



Sun Cluster 3.x With Sun StorEdge A5x00 Array Manual

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Preface

The *Sun Cluster 3.x With Sun StorEdge A5x00 Array Manual* provides procedures specific to Sun StorEdge™ A5x00 arrays that are placed in a Sun™ Cluster environment.

Use this manual with any version of Sun Cluster 3.x software. Unless otherwise noted, procedures are the same for all Sun Cluster 3.x versions. See the “Revision History” on page 6 for a list of changes to this manual.

Who Should Use This Book

This book is for Sun representatives who are performing the initial installation of a Sun Cluster configuration and for system administrators who are responsible for maintaining the system.

This document is intended for experienced system administrators with extensive knowledge of Sun software and hardware. Do not use this document as a planning or presales guide. You should have already determined your system requirements and purchased the appropriate equipment and software before reading this document.

How This Book Is Organized

This book contains one chapter that consists of two major sections.

Section 1 discusses how to install Sun StorEdge A5x00 storage array.

Section 2 describes how to maintain Sun StorEdge A5x00 storage arrays in a running cluster.

Revision History

The following table lists the information that has been revised or added since the initial release of this documentation. The table also lists the revision date for these changes.

TABLE P-1 Sun Cluster 3.1 With Sun StorEdge A5x00 Array Manual

Revision Date	Information Added
	No revisions.

Related Documentation

The following books provide conceptual information or procedures to administer hardware and applications. If you plan to use this documentation in a hardcopy format, ensure that you have the following books available for your reference.

The following Sun Cluster books support Sun Cluster 3.1 release. If you are maintaining a different version of Sun Cluster software, refer to the appropriate documentation. All Sun Cluster documentation is available on <http://docs.sun.com>.

Documentation that is not available on <http://docs.sun.com> is listed with the appropriate URL.

TABLE P-2 Hardware Documentation

Title	Part Number
<i>Sun StorEdge A5000 Configuration Guide</i>	805-0264
<i>Sun StorEdge A5000 Installation and Service Manual</i>	802-7573
<i>Sun StorEdge A5000 Product Note</i>	805-1018

TABLE P-3 Sun Cluster Documentation

Application	Title	Part Number
Concepts	<i>Sun Cluster 3.1 Concepts Guide</i>	816-3383

TABLE P-3 Sun Cluster Documentation (Continued)

Application	Title	Part Number
Hardware	<i>Sun Cluster 3.x Hardware Administration Manual</i>	817-0168
	Sun Cluster 3.x Hardware Administration Collection at http://docs.sun.com/db/coll/1024.1/	
Software Installation	<i>Sun Cluster 3.1 Software Installation Guide</i>	
Data Services	<i>Sun Cluster 3.1 Data Service Planning and Administration Guide</i>	817-1526
	Sun Cluster 3.1 Data Service Collection at http://docs.sun.com/db/coll/573.10/	
API Development	<i>Sun Cluster 3.1 Data Services Developer's Guide</i>	816-3385
Administration	<i>Sun Cluster 3.1 System Administration Guide</i>	816-3384
Error Messages	<i>Sun Cluster 3.1 Error Messages Guide</i>	816-3382
Man Pages	<i>Sun Cluster 3.1 Man Page Reference Manual</i>	816-5251
Release Notes	<i>Sun Cluster 3.1 Release Notes</i>	816-5317
	<i>Sun Cluster 3.1 Release Notes Supplement</i>	816-3381

Using UNIX Commands

This document contains information on commands used to install, configure, or upgrade a Sun Cluster configuration. This document might not contain complete information on basic UNIX[®] commands and procedures such as shutting down the system, booting the system, and configuring devices.

See one or more of the following sources for this information.

- Online documentation for the Solaris software environment
- Other software documentation that you received with your system
- Solaris operating environment man pages

Getting Help

If you have problems installing or using Sun Cluster, contact your service provider and provide the following information.

- Your name and email address (if available)
- Your company name, address, and phone number
- The model number and serial number of your systems
- The release number of the operating environment (for example, Solaris 8)
- The release number of Sun Cluster (for example, Sun Cluster 3.0)

Use the following commands to gather information on your system for your service provider.

