Sun StorEdge™ Availability Suite 3.2 Software Troubleshooting Guide

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Contents

Preface

Sun StorEdge Availability Suite 3.2 Software Troubleshooting Guide helps users solve common problems that might arise when using the Sun StorEdge™ Availability Suite 3.2 software.

Before You Read This Book

To use the information in this document, you must have thorough knowledge of the topics discussed in these books:

■ *Sun StorEdge Availability Suite 3.2 Point-in-Time Copy Software Administration and Operations Guide*

■ *Sun StorEdge Availability Suite 3.2 Remote Mirror Software Administration and Operations Guide*

How This Book Is Organized

This book includes the following chapters:

Chapter 1 helps to solve problems associated with the point-in-time copy software.

Chapter 2 helps to solve problems associated with the remote mirror software.

Chapter 3 provides an alphabetical list of error messages from all sources associated with the Sun StorEdge Availability Suite 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 the following for this information:

- Software documentation that you received with your system
- Solaris™ operating environment documentation, which is at

  `http://docs.sun.com`

Shell Prompts

Shell	Prompt
C shell	*machine-name*%
C shell superuser	*machine-name*#
Bourne shell and Korn shell	$
Bourne shell and Korn shell superuser	#

Typographic Conventions

Typeface[1]	Meaning	Examples
`AaBbCc123`	The names of commands, files, and directories; on-screen computer output	Edit your `.login` file. Use `ls -a` to list all files. `% You have mail.`
`AaBbCc123`	What you type, when contrasted with on-screen computer output	`% `**`su`** `Password:`
AaBbCc123	Book titles, new words or terms, words to be emphasized. Replace command-line variables with real names or values.	Read Chapter 6 in the *User's Guide*. These are called *class* options. You *must* be superuser to do this. To delete a file, type `rm` *filename*.

1 The settings on your browser might differ from these settings.

Related Documentation

Application	Title	Part Number
Man pages	sndradm iiadm dsstat kstat svadm	N/A
Latest release information	*Sun StorEdge Availability Suite 3.2 Software Release Notes*	817-2782
	Sun Cluster 3.0 and Sun StorEdge Software Release Note Supplement	816-5128
Installation and user	*Sun StorEdge Availability Suite 3.2 Software Installation Guide*	817-2783
	SunATM 3.0 Installation and User's Guide	805-0331
	SunATM 4.0 Installation and User's Guide	805-6552
	Sun Gigabit Ethernet FC-AL/P Combination Adapter Installation Guide	806-2385
	Sun Gigabit Ethernet/S 2.0 Adapter Installation and User's Guide	805-2784
	Sun Gigabit Ethernet/P 2.0 Adapter Installation and User's Guide	805-2785
	Sun Enterprise 10000 InterDomain Networks User Guide	806-4131
System administration	*Sun StorEdge Availability Suite 3.2 Remote Mirror Software Administration and Operations Guide*	817-2784
	Sun StorEdge Availability Suite 3.2 Point-In-Time Copy Software Administration and Operations Guide	817-2781
Cluster	*Sun Cluster 3.0 and Sun StorEdge Software Integration Guide*	816-5127
Configuration	*Sun Enterprise 10000 InterDomain Network Configuration Guide*	806-5230

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Sun StorEdge Availability Suite 3.2 Software Troubleshooting Guide, part number 817-3752-10

Point-in-Time Copy Software Troubleshooting Tips

This chapter describes how to avoid or troubleshoot problems that might occur when using the point-in-time copy software.

The chapter includes the following topics:

- "Troubleshooting Checklist" on page 1
- "Checking Log Files" on page 2
- "Improving Performance" on page 2
- "Safeguarding the VTOC Information" on page 3

Troubleshooting Checklist

This table shows the troubleshooting checklist and related sections.

TABLE 1-1   Troubleshooting Checklist

Step	For Instructions
1. Check for installation errors.	*Sun StorEdge Availability Suite 3.2 Software Installation Guide*
2. Check that `/dev/ii` is created after reboot.	*Sun StorEdge Availability Suite 3.2 Software Installation Guide*
3. Check the log file contents.	"Checking Log Files" on page 2

Checking Log Files

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

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

The `/var/opt/SUNWesm/ds.log` file contains timestamped messages about the point-in-time copy software, including error messages and informational messages. For example:

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

- `/var/adm/messages`

The `/var/adm/messages` file contains timestamped messages about the point-in-time copy software, including general system error and informational messages. For example:

```
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
```

Improving Performance

If the Sun StorEdge Availability Suite software is used with a filesystem, tuning the number of SV threads might produce better performance.

When a filesystem flushes its cache, it generates many parallel write operations. The SV's default setting of 32 threads could produce a bottleneck. You can increase the number of SV threads. The maximum number of threads allowed is 1024.

Note – Each thread consumes 32k of memory.

The `sv_threads` value is in the `/usr/drv/conf/sv.conf` file. Because the file is read when a module loads, changes to the `sv_threads` value do not take effect until you reboot the system.

Safeguarding the VTOC Information

Caution – When creating shadow volume sets, do not create shadow or bitmap volumes using partitions that include cylinder 0. Data loss might occur.

The Solaris system administrator must be knowledgable about the virtual table of contents (VTOC) that is created on raw devices by the Solaris operating system. The creation and updating of a physical disk's VTOC is a standard function of the Solaris operating system. Software applications like the Sun StorEdge Availability Suite, the growth of storage virtualization, and the appearance of SAN-based controllers have made it easy for an uninformed Solaris system administrator to allow a VTOC to be altered inadvertently. Altering the VTOC increases the possibility of data loss.

Remember these points about the VTOC:

- A VTOC is a software-generated virtual table of contents based on the geometry of a device and written to the first cylinder of that device by the Solaris format(1M) utility.

- Various software components such as dd(1M), backup utilities, point-in-time copy software, and remote mirror software can copy the VTOC of one volume to another volume if that volume includes cylinder 0 in its mapping.

- If the VTOC of the source and destination volumes are not identical, some type of data loss might occur. This data loss might not be detected initially, but can be detected later when other utilities are used, like fsck(1M), or when the system is rebooted.

  When first configuring and validating volume replication, save copies of all affected devices' VTOCs using the prtvtoc(1M) utility. The fmthard(1M) utility can be used to restore them later, if necessary.

- When using volume managers like SVM and VxVM, copying between individual volumes created under these volume managers is safe. VTOC issues are avoided because the VTOC is excluded from volumes created by these volume managers.

- When formatting individual partitions on a raw device, for all partitions except the backup partition, make sure the partitions do not map cylinder 0, which contains the VTOC. When using raw partitions as volumes, you are the volume manager and you need to exclude the VTOC from partitions that you configure.

- When formatting the backup partition of a raw device, make sure that the physical geometries of the source and destination devices are identical. (Partition 2, by default, maps all cylinders under the backup partition.) If identical device sizing is not possible, make sure that the source backup partition is smaller than the destination partition and that the destination partition does not map cylinder 0.

Remote Mirror Software Troubleshooting Tips

This section describes how to avoid or troubleshoot any problems might occur when using the remote mirror software. The following topics are described.

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-
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Note – The *Sun StorEdge Availability Suite 3.2 Remote Mirror Software Administration and Operations Guide* describes the `dsstat` and `scmadm` commands. These commands are useful for displaying information about remote mirror and point-in-time copy software volumes.

Troubleshooting Checklist

This table shows the troubleshooting checklist and related sections.

TABLE 2-1   Troubleshooting Checklist

Step	For Instructions
1. Check for installation errors.	*Sun StorEdge Availability Suite 3.2 Software Installation Guide*
2. Check that `/dev/rdc` is created after reboot.	"Checking That the `rdc` Service Is Running" on page 8 "If the `/dev/rdc` Link Is Not Created" on page 9
3. Check that the `sndrd` daemon is running.	*Sun StorEdge Availability Suite 3.2 Software Installation Guide*
4. Check the log file contents.	"Checking Log Files" on page 7
5. Check that the `/etc/nsswitch.conf` file is configured correctly.	"Checking the `/etc/nsswitch.conf` File" on page 8
6. Check the integrity of the link.	"Checking the Integrity of the Link" on page 10
7. Check for common errors.	"Correcting Common User Errors" on page 13

Troubleshooting Log Files and Services

The remote mirror software is client-server software that is bidirectional. The primary and secondary hosts each act as a client *and* server in the protocol.

