

Sun Cluster 3.0 - 3.1 with StorageTek Fibre Channel RAID Arrays Manual for Solaris OS



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Preface

The *Sun Cluster 3.0 - 3.1 with StorageTek Fibre Channel RAID Arrays Manual for Solaris OS* provides procedures that are specific to StorageTek™ FC RAID arrays that are placed in a Sun™ Cluster environment.

Arrays discussed in this volume include:

- StorageTek 6140 arrays
- StorageTek 6450 arrays

Use this manual with any version of Sun Cluster 3.0 or 3.1 software on SPARC® based clusters and on any supported version of Sun Cluster 3.1 software on x86 based clusters. Unless otherwise noted, procedures are the same for all supported Sun Cluster 3.0 or 3.1 versions. See the [“Revision History” on page 6](#) for a list of changes to this manual.

Note – In this document, the term “x86” refers to the Intel 32-bit family of microprocessor chips and compatible microprocessor chips made by AMD.

Sun Cluster software runs on two platforms, SPARC and x86. The information in this document pertains to both platforms unless otherwise specified in a special chapter, section, note, bulleted item, figure, table, or example.

This book assumes that you are performing one or more of the following tasks:

- You want to replace an array component to *prevent* a failure.
- You want to replace an array component because you have an *existing* failure.
- You want to add (to an *established* cluster) or install (to a *new* cluster) a storage array.

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 the following chapters:

- [Chapter 1](#) lists limitations of your use of StorageTek storage arrays in a Sun Cluster environment.
- [Chapter 2](#) discusses how to install StorageTek storage arrays and how to configure logical units on them.
- [Chapter 3](#) describes how to maintain StorageTek 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 3.0 - 3.1 with StorageTek Fibre Channel RAID Arrays Manual for Solaris OS

Revision Date	New Information
	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 these books available for your reference.

The following Sun Cluster books support the Sun Cluster 3.1, 2004, and 2005 releases. If you are maintaining a different version of Sun Cluster software, refer to the appropriate documentation. All Sun Cluster documentation is available at <http://docs.sun.com>.

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

For the StorageTek 6140 array, refer to the online product documentation. For the StorageTek 6540 array, the documents listed in the following table are available on docs.sun.com.

TABLE P-2 StorageTek 6540 Array Documentation

Title	Part Number
StorageTek 6540 Array Site Preparation Guide	819-5046
StorageTek 6540 Array Hardware Installation Guide	819-5051
StorageTek 6540 Array Release Notes	819-6521

TABLE P-2 StorageTek 6540 Array Documentation (Continued)

Title	Part Number
StorageTek 6540 Array Regulatory and Safety Compliance	819-6520
StorageTek 6540 Array Hardware Installation Guide	819-6461

TABLE P-3 Sun Cluster Documentation

Application	Title
Concepts	<i>Sun Cluster Concepts Guide for Solaris OS</i>
Overview	<i>Sun Cluster Overview for Solaris OS</i>
Hardware administration	<i>Sun Cluster 3.0-3.1 Hardware Administration Manual for Solaris OS</i> Individual hardware administration guides
Software installation	<i>Sun Cluster Software Installation Guide for Solaris OS</i>
Data service administration	<i>Sun Cluster Data Services Planning and Administration Guide for Solaris OS</i> Individual data service guides
Data service development	<i>Sun Cluster Data Services Developer's Guide for Solaris OS</i>
System administration	<i>Sun Cluster System Administration Guide for Solaris OS</i>
Error messages	<i>Sun Cluster Error Messages Guide for Solaris OS</i>
Command and function reference	<i>Sun Cluster Reference Manual for Solaris OS</i>
Release Notes	<i>Sun Cluster 3.1 8/05 Release Notes for Solaris OS</i> <i>Sun Cluster 3.0-3.1 Release Notes Supplement</i>

Using UNIX Commands

This document contains information about commands that are used to install, configure, or upgrade a Sun Cluster configuration. This document might not contain complete information about 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™ Operating System (Solaris OS)
- Other software documentation that you received with your system
- Solaris Operating System 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 9)
- The release number of Sun Cluster (for example, Sun Cluster 3.1 8/05)

Use the following commands to gather information about 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.

