



Sun StorEdge™ Availability Suite 3.1 Point-in-Time Copy Software Installation Guide

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Adobe PostScript

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Preface

The *Sun StorEdge Availability Suite 3.1 Point-in-Time Copy Software Installation Guide* describes the requirements, considerations, and procedures for installing the Sun StorEdge™ Availability Suite 3.1 point-in-time copy software.

The main sections of this preface are:

- “How This Book Is Organized” on page viii
- “Using UNIX Commands” on page viii
- “Supported Platforms” on page ix
- “Typographic Conventions” on page x
- “Shell Prompts” on page x
- “Related Documentation” on page xi
- “Accessing Sun Documentation Online” on page xii
- “Sun Welcomes Your Comments” on page xii

How This Book Is Organized

[Chapter 1](#) describes the installation of the Sun StorEdge Availability Suite 3.1 software on a system that does not currently have this software or any earlier versions installed.

[Chapter 2](#) describes the installation of the Sun StorEdge Availability Suite 3.1 software on a system that currently has this software or an earlier versions installed.

[Chapter 3](#) describes the removal and reinstallation of Sun StorEdge Availability Suite 3.1 point-in-time copy software.

[Chapter 4](#) describes procedures for adding additional Sun StorEdge Availability Suite 3.1 software packages to existing installations.

[Chapter 5](#) describes common errors and problems involved with installing Sun StorEdge Availability Suite 3.1 point-in-time copy software.

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

Supported Platforms

Storage Platforms	<ul style="list-style-type: none">• A1000, D1000, A3500, A5000, A5100, and A5200• T3 Workgroup• T3 Enterprise• Sun StorEdge 39xx and 69xx• Third party storage
Entry Level Servers	<ul style="list-style-type: none">• Sun Enterprise 220R, 250, Ultra 10S, 420R, and 450• Sun Fire 280R and V880
Midframe and Midrange Servers	<ul style="list-style-type: none">• Sun Fire 3800, 4800, 4810, 6800• Sun Enterprise 3500, 4500, 5500, and 6500
High-End Servers	<ul style="list-style-type: none">• Sun Fire 15K• Sun Enterprise 10000
NEBS Certified Servers	<ul style="list-style-type: none">• Netra 20• Netra ct 400 and 800• Netra t 100, 105, 1120, 1125, 1400, 1405• Netra T1 AC200 and DC200• Netra ft 1800• Netra X1
Workstations	<ul style="list-style-type: none">• Sun Blade 100 and 1000 Workstations• Ultra 60 Workstation• Ultra 80 Workstation

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.
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 root 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)	not applicable
	sndradm(1M)	
	svadm(1M)	
	dscfg(1M)	
	pkgadd(1M)	
	pkgrm(1M)	
	file(1M)	
	scmadm(1M)	
Release	<i>Sun StorEdge Availability Suite 3.1 Point-in-Time Copy Software Release Notes</i>	816-4314
	<i>Sun StorEdge Availability Suite 3.1 Remote Mirror Software Release Notes</i>	816-4414
	<i>Sun Cluster 3.0 and Sun StorEdge Software Release Notes Supplement</i>	816-5128
Installation	<i>Sun StorEdge Availability Suite 3.1 Remote Mirror Software Installation Guide</i>	816-4413
System Administration	<i>Sun StorEdge Availability Suite 3.1 Point-in-Time Copy Software Administration and Operation Guide</i>	816-4313
	<i>Sun StorEdge Availability Suite 3.1 Remote Mirror Software Administration and Operation Guide</i>	816-4415
Sun Cluster Usage	<i>Sun Cluster 3.0 and Sun StorEdge Software Integration Guide</i>	816-5127

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New Installation

This chapter describes how to install the Sun StorEdge Availability Suite 3.1 software in a system that has no current or earlier versions of Sun StorEdge Availability Suite 3.1 software installed. This current or earlier software includes:

- Sun StorEdge Instant Image software
- Sun SNDR software
- SUNWnvm, the operating software for Sun StorEdge Fast Write Cache hardware
- StorEdge Availability Suite 3.1 software

If you are attempting to install the Sun StorEdge Availability Suite 3.1 software in a system that contains earlier versions of the software, follow the procedures in [“Upgrade Installation” on page 21](#).

To reinstall Sun StorEdge Availability Suite 3.1 software in a system in which it is already installed, refer to [“Reinstallation and Removal” on page 29](#).

