



Sun Cluster 3.0 Release Notes Supplement

Sun Microsystems, Inc.
901 San Antonio Road
Palo Alto, CA 94303-4900 U.S.A.
650-960-1300

Part No. 806-7079
April 2001, Revision A

Copyright 2000 -2001 Sun Microsystems, Inc., 901 San Antonio Road, Palo Alto, CA 94303-4900 U.S.A. All rights reserved.

This product or document is distributed under licenses restricting its use, copying, distribution, and decompilation. No part of this product or document may be reproduced in any form by any means without prior written authorization of Sun and its licensors, if any. Third-party software, including font technology, is copyrighted and licensed from Sun suppliers.

Parts of the product may be derived from Berkeley BSD systems, licensed from the University of California. UNIX is a registered trademark in the U.S. and other countries, exclusively licensed through X/Open Company, Ltd.

Sun, Sun Microsystems, the Sun logo, AnswerBook2, docs.sun.com, StorEdge, Netscape, OpenBoot, Enterprise, and Solaris are trademarks, registered trademarks, or service marks of Sun Microsystems, Inc. in the U.S. and other countries. All SPARC trademarks are used under license and are trademarks or registered trademarks of SPARC International, Inc. in the U.S. and other countries. Products bearing SPARC trademarks are based upon an architecture developed by Sun Microsystems, Inc.

The OPEN LOOK and Sun™ Graphical User Interface was developed by Sun Microsystems, Inc. for its users and licensees. Sun acknowledges the pioneering efforts of Xerox in researching and developing the concept of visual or graphical user interfaces for the computer industry. Sun holds a non-exclusive license from Xerox to the Xerox Graphical User Interface, which license also covers Sun's licensees who implement OPEN LOOK GUIs and otherwise comply with Sun's written license agreements.

Federal Acquisitions: Commercial Software—Government Users Subject to Standard License Terms and Conditions.

DOCUMENTATION IS PROVIDED "AS IS" AND ALL EXPRESS OR IMPLIED CONDITIONS, REPRESENTATIONS AND WARRANTIES, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR NON-INFRINGEMENT, ARE DISCLAIMED, EXCEPT TO THE EXTENT THAT SUCH DISCLAIMERS ARE HELD TO BE LEGALLY INVALID.

Copyright 2000-2001 Sun Microsystems, Inc., 901 San Antonio Road, Palo Alto, CA 94303-4900 Etats-Unis. Tous droits réservés.

Ce produit ou document est distribué avec des licences qui en restreignent l'utilisation, la copie, la distribution, et la décompilation. Aucune partie de ce produit ou document ne peut être reproduite sous aucune forme, par quelque moyen que ce soit, sans l'autorisation préalable et écrite de Sun et de ses bailleurs de licence, s'il y en a. Le logiciel détenu par des tiers, et qui comprend la technologie relative aux polices de caractères, est protégé par un copyright et licencié par des fournisseurs de Sun.

Des parties de ce produit pourront être dérivées des systèmes Berkeley BSD licenciés par l'Université de Californie. UNIX est une marque déposée aux Etats-Unis et dans d'autres pays et licenciée exclusivement par X/Open Company, Ltd.

Sun, Sun Microsystems, le logo Sun, AnswerBook2, docs.sun.com, StorEdge, Netscape, OpenBoot, Enterprise, et Solaris sont des marques de fabrique ou des marques déposées, ou marques de service, de Sun Microsystems, Inc. aux Etats-Unis et dans d'autres pays. Toutes les marques SPARC sont utilisées sous licence et sont des marques de fabrique ou des marques déposées de SPARC International, Inc. aux Etats-Unis et dans d'autres pays. Les produits portant les marques SPARC sont basés sur une architecture développée par Sun Microsystems, Inc.

L'interface d'utilisation graphique OPEN LOOK et Sun™ a été développée par Sun Microsystems, Inc. pour ses utilisateurs et licenciés. Sun reconnaît les efforts de pionniers de Xerox pour la recherche et le développement du concept des interfaces d'utilisation visuelle ou graphique pour l'industrie de l'informatique. Sun détient une licence non exclusive de Xerox sur l'interface d'utilisation graphique Xerox, cette licence couvrant également les licenciés de Sun qui mettent en place l'interface d'utilisation graphique OPEN LOOK et qui en outre se conforment aux licences écrites de Sun.

LA DOCUMENTATION EST FOURNIE "EN L'ETAT" ET TOUTES AUTRES CONDITIONS, DECLARATIONS ET GARANTIES EXPRESSES OU TACITES SONT FORMELLEMENT EXCLUES, DANS LA MESURE AUTORISEE PAR LA LOI APPLICABLE, Y COMPRIS NOTAMMENT TOUTE GARANTIE IMPLICITE RELATIVE A LA QUALITE MARCHANDE, A L'APTITUDE A UNE UTILISATION PARTICULIERE OU A L'ABSENCE DE CONTREFAÇON.



Adobe PostScript

Sun Cluster 3.0 Release Notes Supplement

This document supplements the standard user documentation, including the *Sun Cluster 3.0 Release Notes*, shipped with the Sun™ Cluster 3.0 product. These “online release notes” provide the most current information on the Sun Cluster 3.0 product. This document includes the following information:

- [Revision Record](#)
- [Restrictions and Requirements](#)
- [Known Problems](#)

Revision Record

The following table lists the information contained in this document and provides the revision date for this information.

TABLE 1 Sun Cluster 3.0 Release Notes Supplement

Revision Date	Information Added
April 2001	<p>Added an appendix of hardware installation and maintenance procedures for Sun StorEdge T3 disk arrays. 1.16a level firmware is required to use a Sun StorEdge T3 disk tray in a cluster. See “Installing, Configuring, and Maintaining a Sun StorEdge T3 Disk Tray” on page 57.</p> <p>Added a correction to the <i>Sun Cluster 3.0 Installation Guide</i> to identify a Solaris installation instruction for setting the <code>local-mac-address</code> variable that does not work as documented. See “Installation Guide” on page 7.</p>
March 2001	<p>Added a section to the “Known Documentation Problems” on page 7 that describes a solution when using Oracle Parallel Server with StorEdge 3500 disk arrays.</p> <p>Added an appendix of hardware installation and maintenance procedures for Sun StorEdge A3500 and A3500FC disk arrays. See “Installing and Maintaining a Sun StorEdge A3500/A3500FC System” on page 9.</p>
November 2000	<p>“Bug ID 4388265” on page 6</p> <p>Update to the <i>Sun Cluster 3.0 Hardware Guide</i> procedure “How to Replace a Host Adapter.” (This procedure is now a part of “Installing and Maintaining a Sun StorEdge A3500/A3500FC System” on page 9.)</p>

Restrictions and Requirements

The following restrictions and requirements have been added or updated since the Sun Cluster 3.0 GA release:

- **Hardware Restrictions and Requirements**

- Disks in the Sun StorEdge A3500 or A3500FC cannot be used as quorum devices. You must have another storage device for the quorum disks.
- If you are using Sun Enterprise 420R servers with a PCI-card in slot J4701, the motherboard must be at dash-level 16 or higher. (501-5168-16 or higher). Refer to the E420R *Product Notes* for additional information.

Known Problems

In addition to known problems documented in *Sun Cluster 3.0 Release Notes*, the following known problems affect the operation of the Sun Cluster 3.0 GA release.

Bug ID 4388265

Problem Summary: You may encounter I/O errors while replacing a SCSI cable from the Sun StorEdge A3500 controller board to the disk tray. These errors are temporary and should disappear when the cable is securely in place.

Workaround: After replacing a SCSI cable in a Sun StorEdge A3500 disk array, use your volume management recovery procedure to recover from I/O errors.

Bug ID 4410535

Problem Summary: When using the Sun Cluster module to Sun Management Center 3.0, you cannot add a previously deleted resource group.

Workaround:

1. Click on Resource Group->Status->Failover Resource Groups.
2. Right click on the resource group name to be deleted and select Delete Selected Resource Group.
3. Click on the Refresh icon and make sure the row corresponding to the deleted resource group is gone.
4. Right click on Resource Groups in the left pane and select Create New Resource Group.
5. Give the same resource group name that was deleted before and click Next>>. A dialog box pops up saying that the resource group name is already in use.

Known Documentation Problems

This section discusses documentation errors you might encounter and steps to correct these problems. This information is in addition to known documentation problems documented in the *Sun Cluster 3.0 Release Notes*.

Release Notes

There are three URL errors in the *Sun Cluster 3.0 Release Notes*. These URLs are Sun internal URLs. These references need to be changed to refer to external sites.

- The `suncluster.eng` reference should be changed to `http://docs.sun.com`.
- The two `sunsolve.ebay.sun.com` references should be changed to `http://sunsolve.sun.com`.

Installation Guide

Do not perform Step 2 in “How to Install the Solaris Operating Environment” and in “How to Use JumpStart to Install the Solaris Operating Environment and Establish New Cluster Nodes.” This instruction, which checks and corrects the value of the `local-mac-address` variable, occurs before Solaris software is installed and therefore does not work. Because the value of `local-mac-address` is set to `false` by default, the step is also unnecessary. Skip Step 2 when you perform either procedure.

Note – Sun Cluster software requires that the `local-mac-address` variable must be set to `false`, and does not support changing the variable value to `true`.

Data Services Installation and Configuration Guide

Additional documentation is needed when installing Sun Cluster HA for Oracle Parallel Server using the instructions in Chapter 8, “Installing and Configuring Sun Cluster HA for Oracle Parallel Server.”

In the section, “How to Install Sun Cluster HA for Oracle Parallel Server Packages,” it does not describe how to set up the LUNs if you are using RAID 5 rather than VERITAS Volume Manager.

This section should state that if you are using the Sun StorEdge A3500 disk array with hardware RAID, you use the RAID Manager (RM6) software to configure the Sun StorEdge A3500 LUNs. The LUNs can be configured as raw devices on top of the `/dev/did/rdisk` devices.

The section should also provide an example of how to configure the LUNs when using hardware RAID. This example should include the following steps:

1. Create LUNs on the Sun StorEdge A3500 disk array.

Refer to the information in [Appendix A](#) to create the LUNs.

2. After you create the LUNs, run the `format (1M)` command to partition the Sun StorEdge A3500 LUNs into as many slices as you need.

```
0. c0t2d0 <SUN18G cyl 7506 alt 2 hd 19 sec 248>
   /sbus@3,0/SUNW,fas@3,8800000/sd@2,0
1. c0t3d0 <SUN18G cyl 7506 alt 2 hd 19 sec 248>
   /sbus@3,0/SUNW,fas@3,8800000/sd@3,0
2. clt5d0 <Symbios-StorEDGEA3000-0301 cyl 21541 alt 2 hd 64 sec 64>
   /pseudo/rdnexus@1/rdriver@5,0
3. clt5d1 <Symbios-StorEDGEA3000-0301 cyl 21541 alt 2 hd 64 sec 64>
   /pseudo/rdnexus@1/rdriver@5,1
4. c2t5d0 <Symbios-StorEDGEA3000-0301 cyl 21541 alt 2 hd 64 sec 64>
   /pseudo/rdnexus@2/rdriver@5,0
5. c2t5d1 <Symbios-StorEDGEA3000-0301 cyl 21541 alt 2 hd 64 sec 64>
   /pseudo/rdnexus@2/rdriver@5,1
6. c3t4d2 <Symbios-StorEDGEA3000-0301 cyl 21541 alt 2 hd 64 sec 64>
   /pseudo/rdnexus@3/rdriver@4,2
```

Note – If you use slice 0, do not start the partition at cylinder 0.

3. Run the `scdidadm(1M)` command to find the raw DID device that corresponds to the LUNs that you created in Step 1

The following example lists output from the `scdidadm -L` command.

```
1      phys-visa-1:/dev/rdisk/c0t2d0    /dev/did/rdsk/d1
1      phys-visa-2:/dev/rdisk/c0t2d0    /dev/did/rdsk/d1
2      phys-visa-1:/dev/rdisk/c0t3d0    /dev/did/rdsk/d2
2      phys-visa-2:/dev/rdisk/c0t3d0    /dev/did/rdsk/d2
3      phys-visa-2:/dev/rdisk/c4t4d0    /dev/did/rdsk/d3
3      phys-visa-1:/dev/rdisk/c1t5d0    /dev/did/rdsk/d3
4      phys-visa-2:/dev/rdisk/c3t5d0    /dev/did/rdsk/d4
4      phys-visa-1:/dev/rdisk/c2t5d0    /dev/did/rdsk/d4
5      phys-visa-2:/dev/rdisk/c4t4d1    /dev/did/rdsk/d5
5      phys-visa-1:/dev/rdisk/c1t5d1    /dev/did/rdsk/d5
6      phys-visa-2:/dev/rdisk/c3t5d1    /dev/did/rdsk/d6
6      phys-visa-1:/dev/rdisk/c2t5d1    /dev/did/rdsk/d6
```

4. Use the raw DID device that the `scdidadm` output identifies to configure OPS.

For example, the `scdidadm` output might identify that the raw DID device that corresponds to the Sun StorEdge A3500 LUNs is d4. In this instance, use the `/dev/did/rdsk/d4sx` raw device, where x is the slice number, to configure OPS.

Installing and Maintaining a Sun StorEdge A3500 / A3500FC System

This chapter describes the procedures for installing, configuring, and maintaining both Sun StorEdge™ A3500 (SCSI-based) and Sun StorEdge A3500FC (Fibre-Channel-based) systems in a Sun Cluster environment.

This chapter contains the following procedures:

- [“How to Install a StorEdge A3500/A3500FC System” on page 10](#)
- [“How to Create a LUN” on page 18](#)
- [“How to Delete a LUN” on page 21](#)
- [“How to Reset StorEdge A3500/A3500FC LUN Configuration” on page 24](#)
- [“How To Correct Mismatched DID Numbers” on page 27](#)
- [“How to Add a StorEdge A3500/A3500FC System to a Running Cluster” on page 33](#)
- [“How to Remove a StorEdge A3500/A3500FC System From a Running Cluster” on page 43](#)
- [“How to Replace a Failed Controller or Restore an Offline Controller” on page 46](#)
- [“How to Upgrade Controller Module Firmware in a Running Cluster” on page 48](#)
- [“How to Add a Disk Drive in a Running Cluster” on page 50](#)
- [“How to Replace a Failed Disk Drive in a Running Cluster” on page 51](#)
- [“How to Remove a Disk Drive from a Running Cluster” on page 52](#)
- [“How to Upgrade Disk Drive Firmware in a Running Cluster” on page 52](#)
- [“How to Replace a Host Adapter in a Node \(Connected to a StorEdge A3500 System\)” on page 53](#)
- [“How to Replace a Host Adapter in a Node \(Connected to a StorEdge A3500FC System\)” on page 55](#)

Installing a StorEdge A3500/A3500FC System

This section describes the procedure for an *initial installation* of a StorEdge A3500/A3500FC system.

▼ How to Install a StorEdge A3500/A3500FC System

Use this procedure for an initial installation and configuration, *before* installing the Solaris operating environment and Sun Cluster software.

1. Install the host adapters in the nodes that will be connected to the StorEdge A3500/A3500FC system.

For the procedure on installing host adapters, see the documentation that shipped with your host adapters and nodes.

2. Cable the StorEdge A3500/A3500FC system:

- See [FIGURE A-1](#) for a sample StorEdge A3500 system cabling.
- See [FIGURE A-2](#) for a sample StorEdge A3500FC system cabling.

For more sample configurations, see the *Sun StorEdge A3500/A3500FC Hardware Configuration Guide*.