Documentation, Support, and Training

The Sun web site provides information about the following additional resources:

- [Documentation](http://www.sun.com/documentation/) (<http://www.sun.com/documentation/>)
- [Support](http://www.sun.com/support/) (<http://www.sun.com/support/>)
- [Training](http://www.sun.com/training/) (<http://www.sun.com/training/>)

Typographic Conventions

The following table describes the typographic conventions that are used in this book.

TABLE P-4 Typographic Conventions

Typeface	Meaning	Example
AaBbCc123	The names of commands, files, and directories, and onscreen 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 onscreen computer output	<code>machine_name%</code> su Password:
<i>aabbcc123</i>	Placeholder: replace with a real name or value	The command to remove a file is <i>rm filename</i> .
<i>AaBbCc123</i>	Book titles, new terms, and terms to be emphasized	Read Chapter 6 in the <i>User's Guide</i> . A <i>cache</i> is a copy that is stored locally. Do <i>not</i> save the file. Note: Some emphasized items appear bold online.

Shell Prompts in Command Examples

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

TABLE P-5 Shell Prompts

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

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◆ ◆ ◆ CHAPTER 1

Restrictions and Requirements

This chapter includes only restrictions and requirements that have a direct impact on the procedures in this book. For general support information, contact your Sun service provider.

Requirements

When it is deployed in a cluster environment with storage that is using LUN masking, the StorageTek™ array must also implement LUN masking.

Restrictions

When using storage-based replication, do not configure a replicated volume as a quorum device. Locate any quorum devices on an unreplicated volume. See “Using Storage-Based Data Replication” in *Sun Cluster 3.0-3.1 Hardware Administration Manual for Solaris OS* for more information on storage-based replication.

Installing and Configuring a StorageTek Array

This chapter contains the procedures about how to install and configure StorageTek FC RAID arrays. These procedures are specific to a Sun™ Cluster environment.

This chapter contains the following main topics:

- “Installing Storage Arrays” on page 13
- “Configuring Storage Arrays” on page 17

For detailed information about storage array architecture, features, configuration utilities, and installation, see the StorageTek documentation listed in “Related Documentation” on page 6.

For a URL to this storage documentation, see “Related Documentation” on page 6.

Installing Storage Arrays

This section contains the procedures listed in Table 2-1.

TABLE 2-1 Task Map: Installing Storage Arrays

Task	Information
Install a storage array in a new cluster, before the OS and Sun Cluster software are installed.	“How to Install Storage Arrays in a New Cluster” on page 14
Add a storage array to an existing cluster.	“How to Add Storage Arrays to an Existing Cluster” on page 16

Storage Array Cabling Configurations

You can install your storage array in several different configurations: Figure 2-1 and Figure 2-2 are two examples.

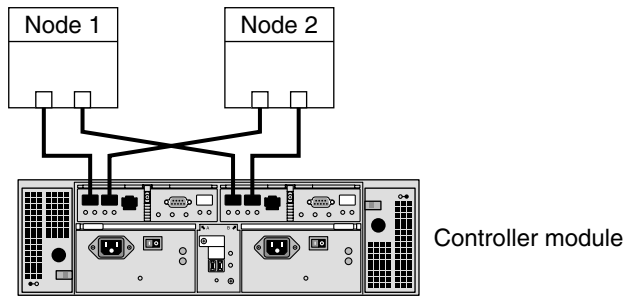


FIGURE 2-1 SPARC: StorageTek Array Direct-Connect Configuration

Note – The StorageTek 6140 array houses two controllers each having four host ports. The cabling approach is the same as shown in [Figure 2-1](#), but it can support up to four nodes in a direct-attach configuration.