If you are attempting to install additional packages to an existing Sun StorEdge Availability Suite 3.1 software installation, follow the procedures in [“Additional Installations” on page 35](#).

This chapter includes the following main topics:

- [“New Installation Procedure” on page 2](#)
- [“Running probe_script” on page 3](#)
- [“Choosing a Configuration Location” on page 6](#)
- [“Installing the Availability Suite 3.1 Software” on page 8](#)
- [“Bitmaps” on page 14](#)
- [“Backing Up and Restoring Configuration Information” on page 15](#)
- [“Adding the iadm Command PATH and Man Page MANPATH to Your Shell Environment” on page 17](#)

New Installation Procedure

Installation Steps

Step	Description
1. Run probe_script.	See “Running probe_script” on page 3.
2. Choose a configuration location.	See “Choosing a Configuration Location” on page 6.
3. Install the software.	See “Installing the Availability Suite 3.1 Software” on page 8.

Post-installation Steps

Step	Description
1. Set up your bitmaps.	See “Bitmaps” on page 14.
2. Configuration Information.	See “Backing Up and Restoring Configuration Information” on page 15.
3. Set up command path and make man pages available.	See “Adding the iiadm Command PATH and Man Page MANPATH to Your Shell Environment” on page 17.

Note – The Sun StorEdge Availability Suite 3.1 point-in-time copy software used to be called Sun StorEdge Instant Image Software. In this document, you will see Instant Image referenced when necessary, for example in the section that presents instructions for removing older versions of the software.

Running probe_script

Before installing the Sun StorEdge Availability Suite 3.1 point-in-time copy software, you must run the `probe_script` shell script provided on the installation CD. This script checks your system and prepares a list of any tasks that you must perform before installing the software. The `probe_script` inspects your system and verifies the following:

- You are the root user
- You are running a compatible Solaris operating environment
- You do not have any earlier versions of the software installed

The `probe_script` also prompts you during installation for the `root_path` for the package installation if you are installing using the `-j` option.

probe_script Syntax

The `probe_script` file on the product CD has the following syntax.

Run the script with no options where the root installation path is the standard root slice (/).

```
probe_script [-h | -j]
```

where:

-h	Displays syntax usage.
-j	Uses standard script checking, but also checks systems where the root installation path is a path other than the standard root slice (/). For example, use this option when root is located on a remotely-mounted device or when older packages might be located on a remote-mounted device.

▼ To Run probe_script

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

This procedure is usable in either single-user or multi-user mode.

2. **Insert the Sun StorEdge Availability Suite 3.1 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`. See “[Running probe_script](#)” on page 3 for details about options for running the `probe_script`.**

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

4. **If you ran the `probe_script -j` command, the following question appears:**

```
What is the root_path for this package installation? [/] [?] /a
```

`/` is the default location for this installation and should always be chosen, but if this is a remotely-mounted installation, enter the full path of where the root slice is mounted.

5. **If you are not the root user, the system displays this message:**

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

6. If you are the root user, the execution of the `probe_script` proceeds:

If the installed version of the Solaris operating environment is not compatible, the system displays this message:

```
WARNING: The version of Solaris currently running is not
a supported version for this product.
Supported versions include: 5.6, 5.7, 5.8, 5.9
Exiting...
```

If any earlier versions of software exist on your system, an ordered list is produced and the system displays the following message:

```
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 $PKGLIST
```

Note – If the script detects that earlier versions are currently installed, *do not continue with this procedure*. Instead, use the procedure in [“Upgrade Installation” on page 21](#).

