Sun StorEdge™ A3500FC Controller Upgrade Guide

THE NETWORK IS THE COMPUTER™

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Contents

Preface

The *Sun StorEdge A3500FC Controller Upgrade Guide* provides instructions for upgrading your Sun StorEdge™ A3000 or A3500 system from UltraSCSI to Fibre Channel-Arbitrated Loop (FC-AL) host connectivity. These instructions are intended for an experienced system administrator.

Note – Unless the A3000 or A3500 is uniquely identified, both types of systems are referred to as "A3*x*00" throughout this document.

Using UNIX Commands

This document does not contain information on basic UNIX® commands and procedures such as shutting down the system, booting the system, and configuring devices.

See one or more of the following for this information:

- *Solaris Handbook for Sun Peripherals*
- AnswerBook™ online documentation for the Solaris™ software environment
- Other software documentation that you received with your system

Typographic Conventions

TABLE P-1 Typographic Conventions

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

Shell Prompts

TABLE P-2 Shell Prompts

Shell	Prompt
C shell	*machine_name*%
C shell superuser	*machine_name*#
Bourne shell and Korn shell	$
Bourne shell and Korn shell superuser	#

Related Documentation

TABLE P-3 Related Documentation

Title	Part Number
Sun StorEdge A3500/A3500FC Controller Module Guide	805-4980-xx
Sun StorEdge A3500/A3500FC Hardware Configuration Guide	805-4981-xx
Sun StorEdge A3500/A3500FC Task Map	805-4982-xx
Sun StorEdge SBus FC-100 Host Adapter Installation and Service Manual	802-7572-xx
Sun StorEdge PCI FC-100 Host Adapter Installation Manual	805-3682-xx
Sun StorEdge Volume Manager 2.6 Release Notes	805-5708-xx
Sun StorEdge Volume Manager 2.6 Installation Guide	805-5707-xx
Sun StorEdge Volume Manager 2.6 System Administrator's Guide	805-5706-xx
Sun StorEdge RAID Manager 6.22 Release Notes	805-7758-xx
Sun StorEdge RAID Manager 6.22 Installation and Support Guide for Solaris	805-7756-xx
Sun StorEdge RAID Manager 6.22 User's Guide	806-0478-xx
Sun StorEdge RAID Manager Controller Replacement Guide	805-7854-xx

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Introduction

The Sun StorEdge A3500FC Controller Upgrade Guide provides instructions for upgrading your Sun StorEdge™ A3000 or A3500 system from UltraSCSI to Fibre Channel-Arbitrated Loop (FC-AL) host connectivity.

Note – Unless the A3000 or A3500 is uniquely identified, both types of systems are referred to as "A3*x*00" throughout this document.

This document describes how to:

- Upgrade to the latest version of Sun StorEdge™ RAID Manager with no change to your Solaris™ operating environment
- Upgrade to the latest version of Sun StorEdge RAID Manager upgrade your Solaris operating environment
- Verify installation of Sun StorEdge RAID Manager
- Install and replace hardware for FC-AL connectivity

Note – In this document, the terms Sun StorEdge RAID Manager and RAID Manager are used interchangeably.

Solaris Releases Supported

Sun StorEdge RAID Manager 6.22 software supports Solaris 2.6 5/98 software and Solaris 7 software. You can find out what version of Solaris software you are currently running by typing:

```
% cat /etc/release
```

The `/etc/release` file includes version information as shown in the following example.

```
Solaris 2.6 5/98 s297s_hw3smccServer_09 SPARC
Copyright 1998 Sun Microsystems, Inc. All Rights Reserved.
Assembled on 24 April 1998
```

If the `/etc/release` file does not exist, your system is running a version earlier than Solaris 2.6 5/98. In such case, you must upgrade to Solaris 2.6 5/98 or to Solaris 7 before you upgrade your RAID Manager software.