For the procedure on installing the cables, refer to the *Sun StorEdge A3500/A3500FC Controller Module Guide*.

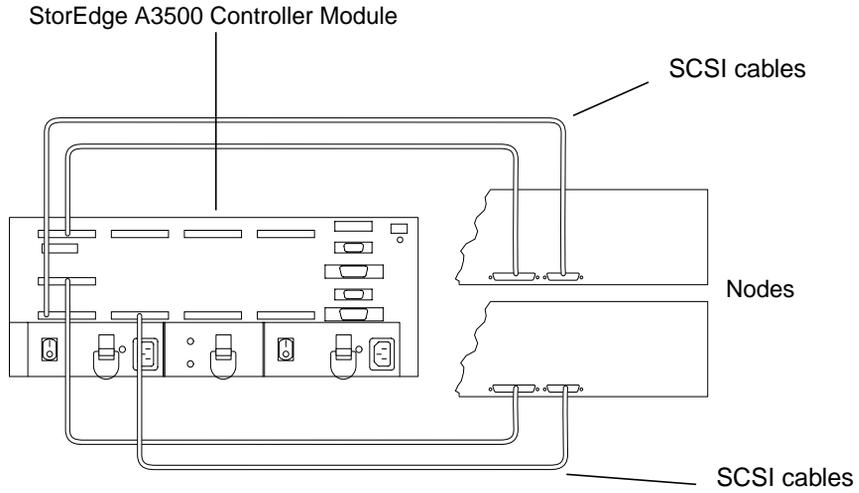


FIGURE A-1 Sample StorEdge A3500 System Cabling

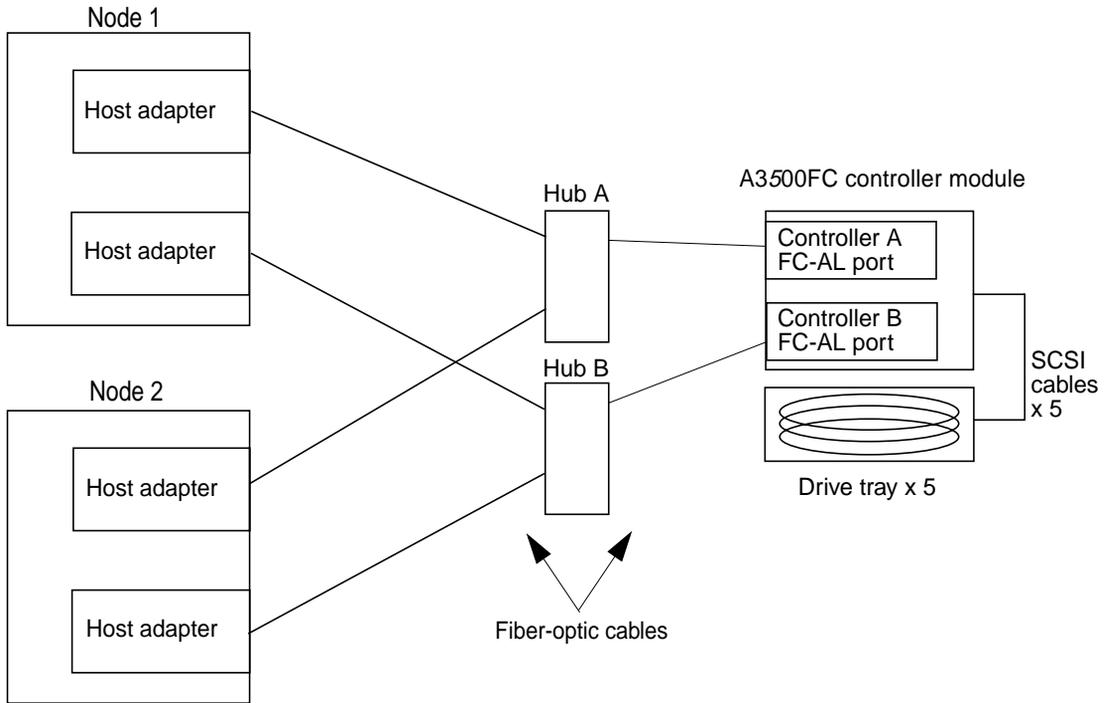


FIGURE A-2 Sample StorEdge A3500FC System Cabling

3. Depending on which type of controller module you are installing:

- If you are installing a StorEdge A3500 controller module, go to [Step 4](#).
- If you are installing a StorEdge A3500FC controller module, set the loop ID of the controller module by installing jumpers to the appropriate pins on the rear of the controller module.

For diagrams and information about setting FC-AL ID settings, see the *Sun StorEdge A3500/A3500FC Controller Module Guide*.

4. Power on the StorEdge A3500/A3500FC system and cluster nodes.

Note – For StorEdge A3500 controller modules only: When you power on the nodes, do not allow them to boot. If necessary, halt the nodes so that you can perform OpenBoot™ PROM (OBP) Monitor tasks at the ok prompt.

For the procedure on powering on the StorEdge A3500/A3500FC system, see the *Sun StorEdge A3500/A3500FC Controller Module Guide*.

5. Depending on which type of controller module you are installing:

- For a StorEdge A3500FC controller module, go to [Step 12](#).
- For a StorEdge A3500 controller module, find the paths to the host adapters in the *first* node:

```
{0} ok show-disks
...
b) /sbus@6,0/QLGC,isp@2,10000/sd
...
d) /sbus@2,0/QLGC,isp@2,10000/sd
...
```

Note – Use this information to change the SCSI addresses of the host adapters in the `nvrampc` script in [Step 6](#), but do not include the `sd` directories in the device paths.

6. Edit the `nvrामrc` script to change the `scsi-initiator-id` for the host adapters on the *first* node.

The default SCSI address for host adapters is 7. Reserve SCSI address 7 for one host adapter in the SCSI chain. This procedure refers to the node that has a host adapter with SCSI address 7 as the “second node.”

To avoid conflicts, you must change the `scsi-initiator-id` of the remaining host adapter in the SCSI chain to an available SCSI address. This procedure refers to the node that has a host adapter with an available SCSI address as the “first node.”

For a full list of `nvrामrc` editor and `nvedit` keystroke commands, see the *OpenBoot 3.x Command Reference Manual*.

The following example sets the `scsi-initiator-id` of the host adapter on the first node to 6. The OpenBoot PROM Monitor prints the line numbers (0:, 1:, and so on).

Note – Insert exactly one space after the first quotation mark and before `scsi-initiator-id`.

```
{0} ok nvedit
0: probe-all
1: cd /sbus@6,0/QLGC,isp@2,10000
2: 6 " scsi-initiator-id" integer-property
3: device-end
4: cd /sbus@2,0/QLGC,isp@2,10000
5: 6 " scsi-initiator-id" integer-property
6: device-end
7: install-console
8: banner <Control C>
{0} ok
```

7. Store the changes.

The changes you make through the `nvedit` command are done on a temporary copy of the `nvrामrc` script. You can continue to edit this copy without risk. After you complete your edits, save the changes. If you are not sure about the changes, discard them.

- To store the changes, type:

```
{0} ok nvstore
```

- To discard the changes, type:

```
{0} ok nvquit
```

8. Verify the contents of the `nvrामrc` script you created in [Step 6](#), as shown in the following example.

If the contents of the `nvrामrc` script are incorrect, use the `nvedit` command again to make corrections.

```
{0} ok printenv nvrामrc  
nvrामrc =  
    probe-all  
    cd /sbus@6,0/QLGC,isp@2,10000  
    6 " scsi-initiator-id" integer-property  
    device-end  
    cd /sbus@2,0/QLGC,isp@2,10000  
    6 " scsi-initiator-id" integer-property  
    device-end  
    install-console  
    banner
```

9. Set the parameter to instruct the OpenBoot PROM Monitor to use the `nvrामrc` script:

```
{0} ok setenv use-nvrामrc? true  
use-nvrामrc? = true
```

10. Verify that the `scsi-initiator-id` for each host adapter on the *second* node is set to 7.

Use the `show-disks` command to find the paths to the host adapters. Select each host adapter's device tree node, then display the node's properties to confirm that the `scsi-initiator-id` for each host adapter is set to 7:

```
{0} ok show-disks
...
b) /sbus@6,0/QLGC,isp@2,10000/sd
...
d) /sbus@2,0/QLGC,isp@2,10000/sd
...
{0} ok cd /sbus@6,0/QLGC,isp@2,10000
{0} ok .properties
scsi-initiator-id          00000007
```

11. Install the Solaris operating environment, then apply any required Solaris patches.

For the procedure on installing the Solaris operating environment, see the *Sun Cluster 3.0 Installation Guide*. For the location of patches and installation instructions, see the *Sun Cluster 3.0 Release Notes*.

12. Install the RAID Manager software.

For the procedure on installing the RAID Manager software, see the *Sun StorEdge RAID Manager Installation and Support Guide*.

Note – RAID Manager 6.22 or later is required for clustering with Sun Cluster 3.0.

Note – For the most current list of software, firmware, and patches required for the StorEdge A3x00/A3500FC controller module, refer to EarlyNotifier 20029, “A1000/A3x00/A3500FC Software/Firmware Configuration Matrix.” This document is available online to Sun service providers and to customers with SunSolve service contracts at the SunSolve site: <http://sunsolve.sun.com>.

13. Install any StorEdge A3500/A3500FC controller module or RAID Manager patches.

For more information, see the *Sun StorEdge RAID Manager Release Notes*.

14. Check the StorEdge A3500/A3500FC controller module NVSRAM file revision, and if required, install the most recent revision.

For the NVSRAM file revision number and boot level, see the *Sun StorEdge RAID Manager Release Notes*. For the procedure on upgrading the NVSRAM file, see the *Sun StorEdge RAID Manager User's Guide*.

15. Check the StorEdge A3500/A3500FC controller module firmware revision, and if required, install the most recent revision.

For the firmware revision number and boot level, see the *Sun StorEdge RAID Manager Release Notes*. For the procedure on upgrading the firmware, see the *Sun StorEdge RAID Manager User's Guide*.

16. Set the Rdac parameters in the `/etc/osa/rmparams` file:

```
Rdac_RetryCount=1
Rdac_NoAltOffline=TRUE
```

17. Verify that the controller module is set to active/active mode (if it is not, set it to active/active).

For more information on controller modes, see *Sun StorEdge RAID Manager Installation and Support Guide* and *Sun StorEdge RAID Manager User's Guide*.

18. Set up the StorEdge A3500/A3500FC controller module with the desired logical unit numbers (LUNs) and hot spares.

For the procedure on setting up the StorEdge A3500/A3500FC controller module with LUNs and hot spares, see the *Sun StorEdge RAID Manager User's Guide*.

Note – Use the `format` command to verify Solaris logical device names.

19. Copy the `/etc/raid/rdac_address` file from the node on which you created the LUNs to the other node to ensure consistency across both nodes.
20. Ensure that the new logical name for the LUN you created in [Step 18](#) appears in the `/dev/rdisk` directory on both nodes by running the `hot_add` command on both nodes:

```
# /etc/raid/bin/hot_add
```

Where to Go From Here

To continue with Sun Cluster software and data services installation tasks, see the *Sun Cluster 3.0 Installation Guide* and the *Sun Cluster 3.0 Data Services Installation and Configuration Guide*.

Configuring a StorEdge A3500/A3500FC System

This section describes the procedures for configuring a StorEdge A3500/A3500FC system *after* installing Sun Cluster software. [TABLE A-1](#) lists these procedures.

Configuring a StorEdge A3500/A3500FC system *before* installing Sun Cluster software is the same as doing so in a non-cluster environment. For procedures on configuring StorEdge A3500/A3500FC systems before installing Sun Cluster, see the *Sun StorEdge RAID Manager User's Guide*.

TABLE A-1 Task Map: Configuring StorEdge A3500/A3500FC Disk Drives

Task	For Instructions, Go To...
Create a logical unit number (LUN).	"How to Create a LUN" on page 18
Remove a LUN.	"How to Delete a LUN" on page 21
Rebalance running LUNs. Follow the same procedure used in a non-cluster environment.	<i>Sun StorEdge RAID Manager User's Guide</i> <i>Sun StorEdge RAID Manager Release Notes</i>
Reset StorEdge A3500/A3500FC configuration.	"How to Reset StorEdge A3500/A3500FC LUN Configuration" on page 24
Create a hot spare. Follow the same procedure used in a non-cluster environment.	<i>Sun StorEdge RAID Manager User's Guide</i> <i>Sun StorEdge RAID Manager Release Notes</i>
Delete a hot spare. Follow the same procedure used in a non-cluster environment.	<i>Sun StorEdge RAID Manager User's Guide</i> <i>Sun StorEdge RAID Manager Release Notes</i>
Increase the size of a drive group. Follow the same procedure used in a non-cluster environment.	<i>Sun StorEdge RAID Manager User's Guide</i> <i>Sun StorEdge RAID Manager Release Notes</i>

▼ How to Create a LUN

Use this procedure to create a logical unit number (LUN) from unassigned disk drives or remaining capacity. See the *Sun StorEdge RAID Manager Release Notes* for the latest information about LUN administration

This product supports the use of hardware RAID and host-based software RAID. For host-based software RAID, this product supports RAID levels 0+1 and 1+0.

Note – You must use hardware RAID for Oracle Parallel Server (OPS) data stored on the StorEdge A3500/A3500FC arrays. Also, do not place OPS data under volume management control. You must place all non-OPS data stored on the arrays that are under volume management control. Use either hardware RAID, host-based software RAID, or both to manage your non-OPS data.

Hardware RAID uses the StorEdge A3500/A3500FC system's hardware redundancy to ensure that independent hardware failures do not impact data availability. Host-based software RAID ensures that independent hardware failures do not impact data availability when an entire array is offline by mirroring across separate arrays. Although you can use hardware RAID and host-based software RAID concurrently, you need only one RAID solution to maintain a high degree of data availability.

Note – When using host-based software RAID with hardware RAID, the hardware RAID levels you use affect the hardware maintenance procedures because they affect volume management administration.

If you use hardware RAID level 1, 3, or 5, you can perform most maintenance procedures in [“Maintaining a StorEdge A3500/A3500FC System” on page 29](#) without volume management disruptions.

If you use hardware RAID level 0, some maintenance procedures in [“Maintaining a StorEdge A3500/A3500FC System” on page 29](#) require additional volume management administration because the availability of the LUNs is impacted.

1. With all cluster nodes booted and attached to the StorEdge A3500/A3500FC system, create the LUN on one node.

Shortly after the LUN formatting completes, a logical name for the new LUN appears in `/dev/rdisk` on all cluster nodes attached to the StorEdge A3500/A3500FC system.

For the procedure on creating a LUN, see the *Sun StorEdge RAID Manager User's Guide*.

Note – If the following warning message is displayed, ignore it and continue with the next step:

```
scsi: WARNING:
/sbus@40,0/SUNW,socal@0,0/sf@1,0/ssd@w200200a0b80740db,4 (ssd0):
corrupt label - wrong magic number
```

Note – Use the `format(1M)` command to verify Solaris logical device names.

