Sun StorEdge™ Instant Image 3.0 Release Notes

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Contents

Sun StorEdge Instant Image 3.0 Release Notes

Caution – Do not install or use any Version 3.0 data services software on servers operating the initial release of the Sun Cluster 3.0 software. The Version 3.0 software is not co-existent in this Sun Cluster 3.0 environment.

The Sun StorEdge Fast Write Cache product, all versions, is not supported in any cluster environment.

See "Using the Sun StorEdge Data Services Software in a Sun Cluster Environment" on page 10.

Note – You can install and use the Sun StorEdge Version 3.0 Core Services, Instant Image, and Sun SNDR software on servers in a Sun Cluster 3.0 Update 1 environment.

The Version 3.0 Core Services, Instant Image, and Sun SNDR software is cluster aware in the Sun Cluster 3.0 Update 1 environment and provides high availablility for the Sun StorEdge software. The Version 3.0 Core Services, Instant Image, and Sun SNDR software is co-existent in the Sun Cluster 2.2, Solaris 8 operating environment, where it will not interfere with failover.

Introduction

This document contains important product notes and open bugs for Sun StorEdge Instant Image Version 3.0 software.

For late-breaking news about this release, go to the following web sites and select the Sun Instant Image software product.

```
http://www.sun.com/storage/software/
```

If you are a Sun support or service provider, go to:

```
http://webhome.ebay/networkstorage/products/
```

For the latest version of released storage software documentation, go to:

```
http://www.sun.com/products-n-solutions/hardware/docs/Software
```

For installation services in the USA, please contact Sun at the following number. For installation services outside the USA, please contact your local sales or service representative.

1-800-USA4SUN (1-800)-872-4786

For information about service, sales, consulting, and support, go to:

```
  http://www.sun.com/service/support/contactsalesoffice.html
  http://www.sun.com/service/support/sunsolve/index.html
```

Related Documentation

Application	Title	Part Number

man pages	`sndradm`
	`dscfg`
	`scmadm`
	`svadm`
	`iiadm`
	`shutdown`
		N/A

Installation and User	*Sun StorEdge Instant Image 3.0 Installation Guide*	806-7675
System Administration	*Sun StorEdge Instant Image 3.0 System Administrator's Guide*	806-7677
Release	*Sun StorEdge Instant Image 3.0 Release Notes*	806-7678

Online Sun Documentation

A broad selection of Sun system documentation is located at:

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

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

`http://docs.sun.com`

Documentation on CD

The Sun StorEdge Instant Image Version 3.0 documentation is available on the Sun Instant Image product CD in Adobe Acrobat (`.pdf`) format.

- `ii_sag_3.0` - Sun StorEdge Instant Image 3.0 System Administrator's Guide
- `ii_install_3.0` - Sun StorEdge Instant Image 3.0 Installation Guide
- `ii_config_3.0` - Sun StorEdge Instant Image 3.0 Configuration Guide

To access this documentation:

1. **Become the root user.**

2. **Insert the Sun StorEdge Instant Image Version 3.0 software CD into the CD-ROM drive that is connected to your system.**

3. **Start the Volume Manager daemon `vold`(1M) (if needed) and change to the `Docs` directory.**

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

From this location, you can view the documentation using the free Adobe Acrobat Reader software. This CD also contains the Adobe Acrobat Reader software in the `/Acro_Read` directory. Install this to your local machine if you do not currently have the Adobe Reader software installed. It is also available from Adobe Systems at `www.adobe.com`.

