



# Sun StorageTek™ Availability Suite 4.0 Release Notes

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# Sun StorageTek Availability Suite 4.0 Release Notes

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This document contains important information about the Sun StorageTek™ Availability Suite 4.0 software that was not available at the time the product documentation was published. Read this document so that you are aware of issues or requirements that can affect the installation and operation of the Sun StorageTek Availability Suite 4.0 software.

- [“Features in This Release” on page 1](#)
- [“System Requirements” on page 5](#)
- [“Known Issues” on page 6](#)
- [“Installing the Software” on page 10](#)
- [“Release Documentation” on page 11](#)
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## Features in This Release

This release includes the following new and changed features, in addition to the noted material that addresses specific issues.

- **Support for Solaris 10 OS**

Availability Suite 4.0 is supported on the Sun Solaris™ 10 Operating System (OS) on SPARC® platforms, including both sun4u and sun4v. Additional support has been added for Solaris 10 OE on x64 AMD Opteron™ platforms, Intel EM64T platforms, and x86 platforms from various vendors. Functionality that is supported by the Sun StorageTek Availability Suite 4.0 software on SPARC platforms is also supported on both x64 and x86 platforms, with the exception of x86 and x64 interoperability of Remote Mirror in Availability Suite 3.2 and 3.2.1.

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**Note** – Support for the Solaris 8 and 9 OS's (SPARC) will continue to be provided by the Sun StorEdge Availability Suite 3.2.1, as Availability Suite 4.0 is not supported on the Solaris 8 or 9 OS, and Availability Suite 3.2.1 is not supported on the Solaris 10 (or later versions) OS.

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■ **Maximum Size of a Supported Volume**

Availability Suite 4.0 now supports a 64-bit data path, allowing for the configuration of Remote Mirror and Point-in-Time Copy sets on volumes with a size of one terabyte or larger. Along with changes to support a 64-bit data path, there is also support for improved Solaris VTOC and Intel EFI Label processing.

■ **Support of the Service Management Facility (SMF)**

Availability Suite 4.0 is now an SMF managed service facility, and once enabled, will be both started and stopped by Solaris at system boot time and shutdown time. Furthermore, a new Availability Suite 4.0 utility, `dscfgadm`, enables the starting up and shutting down of Remote Mirror and Point-in-Time Copy data services.

■ **Least Privileges Support**

Availability Suite 4.0 supports the Solaris 10 least privileges model, which gives a specified process only a subset of the superuser powers and not full access to all privileges.

■ **Maximum Transfer Block Size Support**

To improve performance across a wider array of supported volume configurations, Availability Suite 4.0 inquires about and uses the underlying maximum block transfer size across all volume managers and LUNs, consisting of IDE, SCSI, and SATA drives.

■ **Global Zone Support**

Due to the agnostic behavior of Availability Suite 4.0 regarding underlying LUNs and volume managers and upper-level file systems, databases, and applications, the configuration, control, and monitoring of Remote Mirror and Point-in-Time Copy sets is only allowed from a Solaris global zone.

■ **Improved Packaging Support**

For the Solaris 10 OS, Availability Suite 4.0 software packages can be added (`pkgadd`) and removed (`pkgrm`), without rebooting the Solaris OS. Both the installation and removal of the Availability Suite 4.0 product set can utilize an auto-answer file for `pkgadd` and `pkgrm`, because the prior interactive steps required to configure the persistent database have been moved to the post-installation utility, `dscfgadm`.

- **New Configuration and Control Utility**

Availability Suite 4.0 includes a new utility that facilitates the creation of the persistent configuration database in the Solaris OS. As a means to decrease issues with the persistent configuration database, the database location is now fixed at `/etc/dscfg_local`. The utility also provides the means to start and stop the Remote Mirror and Point-in-Time Copy data services without starting or stopping the Solaris OS. The utility also provides validation of the persistent database and SMF service status.

- **Rolling Upgrade Support**

Rolling upgrade support exists between Availability Suite 3.2 and 3.2.1 on Solaris 8 or Solaris 9 OS, to Solaris 10 OS.

- **Sun StorageTek Availability Suite 4.0 Remote Mirror Software Changes**

- **Mixed Version Replication Support**

Remote Mirror replication is supported between Availability Suite 3.1 and 3.2 (SPARC) and Availability Suite 4.0 (SPARC).