2. Copy the `/etc/raid/rdac_address` file from the node on which you created the LUN to the other node to ensure consistency across both nodes.
3. Ensure that the new logical name for the LUN you created in [Step 1](#) appears in the `/dev/rdisk` directory on both nodes by running the `hot_add` command on both nodes:

```
# /etc/raid/bin/hot_add
```

4. On one node, update the global device namespace:

```
# scgdevs
```

5. Use the `scdidadm` command to verify that the DID numbers for the LUNs are the same on both nodes. In the sample output shown below, the DID numbers are different:

```
# scdidadm -L
...
33      e07a:/dev/rdsk/c1t4d2      /dev/did/rdsk/d33
33      e07c:/dev/rdsk/c0t4d2      /dev/did/rdsk/d33
```

6. Are the DID numbers output from [Step 5](#) the same for both your nodes?
 - If the DID numbers are the same, go to [Step 7](#).
 - If the DID numbers are different, perform the procedure in [“How To Correct Mismatched DID Numbers”](#) on page 27 before you continue with [Step 7](#) of this procedure.

7. If you want a volume manager to manage the new LUN you created in [Step 1](#), run the appropriate Solstice DiskSuite or VERITAS Volume Manager commands to incorporate the new LUN into a diskset or disk group.

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

Note – Do not configure StorEdge A3500/A3500FC LUNs as quorum devices; using StorEdge A3500/A3500FC LUNs as quorum devices is not supported.

▼ How to Delete a LUN

Use this procedure to delete a LUN(s). See the *Sun StorEdge RAID Manager Release Notes* for the latest information about LUN administration.



Caution – This procedure removes all data on the LUN you delete.



Caution – Do not delete LUN 0.

1. From one node connected to the StorEdge A3500/A3500FC system, use the `format` command to determine the paths to the LUN you are deleting (sample output shown below):

```
# format
AVAILABLE DISK SELECTIONS:
0. c0t5d0 <SYMBIOS-StorEdgeA3500FCr-0301 cyl13 alt2 hd64 sec64>
   /pseudo/rdnexus@0/rdriver@5,0
1. c0t5d1 <SYMBIOS-StorEdgeA3500FCr-0301 cyl12025 alt2 hd64 sec64>
   /pseudo/rdnexus@0/rdriver@5,1
```

2. Does a volume manager manage the LUN you are deleting?

- If not, go to [Step 3](#).
- If a volume manager does manage the LUN, run the appropriate Solstice DiskSuite or VERITAS Volume Manager commands to remove the LUN from any diskset or disk group. For more information, see your Solstice DiskSuite or VERITAS Volume Manager documentation (see note below for additional required VERITAS Volume Manager commands).

Note – LUNs that were managed by VERITAS Volume Manager must be completely removed from VERITAS Volume Manager control before you can delete them. To do this, after you delete the LUN from any disk group, use the following commands:

```
# vxdisk offline cNtXdY
# vxdisk rm cNtXdY
```

3. From one node, delete the LUN.

For the procedure on deleting a LUN, see the *Sun StorEdge RAID Manager User's Guide*.

4. Remove the paths to the LUN(s) you are deleting:

```
# rm /dev/rdisk/cNtXdY*
# rm /dev/dsk/cNtXdY*

# rm /dev/osa/dev/dsk/cNtXdY*
# rm /dev/osa/dev/rdisk/cNtXdY*
```

5. Use the `lad` command to determine the *alternate* paths to the LUN(s) you are deleting.

The RAID Manager software creates two paths to the LUN in the `/dev/osa/dev/rdisk` directory. Substitute the `cNtXdY` number from the other controller module in the disk array to determine the alternate path.

For example, with this configuration:

```
# lad
c0t5d0 1T93600714 LUNS: 0 1
c1t4d0 1T93500595 LUNS: 2
```

The alternate paths would be:

```
/dev/osa/dev/dsk/c1t4d1*
/dev/osa/dev/rdisk/c1t4d1*
```

6. Remove the *alternate* paths to the LUN(s) you are deleting:

```
# rm /dev/osa/dev/dsk/cNtXdY*
# rm /dev/osa/dev/rdisk/cNtXdY*
```

7. On both nodes, remove all obsolete device IDs (DID)s:

```
# scdidadm -C
```

8. Switch resources and device groups off the node:

```
# scswitch -Sh nodename
```

9. Shut down the node:

```
# shutdown -y -g0 -i0
```

10. Boot the node and wait for it to rejoin the cluster:

```
# boot -r
```

11. Repeat [Step 3](#) through [Step 10](#) on the other node attached to the StorEdge A3500/A3500FC system.

▼ How to Reset StorEdge A3500/A3500FC LUN Configuration

Use this procedure to reset StorEdge A3500/A3500FC LUN configuration.



Caution – Resetting LUN configuration assigns a new DID number to LUN 0. This is because a new worldwide number (WWN) is assigned to the new LUN.

1. **From one node connected to the StorEdge A3500/A3500FC system, use the `format` command to determine the paths to the LUN(s) you are resetting, as shown in the following example (sample output shown below):**

```
# format
AVAILABLE DISK SELECTIONS:
0. c0t5d0 <SYMBIOS-StorEdgeA3500FCr-0301 cyl13 alt2 hd64 sec64>
   /pseudo/rdnexus@0/rdriver@5,0
1. c0t5d1 <SYMBIOS-StorEdgeA3500FCr-0301 cyl2025 alt2 hd64 sec64>
   /pseudo/rdnexus@0/rdriver@5,1
```

2. **Does a volume manager manage the LUN(s) on the controller module you are resetting?**
 - If not, go to [Step 3](#).
 - If a volume manager does manage the LUN, run the appropriate Solstice DiskSuite or VERITAS Volume Manager commands to remove the LUN from any diskset or disk group. For more information, see your Solstice DiskSuite or VERITAS Volume Manager documentation.

Note – LUNs that were managed by VERITAS Volume Manager must be completely removed from VERITAS Volume Manager control before you can delete them. To do this, after you remove the LUN from any disk group, use the following commands:

```
# vxdisk offline cNtXdY
# vxdisk rm cNtXdY
```

3. **On one node, reset the LUN configuration.**

For the procedure for resetting StorEdge A3500/A3500FC LUN configuration, see the *Sun StorEdge RAID Manager User's Guide*.

Note – Use the `format` command to verify Solaris logical device names.

4. Set the controller module back to active/active mode (it was set to active/passive when reset).

For more information on controller modes, see *Sun StorEdge RAID Manager Installation and Support Guide* and *Sun StorEdge RAID Manager User's Guide*.

5. Using the `format` command, label the new LUN 0.
6. Remove the paths to the old LUN(s) you reset:

```
# rm /dev/rdisk/cNtXdY*
# rm /dev/dsk/cNtXdY*

# rm /dev/osa/dev/dsk/cNtXdY*
# rm /dev/osa/dev/rdisk/cNtXdY*
```

7. Use the `lad` command to determine the *alternate* paths to the old LUN(s) you reset.

The RAID Manager software creates two paths to the LUN in the `/dev/osa/dev/rdisk` directory. Substitute the `cNtXdY` number from the other controller module in the disk array to determine the alternate path.

For example, with this configuration:

```
# lad
c0t5d0 1T93600714 LUNS: 0 1
c1t4d0 1T93500595 LUNS: 2
```

The alternate paths would be:

```
/dev/osa/dev/dsk/c1t4d1*
/dev/osa/dev/rdisk/c1t4d1*
```

8. Remove the *alternate* paths to the old LUN(s) you reset:

```
# rm /dev/osa/dev/dsk/cNtXdY*
# rm /dev/osa/dev/rdisk/cNtXdY*
```

9. Update device namespaces on both nodes:

```
devfsadm -C
```

10. Remove all obsolete DIDs on both nodes:

```
# scdidadm -C
```

11. Switch resources and device groups off the node:

```
# scswitch -Sh nodename
```

12. Shut down the node:

```
# shutdown -y -g0 -i0
```

13. Boot the node and wait for it to rejoin the cluster:

```
# boot -r
```

Note – If the following error message appears, ignore it and continue with the next step. The DID will be updated when the procedure is complete.

```
device id for '/dev/rdisk/c0t5d0' does not match physical disk's id.
```

14. After the node has rebooted and joined the cluster, repeat [Step 6](#) through [Step 13](#) on the other node that is attached to the StorEdge A3500/A3500FC system.

The DID number for the original LUN 0 is removed and a new DID is assigned to LUN 0.

How To Correct Mismatched DID Numbers

Use this section to correct mismatched device ID (DID) numbers that may appear during the creation of A3500/A3500FC LUNs. You correct the mismatch by deleting Solaris and Sun Cluster paths to the LUNs that have DID numbers that are different. After rebooting, the paths are corrected.

Note – Use this procedure only if directed to do so from [“How to Create a LUN” on page 18](#).

1. From one node connected to the StorEdge A3500/A3500FC system, use the `format` command to determine the paths to the LUN(s) that have different DID numbers:

```
# format
```

2. Remove the paths to the LUN(s) that have different DID numbers:

```
# rm /dev/rdisk/cNtXdY*
# rm /dev/dsk/cNtXdY*

# rm /dev/osa/dev/dsk/cNtXdY*
# rm /dev/osa/dev/rdisk/cNtXdY*
```

3. Use the `lad` command to determine the *alternate* paths to the LUN(s) that have different DID numbers.

The RAID Manager software creates two paths to the LUN in the `/dev/osa/dev/rdisk` directory. Substitute the `cNtXdY` number from the other controller module in the disk array to determine the alternate path.

For example, with this configuration:

```
# lad
c0t5d0 1T93600714 LUNS: 0 1
c1t4d0 1T93500595 LUNS: 2
```

The alternate paths would be:

```
/dev/osa/dev/dsk/c1t4d1*
/dev/osa/dev/rdisk/c1t4d1*
```

4. Remove the *alternate* paths to the LUN(s) that have different DID numbers:

```
# rm /dev/osa/dev/dsk/cNtXdY*
# rm /dev/osa/dev/rdisk/cNtXdY*
```

5. On both nodes, remove all obsolete DIDs:

```
# scdidadm -C
```

6. Switch resources and device groups off the node:

```
# scswitch -Sh nodename
```

7. Shut down the node:

```
# shutdown -y -g0 -i0
```

8. Boot the node and wait for it to rejoin the cluster:

```
# boot -r
```

9. Repeat [Step 1](#) through [Step 8](#) on the other node attached to the StorEdge A3500/A3500FC system.
10. Return to [“How to Create a LUN”](#) on page 18.

Maintaining a StorEdge A3500/A3500FC System

This section contains the procedures for maintaining a StorEdge A3500/A3500FC system in a Sun Cluster environment. Some maintenance tasks listed in [TABLE A-2](#) are performed the same as in a non-cluster environment, so the task's procedures are referenced rather than contained in this section. [TABLE A-2](#) lists the procedures for maintaining the StorEdge A3500/A3500FC system.

TABLE A-2 Tasks: Maintaining a StorEdge A3500/A3500FC System

Task	For Instructions, Go To...
A3500/A3500FC system/controller module procedures:	
Add a StorEdge A3500/A3500FC system to a running cluster.	"How to Add a StorEdge A3500/A3500FC System to a Running Cluster" on page 33
Remove a StorEdge A3500/A3500FC system from a running cluster.	"How to Remove a StorEdge A3500/A3500FC System From a Running Cluster" on page 43
Replace a failed StorEdge A3500/A3500FC controller module or restore an offline controller module.	"How to Replace a Failed Controller or Restore an Offline Controller" on page 46
Upgrade StorEdge A3500/A3500FC controller module firmware and NVSRAM file.	"How to Upgrade Controller Module Firmware in a Running Cluster" on page 48
Replace a power cord to a StorEdge A3500/A3500FC controller module. Shut down the cluster, then follow the same procedure used in a non-cluster environment	<i>Sun Cluster 3.0 System Administration Guide</i> for procedures on shutting down a cluster <i>Sun StorEdge A3500/A3500FC Controller Module Guide</i> for replacement procedures
Replace a StorEdge A3500/A3500FC controller module fan canister. Follow the same procedure used in a non-cluster environment.	<i>Sun StorEdge A3500/A3500FC Controller Module Guide</i>

TABLE A-2 Tasks: Maintaining a StorEdge A3500/A3500FC System (*Continued*)

Task	For Instructions, Go To...
<p>Replace the StorEdge A3500/A3500FC controller module card cage.</p> <p>Shut down the cluster, then follow the same procedure used in a non-cluster environment.</p>	<p><i>Sun Cluster 3.0 System Administration Guide</i> for procedures on shutting down a cluster</p> <p><i>Sun StorEdge A3500/A3500FC Controller Module Guide</i> for replacement procedures</p>
<p>Replace the entire StorEdge A3500/A3500FC controller module assembly.</p> <p>Shut down the cluster, then follow the same procedure used in a non-cluster environment.</p>	<p><i>Sun Cluster 3.0 System Administration Guide</i> for procedures on shutting down a cluster</p> <p><i>Sun StorEdge A3500/A3500FC Controller Module Guide</i> for replacement procedures</p>
<p>Cable/hub/connector procedures:</p>	
<p>Replace a SCSI cable from the controller module to the disk array.</p> <p>Follow the same procedure used in a non-cluster environment.</p>	<p><i>Sun StorEdge A3500/A3500FC Controller Module Guide</i></p> <p><i>Sun StorEdge RAID Manager User's Guide</i> <i>Sun StorEdge RAID Manager Release Notes</i></p>
<p>Replace a StorEdge A3500-to-host SCSI cable.</p> <p>Follow the same procedure used in a non-cluster environment.</p>	<p><i>Sun StorEdge A3500/A3500FC Controller Module Guide</i></p> <p><i>Sun StorEdge RAID Manager User's Guide</i> <i>Sun StorEdge RAID Manager Release Notes</i></p>
<p>Replace a StorEdge A3500FC-to-host (or hub) fiber-optic cable.</p> <p>Follow the same procedure used in a non-cluster environment.</p>	<p><i>Sun StorEdge A3500/A3500FC Controller Module Guide</i></p> <p><i>Sun StorEdge RAID Manager User's Guide</i> <i>Sun StorEdge RAID Manager Release Notes</i></p>
<p>Replace a StorEdge FC100 hub.</p> <p>Follow the same procedure used in a non-cluster environment.</p>	<p><i>Sun StorEdge A3500/A3500FC Controller Module Guide</i></p> <p><i>Sun StorEdge FC-100 Hub Installation and Service Manual</i></p>

TABLE A-2 Tasks: Maintaining a StorEdge A3500/A3500FC System (Continued)

Task	For Instructions, Go To...
<p>Replace a StorEdge FC100 hub gigabit interface converter (GBIC) connecting cables to the host or hub.</p> <p>Follow the same procedure used in a non-cluster environment.</p>	<p><i>Sun StorEdge A3500/A3500FC Controller Module Guide</i> <i>Sun StorEdge FC-100 Hub Installation and Service Manual</i></p>
<p>Replace a GBIC on a node.</p> <p>Follow the same procedure used in a non-cluster environment.</p>	<p><i>Sun StorEdge A3500/A3500FC Controller Module Guide</i></p>
<p>Cabinet/power subassembly procedures:</p>	
<p>Replace the power supply fan canister.</p> <p>Follow the same procedure used in a non-cluster environment.</p>	<p><i>Sun StorEdge A3500/A3500FC Controller Module Guide</i></p>
<p>Replace a DC-power or battery harness.</p> <p>Shut down the cluster, then follow the same procedure used in a non-cluster environment.</p>	<p><i>Sun Cluster 3.0 System Administration Guide</i> for procedures on shutting down a cluster <i>Sun StorEdge A3500/A3500FC Controller Module Guide</i> for replacement procedures</p>
<p>Replace the battery unit.</p> <p>Shut down the cluster, then follow the same procedure used in a non-cluster environment.</p>	<p><i>Sun Cluster 3.0 System Administration Guide</i> for procedures on shutting down a cluster <i>Sun StorEdge A3500/A3500FC Controller Module Guide</i> for replacement procedures</p>
<p>Replace the power supply housing.</p> <p>Shut down the cluster, then follow the same procedure used in a non-cluster environment.</p>	<p><i>Sun Cluster 3.0 System Administration Guide</i> for procedures on shutting down a cluster <i>Sun StorEdge A3500/A3500FC Controller Module Guide</i></p>
<p>Replace a power cord to the cabinet power distribution unit.</p> <p>Shut down the cluster, then follow the same procedure used in a non-cluster environment.</p>	<p><i>Sun Cluster 3.0 System Administration Guide</i> for procedures on shutting down a cluster <i>Sun StorEdge Expansion Cabinet Installation and Service Manual</i> for replacement procedures.</p>

TABLE A-2 Tasks: Maintaining a StorEdge A3500/A3500FC System (*Continued*)

Task	For Instructions, Go To...
D1000 Disk Array Procedures:	
Add a disk drive.	“How to Add a Disk Drive in a Running Cluster” on page 50
Replace a disk drive.	“How to Replace a Failed Disk Drive in a Running Cluster” on page 51
Remove a disk drive.	“How to Remove a Disk Drive from a Running Cluster” on page 52
Upgrade disk drive firmware.	“How to Upgrade Disk Drive Firmware in a Running Cluster” on page 52
<p>Replace a power cord to a StorEdge D1000 disk array.</p> <p>Shut down the cluster, then follow the same procedure used in a non-cluster environment</p>	<p><i>Sun Cluster 3.0 System Administration Guide</i> for procedures on shutting down a cluster</p> <p><i>Sun StorEdge A1000 and D1000 Installation, Operations, and Service Manual</i> for replacement procedures</p>
Node/host adapter procedures:	
<p>Replace a host adapter in a node.</p> <p>Follow the procedure for your type of controller module (StorEdge A3500 or StorEdge A3500FC).</p>	<p>“How to Replace a Host Adapter in a Node (Connected to a StorEdge A3500 System)” on page 53</p> <p>“How to Replace a Host Adapter in a Node (Connected to a StorEdge A3500FC System)” on page 55</p>

▼ How to Add a StorEdge A3500/A3500FC System to a Running Cluster

Use this procedure to add a StorEdge A3500/A3500FC system to a running cluster.