Command	Function
<code>prtconf -v</code>	Displays the size of the system memory and reports information about peripheral devices
<code>psrinfo -v</code>	Displays information about processors
<code>showrev -p</code>	Reports which patches are installed
<code>prtdiag -v</code>	Displays system diagnostic information
<code>/usr/cluster/bin/scinstall -pv</code>	Displays Sun Cluster release and package version information

Also have available the contents of the `/var/adm/messages` file.

Accessing Sun Documentation Online

The docs.sun.comSM Web site enables you to access Sun technical documentation online. You can browse the docs.sun.com archive or search for a specific book title or subject. The URL is `http://docs.sun.com`.

Typographic Conventions

The following table describes the typographic changes used in this book.

TABLE P-4 Typographic Conventions

Typeface or Symbol	Meaning	Example
AaBbCc123	The names of commands, files, and directories; on-screen computer output	Edit your <code>.login</code> file. Use <code>ls -a</code> to list all files. <code>machine_name%</code> you have mail.
AaBbCc123	What you type, contrasted with on-screen computer output	<code>machine_name%</code> su Password:
<i>AaBbCc123</i>	Command-line placeholder: replace with a real name or value	To delete a file, type rm <i>filename</i> .
<i>AaBbCc123</i>	Book titles, new words, or terms, or words to be emphasized.	Read Chapter 6 in <i>User's Guide</i> . These are called <i>class</i> options. You must be <i>root</i> to do this.

Shell Prompts in Command Examples

The following table shows the default system prompt and superuser prompt for the C shell, Bourne shell, and Korn shell.

TABLE P-5 Shell Prompts

Shell	Prompt
C shell prompt	<code>machine_name%</code>
C shell superuser prompt	<code>machine_name#</code>
Bourne shell and Korn shell prompt	<code>\$</code>
Bourne shell and Korn shell superuser prompt	<code>#</code>

Installing and Maintaining a Sun StorEdge A5x00 Array

This chapter contains the procedures to install and maintain a Sun StorEdge™ A5x00 array in a Sun™ Cluster environment.

This chapter contains the following procedures.

- “How to Install a Storage Array” on page 12
- “How to Add a Disk Drive” on page 14
- “How to Replace a Disk Drive” on page 15
- “How to Remove a Disk Drive” on page 17
- “How to Add the First Storage Array” on page 19
- “How to Add a Subsequent Storage Array” on page 21
- “How to Replace a Storage Array” on page 22
- “How to Remove a Storage Array” on page 24

For conceptual information on multihost disks, see your Sun Cluster concepts documentation.

For information about how to use a storage array in a storage area network (SAN), see “SAN Considerations” on page 26.

Installing Storage Arrays

This section describes the procedure for an *initial installation* of a storage array.

▼ How to Install a Storage Array

Use this procedure to install a storage array. To add storage arrays to an existing cluster, use the procedure in “How to Add the First Storage Array” on page 19 or “How to Add a Subsequent Storage Array” on page 21. Perform the steps in this procedure in conjunction with the procedures in the Sun Cluster software installation documentation and your server hardware manual.

1. Install host adapters in the nodes that are to be connected to the storage array.

For the procedure about how to install host adapters, see the documentation that shipped with your network adapters and nodes.

Note – To ensure maximum redundancy, put each host adapter on a separate I/O board, if possible.

2. Cable, power on, and configure the storage array.

Figure 1–1 shows a sample storage array configuration.

For more information on cabling and configuring storage arrays, see the *Sun StorEdge A5000 Installation and Service Manual*.

Note – You must use FC switches when installing storage arrays in a partner-group configuration. If you want to create a storage area network (SAN) by using two FC switches and Sun SAN software, see “SAN Considerations” on page 26 for more information.

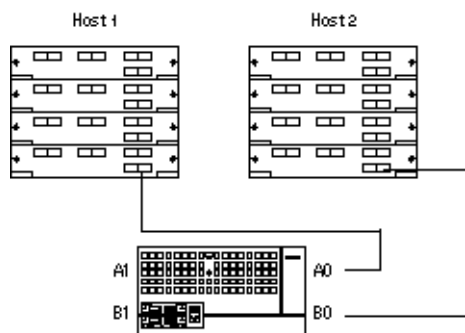


FIGURE 1–1 Installing a Storage Array Configuration: An Example

3. Check the revision number for the storage array’s controller firmware. If necessary, install the most recent firmware.

