

Sun StorEdge™ Instant Image 2.0 Installation Guide



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Sun StorEdge Instant Image 2.0 Software Installation

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The Sun StorEdge™ Instant Image Installation Guide describes installation procedures and product considerations for the Sun StorEdge Instant Image software. The Instant Image software is a point-in-time volume copy facility for the Solaris™ operating environment. With Instant Image software, you create a *volume group*: a point-in-time logical volume copy (*shadow*) from the original logical volume (*master*) that you specify. Once the shadow is established, you can read from and write to this shadow volume and the master volume. An Instant Image volume group contains the master and shadow volumes, with an associated *bitmap* volume, used to track differences between the volumes.

The Instant Image software lets you quickly update the shadow volume from the master volume, or restore the master volume from the shadow. 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

TABLE 1 Related Documentation

Application	Title	Part Number
man Pages	svadm(1SV)	N/A
	iiadm(1M)	
	ii_control(1M)	
	ii_config(1M)	
	ii_health(1M)	
System Administration	<i>Sun StorEdge Instant Image 2.0 System Administrator's Guide</i>	806-0230
Release	<i>Sun StorEdge Instant Image 2.0 Release Notes</i>	806-0231

Reading Instant Image Man Pages

- Set the `MANPATH` environment variable to include `/usr/opt/SUNWesm/man`:

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

Product Considerations

TABLE 2 Product Considerations

Item	Consideration
Enable, copy, and update operations	<p>Do not perform Instant Image enable, copy, or update operations on active master volumes. Either quiesce or unmount the volume before issuing these commands.</p> <p>Do not perform Instant Image enable, copy, or update operations on mounted shadow volumes. Always unmount the shadow volume before issuing these commands to avoid a Solaris environment system panic from occurring.</p>
Using the CLI for copy and update operations	Always specify the shadow volume name of the volume pair when using the copy or update commands.
Length of the volume names	Master, shadow, and bitmap volume names (including the path name) are currently limited to a maximum of 64 characters.
Creating a shadow volume	<p>It requires three devices:</p> <ol style="list-style-type: none">1. A master volume to be shadowed.2. A volume set where the copy will reside. This volume must be equal to or larger than the master volume.3. An bitmap volume file for tracking differences between the shadow and master volumes. This volume must be at least 24 KBytes; 8KBytes for each GByte (or part thereof) of master volume size plus 8KBytes for overhead. For example, to shadow a 3 GByte master volume, the bitmap volume must be $8 \text{ KBytes} + (3 * 8 \text{ KBytes}) = 32 \text{ KBytes}$.
Location of the bitmap volume file	<p>The Instant Image management service GUI automatically creates the bitmap volume; refer to the <i>Sun StorEdge Instant Image System Administrator's Guide</i> for more information about the bitmap volume.</p> <p>The bitmap volume cannot be located on the shadow volume. Put the bitmap volume in the root (/) or /usr directories, or on a dedicated filesystem that gets pre-mounted early in the boot sequence. Make sure that the bitmap volume is on a mirrored volume or filesystem.</p>
Shadowing the root device	You cannot make a shadow volume copy of the root device (/).
Shadowing encapsulated volumes	Instant Image software does not support encapsulated volumes; you cannot create a shadow volume of an encapsulated volume.

TABLE 2 Product Considerations (Continued)

Item	Consideration
<code>sd_stats(1M)</code>	Note that the Instant Image installation script also installs storage device software maintenance utilities such as <code>sd_stats(1M)</code> . These utilities are for use by Sun Enterprise Services personnel only.
Dependent master and shadow volumes	<p>In a dependent volume group, when a write operation to the mounted master occurs:</p> <ol style="list-style-type: none">1. The old data is written to the mounted shadow volume.2. The new data is written to the mounted master volume. <p>The shadow volume does not contain the new data until you issue an update command.</p>
Disk label and format information	If your shadow volume disk partition has its default cylinder starting at 0 and is the first cylinder of the disk, the Instant Image software overwrites your disk formatting and labeling information during enable and full volume copy operations. To avoid losing your disk formatting and labeling information, exclude that cylinder when partitioning the disk.
<code>reboot</code> command	If you need to execute the <code>reboot</code> command after you have established a normal operation with valid data written to the shadow volumes, ensure that all Instant Image volumes are suspended, then use <code>shutdown</code> instead.

