



Sun Cluster 3.x With Sun StorEdge 6120 Array Manual

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Contents

Preface	5
1 Installing and Maintaining a Sun StorEdge 6120 Array	11
Installing Storage Arrays	11
▼ How to Install a Single-Controller Configuration	15
▼ How to Install a Dual-Controller Configuration	17
Configuring Storage Arrays	20
▼ How to Create a LUN	20
▼ How to Remove a LUN	21
Maintaining Storage Arrays	23
▼ How to Upgrade Storage Array Firmware	25
How to Add a Single-Controller Configuration	25
How to Add a Dual-Controller Configuration	29
▼ How to Remove a Single-Controller Configuration	33
▼ How to Remove a Dual-Controller Configuration	35
▼ How to Replace a Node-to-Switch Component	37
▼ How to Replace a Host Adapter	38
Index	39

Preface

The *Sun Cluster 3.x With Sun StorEdge 6120 Array Manual* provides procedures specific to Sun StorEdge 6120 arrays in dual-controller configurations and in single-controller configurations 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 three major sections.

Section 1 discusses how to install Sun StorEdge 6120 storage arrays.

Section 2 discusses how to configure logical units on Sun StorEdge 6120 storage arrays.

Section 3 describes how to maintain Sun StorEdge 6120 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.x With Sun StorEdge 6120 Array Manual

Revision Date	New Information
July 2003	Updated documentation with editorial changes.
April 2003	Updated the Related Documentation section.
	Removed an unnecessary <code>devfsadm</code> command.
	Removed the procedure on How to Replace a Failed Disk Drive.
	Combined and revised the two procedures on How to Upgrade Storage Array Firmware.

Related Documentation

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

The following Sun Cluster books support the 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 Traffic Manager Software Release Notes</i> Available on http://www.sun.com/storage/san/	817-0385
<i>Sun StorEdge Traffic Manager Installation and Configuration Guide</i> Available on http://www.sun.com/products-n-solutions/hardware/docs	816-1420
<i>Sun StorEdge 6120 Array Release Notes</i> Available on http://www.sun.com/products-n-solutions/hardware/docs	
<i>Sun StorEdge 6020 and 6120 Array System Manual</i> Available on http://www.sun.com/products-n-solutions/hardware/docs	817-0200
<i>Sun StorEdge 6120 Array Installation Guide</i> Available on http://www.sun.com/products-n-solutions/hardware/docs	817-0199

TABLE P-3 Sun Cluster Documentation

Application	Title	Part Number
Concepts	<i>Sun Cluster 3.1 Concepts Guide</i>	816-3383
Hardware	<i>Sun Cluster 3.x Hardware Administration Manual</i> Sun Cluster 3.x Hardware Administration Collection at http://docs.sun.com/db/coll/1024.1/	817-0168
Software Installation	<i>Sun Cluster 3.1 Software Installation Guide</i>	816-3388
Data Services	<i>Sun Cluster 3.1 Data Service Planning and Administration Guide</i> Sun Cluster 3.1 Data Service Collection at http://docs.sun.com/db/coll/573.10/	817-1526
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

TABLE P-3 Sun Cluster Documentation (Continued)

Application	Title	Part Number
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

Command	Function
<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% su</code> Password:
<i>AaBbCc123</i>	Command-line placeholder: replace with a real name or value	To delete a file, type <i>rm</i> <i>filename</i> .

TABLE P-4 Typographic Conventions (Continued)

Typeface or Symbol	Meaning	Example
<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	machine_name%
C shell superuser prompt	machine_name#
Bourne shell and Korn shell prompt	\$
Bourne shell and Korn shell superuser prompt	#

Installing and Maintaining a Sun StorEdge 6120 Array

This chapter contains the procedures about how to install, configure, and maintain a Sun StorEdge™ 6120 array in dual-controller configurations and in single-controller configurations. These procedures are specific to a Sun StorEdge 6120 array in a Sun™ Cluster environment.

This chapter contains the following procedures.

- “How to Install a Single-Controller Configuration” on page 15
- “How to Install a Dual-Controller Configuration” on page 17
- “How to Create a LUN” on page 20
- “How to Remove a LUN” on page 21
- “How to Upgrade Storage Array Firmware” on page 25
- “How to Add a Single-Controller Configuration” on page 25
- “How to Add a Dual-Controller Configuration” on page 29
- “How to Remove a Single-Controller Configuration” on page 33
- “How to Remove a Dual-Controller Configuration” on page 35
- “How to Replace a Node-to-Switch Component” on page 37
- “How to Replace a Host Adapter” on page 38

Installing Storage Arrays

This section contains the procedure for an *initial installation* of single-controller configurations and dual-controller configurations in a new Sun Cluster configuration. If you are adding a dual-controller configuration to an existing cluster, use the procedure in “How to Add a Dual-Controller Configuration” on page 29. If you are adding a single-controller configuration to an existing cluster, use the procedure in “How to Add a Single-Controller Configuration” on page 25.

You can install your storage array in several different configurations. Use the *Sun StorEdge 6120 Array Installation Guide* to evaluate your needs and determine which configuration is best for your situation.

The following figures illustrate example configurations.

Figure 1–1 shows two storage arrays, and two have controllers. The two storage arrays connect to a 2-node cluster through two switches. Dual-controller configurations require software RAID-1 (host-based mirroring).