1. Install the RAID Manager software.

For the procedure on installing RAID Manager software, see *Sun StorEdge RAID Manager Installation and Support Guide*.

Note – RAID Manager 6.22 or later is required for clustering with Sun Cluster 3.0.

Note – For the most current list of software, firmware, and patches required for the StorEdge A3x00/A3500FC controller module, refer to EarlyNotifier 20029, “A1000/A3x00/A3500FC Software/Firmware Configuration Matrix.” This document is available online to Sun service providers and to customers with SunSolve service contracts at the SunSolve site: <http://sunsolve.sun.com>.

2. Install any StorEdge A3500/A3500FC system patches.

For the location of patches and installation instructions, see *Sun Cluster 3.0 Release Notes*.

3. Set the `Rdac` parameters in the `/etc/osa/rmparams` file:

```
Rdac_RetryCount=1
Rdac_NoAltOffline=TRUE
```

4. Power on the StorEdge A3500/A3500FC system.

For the procedure on powering on the StorEdge A3500/A3500FC system, see the *Sun StorEdge A3500/A3500FC Controller Module Guide*.

5. Depending on which type of system you are adding:

- If you are adding a StorEdge A3500 system, go to [Step 6](#).
- If you are adding a StorEdge A3500FC system, set the loop ID of the controller module by installing jumpers to the appropriate pins on the rear of the controller module.

For diagrams and information about setting FC-AL ID settings, see the *Sun StorEdge A3500/A3500FC Controller Module Guide*.

6. Are you installing new host adapters to your nodes for connection to the StorEdge A3500/A3500FC system?

- If not, go to [Step 8](#).
- If you are installing new host adapters, shut down and power off the *first* node.

```
# scswitch -S -h nodename  
# shutdown -y -g0 -i0
```

For the full procedure on shutting down and powering off a node, see the *Sun Cluster 3.0 System Administration Guide*.

7. Install the host adapters in the first node.

For the procedure on installing host adapters, see the documentation that shipped with your host adapters and nodes.

8. Cable the StorEdge A3500/A3500FC system to the first node. Depending on which type of system you are adding:

- If you are adding a StorEdge A3500 system, connect the differential SCSI cable between the node and the controller module as shown in [FIGURE A-3](#). Make sure that the *entire* SCSI bus length to each enclosure is less than 25 m. This measurement includes the cables to both nodes, as well as the bus length internal to each enclosure, node, and host adapter.
- If you are installing a StorEdge A3500FC system, see [FIGURE A-4](#) for a sample StorEdge A3500FC cabling connection. The example shows the first node connected to a StorEdge A3500FC controller module.

For more sample configurations, see the *Sun StorEdge A3500/A3500FC Hardware Configuration Guide*.

For the procedure on installing the cables, refer to the *Sun StorEdge A3500/A3500FC Controller Module Guide*.

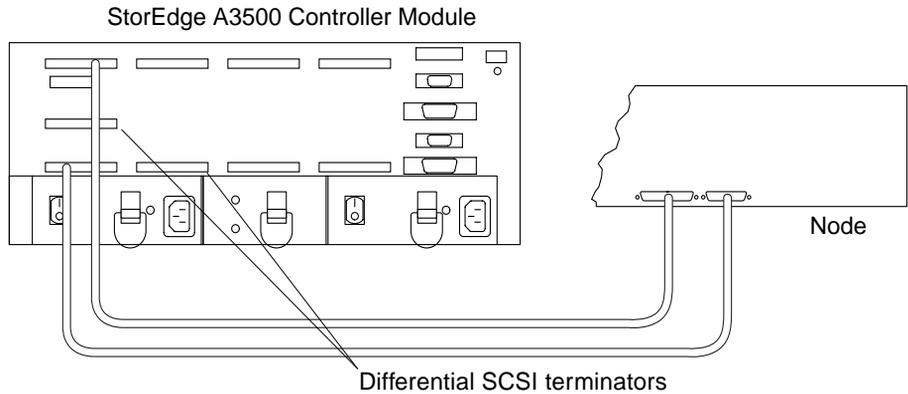


FIGURE A-3 Sample StorEdge A3500 Cabling

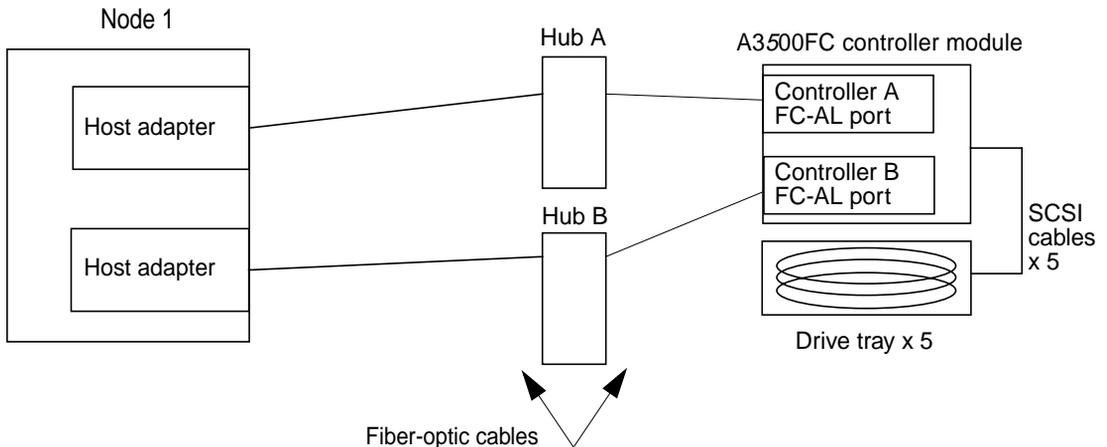


FIGURE A-4 Sample StorEdge A3500FC Cabling (1st Node Attached)

9. Did you power off the first node to install a host adapter?

- If not, go to [Step 10](#).
- If you did power off the first node, power it and the StorEdge A3500 system on, *but do not allow the node to boot*. If necessary, halt the system to continue with OpenBoot PROM (OBP) Monitor tasks.

10. Depending on which type of controller module you are adding:

- If you are installing a StorEdge A3500FC controller module, go to [Step 15](#).
- If you are adding a StorEdge A3500 controller module, find the paths to the SCSI host adapters.

```
{0} ok show-disks
...
b) /sbus@6,0/QLGC,isp@2,10000/sd
...
d) /sbus@2,0/QLGC,isp@2,10000/sd
...
```

Identify and record the two controllers that will be connected to the disk arrays, and record these paths. Use this information to change the SCSI addresses of these controllers in the `nvrामrc` script in [Step 11](#). Do not include the `sd` directories in the device paths.

11. Edit the `nvrामrc` script to change the `scsi-initiator-id` for the host adapters on the *first* node.

The default SCSI address for host adapters is 7. Reserve SCSI address 7 for one host adapter in the SCSI chain. This procedure refers to the host adapter that has SCSI address 7 as the host adapter on the “second node.”

To avoid conflicts, change the `scsi-initiator-id` of the remaining host adapter in the SCSI chain to an available SCSI address. This procedure refers to the host adapter that has an available SCSI address as the host adapter on the “first node.”

For a partial list of `nvrामrc` editor and `nvedit` keystroke commands, see Appendix B of this guide. For a full list of commands, see the *OpenBoot 3.x Command Reference Manual*.

The following example sets the `scsi-initiator-id` to 6. The OpenBoot PROM Monitor prints the line numbers (0:, 1:, and so on).

Note – Insert exactly one space after the quotation mark and before `scsi-initiator-id`.

```
{0} ok nvedit
0: probe-all
1: cd /sbus@6,0/QLGC,isp@2,10000
2: 6 " scsi-initiator-id" integer-property
3: device-end
4: cd /sbus@2,0/QLGC,isp@2,10000
5: 6 " scsi-initiator-id" integer-property
6: device-end
7: install-console
8: banner <Control C>
{0} ok
```

12. Store the changes.

The changes you make through the `nvedit` command are done on a temporary copy of the `nvrामrc` script. You can continue to edit this copy without risk. After you have completed your edits, save the changes. If you are not sure about the changes, discard them.

- To store the changes, type:

```
{0} ok nvstore
{0} ok
```

- To discard the changes, type:

```
{0} ok nvquit
{0} ok
```

13. Verify the contents of the `nvramrc` script you created in [Step 11](#), as shown in the following example.

If the contents of the `nvramrc` script are incorrect, use the `nvedit` command to make corrections.

```
{0} ok printenv nvramrc
nvramrc =
        probe-all
        cd /sbus@6,0/QLGC,isp@2,10000
        6 " scsi-initiator-id" integer-property
        device-end
        cd /sbus@2,0/QLGC,isp@2,10000
        6 " scsi-initiator-id" integer-property
        device-end
        install-console
        banner
{0} ok
```

14. Instruct the OpenBoot PROM Monitor to use the `nvramrc` script:

```
{0} ok setenv use-nvramrc? true
use-nvramrc? = true
{0} ok
```

15. Did you power off the first node to install a host adapter?

- If not, go to [Step 21](#).
- If you powered off the first node, boot it now and wait for it to join the cluster.

```
{0} ok boot -r
```

For more information on booting nodes, see *Sun Cluster 3.0 System Administration Guide*.

16. **Are you installing new host adapters to the second node for connection to the StorEdge A3500/A3500FC system?**
- If not, go to [Step 21](#).
 - If you are installing new host adapters, shut down and power off the *second* node.

```
# scswitch -s -h nodename  
# shutdown -y -g0 -i0
```

For the procedure on shutting down and powering off a node, see the *Sun Cluster 3.0 System Administration Guide*.

17. **Install the host adapters in the second node.**

For the procedure on installing host adapters, see the documentation that shipped with your nodes.

18. **Cable the StorEdge A3500/A3500FC system to your node. Depending on which type of controller module you are adding:**

- If you are adding a StorEdge A3500 controller module, connect the differential SCSI cable between the node and the controller module as shown in [FIGURE A-3](#). Make sure that the *entire* SCSI bus length to each enclosure is less than 25 m. This measurement includes the cables to both nodes, as well as the bus length internal to each enclosure, node, and host adapter.
- If you are installing a StorEdge A3500FC controller module, see [FIGURE A-5](#) for a sample StorEdge A3500FC cabling connection. The example shows two nodes connected to a StorEdge A3500FC controller module.

For more sample configurations, see the *Sun StorEdge A3500/A3500FC Hardware Configuration Guide*.

For the procedure on installing the cables, refer to the *Sun StorEdge A3500/A3500FC Controller Module Guide*.

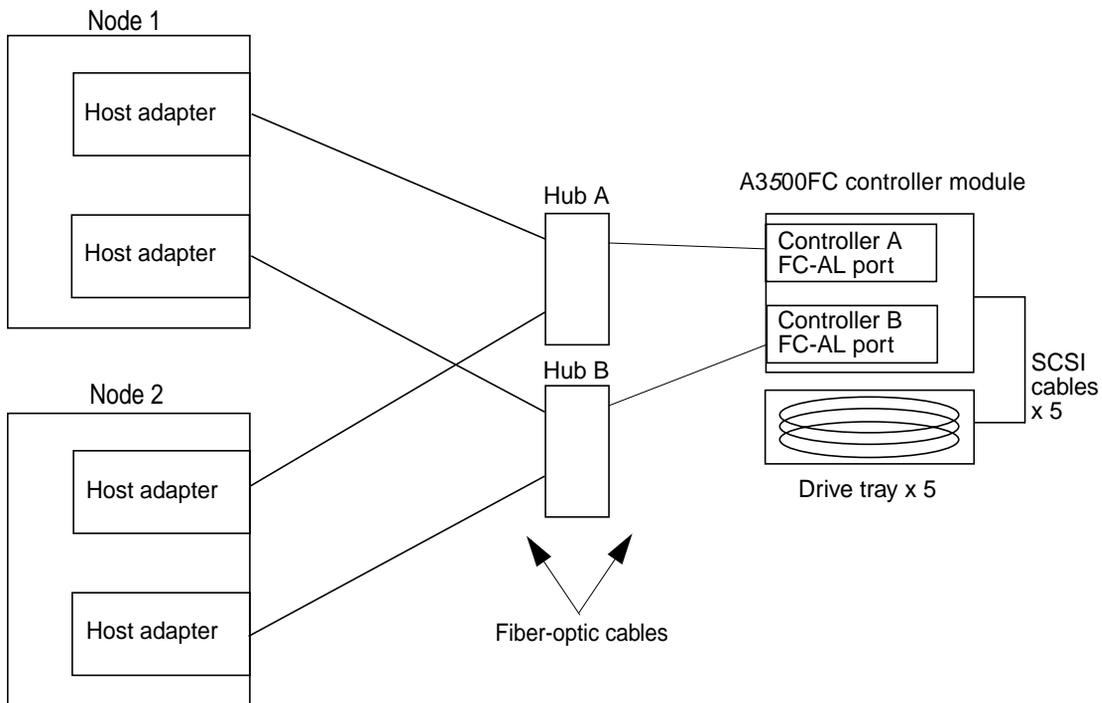


FIGURE A-5 Sample StorEdge A3500FC Cabling (2nd Node Attached)

19. Did you power off the second node to install a host adapter?

- If not, go to [Step 21](#).
- If you did power off the second node, power it and the StorEdge A3500/A3500FC system on, *but do not allow the node to boot*. If necessary, halt the system to continue with OpenBoot PROM (OBP) Monitor tasks.