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 Sun StorEdge Availability Suite 3.1
installation
```

Choosing a Configuration Location

Before installing the Sun StorEdge Availability Suite 3.1 point-in-time copy software, you should decide on the best location for the configuration. Doing this now will save you time during the installation.

This location is the single configuration location used by all the Sun StorEdge Availability Suite 3.1 software packages: its integrity is important.

Note – Routine backup of the configuration store is as important as backups to `/etc/vfstab` and `/etc/mnttab`. See [“Backing Up and Restoring Configuration Information”](#) on page 15.

▼ To Choose a Configuration Location

Note – If this installation is in a Sun Cluster environment, see *Sun Cluster 3.0 and Sun StorEdge Software Integration Guide* for important configuration information.

- **Choose a location that is either a file, a block device, or a volume manager-controlled volume that satisfies the criteria in [TABLE 1-1](#):**

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



Caution – When selecting a volume manager-controlled 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 assigned.

TABLE 1-1 Configuration Location Requirements and Considerations

Item	Requirement or Consideration
Location type requirements	<p>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:</p> <p><code>/dev/dsk/c1t1d0s7</code> or <code>/config</code></p> <p>If you select a file name, its file system must be the root (<code>/</code>) or the <code>/usr</code> file system. If you select a volume manager-controlled volume, it must be available when the Sun StorEdge software is started.</p>
Availability	<ul style="list-style-type: none">• If the location is a block device (for example, <code>/dev/dsk/*</code>), it cannot be the same location as the current boot device.• The location must be writable by the superuser user.• The location is available or persistent at system startup and reboots.• The location does not exist on an invalid file system such as <code>cachefs</code>, <code>tmpfs</code>, <code>nfs</code>, <code>procfs</code>, <code>hsfs</code>, <code>autofs</code>, <code>fdfs</code>, and <code>mntfs</code>.• The location does not exist on a reserved mount point such as <code>/cdrom</code>, <code>/tmp</code>, <code>/proc</code>, <code>/mnt</code>, <code>/net</code>, <code>/floppy</code>, and <code>/vol</code>.
Cluster environment	<p>If you are installing the software in a cluster environment, your configuration location must be a block device and it must exist in the directory <code>/dev/did</code>.</p>
Disk space	<p>The configuration location requires 5.5 MB of disk space. If you specify a file for the configuration location during the installation, the file of the appropriate size is automatically created.</p>
Mirror the location	<p>Consider configuring RAID (such as mirrored partitions) for the location and ensure that you mirror the location to another disk in the array. The location cannot be stored on the same disk as the assigned volume.</p>

Installing the Availability Suite 3.1 Software

This section describes installing the software after initial system preparation. Ideally you would install all needed software packages at the same time (point-in-time copy software and remote mirror software), but if you must install another package at a later time, see [“Additional Installations” on page 35](#).

Installation Script Syntax

The `install.sh` script on the product CD has the following syntax. You can install all Sun StorEdge software or just individual packages.

Each option also installs the Sun StorEdge core software, which is required for all products.

```
install.sh [-j] {a | p | r}
```

where:

-j	Install the packages where the root installation path is a path other than the standard root slice (/). For example, use this option when root is located on a remotely-mounted device and you want to install the packages on a remotely-mounted device.
-a	Install the remote mirror software, the point-in-time copy software, and the core software products from the CD.
-p	Install the point-in-time copy software and the core software products.
-r	Install the remote mirror software product. See the <i>Sun StorEdge Availability Suite 3.1 Remote Mirror Software Installation Guide</i> for important information about installing this software.

Note – The install script checks the `root_path` for available storage space. If it finds less than 50MB of available space, you are notified and given an opportunity to quit the installation. If you choose to continue, you are warned of possible administrative messages during installation.

▼ To Install the Availability Suite 3.1 Software

1. Log in as the root user.

- For a new installation, you can be in either the single-user or multi-user mode.
- If this is an upgrade installation, with existing data volumes, you *must* perform the installation in single-user mode.

2. Insert the Sun StorEdge Availability Suite 3.1 software CD into the CD-ROM drive that is connected to your system.

3. Start the Volume Manager daemon `vold(1M)` (if needed).

```
# /etc/init.d/volmgt start
```

4. To install the software, use the `install.sh` script with the proper option `[-a | -p | -r]` (see “[Installation Script Syntax](#)” on page 8):

Note – If this is an installation on a remotely mounted device, use the `-j` option.

```
# cd /cdrom/cdrom0
# ./install.sh -p
```

5. When the following message is displayed, type `y`. See “[Installation Script Syntax](#)” on page 8 for information about this message.

```
Attention!

By continuing with this installation, you acknowledge you have read
installation documentation and the "probe_script" has been run on
this system.

Do you want to continue [y,n,?] y
```

6. If you ran the installation with the `-j` option, you are now prompted to enter the `root_path` for the installation.

```
What is the root_path for this package installation? [/] [?]
```

`/` is the default location for this installation, but if this is a remotely-mounted installation, enter the full path of where the root slice is mounted.

7. Set the configuration location.

Depending on your circumstances, you will need to answer a series of questions to select your configuration location.

- a. If `install.sh` cannot find an existing configuration, the following question is displayed. Enter the configuration location you selected and installation continues (see [“Choosing a Configuration Location” on page 6](#)).