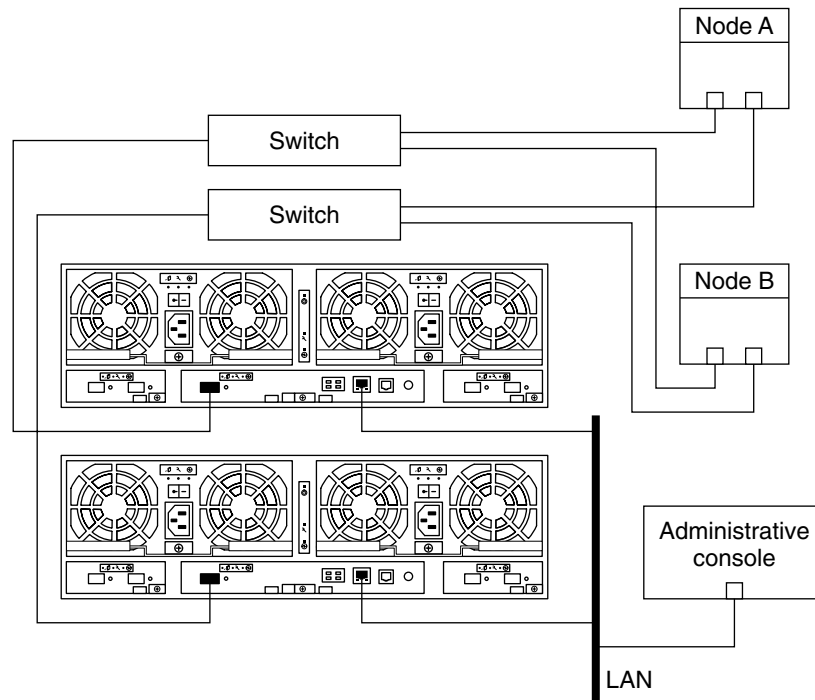


FIGURE 1–1 Installing a 1x1 Configuration With Software RAID-1

Figure 1–2 shows four storage arrays, and two have controllers. The first storage array without a controller connects to the second storage array, which has a controller. The third storage array without a controller connects to the fourth storage array, which as a controller. The two storage arrays with controllers connect to a 2-node cluster through two switches. Dual-controller configurations require software RAID-1 (host-based mirroring).

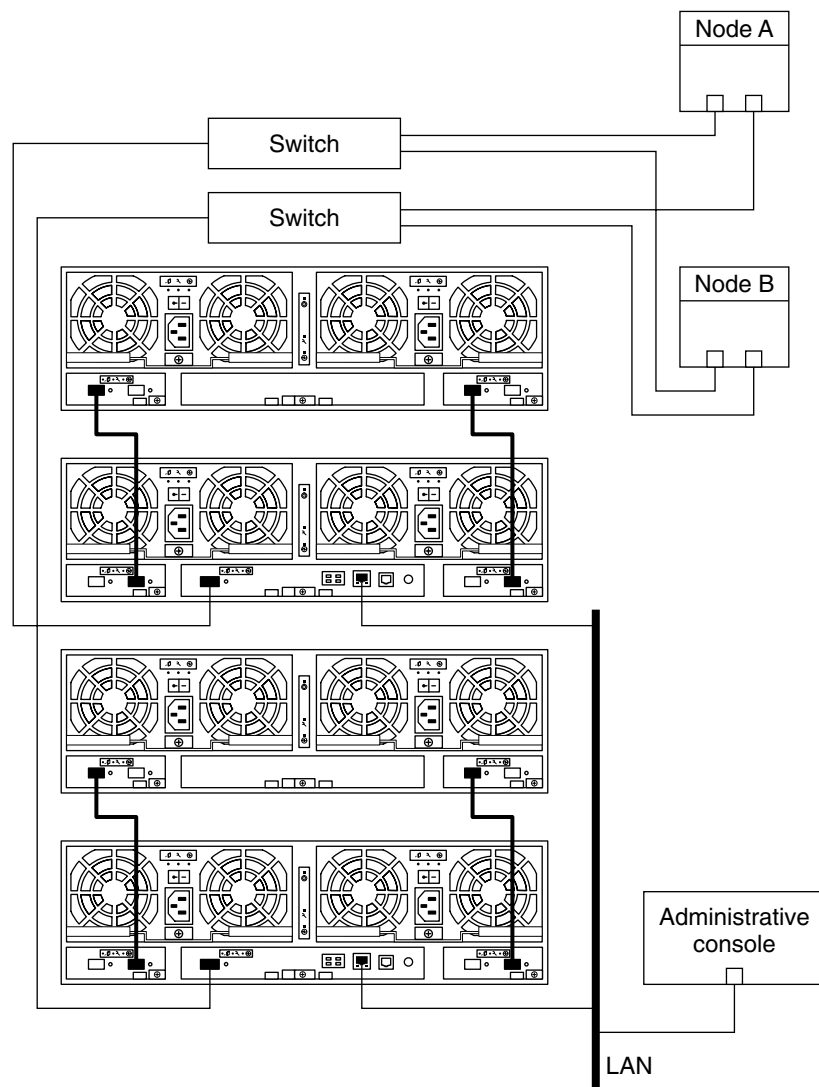


FIGURE 1-2 Installing a 1x2 Configuration With Software RAID-1

Figure 1-3 shows two storage arrays, and two have controllers. The two storage arrays are daisy-chained. The two storage arrays connect to a 2-node cluster through two switches.

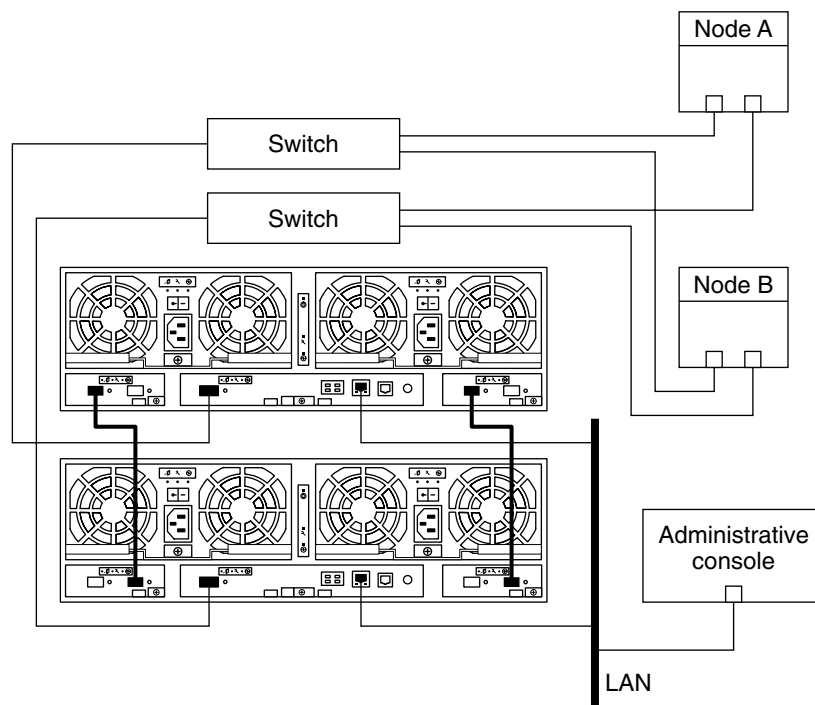


FIGURE 1-3 Installing a 2x2 Configuration

Figure 1-4 shows four storage arrays, and two have controllers. All storage array are daisy-chained in the following order: alternate master, master, alternate master, and master. The two storage arrays with controllers connect to a 2-node cluster through two switches.