Supported Hardware Configurations

Controller connection to the host can be attained in two ways:

- Direct controller connection to the host through a fibre optic cable to a Sun StorEdge Sbus or PCI FC-100 Host Adapter, or
- Controller connection through the Sun StorEdge FC-100 Hub. Each hub is connected to the host through a fibre optic cable to a Sun StorEdge Sbus or PCI FC-100 Host Adapter.

TABLE 1 and TABLE 2 lists supported hardware for Sbus and PCI configurations, including part numbers and a brief description of each item.

Note – The maximum length supported for a fibre optic cable is 500m.

TABLE 1 Supported Hardware for Sbus Configurations

Part Number	Description
540-4026	A3500FC—FC-AL controller for A3500 array (with D1000 tray)
540-4027	A3500FC—FC-AL controller for A3000 array (with RSM tray)
X6730A	Sun StorEdge Sbus FC-100 Host Adapter
X6731A	GBIC—Gigabit Interface Converter for the Sbus FC-100 Host Adapter
X978A	15m fibre optic cable
X6732A	Sun StorEdge FC-100 Hub

Caution: Do not use the Sbus HBA card with a part number of 501-3060.

TABLE 2 Supported Hardware for PCI Configurations

Part Number	Description
540-4026	A3500FC—FC-AL controller for A3500 array (with D1000 tray)
540-4027	A3500FC—FC-AL controller for A3000 array (with RSM tray)
X6729A	Sun StorEdge PCI FC-100 Host Adapter
X6731A	GBIC—Gigabit Interface Converter for the Sbus FC-100 Host Adapter
X978A	15m fibre optic cable
X6732A	Sun StorEdge FC-100 Hub

Direct Host Attachment

FIGURE 1 shows direct host attachment from the A3x00 array. This configuration requires the following hardware to attain the highest degree of availability:

- (2) Sbus FC-100 HBAs or (2) PCI FC-100 HBAs
- (2) GBICs
- (2) 15m fibre optic cables

Note – For the highest availability, each SOC+ HBA should be installed on a different Sbus. For servers that have multiple Sbuses per I/O board, each SOC+ HBA should be installed on a different I/O board.

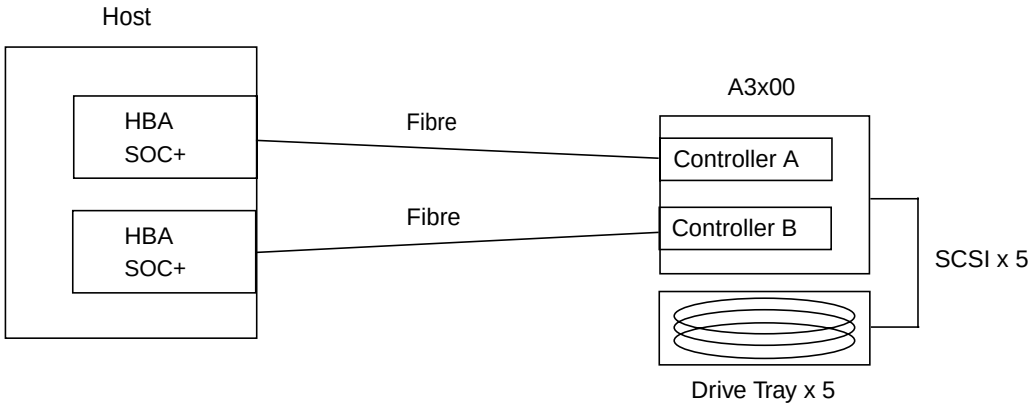

FIGURE 1 Direct Host Attachment—Single Array, Single Host

Host Attachment Through Hubs

Single Array

FIGURE 2 shows host attachment through hubs from a single A3x00 array. This configuration requires the following hardware to attain the highest degree of availability:

- (2) Sbus FC-100 HBAs or (2) PCI FC-100 HBAs
- (2) Sbus FC-100 HBAs
- (6) GBICs
- (4) 15m fibre optic cables

Note – For the highest availability, each SOC+ HBA should be installed on a different Sbus. For servers that have multiple Sbuses per I/O board, each SOC+ HBA should be installed on a different I/O board.