Installation Requirements

- Solaris 2.6 5/98 operating environment or a subsequent compatible version. Upgrade your operating environment if you are running an earlier release.
- Supported Sun hardware platforms:
 - Sun Enterprise™ Server models ES250 and ES450
 - Sun Enterprise Server models ES3x00 through ES10000
- 2 MBytes of disk drive space; supporting packages require approximately 70 MBytes of additional disk space
- Java version 1.2.1_04b or compatible versions. To update your version of java, go to <http://java.sun.com>. To verify your version of java:

```
# java -version
```

- Install the latest Solaris Recommended Patch Cluster before loading the Instant Image software and patches. The following patches, which are available at <http://www.sunsolve.sun.com> when you have a service contract, are the minimum revisions required:

Solaris Environment Version	Patch	Description
2.6	105181-23	Kernel Update patch is to be installed before loading data services software. This patch is included with the Solaris Recommended Patch Cluster.
	108091-03	Sun OS 5.6: ss JDK 1.2.1_04b or a compatible version
7	106541-14	Kernel Jumbo patch is to be installed before loading data services software. This patch is included in the Solaris Recommended Patch Cluster.
	106924-06	5.7 isp driver
	106980-15	5.7 libthread
	107081-25	5.7 Motif 1.2.7 and 2.1.1 runtime library
	108376-18	OpenWindows 3.6.1 Xsun
	107636-05	X input and output method patch
8	108528-05	Kernel Update patch is to be installed before loading data services software. This patch is included with the Solaris Recommended Patch Cluster.

Installing the Instant Image Software

These procedures describe how to perform a clean install of the Instant Image software. The procedures assume you have not previously installed any versions of Instant Image software. You may install Instant Image automatically or manually.

Note – The installation procedure assumes that the system is running Sun Enterprise Volume Manager™. If you are not using Volume Manager to manage diskettes and CDs, refer to the *Solaris System Administration Guide, Volume I* for detailed information about managing removable media with Volume Manager. If you inserted a CD, Volume Manager automatically mounts it.

▼ To Install the Instant Image Software Automatically

Note – You should load data services software in a single user state. This procedure assumes that the Solaris volume manager is controlling the CD. If it is not, refer to the *Guidelines for Using CDs and Diskettes* in the Solaris AnswerBook.

1. **Become superuser (root).**
2. **On a system running the Solaris 2.6 environment, add this line to the `/etc/system` file:**

```
set kobj_map_space_len=0x200000
```

If you have not set this, the system may hang on reboot.

3. **Reboot the system.**
You only need to reboot if you are using the Solaris 2.6 operating environment.
4. **If the Instant Image CD is not already in the CD-ROM, insert it into the CD-ROM drive connected to your system.**
5. **Start the Volume Manager daemon (if needed) and start the II installation.**

To install the package automatically where the value of the variable `<Solaris_version>` is either `Solaris_2.6`, `Solaris_7` or `Solaris_8`:

```
# /etc/init.d/volmgt start
# cd /cdrom/cdrom0/ii/<Solaris_version>
# ./install_ii.ksh
```

`install_ii` installs the data services, and the Instant Image Management service.

▼ To Install the Instant Image Software Manually

Note – You should load data services software in a single user state. This procedure assumes that the Solaris volume manager is controlling the CD. If it is not, refer to the *Guidelines for Using CDs and Diskettes* in the Solaris AnswerBook.

1. **Become superuser (root).**
2. **On a system running the Solaris 2.6 environment, add this line to the `/etc/system` file:**

```
set kobj_map_space_len=0x200000
```

If you have not set this, the system may hang on reboot.

3. **Reboot the system.**
You only need to reboot for the Solaris 2.6 operating environment.
4. **If the Instant Image CD is not already in the CD-ROM, insert it into the CD-ROM drive connected to your system.**
5. **Start the Volume Manager daemon (if needed) and start the Instant Image installation.**

Follow the order of installation when you add packages manually for a successful installation.

If you are installing packages for a non-English locale, first install the English packages and then install the French, Japanese or Chinese packages.

- a. **For the English local, where the value of the variable `<Solaris_version>` is either `Solaris_2.6`, `Solaris_7` or `Solaris_8`, enter:**

```
# /etc/init.d/volmgt start
# cd /cdrom/cdrom0/ii/<Solaris_version>
# pkgadd -d . SUNWspuni SUNWscm SUNWspsv SUNWii
# pkgadd -d . SUNWesm SUNWspcsl SUNWdaert SUNWesmrt SUNWesmru
# pkgadd -d . SUNWsvmsr SUNWsvmsu SUNWiimsr SUNWiimsu
# pkgadd -d . SUNWmjhlp SUNWmjacf SUNWmjmai
```

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

```
# pkgadd -d . SUNWfrdae SUNWfresm SUNWfrii
```

c. For the Japanese locale, enter:

```
# pkgadd -d . SUNWjadae SUNWjeesm SUNWjaii
```

d. For the Chinese locale, enter:

```
# pkgadd -d . SUNWcdae SUNWcesm SUNWcii
```

Post-Installation Patches

After installing the Instant Image packages, install the appropriate patches.