Supported Hardware and Software

Operating Environment	Solaris 7 (all versions) Solaris 8 Solaris 8 6/00 (also known as Update 1) Solaris 8 10/00 (also known as Update 2) Solaris 8 01/01 (also known as Update 3) Solaris 8 04/01 (also known as Update 4)
Optional Software	Sun StorEdge Network Data Replicator 3.0 software (SNDR), which provides remote replicated storage
Host Types	Server hosts using the Solaris Operating Environment include: Sun Enterprise™ Server models 2x0 through 4x0 Sun Enterprise Server models 3x00 through 10000 Sun Fire™ server models 3800, 4800, 4810, and 6800
Supported Attached Storage	Sun StorEdge Instant Image software supports both Sun StorEdge and third-party storage solutions

Upgrading the Solaris Operating Environment with the Instant Image Software Installed

If you installed the Instant Image 3.0 software in the Solaris 7 operating environment and now wish to upgrade to the Solaris 8 operating environment, you do not have to remove or reinstall the Instant Image software.

Product Notes

Differences between Versions 2.0 and 3.0

This section briefly describes the differences between Sun StorEdge Instant Image software versions 2.0 and 3.0. See the *Sun StorEdge Instant Image 3.0 System Administrator's Guide* for detailed information.

- *Multiple shadows of the same master*

  You can enable more than one volume set with the same master volume, which provides multiple shadow volumes for that master volume.

- *Compact dependent shadow volume*

  Compact dependent shadow volumes can be much smaller than their master volumes, which enables you to use your storage space more efficiently.

- *Overflow volumes for compact dependent shadows*

  Compact dependent shadow volumes should be sized to contain all the expected changes caused by writes, but, in case the actual changes exceed the size of the compact dependent shadow volume, you can attach an overflow volume to accept writes to a compact dependent shadow volume that is full.

- *Deport and import of dual-ported shadow volumes*

  A shadow volume that is stored on a dual-ported device can be deported, which allows another host to import the shadow and use it as though it were part of its own storage. Later the shadow volume can be rejoined to the master volume on the original host along with any changes made while exported.

- *Grouping of Instant Image volume sets*

  You can collect volume sets into I/O groups of one or more sets. Grouping enables you to execute atomic commands against all members of the I/O group. Grouping also enables a single point-in-time for all members of an I/O group.

- *Sun Cluster Version 2.2 coexistent; Sun Cluster Version 3.0, Update 1 aware*

  The Sun StorEdge data services and core software is coexistent in the Sun Cluster 2.2 environment and will not prevent a failover. It is cluster aware and will provide high availability in a Sun Cluster 3.0 Update 1 environment. *Do not install any 3.0 data services in a Sun Cluster 3.0 environment.*

- *Enhanced CLI*

  The Sun StorEdge Instant Image 3.0 software is based on an enhanced CLI and does not employ a Graphical User Interface (GUI).

- *The Solaris operating environment Version 2.6 is no longer supported*

  Only Solaris 7 and Solaris 8 or a subsequent compatible version are supported.

- *Only volume-based bitmaps, not file-based bitmaps, are supported*

  For upgrades, the *Sun StorEdge Instant Image 3.0 Installation Guide* contains a procedure for converting existing bitmap files into bitmap volumes.

- *Sun StorEdge Instant Image 3.0 does not support Sun StorEdge Target Emulation (STE)*

  The Sun StorEdge Version 3.0 data services software does not include support for Sun StorEdge Target Emulation (STE). Customers requiring secondary host access to an Instant Image shadow volume can consider using either the new functionality of deporting a shadow volume with the export, import, and join commands, or Sun StorEdge Network Data Replicator 3.0 software.

Rebooting Your Server Using the `Shutdown` Command

During the Sun StorEdge Core and data services installation and upgrade processes, the Sun SNDR and Instant Image 3.0 installation guides instruct you to reboot your server. *Do not use the* `reboot` *command.* As described in the instructions, always use the `shutdown` command. The `shutdown` command also ensures that any shutdown scripts in the `/etc/init.d` directory are executed.

Volume Size Requirements

Ensure that you have at least 500 Kbytes of disk space for the Sun StorEdge configuration used by the Sun StorEdge data services.

The configuration location must be a file name or block device for the single configuration location used by all Sun StorEdge data service software you plan to install. For example: `/dev/dsk/c1t1d0s7` or `/config`.