```
The Sun StorEdge Availability Suite 3.1 configuration
location has not been set
Enter database configuration location: [?] /<config>
Setting new database configuration to /<config>...
```

- b. If `install.sh` finds an existing configuration location, the location is displayed and you are asked if you want to keep it.

```
The Sun StorEdge Data Services database configuration location
has already been set.
Current location: /<old_config>

Would you like to keep its current location [y,n,?]
```

- i. If you answer `y`, the installation continues.

- ii. If you answer `n`, you are asked for the new configuration location, after which the installation continues.

```
The Sun StorEdge Data Services database configuration location
has already been set.
Current location: /<old_config>

Would you like to keep its current location [y,n,?] n

Enter database configuration location: [?] /<new_config>
Setting new database configuration to /<new_config>...
```

- c. If the new location you enter already contains a valid configuration location, you are given three options `[y,n,maybe,?]`:

- `y` - Keep the current configuration
- `n` - Create a new configuration
- `maybe` - Examine the existing contents

i. If you answer y, the existing configuration information is retained and written to the new location.

```
The Sun StorEdge Data Services database configuration location
has already been set.
Current location:  /<old_config>

Would you like to keep its current location [y,n,?] n

Enter database configuration location: [?] /<new_config>
Setting new database configuration to /<new_config>...
It appears a valid database configuration exists here already.

Would you like to preserve this information and continue?
    y - preserve current configuration
    n - overwrite with new configuration
    maybe - view contents of current configuration

Enter appropriate value [y,n,maybe,?] y
Keeping database configuration at /<new_config>...
```

ii. If you answer n, the existing contents are overwritten and installation continues.

```
The Sun StorEdge Data Services database configuration location
has already been set.
Current location:  /<old_config>

Would you like to keep its current location [y,n,?] n

Enter database configuration location: [?] /<new_config>
Setting new database configuration to /<new_config>...
It appears a valid database configuration exists here already.

Would you like to preserve this information and continue?
    y - preserve current configuration
    n - overwrite with new configuration
    maybe - view contents of current configuration

Enter appropriate value [y,n,maybe,?] n
Setting new database configuration to /<new_config>...
```

iii. If you answer maybe, the existing contents are displayed for your evaluation, after which you must select *y* to preserve the configuration, select *n* to overwrite the configuration, or select maybe to see the configuration again.

```
The Sun StorEdge Data Services database configuration location
has already been set.
Current location:  /<old_config>

Would you like to keep its current location [y,n,?] n

Enter database configuration location: [?] /<new_config>
Setting new database configuration to /<new_config>...
It appears a valid database configuration exists here already.

Would you like to preserve this information and continue?
    y - preserve current configuration
    n - overwrite with new configuration
    maybe - view contents of current configuration

Enter appropriate value [y,n,maybe,?] maybe
# Consolidated Dataservice Configuration
# Do not edit out whitespace or dashes
# File created on: Fri Mar 22 10:08:00 2002
# Storage Cache Manager
# thrds csiz wrtcache filpat reservedl niobuf ntdaemon fwrthru
nofwrthru [resource group]
scm: 128 64 - - - - - 80cf981d
scm: 128 64 - - - - - 80cfceb1
# Bitmap filesystem to mount before other filesystems [resource
group]
<remainder of file contents>

Would you like to preserve this information and continue?
    y - preserve current configuration
    n - overwrite with new configuration
    maybe - view contents of current configuration

Enter appropriate value [y,n,maybe,?]
```

8. When `install.sh` finishes installing the software, the system will display this message:

```
"Installation of point-in-time copy software is complete. If
this is the last Sun StorEdge Services product to be
installed, please shutdown and restart your system now"
```

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. Eject the CD.

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

11. If you have not finished installing packages for the Sun StorEdge Availability Suite 3.1 software, restart your system as follows:

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

Restarting in this manner brings you up in single-user mode, which prevents other users from accessing your system while the installation is incomplete.

12. If this is an additional installation (see [“Additional Installations” on page 35](#)) and you have finished the installation, reboot as follows:

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

13. If you have finished installing all the packages you want to install for the Sun StorEdge Availability Suite 3.1 software, you can reboot as follows:

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

Note – Do not use the `reboot` command. Always use the `/etc/shutdown` command. The `/etc/shutdown` command ensures that any shutdown scripts in the `/etc/init.d` directory are executed.

Bitmaps

The Sun StorEdge Availability Suite 3.1 point-in-time copy software uses raw volumes to store bitmaps. It is recommended that bitmap raw volumes be stored on a disk separate from the disk that contains its associated master and shadow volumes. It is also recommended that you 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 Availability Suite 3.1 point-in-time copy 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.

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 dependent shadow volume sets:
 - 8 KB per 1 GB of master volume size (rounded-up to the nearest whole GB), plus an additional 24 KB for overhead.
For example, to shadow a 3 GB master volume, the bitmap size must be $(3 \times 8 \text{ KB}) + 24 \text{ KB}$, or 48 KB in size. A 50 GB master volume requires a 424 KB bitmap volume.
- For compact dependent shadow volume sets:
 - 264 KB per 1 GB of master volume size (rounded up to the nearest whole GB), plus an additional 24 KB for overhead.
For example, to shadow a 3 GB master volume, the bitmap size must be $(3 \times 264 \text{ KB}) + 24 \text{ KB}$, or 816 KB in size. A 50 GB master volume in a compact dependent shadow volume set requires a 13224 KB bitmap volume.

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

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 Availability Suite 3.1 Administration and Operation Guide*.

▼ To Back Up Configuration Information

Note – Perform this step on a routine basis, 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 – *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.*



Caution – Perform the restore procedure only if the Sun StorEdge services software (point-in-time copy software and remote mirror software) is not in use. In clustered environments, be sure that no node is using the 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 15.

```
# /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 point-in-time copy software 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 point-in-time copy software 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 point-in-time copy software 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 point-in-time copy software 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 `MANPATH` statement in your `.login` file.**

This path enables you to read the point-in-time copy software 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 point-in-time copy software 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>	ds.log.4
	dscfg.1m
	scmadm.1m

Upgrade Installation

This chapter describes how to install the Sun StorEdge Availability Suite 3.1 software in a system that contains earlier versions of the software. This chapter also applies to completely reinstalling Sun StorEdge Availability Suite 3.1 software in a system in which it has already been installed.

If you are removing and reinstalling only the point-in-time copy software, see [“Reinstallation and Removal” on page 29](#).

If this is a new installation in a system that does not contain earlier versions of the software, follow the procedures in [“New Installation” on page 1](#).

If you are attempting to install an additional software package in an existing Sun StorEdge Availability Suite 3.1 installation, follow the procedures in [“Additional Installations” on page 35](#).

This chapter includes the following main topics:

- [“Upgrade Installation Procedure” on page 22](#)
- [“Saving Your Current Configuration” on page 23](#)
- [“Removing Earlier Versions” on page 24](#)
- [“Converting Bitmaps” on page 28](#)
- [“Backing Up and Restoring Configuration Information” on page 15](#)

Note – The Sun StorEdge Availability Suite 3.1 point-in-time copy software used to be called Sun StorEdge Instant Image Software. In this document, you will see Instant Image referenced when necessary, for example in the section that presents instructions for removing older versions of the software.

Upgrade Installation Procedure

Installation Steps

Step	Description
1. Run probe_script.	See “Running probe_script” on page 3.
2. Choose a configuration location.	See “Choosing a Configuration Location” on page 6.
3. Save current configuration.	See “Saving Your Current Configuration” on page 23
4. Removing earlier versions of the software.	See “To Remove Versions 2.0 and 2.0.1 of the Sun StorEdge Instant Image Software” on page 24 if this upgrade is from versions 2.0 or 2.0.1 to version 3.1. See “To Remove Versions 3.0 and 3.0.1 of the Sun StorEdge Instant Image Software” on page 27 if this upgrade is from versions 3.0 or 3.0.1 to version 3.1.
5. Install the software.	See “Installing the Availability Suite 3.1 Software” on page 8.

Post-installation Steps

Step	Description
1. Convert Version 2.0 and 2.0.1 bitmaps.	See “Converting Bitmaps” on page 28. This step is only for upgrades from versions 2.0 and 2.0.1 to version 3.1. See also “Bitmaps” on page 14 for general information about bitmaps.
2. Configuration Information.	See “Backing Up and Restoring Configuration Information” on page 15.
3. Set up command path and make man pages available.	See “Adding the iiadm Command PATH and Man Page MANPATH to Your Shell Environment” on page 17.

Saving Your Current Configuration

If this is an upgrade from Sun StorEdge Instant Image Version 2.0.*n* software to Sun StorEdge Availability Suite 3.1 software, save your current configuration for use with the new software.