Checking Log Files

Check the following files to troubleshoot problems:

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

The `/var/opt/SUNWesm/ds.log` file contains timestamped messages about the software. For example:

```
Aug 20 19:13:55 scm: scmadm cache enable succeeded
Aug 20 19:13:55 ii: iiboot resume cluster tag <none>
Aug 20 19:13:58 sndr: sndrboot -r first.atm /dev/vx/rdsk/rootdg/vol5
/dev/vx/rdsk/
rootdg/bm6 second.atm /dev/vx/rdsk/rootdg/vol7 /dev/vx/rdsk/rootdg/bm7
Successful
Aug 20 19:13:58 sndr: sndrboot -r first.atm /dev/vx/rdsk/rootdg/vol4
/dev/vx/rdsk/
rootdg/bm4 second.atm /dev/vx/rdsk/rootdg/vol4 /dev/vx/rdsk/rootdg/vol4
Successful
Aug 20 19:13:58 sndr: sndrboot -r first.atm /dev/vx/rdsk/rootdg/vol2
/dev/vx/rdsk/
rootdg/bm2 second.atm /dev/vx/rdsk/rootdg/vol2 /dev/vx/rdsk/rootdg/bm2
Successful
Aug 20 19:13:58 sndr: sndrboot -r first.atm /dev/vx/rdsk/rootdg/vol3
/dev/vx/rdsk/
rootdg/bm3 second.atm /dev/vx/rdsk/rootdg/vol3 /dev/vx/rdsk/rootdg/bm3
Successful
```

- `/var/adm/messages`

Make sure that the `rdc` service is active when the remote mirror software starts or you see the following error messages:

```
Completing SNDR startup: sndrd Aug 16 08:37:16 sndrd[291]: Cannot get address
for transport tcp6 host \1 service rdc
Aug 16 08:37:16 sndrd[291]: Cannot establish RDC service over /dev/tcp6:
transport setup problem.
Aug 16 08:37:16 sndrd[291]: Cannot get address for transport tcp host \1 service
rdc
Aug 16 08:37:16 sndrd[291]: All transports have been closed with errors.
Exiting.
Aug 16 08:37:16 sndrd[291]: SNDR Fatal server error
sndrsyncd done
```

Checking the `/etc/nsswitch.conf` File

If entries in the `/etc/nsswitch.conf` are not configured correctly, you might encounter these problems:

- If the `hosts:` entry is incorrect, volume sets not resume after a reboot.

- If the `services:` entry is incorrect, the `rdc` service might not activate and no data is replicated.

Note – The services port number must be the same between all interconnected remote mirror host systems.

When the `hosts:` and `services:` entries are included in the `/etc/nsswitch.conf` file, ensure that `files` is placed before `nis`, `nisplus`, `ldap`, `dns`, or any other service the machine is using. For example, for systems using the NIS naming service, the file must include:

```
hosts: files nis
services: files nis
```

If you need to edit the `/etc/nsswitch.conf`(4) file, use a text editor.

● **After editing the file, shut down and restart your machine.**

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

Checking That the `rdc` Service Is Running

When the remote mirror software loads, it adds an entry into the `/etc/services` file for the `rdc` service. Search for an entry that looks like this:

```
# grep rdc /etc/services
rdc             121/tcp                         # SNDR server daemon
```

Use the `rpcinfo` and `netstat` commands to check the service:

- **rpcinfo**

```
# rpcinfo -T tcp hostname 100143
 program 100143 version 6 ready and waiting
```

where:

- −T tcp specifies the transport that the service uses.
- *hostname* is the name of the machine where the service is running.

If the service is not running, this message is displayed:

```
rpcinfo: RPC: Program not registered
```

If you see this message, it is possible that the /etc/nsswitch.conf services:
entry is incorrectly configured. See "Checking the /etc/nsswitch.conf File" on
page 8.

- **netstat**

This messages shows that the service is running:

```
# netstat -a|grep rdc
*.rdc                *.*            0      0 65535      0 LISTEN
*.rdc                *.*            0      0 65535      0 LISTEN
*.rdc                         *.*                        0      0
65535     0 LISTEN
```

If the /dev/rdc Link Is Not Created

Note – Although other applications make entries in the files described in this
section, you can edit the files to correct these problems. Always make a backup copy
of a file before editing it.

The /dev/rdc pseudo-link might not be created for the following reasons:

- The /etc/devlink.tab file is missing an entry for the /dev/rdc pseudo-link.
  This example shows a valid entry:

```
# grep rdc /etc/devlink.tab

type=ddi_pseudo;name=rdc          \D
```

- The `/etc/name_to_major` file is missing an entry for the `/dev/rdc` pseudo-link. This example shows a valid entry (the number following `rdc` can be any number):

```
# grep rdc /etc/name_to_major

rdc 239
```

- The `/usr/kernel/drv/rdc.conf` file is incomplete. This example shows a valid entry:

```
# grep pseudo /usr/kernel/drv/rdc.conf

name="rdc" parent="pseudo";
```

Checking the Integrity of the Link

After you determine that the `rdc` service is ready, check the integrity of the TCP/IP link. As part of the installation process, you entered the primary and secondary host names and IP addresses of the machines where the software is installed in the `/etc/hosts` file. Make sure this file contains the same information on the primary and secondary hosts because the software is bidirectional. The software uses these hosts to transfer data.

Simple tests to check link integrity include the following:
- Use the `telnet` or `rlogin` commands to connect to the hosts.
- Use the `ifconfig` command to check your network interfaces.
- Use the `ping` command to make sure packets are being transmitted.
- Use the `snoop` or `atmsnoop` commands to make sure the software is copying data.

Note – The `dsstat` command displays volume information The `sndradm -H` command displays link I/O statistics.

Testing with `ifconfig`

Use the `ifconfig` command to make sure that the network interface is configured and running correctly. This example output shows all the interfaces that are configured and running:

```
# ifconfig -a
ba0: flags=1000843<UP,BROADCAST,RUNNING,MULTICAST,IPv4> mtu 9180 index 1
        inet 192.9.201.10 netmask ffffff00 broadcast 192.2.201.255
        ether 8:0:20:af:8e:d0
lo0: flags=1000849<UP,LOOPBACK,RUNNING,MULTICAST,IPv4> mtu 8232 index 2
        inet 127.0.0.1 netmask ff000000
hme0: flags=1000843<UP,BROADCAST,RUNNING,MULTICAST,IPv4> mtu 1500 index 3
        inet 192.9.201.124 netmask ffffff00 broadcast 192.9.200.255
        ether 8:0:20:8d:f7:2c
lo0: flags=2000849<UP,LOOPBACK,RUNNING,MULTICAST,IPv6> mtu 8252 index 2
        inet6 ::1/128
hme0: flags=2000841<UP,RUNNING,MULTICAST,IPv6> mtu 1500 index 3
        ether 8:0:20:8d:f7:2c
        inet6 fe80::a00:20ff:fe8d:f72c/10
```

Testing with `ping`

Use the `ping` command to verify that the network interfaces can communicate and that IPv4 or IPv6 addressing is being used. Issue this command from the primary host and secondary host to make sure communication is bidirectional. This command also determines whether both hosts are using the same IP protocol (IPv4 or IPv6).

This example checks the communication on host `second.atm.`:

```
# ping -s second.atm
PING second.atm: 56 data bytes
64 bytes from second.atm (192.9.201.2): icmp_seq=0. time=1. ms
64 bytes from second.atm (192.9.201.2): icmp_seq=1. time=0. ms
64 bytes from second.atm (192.9.201.2): icmp_seq=2. time=0. ms
64 bytes from second.atm (192.9.201.2): icmp_seq=3. time=0. ms
```

Testing with `snoop` and `atmsnoop`

Use the `snoop` or `atmsnoop` utility to make sure that the software is sending and receiving data during a copy or update operation.