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

If you specify a file for the configuration location, the file of the appropriate size is automatically created.

Increasing the Storage Volume Limit

The Sun StorEdge Version 3.0 data services software has a default limit of 1024 storage volumes for use with the software. For example, if you use Instant Image only, you can have 341 volume sets, each consisting of master, shadow, and bitmap volumes. If you use Sun SNDR and Instant Image Version 3.0 software packages together, the number of volume sets is divided between these two packages. Any additional 3.0 data services also share the available storage volumes with Sun SNDR and Instant Image.

The following procedure describes how to increase this default limit.

▼ To Increase the Storage Volume Limit

Caution – Increasing this limit causes more memory to be consumed. You might have to adjust the `nsc_global_pages` value in the `/kernel/drv/mc_rms.conf` file. Only an experienced system administrator should make these changes.

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

2. **Open the** `/kernel/drv/nsctl.conf` **file using a text editor such as** `vi`**(1) or** `ed`**(1).**

3. **Search for the** `nsc_max_devices` **field.**

4. **Edit the number in this field to increase your volume limit.**

5. **Save and exit the file.**

6. **Restart your server as follows:**

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

Product Limitations

Caution – The Versions 1.x, 2.0, and 2.0.1 of the Sun StorEdge data services software can not operate with the Version 3.0 editions. These editions include Instant Image Versions 1.0, 2.0, and 2.01; Sun StorEdge Target Emulation Version 1.2; Sun StorEdge Fast Write Cache; and Sun SNDR software.

For example, you cannot use Instant Image 2.0 with Sun SNDR 3.0. If you plan to install or upgrade to a Version 3.0 data service, you must first uninstall all Version 1.x, 2.0, and 2.0.1 data services software.

The Versions 1.x ,2.0, and 2.0.1 Sun StorEdge data services are binary incompatible with Version 3.0. If your system includes Versions 1.x or 2.x of the Sun StorEdge Instant Image, Sun SNDR, Sun StorEdge Fast Write Cache software and supporting packages, you must remove them before installation. See the installation documentation listed in "Related Documentation" on page 3.

However, the Sun StorEdge Core Services Version 3.0 CD contains the Sun StorEdge SUNWnvm Version 3.0 software package. This package is intended for those users whose systems include Version 2.0 of the Sun Fast Write Cache (FWC) hardware and software product and who wish to continue using the Sun FWC product in a nonclustered environment. See the *Sun StorEdge Instant Image 3.0 Installation Guide* for details.

The Sun StorEdge Fast Write Cache product, all versions, is not supported in a Sun Cluster environment because cached data is inaccessible from other machines in a cluster. To compensate, you can use a caching array such as the Sun StorEdge A3500 disk array.

Using the Sun StorEdge Data Services Software in a Sun Cluster Environment

⚠️ **Caution –** The Version 3.0 data services are not supported in a Sun Cluster 2.2, Solaris 7 operating environment.

The Sun StorEdge Fast Write Cache product, all versions, is not supported in a Sun Cluster environment because cached data is inaccessible from other machines in a cluster. To compensate, you can use a caching array such as the Sun StorEdge A3500 disk array.

Note – The Sun StorEdge data services software volumes, such as those used with the Instant Image and Sun SNDR software, do not fail over in a Sun Cluster 2.2 environment.

In a Sun Cluster 2.2 environment, the Sun StorEdge Version 3.0 data services software requires that the following patch be installed:

Solaris 8 operating environment	Patch number 109210-05

During a failover or takeover operation on a Sun Cluster logical host, the list of all volumes being deported is checked to determine whether they are part of one or more Sun StorEdge data services software volume sets. For each volume that is part of such a volume set, the following occurs:

- All processes accessing these volumes or raw devices will be politely killed
- All mounted file systems (`nfs`, `ufs`, or `VxFS`) will be unshared or unmounted
- The Sun StorEdge data services software volume sets will be disabled and then removed from the data services and Storage Volume (SV) driver configuration.