- **Cross Architecture Replication Support**

Remote Mirror replication is supported between Availability Suite 4.0 on SPARC, x86 and x64 platforms.

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**Note** – Due to the file system–agnostic behavior of Availability Suite 4.0, Solaris disks formatted for the UFS files system (and others) are restricted to being mounted on the hardware platform on which they were originally formatted. In other words, a UFS disk formatted on a SPARC-based platform cannot be used for UFS on an x86-based platform, nor can a disk formatted on an x86 platform be used on a SPARC-based platform. This is because the SPARC and x86 UFS formats are different. SPARC uses big–endian bit coding, whereas x86 and x64 platforms use little–endian bit coding.

This issue is not pertinent to ZFS file systems. For ZFS, a storage pool can be replicated between big- and little-endian architectures and ZFS will operate correctly. ZFS uses an adaptive endianness concept, where all ZFS metadata is written in the current native endianness and is marked appropriately. On being read, the endianness is determined and adjusted as needed. Although a ZFS file system is endian neutral, it does not offer the guarantee that an application writing or reading the contents of files within a ZFS file system is endian neutral.

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- **Sun StorageTek Availability Suite Point-in-Time Copy Software Changes**

- **Point-in-Time Copy Timestamping Support**

Availability Suite 4.0 has added support to associate a Solaris timestamp with each Point-in-Time Copy set, thereby offering an administrative means by which to query when the last snapshot was taken.

- **Sun StorageTek Availability Suite 4.0 and Sun Cluster 3.1 Changes**

- **Rolling Upgrade Support**

Rolling upgrade support exists between Availability Suite 3.2.1 on the Solaris 8 or Solaris 9 OS to the Solaris 10 OS, including support for Sun™ Cluster operating environment (OE) upgrades.

- **Installation Before or After Sun Cluster**

Availability Suite 4.0 can be installed either before or after Sun Cluster, with the only requirement being that `dscfgadm` be run once before configuring any Sun Cluster–controlled devices under Availability Suite 4.0.

- **Separate Persistence Database for Sun Cluster OE**

In a Sun Cluster OE, not only does Availability Suite 4.0 have a persistence database located at `/etc/dscfg_local`, but also the Sun Cluster shared portion of the persistence database is located on a Sun Cluster administrator-specified DID device, accessed through the pointer file `/etc/dscfg_cluster`.

- **Concurrent Access to the Persistence Database in Sun Cluster OE**

The ability to configure, control, and monitor Availability Suite 4.0 configuration information can now be done concurrently from any node within a Sun Cluster where Availability Suite 4.0 has been installed. This requires continuous access to the DID device on which the persistence database is located, from all nodes where Availability Suite 4.0 is installed.

- **Failover Support on As Many Nodes As Sun Cluster Allows**

The changes to the Availability Suite 4.0 persistence database (described earlier), along with changes in Sun Cluster 3.1, have allowed the supported number of Sun Cluster nodes to increase to the level started by Sun Cluster for failover data services.

- **Export/Import/Join Support in a Sun Cluster OE**

The ability to support the Point-in-Time Copy functionality of Export/Import/Join has been extended to include a Sun Cluster OE. A Point-in-Time independent shadow volume is said to be an “exportable” shadow volume, due to its existence in a Sun Cluster device group that differs from that of the master and bitmap volume. Once exported, the device group of the shadow volume can be moved independently of the device group of the master and bitmap volume.

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**Note** – Although a Point-in-Time Copy shadow volume can be exported, imported, and joined within a Sun Cluster OE, there currently exists no supported means for Sun Cluster to export or import the device group of the exportable shadow volume outside of a Sun Cluster OE.

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- **Remote Mirror Resource Group in a Sun Cluster No Longer “Lightweight”**

Prior restrictions when using Remote Mirror software in a Sun Cluster OE, regarding the naming and contents of a Sun Cluster resource group, have been removed. Although for Remote Mirror to failover correctly in a Sun Cluster OE there is a requirement that the resource group must contain one `SUNW.HAStoragePlus` resource type and one `SUNW.LogicalHostname` resource type, any number of and any other failover (HA) resource type can also be included in the resource group. With improvements in Sun Cluster 3.1, regarding “affinity,” there is no longer a requirement to rename the Sun Cluster resource group to the name of the Sun Cluster device group, suffixed with the string `-stor-rg`.