In the first example, the command is issued from the primary host `nws822` to the secondary host `nws350`. The network interface is `hme0` and the port used by the `rdc` service is reported.

```
[nws822]# snoop -d hme0 port rdc
Using device /dev/hme (promiscuous mode)
 nws822 -> nws350  RPC C XID=3565514130 PROG=100143 (?) VERS=4 PROC=8
 nws350 -> nws822  RPC R (#1) XID=3565514130 Success
 nws822 -> nws350  TCP D=121 S=1018    Ack=1980057565 Seq=2524537885
Len=0 Win=33304 Options=<nop,nop,tstamp 1057486 843038>
 nws822 -> nws350  RPC C XID=3565514131 PROG=100143 (?) VERS=4 PROC=8
 nws350 -> nws822  RPC R (#4) XID=3565514131 Success
 nws822 -> nws350  TCP D=121 S=1018    Ack=1980057597 Seq=2524538025
Len=0 Win=33304 Options=<nop,nop,tstamp 1057586 843138>
 nws822 -> nws350  RPC C XID=3565514133 PROG=100143 (?) VERS=4 PROC=8
 nws350 -> nws822  RPC R (#7) XID=3565514133 Success
 nws822 -> nws350  TCP D=121 S=1018    Ack=1980057629 Seq=2524538165
Len=0 Win=33304 Options=<nop,nop,tstamp 1057686 843238>
 nws822 -> nws350  RPC C XID=3565514134 PROG=100143 (?) VERS=4 PROC=8
```

In the second example, the link is ATM so the `atmsnoop` utility is appropriate.

```
# /etc/opt/SUNWconn/atm/bin/atmsnoop -d ba0 port rdc
device ba0
Using device /dev/ba (promiscuous mode)
TRANSMIT : VC=32
TCP D=121 S=1011 Syn Seq=2333980324 Len=0 Win=36560
_____
RECEIVE : VC=32
TCP D=1011 S=121 Syn Ack=2333980325 Seq=2878301021 Len=0 Win=36512
_____
TRANSMIT : VC=32
TCP D=121 S=1011    Ack=2878301022 Seq=2333980325 Len=0 Win=41076
_____
TRANSMIT : VC=32
RPC C XID=1930565346 PROG=100143 (?) VERS=4 PROC=11
_____
RECEIVE : VC=32
TCP D=1011 S=121    Ack=2333980449 Seq=2878301022 Len=0 Win=36450
_____
RECEIVE : VC=32
RPC R (#4) XID=1930565346 Success
_____
TRANSMIT : VC=32
TCP D=121 S=1011    Ack=2878301054 Seq=2333980449 Len=0 Win=41076
```

Correcting Common User Errors

This section describes user errors encountered often when using the software.

Enabled Software on Only One Host

New users sometimes forget to issue the sndradm -e enable command on both the primary host *and* the secondary host. Other problems include making a mistake when typing a disk or volume name or attempting to get access to a disk that does not allow access.

Volumes Are Inaccessible

Verify that a volume or disk is accessible:

- Confirm each volume is available on the primary and secondary host by using the dd(1M) command to read a volume. Issue the following command on the primary and secondary hosts for each primary, secondary, and bitmap volume:

```
# dd if=volume-name of=/dev/null count=10

10+0 records in
10+0 records out
```

  The result shows that the command was able to read 10 512-byte records, indicating that the volume is accessible.

- Issue a newfs -N command and see if an error results. This command displays file system information and does not display an error if the disk or volume is accessible.

Note – Be sure to enter these commands properly, including the correct options. Neither of these commands, if properly entered, overwrites data.

This example shows the `newfs -N` command completing successfully:

```
# newfs -N /dev/vx/rdsk/rootdg/test0
/dev/vx/rdsk/rootdg/tony0: 2048000 sectors in 1000 cylinders of 32 tracks, 64
sectors
        1000.0MB in 63 cyl groups (16 c/g, 16.00MB/g, 7680 i/g)
super-block backups (for fsck -F ufs -o b=#) at:
32, 32864, 65696, 98528, 131360, 164192, 197024, 229856, 262688, 295520,
328352, 361184, 394016, 426848, 459680, 492512, 525344, 558176, 591008,
623840, 656672, 689504, 722336, 755168, 788000, 820832, 853664, 886496,
919328, 952160, 984992, 1017824, 1048608, 1081440, 1114272, 1147104, 1179936,
1212768, 1245600, 1278432, 1311264, 1344096, 1376928, 1409760, 1442592,
1475424, 1508256, 1541088, 1573920, 1606752, 1639584, 1672416, 1705248,
1738080, 1770912, 1803744, 1836576, 1869408, 1902240, 1935072, 1967904,
2000736, 2033568,
```

This example shows a typical error caused when the secondary host is not enabled or a disk or volume is inaccessible:

```
SNDR: first.atm /dev/vx/rdsk/rootdg/vol11 /dev/vx/rdsk/rootdg/bm11
second.atm /dev/vx/rdsk/rootdg/vol11 /dev/vx/rdsk/rootdg/bm11
SNDR: Error
SNDR: Could not open file second.atm:/dev/vx/rdsk/rootdg/vol11 on remote node
Aug 27 14:25:45 ns-east-124 rdc: NOTICE: SNDR: Interface 192.9.200.1 <==>
192.9.200.2
: Up
```

Wrong Volume Set Name Specified

When you first enable a set, the remote mirror software assigns a default volume set name of *shost*:*sdev*, where *shost* is the secondary host name and *sdev* is the secondary volume name, separated by a colon (:).

After enabling the software for a volume set, you can use the *shost*:*sdev* name for a volume set each time you issue an `sndradm` command, instead of specifying the complete primary and secondary host, volume, and bitmap information for a volume set.

If you issue an `sndradm` command *without* specifying a volume set name, the software executes the command on all configured volume sets. Make sure that you specify the correct volume set on the command line.

For example, this command updates the volume on the secondary host `calamari` from the primary host volume:

```
# sndradm -un calamari:/dev/vx/rdsk/rootdg/tony1
```

To correctly display the volume set name, use the `sndradm -p` command on the primary host. See "To Find the Volume Set Name" on page 16.

Using the `dsstat` Command Incorrectly

An administrator might use the `dsstat`(1M) command instead of `sndradm -p` to find the volume set name. The output of both commands only appears to be similar

```
# dsstat -m sndr
Name            t  s    pct      role   kps  tps  svt
sk/rootdg/tony1 P  L    0.00     net    0    0    0
sk/rootdg/bmap1                  bmp    0    0    0
```

Issuing the `sndradm -p` Command on the Secondary Host Incorrectly

An administrator might use the `sndradm -p` command to find the volume set name correctly but issue the command from the secondary host incorrectly. Depending on which host you issue the command from, the output differs. For example, when issued from the primary host, the command shows the correct volume set name of `calamari:/dev/vx/rdsk/rootdg/tony1`:

```
# sndradm -p
/dev/vx/rdsk/rootdg/tony1      -> calamari:/dev/vx/rdsk/rootdg/tony1
```

When issued from the secondary host, the command shows the *incorrect* volume set name. The name `ariell:/dev/vx/rdsk/rootdg/tony0` is the name of the primary host and its volume set.

```
# sndradm -p
 /dev/vx/rdsk/rootdg/tony0      <- ariell:/dev/vx/rdsk/rootdg/tony0
```

▼ To Find the Volume Set Name

1. If you are unsure of the volume set name, type the following command from the primary host:

```
# sndradm -p
/dev/vx/rdsk/rootdg/tony1         -> calamari:/dev/vx/rdsk/rootdg/tony1
```

Running Startup Script Out of Order

The scripts to configure the network interface must run before the Availability Suite's startup script. If the startup script runs first, the following error is reported when the primary host is restarted:

```
Error: Neither <phost> nor <shost> is local
```

The scripts are out of order if the configuration file includes the set information but the sndradm -i and sndradm -P commands do not report the set.

The startup process runs the startup scripts in alphabetical order. The Availability Suite startup script is SOOtrdc. Move the network configuration procedures, plumb, ifconfig, and route_add, to a file that has a name that comes after SOOtrdc in alphabetical order.

Accommodating Memory Requirements

In releases prior to the Sun StorEdge Availability Suite 3.2 software, a single asynchronous thread was created for each group of volume sets on the primary host. Asynchronous I/O requests were placed on an in-memory queue and serviced by this single thread. Because there was only one thread, only one RPC request could be in-flight for each group and each request had to be completed before a new request could be issued.

The version 3.2 software enables the number of asynchronous service threads to be set on a per group basis, which enables multiple in-flight RPC requests and faster servicing of the asynchronous queue. Enabling more than one RPC request creates the possibility that requests arrive out of order with respect to the order that the write operations were issued on the primary host. In other words, a request might arrive before a previous request has completed its I/O.

The order of write operations must be maintained within a group. Therefore, these out of order requests must be stored in memory on the secondary host until the missing request comes in and completes.

The secondary host can store up to the hard-coded limit of 64 requests per group. Exceeding 64 stored requests stalls the primary host from issuing any more requests. This hard limit is applied only to the number of possible outstanding requests, not the size of their payload. For example, if the I/O consists of 4 Kbyte writes with six groups, the total memory requirement could be 4Kbyte x 6 x 64 = 1536 Kbyte. However, with an I/O size of 1 Mbyte, this requirement could rise to 1 Mbyte x 6 x 64 = 384 Mbyte. You need to be aware of this requirement to avoid exhausting the memory of the secondary host.

The most common symptom of secondary memory exhaustion is the volume sets changing to logging mode. The RPC requests fail when memory is low. To avoid the problem, change the number of asynchronous threads for some of the groups from the default of two to one. This forces the earlier version 3.1 behavior with no extra memory requirement on the secondary host.