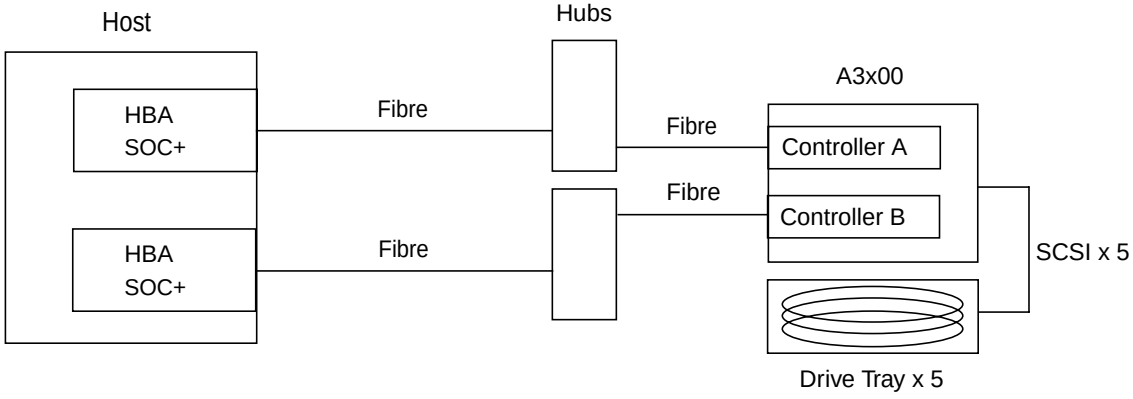

FIGURE 2 Host Attachment Through Hubs—Single Array, Single Host

Multiple Arrays

FIGURE 3 shows host attachment through hubs from multiple A3x00 arrays. This configuration requires the following hardware to attain the highest degree of availability:

- (2) FC-100 Hubs
- (2) Sbus FC-100 HBAs or (2) PCI FC-100 HBAs
- (4) GBICs + (2) GBICs per array
- (2) 15m fibre cables + (2) 15m fibre cables per array

Note – For the highest availability, each SOC+ HBA should be installed on a different Sbus. For servers that have multiple Sbuses per I/O board, each SOC+ HBA should be installed on a different I/O board.

Each controller connected to a hub must have a unique LOOP ID. To avoid inadvertently changing fibre channel LOOP IDs, you can configure two enclosures through hubs as shown in FIGURE 3. If you want to connect the controllers in an enclosure to the *same* hub, you will need to set their LOOP IDs. For detailed information about setting fibre channel LOOP IDs, refer to the *Sun StorEdge RAID Manager 6.22 Installation and Support Guide for Solaris* (805-7756) and the *Sun StorEdge A3500/A3500FC Hardware Configuration Guide* (805-4981).