20. Verify that the second node sees the new host adapters and disk drives.

If the node does not see the new hardware, check all hardware connections and repeat installation steps you performed in [Step 17](#).

```
{0} ok show-disks
...
b) /sbus@6,0/QLGC,isp@2,10000/sd
...
d) /sbus@2,0/QLGC,isp@2,10000/sd
...
{0} ok
```

21. Depending on which type of controller module you are adding:

- If you are installing a StorEdge A3500FC controller module, go to [Step 26](#).
- If you are adding a StorEdge A3500 controller module, Verify that the `scsi-initiator-id` for the host adapters on the second node is set to 7.

Use the `show-disks` command to find the paths to the host adapters connected to these enclosures. Select each host adapter's device tree node, and display the node's properties to confirm that the `scsi-initiator-id` for each host adapter is set to 7.

```
{0} ok cd /sbus@6,0/QLGC,isp@2,10000
{0} ok .properties
scsi-initiator-id      00000007
...
```

22. Did you power off the second node to install a host adapter?

- If not, go to [Step 26](#).
- If you powered off the second node, boot it now and wait for it to join the cluster.

```
{0} ok boot -r
```

For more information, see *Sun Cluster 3.0 System Administration Guide*.

23. Check the StorEdge A3500/A3500FC controller module NVSRAM file revision, and if required, install the most recent revision.

For the NVSRAM file revision number and boot level, see the *Sun StorEdge RAID Manager Release Notes*. For the procedure on upgrading the NVSRAM file, see the *Sun StorEdge RAID Manager User's Guide*.

24. Check the StorEdge A3500/A3500FC controller module firmware revision, and, if required, install the most recent firmware revision.

For the StorEdge A3500/A3500FC controller module firmware revision number and boot level, see *Sun StorEdge RAID Manager Release Notes*. For the procedure on upgrading the StorEdge A3500/A3500FC controller firmware, see ["How to Upgrade Controller Module Firmware in a Running Cluster"](#) on page 48.

25. One at a time, boot each node into cluster mode.

```
# reboot
```

26. On one node, verify that the DIDs have been assigned to the StorEdge A3500/A3500FC LUNs for all nodes attached to the StorEdge A3500/A3500FC system.

```
# scdidadm -L
```

27. Verify that the controller module is set to active/active mode (if it is not, set it to active/active).

For more information on controller modes, see *Sun StorEdge RAID Manager Installation and Support Guide* and *Sun StorEdge RAID Manager User's Guide*.

Where to Go From Here

To create a LUN from unassigned disk drives, see [“How to Create a LUN”](#) on page 18.

To upgrade StorEdge A3500/A3500FC controller module firmware, see [“How to Upgrade Controller Module Firmware in a Running Cluster”](#) on page 48.

▼ How to Remove a StorEdge A3500/A3500FC System From a Running Cluster

Use this procedure to remove a StorEdge A3500/A3500FC system from a running cluster.



Caution – This procedure removes all data that is on the StorEdge A3500/A3500FC system you remove.

1. **Migrate any Oracle Parallel Server (OPS) tables, data services, or volumes off of the StorEdge A3500/A3500FC system.**
2. **Halt all activity to the StorEdge A3500/A3500FC controller module.**
See the *Sun StorEdge RAID Manager User's Guide* and your operating system documentation for instructions.
3. **Does a volume manager manage any of the LUNs on the StorEdge A3500/A3500FC controller module you are removing?**
 - If not, go to [Step 4](#).
 - If a volume manager does manage the LUNs, run the appropriate Solstice DiskSuite or VERITAS Volume Manager commands to remove the LUN from any diskset or disk group. For more information, see your Solstice DiskSuite or VERITAS Volume Manager documentation.

Note – LUNs that were managed by VERITAS Volume Manager must be completely removed from VERITAS Volume Manager control before you can delete them. To do this, after you remove the LUN from any disk group, use the following commands:

```
# vxdisk offline cNtXdY
# vxdisk rm cNtXdY
```

4. **Disconnect all cables from the StorEdge A3500/A3500FC system and remove the hardware from your cluster.**
5. **From one node, delete the LUN.**
For the procedure on deleting a LUN, see the *Sun StorEdge RAID Manager User's Guide*.

6. Remove the paths to the LUN(s) you are deleting:

```
# rm /dev/rdisk/cNtXdY*
# rm /dev/dsk/cNtXdY*

# rm /dev/osa/dev/dsk/cNtXdY*
# rm /dev/osa/dev/rdisk/cNtXdY*
```

7. Use the `lad` command to determine the *alternate* paths to the LUN(s) you are deleting.

The RAID Manager software creates two paths to the LUN in the `/dev/osa/dev/rdisk` directory. Substitute the `cNtXdY` number from the other controller module in the disk array to determine the alternate path.

For example, with this configuration:

```
# lad
c0t5d0 1T93600714 LUNS: 0 1
c1t4d0 1T93500595 LUNS: 2
```

The alternate paths would be:

```
/dev/osa/dev/dsk/c1t4d1*
/dev/osa/dev/rdisk/c1t4d1*
```

8. Remove the *alternate* paths to the LUN(s) you are deleting:

```
# rm /dev/osa/dev/dsk/cNtXdY*
# rm /dev/osa/dev/rdisk/cNtXdY*
```

9. On all cluster nodes, remove references to the StorEdge A3500/A3500FC system:

```
# scdidadm -C
```

10. Are you removing the *last* StorEdge A3500FC controller module from a hub in your cluster?

- If not, go to [Step 11](#).
- If you are removing the last StorEdge A3500FC controller module from a particular hub, remove the hub hardware and cables from your cluster.

11. Remove any unused host adapter from nodes that were attached to the StorEdge A3500/A3500FC system:

- a. Shut down and power off the first node from which you are removing a host adapter:**

```
# scswitch -S -h nodename  
# shutdown -y -g0 -i0
```

For the procedure on shutting down and powering off a node, see the *Sun Cluster 3.0 System Administration Guide*.

- b. Remove the host adapter from the first node.**

See the documentation that came with your node hardware for removal instructions.

- c. Boot the node and wait for it to rejoin the cluster.**

```
# boot -r
```

- d. Repeat [Step a](#) through [Step c](#) for the second node that was attached to the StorEdge A3500/A3500FC system.**

12. Switch the cluster back online.

```
# scswitch -z
```

13. Are you removing the *last* StorEdge A3500/A3500FC system from your cluster?

- If not, you are finished with this procedure.
- If you are removing the last StorEdge A3500/A3500FC system from your cluster, remove StorEdge A3500/A3500FC software packages. For the procedure on removing software packages, see the documentation that shipped with your StorEdge A3500/A3500FC system.

▼ How to Replace a Failed Controller or Restore an Offline Controller

Use this procedure to replace a StorEdge A3500/A3500FC controller, or to restore an offline controller.

For conceptual information on SCSI reservations and failure fencing, see *Sun Cluster 3.0 Concepts*.

1. **On both nodes, to prevent LUNs from being automatically assigned to the controller being brought online, set the `System_LunReDistribution` parameter in the `/etc/raid/rmparams` file to `false`.**



Caution – You must set the `System_LunReDistribution` parameter in the `/etc/raid/rmparams` file to `false` so that no LUNs are assigned to the controller being brought online. After you verify in [Step 5](#) that the controller has the correct SCSI reservation state, you can balance LUNs between both controllers.

For the procedure on modifying the `rmparams` file, see *Sun StorEdge RAID Manager Installation and Support Guide*.

2. **Restart the RAID Manager daemon:**

```
# /etc/init.d/amdemon stop
# /etc/init.d/amdemon start
```

3. **Do you have a failed controller?**

- If your controller module is offline, but does not have a failed controller, go to [Step 4](#).
- If you have a failed controller, replace the failed controller with a new controller, *but do not bring the controller online*.

For the procedure on replacing StorEdge A3500/A3500FC controllers, see the *Sun StorEdge A3500/A3500FC Controller Module Guide* and the *Sun StorEdge RAID Manager Installation and Support Guide* for additional considerations.

4. **On one node, use the RAID Manager GUI's Recovery application to restore the controller online.**

Note – You must use the RAID Manager GUI's Recovery application to bring the controller online. Do not use the Redundant Disk Array Controller Utility (rdacutil) because it ignores the value of the `System_LunReDistribution` parameter in the `/etc/raid/rmparams` file.

For information on the Recovery application, see the *Sun StorEdge RAID Manager User's Guide*. If you have problems bringing the controller online, see the *Sun StorEdge RAID Manager Installation and Support Guide*.

5. On one node connected to the StorEdge A3500/A3500FC system, verify that the controller has the correct SCSI reservation state.

Run the `scdidadm(1M)` repair option (-R) on LUN 0 of the controller you want to bring online:

```
# scdidadm -R /dev/dsk/cNtXdY
```

6. Set the controller to active/active mode and assign LUNs to it.

For more information on controller modes, see *Sun StorEdge RAID Manager Installation and Support Guide* and *Sun StorEdge RAID Manager User's Guide*.

7. Reset the `System_LunReDistribution` parameter in the `/etc/raid/rmparams` file to true.

For the procedure on changing the `rmparams` file, see *Sun StorEdge RAID Manager Installation and Support Guide*.

8. Restart the RAID Manager daemon:

```
# /etc/init.d/amdemon stop  
# /etc/init.d/amdemon start
```

How to Upgrade Controller Module Firmware in a Running Cluster

Use this procedure to upgrade firmware in a StorEdge A3500/A3500FC controller module, in a running cluster. Depending on which firmware you are upgrading, you must use either the *online* or *offline* method, as described in the *Sun StorEdge RAID Manager User's Guide*.

1. Are you upgrading the NVSRAM firmware file?

- If you are not upgrading the NVSRAM file, you can use the online method.

Upgrade the firmware using the online method, as described in the *Sun StorEdge RAID Manager User's Guide*. No special steps are required for a cluster environment.

- If you are upgrading the NVSRAM file, you must use the offline method, using one of the following two procedures:
 - If the data on your StorEdge A3500/A3500FC controller module is mirrored on another controller module, use the procedure described in [Step 2](#).
 - If the data on your StorEdge A3500/A3500FC controller module is *not* mirrored on another controller module, use the procedure described in [Step 3](#).

2. Use this step if you are upgrading the NVSRAM and other firmware files on a controller module that has its data mirrored:

a. Halt all activity to the StorEdge A3500/A3500FC controller module.

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

b. Update the firmware files using the offline method, as described in the *Sun StorEdge RAID Manager User's Guide*.

c. Restore all activity to the StorEdge A3500/A3500FC controller module.

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

This step completes the firmware upgrade.

3. Use this step if you are upgrading the NVSRAM and other firmware files on a controller module that does *not* have its data mirrored:

- a. Shutdown the entire cluster.

```
# scshutdown -y -g0 -i0
```

For the full procedure on shutting down a cluster, see the *Sun Cluster 3.0 System Administration Guide*.

- b. Boot one node that is attached to the controller module into non-cluster mode.

```
ok boot -x
```

For the full procedure on booting a node into non-cluster mode, see the *Sun Cluster 3.0 System Administration Guide*.

- c. Update the firmware files using the offline method, as described in the *Sun StorEdge RAID Manager User's Guide*.

- d. Reboot both nodes into cluster mode.

```
ok boot
```

For the full procedure on booting nodes into the cluster, see the *Sun Cluster 3.0 System Administration Guide*.

This step completes the firmware upgrade.

▼ How to Add a Disk Drive in a Running Cluster

Use this procedure to add a disk drive to a StorEdge A3500/A3500FC controlled disk array that is in a running cluster.



Caution – If the disk drive you are adding was previously owned by another controller module, preformat the disk drive to wipe clean the old DacStore information before adding it to this disk array.

1. Install the new disk drive to the disk array.

For the procedure on installing a disk drive, see the *Sun StorEdge D1000 Storage Guide*.

2. Allow the disk drive to spin up (approximately 30 seconds).

3. Run Health Check to ensure that the new disk drive is not defective.

For instructions on running Recovery Guru and Health Check, see the *Sun StorEdge RAID Manager User's Guide*.

4. Fail the new drive, then revive the drive to update DacStore on the drive.

For instructions on failing drives and manual recovery procedures, see the *Sun StorEdge RAID Manager User's Guide*.

5. Repeat [Step 1](#) through [Step 4](#) for each disk drive you are adding.

Where to Go From Here

To create LUNs for the new drives, see [“How to Create a LUN” on page 18](#) for more information.

▼ How to Replace a Failed Disk Drive in a Running Cluster

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

1. Does replacing the disk drive affects any LUN's availability?

- If not, go to [Step 2](#).
- If it does affect LUN availability, remove the LUN(s) from volume management control. For more information, see your Solstice DiskSuite or VERITAS Volume Manager documentation.

2. Replace the disk drive in the disk array.

For the procedure on replacing a disk drive, see the *Sun StorEdge D1000 Storage Guide*.

3. Run Health Check to ensure that the new disk drive is not defective.

For instructions on running Recovery Guru and Health Check, see the *Sun StorEdge RAID Manager User's Guide*.

4. Does the failed drive belong to a drive group?

- If the drive does *not* belong to a device group, go to [Step 5](#).
- If the drive is part of a device group, reconstruction is started automatically. If reconstruction does not start automatically for any reason, then select Reconstruct from the Manual Recovery application. Do not select Revive. When reconstruction is complete, go to [Step 6](#).

5. Fail the new drive, then revive the drive to update DacStore on the drive.

For instructions on failing drives and manual recovery procedures, see the *Sun StorEdge RAID Manager User's Guide*.

6. If you removed LUNs from volume management control in [Step 1](#), return the LUN(s) to volume management control.

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

▼ How to Remove a Disk Drive from a Running Cluster

Use this procedure to remove a disk drive from a running cluster.

1. **Remove the logical unit number (LUN) associated with the disk drive you want to remove.**

For the procedure on removing a LUN, see [“How to Delete a LUN” on page 21](#).

2. **Remove the disk drive from the disk array.**

For the procedure on removing a disk drive, see the *Sun StorEdge D1000 Storage Guide*.



Caution – After you remove the disk drive, install a dummy drive to maintain proper cooling.

How to Upgrade Disk Drive Firmware in a Running Cluster

Note – Disk drive firmware updates should be performed by qualified service personnel only. If you need to upgrade drive firmware, contact your local Sun solution center or Sun service provider.

▼ How to Replace a Host Adapter in a Node (Connected to a StorEdge A3500 System)

Note – This section describes the procedure for replacing a failed host adapter in a running node that is attached to a StorEdge A3500 *SCSI-based* system. For the same procedure for a cluster node attached to an A3500FC system, see [“How to Replace a Host Adapter in a Node \(Connected to a StorEdge A3500FC System\)”](#) on page 55.

In the following procedure, node 1’s host adapter on SCSI bus A needs replacement but node 2 remains in service.

Note – Several steps in this procedure require that you halt I/O activity. To halt I/O activity, take the controller module offline using the RAID Manager 6.x GUI’s manual recovery procedure in the *Sun StorEdge RAID Manager User’s Guide*.

1. Without powering off the node, shut down node 1.

```
# scswitch -s -h nodename  
# shutdown -y -g0 -i0
```

For the procedure on shutting down a node, see *Sun Cluster 3.0 System Administration Guide*.

2. From node 2, halt I/O activity to SCSI bus A.

See the *Sun StorEdge RAID Manager User’s Guide* for instructions.