The need for extra memory is most common with large I/O on a high latency link. When selecting groups to use a single thread, your best choices are those groups with a good network connection. Such groups are most likely to fill the secondary queue and they derive the least benefit from multiple threads.

Users upgrading from Sun StorEdge Availability Suite 3.1 software must be aware that the default number of asynchronous threads is two, not one. Out-of-order requests can occur and extra memory might be required on the secondary host.

Error Messages

Error messages during the installation process are described in the *Sun StorEdge Availability Suite 3.2 Software Installation Guide.* Solaris error messages related to the Sun StorEdge Availability Suite software are described in ....

TABLE 3-1 lists Sun StorEdge Availability Suite 3.2 error messages in alphabetical order. The error messages come from the following sources:

- PITC: From the point-in-time copy software. This software used to be called "Sun StorEdge Instant Image" software.

- RM: From the remote mirror software

- Kernel: From the kernel software

Kernel messages might not be printed on the screen but are usually written to `/var/opt/SUNWesm/ds.log` or to the system console and recorded in `/var/adm/messages.`

TABLE 3-1   Error Messages for the Sun StorEdge Availability Suite 3.2 Software

Error Message	From	Meaning
`'%s'` is not a valid number	PITC	`iiadm` was expecting a number to be on the command line. This happens when the copy parameters option (-P) is used but the arguments for units and delay are not valid numbers.
-C *<ctag>* does not match disk group	PITC	`iiadm` determined that the cluster resource group that contains the volumes does not match the cluster tag given as an argument to the -C option.
-C is valid only in a Sun Cluster	PITC	The user attempted to specify a cluster tag when not in a cluster.

TABLE 3-1   Error Messages for the Sun StorEdge Availability Suite 3.2 Software *(Continued)*

Error Message	From	Meaning
Abort failed	PITC	iiadm could not abort a copy or update operation on a set. Possible errors: EFAULT: The kernel module tried to read out-of-bounds. File a bug against iiadm. ENOMEM: The kernel module ran out of memory. DSW_EEMPTY: No set was specified. DSW_ENOTFOUND: The specified set does not exist.
Allocation of bitmap device %s failed	Kernel	Remote mirror could not use the bitmap requested to enable or resume a remote mirror set. This could happen for one of these reasons: • The bitmap is not accessible. Verify that the specified bitmap volume exists and is accessible. • The volume requested for use as the bitmap is already in use. Verify that the volume is not already in use as a remote mirror data volume or bitmap volume, or as a point-in-time copy master volume, shadow volume, or bitmap volume.
Attach failed	PITC	The overflow volume could not be attached to the specified set. Possible errors: ENOMEM: The kernel module ran out of memory. DSW_EEMPTY: No overflow volume was specified. DSW_EINUSE: The overflow volume is already being used by point-in-time copy software in a different capacity (master, shadow, bitmap). DSW_ENOTFOUND: The set that the user is trying to attach to does not exist. DSW_EALREADY: The set already has an overflow volume attached. DSW_EWRONGTYPE: The set is not compact-dependent. DSW_ERSRVFAIL: The kernel module could not get access to the overflow volume. DSW_EHDRBMP: The set's bitmap could not be read.
Bad host specified Bad set specified	RM	A remote mirror command was issued referring to a set in abbreviated format, but a mistake was made. The format did not specify the set in the format: *shost:svol.*
Bitmap in use	PITC	The volume that was specified as the bitmap volume during an enable operation is already being used by another set.

Error Message	From	Meaning
`Bitmap reconfig failed %s:%s`	Kernel	A request to reconfigure the bitmap on the local host has failed. This can happen for two reasons: • The old bitmap cannot be read from to obtain needed information. • The new bitmap cannot be reserved because the volume is not accessible or is already in use. Verify that the new bitmap volume is accessible and is not already in use.
`bitmap <vol> is already in use by StorEdge Network Data Replicator`	RM	The volume requested as a bitmap for the remote mirror set is already configured to be used by the remote mirror software.
`bitmap <vol> is in use by Instant Image`	RM	The volume requested as a remote mirror bitmap volume is already configured to be a volume used by the point-in-time copy software.
`bitmap <vol> is in use by SCSI Target Emulation`	RM	The volume requested as a remote mirror bitmap volume is already configured for use by STE (SCSI Target Emulation).
`Bitmap volume is already an overflow volume`	PITC	The volume that was specified as the bitmap volume during an enable operation is already being used by another set as an overflow volume.
`Bitmap volume is not a character device`	PITC	The volume that was specified as the bitmap volume during an enable operation is a block device and not a character device.
`bitmap volume name must start with /dev`	PITC	The volume that was specified as the bitmap volume during an enable or import operation does not start with `/dev`.
`both <phost> and <shost> are local`	RM	The set specifies the same host as both primary and secondary. The primary and secondary hosts must be different.
`Cannot add %s:%s ==> %s:%s to group %s`	Kernel	The set being added to a group cannot be added. Typically, this happens because the set being added is of a different type (sync or async) than the sets already in the group.
`Cannot change disk queue %s, Must be in logging mode`	Kernel	A disk queue cannot be added to or removed from a set if it is not in logging mode. Place the set into logging mode and then attempt to add or remove the disk queue.
`Can not check volume against mount table`	PITC	The `iiadm` operation attempted to determine whether a volume on the command line belongs to a mounted filesystem . The test for this has failed.

Error Message	From	Meaning
`cannot find SNDR set` `<shost>:<svol> in config`	RM	Remote mirror set cannot be found in the configuration database. The set is not configured. Check the entry for errors.
`Cannot reconfig %s:%s to %s:%s,` `Must be in logging mode`	Kernel	An operation has been requested that requires the remote mirror set to be in logging mode. Put the remote mirror set into logging mode and then request the reconfiguration.
`Cannot reconfigure sync/async on` `members of a group`	Kernel	The user attempted to reconfigure the mode of a set that is in a group. The set must be removed from the group before its mode can be reconfigured.
`cannot replace disk queue <diskq1>` `with <diskq2>`	RM	Look at check_diskqueue(cfg, qvol, group_arg);
`can not start reverse sync as a` `file system is mounted on <vol>`	RM	The primary volume has a file system mounted on it. Unmount the file system on the primary volume and then issue the reverse sync command.
`can not start sync as SNDR set` `<shost>:<svol> is not logging`	RM	The remote mirror set must be in logging mode on the primary host before a sync can be started. If the primary site is in an error state, fix the error and then place the primary site into logging mode for this set. Then reissue the forward sync command.
`can not use current config for` `bitmap reconfiguration`	RM	A single set must be specified for bitmap operations. The default configuration cannot be used for these operations.

`can not use current config for`
`disk queue operations`
 	
`can not use a config file for disk`
`queue operations`
	RM	An individual set or group must be specified when issuing disk queue operations. A single disk queue operation cannot operate on all sets configured or all sets in a file.

`can not use current config for` `enable command`	RM	A set must be specified when issuing an enable command. An enable command cannot operate on the default configuration.
`Can't export a mounted volume`	PITC	A volume cannot belong to a mounted file system before it is exported.
`Can't get memory for list enquiry`	PITC	`iiadm` ran out of memory.
`Can't open sort program`	PITC	The `iiadm` operation is attempting to sort output before displaying it but cannot find the sort utility (typically found in `/usr/bin/sort`).

Error Message	From	Meaning
`Cannot enable %s:%s, secondary in use in another set`	Kernel	A set being enabled or resumed has a secondary volume that is already in use as a secondary volume for another remote mirror set. A volume cannot be enabled as a secondary volume if it is already in use as a secondary volume by another remote mirror set.
`Cannot enable master volume`	PITC	`iiadm` attempted to put the master volume under SV control during an enable operation, but failed.
`Cannot enable shadow volume`	PITC	`iiadm` attempted to put the shadow volume under SV control during an enable operation, but failed.
`Cannot reverse sync %s:%s <== %s:%s, set is in queuing mode`	Kernel	A reverse sync has been requested on a set that is in queuing mode. Put the set into logging mode and then the issue the reverse sync command for the set.
`Change request denied, don't understand request version`	Kernel	A request was sent from one remote mirror host to the other, and the version of the software was not understood by the receiving host. Verify that both hosts are running compatible versions of the remote mirror software.
`Change request denied, volume mirror is up`	Kernel	The user asked to sync a remote mirror set, and the secondary host has refused the sync event.
`changing queue parameters may only be done on a primary SNDR host`	RM	The queue parameters for the async I/O queue, both memory-based and disk-based, can be changed only on the primary host.
`Cluster list access failure`	PITC	`iiadm` was unable to retrieve a list of cluster groups from the kernel. Possible errors: EFAULT: The kernel module tried to read out-of-bounds. File a bug against `iiadm` ENOMEM: The kernel module ran out of memory.
`cluster name is longer than <MAX> characters`	RM	The cluster resource tag is too long for the remote mirror software to accept.
`config error: neither <host1> nor <host2> is localhost`	RM	The current host is neither the primary nor secondary host for the remote mirror set. Verify that the hostname of the system has not been changed since the remote mirror set was enabled.