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## System Requirements

This section describes the requirements for the Sun StorageTek Availability Suite 4.0 software.

### Hardware Requirements

The Sun StorageTek Availability Suite 4.0 software can be installed on a Sun server based on UltraSPARC® technology (`sun4u` or `sun4v`), on a server based on AMD Opteron x64 technology, on a server based on Intel EM64T technology, or on a server based on x86 technology from various vendors.

### Operating System Requirements

The Sun StorageTek Availability Suite 4.0 software runs in the following operating system environments:

- Solaris 10 OS (and subsequent releases)

### ▼ To Verify the Operating System

To verify the operating system, repeat the following steps for each host on which you want to install the Sun StorageTek Availability Suite 4.0 software:

1. **Verify that your system has a CD-ROM / DVD-ROM drive or that it can access the release package at the Sun Download Center.**

The Sun Download Center is at the following URL:

<http://www.sun.com/software/downloads>

## 2. Log in to your system as root.

You must have superuser access to install the software.

## 3. Verify your system's Solaris OS level.

For example:

```
# uname -rsmpp
SunOS 5.10 sun4u sparcc
```

The software relies on properly configured Solaris software at the following release level:

- Solaris 10 OS (for SPARC, x86 or x64 platforms)

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# Known Issues

This section describes known issues when using the Sun StorageTek Availability Suite 4.0 software.

## Shadow Volume Not Same Size As Master Volume

**Issue** – The Availability Suite 4.0 software returns the following error message in several situations when the shadow volume of a Point-in-Time Copy volume set is not the same size as the master volume.

```
Another package would not allow target to be changed at this
moment
```

Whenever a Point-in-Time Copy snapshot is taken, the volume that is used to create the snapshot, the shadow volume, is made to look exactly like the master volume, including matching the number of blocks. If the master volume is larger or smaller than the shadow volume's physical size, the shadow volume appears to be resized at the moment the snapshot is taken. Physically, the shadow volume has not changed size, but the Point-in-Time Copy kernel module always reports its size to be the same size as the master volume. This can present several problems for the Remote Mirror software, which does not expect the size of the volume to change:

- If you plan to use a Remote Mirror primary or secondary volume as a Point-in-Time Copy shadow volume, the master and the shadow of that volume set must be exactly the same size. If they are different, you get an error when attempting to enable the Point-in-Time Copy volume set with the `iiadm -e` command.
- You might also see this error during a `iiadm -d` disable command. If the shadow volume of the existing Point-in-Time Copy volume set is not the same size as the master volume and a Remote Mirror volume set was enabled using that shadow volume as the primary or secondary, the Point-in-Time Copy software stops you from performing the disable operation.

## Bitmap Volume Placement

**Issue** – Due to the read-modify-write behavior of Point-in-Time Copy bitmap volumes, placing many of them on a single RAID-5 volume introduces high I/O contention involving the disks associated with the RAID-5 volume. This I/O contention is noticeable at volume unmounting time, as seen when an application suite or system is being shutdown.

**Workaround** – Place bitmap volumes on RAID-1 sets, multiple RAID-5 sets, or on a cached-array disk controller.

## nskernd Daemon Reports Some Number of Kernel Threads in Use

**Bug 6326350** – During a reboot, or sometimes a shutdown of the Solaris OS, the Availability Suite 4.0 daemon process `nskernd` reports that there are some number of kernel threads in use. For example:

```
nskernd: unable to shutdown: 128 kernel threads in use
```

**Workaround** – None. This is only a warning message, in that the `nskernd` daemon process detects that kernel threads previously allocated have not been deallocated. Because the Solaris OS is about to shut down, reboot, or halt, the failure to delete these threads is not an issue.

## Resize of Point-in-Time Copy Set Master Volume Does Not Resize the File System (growfs)

**Bug 6383124** – Point-in-Time Copy and Remote Mirror software are based on fixed volume size values obtained at enable time (`iiadm -e ...`, or `sndradm -e ...`), and record in the associated bitmap volume.