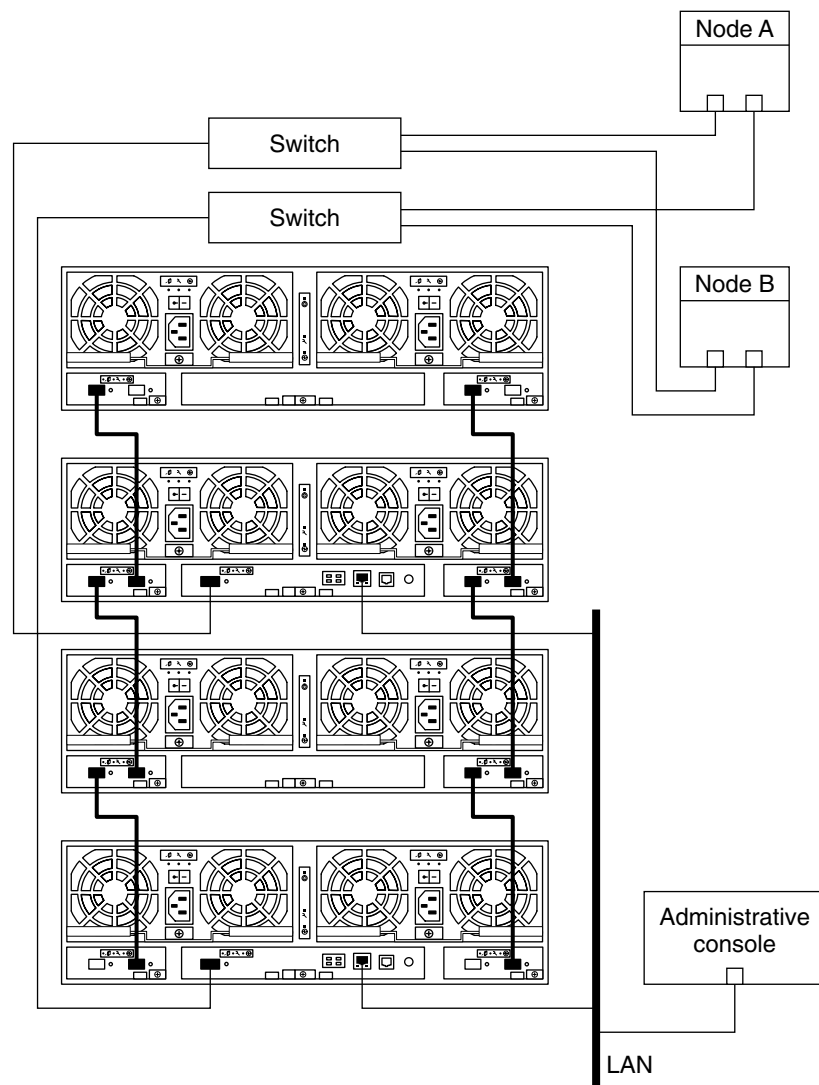


FIGURE 1-4 Installing a 2x4 Configuration

▼ How to Install a Single-Controller Configuration

Use this procedure to install a storage array in a single-controller configuration *before* you install the Solaris operating environment and Sun Cluster software on your nodes. To add a storage array to an existing cluster, use the procedure in “How to Add a Single-Controller Configuration” on page 25.

1. Install the 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 host adapters and nodes.

2. Install the Fibre Channel (FC) switches.

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

3. Set up a Reverse Address Resolution Protocol (RARP) server on the network on which the new storage array is to reside.

Use the RARP server to set up the following network settings.

- IP address
- gateway (if necessary)
- netmask (if necessary)
- hostname

For the procedure about how to set up a RARP server, see the *Sun StorEdge 6120 Array Installation Guide*.

4. Cable the storage arrays.

For the procedures on how to connect your storage array, see the *Sun StorEdge 6120 Array Installation Guide*.

- a. **Connect the storage arrays to the FC switches by using fiber-optic cables.**
- b. **Connect the Ethernet cables from each storage array to the Local Area Network (LAN).**
- c. **If necessary, install the interconnect cables between storage arrays.**
- d. **Connect the power cords to each storage array.**

5. Power on the storage array.

Verify that all components are powered on and functional.

Note – The storage array might require a few minutes to boot.

For the procedure about how to power on a storage array, see the *Sun StorEdge 6120 Array Installation Guide*.

6. Install any required controller firmware for the storage arrays.

For the required controller firmware for the storage array, see the *Sun StorEdge 6120 Array Release Notes*.

See the *Sun Cluster release notes documentation* for information about accessing Sun's Info Docs on <http://sunsolve.sun.com>. The Info Docs list information about

required patches and firmware that are available for download. For the procedure about how to apply host adapter firmware, see the firmware patch README file.

7. **Ensure that the `cache` and `mirror` settings for each storage array are set to `auto`.**

For more information, see the *Sun StorEdge 6020 and 6120 Array System Manual*.

8. **Ensure that the `mp_support` parameter for each storage array is set to `none`.**

For more information, see the *Sun StorEdge 6020 and 6120 Array System Manual*.

9. **Ensure that all storage array controllers are `ONLINE`.**

For more information about how to bring controllers online, see the *Sun StorEdge 6020 and 6120 Array System Manual*.

10. **Reset the storage array to update the network settings and system settings that you changed.**

For the procedure about how to reboot or reset a storage array, see the *Sun StorEdge 6020 and 6120 Array System Manual*.