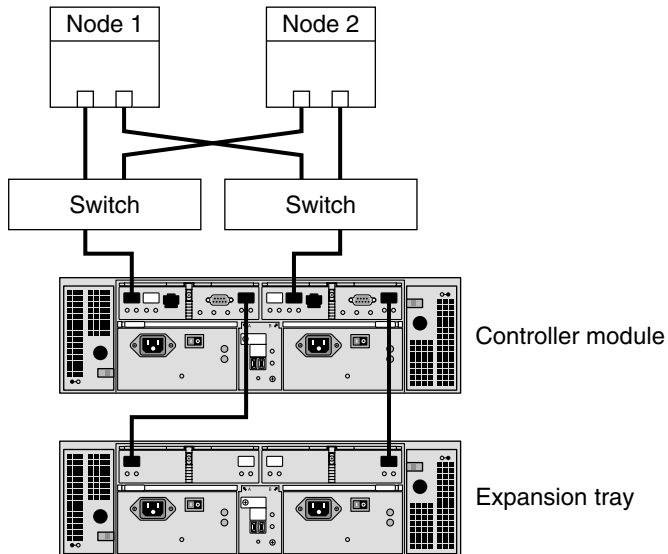


FIGURE 2-2 StorageTek Array Switched Configuration

How to Install Storage Arrays in a New Cluster

Use this procedure to install a storage array in a new cluster. To add a storage array to an existing cluster, use the procedure in [“How to Add Storage Arrays to an Existing Cluster”](#) on page 16.

This procedure relies on the following assumptions:

- You have *not* installed the Solaris Operating System.
- You have *not* installed the Sun Cluster software.
- Your cluster has *not* been established.
- You have enough host adapters to connect the nodes and the storage array to the service processor panel.

If you need to install host adapters, see “[How to Replace a Host Adapter](#)” on page 27. When this procedure asks you to replace the failed host adapter, simply install the new host adapter instead.

▼ Install and Cable the Hardware

1 **Unpack, place, and level the storage array.**

For instructions, see the StorageTek online documentation listed in [Table P-2](#).

2 **(Optional) Install the Fibre Channel (FC) switch for the storage array if you do not have a switch installed.**

For the procedure about how to install an FC switch, see the documentation that shipped with your FC switch hardware.

3 **Connect the nodes to the service processor panel.**

- (*SAN Configuration*) **Connect the FC switches to the service processor panel.**
- (*Direct-Attached Configuration*) **Connect each node to the service processor panel directly.**

For instructions, see the StorageTek documentation listed in “[Related Documentation](#)” on page 6.

4 **Install the storage array.**

For instructions, see the StorageTek documentation listed in “[Related Documentation](#)” on page 6.

5 **Power on the storage array and the nodes.**

For instructions, see the StorageTek documentation listed in “[Related Documentation](#)” on page 6.

6 **Configure the service processor.**

For instructions, see the StorageTek documentation listed in “[Related Documentation](#)” on page 6.

▼ Install the Solaris Operating System and Configure Multipathing

1 **On all nodes, install the Solaris operating system and apply the required Solaris patches for Sun Cluster software and storage array support.**

For the procedure about how to install the Solaris operating environment, see “[How to Install Solaris Software](#)” in *Sun Cluster Software Installation Guide for Solaris OS*.

2 Install any required patches or software for Sun StorEdge Traffic Manager software support to nodes and enable multipathing.

For the procedure about how to install the Sun StorEdge Traffic Manager software, see “How to Install Sun Multipathing Software” in *Sun Cluster Software Installation Guide for Solaris OS*.

- See Also**
- To create a logical volume, see “[How to Create a Logical Volume](#)” on page 17.
 - To continue with Sun Cluster software installation tasks, see your Sun Cluster software installation documentation.

▼ How to Add Storage Arrays to an Existing Cluster

Use this procedure to add a new storage array to a *running* cluster. To install a new storage array in a Sun Cluster configuration that is not running, use the procedure in “[How to Install Storage Arrays in a New Cluster](#)” on page 14.

Before You Begin This procedure relies on the following assumptions:

- (*VERITAS Volume Manager Only*) You have a version of VERITAS Volume Manager that includes Array Support Library (ASL). For more information on this requirement, see “[Requirements](#)” on page 11.
- You have enough host adapters to connect the nodes and the storage array to the service processor panel.
If you need to install host adapters, see “[How to Replace a Host Adapter](#)” on page 27. When this procedure asks you to replace the failed host adapter, simply install the new host adapter instead.
- You do *not* need to install a new node in your cluster.
If you need to add a node to your cluster, see your Sun Cluster system administration documentation. Ensure that you install the required Solaris patches for storage array support.

1 Unpack, place, and level the storage array.

For instructions, see the StorageTek online documentation listed in [Table P-2](#).

2 (Optional) Install the Fibre Channel (FC) switch for the storage array if you do not have a switch installed.