TABLE 3-1 Error Messages for the Sun StorEdge Availability Suite 3.2 Software *(Continued)*

Error Message	From	Meaning
`Copy failed`	PITC	A copy or update operation could not be initiated. Possible errors:
		`EFAULT`: The kernel module tried to read out-of-bounds. File a bug against `iiadm`.
		`ENOMEM`: The kernel module ran out of memory.
		`DSW_EEMPTY`: No set was specified on the command line.
		`DSW_ENOTFOUND`: The specified set could not be found in the kernel.
		`DSW_ECOPYING`: A copy is already in progress, or a partial copy was aborted and the new copy request does not match the aborted one.
		`DSW_EOFFLINE`: One or more volumes in the set is offline.
		`DSW_EINCOMPLETE`: The shadow is exported or imported.
		`DSW_EINUSE`: The set is PID-locked by another process.
		`DSW_ERSRVFAIL`: The kernel was unable to access one or more volumes in the set.
		`DSW_EOPACKAGE`: Another package (for example:, RDC) told the point-in-time copy software not to perform the copy operation.
		`DSW_EIO`: The kernel had a problem reading or writing one of the volumes in the set.
`Could not create rdc_config process`	Kernel	The user has issued a sync for a remote mirror set and the process could not be started for the set. The system is probably low on resources. Check the amount of memory and threads available.
`Could not open file %s:%s on remote node`	Kernel	The user issued a sync command and the primary host could not reach the secondary host. Verify that the link from the primary to the secondary host is operating and that none of the ports used by the remote mirror are blocked by a firewall or in use by another application.

Error Message	From	Meaning
`Create overflow failed`	PITC	An overflow volume couldn't be initialized. Possible errors:
		`EFAULT`: The kernel module tried to read out-of-bounds. File a bug against `iiadm`.
		`ENOMEM`: The kernel module ran out of memory.
		`DSW_EEMPTY`: No overflow volume was specified.
		`DSW_EINUSE`: The volume that was specified is already being used by the point-in-time copy software in another capacity.
		`DSW_EIO`: The kernel was unable to write to the volume.
		`DSW_ERSRVFAIL`: The kernel was unable to access the volume.
`ctag "<ctag2>" is does not match disk group name "<ctag1>" of volume <vol>`	RM	The cluster resource tag given for a set is different from the configured cluster resource tag.
`ctags <ctag1> and <ctag2> do not match`	RM	The set specified contains both the syntax '`-C ctag1`' and '`... C ctag2`'. This error indicates the values specifed for `ctag1` and `ctag2` do not match.
`device name is longer than <MAX> characters`	RM	The name for the primary data volume, primary bitmap volume, secondary data volume, or secondary bitmap volume is too long for the remote mirror software.
`Disable failed`	PITC	`iiadm` was unable to disable one or more sets. Possible errors:
		`EFAULT`: The kernel module tried to read out-of-bounds. File a bug against `iiadm`
		`ENOMEM`: The kernel module ran out of memory.
		`DSW_EEMPTY`: No set was specified.
		`DSW_ENOTFOUND`: The specified set could not be found in the kernel.
		`DSW_EDEPENDENCY`: An attempt was made to disable an independent set, but the set is not yet independent.
		`DSW_EOPACKAGE`: Another package (for example: RDC) told the point-in-time copy software not to disable the set.
		`DSW_ERSRVFAIL`: The kernel could not access the shadow or bitmap volumes.

Error Message	From	Meaning
`Disable pending on diskq %s, try again later`	Kernel	A request to disable the disk queue is already in progress. Verify that the previous request has completed successfully. If it has, this request is no longer valid. If it has not, wait for it to complete unsuccessfully before attempting to disable the disk queue.
`disk service, <ctag>, is active on node "<hostname>" Please re-issue the command on that node`	RM	The remote mirror set being operated on is not active on the current node in the cluster.
`disk service, %s, is active on node "%s"; Please re-issue the command on that node`	PITC	The `iiadm` command must be issued on the other node of the cluster. The disk group that the user is attempting to operate on is not active on the node where the `iiadm` command was issued.
`diskq name is longer than <MAX> characters`	RM	The device specified for the disk queue volume is too long for remote mirror to accept.
`disk queue <diskq2> does not match <diskq1> skipping set`	RM	The user tried to enable a set into a group that has a disk queue, but the user specified a disk queue that does not match the group's disk queue.
`diskqueue <diskq> is incompatible`	RM	The user tried to enable a set into a group that has a disk queue, but the user specified a disk queue that does not match the group's disk queue.
`Disk queue %s is already in use`	Kernel	The volume for the disk queue being added to the set or group is already in use as a data volume, bitmap volume, or disk queue. Use a different volume for the disk queue.
`Disk queue %s operation not possible, set is in replicating mode`	Kernel	The user attempted to perform disk queue maintenance on a set while the set is replicating.
`Disk queue does not exist for set %s:%s ==> %s:%s`	Kernel	The user attempted to perform disk queue maintenance on a set that does not have a disk queue.
`disk queue <diskq> is incompatible with existing queue`	RM	The user tried to enable a set into a group that has a disk queue, but the user specified a disk queue that does not match the group's disk queue.
`disk queue <diskq> is not in disk group "<ctag>"`	RM	The user tried to enable a disk queue that does not reside in the same cluster resource group in which the volume and bitmap reside.
`Disk queue operations on synchronous sets not allowed`	Kernel	An attempt to enable a sync set with a disk queue, or to add a disk queue to a sync set, has been made. Sync sets cannot have disk queues attached to them.

Error Message	From	Meaning
`disk queue volume <vol> must not match any primary SNDR volume or bitmap`	RM	The disk queue volume specified for the reconfiguration operation is already in use by the remote mirror software as a data volume or bitmap volume.
`don't understand shadow type`	PITC	The iiadm -e command expected dep or ind.
`DSWIOC_LISTLEN`	PITC	iiadm tried to get a count of the number of sets recognized by the kernel, but failed. This is a bug in iiadm.
`Dual copy failed, offset:%s`	Kernel	A sync or reverse sync was started but could not complete, for one of the following reasons:. • The user issued a logging request manually, causing the sync or reverse sync to abort. • The network link between the primary and the secondary host failed, causing the sync or reverse sync to stop. • The primary or secondary volume encountered an error and the remote mirror software was unable to read or write to the volume. • In a Sun Cluster environment, a failover of the resource group might have been issued, causing the sync ot reverse sync to be stopped.
`Duplicate volume specified`	PITC	A command that can take multiple shadow volume names (like update or copy) detected that a shadow volume was specified more than once.

`either <phost>:<pfile> or <shost>:<sfile> is not local`
 	
`either <phost>:<pvol> or <shost>:<svol> is not local`
	RM	The command was issued on a system that is not the primary or secondary host for the specified set. Verify the command is being issued on the proper system.

`Empty string`	Kernel	An enable or resume request for a remote mirror set was issued but a required field was not filled in when the request was received in the kernel. This is not something the user can control.

TABLE 3-1   Error Messages for the Sun StorEdge Availability Suite 3.2 Software *(Continued)*

Error Message	From	Meaning
`Enable failed`	PITC	Could not enable volume. Possible errors:
		EFAULT: The kernel module tried to read out-of-bounds. File a bug against `iiadm`.
		ENOMEM: The kernel module ran out of memory.
		DSW_ESHUTDOWN: The kernel module is in the process of shutting down the point-in-time copy software. No new sets can be enabled.
		DSW_EEMPTY: One of the volumes' names (master, shadow, bitmap) is blank. File a bug against `iiadm`.
		DSW_EINUSE: One of the volumes (master, shadow, bitmap) is already being used by another set.
		DSW_EOPEN: Failed to open one of the volumes (master, shadow, or bitmap).
		DSW_EHDRBMP: Could not read bitmap header. Bitmap volume might be inaccessible or bad.
		DSW_EOFFLINE: One of the volumes (master, shadow, bitmap) is offline and cannot be made part of a set.
		DSW_ERSRVFAIL: Could not get access to the underlying volume (master, shadow, bitmap).
`Enable failed, can't tidy up cfg`	PITC	Could not enable volume and could not remove new entry from configuration file.
`Enable pending on %s ==> %s, try again later`	Kernel	A previous enable operation of a set is still processing when another enable operation is attempted.
`enabling disk queue on an SNDR secondary is not allowed (<diskq>)`	RM	A disk queue can be added only to a set on the primary site.
`Export failed`	PITC	Could not export the shadow of the specified set. Possible errors:
		EFAULT: The kernel module tried to read out-of-bounds. File a bug against `iiadm`.
		ENOMEM: The kernel module ran out of memory.
		DSW_EEMPTY: No set was specified to export from.
		DSW_ENOTFOUND: The specified set does not exist in the kernel.
		DSW_EDEPENDENCY: The set is not independent.
		DSW_ERSRVFAIL: Could not access the bitmap header to record the export operation.
`Failed to allocate memory`	PITC	`iiadm` ran out of memory.