11. **On all nodes, install the Solaris operating environment. Apply any required Solaris patches for Sun Cluster software and storage array support.**

For the procedure about how to install the Solaris operating environment, see your Sun Cluster software installation documentation.

See the *Sun Cluster release notes documentation* for information about accessing Sun's Info Docs on <http://sunsolve.sun.com>. The Info Docs list information about required patches and firmware that are available for download. For the procedure about how to apply host adapter firmware, see the firmware patch README file.

12. **On each node, ensure that the `mpxio-disable` parameter is set to `yes` in the `/kernel/drv/scsi_vhci.conf` file.**

Where to Go From Here

To continue with Sun Cluster software installation tasks, see your Sun Cluster software installation documentation.

▼ How to Install a Dual-Controller Configuration

Use this procedure to install a partner group in a dual-controller configuration *before* you install the Solaris operating environment and Sun Cluster software on your nodes. To add a partner group to an existing cluster, use the procedure in "How to Add a Dual-Controller Configuration" on page 29.

1. **Install the host adapters in the nodes to be connected to the storage arrays.**

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

2. Install the Fibre Channel (FC) switches.

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

3. If necessary, install GBICs or SFPs in the FC switches.

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

4. Set up a Reverse Address Resolution Protocol (RARP) server on the network on which the new storage array is to reside.

Use the RARP server to set up the following network settings.

- IP address
- gateway (if necessary)
- netmask (if necessary)
- hostname

For the procedure about how to set up a RARP server, see the *Sun StorEdge 6120 Array Installation Guide*.

5. Cable the storage arrays.

For the procedures on how to connect your storage array, see the *Sun StorEdge 6120 Array Installation Guide*.

- a. **Connect the storage arrays to the FC switches by using fiber-optic cables.**
- b. **Connect the Ethernet cables from each storage array to the LAN.**
- c. **If necessary, install the interconnect cables between storage arrays.**
- d. **Connect the power cords to each storage array.**

For the procedure about how to install fiber-optic, Ethernet, and interconnect cables, see the *Sun StorEdge 6120 Array Installation Guide*.

6. Power on the storage arrays.

Verify that all components are powered on and functional.

For the procedure about how to power on the storage arrays, see the *Sun StorEdge 6120 Array Installation Guide*.

7. Install any required controller firmware for the storage arrays.

Use the `telnet` command to access the *master* controller unit and administer the storage arrays. The master controller unit is the storage array that has the interconnect cables attached to the second port of each interconnect card, when viewed from the rear of the storage arrays.

For the required controller firmware for the storage array, see the *Sun StorEdge 6120 Array Release Notes*.

See the *Sun Cluster release notes documentation* for information about accessing Sun's Info Docs on <http://sunsolve.sun.com>. The Info Docs list information about

required patches and firmware that are available for download. For the procedure about how to apply host adapter firmware, see the firmware patch README file.

8. Ensure that each storage array has a unique target address.

For the procedure about how to assign a target address to a storage array, see the *Sun StorEdge 6020 and 6120 Array System Manual*.

9. Ensure that the cache and mirror settings for each storage array are set to auto.

For more information, see the *Sun StorEdge 6020 and 6120 Array System Manual*.

10. On each node, ensure that the mp_support parameter for each storage array is set to mpxio.

For more information, see the *Sun StorEdge 6020 and 6120 Array System Manual*.

11. Ensure that all storage array controllers are ONLINE.

For more information about how to bring controllers online, see the *Sun StorEdge 6020 and 6120 Array System Manual*.

12. Reset the storage array to update the network settings and system settings that you changed.

For the procedure about how to reboot or reset a storage array, see the *Sun StorEdge 6020 and 6120 Array System Manual*.

13. On all nodes, install to the Solaris operating environment. 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 your Sun Cluster software installation documentation.

See the *Sun Cluster release notes documentation* for information about accessing Sun's Info Docs on <http://sunsolve.sun.com>. The Info Docs list information about required patches and firmware that are available for download. For the procedure about how to apply host adapter firmware, see the firmware patch README file.

14. Install any required patches or software for Sun StorEdge Traffic Manager software support to nodes.

For the procedure on how to install the Sun StorEdge Traffic Manager software, see the *Sun StorEdge Traffic Manager Installation and Configuration Guide* at <http://www.sun.com/products-n-solutions/hardware/docs/>. For a list of required patches for Sun StorEdge Traffic Manager software, see the *Sun StorEdge Traffic Manager Software Release Notes* on <http://www.sun.com/storage/san>.

15. Edit the /kernel/drv/scsi_vhci.conf file to activate the Sun StorEdge Traffic Manager software functionality. Set the mpxio-disable parameter to no.

16. Perform a reconfiguration boot on all nodes to create the new Solaris device files and links.

17. Confirm that all storage arrays that you installed are visible to all nodes.

```
# luxadm probe
```

Where to Go From Here

To continue with Sun Cluster software installation tasks, see your Sun Cluster software installation documentation.

Configuring Storage Arrays

This section contains the procedures about how to configure a storage array in a running cluster. Table 1–1 lists these procedures.

TABLE 1–1 Task Map: Configuring a Storage Array

Task	Information
Create a LUN	"How to Create a LUN" on page 20
Remove a LUN	"How to Remove a LUN" on page 21

The following is a list of administrative tasks that require no cluster-specific procedures. See the *Sun StorEdge 6020 and 6120 Array System Manual* for the following procedures.

- Removing a logical volume.
- Creating a logical volume.

▼ How to Create a LUN

Use this procedure to create a LUN in a running cluster. This procedure assumes that you created the logical volume that is to contain the LUN that you are creating. For the procedure about how to create a logical volume, see the *Sun StorEdge 6320 System Reference and Service Manual*.

1. Create a LUN.

For the procedure about how to create a LUN, see the *Sun StorEdge 6020 and 6120 Array System Manual*.

2. (Optional) Specify initiator groups for the LUN.

For the procedure about how to specify initiator groups, see the *Sun StorEdge 6020 and 6120 Array System Manual*.