3. From the controller module end of the SCSI cable, disconnect the SCSI bus A cable that connects the StorEdge A3500 controller module to node 1, then replace this cable with a differential SCSI terminator.

4. Restart I/O activity on SCSI bus A.

See the *Sun StorEdge RAID Manager User’s Guide* for instructions.

5. Does servicing the failed host adapter affect SCSI bus B?

- If SCSI bus B is not affected, go to [Step 9](#).
- If SCSI bus B is affected, continue with [Step 6](#).

6. From node 2, halt I/O activity to the StorEdge A3500 controller module on SCSI bus B.

See the *Sun StorEdge RAID Manager User’s Guide* for instructions.

7. **From the controller module end of the SCSI cable, disconnect the SCSI bus B cable that connects the StorEdge A3500 controller module to node 1 and replace this cable with a differential SCSI terminator.**
8. **Restart I/O activity on SCSI bus B.**
See the *Sun StorEdge RAID Manager User's Guide* for instructions.
9. **Power off node 1.**
10. **Replace node 1's host adapter.**
See the documentation that came with your node hardware for instructions.
11. **Power on node 1, but do not allow it to boot. If necessary, halt the system.**
12. **From node 2, halt I/O activity to the StorEdge A3500 controller module on SCSI bus A.**
See the *Sun StorEdge RAID Manager User's Guide* for instructions.
13. **Remove the differential SCSI terminator from SCSI bus A, then reinstall the SCSI cable to connect the StorEdge A3500 controller module to node 1.**
14. **Restart I/O activity on SCSI bus A.**
See the *Sun StorEdge RAID Manager User's Guide* for instructions.
15. **Did you install a differential SCSI terminator to SCSI bus B in [Step 7](#)?**
 - If not, skip to [Step 18](#).
 - If you did install a SCSI terminator to SCSI bus B, halt I/O activity on SCSI bus B, then continue with [Step 16](#).
16. **Remove the differential SCSI terminator from SCSI bus B, then reinstall the SCSI cable to connect the StorEdge A3500 controller module to node 1.**
17. **Restart I/O activity on SCSI bus B.**
See the *Sun StorEdge RAID Manager User's Guide* for instructions.
18. **Bring the StorEdge A3500 controller module back online.**
See the *Sun StorEdge RAID Manager User's Guide* for instructions.
19. **Rebalance all logical unit numbers (LUNs).**
See the *Sun StorEdge RAID Manager User's Guide* for instructions.
20. **Boot node 1 into cluster mode.**

```
{0} ok boot
```

▼ How to Replace a Host Adapter in a Node (Connected to a StorEdge A3500FC System)

Note – This section describes the procedure for replacing a failed host adapter in a node that is attached to a StorEdge A3500FC *fiber-optic-based* system. For the same procedure for a cluster node attached to a StorEdge A3500 system, see [“How to Replace a Host Adapter in a Node \(Connected to a StorEdge A3500 System\)”](#) on page 53.

Note – Several steps in this procedure require that you halt I/O activity. To halt I/O activity, take the controller module offline using the RAID Manager 6.x GUI’s manual recovery procedure in *Sun StorEdge RAID Manager User’s Guide*.

1. **Move all Sun Cluster data services off of the node in which you are replacing a host adapter.**

See the *Sun Cluster 3.0 Data Services Installation and Configuration Guide* for instructions.

2. **Halt all I/O activity on the affected StorEdge A3500FC controller module.**

See the *Sun StorEdge RAID Manager User’s Guide* for instructions.

3. **Shut down and power off the node in which you are replacing a host adapter.**

```
# scswitch -S -h nodename  
# shutdown -y -g0 -i0
```

For the procedure on shutting down and powering off a node, see *Sun Cluster 3.0 System Administration Guide*.

4. **Disconnect the fiber optic cable from the host adapter that you are replacing.**
5. **Replace the host adapter in the node.**
See the documentation that came with your node hardware for instructions.
6. **Connect the fiber optic cable to the new host adapter that you just installed.**
7. **Boot the node into cluster mode.**

```
{0} ok boot
```

- 8. Restart I/O activity on the affected StorEdge A3500FC controller module.**
See the *Sun StorEdge RAID Manager User's Guide* and your operating system documentation for instructions.
- 9. Check the status of the affected StorEdge A3500FC controller module.**
Observe the front panel LEDs and interpret them using the *Sun StorEdge A3500/A3500FC Controller Module Guide*.
- 10. Rebalance LUNs running on the affected StorEdge A3500FC controller module.**
For more information, see the *Sun StorEdge RAID Manager User's Guide*.
- 11. Move the Sun Cluster data services back to the node in which you replaced the host adapter.**
See the *Sun Cluster 3.0 Data Services Installation and Configuration Guide* for instructions.

Installing, Configuring, and Maintaining a Sun StorEdge T3 Disk Tray

This chapter provides the procedures for installing, configuring, and maintaining a Sun StorEdge™ T3 disk tray.

This chapter contains the following procedures:

- [“How to Install a Sun StorEdge T3 Disk Tray” on page 58](#)
- [“How to Create a Sun StorEdge T3 Disk Tray Logical Volume” on page 61](#)
- [“How to Remove a Sun StorEdge T3 Disk Tray Logical Volume” on page 63](#)
- [“How to Upgrade Sun StorEdge T3 Disk Tray Firmware” on page 68](#)
- [“How to Replace a Disk Drive” on page 69](#)
- [“How to Add a Sun StorEdge T3 Disk Tray” on page 70](#)
- [“How to Remove a Sun StorEdge T3 Disk Tray” on page 80](#)
- [“How to Replace a Host-to-Hub Component” on page 83](#)
- [“How to Replace a Sun StorEdge FC-100 Hub and Hub-to-Disk Tray Component” on page 84](#)
- [“How to Replace a Sun StorEdge T3 Disk Tray Controller” on page 85](#)
- [“How to Replace a Sun StorEdge T3 Disk Tray Chassis” on page 86](#)
- [“How to Replace a Host Adapter” on page 87](#)

For conceptual information on multihost disks, see *Sun Cluster 3.0 Concepts*.

Installing a Sun StorEdge T3 Disk Tray

This section provides the procedure for an initial installation of a new Sun StorEdge T3 disk tray.

▼ How to Install a Sun StorEdge T3 Disk Tray

Use this procedure to install and configure a new Sun StorEdge T3 disk tray in a cluster that is not running. Perform the steps in this procedure in conjunction with the procedures in the *Sun Cluster 3.0 Installation Guide* and your server hardware manual.

1. Install the host adapters in the nodes that will be connected to the Sun StorEdge T3 disk trays.

For the procedure on installing host adapters, see the documentation that shipped with your host adapters and nodes.

2. Install the Sun StorEdge FC-100 hubs.

For the procedure on installing a Sun StorEdge FC-100 hub, see the *FC-100 Hub Installation and Service Manual*.

3. Set up a Reverse Address Resolution Protocol (RARP) server on the network you want the new Sun StorEdge T3 disk tray to reside on.

This RARP server enables you to assign an IP address to the new Sun StorEdge T3 disk tray using the Sun StorEdge T3 disk tray's unique MAC address.

For the procedure on setting up a RARP server, see the *Sun StorEdge T3 Installation, Operation, and Service Manual*.

4. Cable and power on the Sun StorEdge T3 disk trays as shown in [FIGURE B-1](#).

Note – There are no hub port assignment restrictions. You can connect your Sun StorEdge T3 disk tray and node to any hub port.

For the procedure on installing fiber optic cables, see the *Sun StorEdge T3 Configuration Guide*. For the procedure on powering on the Sun StorEdge T3 disk tray, see the *Sun StorEdge T3 Installation, Operation, and Service Manual*.

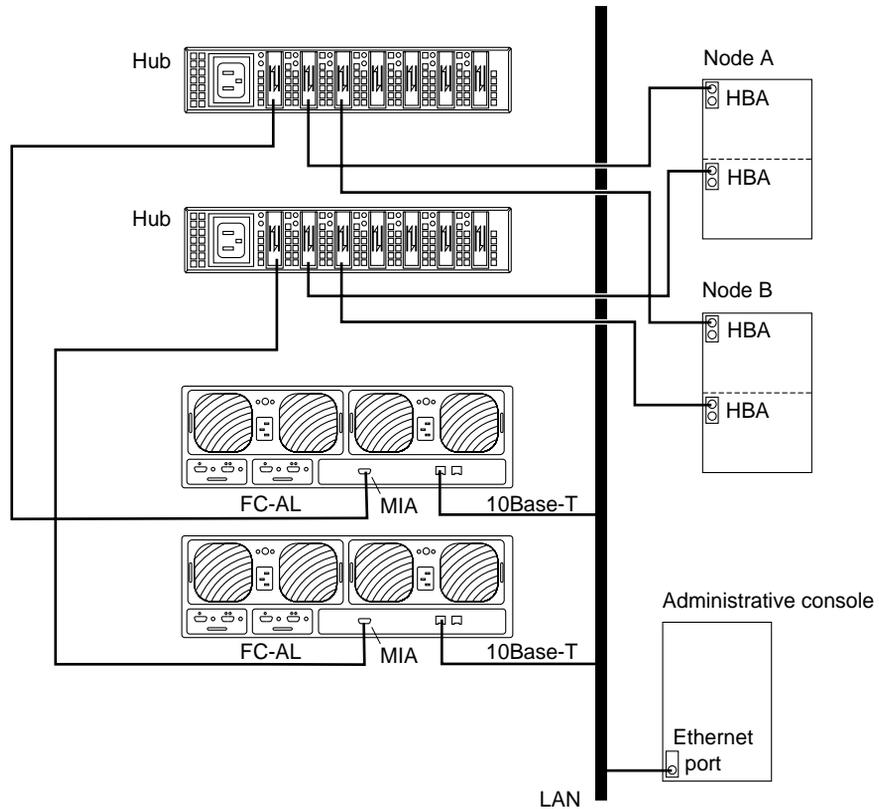


FIGURE B-1 Cabling a Sun StorEdge T3 disk tray in a single-tray configuration

5. (Optional) Configure the Sun StorEdge T3 disk tray with the desired Sun StorEdge T3 disk tray logical volumes.

For the procedure on configuring the Sun StorEdge T3 disk tray with Sun StorEdge T3 disk tray logical volumes, see the *Sun StorEdge T3 Disk Tray Administrator's Guide*.

6. Telnet to the Sun StorEdge T3 disk tray you want to add, and install the required Sun StorEdge T3 disk tray controller firmware.

Revision 1.16a firmware is required for the Sun StorEdge T3 disk tray controller. For the procedure on upgrading firmware, see the firmware patch README.

7. Ensure that this new Sun StorEdge T3 disk tray has a unique target address.

For the procedure on verifying and assigning a target address, see the *Sun StorEdge T3 Configuration Guide*.

8. Reset the Sun StorEdge T3 disk tray.

For the procedure on rebooting or resetting a Sun StorEdge T3 disk tray, see the *Sun StorEdge T3 Installation, Operation, and Service Manual*.

9. Install the Solaris operating environment, and apply the required Solaris patches for Sun Cluster software and Sun StorEdge T3 disk tray support.

For the procedure on installing the Solaris operating environment, see the *Sun Cluster 3.0 Installation Guide*. For the location of required Solaris patches and installation instructions for Sun Cluster software support, see the *Sun Cluster 3.0 Release Notes*. For a list of required Solaris patches for Sun StorEdge T3 disk tray support, see the *Sun StorEdge T3 Disk Tray Release Notes*.

Where to Go From Here

To continue with Sun Cluster software installation tasks, see the *Sun Cluster 3.0 Installation Guide*.

To continue building a cluster, see [“Task Map: Installing Cluster Hardware”](#) on page 3.

Configuring a Sun StorEdge T3 Disk Tray

This section provides the procedures for configuring a Sun StorEdge T3 disk tray in a running cluster. The following table lists these procedures.

TABLE B-1 Task Map: Configuring a Sun StorEdge T3 Disk Tray

Task	For Instructions, Go To...
Create a Sun StorEdge T3 disk tray logical volume	“How to Create a Sun StorEdge T3 Disk Tray Logical Volume” on page 61
Remove a Sun StorEdge T3 disk tray logical volume	“How to Remove a Sun StorEdge T3 Disk Tray Logical Volume” on page 63

▼ How to Create a Sun StorEdge T3 Disk Tray Logical Volume

Use this procedure to create a Sun StorEdge T3 disk tray logical volume. This procedure assumes all cluster nodes are booted and attached to the Sun StorEdge T3 disk tray that will host the Sun StorEdge T3 disk tray logical volume you want to create.

- 1. Telnet to the Sun StorEdge T3 disk tray that will host the Sun StorEdge T3 disk tray logical volume you want to create.**
- 2. Create the Sun StorEdge T3 disk tray logical volume.**

Creating a Sun StorEdge T3 disk tray logical volume involves adding, mounting, and initializing a Sun StorEdge T3 disk tray logical volume.

For the procedure on creating and initializing a Sun StorEdge T3 disk tray logical volume, see the *Sun StorEdge T3 Disk Tray Administrator's Guide*. For the procedure on mounting a Sun StorEdge T3 disk tray logical volume, see the *Sun StorEdge T3 Installation, Operation, and Service Manual*.

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

```
# devfsadm
```

After this process, a Solaris logical device name for the new Sun StorEdge T3 disk tray logical volume appears in the `/dev/rdisk` and `/dev/dsk` directories on all cluster nodes attached to the Sun StorEdge T3 disk tray.

4. If you are running VERITAS Volume Manager, update VERITAS Volume Manager's device tables on all cluster nodes attached to the Sun StorEdge T3 disk tray logical volume you created in [Step 2](#). Otherwise, proceed to [Step 5](#).
5. If needed, partition the Sun StorEdge T3 disk tray logical volume.
6. From any node in the cluster, update the global device namespace.

```
# scgdevs
```

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 expected behavior.

Where to Go From Here

To create a new resource or reconfigure a running resource to use the new Sun StorEdge T3 disk tray logical volume, see the *Sun Cluster 3.0 Data Services Installation and Configuration Guide*.

To configure a Sun StorEdge T3 disk tray logical volume as a quorum device, see the *Sun Cluster 3.0 System Administration Guide* for the procedure on adding a quorum device.

▼ How to Remove a Sun StorEdge T3 Disk Tray Logical Volume

Use this procedure to remove a Sun StorEdge T3 disk tray logical volume. This procedure assumes all cluster nodes are booted and attached to the Sun StorEdge T3 disk tray that hosts the Sun StorEdge T3 disk tray logical volume you want to remove.

This procedure defines Node A as the node you want to begin working with, and Node B as the remaining node.



Caution – This procedure removes all data on the Sun StorEdge T3 disk tray logical volume you want to remove.

1. **If necessary, migrate all data and volumes off the Sun StorEdge T3 disk tray logical volume you want to remove. Otherwise, proceed to [Step 2](#).**
2. **Is the Sun StorEdge T3 disk tray logical volume you want to remove a quorum device?**

```
# scstat -q
```

- If yes, remove the quorum device before you proceed.
- If no, proceed to [Step 3](#).

For the procedure on removing a quorum device, see the *Sun Cluster 3.0 System Administration Guide*.