Note – If usage of Instant Image falls outside of the functionality listed above, then those Instant Image volumes must be incorporated into a High Availability Data Service as detailed in *Sun Cluster 2.2 API Developer's Guide* (Part No.805-4241-10), section 2.2.3, sample STOP_NET method.

After a Sun Cluster failover or takeover of an Instant Image set, the sets are still disabled and will require manual reconfiguration prior to use. The volume state after the failover or takeover is as follows:

Type	Operation In Progress	Master State	Shadow State
independent	none	consistent	consistent
independent	master-to-shadow	consistent	inconsistent
independent	shadow-to-master	inconsistent	consistent
dependent	none	consistent	inconsistent
dependent	master-to-shadow	consistent	inconsistent
dependent	shadow-to-master	inconsistent	inconsistent

Considerations for Sun Cluster Installations

- Each Instant Image set's constituent volumes (master, shadow, and bitmap) must all reside in the same Volume Manager Disk Group. During a Sun Cluster switchover, the `sc.stop.sh` script will log to the console any Instant Image constituent volumes that do not conform to this restriction.

- To assure consistency of Instant Image bitmaps, it is strongly recommended that bitmaps be written to disk (default behavior), by assuring that the setting `ii_bitmap=1`, is enabled in the file `/usr/kernel/drv/ii.conf`.

- The use of Fast Write Cache (FWC) in combination with Instant Image is not applicable in a Sun Cluster environment, due to the fact that cached data would be inaccessible from other members of a Sun Cluster environment. The loss of this functionality may be mitigated by use of a caching array, such as the A3500.

- The use of Solstice DiskSuite trans-meta devices in combination with Instant Image is prohibited, even though a logging file system is desired in a Sun Cluster environment. Therefore the following logging file system in combination with Instant Image is supported:

    - Solaris 8 - VxFS or UFS (without SDS trans-meta device)

- Sun Cluster switchover processing time involving Instant Image volumes will increase due to the per-volume processing required, as noted above. Due to the system specific nature of this per-volume processing, it is suggested that you perform testing of Instant Image - Sun Cluster switchover processing. In light of this additional per-volume processing, the number of Instant Image sets will be limited to 100 to avoid excessive switchover times. Even with this limit in place, Sun Cluster timers may be exceeded and thus require adjustment as follows:

- The Sun Cluster step 10 and 11 time-out is adjusted as follows:

  ```
  scconf <clustername> -T <seconds>
  ```

- The Sun Cluster logical host time-out is adjusted as follows:

  ```
  scconf <clustername> -l <seconds>
  ```

- The current values of both of these time-outs can be displayed using:

  ```
  scconf <clustername> -p
  ```

■ Prior to starting a Sun Cluster (`scadmin startcluster`), assure that no Instant Image sets have an active update (`iiadm -u`) or copy (`iiadm -c`) operation in progress.

■ Prior to invoking an HASWITCH over, assure that all Instant Image volumes are fully configured in both Instant Image (`iiadm -i all`) and SV driver (`svadm -i`).

Documentation Errata and Additions

4462728

The CD Insert for the Instant Image 3.0 software erroneously states that the release notes are included on the CD. They are not; they are provided in printed form.

4464277

The glossaries in the *Sun StorEdge Instant Image 3.0 System Administrator's Guide* and the *Sun StorEdge Instant Image 3.0 Configuration Guide*, under the heading for *fast resynchronization*, state: "the master can be updated from the master."

The text should read: "The master can be updated from the shadow and the shadow can be updated from the master..."

4469076

The Sun StorEdge Instant Image 3.0 Installation Guide instructions for reinstalling Instant Image 3.0 are incorrect. In the section, To Reinstall Instant Image 3.0, step 5 states:

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

   This step should read,

5. **Remove the Sun StorEdge Core Services software packages only if Instant Image 3.0 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 of the** *Sun StorEdge Instant Image 3.0 Installation Guide* **for FWC information and see the Sun SNDR documentation for that product.**

4462805 and 4472877

The instructions for exporting, importing, and joining a shadow volume in the *Sun StorEdge Instant Image 3.0 System Administrator's Guide* and in the *Sun StorEdge Instant Image 3.0 Configuration Guide* are incorrect.