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

```
# cfmadm -al | grep disk
```

- If no, proceed to Step 4.
- If yes, configure the STMS paths.

```
cfmadm -c configure controllerinstance
```

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

Note – You need to reboot if the `cfmadm` command does not configure the unconfigured devices that are associated with the LUN you are creating. See the *Sun StorEdge Traffic Manager Installation and Configuration Guide* for more information.

4. On one node that is connected to the storage array, label the new LUN.

```
# format
```

5. Are you running VERITAS Volume Manager?

- If no, proceed to Step 6.
- If yes, update the list of devices on all nodes that are attached to the new volume that you created in Step 1.

For more information, see your VERITAS Volume Manager documentation.

6. (Optional) Partition the LUN.

7. 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.

▼ How to Remove a LUN

Use this procedure to remove a LUN in a running cluster. This procedure assumes all nodes are booted and are attached to the storage array that hosts the LUN that you are removing.



Caution – This procedure removes all data from the LUN that you are removing.

1. If necessary, perform one of the following tasks to protect your data.

- Migrate all data off the volume that you are removing.
- Backup all data that resides on the volume that you are removing.

2. Is the LUN that you are removing a quorum device?

`scstat -q`

- If no, proceed to Step 3.
- If yes, choose and configure another device to be the new quorum device. Then remove the old quorum device.

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

3. Are you running VERITAS Volume Manager?

- If no, proceed to Step 4.
- If yes, update the list of devices on all nodes that are attached to the LUN that you are removing.

For more information, see your VERITAS Volume Manager documentation.

4. Remove the reference to the logical unit number (LUN) from any diskset or disk group.

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

5. Use the `telnet` command to access the storage array.

- If you have a single-array configuration, this storage array is to host the logical volume that you are removing.
- If you have a partner-group configuration, this storage array is the master controller unit of your partner-group configuration.

The master controller unit is the storage array that has the interconnect cables attached to the second port of each interconnect card, when viewed from the rear of the storage arrays.

6. Remove the LUN.

For the procedure about how to remove a LUN, see the *Sun StorEdge 6020 and 6120 Array System Manual*.

7. On all nodes, remove the obsolete Solaris links and device IDs (DIDs).

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

Where to Go From Here

To remove a logical volume, see the *Sun StorEdge 6020 and 6120 Array System Manual*.

Maintaining Storage Arrays

This section contains the procedures about how to maintain a storage array in a running cluster. Table 1–2 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 ID (DID) might change unexpectedly. When you perform a check of the DID configuration by running the `sddidadm -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.
```

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

TABLE 1–2 Task Map: Maintaining a Storage Array

Task	Information
Upgrade storage array firmware.	"How to Upgrade Storage Array Firmware" on page 25
Add a storage array.	"How to Add a Single-Controller Configuration" on page 25 "How to Add a Dual-Controller Configuration" on page 29
Remove a storage array or partner group.	"How to Remove a Single-Controller Configuration" on page 33 "How to Remove a Dual-Controller Configuration" on page 35

TABLE 1–2 Task Map: Maintaining a Storage Array (Continued)

Task	Information
Replace a node-to-switch component. ■ Node-to-switch fiber-optic cable ■ FC host adapter ■ FC switch ■ GBIC or SFP	“How to Replace a Node-to-Switch Component” on page 37
Replace a node’s host adapter.	“How to Replace a Host Adapter” on page 38
Add a node to the storage array.	Sun Cluster system administration documentation
Remove a node from the storage device.	Sun Cluster system administration documentation

The following is a list of administrative tasks that require no cluster-specific procedures. See the *Sun StorEdge 6020 and 6120 Array System Manual* for the following procedures.

- Adding an expansion unit.
 - Removing an expansion unit.
 - Replacing an expansion unit.
 - Adding a disk drive.
 - Replacing a failed disk drive.
 - Removing a disk drive.
 - Replacing an Ethernet cable.
 - Replacing a power cable on the storage array.
 - Replacing a Power and Cooling Unit (PCU).
 - Replacing a chassis.
 - Replacing a controller.
 - Replacing a storage array-to-switch component in a dual-controller configuration.
- A storage array-to-switch component includes all of the following components.
- Fiber-optic cable that connects an FC switch to a storage array
 - FC switch GBIC or an SFP that connects an FC switch to a storage array
 - FC switch that connects an FC switch to a storage array
 - FC switch power cord
 - Interconnect cables that connect two storage arrays
 - Interconnect cards

▼ 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.

1. **Stop all I/O to the storage arrays you are upgrading.**

2. **Apply the controller, disk drive, and UIC firmware patches.**

For the list of required storage array patches, see the *Sun StorEdge 6120 Array Release Notes*. For the procedure about how to apply firmware patches, see the firmware patch README file. For the procedure about how to verify the firmware level, see the *Sun StorEdge 6020 and 6120 Array System Manual*. For the procedure about how to reset a storage array, see the *Sun StorEdge 6020 and 6120 Array System Manual*.

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 all I/O to these storage arrays in Step 1.**

How to Add a Single-Controller Configuration

Use this procedure to add a single-controller configuration to a running cluster. This storage array reside in a single-controller configuration. To install a single-controller to a cluster that is *not* yet running Sun Cluster software, use the procedure in “How to Install a Single-Controller Configuration” on page 15.

This procedure defines Node N as the node with which you begin working.

▼ How to Perform Initial Configuration Tasks on the Storage Array

1. **Power on the storage array.**

Note – the storage array might require a few minutes to boot.

For the procedure about how to power on a storage array, see the *Sun StorEdge 6120 Array Installation Guide*.

2. **Administer the storage array’s network settings. Network settings include the following settings.**

- IP address
- gateway (if necessary)
- netmask (if necessary)
- hostname

For the procedure about how to set up an IP address, gateway, netmask, and hostname on a storage array, see the *Sun StorEdge 6020 and 6120 Array System Manual*.

3. **Ensure that the cache and mirror settings for each storage array are set to auto.**

For more information, see the *Sun StorEdge 6020 and 6120 Array System Manual*.

4. **Ensure that the mp_support parameter for each storage array is set to none.**

For more information about, see the *Sun StorEdge 6020 and 6120 Array System Manual*.

5. **Install any required controller firmware for the storage arrays you are adding.**

For the required controller firmware for the storage array, see the *Sun StorEdge 6120 Array Release Notes*.

See the *Sun Cluster release notes documentation* for information about accessing Sun's Info Docs on <http://sunsolve.sun.com>. The Info Docs list information about required patches and firmware that are available for download. For the procedure about how to apply host adapter firmware, see the firmware patch README file.

6. **Reset the storage array to update the network settings and system settings that you changed.**

For the procedure about how to reboot or reset a storage array, see the *Sun StorEdge 6020 and 6120 Array System Manual*.

7. **Confirm that all storage arrays that you upgraded are visible to all nodes.**