3. **If you are running VERITAS Volume Manager, update VERITAS Volume Manager's device tables on all cluster nodes attached to the Sun StorEdge T3 disk tray logical volume you want to remove. Otherwise, proceed to [Step 4](#).**
4. **Run the appropriate Solstice DiskSuite or VERITAS Volume Manager commands to remove the reference to the logical unit number (LUN) from any diskset or disk group.**

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

5. **Remove the Sun StorEdge T3 disk tray logical volume.**

For the procedure on deleting a Sun StorEdge T3 disk tray logical volume, see the *Sun StorEdge T3 Disk Tray Administrator's Guide*.

6. Determine the resource groups and device groups running on Node A and Node B.

Record this information because you will use it in [Step 15](#) of this procedure to return resource groups and device groups to these nodes.

```
# scstat
```

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

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

8. Shut down Node A.

```
# shutdown -y -g0 -i0
```

9. Boot Node A into cluster mode.

```
{0} ok boot
```

For more information, see the *Sun Cluster 3.0 System Administration Guide*.

10. On Node A, remove the obsolete device IDs (DIDs).

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

11. Move all resource groups and device groups off Node B.

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

12. Shut down Node B.

```
# shutdown -y -g0 -i0
```

13. Boot Node B into cluster mode.

```
{0} ok boot
```

For more information, see the *Sun Cluster 3.0 System Administration Guide*.

14. On Node B, remove the obsolete DIDs.

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

15. Return the resource groups and device groups you identified in [Step 6](#) to Node A and Node B.

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

For more information, see the *Sun Cluster 3.0 System Administration Guide*.

Where to Go From Here

To create a Sun StorEdge T3 disk tray logical volume, see [“How to Create a Sun StorEdge T3 Disk Tray Logical Volume”](#) on page 61.

Maintaining a Sun StorEdge T3 Disk Tray

This section provides the procedures for maintaining a Sun StorEdge T3 disk tray. The following table lists these procedures. This section does not include a procedure for adding a disk drive and a procedure for removing a disk drive because a Sun StorEdge T3 disk tray only operates when fully configured.



Caution – If you remove any field replaceable unit (FRU) for an extended period of time, thermal complications might result. To prevent this complication, the Sun StorEdge T3 disk tray is designed so an orderly shutdown occurs when you remove a component for longer than 30 minutes. A replacement part must be immediately available before starting a FRU replacement procedure. You must replace a FRU within 30 minutes or the Sun StorEdge T3 disk tray, and all attached Sun StorEdge T3 disk trays, will shut down and power off.

TABLE B-2 Task Map: Maintaining a Sun StorEdge T3 Disk Tray

Task	For Instructions, Go To...
Upgrade Sun StorEdge T3 disk tray firmware	“How to Upgrade Sun StorEdge T3 Disk Tray Firmware” on page 68
Replace a disk drive	“How to Replace a Disk Drive” on page 69
Add a Sun StorEdge T3 disk tray	“How to Add a Sun StorEdge T3 Disk Tray” on page 70
Remove a Sun StorEdge T3 disk tray	“How to Remove a Sun StorEdge T3 Disk Tray” on page 80
Replace a host-to-hub fiber optic cable	“How to Replace a Host-to-Hub Component” on page 83
Replace an FC-100/S host adapter Gigabit Interface Converter (GBIC)	“How to Replace a Host-to-Hub Component” on page 83
Replace an FC-100 hub GBIC that connects a FC-100 hub to a host	“How to Replace a Host-to-Hub Component” on page 83
Replace a hub-to-disk tray fiber optic cable	“How to Replace a Sun StorEdge FC-100 Hub and Hub-to-Disk Tray Component” on page 84

TABLE B-2 Task Map: Maintaining a Sun StorEdge T3 Disk Tray (Continued)

Task	For Instructions, Go To...
Replace an FC-100 hub GBIC that connects the FC-100 hub to a Sun StorEdge T3 disk tray	"How to Replace a Sun StorEdge FC-100 Hub and Hub-to-Disk Tray Component" on page 84
Replace a Sun StorEdge FC-100 hub	"How to Replace a Sun StorEdge FC-100 Hub and Hub-to-Disk Tray Component" on page 84
Replace a Sun StorEdge FC-100 hub power cord	"How to Replace a Sun StorEdge FC-100 Hub and Hub-to-Disk Tray Component" on page 84
Replace a media interface adapter (MIA)	"How to Replace a Sun StorEdge FC-100 Hub and Hub-to-Disk Tray Component" on page 84
Replace a Sun StorEdge T3 disk tray controller	"How to Replace a Sun StorEdge T3 Disk Tray Controller" on page 85
Replace a Sun StorEdge T3 disk tray chassis	"How to Replace a Sun StorEdge T3 Disk Tray Chassis" on page 86
Replace a host adapter	"How to Replace a Host Adapter" on page 87
Replace a Power and Cooling Unit (PCU) Follow the same procedure used in a non-cluster environment.	<i>Sun StorEdge T3 Installation, Operation, and Service Manual</i>
Replace a unit interconnect card (UIC) Follow the same procedure used in a non-cluster environment.	<i>Sun StorEdge T3 Installation, Operation, and Service Manual</i>
Replace a Sun StorEdge T3 disk tray power cable Follow the same procedure used in a non-cluster environment.	<i>Sun StorEdge T3 Installation, Operation, and Service Manual</i>
Replace an Ethernet cable Follow the same procedure used in a non-cluster environment.	<i>Sun StorEdge T3 Installation, Operation, and Service Manual</i>

▼ How to Upgrade Sun StorEdge T3 Disk Tray Firmware

Use this procedure to upgrade Sun StorEdge T3 disk tray firmware in a running cluster. Sun StorEdge T3 disk tray firmware includes controller firmware, unit interconnect card (UIC) firmware, and disk drive firmware.



Caution – Perform this procedure on one Sun StorEdge T3 disk tray at a time. This procedure requires that you reset the Sun StorEdge T3 disk tray you want to upgrade. If you reset more than one Sun StorEdge T3 disk tray, your cluster will lose access to data if the Sun StorEdge T3 disk trays are submirrors of each other.

1. **On one node attached to the Sun StorEdge T3 disk tray you want to upgrade, detach that Sun StorEdge T3 disk tray's submirrors.**

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

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

For the list of required Sun StorEdge T3 disk tray patches, see the *Sun StorEdge T3 Disk Tray Release Notes*. For the procedure on applying firmware patches, see the firmware patch README. For the procedure on verifying the firmware level, see the *Sun StorEdge T3 Installation, Operation, and Service Manual*.

3. **Reset the Sun StorEdge T3 disk tray, if you have not already done so.**

For the procedure on rebooting a Sun StorEdge T3 disk tray, see the *Sun StorEdge T3 Installation, Operation, and Service Manual*.

4. **Reattach the submirrors to resynchronize them.**

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

▼ How to Replace a Disk Drive

Use this procedure to replace one failed disk drive in a Sun StorEdge T3 disk tray in a running cluster.



Caution – If you remove any field replaceable unit (FRU) for an extended period of time, thermal complications might result. To prevent this complication, the Sun StorEdge T3 disk tray is designed so an orderly shutdown occurs when you remove a component for longer than 30 minutes. A replacement part must be immediately available before starting a FRU replacement procedure. You must replace a FRU within 30 minutes or the Sun StorEdge T3 disk tray, and all attached Sun StorEdge T3 disk trays, will shut down and power off.

- 1. If the failed disk drive impacted the Sun StorEdge T3 disk tray logical volume's availability, remove the Sun StorEdge T3 disk tray logical volume from volume management control. Otherwise, proceed to [Step 2](#).**

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

- 2. Replace the disk drive.**

For the procedure on replacing a disk drive, see the *Sun StorEdge T3 Installation, Operation, and Service Manual*.

- 3. If you removed a LUN from volume management control in [Step 1](#), return the LUN(s) to volume management control. Otherwise, [Step 2](#) completes this procedure.**

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

▼ How to Add a Sun StorEdge T3 Disk Tray

Use this procedure to add a new Sun StorEdge T3 disk tray to a running cluster. This procedure provides flexibility so you can either add a Sun StorEdge T3 disk tray, a Sun StorEdge FC-100 hub and host adapters, or add a Sun StorEdge T3 disk tray to an existing Sun StorEdge FC-100 hub and host adapters.

This procedure defines Node A as the node you want to begin working with, and Node B as the remaining node.

1. **Set up a Reverse Address Resolution Protocol (RARP) server on the network you want the new Sun StorEdge T3 disk tray to reside on, and then assign an IP address to the new Sun StorEdge T3 disk tray.**

This RARP server enables you to assign an IP address to the new Sun StorEdge T3 disk tray using the Sun StorEdge T3 disk tray's unique MAC address.

For the procedure on setting up a RARP server, see the *Sun StorEdge T3 Installation, Operation, and Service Manual*.

2. **Install the media interface adapter (MIA) in the Sun StorEdge T3 disk tray you want to add as shown in [FIGURE B-2](#).**

For the procedure on installing a media interface adapter (MIA), see the *Sun StorEdge T3 Configuration Guide*.

3. **If necessary, install a gigabit interface converter (GBIC) in the Sun StorEdge FC-100 hub as shown in [FIGURE B-2](#).**

This GBIC allows you to connect the Sun StorEdge FC-100 hub to the Sun StorEdge T3 disk tray you want to add.

Note – There are no hub port assignment restrictions. You can connect your Sun StorEdge T3 disk tray and node to any hub port.

For the procedure on installing an FC-100 hub GBIC, see the *FC-100 Hub Installation and Service Manual*.

4. **Install the 10Base-T Ethernet cable between the Sun StorEdge T3 disk tray and the Local Area Network (LAN) as shown in [FIGURE B-2](#).**
5. **Power on the Sun StorEdge T3 disk tray.**

Note – The Sun StorEdge T3 disk tray might take a few minutes to boot.

For the procedure on powering on a Sun StorEdge T3 disk tray, see the *Sun StorEdge T3 Installation, Operation, and Service Manual*.

6. **Telnet to the Sun StorEdge T3 disk tray you want to add, and, if necessary, install the required Sun StorEdge T3 disk tray controller firmware.**

Revision 1.16a firmware is required for the Sun StorEdge T3 disk tray controller. For the procedure on upgrading firmware, see the firmware patch [README](#).

7. **Does this new Sun StorEdge T3 disk tray have a unique target address?**

- If yes, proceed to [Step 8](#).
- If no, change the target address for this new Sun StorEdge T3 disk tray.

For the procedure on verifying and assigning a target address, see the *Sun StorEdge T3 Configuration Guide*.

8. **Install a fiber optic cable between the Sun StorEdge FC-100 hub and the Sun StorEdge T3 disk tray as shown in [FIGURE B-2](#).**

Note – There are no hub port assignment restrictions. You can connect your Sun StorEdge T3 disk tray and node to any hub port.

For the procedure on installing a fiber optic cable, see the *Sun StorEdge T3 Configuration Guide*.

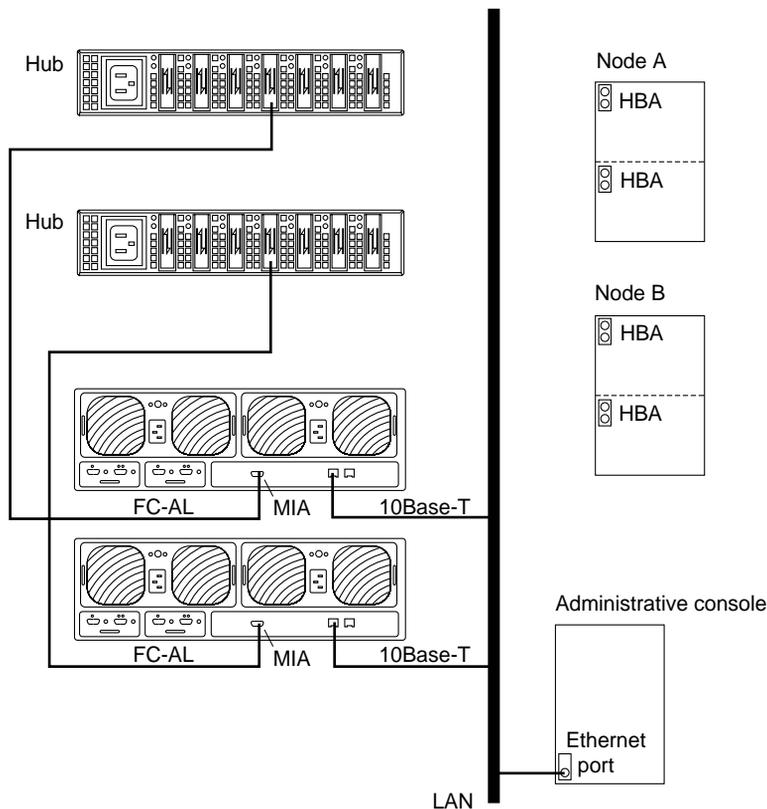


FIGURE B-2 Adding a Sun StorEdge T3 disk tray in a single-tray configuration

9. Configure the new Sun StorEdge T3 disk tray.

For the procedure on creating a Sun StorEdge T3 disk tray logical volume, see the *Sun StorEdge T3 Disk Tray Administrator's Guide*.

10. Determine the resource groups and device groups running on Node A and Node B.

Record this information because you will use it in [Step 42](#) of this procedure to return resource groups and device groups to these nodes.

```
# scstat
```

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

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

12. Do you need to install a host adapter in Node A?

- If yes, proceed to [Step 13](#).
- If no, skip to [Step 20](#).

13. Is the host adapter you want to install the first FC-100/S host adapter on Node A?

- If no, skip to [Step 15](#).
- If yes, determine whether the Fibre Channel support packages are already installed on these nodes. 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
```

14. Are the Fibre Channel support packages installed?

- If yes, proceed to [Step 15](#).
- If no, install them.

The Sun StorEdge T3 disk tray packages are located in the `Product` directory of the Solaris CD-ROM. Use the `pkgadd` command to add any necessary packages.

```
# pkgadd -d path_to_Solaris/Product Pkg1 Pkg2 Pkg3 ... PkgN
```

15. Stop the Sun Cluster software on Node A and shut down Node A.

```
# shutdown -y -g0 -i0
```

For the procedure on shutting down a node, see the *Sun Cluster 3.0 System Administration Guide*.

16. Power off Node A.

17. Install the host adapter in Node A.

For the procedure on installing a host adapter, see the documentation that shipped with your host adapter and node.

18. If necessary, power on and boot Node A.