For the procedure about how to install an FC switch, see the documentation that shipped with your FC switch hardware.

3 Connect the nodes to the service processor panel.

- (*SAN Configuration*) **Connect the FC switches to the service processor panel.**
- (*Direct-Attached Configuration*) **Connect each node to the service processor panel directly.**

For instructions, see the StorageTek documentation listed in “[Related Documentation](#)” on page 6.

4 Install the storage array.

For instructions, see the StorageTek documentation listed in [“Related Documentation”](#) on page 6.

5 Power on the storage array and the nodes.

For instructions, see the StorageTek documentation listed in [“Related Documentation”](#) on page 6.

6 Configure the service processor.

For instructions, see the StorageTek documentation listed in [“Related Documentation”](#) on page 6.

- See Also**
- To create a logical volume, see [“How to Create a Logical Volume”](#) on page 17.
 - If you added a new node, perform the steps in [“Install the Solaris Operating System and Configure Multipathing”](#) on page 15 as appropriate. Apply the correct patches for storage array support enable multipathing.

Configuring Storage Arrays

This section contains the procedures about how to configure a storage array in a running cluster. [Table 2–2](#) lists these procedures.

TABLE 2–2 Task Map: Configuring a Storage Array

Task	Information
Create a logical volume.	“How to Create a Logical Volume” on page 17
Remove a logical volume.	“How to Remove a Logical Volume” on page 19

The following is a list of administrative tasks that require no cluster-specific procedures. See the storage array’s online help for the following procedures.

- Creating a storage pool
- Removing a storage pool
- Creating a volume group
- Removing a volume group
- Creating an initiator group
- Adding an initiator group
- Removing an initiator group

▼ How to Create a Logical Volume

Use this procedure to create a logical volume from unassigned storage capacity.

Note – Sun storage documentation uses the following terms:

- Logical volume
- Logical device
- Logical unit number (LUN)

This manual uses *logical volume* to refer to all such logical constructs.

Before You Begin This procedure relies on the following prerequisites and assumptions.

- All nodes are booted in cluster mode and attached to the storage device.
- The storage device is installed and configured. If you are using multipathing, the storage devices is configured as described in the installation procedure.
- If you are using Sun StorEdge Traffic Manager, it is installed and configured and the path between Traffic Manager and the storage device is functioning.

1 Follow the instructions in your storage device’s documentation to create and map the logical volume. For a URL to this storage documentation, see “Related Documentation” on page 6.

- Completely set up the logical volume. When you are finished, the volume must be created, mapped, mounted, and initialized.
- If necessary, partition the volume.
- To allow multiple clusters and nonclustered nodes to access the storage device, create initiator groups by using LUN masking.

2 Are you using multipathing?

- **If yes, proceed to Step 3.**
- **If no, skip to Step 4.**

3 Are any devices that are associated with the volume you created at an unconfigured state?

```
# cfdm -al | grep disk
```

- **If no, proceed to Step 4.**
- **If yes, configure the Traffic Manager paths on each node that is connected to the storage device.**
`cfdm -o force_update -c configure controllerinstance`

For the procedure about how to configure Traffic Manager paths, see the *Sun StorEdge Traffic Manager Installation and Configuration Guide*.

4 On one node that is connected to the storage device, use the `format` command to label the new logical volume.

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

```
# scgdevs
```

Note – You might have a volume management daemon such as `vold` running on your node, and have a CD-ROM drive connected to the node. Under these conditions, a device busy error might be returned even if no disk is in the drive. This error is expected behavior. You can safely ignore this error message.

6 To manage this volume with volume management software, use the appropriate Solstice DiskSuite/Solaris Volume Manager or VERITAS Volume Manager commands to update the list of devices on all nodes that are attached to the new volume that you created.

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

- See Also**
- To configure a logical volume as a quorum device, see Chapter 5, “Administering Quorum,” in *Sun Cluster System Administration Guide for Solaris OS*.
 - To create a new resource or configure a running resource to use the new logical volume, see Chapter 2, “Administering Data Service Resources,” in *Sun Cluster Data Services Planning and Administration Guide for Solaris OS*.

▼ How to Remove a Logical Volume

Use this procedure to remove a logical volume. This procedure defines Node A as the node with which you begin working.