The following text is correct and should be used in place of the instructions in the *Sun StorEdge Instant Image 3.0 System Administrator's Guide* and in the *Sun StorEdge Instant Image 3.0 Configuration Guide*.

Exporting, Importing, and Joining Shadows

The Instant Image functionality implemented via the three `iiadm` options of `-E` (export), `-I` (import) and `-J` (join) allow for a dual-ported shadow volume to be deported back and forth between a primary and secondary host while under Instant Image control. This capability allows shadow volume processing by its associated applications to be off-loaded to a secondary host without impacting the primary host's master volume or its associated applications.

Retaining Instant Image control of the shadow volume while on the secondary host maintains bitmap integrity to facilitate fast resynchronization via copy or update processing at a later time.

While the shadow volume is deported to a secondary host, read and write access to the master volume is tracked by Instant Image. Read and write access to the shadow volume on the secondary host is tracked by Instant Image using a second bitmap.

Once secondary host processing has completed, the shadow volume and second bitmap can be deported from the secondary host back to the primary host and rejoined with the master volume such that the master, shadow, and bitmap consistency is reconstructed. After completing the join processing, the Instant Image set is now in the same state as it would have been if the secondary host processing of the shadow volume had been performed by the primary host.

Note – You may not need to copy the bitmap to the original host if the bitmap is on a dual-ported drive.

Note – The bit map from Host B (which can be a file) that was copied across to be joined can be removed from Host A once the join command is complete.

Caution – Once a shadow is rejoined to its original master on Host A, Host B should not use the shadow volume even if it is still accessible.

▼ To Export, Import, and Join a Shadow Volume

The following is a tabular outline that describes how to export, import, and join a shadow volume.

- **Create Instant Image shadow volume on primary node and start application using shadow volume.**

Primary Host	Secondary Host	Comments
master volume		existing *master* volume, mounted, valid data
create *shadow* and *bitmap1* volumes		should be the same redundancy (RAID) as the *master*
shadow volume		same size as *master* on a dual-ported device
bitmap1 volume		size based on *master* volume set
enable independent shadow set		`iiadm -e ind` *master shadow*\ *bitmap1*
mount *shadow* volume		`mount` *shadow mount_point*
start application using *shadow*		

● **Switch application and shadow volume to secondary host.**

Primary Host	Secondary Host	Comments
stop application using *shadow*		existing *master* volume, mounted, valid data
unmount *shadow*		`umount` *mount_point*
export *shadow* volume		`iiadm -E` *shadow*
SV disable		`svadm -d` *shadow*
create *bitmap2*		same size as *bitmap1*, on dual-port device
copy *bitmap1* to *bitmap2*		`cp` *bitmap1 bitmap2*
deport *shadow/bitmap2*		required for VxVM or SDS(SLVM)
	import *shadow/bitmap2*	required for VxVM or SDS(SLVM)
	import *shadow* volume	`iiadm -I` *shadow bitmap2*
	SV enable *shadow* volume	`svadm -e` *shadow*
	mount *shadow* volume	`mount` *shadow mount_point*
	start application using *shadow*	

● **Switch application and shadow volume to primary host.**

Primary Host	Secondary Host	Comments
	stop application using *shadow*	
	unmount *shadow* volume	`umount` *mount_point*
	suspend *shadow* volume	`iiadm -s` *shadow*
	disable *shadow* volume	`iiadm -d` *shadow*
	SV disable *shadow* volume	`svadm -d` *shadow*
	deport *shadow/bitmap2*	required for VxVM or SDS(SLVM)
import *shadow/bitmap2*		required for VxVM or SDS(SLVM)
join *shadow* volume		`iiadm -J` *shadow bitmap2*
SV enable *shadow* volume		`svadm -e` *shadow*
mount *shadow* volume		`mount` *shadow mount_point*
start application using *shadow*		

Open Bugs

4456451

svadm commands used against attached overflow volumes causes svadm to cease working.