For more information, see the *Sun StorEdge A5000 Product Note*.

Where to Go From Here

To install software, follow the procedures in Sun Cluster software installation documentation.

Maintaining Storage Arrays

This section describes the procedures about how to maintain a storage array. Table 1-1 lists these procedures.

Note – When you upgrade firmware on a storage device or on an enclosure, redefine the stripe size of a LUN, or perform other LUN operations, a device’s device ID (DID) might change unexpectedly. When you perform a check of the DID configuration by running the `scdidadm -c` command, the following error message appears on your console if the DID changed unexpectedly.

```
device id for nodename:/dev/rdisk/cXtYdZsN does not match physical
device's id for ddecimalnumber, device may have been replaced.
```

Run the `scdidadm -R` command for each affected device.

TABLE 1-1 Task Map: Maintaining a Storage Array

Task	Information
Add a disk drive.	“How to Add a Disk Drive” on page 14
Replace a disk drive.	“How to Replace a Disk Drive” on page 15
Remove a disk drive.	“How to Remove a Disk Drive” on page 17
Add a storage array.	“How to Add the First Storage Array” on page 19 or “How to Add a Subsequent Storage Array” on page 21

TABLE 1-1 Task Map: Maintaining a Storage Array (Continued)

Task	Information
Replace a storage array.	"How to Replace a Storage Array" on page 22
Remove a storage array.	"How to Remove a Storage Array" on page 24

▼ How to Add a Disk Drive

Use this procedure to add a disk drive to a running cluster. Perform the steps in this procedure in conjunction with the procedures in the Sun Cluster system administration documentation and your server hardware manual.

For conceptual information on quorums, quorum devices, global devices, and device IDs, see your Sun Cluster concepts documentation.

1. On one node that is connected to the storage array, install the new disk.

Install the new disk drive. Press the Return key when prompted. You can insert multiple disk drives at the same time.

```
# luxadm insert_device enclosure,slot
```

2. On all other nodes that are attached to the storage array, probe all devices. Write the new disk drive to the /dev/rdisk directory.

The amount of time that the `devfsadm` command requires to complete depends on the number of devices that are connected to the node. Expect at least five minutes.

```
# devfsadm
```

3. Ensure that entries for the disk drive have been added to the /dev/rdisk directory.

```
# ls -l /dev/rdisk
```

4. If necessary, partition the disk drive.

You can use either the `format(1M)` command or copy the partitioning from another disk drive in the storage array.

5. From any node in the cluster, update the global device namespace.

If a volume management daemon such as `vold` is running on your node, and you have a CD-ROM drive connected to the node, a `device busy` error might be returned even if no disk is in the drive. This error is an expected behavior.

```
# scgdevs
```

6. Verify that a device ID (DID) has been assigned to the disk drive.

```
#scdidadm -l
```

Note – The DID that was assigned to the new disk drive might not be in sequential order in the storage array.

7. Perform necessary volume management administration actions on the new disk drive.

For more information, see your Solstice DiskSuite/Solaris Volume Manager or VERITAS Volume Manager documentation.

Where to Go From Here

For procedures about how to add and remove quorum devices, see Sun Cluster system administration documentation

▼ How to Replace a Disk Drive

Use this procedure to replace a disk drive in a storage array. Perform the steps in this procedure in conjunction with the procedures in the Sun Cluster system administration documentation and your server hardware manual. Use the procedures in your server hardware manual to identify a failed disk drive.

For conceptual information on quorums, quorum devices, global devices, and device IDs, see your Sun Cluster concepts documentation.

1. Identify the disk drive that needs replacement.

If the disk error message reports the drive problem by device ID (DID), determine the Solaris logical device name. If the disk error message reports the drive problem by the Solaris physical device name, use your Solaris documentation to map the Solaris physical device name to the Solaris logical device name. Use this Solaris *logical* device name and DID throughout this procedure.

```
# scdidadm -l deviceID
```

2. Is the disk drive you are replacing a quorum device?

```
# scstat -q
```

- If no, proceed to Step 3.
- If yes, add a new quorum device on a different storage array. Remove the old quorum device.

For procedures about how to add and remove quorum devices, see Sun Cluster system administration documentation

3. If possible, back up the metadvice or volume.

For more information, see your Solstice DiskSuite/Solaris Volume Manager or VERITAS Volume Manager documentation.

