. Stop the Sun StorEdge Instant Image and supporting Sun StorEdge management services software.

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

4. Remove the Sun StorEdge software-specific patches using `patchrm(1M)`.
  - *For the Solaris 2.6 operating environment*, remove the following patches in the order listed:

---

109975- <i>nn</i>	Sun StorEdge Instant Image software patch
109624- <i>nn</i>	Sun StorEdge Instant Image software patch
109967- <i>nn</i>	Sun StorEdge core services software patch

---

where *nn* specifies the patch revision.

- *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

---

- *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

If `patchrm(1M)` fails to remove the -06 patch revision level of the patches with the following error:

```
Patch patch-06 is not installed or is invalid
(patch = patch number)
```

then you can ignore the error and continue.

## 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 Sun StorEdge 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 Sun StorEdge Instant Image software Version 2.01, remove the Sun target emulation utility (SUNWte) Version 1.2.

```
# pkgrm SUNWsftm SUNWte
```

9. If you have any other data services Version 2.0 products installed, remove those packages. For instructions, refer to the *Sun StorEdge Network Data Replicator 3.0.1 Installation Guide* or [“Appendix A: Sun StorEdge Fast Write Cache Software” on page 27](#) of this guide for SUNWnvm software.

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. Shut down and restart your server.**

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

You are now ready to install the packages according to the procedures described in [“Installing the Sun StorEdge Instant Image 3.0.1 Software” on page 15.](#)

---

# Installing the Sun StorEdge Instant Image 3.0.1 Software

This section describes installing the software after initial system preparation. Ideally you would 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 18](#).

## ▼ To Install the Sun StorEdge Instant Image Software

### 1. Log in as the root user.

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

### 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).

---

**Note** – If you are installing more than one Sun StorEdge data service, only 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.

---

### 4. To install the Sun StorEdge core services software, 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 5](#).

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

**5. 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?
```

**6. 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.

---

**7. Remove the Sun StorEdge core services software CD from the CD-ROM drive:**

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

**8. Insert the Sun StorEdge Instant Image CD and install the software.**

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

The packages install.

**9. On a system running the Solaris 2.6 operating environment, add this line to the `/etc/system` file after installation and before you shut down and restart your server:**

```
set kobj_map_space_len=0x200000
```

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

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

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



- If you are installing this data service at a later time than the original installation, see [“Installing the Sun StorEdge Software at Different Times”](#) on page 18.
- If you are installing only the Sun StorEdge Instant Image software or if this is the last data service you are installing, eject the CD and shut down and restart the system. *You only need to shut down and restart your system once, after you have installed all Sun StorEdge data services 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 3.0.1 software and have shut down and restarted your system
- Installed the core services and one or more Version 3.0.1 data service software package and have shut down and restarted your system

*Then* you must shut down and restart your server as described in the following text after you install another Version 3.0.1 software package. This situation also applies if you want to add data services software at a later date.

For example, if you have:

- Installed the core services software, then
- Installed the Sun StorEdge Instant Image software, then
- Shut down and restarted your server

Then, if you want to install the Sun SNDR software, you must shut down and restart your server as follows after installing the Sun SNDR software:

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

---

# Reinstalling Sun StorEdge Instant Image Version 3.0.1

Perform the following procedures on each server where you plan to *reinstall* the Sun StorEdge Instant Image Version 3.0.1 software on a system that has already had the Sun StorEdge Instant Image Version 3.0.1 software installed. *This procedure is not for new installations or for upgrades.*

---

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

---

## ▼ To Reinstall Sun StorEdge Instant Image Version 3.0.1

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 22](#).
3. Disable every Instant Image volume set and ensure that they are disabled.

```
# /usr/opt/SUNWesm/sbin/iiadm -d shadowvol1
# /usr/opt/SUNWesm/sbin/iiadm -d shadowvol2
# /usr/opt/SUNWesm/sbin/iiadm -i
```

Where *shadowvoln* is the raw volume.

If all volume sets have been disabled, the output of `iiadm -i` is empty and the prompt is returned.

4. Remove the Sun StorEdge Instant Image software package.