**Workaround** – None. When growing a volume using `format (1m)`, SVM or VxVM, there is no supportable means by which to grow the master or primary volume, except to disable and then reenable the Point-in-Time Copy or Remote Mirror set with a newly sized bitmap volume.

For Remote Mirror, there is the ability to eliminate the full volume synchronization required at enable time by using `sndradm -E ...` to perform a fast-enable with bitmap clear.

Care must be taken to only grow the actual Remote Mirror primary and secondary volume, plus associated bitmap volumes, while the Remote Mirror set is disabled, and to defer the growing of the file system, database, or application data until after Remote Mirror is enabled on both hosts. This will allow the grow file system, grow database, or grow application data changes to be replicated to the Remote Mirror secondary volume.

## Restart of Remote Mirror Services After Reconfiguring `max_sets` Does Not Incorporate Changes

**Bug 6400884** – When changing the value `max_sets` in the file `/usr/kernel/drv/rdc.conf`, the change might not take effect just by disabling (`dscfgadm -d`) and reenabling (`dscfgadm -e`) the Availability Suite 4.0 data services.

**Workaround** – Ensure that when any driver configuration file (see the following list) changes occur, not only are the Availability Suite data services disabled and associated modules unloaded, but also that the Solaris kernel cache of driver properties is flushed prior to the data services being reenabled (and loaded). It is only during the first load of a device driver by the Solaris OS, that the configuration parameters are read.

Device properties are flushed by the Solaris `update_drv (1M)` command.

The correct sequence to change a driver configuration parameter is as follows:

1. `svboot -u`

2. `dscfgadm -d`
3. `update_drv <driver name>`
4. `dscfgadm -e`

System Administrators must be cautious when performing this sequence, as the sequence of commands disables *all* Availability Suite 4.0 volume processing (replication and snapshot), such that if any file system, database, or application I/O was issued to any Availability Suite 4.0 configured volume, data will not be replicated to the secondary or shadow volume, resulting in inconsistent volume data, a form of data corruption. Quiescing the volumes (dismount, stopping applications, `lockfs -f`, and so on), are application-specific steps that must be performed.

Although Availability Suite 4.0 no longer requires a reboot of the Solaris OS, performing a reboot and transitioning to single user mode is a guaranteed way to eliminate all concerns regarding Availability Suite 4.0 volume consistency.

The driver names and associated configuration files for the Availability Suite 4.0 data services are as follows:

```
nskern - /usr/kernel/drv/nskern.conf
nsctl - /usr/kernel/drv/nsctl.conf
ncall - /usr/kernel/drv/ncall.conf
sdbc - /usr/kernel/drv/sdbc.conf
sv - /usr/kernel/drv/sv.conf
ii - /usr/kernel/drv/ii.conf
rdc - /usr/kernel/drv/rdc.conf
```

## Point-in-Time Copy Creation of -C Local Set in Existing Export Import Join Failover I/O Group

**Bug 6418503** – Point-in-Time Copy I/O consistency groups with two or more Sun Cluster device groups fail to work correctly, reporting the following error:

```
iiadm: Point-in-Time Copy volumes, that are not in a device
group which has been registered with SunCluster, require usage
of "-C": Error 0
```

**Workaround** – In a Sun Cluster OE, Point-in-Time volumes are either in a local device group `-C local`, or a Sun Cluster device group (global device, SVM metaset, VxVM disk group).

When using I/O consistency groups (`iiadm -g <group_name>, ...`), place only a single device group (local or Sun Cluster) within each I/O consistency group.

## scmadm Usage Statement Contains Unsupported Options and Man Pages for scmadm Refer to Unsupported Options

**Bugs 6425408 and 6425409** – Although support for `s = sync`, `p = purge`, and `r = redevid` was removed from prior versions of Availability Suite, the usage statement (`scmadm -h`) and man pages (`man scmadm`), still list these as viable options.

**Workaround** – None. Although listed, these `scmadm` options no longer function as documented.

## autosync Does Not Automatically Start

**Bug 6426349** – When using the Remote Mirror software under certain conditions when auto-synchronization has been enabled, `autosync` fails to automatically start (even after waiting two hours) when the Remote Mirror secondary node becomes available.