4. Identify the failed disk drive's physical DID.

Use this physical DID in Step 11 to verify that the failed disk drive has been replaced with a new disk drive. The DID and the World Wide Name (WWN) for the disk drive are the same.

```
#sccdidadm -o diskid -l cNtXdY
```

5. Which volume manager are you using?

- If VERITAS Volume Manager, proceed to Step 6.
- If Solstice DiskSuite/Solaris Volume Manager, save the disk partitioning information to partition the new disk drive.

```
# prtvtoc /dev/rdisk/cNtXdYs2 > filename
```

Note – You can also use the `format` utility to save the disk's partition information.

6. On any node that is connected to the storage array, remove the disk drive when prompted.

```
# luxadm remove_device -F /dev/rdisk/cNtXdYs2
```

After running the command, warning messages might display. These messages can be ignored.

7. On any node that is connected to the storage array, run the `luxadm insert_device` command. Add the new disk drive when prompted.

```
# luxadm insert_device boxname,rslotnumber  
# luxadm insert_device boxname,fslotnumber
```

If you are inserting a front disk drive, use the `fslotnumber` parameter. If you are inserting a rear disk drive, use the `rslotnumber` parameter.

8. On all other nodes that are attached to the storage array, probe all devices. Write the new disk drive to the `/dev/rdisk` directory.

The amount of time that the `devfsadm` command requires to complete depends on the number of devices that are connected to the node. Expect at least five minutes.

```
# devfsadm
```

9. Which volume manager are you using?

- If VERITAS Volume Manager, go to Step 10.
- If Solstice DiskSuite/Solaris Volume Manager, on one node that is connected to the storage array, partition the new disk drive. Use the partitioning information you saved in Step 5.


```
# fmthard -s filename /dev/rdisk/cNtXdYs2
```

Note – You can also use the `format` utility to partition the new disk drive.

10. From all nodes that are connected to the storage array, update the DID database and driver.

```
# scdidadm -R deviceID
```

Note – After running `scdidadm -R` on the first node, each subsequent node that you run the command on might display the warning, `device id for the device matches the database`. This warning can be ignored.

11. On any node, confirm that the failed disk drive has been replaced. Compare the following physical DID to the physical DID in Step 4.

If the following physical DID is different from the physical DID in Step 4, you successfully replaced the failed disk drive with a new disk drive.

```
# scdidadm -o diskid -l cNtXdY
```

12. Perform volume management administration to add the disk drive back to its diskset or disk group.

For more information, see your Solstice DiskSuite/Solaris Volume Manager or VERITAS Volume Manager documentation.

13. If you want this new disk drive to be a quorum device, add the quorum device.

For the procedure about how to add a quorum device, see Sun Cluster system administration documentation.

▼ How to Remove a Disk Drive

Use this procedure to remove a disk drive from a storage array. “Example—Removing a Disk Drive” on page 18 shows you how to apply this procedure. Perform the steps in this procedure in conjunction with the procedures in the Sun Cluster system administration documentation and your server hardware manual.

For conceptual information on quorum, quorum devices, global devices, and device IDs, see your Sun Cluster concepts documentation.

1. Determine if the disk drive that you are removing is a quorum device.

```
# scstat -q
```

- If the disk that you are replacing is not a quorum device, go to Step 2.

- If the disk drive is configured as a quorum device, choose and configure another device to be the new quorum device. Then remove the old quorum device.

For procedures about how to add and remove quorum devices, see Sun Cluster system administration documentation

2. If possible, back up the metadvice or volume.

For more information, see your Solstice DiskSuite/Solaris Volume Manager or VERITAS Volume Manager documentation.

3. Perform volume management administration to remove the disk drive from the configuration.

For more information, see your Solstice DiskSuite/Solaris Volume Manager or VERITAS Volume Manager documentation.