```
# luxadm probe
```

▼ How to Connect the Storage Array to FC Switches

1. **Install the GBICs or SFPs in the storage array that you plan to add.**

For the procedure about how to install a GBICs or SFPs, see the *Sun StorEdge 6120 Array Installation Guide*.

2. **If necessary, install GBICs or SFPs in the FC switches.**

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

3. **Install the Ethernet cable between the storage array and the Local Area Network (LAN).**

4. **If necessary, daisy-chain or interconnect the storage arrays.**

For the procedure about how to install interconnect cables, see the *Sun StorEdge 6120 Array Installation Guide*.

5. Install a fiber-optic cable between the FC switch and the storage array.

For the procedure about how to install a fiber-optic cable, see the *Sun StorEdge 6120 Array Installation Guide*.

▼ How to Connect the Node to the FC Switches or the Storage Array

1. Determine the resource groups and device groups that are running on all nodes.

Record this information because you use this information in Step 18 of this procedure to return resource groups and device groups to these nodes.

```
# scstat
```

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

```
# scswitch -S -h from-node
```

3. Do you need to install a host adapter in Node N?

- If no, skip to Step 10.
- If yes, proceed to Step 4.

4. Is the host adapter that you are installing the first FC host adapter on Node N?

- If no, skip to Step 6.
- If yes, determine whether the required drivers for the host adapter are already installed on this node. For the required packages, see the documentation that shipped with your host adapters.

5. Are the Fibre Channel support packages installed?

- If yes, proceed to Step 6.
- If no, install the packages.

The storage array packages are located in the `Product` directory of the Solaris CD-ROM. Add any necessary packages.

6. Shut down and power off Node N.

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

7. Install the host adapter in Node N.

For the procedure about how to install a host adapter, see the documentation that shipped with your host adapter and node.

8. Power on and boot Node N into noncluster mode.

For the procedure about how to boot a node in noncluster mode, see your Sun Cluster system administration documentation.

9. If necessary, upgrade the host adapter firmware on Node N.

See the *Sun Cluster release notes documentation* for information about accessing Sun's Info Docs on <http://sunsolve.sun.com>. The Info Docs list information about required patches and firmware that are available for download. For the procedure about how to apply host adapter firmware, see the firmware patch README file.

10. If necessary, install a GBIC or an SFP in the FC switch or the storage array.

For the procedure about how to install a GBIC or an SFP, see the documentation that shipped with your FC switch hardware. For the procedure on how to install a GBIC or an SFP, see the *Sun StorEdge 6120 Array Installation Guide*.

11. Connect a fiber-optic cable between the FC switch and Node N.

For the procedure about how to install a fiber-optic cable, see the *Sun StorEdge 6120 Array Installation Guide*.

12. If necessary, install the required Solaris patches for storage array support on Node N.

For a list of required Solaris patches for storage array support, see the *Sun StorEdge 6120 Array Release Notes*.

13. On the node, update the `/devices` and `/dev` entries.

```
# devfsadm -C
```

14. On the node, update the paths to the DID instances.

```
# scgdevs
```

15. If necessary, label the new logical volume.

For the procedure about how to label a logical volume, see the *Sun StorEdge 6020 and 6120 Array System Manual*.

16. (Optional) On Node N, verify that the device IDs (DIDs) are assigned to the new storage array.

```
# scdidadm -l
```

17. Repeat Step 2 through Step 16 for each remaining node that you plan to connect to the storage array.

18. (Optional) Return the resource groups and device groups that you identified in Step 1 to the original nodes.

```
# 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.

19. Perform volume management administration to incorporate the new logical volumes into the cluster.

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

How to Add a Dual-Controller Configuration

Use this procedure to add a dual-controller configuration to a running cluster. To install a dual-controller configuration to a cluster that is *not* yet running Sun Cluster software, use the procedure in “How to Install a Dual-Controller Configuration” on page 17.

This procedure defines Node N as the node with which you begin working.

▼ How to Perform Initial Configuration Tasks on the Storage Array

1. Power on the storage arrays.

Note – The storage arrays might require several minutes to boot.

For the procedure about how to power on storage arrays, see the *Sun StorEdge 6120 Array Installation Guide*.

2. Administer the storage array’s network settings. Network settings include the following settings.

- IP address
- gateway (if necessary)
- netmask (if necessary)
- hostname

Assign an IP address to the *master* controller unit only. The master controller unit is the storage array that has the interconnect cables attached to the second port of each interconnect card.

For the procedure about how to set up an IP address, gateway, netmask, and hostname on a storage array, see the *Sun StorEdge 6020 and 6120 Array System Manual*.

3. Ensure that each storage array has a unique target address.

For the procedure about how to assign a target address to a storage array, see the *Sun StorEdge 6020 and 6120 Array System Manual*.

4. Ensure that the cache and mirror settings for each storage array are set to auto.

For more information, see the *Sun StorEdge 6020 and 6120 Array System Manual*.

5. **Ensure that the `mp_support` parameter for each storage array is set to `mpxio`.**

For more information, see the *Sun StorEdge 6020 and 6120 Array System Manual*.

6. **Install any required controller firmware for the storage arrays you are adding.**

Use the `telnet` command to access the *master* controller unit and administer the storage arrays. The master controller unit is the storage array that has the interconnect cables attached to the second port of each interconnect card, when viewed from the rear of the storage arrays.