Workaround: In general, don't use svadm commands against overflow volumes. However, prior to using an overflow volume, make sure it is not under SV control with the svadm -i command. If you plan to use svadm commands against an overflow volume, for instance if you are going to use it as a shadow volume, make sure you detach the overflow volume with the iiadm -D command option prior to using svadm commands against it.

4431826

When removing Instant Image software, the pkgrm utility may stop working while removing SUNWscmu.

Workaround A: Disable all compact dependent shadow volumes with associated overflow volumes prior to removing Instant Image software.

Workaround B: Boot the system. The remaining packages can be removed normally.

4459424

When you enable a compact dependent volume pair, the command prompt does not return until the enable is complete. Do not interrupt the command by using Control-C (^C), wait for the command to complete.

Workaround: If you need the command prompt to return at once, run the enable in the background. For example: iiadm -e *options* &

4457774

You can enable a volume group using bitmap volumes that are already in use. No checking is performed to prevent you from doing this.

Workaround: Make sure that the bitmap volumes you intend to use in a volume group are not already in use by using the iiadm -i command option.

4459512

When you enable a volume group whose master volume is the primary volume of a Sun SNDR set, the `iiadm -e` command will not complete until all pending Sun SNDR synchronization operations are complete. Depending on current activity, this can appear to be a hang. Also, you can not know if the snapshot is based on the time the Instant Image volume group was enabled or on the time the Sun SNDR operations were concluded.

Workaround: Do not enable an Instant Image volume group with a master volume that is also a Sun SNDR primary volume. Instead, use the Sun SNDR primary volume as the shadow volume.

4459432

After you enable an independent volume group with large volumes (greater than or equal to 1 Tbyte) and while the copy is still in progress, the `iiadm -i` command option will erroneously report the percentage of the bitmap set as not being in the 0% to 100% range.

4469068

The resume command option, `iiadm -r`, if executed on a volume group that was suspended during a copy operation, will not return the system prompt until the copy is complete.

Workaround: If you want the command prompt back right away, run the resume command option in the background.

4470618

The suspend all command option, `iiadm -s all`, does *not* verify that all the master volumes have been dismounted. If writes are sent to a mounted master volume after its volume group has been suspended, data becomes inconsistent.

Workaround: Unmount all master volumes before executing the `iiadm -s all` command option. Use the `iiadm -i` command option to get a list of all volume groups.

4441357

The `iiadm -g group -R` command *must not* be used with multiple shadows of single masters because all the resets occur at the same time with inconsistent results. If the master volume of more than one shadow volume (multiple shadows) goes offline and, upon repair, must be returned online with the `iiadm -R` command, follow this procedure:

1. **Reset all independent shadow sets, except the shadow set that you want to update the master volume with.**

   ```
   # iiadm -R shadow  shadow2 ... shadowN
   ```

2. **Wait for all these resets to finish with the `-w` command.**

   ```
   # iiadm -w shadow  shadow2 ... shadowN
   ```

3. **Reset the final shadow set that contains the shadow volume you want to update the master volume with.**

   ```
   # iiadm -R shadow
   ```

4. **Wait for the copy to complete.**

   ```
   # iiadm -w shadow
   ```

5. **Reset all dependent shadow sets.**

   ```
   # iiadm -R shadow  shadow2 ... shadowN
   ```

Offline Volume Type	After Issuing A Reset, The Instant Image 3.0 Software:
Dependent shadow volume	Automatically updates the shadow volume from the master volume using volume differences stored in the bitmap
Independent shadow volume	Automatically copies the master volume to the shadow volume
Bitmap	Resynchronizes the volume pair by copying the master volume to the shadow volume