```
{0} ok boot -x
```

For more information, see the *Sun Cluster 3.0 System Administration Guide*.

19. If necessary, upgrade the host adapter firmware on Node A.

For the required host adapter firmware patch, see the *Sun StorEdge T3 Disk Tray Release Notes*. For the procedure on applying the host adapter firmware patch, see the firmware patch README.

20. If necessary, install gigabit interface converters (GBIC) as shown in [FIGURE B-3](#).

For the procedure on installing an FC-100 hub GBIC, see the *FC-100 Hub Installation and Service Manual*.

21. If necessary, connect a fiber optic cable between the Sun StorEdge FC-100 hub and Node A as shown in [FIGURE B-3](#).

Note – There are no hub port assignment restrictions. You can connect your Sun StorEdge T3 disk tray and node to any hub port.

For the procedure on installing a FC-100/S host adapter GBIC, see your host adapter documentation. For the procedure on installing a fiber optic cable, see the *Sun StorEdge T3 Configuration Guide*.

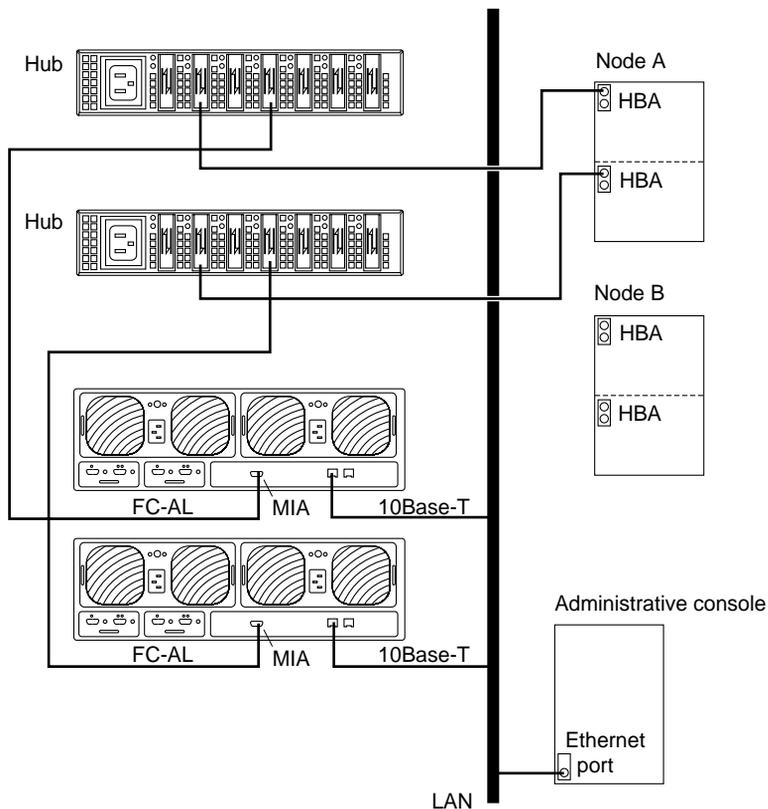


FIGURE B-3 Adding a Sun StorEdge T3 disk tray in a single-tray configuration

22. If necessary, install the required Solaris patches for Sun StorEdge T3 disk tray support on Node A.

For a list of required Solaris patches for Sun StorEdge T3 disk tray support, see the *Sun StorEdge T3 Disk Tray Release Notes*.

23. Shut down Node A.

```
# shutdown -y -g0 -i0
```

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

```
{0} ok boot -r
```

25. Label the new Sun StorEdge T3 disk tray logical volume.

For the procedure on labeling a Sun StorEdge T3 disk tray logical volume, see the *Sun StorEdge T3 Disk Tray Administrator's Guide*.

26. (Optional) On Node A, verify that the device IDs (DIDs) are assigned to the new Sun StorEdge T3 disk tray.

```
# scdidadm -l
```

27. Do you need to install a host adapter in Node B?

- If yes, proceed to [Step 28](#).
- If no, skip to [Step 36](#).

28. Is the host adapter you want to install the first FC-100/S host adapter on Node B?

- If no, skip to [Step 30](#).
- If yes, determine whether the Fibre Channel support packages are already installed on these nodes. 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
```

29. Are the Fibre Channel support packages installed?

- If yes, proceed to [Step 30](#).
- If no, install them.

The Sun StorEdge T3 disk tray packages are located in the `Product` directory of the Solaris CD-ROM. Use the `pkgadd` command to add any necessary packages.

```
# pkgadd -d path_to_Solaris/Product Pkg1 Pkg2 Pkg3 ... PkgN
```

30. Move all resource groups and device groups off Node B.

```
# scswitch -s -h nodename
```

31. Stop the Sun Cluster software on Node B, and shut down the node.

```
# shutdown -y -g0 -i0
```

For the procedure on shutting down a node, see the *Sun Cluster 3.0 System Administration Guide*.

32. Power off Node B.

For more information, see the *Sun Cluster 3.0 System Administration Guide*.

33. Install the host adapter in Node B.

For the procedure on installing a host adapter, see the documentation that shipped with your host adapter and node.

34. If necessary, power on and boot Node B.

```
{0} ok boot -x
```

For more information, see the *Sun Cluster 3.0 System Administration Guide*.

35. If necessary, upgrade the host adapter firmware on Node B.

For the required host adapter firmware patch, see the *Sun StorEdge T3 Disk Tray Release Notes*. For the procedure on applying the host adapter firmware patch, see the firmware patch README.

36. If necessary, install gigabit interface converters (GBIC) as shown in [FIGURE B-4](#).

For the procedure on installing an FC-100 hub GBIC, see the *FC-100 Hub Installation and Service Manual*.

37. If necessary, connect a fiber optic cable between the Sun StorEdge FC-100 hub and Node B as shown in [FIGURE B-4](#).

For the procedure on installing a FC-100/S host adapter GBIC, see your host adapter documentation. For the procedure on installing a fiber optic cable, see the *Sun StorEdge T3 Configuration Guide*.

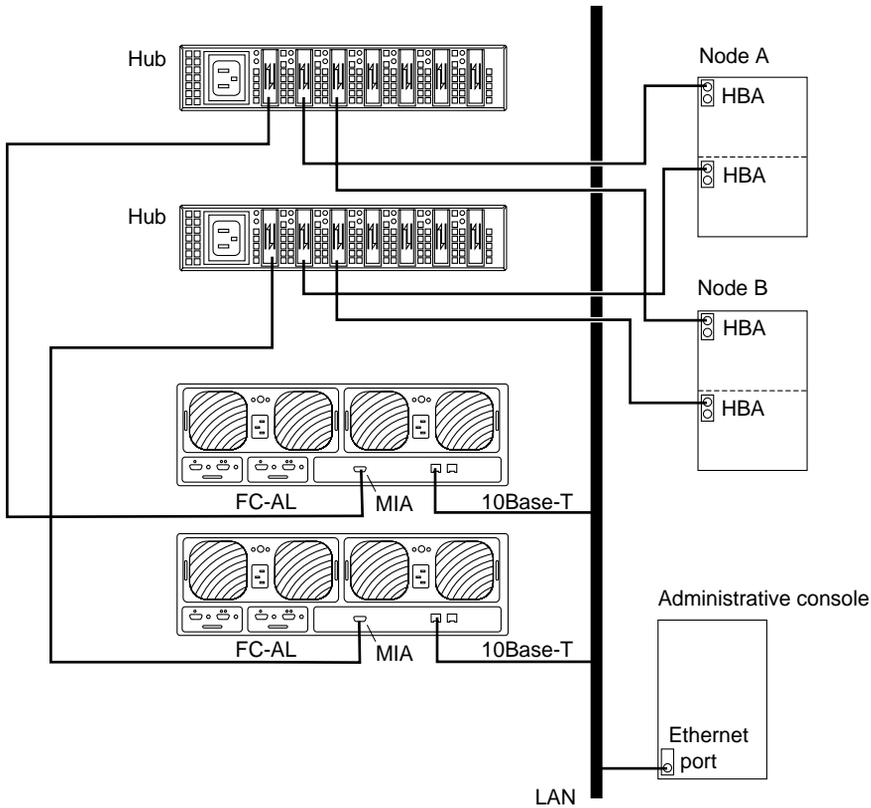


FIGURE B-4 Adding a Sun StorEdge T3 disk tray in a single-tray configuration

38. If necessary, install the required Solaris patches for Sun StorEdge T3 disk tray support on Node B.

For a list of required Solaris patches for Sun StorEdge T3 disk tray support, see the *Sun StorEdge T3 Disk Tray Release Notes*.

39. Shut down Node B.

```
# shutdown -y -g0 -i0
```

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

```
{0} ok boot -r
```

41. (Optional) On Node B, verify that the device IDs (DIDs) are assigned to the new Sun StorEdge T3 disk tray.

```
# sctidadm -l
```

42. Return the resource groups and device groups you identified in [Step 10](#) to Node A and Node B.

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

For more information, see the *Sun Cluster 3.0 System Administration Guide*.

43. Perform volume management administration to incorporate the new Sun StorEdge T3 disk tray logical volumes into the cluster.

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

▼ How to Remove a Sun StorEdge T3 Disk Tray

Use this procedure to permanently remove a Sun StorEdge T3 disk tray and its submirrors from a running cluster. This procedure provides the flexibility to remove the host adapters from the nodes for the Sun StorEdge T3 disk tray you want to remove.

This procedure defines Node A as the node you want to begin working with, and Node B as the remaining node.



Caution – During this procedure, you will lose access to the data that resides on the Sun StorEdge T3 disk tray you want to remove.

1. **If necessary, back up all database tables, data services, and volumes associated with the Sun StorEdge T3 disk tray you want to remove.**
2. **Detach the submirrors from the Sun StorEdge T3 disk tray you want to remove to stop all I/O activity to the Sun StorEdge T3 disk tray.**

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

3. **Run the appropriate Solstice DiskSuite or VERITAS Volume Manager commands to remove the references to the LUN(s) from any diskset or disk group.**

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

4. **Determine the resource groups and device groups running on Node B.**

```
# scstat
```

5. **Move all resource groups and device groups off Node A.**

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

6. **Stop the Sun Cluster software on Node A, and shut down Node A.**

```
# shutdown -y -g0 -i0
```

For the procedure on shutting down a node, see the *Sun Cluster 3.0 System Administration Guide*.

7. Is the Sun StorEdge T3 disk tray you want to remove the last Sun StorEdge T3 disk tray connected to Node A?

- If yes, disconnect the fiber optic cable between Node A and the Sun StorEdge FC-100 hub connected to this Sun StorEdge T3 disk tray, and then disconnect the fiber optic cable between the Sun StorEdge FC-100 hub and this Sun StorEdge T3 disk tray.
- If no, proceed to [Step 8](#).

For the procedure on removing a fiber optic cable, see the *Sun StorEdge T3 Configuration Guide*.

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

- If yes, power off Node A.
- If no, skip to [Step 10](#).

9. Remove the host adapter from Node A.

For the procedure on removing host adapters, see the documentation that shipped with your nodes.

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

For more information, see the *Sun Cluster 3.0 System Administration Guide*.

11. Boot Node A into cluster mode.

```
{0} ok boot
```

12. Move all resource groups and device groups off Node B.

```
# scswitch -s -h nodename
```

13. Stop the Sun Cluster software on Node B, and shut down Node B.

```
# shutdown -y -g0 -i0
```

14. Is the Sun StorEdge T3 disk tray you want to remove the last Sun StorEdge T3 disk tray connected to the Sun StorEdge FC-100 hub.

- If yes, disconnect the fiber optic cable connecting this Sun StorEdge FC-100 hub and Node B.
- If no, proceed to [Step 15](#).

For the procedure on removing a fiber optic cable, see the *Sun StorEdge T3 Configuration Guide*.

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

- If yes, power off Node B.
- If no, skip to [Step 18](#).

16. Remove the host adapter from Node B.

For the procedure on removing host adapters, see the documentation that shipped with your nodes.

17. Without allowing the node to boot, power on Node B.

For more information, see the *Sun Cluster 3.0 System Administration Guide*.

18. Boot Node B into cluster mode.

```
{0} ok boot
```

For more information, see the *Sun Cluster 3.0 System Administration Guide*.

19. On all cluster nodes, update the /devices and /dev entries.

```
# devfsadm -C  
# sctidadm -C
```

20. Return the resource groups and device groups 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 Replace a Host-to-Hub Component

Use this procedure to replace the following host-to-hub components.

- Host-to-hub fiber optic cable
- FC-100/S host adapter Gigabit Interface Converter (GBIC)
- FC-100 hub GBIC that connects a Sun StorEdge FC-100 hub to a node

1. **On the node connected to the host-to-hub connection you want to replace, determine the resource groups and device groups running on this node.**

```
# scstat
```

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

```
# scswitch -s -h nodename
```

3. **Replace the host-to-hub component.**

For the procedure on replacing a fiber optic cable, see the *Sun StorEdge T3 Configuration Guide*. For the procedure on replacing an FC-100 hub GBIC, see the *FC-100 Hub Installation and Service Manual*. For the procedure on replacing a FC-100/S host adapter GBIC, see your host adapter documentation.

4. **Return the resource groups and device groups you identified in [Step 1](#) to the node connected to the host-to-hub connection you replaced.**

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

▼ How to Replace a Sun StorEdge FC-100 Hub and Hub-to-Disk Tray Component

Use this procedure to replace the following hub-to-disk tray components.

- Fiber optic cable that connects a Sun StorEdge FC-100 hub to a Sun StorEdge T3 disk tray
- FC-100 hub GBIC that connects a Sun StorEdge FC-100 hub to a Sun StorEdge T3 disk tray
- Sun StorEdge FC-100 hub
- Sun StorEdge FC-100 hub power cord
- Media Interface Adapter (MIA)

1. **Detach the submirrors on the Sun StorEdge T3 disk tray connected to the hub-to-disk tray fiber optic cable you want to replace to stop all I/O activity to this Sun StorEdge T3 disk tray.**

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

2. **Replace the hub-to-disk tray component.**

For the procedure on replacing a fiber optic cable, see the *Sun StorEdge T3 Configuration Guide*. For the procedure on replacing an FC-100 hub GBIC, a Sun StorEdge FC-100 hub, or a Sun StorEdge FC-100 hub power cord, see the *FC-100 Hub Installation and Service Manual*. For the procedure on replacing an MIA, see the *Sun StorEdge T3 Installation, Operation, and Service Manual*.

3. **Reattach the submirrors to resynchronize them.**

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

▼ How to Replace a Sun StorEdge T3 Disk Tray Controller

Use this procedure to replace a Sun StorEdge T3 disk tray controller.

- 1. Detach the submirrors on the Sun StorEdge T3 disk tray connected to the controller you want to replace to stop all I/O activity to this Sun StorEdge T3 disk tray.**

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

- 2. Replace the controller.**

For the procedure on replacing a Sun StorEdge T3 controller, see the *Sun StorEdge T3 Installation, Operation, and Service Manual*.

- 3. Reattach the submirrors to resynchronize them.**

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

▼ How to Replace a Sun StorEdge T3 Disk Tray Chassis

Use this procedure to replace a Sun StorEdge T3 disk tray chassis. This procedure assumes that you want to retain all FRUs other than the chassis and the backplane. To replace the chassis, you must replace both the chassis and the backplane because these components are manufactured as one part.

Note – Only trained, qualified service providers should use this procedure to replace a Sun StorEdge T3 disk tray chassis.

1. **Detach the submirrors on the Sun StorEdge T3 disk tray connected to the chassis you want to replace to stop all I/O activity to this Sun StorEdge T3 disk tray.**

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

2. **Replace the chassis/backplane.**

For the procedure on replacing a Sun StorEdge T3 chassis, see the *Sun StorEdge T3 Field Service Manual*.

3. **Reattach the submirrors to resynchronize them.**

Note – Account for the change in the World Wide Number (WWN).

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

▼ How to Replace a Host Adapter

Use this procedure to replace a failed host adapter in a running cluster. Node A in this procedure refers to the node with the failed host adapter you want to replace. Node B is a backup node.

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

Record this information because you will use it 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 A.

```
# scswitch -s -h nodename
```

3. Shut down Node A.

```
# shutdown -y -g0 -i0
```

4. Power off Node A.

For more information, see the *Sun Cluster 3.0 System Administration Guide*.

5. Replace the failed host adapter.

For the procedure on removing and adding host adapters, see the documentation that shipped with your nodes.

6. Power on Node A.

For more information, see the *Sun Cluster 3.0 System Administration Guide*.

7. Boot Node A into cluster mode.

```
{0} ok boot
```

For more information, see the *Sun Cluster 3.0 System Administration Guide*.

8. Return the resource groups and device groups you identified in [Step 1](#) to Node A and Node B.

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

For more information, see the *Sun Cluster 3.0 System Administration Guide*.