▼ To Complete the Post-Installation

1. Install the appropriate patches.

The patches listed here are required. Patches are included on the software CD, but you should check <http://sunsolve.sun.com> to make sure you have the latest revision of the patches.

Solaris Environment	Patch	Description
2.6	109967 ¹	data services core patch
	109624	Sun StorEdge Instant Image patch
	109975 ¹	Sun StorEdge Instant Image patch
7	109969 ²	data services core patch
	109624	Sun StorEdge Instant Image patch
	109977 ²	Sun StorEdge Instant Image patch
8	109970 ³	data services core patch
	109624	Sun StorEdge Instant Image patch
	109978 ³	Sun StorEdge Instant Image patch

¹Load patch 109967 before you load 109975.

²Load patch 109969 before you load 109977.

³Load patch 109970 before you load 109978.

2. If you are installing other Data Services, eject the Instant Image CD and continue. Otherwise, eject the CD and reboot the system:

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

Before enabling and using the Instant Image software, see “Adding Instant Image Volumes to the Storage Volume Driver Configuration File” on page 14.

Removing Instant Image Software

▼ To Remove Instant Image

1. Stop Instant Image and supported Data Services:

```
# esm_orderly stop
```

2. Back out II and Data Services patches.

If patch 109624 (all Solaris environments), 109975 (Solaris 2.6 environment), 109977 (Solaris 7 environment) or patch 109978 (Solaris 8 environment) is installed, remove it. Also remove any other revisions. For example:

```
# showrev -p | grep 109624
Patch: 109624-01 Obsoletes: Requires: Incompatibles: \
Packages: SUNWiimsu
# patchrm 109924-01
```

If there are no other Data Services on the system, remove patch 109967 (Solaris 2.6 environment), 109969 (Solaris 7 environment) or 109970 (Solaris 8 environment). Also remove any other revisions. For example:

```
# showrev -p | grep 109969
Patch: 109969-05 Obsoletes: Requires: 106541-06 Incompatibles: \
Packages: SUNWspuni,SUNWscm, SUNWspsv, SUNWspcsl
# patchrm 109969-05
```

3. Remove localized packages.

Remove any localized Data Services packages that are loaded. If you are using only English packages, skip to Step 4.

a. For the French locale, type:

```
# pkgrm SUNWfrie SUNWfresm SUNWfrdae
```

b. For the Japanese locale, type:

```
# pkgrm SUNWjiai SUNWjeesm SUNWjadae
```

c. For the Chinese locale, type:

```
# pkgrm SUNWcii SUNWcesm SUNWcdae
```

4. Remove the Data Services Java packages:

```
# pkgrm SUNWmjmai SUNWmjacf SUNWmjhlp
```

When uninstalling, the order in which you remove packages does matter.

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

5. Remove the II Data Service package:

```
# pkgrm SUNWii
```

6. If there are no other data services on the system, uninstall the core data services packages:

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

If you are not going to reinstall SUNWscm and SUNWspsv, and you wish to completely remove them, remove the `/etc/opt/SUNWspsv/sv.cf`, `/etc/opt/SUNWscm/sd.cf` and `/etc/opt/SUNWscm/bitmapfs.cf` files if they exist.

7. Remove the II Management Services packages.

8. If Fast Write Cache is not installed, remove the Management Services supporting packages:

```
# pkgrm SUNWesmru SUNWesmrt SUNWdaert SUNWesm
```

If you are not going to reinstall SUNWesm, also remove the Data Services persistence files:

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

9. If you have other data services to remove, continue to do so. If this is the last data service that you are removing, reboot the system now:

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

Note – If you are going to reinstall any data services software, reboot the system into a single user state before you load the new data services software.

Adding Instant Image Volumes to the Storage Volume Driver Configuration File

Before you can enable and use the Instant Image software, you must add the Instant Image volumes to the Storage Volume (SV) driver configuration file and reconfigure the driver.