Follow this procedure to save your current configuration for use with Sun StorEdge Availability Suite 3.1 point-in-time copy software when upgrading from Sun StorEdge Instant Image 2.0.*n* software only.

▼ To Save Your Current Configuration

Note – The following command *should not be run* if you are upgrading from 3.0.*n*, because doing so will create duplicate entries in the configuration file.

- **Enter the following command as the root user *before* you remove old versions.**

The location of the `iiadm.out` file must be as shown in the following command line or else the configuration data will not be converted to the correct format and will not be usable to the point-in-time copy software.

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

During installation, the output of the `iiadm -i all` command is converted to the Version 3.1 format, to be used by Sun StorEdge Availability Suite 3.1 point-in-time copy software.

Removing Earlier Versions

▼ To Remove Versions 2.0 and 2.0.1 of the Sun StorEdge Instant Image Software

1. Boot your system in single-user mode to prevent other users from attempting access to existing data volumes, which can cause data to become inconsistent.
2. Log in as the root user.
3. If you have not already done so, run the `probe_script` described in [“Running probe_script” on page 3](#), which lists the packages you must remove and the order in which to remove them.
4. Stop the Sun StorEdge Instant Image and supporting Sun StorEdge management services software.

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

5. 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:

TABLE 1

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:

TABLE 2

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:

TABLE 3

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, then you can ignore the error and continue:

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

6. Using `pkgrm`, remove all packages reported by the `probe_script` in the order listed.
7. You can remove the Sun StorEdge management services software packages if you choose to do so. These packages are *not* reported by the `probe_script` and will not cause a problem if left installed.

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
```

8. Shut down your server and reboot in single user mode as follows:

Restarting in this manner prevents other users from corrupting your data while the installation is incomplete.

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

Note – Do not use the `reboot` command. Always use the `/etc/shutdown` command. The `/etc/shutdown` command ensures that any shutdown scripts in the `/etc/init.d` directory are executed.

You are now ready to install the packages according to the procedures described in [“Installing the Availability Suite 3.1 Software” on page 8](#).

▼ To Remove Versions 3.0 and 3.0.1 of the Sun StorEdge Instant Image Software

1. Boot your system in single-user mode to prevent other users from attempting access to existing data volumes, which can cause data to become inconsistent.
2. Log in as the root user.
3. If you have not already done so, run the `probe_script` described in [“Running probe_script” on page 3](#), which lists the packages you must remove and the order in which to remove them.
4. Remove the Sun StorEdge software-specific patches using `patchrm(1M)`:

111945- <i>nn</i>	SCM software patch
111946- <i>nn</i>	SV software patch
111947- <i>nn</i>	Instant Image software patch
111948- <i>nn</i>	SNDR software patch
111949- <i>nn</i>	Fast Write Cache (NVRAM) software patch

If `patchrm(1M)` fails to remove the -02 patch revision level of the patches with the following error, then you can ignore the error and continue:

```
Patch patch-02 is not installed or is invalid
(patch = patch number)
```

5. Use `pkgrm` to remove all packages listed by `probe_script` in the order listed.
6. Shut down your server and reboot in single user mode as follows:
Restarting in this manner prevents other users from corrupting your data while the installation is incomplete.

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

Note – Do not use the `reboot` command. Always use the `/etc/shutdown` command. The `/etc/shutdown` command ensures that any shutdown scripts in the `/etc/init.d` directory are executed.

You are now ready to install the packages according to the procedures described in [“Installing the Availability Suite 3.1 Software” on page 8](#).

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 type is listed as 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 14](#).

4. Suspend all point-in-time operations.

```
# /usr/opt/SUNWesm/sbin/iiboot -s
```

5. Perform the following command for each bitmap file:

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

6. When done with all bitmaps, resume all point-in-time operations.