Note – Sun storage documentation uses the following terms:

- Logical volume
- Logical device
- Logical unit number (LUN)

This manual uses *logical volume* to refer to all such logical constructs.

Before You Begin This procedure relies on the following prerequisites and assumptions.

- All nodes are booted in cluster mode and attached to the storage device.
- The logical volume and the path between the nodes and the storage device are both operational.

1 Identify the logical volume that you are removing.

Refer to your Solstice DiskSuite/Solaris Volume Manager or VERITAS Volume Manager documentation for more information.

- 2 (Optional) Migrate all data off the logical volume that you are removing. Alternatively, back up that data.**

- 3 Check if the logical volume that you are removing is a quorum device.**

```
# scstat -q
```

If yes, choose and configure another device as the quorum device. Then remove the old quorum device.

For procedures about how to add and remove quorum devices, see Chapter 5, “Administering Quorum,” in *Sun Cluster System Administration Guide for Solaris OS*.

- 4 If you are using volume management software, use that software to update the list of devices on all nodes that are attached to the logical volume that you are removing.**

For instructions about how to update the list of devices, see your Solstice DiskSuite/Solaris Volume Manager or VERITAS Volume Manager documentation.

- 5 If you are using volume management software, run the appropriate Solstice DiskSuite/Solaris Volume Manager or VERITAS Volume Manager commands to remove the logical volume from any diskset or disk group.**

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

Note – Volumes that were managed by VERITAS Volume Manager must be completely removed from VERITAS Volume Manager control before you can delete them from the Sun Cluster environment. After you delete the volume from any disk group, use the following commands on both nodes to remove the volume from VERITAS Volume Manager control.

```
# vxdisk offline Accessname
```

```
# vxdisk rm Accessname
```

Accessname Disk access name

- 6 If you are using multipathing, unconfigure the volume in Sun StorEdge Traffic Manager.**

```
# cfgadm -o force_update -c unconfigure Logical_Volume
```

- 7 Access the storage device and remove the logical volume.**

For the procedure about how to remove the volume, see your storage documentation. For a list of storage documentation, see “[Related Documentation](#)” on page 6.

- 8 Determine the resource groups and device groups that are running on all nodes.**

Record this information because you use it in [Step 13](#) of this procedure to return resource groups and device groups to these nodes.

```
# scstat
```

9 Move all resource groups and device groups off Node A.

```
# scswitch -s -h from-node
```

10 Shut down and reboot Node A.

For the procedure about how to shut down and power off a node, see Chapter 3, “Shutting Down and Booting a Cluster,” in *Sun Cluster System Administration Guide for Solaris OS*.

11 On Node A, remove the paths to the logical volume that you removed. Remove obsolete device IDs.

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

12 For each additional node that is connected to the shared storage that hosted the logical volume, repeat [Step 8](#) to [Step 11](#).**13 (Optional) Return the resource groups and device groups that you identified in [Step 8](#) to all cluster nodes.**

Maintaining a StorageTek Array

This chapter contains the procedures about how to maintain a StorageTek array. These procedures are specific to a Sun™ Cluster environment.

This chapter contains the following procedures:

- “How to Upgrade Storage Array Firmware” on page 24
- “How to Remove a Storage Array” on page 25
- “Replacing a Node-to-Switch Component” on page 26
- “How to Replace a Host Adapter” on page 27
- “How to Replace a Disk Drive” on page 29

For detailed information about storage array architecture, features, and configuration utilities, see the StorageTek documentation listed in “[Related Documentation](#)” on page 6.

FRUs That *Do Not* Require Sun Cluster Maintenance Procedures

In general, the following is a list of administrative tasks that require no cluster-specific procedures. See the base-product documentation for these procedures.

Note – Depending on your configuration type and the state of your cluster, a few of the following FRUs might require cluster-specific steps. Such FRUs include the DSP and service processor panel.

- Adding a disk drive.
- Replacing a storage array’s chassis.
- Replacing an Ethernet cable.
- Replacing a power supply.
- Replacing the power cable on the storage array.
- Replacing a power and cooling unit (PCU).
- Replacing a controller.

Before removing a disk drive, stop all I/O to the storage array. There are no other cluster-specific steps.