4. Identify the disk drive that needs to be removed.

If the disk error message reports the drive problem by DID, determine the Solaris device name.

```
# sddidadm -l deviceID
```

5. On any node that is connected to the storage array, run the luxadm remove_device command.

Remove the disk drive. Press the Return key when prompted.

```
# luxadm remove_device -F /dev/rdisk/cNtXdYsZ
```

6. On all connected nodes, remove references to the disk drive.

```
# devfsadm -C
# sddidadm -C
```

Example—Removing a Disk Drive

The following example shows how to apply the procedure about how to remove a disk drive from a storage array.

```
# sddidadm -l d4
4          phys-schost-2:/dev/rdisk/c1t32d0 /dev/did/rdisk/d4
# luxadm remove_device -F /dev/rdisk/c1t32d0s2
```

```
WARNING!!! Please ensure that no filesystems are mounted on these device(s).
All data on these devices should have been backed up.
```

```
The list of devices that will be removed is:
1: Box Name "venus1" front slot 0
```

```
Please enter 'q' to Quit or <Return> to Continue: <Return>
```

```
stopping: Drive in "venus1" front slot 0...Done
offlining: Drive in "venus1" front slot 0...Done
```

```

Hit <Return> after removing the device(s). <Return>

Drive in Box Name "venus1" front slot 0
Logical Nodes being removed under /dev/dsk/ and /dev/rdisk:
    c1t32d0s0
    c1t32d0s1
    c1t32d0s2
    c1t32d0s3
    c1t32d0s4
    c1t32d0s5
    c1t32d0s6
    c1t32d0s7
# devfsadm -C
# sddidadm -C

```

▼ How to Add the First Storage Array

Use this procedure to install a storage array in a running cluster that does not yet have an existing storage array that is installed.

If you are installing a storage array in a running cluster that already has storage arrays installed and configured, use the procedure in “How to Add a Subsequent Storage Array” on page 21.

Perform the steps in this procedure in conjunction with the procedures in the Sun Cluster system administration documentation and your server hardware manual.

- 1. Determine if the storage array packages need to be installed on the nodes. These nodes are the node to which you are connecting the storage array. This product requires the following packages.**

```

# pkginfo | egrep Wlux
system    SUNWluxd      Sun Enterprise Network Array sf Device Driver
system    SUNWluxdx     Sun Enterprise Network Array sf Device Driver
              (64-bit)
system    SUNWluxl      Sun Enterprise Network Array social Device Driver
system    SUNWluxlx     Sun Enterprise Network Array social Device Driver
              (64-bit)
system    SUNWluxop     Sun Enterprise Network Array firmware and utilities

```

- 2. On each node, install any necessary packages for the Solaris operating environment.**

The storage array packages are located in the Product directory of the CD-ROM. Use the `pkgadd` command to add any necessary packages.

```

# pkgadd -d path_to_Solaris/Product Pkg1 Pkg2 Pkg3 ... PkgN
path_to_Solaris    Path to the Solaris operating environment
Pkg1 Pkg2          The packages to be added

```

3. Shut down and power off any node that is connected to the storage array.

For the procedure about how to shut down and power off a node, see Sun Cluster system administration documentation.

4. Install host adapters in the node that is to be connected to the storage array.

For the procedure about how to install host adapters, see the documentation that shipped with your network adapters and nodes.

5. Cable, configure, and power on the storage array.

For more information, see the *Sun StorEdge A5000 Installation and Service Manual* and the *Sun StorEdge A5000 Configuration Guide*.

Figure 1–2 shows a sample storage array configuration.

Note – You must use FC switches when installing storage arrays in a partner-group configuration. If you want to create a storage area network (SAN) by using two FC switches and Sun SAN software, see “SAN Considerations” on page 26 for more information.

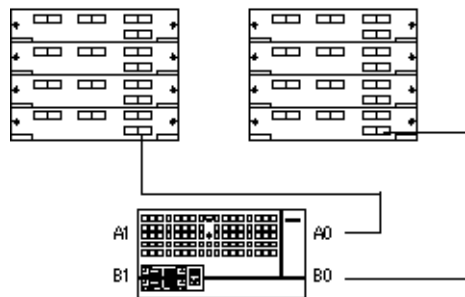


FIGURE 1–2 Adding a Storage Array Configuration: An Example

6. Perform a reconfiguration boot to create the new Solaris device files and links.

7. Determine if any patches need to be installed on nodes that are to be connected to the storage array.

For a list of patches specific to Sun Cluster, see your Sun Cluster release notes documentation.

8. Obtain and install any necessary patches on the nodes that are to be connected to the storage array.

For procedures about how to apply patches, see your Sun Cluster system administration documentation.

Note – Read any README files that accompany the patches before you begin this installation. Some patches must be installed in a specific order.