For the required controller firmware for the storage array, see the *Sun StorEdge 6120 Array Release Notes*.

7. **Reset the storage array to update the network settings and system settings that you changed.**

For the procedure about how to reboot or reset a storage array, see the *Sun StorEdge 6020 and 6120 Array System Manual*.

▼ How to Connect the Storage Array to FC Switches

1. **Install the GBICs or SFPs in the storage array that you plan to add.**

For the procedure about how to install a GBICs or SFPs, see the *Sun StorEdge 6120 Array Installation Guide*.

2. **If necessary, install GBICs or SFPs in the FC switches.**

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

3. **Install the Ethernet cable between the storage arrays and the local area network (LAN).**

4. **If necessary, daisy-chain or interconnect the storage arrays.**

For the procedure about how to install interconnect cables, see the *Sun StorEdge 6120 Array Installation Guide*.

5. **Install a fiber-optic cable between each FC switch and both new storage arrays of the partner group.**

For the procedure about how to install a fiber-optic cable, see the *Sun StorEdge 6120 Array Installation Guide*.

▼ How to Connect the Node to the FC Switches or the Storage Array

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

Record this information because you use this information in Step 20 of this procedure to return resource groups and device groups to these nodes.

```
# scstat
```

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

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

3. Do you need to install host adapters in Node N?

- If no, skip to Step 10.
- If yes, proceed to Step 4.

4. Is the host adapter that you that are installing the first host adapter on Node N?

- If no, skip to Step 6.
- If yes, determine whether the required drivers for the host adapter are already installed on this node. For the required packages, see the documentation that shipped with your host adapters.

5. Are the required support packages already installed?

- If yes, skip to Step 6.
- If no, install the packages.

The support packages are located in the `Product` directory of the Solaris CD-ROM.

6. Shut down and power off Node N.

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

7. Install the host adapters in Node N.

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

8. Power on and boot Node N into noncluster mode.

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

9. If necessary, upgrade the host adapter firmware on Node N.

See the *Sun Cluster release notes documentation* for information about accessing Sun's Info Docs on <http://sunsolve.sun.com>. The Info Docs list information about required patches and firmware that are available for download. For the procedure about how to apply host adapter firmware, see the firmware patch README file.

10. If necessary, install a GBIC or an SFP in the FC switch or the storage array.

For the procedure about how to install a GBIC or an SFP, see the documentation that shipped with your FC switch hardware. For the procedure on how to install a GBIC or an SFP, see the *Sun StorEdge 6120 Array Installation Guide*.

11. Connect a fiber-optic cable between the FC switch and Node N.

For the procedure about how to install a fiber-optic cable, see the *Sun StorEdge 6120 Array Installation Guide*.

12. Install the required Solaris patches for storage array support on Node N.

See the *Sun Cluster release notes documentation* for information about accessing Sun's Info Docs on <http://sunsolve.sun.com>. The Info Docs list information about required patches and firmware that are available for download. For the procedure about how to apply host adapter firmware, see the firmware patch README file.

13. Install any required patches or software for Sun StorEdge Traffic Manager software support to Node N.

For the procedure on how to install the Sun StorEdge Traffic Manager software, see the *Sun StorEdge Traffic Manager Installation and Configuration Guide* at <http://www.sun.com/products-n-solutions/hardware/docs/>. For a list of required patches for Sun StorEdge Traffic Manager software, see the *Sun StorEdge Traffic Manager Software Release Notes* on <http://www.sun.com/storage/san>.

14. Edit the `/kernel/drv/scsi_vhci.conf` file to activate the Sun StorEdge Traffic Manager software functionality. Set the `mpxio-disable` parameter to `no`.

15. Perform a reconfiguration boot on Node N to create the new Solaris device files and links.

16. On Node N, update the paths to the DID instances.

```
# scgdevs
```

17. If necessary, label the new storage array logical volume.

For the procedure about how to label a logical volume, see the *Sun StorEdge 6020 and 6120 Array System Manual*.

18. (Optional) On Node N, verify that the device IDs (DIDs) are assigned to the new storage array.

```
# scdidadm -l
```

19. Repeat Step 2 through Step 18 for each remaining node that you plan to connect to the storage array.

20. (Optional) Return the resource groups and device groups that you identified in Step 1 to the original nodes.

```
# 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.

21. Perform volume management administration to incorporate the new logical volumes into the cluster.

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

▼ How to Remove a Single-Controller Configuration

Use this procedure to permanently remove a storage array from a running cluster. This storage array resides in a single-controller configuration. This procedure provides the flexibility to remove the host adapters from the nodes for the storage array that you are removing.

This procedure defines Node A as the node with which you begin working. Node B is the remaining node.



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

1. **Back up all database tables, data services, and volumes that are associated with the storage array that you are removing.**
2. **Detach the submirrors from the storage array that you are removing. Detach the submirrors to stop all I/O activity to the storage array.**

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

3. **Remove the references to the LUN(s) from any diskset or disk group.**

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

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