Maintaining Storage Arrays

This section contains the procedures about how to maintain a storage system in a running cluster. [Table 3-1](#) lists these procedures.

TABLE 3-1 Task Map: Maintaining a Storage System

Task	Information
Remove a storage array.	“How to Remove a Storage Array” on page 25
Upgrade storage array firmware.	“How to Upgrade Storage Array Firmware” on page 24
Replace a node-to-switch component.	“How to Replace a Node-to-Switch Component in a Cluster Without Multipathing” on page 27
Replace a node’s host adapter.	“How to Replace a Host Adapter” on page 27
Replace a disk drive.	“How to Replace a Disk Drive” on page 29
Add a node to the storage array.	Sun Cluster system administration documentation
Remove a node from the storage array.	Sun Cluster system administration documentation

▼ How to Upgrade Storage Array Firmware

Use this procedure to upgrade storage array firmware in a running cluster. Storage array firmware includes controller firmware, unit interconnect card (UIC) firmware, EPROM firmware, and disk drive firmware.

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 ID might change unexpectedly. When you perform a check of the device ID configuration by running the `scdidadm -c` command, the following error message appears on your console if the device ID changed unexpectedly.

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

To fix device IDs that report this error, run the `scdidadm -R` command for each affected device.

- 1 Stop all I/O to the storage arrays you are upgrading.**
- 2 Apply the controller, disk drive, and loop-card firmware patches by using the arrays' GUI tools.**
For specific instructions, see the array's online documentation.
- 3 Confirm that all storage arrays that you upgraded are visible to all nodes.**
`# luxadm probe`
- 4 Restart all I/O to the storage arrays.**
You stopped I/O to these storage arrays in [Step 1](#).

▼ How to Remove a Storage Array

Use this procedure to permanently remove a storage array from a running cluster.

This procedure defines Node N as the node that is connected to the storage array you are removing and the node with which you begin working.



Caution – During this procedure, you lose access to the data that resides on the storage array that you are removing.

- 1 If necessary, back up all database tables, data services, and volumes that are associated with each partner group that is affected.**
- 2 Remove references to the volumes that reside on the storage array that you are removing.**
For more information, see your Solstice DiskSuite/Solaris Volume Manager or VERITAS Volume Manager documentation.
- 3 Disconnect the cables that connected Node N to the FC switches in your storage array.**

4 On all nodes, remove the obsolete Solaris links and device IDs.

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

5 Repeat [Step 3](#) through [Step 4](#) for each node that is connected to the storage array.

Replacing a Node-to-Switch Component

Use this procedure to replace a node-to-switch component that has failed or that you suspect might be contributing to a problem.

Note – Node-to-switch components that are covered by this procedure include the following components:

- Node-to-switch fiber-optic cables
- Gigabit interface converters (GBICs) or small form-factor pluggables (SFPs) on an FC switch
- FC switches

For the procedure about how to replace a host adapter, see [“How to Replace a Host Adapter”](#) on page 27.

This procedure defines Node A as the node that is connected to the node-to-switch component that you are replacing. This procedure assumes that, except for the component you are replacing, your cluster is operational.

Ensure that you are following the appropriate instructions:

- If your cluster uses multipathing, see [“How to Replace a Node-to-Switch Component in a Cluster That Uses Multipathing”](#) on page 26.
- If your cluster does *not* use multipathing, see [“How to Replace a Node-to-Switch Component in a Cluster Without Multipathing”](#) on page 27.

▼ **How to Replace a Node-to-Switch Component in a Cluster That Uses Multipathing**

1 Is your configuration active-passive?

If yes, and the active path is the path that needs a component replaced, make that path passive.

2 Replace the component.

Refer to your hardware documentation for any component-specific instructions.

3 (Optional) If your configuration is active-passive and you changed your configuration in [Step 1](#), switch your original data path back to active.

▼ How to Replace a Node-to-Switch Component in a Cluster Without Multipathing

1 Check if the physical data path failed.

If no, proceed to [Step 2](#).

If yes:

a. Replace the component.

Refer to your hardware documentation for any component-specific instructions.

b. Fix the volume manager error that was caused by the failed data path.

c. (Optional) If necessary, return resource groups and device groups to this node.

You have completed this procedure.