You cannot enable and use the Instant Image software on volumes that are not in the SV driver configuration file and enabled by the SV driver. The SV driver provides a simple layer of volume management for the Instant Image software.

Tip – If you want to add devices later, repeat the steps in “To Add Instant Image Volumes” on page 14”.

▼ To Add Instant Image Volumes

1. **Decide which volumes you are going to use with the Instant Image software.**
2. **Using a text editor, add the volumes to the Storage Volume (SV) driver configuration file** `/etc/opt/SUNWspcv/sv.cf`.

This file includes two fields per line for each volume: the resource name field and access mode field. Separate the fields in the file with spaces.

The resource name field contains the name of a raw device for which the SV driver is to be enabled. *It must be the full path to the raw device node and cannot be the block device node.*

The access mode field can be `cache` or `raw`. This field specifies how this device volume is accessed: through the Storage Cache Management module `cache` or directly through the raw device.

The following example shows four master and four shadow devices, two of each type to be accessed directly and two of each type to be cached.

Note – The example file shown shows volume names placed in order in the file: master followed by shadow. This is not required; you can place the volume names in any order.

```
# devices clt3d0s0 to master02 are master volumes
/dev/rdisk/clt3d0s0 cache
/dev/rdisk/clt3d0s1 cache
/dev/vx/rdsk/master01 raw
/dev/vx/rdsk/master02 raw
#
# devices clt3d0s4 to shadow02 are shadow volumes
/dev/rdisk/clt3d0s4 cache
/dev/rdisk/clt3d0s5 cache
/dev/vx/rdsk/shadow01 raw
/dev/vx/rdsk/shadow02 raw
```

3. **Save and exit** `/etc/opt/SUNWspv/sv.cf`.
4. **Use the `svadm(1SV)` utility to reconfigure the SV driver to add the new volumes in the configuration file to the SV layer.**

```
# /usr/opt/SUNWesm/SUNWspv/sbin/svadm -r
```

Reinstalling or Upgrading Instant Image Software

This section describes how to reinstall or upgrade Instant Image software and its related packages.

▼ To Reinstall the Instant Image Management Services SUNWiimsu and SUNWiimsr

1. Become superuser (root).
2. Suspend any currently enabled volume pairs.
 - Using the CLI, type:

```
# /usr/opt/SUNWesm/bin/esm_cli  
> cd InstantImage  
> control -s -a
```

3. Reinstall the packages according to the steps in “Installing the Instant Image Software” on page 7. Reply yes to all prompts by typing `y`.
4. shutdown your server to perform a reboot.

Enter:

```
shutdown -y -i 6 -g <grace-period>
```

The Instant Image software automatically resumes the suspended volume pairs after you reboot your server.

▼ To Upgrade From the Legacy CLI Version (SUNWii)

1. Become superuser (root).
2. Suspend any currently enabled Instant Image volume pairs.

```
# iiadm -s all
```

3. Install the Instant Image software and related packages as described in “Installing the Instant Image Software” on page 7.
4. Make sure that the Instant Image management service packages copy `/etc/iitab` to `/etc/opt/SUNWii/iitab.old`.

```
# ls -l /etc/opt/SUNWii/iitab*
```

5. Check the `/usr/opt/SUNWesm/sbin/sh_upgrade` file to make sure it includes the enabled volume pairs.

```
# pg /usr/opt/SUNWesm/sbin/sh_upgrade
```

6. Start the Management Console.

```
# /usr/opt/SUNWesm/bin/esm_gui
```

7. Run the upgrade script.

```
# sh /usr/opt/SUNWesm/sbin/sh_upgrade
```

The Instant Image interface shows any currently-enabled volume pairs.

8. shutdown **your server to reboot**.

Enter:

```
shutdown -y -i 6 -g <grace-period>
```

The Instant Image software automatically resumes the suspended volume pairs after you reboot your server.

Uninstalling and Configuration Files

Bitmap files are created in the `/etc/opt/SUNWesm/SUNWms/bm` directory when Instant Image pairs are created. Therefore, when you uninstall Instant Image, you must disable all Instant Image pairs; otherwise, the bitmap files will not be removed by the uninstall.

If you are removing all management services, you may remove all of their current configuration information by removing the bitmap, persistence, log, and trace files. If you remove the bitmap files without removing the persistence files, you will have pairs configured without associated bitmaps. Persistence files for all management services are kept in the `/var/opt/SUNWesm/mo/persistence` and `/var/opt/SUNWesm/mc/persistence` directories. Log and trace files are in `/var/opt/SUNWesm/log`.