```
# scstat
```

5. **Shut down Node A.**

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

6. **Is the storage array that you are removing the last storage array that is connected to Node A?**

- If yes, disconnect the fiber-optic cable between Node A and the FC switch that is connected to this storage array. Afterward, disconnect the fiber-optic cable between the FC switch and this storage array.
- If no, proceed to Step 7.

For the procedure about how to remove a fiber-optic cable, see the *Sun StorEdge 6020 and 6120 Array System Manual*.

7. Do you want to remove the host adapter from Node A?

- If yes, power off Node A.
- If no, skip to Step 10.

8. Remove the host adapter from Node A.

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

9. Without enabling the node to boot, power on Node A.

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

10. Boot Node A into cluster mode.

For the procedure about how to boot nodes, see your Sun Cluster system administration documentation.

11. Shut down Node B.

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

12. Is the storage array that you are removing the last storage array that is connected to the FC switch?

- If yes, disconnect the fiber-optic cable that connects this FC switch and Node B.
- If no, proceed to Step 13.

For the procedure about how to remove a fiber-optic cable, see the *Sun StorEdge 6020 and 6120 Array System Manual*.

13. Do you want to remove the host adapter from Node B?

- If yes, power off Node B.
- If no, skip to Step 16.

14. Remove the host adapter from Node B.

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

15. Without enabling the node to boot, power on Node B.

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

16. Boot Node B into cluster mode.

For the procedure about how to boot nodes, see your Sun Cluster system administration documentation.

17. On all nodes, update the `/devices` and `/dev` entries.

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

18. Return the resource groups and device groups that you identified in Step 4 to Node A and Node B.

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

▼ How to Remove a Dual-Controller Configuration

Use this procedure to remove a dual-controller configuration from a running cluster. This procedure defines Node A as the node with which you begin working. Node B is the remaining node.



Caution – During this procedure, you lose access to the data that resides on each partner group that you are removing.

1. If necessary, back up all database tables, data services, and volumes that are associated with each partner group that you are removing.
2. If necessary, detach the submirrors from each storage array or partner group that you are removing. Detach the submirrors to stop all I/O activity to the storage array or partner group.

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

3. Remove references to each LUN. This LUN belongs to the storage array or partner group that you are removing.

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

4. Determine the resource groups and device groups that are running on all nodes.

Record this information because you use this information in Step 19 of this procedure to return resource groups and device groups to these nodes.

```
# scstat
```

5. Shut down Node A.

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

6. Disconnect from both storage arrays the fiber-optic cables that connect to the FC switches. Then disconnect the Ethernet cables.

7. Is any storage array that you are removing the last storage array that is connected to an FC switch that is on Node A?

- If no, skip to Step 11.

- If yes, disconnect the fiber-optic cable between Node A and the FC switch that was connected to this storage array.

For the procedure about how to remove a fiber-optic cable, see the *Sun StorEdge 6020 and 6120 Array System Manual*.

8. Do you want to remove the host adapters from Node A?

- If no, skip to Step 11.
- If yes, power off Node A.

9. Remove the host adapters from Node A.

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

10. Without enabling the node to boot, power on Node A.

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

11. Boot Node A into cluster mode.

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

12. Shut down Node B.

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

13. Is any storage array that you are removing the last storage array that is connected to an FC switch that is on Node B?

- If no, proceed to Step 14.
- If yes, disconnect the fiber-optic cable that connects this FC switch to Node B.

For the procedure about how to remove a fiber-optic cable, see the *Sun StorEdge 6020 and 6120 Array System Manual*.

14. Do you want to remove the host adapters from Node B?

- If no, skip to Step 17.
- If yes, power off Node B.

15. Remove the host adapters from Node B.

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

16. Without enabling the node to boot, power on Node B.

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

17. Boot Node B into cluster mode.

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

18. On all nodes, update the `/devices` and `/dev` entries.

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

19. Return the resource groups and device groups that you identified in Step 4 to all nodes.

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

▼ How to Replace a Node-to-Switch Component

Use this procedure to replace the following node-to-switch components.

- Node-to-switch fiber-optic cable
- FC host adapter
- FC switch
- GBIC or SFP

1. On the node that is connected to the node-to-switch connection that you are replacing, determine the resource groups and device groups that are running on this node.

```
# scstat
```

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

```
# scswitch -S -h from-node
```

3. Replace the node-to-switch component.

- For the procedure about how to replace a fiber-optic cable, see the *Sun StorEdge 6020 and 6120 Array System Manual*.
- For the procedure about how to replace an FC switch, see the documentation that shipped with your FC switch hardware.
- For the procedure about how to replace an FC host adapter, see your host adapter documentation.
- For the procedure about how to replace GBIC or an SFP, see your switch documentation.

4. Return the resource groups and device groups that you identified in Step 1 to the node that is connected to the node-to-switch connection that you replaced.

```
# scswitch -z -g resource-group -h nodename
# scswitch -z -D device-group-name -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 N** as the node with the failed host adapter that you are replacing.

1. Determine the resource groups and device groups that are running on all nodes.

Record this information because you use this information in Step 8 of this procedure to return resource groups and device groups to these nodes.

```
# scstat
```

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

```
# scswitch -S -h from-node
```

3. Shut down Node N.

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

4. Power off Node N.

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

5. Replace the failed host adapter.

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

6. Power on Node N.

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

7. Boot Node N into cluster mode.

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

8. Return the resource groups and device groups that you identified in Step 1 to all nodes.

```
# 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.

Index

A

adding
 See also installing
 disk drive, 24
 expansion units, 24
 nodes, 24
 partner groups, 29
 storage arrays, 25

C

chassis, replacing, 24
components
 node-to-switch
 replacing, 37
controllers, replacing, 24
cooling units, replacing, 24
creating
 logical volumes, 20
 LUNs, 20

D

deleting
 See also removing
disk drive
 adding, 24
 removing, 24
disk drives, replacing, 24

E

Ethernet cables, replacing, 24
expansion units
 adding, 24
 removing, 24
 replacing, 24

H

help, 8
host adapters, replacing, 38

I

installing
 See also adding
 storage arrays, 15
interconnect cables, replacing, 24
interconnect cards, replacing, 24

L

logical unit numbers
 See logical volumes
 See LUNs
logical volumes
 creating, 20
 removing, 20

loop cables, *See* interconnect cables

loop cards, *See* interconnect cards

LUNs

creating, 20

removing, 21

M

midplane, replacing, 24

N

node-to-switch components, replacing, 37

nodes

adding, 24

removing, 24

P

partner groups

adding, 29

removing, 35

power cables, replacing, 24

power units, replacing, 24

R

removing

disk drive, 24

expansion units, 24

logical volumes, 20

LUNs, 21

nodes, 24

partner groups, 35

storage arrays, 33

replacing

chassis, 24

controllers, 24

cooling units, 24

disk drives, 24

Ethernet cables, 24

expansion units, 24

host adapters, 38

midplane, 24

replacing (Continued)

node-to-switch components, 37

power cables, 24

power units, 24

switch-to-storage array components, 24

S

storage array firmware, upgrading, 25

storage arrays

adding, 25

installing, 15

removing, 33

switch-to-storage array components,

replacing, 24

T

technical support, 8

U

upgrading, storage array firmware, 25