```
# /usr/opt/SUNWesm/sbin/iiboot -r
```

Reinstallation and Removal

This chapter describes how to re-install the Sun StorEdge Availability Suite 3.1 point-in-time copy software only. Re-installation involves first booting the system into single-user mode, then removing the `SUNWiir` and `SUNWiiu` software packages. Once the software has been removed, you can use the CD ROM to reinstall the point-in-time copy software packages.

You can also completely remove Sun StorEdge Availability Suite 3.1 software from your system with procedures in this chapter.

This chapter includes the following reinstallation topics:

- [“Reinstallation Procedure” on page 30](#)
- [“Reinstalling Point-in-Time Copy Software” on page 31](#)

This chapter also includes the procedures for complete removal of the software.

- [“Removing the Availability Suite 3.1 Software” on page 33](#)

Reinstallation Procedure

Reinstallation Steps

Step	Description
1. Remove existing point-in-time copy software.	See “To Remove Point-in-Time Copy Software Only” on page 31.
2. Install the software.	See “To Reinstall Point-in-Time Copy Software” on page 32.

Note – This procedure assumes that you are familiar with the installation procedure for Sun StorEdge Availability Suite 3.1 software and are aware of the correct answers for the installation questions.

Reinstalling Point-in-Time Copy Software

Perform the following procedures on each server where you plan to *reinstall* the point-in-time copy software. The following procedure is for a system that has already had the point-in-time copy software installed. *This procedure is not for new installations or for upgrades.*

▼ To Remove Point-in-Time Copy Software Only

1. Boot your system in single-user mode to assure that no other user can attempt access to shadow volume sets, which can make your data inconsistent.
2. Log on as the root user.
3. Back up your configuration information as described in [“Backing Up and Restoring Configuration Information” on page 15.](#)
4. Remove the point-in-time copy software packages.

```
# pkgrm SUNWiiu
# pkgrm SUNWiir
```

5. Shut down your server and reboot in single user mode as follows:

Restarting in this manner prevents other users from corrupting your data while the installation is incomplete.

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

Note – Do not use the `reboot` command. Always use the `/etc/shutdown` command. The `/etc/shutdown` command ensures that any shutdown scripts in the `/etc/init.d` directory are executed.

▼ To Reinstall Point-in-Time Copy Software

1. Follow the procedure in [“Installing the Availability Suite 3.1 Software”](#) on page 8 to reinstall the point-in-time copy software.

Removing the Availability Suite 3.1 Software

To completely remove the Sun StorEdge Availability Suite 3.1 software from your system, follow this procedure.

Note – Do not use this procedure if you plan to re-install all or any part of the Sun StorEdge Availability Suite 3.1 software because this procedure removes configuration files.

▼ To Remove the Software

1. **Log in as the root user.**
2. **Run the following command to determine which packages to remove for a complete removal of the Sun StorEdge Availability Suite software.**

```
# pkginfo -x | grep StorEdge

SUNWiir      Sun StorEdge Availability Suite point-in-time copy software (root)
SUNWiiu      Sun StorEdge Availability Suite point-in-time copy software (usr)
SUNWrddcr    Sun StorEdge Availability Suite remote mirror software (root)
SUNWrddcu    Sun StorEdge Availability Suite remote mirror software (usr)
SUNWscmr     StorEdge Cache Management (root)
SUNWscmu     StorEdge Cache Management (usr)
SUNWspsvr    StorEdge Volume Driver (root)
SUNWspsvu    StorEdge Volume Driver (usr)
```

The list shown is all-inclusive. You may not have all of the packages installed on your system.

3. **Remove all but the core software packages.**

```
# pkgrm SUNWiiu SUNWiir SUNWrddcu SUNWrddcr
```

The list shown is all inclusive. You may not have all of the packages installed on your system.

4. Remove the Sun StorEdge core services software packages.

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

5. After removing the software, remove these files if they exist:

a. Enter the following commands:

```
# rm /etc/opt/SUNWesm/dscfg.cf
# rm /usr/opt/SUNWrdc/lib/sndrd
```

You may not have both these files on your system.

b. See “[Choosing a Configuration Location](#)” on [page 6](#). If you chose to use a file to store the configuration, then delete this file if it exists. If, instead, you chose to use a block device, then you do not need to do anything. The block device can be reused.

c. For systems running Solaris 2.6 only.

Optionally, you can remove this entry which was added to the `/etc/system` file in step 9 of the software installation on [page 16](#).