```
# pkgrm SUNWii
```

5. Remove the Sun StorEdge core services software packages only if Sun StorEdge Instant Image Version 3.0.1 is the last or only data service installed. If other data services software packages are installed, they must be removed before you remove

the core services software. See [“Appendix A: Sun StorEdge Fast Write Cache Software” on page 27](#) for FWC information and see the Sun SNDR documentation for removal of Sun SNDR.

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

**6. Shut down and restart your server.**

```
# /etc/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 Sun StorEdge Instant Image 3.0.1 Software” on page 15](#).**

**a. During this installation, if you want to keep the previously designated configuration location, answer `n` to the question:**

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

**b. If you answer `y` to this question, follow the instructions in [“To Restore Configuration Information” on page 23](#) to restore your backup configuration.**

**8. Shut down and restart your server.**

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

---

# Converting Bitmaps

If this installation is an upgrade from Version 2.0 or Version 2.01, existing bitmap files must be converted to bitmap volumes with this procedure.

## ▼ To Convert Bitmap Files into Bitmap Volumes

1. List all volume pairs and bitmaps.

```
# /usr/opt/SUNWesm/sbin/iiaadm -i all
```

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.

See [“Bitmaps” on page 3](#).

4. Suspend the data services with the `-s all` command option.

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

---

# Backing Up and Restoring Configuration Information



---

**Caution** – *Do not use this command to restore your configuration unless it is absolutely necessary. You risk corrupting your configuration if you make any errors. Use it to back up your configuration. Perform the restore procedure only if the volume where the configuration resides fails. Contact your Sun support person for more information.*

---

You use the `/usr/opt/SUNWscm/sbin/dscfg` command to back up the services software configuration information. Typically, you make any volume set-related changes using the `/usr/opt/SUNWesm/sbin/iiadm` command described in the *Sun StorEdge Instant Image 3.0 System Administrator's Guide*.

## ▼ To Back Up Configuration Information

---

**Note** – Perform this step after you have set up an initial configuration and anytime you change your configuration (for example, 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** – Perform the restore procedure only if the Sun StorEdge services software (Instant Image, Sun SNDR, and Fast Write Cache) is not in use. In clustered environments, no node can be using the data service software.

---

---

**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.*

---

### 1. Initialize the configuration file.

---

**Note** – All services software configuration information will be lost.

---

The command prompts you to confirm the action before any action is taken, to which you must answer `y` or `n`.

```
# /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 22.

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

---

# Adding the `iiadm` Command `PATH` and Man Page `MANPATH` to Your Shell Environment

This section describes how to add the Sun Instant Image command and man page paths to your environment.

## ▼ To Add the Paths to Your Bourne or Korn Shell

1. **Add `/usr/opt/SUNWesm/sbin` to your `PATH` statement in your `.profile` file.**

This path enables you to access the Sun Instant Image commands like `iiadm`. For example, edit your `.profile` file in a text editor and add the command path:

```
PATH=$PATH:/usr/opt/SUNWesm/sbin
export PATH
```

where `$PATH` indicates all other paths in your file.

2. **Add `/usr/opt/SUNWesm/man` to your `MANPATH` statement in your `.profile` file.**

This path enables you to read the Sun Instant Image-related man pages.

```
MANPATH=$MANPATH:/usr/opt/SUNWesm/man
export MANPATH
```

where `$MANPATH` indicates the default man page path of `/usr/share/man` and other man page locations you might have. See the `man(1M)` man page for more information about the `man` command.

3. **Save this file and exit.**



## ▼ To Add the Paths to Your C Shell

1. **Add `/usr/opt/SUNWesm/sbin` to your `path` statement in your `.cshrc` file.**

This path enables you to access the Sun Instant Image commands like `iiadm`. For example, edit your `.cshrc` file in a text editor and add the command path:

```
set path = ($path /usr/opt/SUNWesm/sbin )
```

where `$path` indicates all other paths in your file.

2. **Save this file and exit.**

3. **Add `/usr/opt/SUNWesm/man` to your `PATH` statement in your `.login` file.**

This path enables you to read the Sun Instant Image-related man pages. For example, edit your `.login` file in a text editor and add the command path:

```
setenv MANPATH "$MANPATH:/usr/opt/SUNWesm/man"
```

where `$MANPATH` indicates the default man page path of `/usr/share/man` and other man page locations you might have. See the `man(1M)` man page for more information about the `man` command.

4. **Save this file and exit.**

## ▼ To Use An Alternate Method to Read Man Pages

These procedures describe how to read man pages without having to add paths to your environment.

- To read the Sun Instant Image man pages, type:

```
# man -M /usr/opt/SUNWesm/SUNWii/man iiadm.1m
```

- To read related manpages, type:

```
# man -M /usr/opt/SUNWesm/SUNWscm/man/ manpage
```

where *manpage* is one of the following:

<i>manpage</i>	<i>ds.log.4</i>
	<i>dscfg.1m</i>
	<i>scmadm.1m</i>

## Appendix A: 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 Sun StorEdge 3.0.1 services software is binary incompatible with the Sun StorEdge software Versions 1.x, 2.0, and 2.0.1.

However, the Sun StorEdge core services Version 3.0.1 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.

If your system includes Versions 1.x and 2.0 of the Sun StorEdge Instant Image software (including Instant Image 2.0.1 with the Sun target emulation utility version 1.2) or Sun SNDR software, you must remove them before installing the Version 3.0.1 services.

For example, you cannot use the Sun StorEdge Instant Image software Version 2.0 with the Sun SNDR software Version 3.0.1. When you plan to install or upgrade to a Version 3.0.1 service, you must remove all Version 1.X, 2.0, and 2.0.1 services.

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

- The Sun FWC Version 2.0 software includes a graphical user interface to administer its features. 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. See [“The `/etc/opt/SUNWscm/sd.cf` Configuration File” on page 29.](#)

---

# Preparing to Upgrade the Sun FWC Version 2.0 Software

---

**Note** – Read the `pkgrm(1M)` and `patchrm(1M)` man pages.

---

This table shows the general steps to upgrade the Sun FWC Version 2.0 software to the Version 3.0 software.

- 
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 [“Running the 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. Shut down and restart your server.
- 

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

The Sun StorEdge 3.0.1 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 Version 3.0.1 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



---

**Caution** – Do not execute the validation script after you have installed Version 3.0.1 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.

---

When removing the software, the order in which you remove packages matters. Do not remove the packages out of the order reported by the validation script.

- The `probe_script` described in [“Running the Validation Script” on page 7](#) lists the packages you must remove before upgrading and the order in which to remove them. You must remove the packages in the order listed by using the `pkgrm(1M)` utility.
- 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 3.0.1.

## ▼ To Remove the Sun FWC Version 2.0 Software

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** [“Running the 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 Version 2.0 and Sun StorEdge patches using `patchrm(1M)`.
- For all Solaris operating environments (OE), remove the following patch:

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

where *nn* specifies the patch revision.

- For the Solaris 2.6 OE, remove the following patches in the order listed:

109971- <i>nn</i>	Sun StorEdge Fast Write Cache software patch
109967- <i>nn</i>	Sun StorEdge core services software patch

where *nn* specifies the patch revision.

- For the Solaris 7 OE, 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 OE, 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 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 services 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 service persistence files.**

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

**11. If this is the last Version 2.0 or 2.0.1 service that you are removing, shut down and restart 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 18.

---

## ▼ 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** – If you are installing more than one Sun StorEdge data service, only 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.

---

---

**Note** – This procedure assumes that you have already installed the Sun StorEdge core services software (see [“Installing the Sun StorEdge Instant Image 3.0.1 Software”](#) on page 15). If you are installing more than one Sun StorEdge data service, only 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 shut down and restart the system. *You only need to reboot your system once, after you have installed all Sun StorEdge data services software products.*

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

- See also [“Installing the Sun StorEdge Software at Different Times”](#) on page 18.

---

# 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.

---

The `fwcadm` utility is the administration command for the cache, NVRAM card, and the Storage Volume (SV) driver. The `fwcadm` utility 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
- `nvr` – 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 nvr -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 redevid <i>diskname</i>	Allows the re-identification of a replaced physical disk. This option is necessary only if <i>pinned data</i> exists for the device. (Pinned data is data on the NVRAM card that has not been flushed to disk.)

## nvramp Options

Option	Description
nvramp -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 ( <i>-f 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 ( <i>-f config-file</i> ).
volume -s [-C tag] diskname	Displays the current state of the SV subsystem. Specifies the disk device to operate on.
-f config-file	Specifies a configuration file containing a list of SV disk devices.
-C tag	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.