Error Message	From	Meaning
`Failed to detach overflow volume`	PITC	`iiadm` had a problem detaching the overflow volume from a set. Possible errors:
		`EFAULT`: The kernel module tried to read out-of-bounds. File a bug against `iiadm`.
		`ENOMEM`: The kernel module ran out of memory.
		`DSW_EEMPTY`: No set was specified to detach from.
		`DSW_ENOTFOUND`: The set to detach from does not exist.
		`DSW_EODEPENDENCY`: The overflow volume is still in use by the set that the user attempted to detach it from.
		`DSW_ERSRVFAIL`: Could not access the bitmap header to record the overflow detach.
		`DSW_EHDRBMP`: Could write the bitmap header to record the overflow detach.
`Failed to move group in kernel`	PITC	Could not move the set from one group to another. Possible errors:
		`EFAULT`: The kernel module tried to read out-of-bounds. File a bug against `iiadm`.
		`ENOMEM`: The kernel module ran out of memory.
		`DSW_EEMPTY`: `iiadm` failed to fill in the group name. This is a bug.
`failed to update autosync for SNDR set <shost>:<svol>`	RM	Autosync could not be activated for the set when going from logging mode to replicating mode.
`<file> contains no matching SNDR sets`	RM	The configuration file specified with the `-f` switch contains no valid remote mirror sets.
`found matching ndr_ii entry for <vol>`	RM	There is already an `ndr_ii` entry for this remote mirror set.
`Group config does not match kernel`	PITC	The groups in `dscfg` are different from the groups in the kernel.
`Group does not exist or has no members`	PITC	An invalid group was specified for a group-based command. For example: `copy`, `update`, and `abort`
`Group list access failure`	PITC	Could not retrieve the list of sets belonging to a group from the kernel. Possible errors:
		`EFAULT`: The kernel module tried to read out-of-bounds. File a bug against `iiadm`
		`ENOMEM`: The kernel module ran out of memory.
`group name is longer than <MAX> characters`	RM	The group name specified is too long for the remote mirror software to accept.
`hostname is longer than <MAX> characters`	RM	The host name specified is too long for the remote mirror software.

Error Message	From	Meaning
`hostname tag exceeds CFG_MAX_BUF`	PITC	Because `CFG_MAX_BUF` is 1k, this message is not expected to be reported.
`Import failed`	PITC	Could not import shadow volume. Possible errors:
		`EFAULT`: The kernel module tried to read out-of-bounds. File a bug against `iiadm`
		`ENOMEM`: The kernel module ran out of memory.
		`DSW_ESHUTDOWN`: The kernel module is in the process of shutting down the point-in-time software. No new sets can be enabled.
		`DSW_EEMPTY`: One of the volume names is blank. File a bug against `iiadm`.
		`DSW_EINUSE`: One of the volumes is already in use by another set.
		`DSW_EOPEN`: Failed to open one of the volumes.
		`DSW_EHDRBMP`: Could not read bitmap header. Bitmap volume might be inaccessible or bad
		`DSW_EOFFLINE`: One of the volumes is offline and cannot be made part of a set.
		`DSW_ERSRVFAIL`: Could not get access to the underlying volume.
`incorrect Solaris release (requires <release>)`	RM	The Solaris version that the remote mirror software is trying to run on is not supported.
`Instant Image volumes, that are not in a device group which has been registered with SunCluster, require usage of "-C"`	PITC	`check_resource_group()`
`Invalid flag %s`	Kernel	The set that the software trying to enable has not passed the proper options to the kernel. The sync or async value, primary or secondary value, or enable map set or clear map set value is not valid. This is not something the user can control.

Error Message	From	Meaning
`Join failed`	PITC	Could not join shadow volume back to the set. Possible errors:
		`EFAULT`: The kernel module tried to read out-of-bounds. File a bug against `iiadm`.
		`ENOMEM`: The kernel module ran out of memory.
		`DSW_EEMPTY`: A volume was missing on the command line.
		`DSW_ENOTFOUND`: The set could not be found in the kernel.
		`DSW_ENOTEXPORTED`: The set to which the user is trying to join the volume is not in the exported state.
		`DSW_EINVALBMP`: The bitmap volume is not big enough to handle the master volume.
		`DSW_ERSRVFAIL`: The kernel module was unable to access the bitmap volume.
		`DSW_EOPEN`: The kernel module was unable to access the shadow volume.
`List failed`	PITC	Could not get a list of volumes from the kernel. Possible errors:
		`EFAULT`: The kernel module tried to read out-of-bounds. File a bug against `iiadm`.
		`ENOMEM`: The kernel module ran out of memory when attempting to perform the operation.
`local tag "<ltag>" is longer than CFG_MAX_BUF (x)`	RM	The `l.<hostname>` tag generated for the `ctag` to use to mark the remote mirror set as local is too long. This results if a long host name is returned from the call to `uname`.
`Master and bitmap are the same device`	PITC	During an enable operation, `iiadm` discovered that the master volume and the bitmap volume are the same.
`Master and shadow are the same device`	PITC	During an enable operation, `iiadm` discovered that the master volume and the shadow volume are the same
`Master volume is already an overflow volume`	PITC	During an enable operation, `iiadm` discovered that the volume specified as the master is already in use as an overflow volume.
`Master volume is not a character device`	PITC	During an enable operation, `iiadm` discovered that the master volume is a block device and not a character or raw device.
`master volume name must start with /dev`	PITC	The master volume must exist in the `/dev` directory tree.
`Memory allocation error`	PITC	`iiadm` ran out of memory.

TABLE 3-1   Error Messages for the Sun StorEdge Availability Suite 3.2 Software *(Continued)*

Error Message	From	Meaning
`Memory allocation failure`	PITC	`iiadm` ran out of memory.
`Must be super-user to execute`	Kernel	The user issued a remote mirror command but does not have superuser privileges. All remote mirror commands require superuser privileges.
`must specify full set details for enable command`	RM	The user attempted to enable a set using the *shost:svol* format. All parameters for a set must be specified.
`no matching SNDR sets found in config`	RM	The set specified for the command cannot be found in the current configuration. Check the set to ensure that it matches one of the configured sets. Use `sndradm -i` to view the sets configured sets.
`Not a compact dependent shadow`	PITC	The user attempted to attach an overflow volume to a set that is not a compact dependent set. Possible errors: EFAULT: The kernel module tried to read out-of-bounds. File a bug against `iiadm` ENOMEM: The kernel module ran out of memory. DSW_EEMPTY: No volume name was specified. DSW_ENOTFOUND: The set could not be found in the kernel.
`Not all Instant Image volumes are in a disk group`	PITC	All volumes (master, shadow, and bitmap) must be in the same cluster device group.
`not a valid number, nust be a decimal between 1 and <max>`	RM	The number entered is out of the allowed range or is not a number.
`Not primary, cannot sync %s:%s and %s:%s`	Kernel	An update, full sync, or reverse sync command was issued on the secondary host. These command can be issued only on the primary host. Log in to the primary host and issue the request.
`NULL struct knetconfig passed down from user program`	Kernel	The remote mirror software could not get network information for the remote mirror set.
`NULL struct netbuf passed down from user program for %s`	Kernel	The remote mirror software could not get network information for the remote mirror set.
`Operation not possible, disk queue %s is not empty.`	Kernel	Disk queue was not empty when the current operation was attempted. This usually occurs when the user attempts to disable.
`Out of memory`	PITC	`iiadm` ran out of memory.
`Out of memory creating lookup table`	PITC	`iiadm` ran out of memory.