2 Determine the resource groups and device groups that are running on Node A.

```
# scstat
```

3 Move all resource groups and device groups to another node.

```
# scswitch -s -h from-node
```

4 Replace the node-to-switch component.

Refer to your hardware documentation for any component-specific instructions.

5 (Optional) If necessary, return the resource groups and device groups that you identified in [Step 2](#) to Node A.

```
# scswitch -z -g resource-group -h nodename
```

```
# swwswitch -z -D device-group -h nodename
```

▼ How to Replace a Host Adapter

Use this procedure to replace a failed host adapter in a running cluster. This procedure defines Node A as the node with the failed host adapter that you are replacing.

Before You Begin This procedure relies on the following prerequisites and assumptions.

- Except for the failed host adapter, your cluster is operational and all nodes are powered on.
- Your nodes are not configured with dynamic reconfiguration functionality.

If your nodes are configured for dynamic reconfiguration **and** you are using two entirely separate hardware paths to your shared data, see the *Sun Cluster Hardware Administration Manual for Solaris OS* and skip steps that instruct you to shut down the cluster.

You cannot replace a single, dual-port HBA that has quorum configured on that storage path by using DR. Follow all steps in the procedure. For the details on the risks and limitations of this configuration, see “Configuring Cluster Nodes With a Single, Dual-Port HBA” in *Sun Cluster 3.0-3.1 Hardware Administration Manual for Solaris OS*.

Exceptions to this restriction include three-node or larger cluster configurations where no storage device has a quorum device configured.

1 Determine the resource groups and device groups that are running on Node A.

Record this information because you use this information in [Step 9](#) of this procedure to return resource groups and device groups to Node A.

```
# scstat
```

2 Move all resource groups and device groups off Node A.

```
# scswitch -S -h nodename
```

3 Shut down Node A.

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

4 Power off Node A.

5 Replace the failed host adapter.

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

6 Do you need to upgrade the node’s host adapter firmware?

- **If yes, boot Node A into noncluster mode. Proceed to [Step 7](#).**

For more information about how to boot nodes, see your Sun Cluster system administration documentation.

- **If no, proceed to [Step 8](#).**

7 Upgrade the host adapter firmware on Node A.

PatchPro is a patch-management tool that eases the selection and download of patches required for installation or maintenance of Sun Cluster software. PatchPro provides an Interactive Mode tool

especially for Sun Cluster. The Interactive Tool makes the installation of patches easier. PatchPro's Expert Mode tool helps you to maintain your configuration with the latest set of patches. Expert Mode is especially useful for obtaining all of the latest patches, not just the high availability and security patches.

To access the PatchPro tool for Sun Cluster software, go to <http://www.sun.com/PatchPro/>, click Sun Cluster, then choose either Interactive Mode or Expert Mode. Follow the instructions in the PatchPro tool to describe your cluster configuration and download the patches.

For third-party firmware patches, see the SunSolveSM Online site at <http://sunsolve.ebay.sun.com>.

8 Boot Node A into cluster mode.

For more information about how to boot nodes, see your Sun Cluster system administration documentation.

9 Return the resource groups and device groups you identified in Step 1 to Node A.

```
# scswitch -z -g resource-group -h nodename
# scswitch -z -D device-group-name -h nodename
```

For more information, see your Sun Cluster system administration documentation.

▼ How to Replace a Disk Drive

Use this procedure to replace a failed disk drive in a storage array in a running cluster.

Note – Sun storage documentation uses the following terms:

- Logical volume
- Logical device
- Logical unit number (LUN)

This manual uses *logical volume* to refer to all such logical constructs.

1 If the failed disk drive affect the storage array logical volume's availability, If yes, use volume manager commands to detach the submirror or plex.

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

2 Check if the logical volume (in Step 1) is a quorum device.

```
# scstat -q
```

If yes, choose and configure another device to be the new quorum device. Remove the old quorum device. For procedures about how to add and remove quorum devices, see your Sun Cluster system administration documentation.

3 Replace the failed disk drive.

4 (Optional) If the new disk drive is part of a logical volume that you want to be a quorum device, add the quorum device.

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

5 Did you detach a submirror or plex in [Step 1](#)?

- If no, you are finished with this procedure.
- If yes, use volume manager commands to reattach the submirror or plex.

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

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