**Workaround** – None.

**Solution** – Patches to fix this problem are available as follows:

123246-01 (SPARC)

123247-01 (x86/x64)

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## Installing the Software

Install the Sun StorageTek Availability Suite 4.0 software on the Solaris host machines.

## Installation Script Syntax

You can install all Sun StorEdge software or just individual packages (for example, Point-In-Time Copy or Remote Mirror). Each option also installs the core software, which is required for all products. The `install.sh` installation script on the product CD checks to see if the core software is already installed. If it is not, it is installed.

The `install.sh` installation script has the following syntax:

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

where:

`-j` – Installs the packages where the root installation path is a path other than the standard root slice (`/`). Use this option when the root is located on a remotely-mounted device and you want to install the packages on a remotely-mounted device.

`-a` – Installs the core, Remote Mirror, and Point-in-Time Copy software.

`-p` – Installs the core and Point-in-Time Copy software.

`-r` – Installs the core and Remote Mirror software.

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## Release Documentation

This section lists all documents in the documentation set, as well as any online information (help, man pages) included in the release.

Subject	Title	Part Number
Installation and configuration	<i>Sun StorageTek Availability Suite 4.0 Software Installation and Configuration Guide</i>	819-6147
System administration	<i>Sun StorageTek Availability Suite 4.0 Point-in-Time Copy Software Administration Guide</i>	819-6149
	<i>Sun StorageTek Availability Suite 4.0 Remote Mirror Software Administration Guide</i>	819-6148
Integration	<i>Sun Cluster and Sun StorageTek Availability Suite 4.0 Software Integration Guide</i>	819-6150
Troubleshooting	<i>Sun StorageTek Availability Suite 4.0 Software Troubleshooting Guide</i>	819-6151
Man pages	<code>ds.log</code> – Contents of <code>/var/adm/ds.log</code> configuration journal log	N/A
	<code>dsbitmap</code> – Data services bitmap sizing utility	
	<code>dscfg</code> – Data services configuration utility	
	<code>dscfgadm</code> – Data services configuration administration utility	

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Subject	Title	Part Number
Man pages (continued)	dsconfiglockd – Data services configuration database cluster lock daemon dsstat – Data services kernel I/O statistics utility dsw – Point-in-Time Copy data shadow device driver ii – Point-in-Time Copy device driver configuration iiadm – Point-in-Time Copy administration utility iicpbmp – Point-in-Time Copy copy bitmap utility iicpshd – Point-in-Time Copy copy shadow utility nscadm – Network Storage Configuration administration utility rdc.cf – Remote Mirror remote data copy configuration data scmadm – Sun StorEdge cache management administration utility sdbc – Sun StorEdge disk block cache device driver configuration sndr – Remote Mirror device driver sndradm – Remote Mirror administration utility sndrd – Remote Mirror daemon sndrsyncd – Remote Mirror synchronization daemon sv – Sun StorEdge volume device driver svadm – Sun StorEdge volume administration utility	N/A

## ▼ To Access the Release Documentation

The product documentation is located on the product CD in Adobe® Acrobat (PDF) format.

1. **Change to the root user.**
2. **Insert the product CD into the CD-ROM drive that is connected to your system.**
3. **If the Volume Manager daemon `vold(1M)` is not started, type one of the following sequences:**
  - a. **If the package installation path is the normal root slice (/):**

```
# /etc/init.d/volmgt start
# cd /cdrom/cdrom0
# ./install.sh -a
```



- b. If the package installation root path is located on a remotely-mounted device or when older packages might be located on a remote-mounted device:**

```
# /etc/init.d/volmgt start
# cd /cdrom/cdrom0
# ./install.sh -j
```

- 4. If you typed `./install.sh -j`, the script prompts you as follows. Otherwise, skip to Step 5.**

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

Perform one of the following steps:

- a. Press <Return> to accept the default root path (/).**
  - b. Type the full path where the root slice is mounted.**
- 5. Change to the Docs directory.**

From this location, you can view the documentation using the free Adobe Acrobat Reader software. The software is available from Adobe Systems at:

[www.adobe.com](http://www.adobe.com).

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## Service Contact Information

If you need help installing or using this product, call 1-800-USA-4SUN, or go to:

<http://www.sun.com/service/contacting/index.html>