Error Message	From	Meaning
`Overflow list access failure`	PITC	`iiadm` could not get a list of overflow volumes from the kernel. Possible errors: EFAULT: The kernel module tried to read out-of-bound. File a bug against `iiadm`. ENOMEM: The kernel module ran out of memory.
`Overflow volume is already in an InstantImage group`	PITC	During an attach operation, `iiadm` determined that the volume the user specified to attach to a compact dependent set is already in use by another set as a master, shadow, or bitmap volume.
`overflow volume name must start with /dev`	PITC	The overflow volume must exist in the /dev directory tree
`Overflow volume not in a disk group`	PITC	The user attempted to attach a volume to a set, but the set's volumes are part of a cluster device group and the overflow volume is not.
`Overflow volume not in same disk group as shadow set members`	PITC	The user attempted to attach a volume to a set, but the set's volumes are in a different cluster device group than the overflow volume.
`Recovery bitmaps not allocated`	Kernel	A full copy, update, sync, or reverse sync operation has been requested but the bitmap on the primary host cannot be accessed. Verify that the bitmap volume is a valid volume and is not in an error state.
`Request not serviced, %s is currently being synced.`	Kernel	The user attempted to sync the remote mirror set, or put the remote mirror set into logging mode, while a previous sync request is being set up. If the user issued a second sync request, the user must first put the remote mirror set into logging mode and then issue the sync. If the user issued a logging request, the user must first wait for the sync request to finish setting up and then issue the logging request. This stops the sync and places the remote mirror set into logging mode.
`Reset shadow failed`	PITC	`iiadm` could not reset the set. Possible errors: EFAULT: The kernel module tried to read out-of-bounds. File a bug against `iiadm`. ENOMEM: The kernel module ran out of memory. DSW_EEMPTY: No set was specified to reset. DSW_ENOTFOUND: The specified set could not be found in the kernel. EINVAL: Bitmap volume is invalid. DSW_ERSRVFAIL: The kernel could not access one of the volumes. DSW_EHDRBMP: Could not set up bitmap header.

TABLE 3-1   Error Messages for the Sun StorEdge Availability Suite 3.2 Software *(Continued)*

Error Message	From	Meaning
`Reverse sync needed, cannot sync %s:%s ==> %s:%s`	Kernel	The user requested a forward sync operation for a remote mirror set which needs a reverse sync. This occurs when a previous reverse sync does not complete successfully or because the primary volume was damaged and had to be replaced. Issue a reverse sync for the set.
`%s:%s ==> %s:%s already has a disk queue attached`	Kernel	A set cannot contain more than one disk queue. To add a new disk queue, remove the old disk queue first. The disk queue replace command can also be used to accomplish this task.
`%s:%s has invalid size (%s)..cannot proceed`	Kernel	The remote mirror software could not determine the size of the secondary volume. Verify that the secondary volume is not in an error state and can be accessed.
`%s:%s ==> %s:%s is already enabled`	Kernel	The user attempted to enable a remote mirror set using the same secondary volume and secondary host as a remote mirror set that is already enabled. Specify a different secondary volume or secondary host for the new set.
`%s ==> %s not already enabled`	Kernel	The user has tried to do an operation on a set that is not enabled. Verify that the proper set has been specified to sndradm and then verify that the set is enabled using sndradm -i.
`Set Copy Parameters failed`	PITC	iiadm could not modify the copy units and delay values for the specified set. Possible errors: EFAULT: The kernel module tried to read out-of-bounds. File a bug against iiadm ENOMEM: The kernel module ran out of memory. DSW_EEMPTY: No set was specified for the parameters DSW_ENOTFOUND: The specified set was not found in the kernel. EINVAL: The *delay* or *units* value is out of range.
`set <shost>:<svol> neither sync nor async`	RM	The mode of the set specified in the configuration file is incorrect. This occurs whenthe user inserts a set into the configuration manually, using dscfg with an incorrect mode tag.
`set <shost>:<svol> not found in config`	RM	The specified set is not in the current configuration. Use sndradm -i to verify that the set is in the current configuration.
`Shadow and bitmap are the same device`	PITC	During an enable operation, iiadm discovered that the shadow volume and the bitmap volume are the same.

Error Message	From	Meaning
`Shadow group %s is suspended`	PITC	The user attempted to perform a copy or update operation on a group with one or more suspended sets. The `%s` parameter identifies the first set found in the group that is suspended.
`Shadow group suspended`	PITC	The user attempted to perform a copy or update operation on a suspended set.
`Shadow volume is already an overflow volume`	PITC	During an enable operation, `iiadm` discovered that the volume specified as the shadow volume is already in use as an attached overflow volume.
`Shadow volume is already configured`	PITC	During an enable operation, `iiadm` discovered that the volume specified as the shadow volume is already in use as a shadow for a different master volume.
`Shadow Volume is currently mounted and dependent on the master volume`	PITC	`iiadm` could not disable the set because the shadow volume is mounted and part of an independent set and the copy has not yet completed.
`Shadow volume is mounted, unmount it first`	PITC	During an enable operation, `iiadm` discovered that the volume specified as the shadow volume is currently mounted.
`Shadow volume is not a character device`	PITC	During an enable operation, `iiadm` discovered that the shadow volume is a block device and not a character or a raw device.
`shadow volume name must start with /dev`	PITC	The shadow volume must exist in the `/dev` directory tree.
`Shadow volume not in a disk group`	PITC	During an attach operation, `iiadm` determined that the set to which the user is attaching an overflow volume is neither in a cluster device group nor in a local (`1.`*hostname*) group.
`Size of Primary %s:%s(%s) must be less than or equal to size of Secondary %s:%s(%s)`	Kernel	The user set up a remote mirror set in which the secondary volume is smaller than the primary volume. The secondary volume must be equal to or larger than the primary volume but the size is not checked until a sync is issued for the remote mirror set. The user must either disable the remote mirror set on the primary host and decrease the size of the primary volume so that it is equal to or smaller than the secondary volume, or disable the remote mirror set on the secondary host and increase the size of the secondary volume so that it is equal to or larger than the primary volume.
`SNDR: can't stat <vol>`	RM	The volume specified cannot be accessed by the system.

Error Message	From	Meaning
`SNDR set does not have a disk queue`	RM	Set does not have a disk queue attached when attempting either a queue remove operation or a queue replace operation.
`SNDR: The volume '<vol2>' has been configured previously as '<vol1>'. Re-enter command with the latter name.`	RM	The user attempted to enable a set in which the volume was already enabled, but with a different name.
`SNDR: '<vol1>' and '<vol2>' refer to the same device`	RM	A physical device cannot be used for more than one volume in the remote mirror set.
`Stat failed`	PITC	Possible errors: `EFAULT`: The kernel module tried to read out-of-bounds. File a bug against `iiadm` `ENOMEM`: The kernel module ran out of memory. `DSW_EEMPTY`: No volume name was specified `DSW_ENOTFOUND`: Could not find specified volume in kernel.
`SV-disable failed`	PITC	`iiadm` tried to perform `svadm -d` on a volume. See the `ds.log` file for more information.
`SV-enable failed`	PITC	`iiadm` tried to perform `svadm -e` on a volume. See the `ds.log` file for more information.
`Target of copy/update is mounted, unmount it first`	PITC	If the shadow in a master-to-shadow copy or update operation or the master in a shadow-to-master copy or update operation is mounted, it cannot be copied to.
`The bitmap %s is already in use`	Kernel	The bitmap requested for the remote mirror set being enabled is already in use as a bitmap for another set. Enable the set and specify a different volume for the bitmap.
`The remote state of %s:%s ==> %s:%s prevents this operation`	Kernel	The user attempted to do a sync or reverse sync while the secondary volume is mounted. First unmount the secondary volume and then issue the sync or reverse sync request.
`The state of %s:%s ==> %s:%s prevents this operation`	Kernel	The set the user is attempting to sync is part of an advanced configuration. The state of one of the other sets in the configuration prevents this sync from occurring for one of the following reasons: • Another set in a one-to-many configuration is currently doing a reverse sync. • A reverse sync is being requested for a set in a one-to-many configuration and at least one of the other sets is not in logging mode. • A set is already syncing.