9. **If required by the patch README instructions, shut down and reboot the node.**
For the procedure about how to shut down and power off a node, see Sun Cluster system administration documentation.
10. **Perform Step 3 through Step 9 for each node that is attached to the storage array.**
11. **Perform volume management administration to add the disk drives in the storage array to the volume management configuration.**
For more information, see your Solstice DiskSuite/Solaris Volume Manager or VERITAS Volume Manager documentation.

▼ How to Add a Subsequent Storage Array

Use this procedure to install a storage array in a running cluster that already has storage arrays installed and configured.

If you are installing a storage array in a running cluster that does not yet have a storage array that is installed, use the procedure in “How to Add the First Storage Array” on page 19.

Perform the steps in this procedure in conjunction with the procedures in the Sun Cluster system administration documentation and your server hardware manual.

1. **Configure the new storage array.**

Note – Each storage array in the loop must have a unique box ID. If necessary, use the front-panel module (FPM) to change the box ID for the new storage array that you are adding. For more information about loops and general configuration, see the *Sun StorEdge A5000 Configuration Guide* and the *Sun StorEdge A5000 Installation and Service Manual*.

2. **On both nodes, insert the new storage array into the cluster. Add paths to the disk drives.**

```
# luxadm insert_device
Please hit <RETURN> when you have finished adding
Fibre Channel Enclosure(s)/Device(s) :
```

Note – Do not press the Return key until you complete Step 3.

3. **Cable the new storage array to a spare port in the existing hub, switch, or host adapter in your cluster.**

For more information, see the *Sun StorEdge A5000 Installation and Service Manual* and the *Sun StorEdge A5000 Configuration Guide*.

Note – You must use FC switches when installing storage arrays in a partner-group configuration. If you want to create a storage area network (SAN) by using two FC switches and Sun SAN software, see “SAN Considerations” on page 26 for more information.

4. **After you cable the new storage array, press the Return key to complete the `luxadm insert_device` operation.**

```
Waiting for Loop Initialization to complete...
New Logical Nodes under /dev/dsk and /dev/rdisk :
c4t98d0s0
c4t98d0s1
c4t98d0s2
c4t98d0s3
c4t98d0s4
c4t98d0s5
c4t98d0s6
...
New Logical Nodes under /dev/es:
ses12
ses13
```

5. **On both nodes, verify that the new storage array is visible to both nodes.**

```
#luxadm probe
```

6. **On one node, use the `scgdevs` command to update the DID database.**

```
#scgdevs
```

▼ How to Replace a Storage Array

Use this procedure to replace a failed storage array in a running cluster. “Example—Replacing a Storage Array” on page 24 shows you how to apply this procedure. This procedure assumes that you are retaining the disk drives.

If you are replacing your disk drives, see “How to Replace a Disk Drive” on page 15.

1. **If possible, back up the metadevices or volumes that reside in the storage array.**
For more information, see your Solstice DiskSuite/Solaris Volume Manager or VERITAS Volume Manager documentation.
2. **Perform volume management administration to remove the storage array from the configuration.**
For more information, see your Solstice DiskSuite/Solaris Volume Manager or VERITAS Volume Manager documentation.
3. **On all nodes that are connected to the storage array, run the `luxadm remove_device` command.**

```
# luxadm remove_device -F boxname
```
4. **Disconnect the fiber optic cables from the storage array.**
5. **Power off and disconnect the storage array from the AC power source.**
For more information, see the *Sun StorEdge A5000 Installation and Service Manual* and the *Sun StorEdge A5000 Configuration Guide*.
6. **Connect the fiber optic cables to the new storage array.**
7. **Connect the new storage array to an AC power source.**
8. **One disk drive at a time, remove the disk drives from the old storage array. Insert the disk drives into the same slots in the new storage array.**
9. **Power on the storage array.**
10. **Use the `luxadm insert_device` command to find the new storage array.**
Repeat this step for each node that is connected to the storage array.

```
# luxadm insert_device
```
11. **On all nodes that are connected to the new storage array, upload the new information to the DID driver.**
If a volume management daemon such as `vold` is running on your node, and you have a CD-ROM drive that is connected to the node, a `device busy` error might be returned even if no disk is in the drive. This error is an expected behavior.

```
# scgdevs
```
12. **Perform volume management administration to add the new storage array to the configuration.**
For more information, see your Solstice DiskSuite/Solaris Volume Manager or VERITAS Volume Manager documentation.