```
set kobj_map_space_len=0x200000
```

Leaving this entry as is should have no adverse effects on the system. The parameter will be reset after the next system reboot.

6. Shut down and restart your server.

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

Note – Do not use the `reboot` command. Always use the `/etc/shutdown` command. The `/etc/shutdown` command ensures that any shutdown scripts in the `/etc/init.d` directory are executed.

Additional Installations

This chapter describes how to install the Sun StorEdge Availability Suite 3.1 point-in-time copy software into an existing Sun StorEdge Availability Suite 3.1 software installation that does not currently include it.

This chapter includes the following main topics:

- [“Installing the Software at Different Times” on page 36](#)

Installing the Software at Different Times

This procedure applies if you want to add the point-in-time copy software to an existing Sun StorEdge Availability Suite 3.1 installation. For example, if you have installed the remote mirror software and have shut down and restarted your server and now you want to install the point-in-time copy software, then use this procedure.

This procedure covers adding packages to a new installation and to an upgrade installation.

▼ To Install the Availability Suite 3.1 Software

You only need to follow the installation steps for the software using the `install.sh` script. You do not need to run `probe_script`.

- Follow the procedures in **“Installing the Availability Suite 3.1 Software” on page 8** to install the software package(s), selecting the `install.sh` option that adds the desired packages.

Note – Prior to restarting after this additional installation, you will need to run the command `touch /reconfigure`.

Troubleshooting Tips

This chapter describes general tips to help avoid and troubleshoot any problems that might occur when using the point-in-time copy software.

The chapter includes the following topics:

- [“Troubleshooting Checklist” on page 38](#)
- [“Checking the Installation” on page 39](#)
- [“Log Files and Devices” on page 41](#)

Troubleshooting Checklist

This table shows the troubleshooting checklist and related sections.

TABLE 5-1 Troubleshooting Checklist

Step	See This Section
1. Check for installation errors.	“Checking the Installation” on page 39
2. Check that <code>/dev/ii</code> is created after reboot.	“Checking the Installation” on page 39
3. Check the log file contents.	“Log Files to Check” on page 41

Checking the Installation

You can verify that the packages have been installed and that the point-in-time copy service is running.

Verifying the Package Installation

The version 3.1 software installation process installs some or all of the following software packages, depending on the chosen installation options:

- SUNWscmr
- SUNWscmu
- SUNWspsvr
- SUNWspsvu
- SUNWiir
- SUNWiiu

During and after the installation process, be sure to:

1. Watch the `SUNWscmu` postinstall process as it displays on your screen. During the core software install process, you specify a configuration location for the point-in-time copy software. If an error occurs as the result of this choice, this postinstall process might fail.
2. Watch all packages complete their postinstall process and check for any error messages or failures.
3. Issue a `pkginfo -i` command on each package after the postinstall process finishes. Make sure the packages are completely installed.

```
# pkginfo -l SUNWiir
<...miscellaneous information>
STATUS: completely installed
<...miscellaneous information>
```

Correct Shutdown and Restart

When you install the Sun StorEdge Availability Suite 3.1 software, you are advised to shut down and restart your system as shown here after installation.

Note – Do not use the `reboot` command. Always use the `/etc/shutdown` command. The `/etc/shutdown` command ensures that any shutdown scripts in the `/etc/init.d` directory are executed.

If you do not shut down and restart your system as shown here and then try to use the software, you might see an error message similar to this:

```
/dev/ii: No such file or directory
```

This error occurs because the `/dev/ii` service has not been created yet. Shutting down your system correctly after installation creates this service.

▼ To Shut Down Correctly

1. Shut down and restart your machine.

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

Note – Do not use the `reboot` command. Always use the `/etc/shutdown` command. The `/etc/shutdown` command ensures that any shutdown scripts in the `/etc/init.d` directory are executed.

2. After your system restarts, check for the `ii` device:

```
# ls -al /dev/ii
lrwxrwxrwx  1 root    root          27 Aug 24 12:44 /dev/ii ->
../devices/pseudo/ii@0:ii
```

Log Files and Devices

You can check the status of the point-in-time copy software by examining the system log files.

Log Files to Check

Check the following files, which help you troubleshoot problems:

- `/var/opt/SUNWesm/ds.log`

This log contains error or informational messages.

- `/var/adm/messages`

This log contains general system error or informational messages.

Example `/var/adm/messages` Output

The `/var/adm/messages` file contains timestamped messages about point-in-time copy software.

```
Mar 5 16:21:24 doubleplay pseudo: [ID 129642 kern.info] pseudo-device: ii0
Mar 5 16:21:24 doubleplay genunix: [ID 936769 kern.info] ii0 is /pseudo/ii@0
```

Example `/var/opt/SUNWesm/ds.log` Output

The `/var/opt/SUNWesm/ds.log` file contains timestamped messages about point-in-time copy software.

```
Mar 05 15:56:16 scm: scmadm cache enable succeeded
Mar 05 15:56:16 ii: iiboot resume cluster tag <none>
```