TABLE 3-1 Error Messages for the Sun StorEdge Availability Suite 3.2 Software *(Continued)*

Error Message	From	Meaning
The volume %s is already in use	Kernel	The data volume in the remote mirror set is already in use as a bitmap volume or a disk queue volume. Use a different data volume.
Too many volumes given for update	PITC	`iiadm` ran out of memory.
Unable to access bitmap	PITC	During an enable operation, `iiadm` tried to validate the bitmap device, but could not get access to it.
Unable to access master volume	PITC	During an enable operation, `iiadm` tried to validate the master device, but could not get access to it.
Unable to access set in core	PITC	During a reset operation, `iiadm` was unable to find the set listed in the kernel.
Unable to access shadow volume	PITC	During an enable operation, `iiadm` tried to validate the shadow device, but could not get access to it.
unable to access <vol>: <error>	RM	The data volume cannot be accessed. Verify that the data volume has been entered correctly and that it exists on the system.
unable to add "<host>" to configuration storage: <error>	RM	An error has occurred preventing remote mirror from accessing the configuration storage while trying to update the options field.
Unable to add interface %s to %s	Kernel	The remote mirror software was unable to add host information to its configuration. Verify that the system is not running low on memory.
unable to add "<set>" to configuration storage: <error>	RM	An error has occurred that prevents the remote mirror software from accessing the configuration storage database when trying to enable <set>.
unable to allocate memory for cluster tag	RM	System is running low on available memory.
unable to allocate pair_list array for <rdc_max_sets> sets	RM	System is running out of memory.
Unable to allocate <X> bytes for bitmap file <vol>	RM	The system is running low on available memory.
unable to ascertain environment	PITC	`iiadm` tried to determine whether the host is part of a cluster, but was unable to do so.
unable to ascertain environment	RM	The remote mirror software was not able to determine if the system is part of a SunCluster configuration.
unable to clear autosync value in config for SNDR set <shost>:<svol>	RM	Autosync could not be turned off for the remote mirror set in the configuration file because of an error writing to the configuration database.
unable to determine disk group name for %s	PITC	`iiadm` tried to find out to which cluster device group a volume belonged, but was unable to do so.

TABLE 3-1 Error Messages for the Sun StorEdge Availability Suite 3.2 Software *(Continued)*

Error Message	From	Meaning
`unable to determine hostname: <host>`	RM	Could not determine the host name of the system.
`unable to determine IP addresses for either host <phost> or host <shost>`	RM	The IP address for either the primary host or the secondary host could not be determined.
`unable to determine IP addresses for hosts <host1>, <host2>`	RM	The IP addresses for the host names specified for the primary or secondary hosts could not be determined. Verify that the host names are in the `/etc/hosts` file.
`unable to determine local hostname`	PITC	`iiadm` needed to find out the name of the host it is running on, but was unable to do so.
`unable to determine network information for <host>`	RM	Network information for the secondary host could not be determined. Verify the settings in the `/etc/nsswitch.conf` file.
`unable to determin the current Solaris release: <error>`	RM	Look at `rdc_check_release();`
`unable to find disk service, <ctag>: <errno>`	RM	SunCluster could not find the specified disk service.
`Unable to find disk service:%s`	PITC	`iiadm` could not determine whether a cluster device group is active on the current host.
`Unable to find <group> in configuration storage`	RM	Could not find remote mirror group in configuration database while trying to do a diskq operation.
`Unable to find <shost>:<svol> in configuration storage`	RM	Could not find remote mirror set in configuration database while trying to do a diskq operation.
`unable to find SNDR set <shost>:<svol>: in config`	RM	The remote mirror set is not configured while trying to set autosync, for one of the following reasons: • The set could not be found in the configuration. • The set is not configured in the configuration database. Verify that the set is entered properly and matches a set returned by the `sndradm -i` command.
`Unable to fork`	PITC	`iiadm` ran out of process space.
`unable to get maxsets value from kernel`	RM	The remote mirror software failed to read the sndr_max_sets value from the `/usr/kernel/drv/rdc.conf` file.
`unable to get set status before reconfig operation`	RM	The remote mirror software could not get the kernel configuration.
`Unable to initialize the kernel thread set`	Kernel	The remote mirror software could not initialize a kernel thread. Verify that the system is not running low on memory.

Error Message	From	Meaning
unable to obtain unique set id for <shost>:<svol>	RM	Lookup of the set ID in the configuration database for this set has failed.
Unable to open bitmap file <vol>	RM	The volume specified for the bitmap could not be opened. The volume might not exist or is already in use by another program.
Unable to open %s:%s	Kernel	The data volume for the set on the local host cannot be opened by the remote mirror software, for one of the following reasons: • The volume requested does not exist or is inaccessible. • The volume is already in use as a remote mirror or point-in-time copy bitmap.
Unable to parse config file	PITC	iiadm attempted to access the configuration file dscfg, but could not do so. This indicates a problem with the configuration, and might require either restoring the configuration file or reinstalling the Sun StorEdge Availability Suite software.
Unable to read the bitmap file, read returned <X> instead of <Y>	RM	Bitmap could not be read correctly.
Unable to register %s	Kernel	The remote mirror software could not use the volume requested. Verify that the volume exists, is accessible, and is not in an error state.
unable to remove "<set>" from configuration storage: <error>	RM	An error has occurred that prevents the remote mirror software from removing the set from the configuration database.
Unable to set locking on the configuration	PITC	iiadm needs to lock the configuration file for reading or writing, but was unable to do so.
unable to store unique set id for <shost>:<svol>	RM	The set ID for the set being enabled could not be added to the configuration database.
unable to update autosync value in config for SNDR set <shost>:<svol>	RM	Autosync could not be turned on for the remote mirror set in the configuration database because of an error writing to the configuration database.
Unexpected return from check_cluster()	PITC	File a bug for iiadm.

TABLE 3-1   Error Messages for the Sun StorEdge Availability Suite 3.2 Software *(Continued)*

Error Message	From	Meaning
`Update failed`	PITC	One or more volumes in a group copy or update command failed. Possible errors:
		`EFAULT`: The kernel module tried to read out-of-bounds. File a bug against `iiadm`.
		`ENOMEM`: The kernel module ran out of memory.
		`EINVAL`: User is performing a shadow-to-master copy, but two or more shadows are of the same master.
		`DSW_EIO`: The kernel had a problem reading or writing one of the volumes in the set.
`Update of %s failed`	PITC	Same as `Update failed` meaning but for a specific volume.
`Update of config failed`	PITC	During a reset, `iiadm` tried to update the configuration file to indicate that the set is now online, but failed to do so.
`Version failed`	PITC	iiadm queried the kernel for the version of the code it was running, but failed. Possible errors:
		`EFAULT`: The kernel module tried to read out-of-bounds. File a bug against `iiadm`
`<vol> is already configured as an SNDR bitmap`	RM	The master, shadow, or bitmap volume in the `ndr_ii` entry is already configured as a remote mirror bitmap volume.
`<vol> is not a character device`	RM	The volume specified is not a character device.
`Volume is not in an InstantImage group`	PITC	A volume specified on the command line does not belong to a point-in-time copy set.
`Volume is part of an InstantImage group`	PITC	The user attempted to initialize an overflow volume, but the volume is in use as a master, shadow, or bitmap
`volumes and bitmaps must not match`	RM	The same volume has been specified for both the data volume and the bitmap volume.

TABLE 3-1   Error Messages for the Sun StorEdge Availability Suite 3.2 Software *(Continued)*

Error Message	From	Meaning
`Volumes are not in same disk group`	PITC	`iiadm` detected that the master, shadow, and bitmap volumes are not all in the same cluster device group, as required by the point-in-time copy software.
`volume "<vol>" is not part of a disk group, please specify resource ctag`	RM	The volume `<vol>` is not being managed by SunCluster.
`Wait failed`	PITC	Possible errors:
		EFAULT: The kernel module tried to read out-of-bounds. File a bug against `iiadm`.
		ENOMEM: The kernel module ran out of memory.
		EINTR: The user interrupted the wait process.
		DSW_EEMPTY: No set was specified to wait for.
		DSW_ENOTFOUND: The specified set could not be found in the kernel.
		DSW_ENOTLOCKED: User tried to remove the PIDlock, but the set is not locked.
		DSW_EINUSE: The user tried to remove the PIDlock, but the set is locked by someone else.

Related Error Messages

The Solaris configuration administration utility, cfgadm, reports an error when it is used on systems where the Sun StorEdge Availability Suite software is installed. The error occurs because a process does not suspend properly so that the cfgadm operation can proceed. The error message has the following format:

```
cfgadm: Hardware specific failure <operation> failed: could not
suspend user process <process_id>
```

You must stop the process manually, perform the cfgadm operation, and then start the process again. Use the following commands to accomplish this:

1. **Quiesce I/O to the sets, using the following series of commands:**

```
/etc/init.d/rdc stop
/etc/init.d/ii stop
/etc/init.d/sv stop
/etc/init.d/scm stop
```

2. **Issue the cfgadm command.**

3. **Start I/O to the sets, using the following series of commands:**

```
/etc/init.d/scm start
/etc/init.d/sv start
/etc/init.d/ii start
/etc/init.d/rdc start
/etc/init.d/rdcfinish start
```