Example—Replacing a Storage Array

The following example shows how to apply the procedure about how to replace a storage array.

```
# luxadm remove_device -F venus1

WARNING!!! Please ensure that no filesystems are mounted on these device(s).
All data on these devices should have been backed up.

The list of devices that will be removed is:
  1: Box name:      venus1
     Node WWN:     123456789abcdeff
     Device Type:  SENA (SES device)
     SES Paths:
           /devices/nodes@1/sbus@1f,0/SUNW,socal@1,0/sf@0,0/ \
           ses@w123456789abcd03,0:0
           /devices/nodes@1/sbus@1f,0/SUNW,socal@1,0/sf@1,0/ \
           ses@w123456789abcd00,0:0

Please verify the above list of devices and
then enter 'c' or <CR> to Continue or 'q' to Quit. [Default: c]:
<Return>

Hit <Return> after removing the device(s). <Return>
# luxadm insert_device
Please hit <RETURN> when you have finished adding Fibre Channel
Enclosure(s)/Device(s): <Return>
# scgdevs
```

▼ How to Remove a Storage Array

Use this procedure to remove a storage array from a cluster. “Example—Removing a Storage Array” on page 25 shows you how to apply this procedure. Use the procedures in your server hardware manual to identify the storage array.

1. Perform volume management administration to remove the storage array from the configuration.

For more information, see your Solstice DiskSuite/Solaris Volume Manager or VERITAS Volume Manager documentation.

2. On all nodes that are connected to the storage array, run the `luxadm remove_device` command.

```
# luxadm remove_device -F boxname
```

3. Remove the storage array and the fiber-optic cables that are connected to the storage array.

For more information, see the *Sun StorEdge A5000 Installation and Service Manual*.

Note – If you are using your storage arrays in a SAN-configured cluster, you must keep two FC switches configured in parallel. This configuration maintains cluster availability. See “SAN Considerations” on page 26 for more information.

4. On all nodes, remove references to the storage array.

```
# devfsadm -C
# scdidadm -C
```

5. If necessary, remove any unused host adapters from the nodes.

For the procedure about how to remove host adapters, see the documentation that shipped with your nodes.

Example—Removing a Storage Array

The following example shows how to apply the procedure about how to remove a storage array.

```
# luxadm remove_device -F venus1
WARNING!!! Please ensure that no filesystems are mounted on these device(s).
All data on these devices should have been backed up.
```

The list of devices that will be removed is:

```
1: Box name:      venus1
   Node WWN:      123456789abcdeff
   Device Type:   SENA (SES device)
   SES Paths:
     /devices/nodes@1/sbus@1f,0/SUNW,socal@1,0/sf@0,0/ \
       ses@w123456789abcdef03,0:0
     /devices/nodes@1/sbus@1f,0/SUNW,socal@1,0/sf@1,0/ \
       ses@w123456789abcdef00,0:0
```

Please verify the above list of devices and then enter 'c' or <CR> to Continue or 'q' to Quit. [Default: c]: **<Return>**

Hit <Return> after removing the device(s). <Return>

```
# devfsadm -C
# scdidadm -C
```

SAN Considerations

This section contains information about how to use storage array in a SAN. This information is specific to a SAN in a Sun Cluster environment. Use the cluster-specific procedures in this chapter to install and maintain a storage array in your cluster.

For instructions about how to create and maintain a SAN, see the documentation that shipped with your switch hardware. For information on switch ports, zoning, and required software and firmware, also see the documentation that shipped with your switch hardware.

SAN hardware includes the following components.

- FC switches
- FC host adapters
- Storage devices
- Enclosures

SAN software includes the following components.

- Drivers that are packaged with the operating system
- Firmware for the switches
- Management tools for the switches and storage devices
- Volume management software
- Other administration tools

SAN Clustering Considerations

If you are replacing an FC switch and you intend to save the switch IP configuration for restoration to the replacement switch, wait to connect the cables to the replacement switch. Connect the cables to the replacement switch *after* you recall the Fabric configuration to the replacement switch. For more information about how to save and recall switch configurations, see the documentation that shipped with your switch hardware.

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