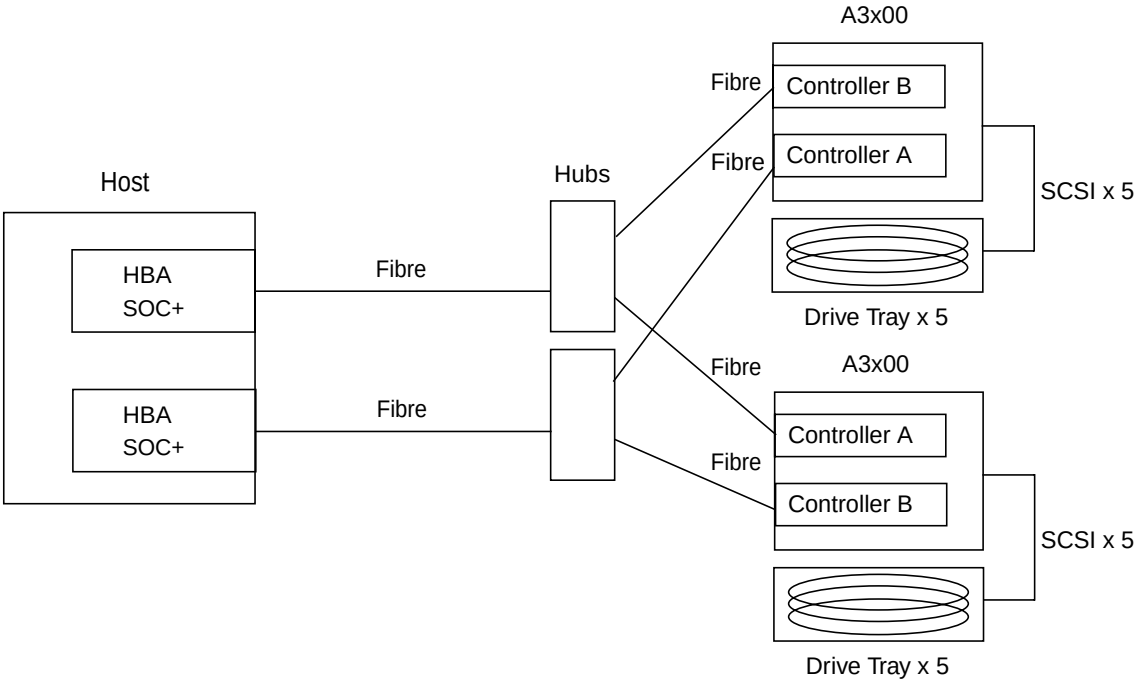

FIGURE 3 Host Attachment Through Hubs—Multiple Arrays, Single Host

Required Patches

Refer to the *Sun StorEdge RAID 6.22 Manager Release Notes* (805-7758) for a list of the hardware and software patches that you must install before using the Sun StorEdge RAID Manager 6.22 product on Solaris platforms.

Patches are listed in the order in which they should be installed. All hardware-specific patches should be applied and executed (disk firmware downloaded, system board PROM updated, and so on) prior to starting the RAID Manager upgrade procedure.

Note – Instead of installing the individual patches required for your Solaris operating environment, it is recommended that you install the Recommended Patch Cluster for your version of Solaris software to ensure that you have installed all patches required by the RAID Manager software.

You can download the actual patches from the SunSolve Online™ Public Patch Page Web site:

```
http://sunsolve.sun.com/
```

Be sure you download the latest revision level for each patch. If you have any questions, contact your local Sun solution center or Sun service provider for assistance in downloading the patches.

Upgrading to RAID Manager 6.22 With No Change to Solaris

Following is the procedure for upgrading to the latest version of Sun StorEdge RAID Manager software *with no change* to the Solaris operating environment.

If you want to upgrade to the latest version of RAID Manager software and upgrade the Solaris operating environment, go to "Upgrading to RAID Manager 6.22 and Upgrading Solaris" on page 11.

Note – Perform this procedure *only* if you are currently running Solaris 2.6 5/98 software.

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1. **Repair any hardware failures on the A3*x*00 arrays.**
2. **Prepare any layered volume management applications for upgrade.**
   - For Solstice DiskSuite, see the *Solstice DiskSuite 4.1 Reference Guide* (802-6724).
   - For Volume Manager, see the *Sun StorEdge Volume Manager 2.6 Installation Guide* (805-5707).
3. **Prepare for upgrading to the latest version of Sun StorEdge RAID Manager software**

   Go to "To Prepare for Upgrading Sun StorEdge RAID Manager" on page 13.
4. **Remove an earlier version of RAID Manager.**

   Go to "To Remove an Earlier Version of Sun StorEdge RAID Manager" on page 14.
5. **Install all required patches as outlined in the** *Sun StorEdge RAID Manager Release Notes* **(805-7758).**

Note – If you have not already done so, update your current Solaris operating environment with the latest device driver patches; refer to the *Sun StorEdge RAID Manager Release Notes* for a list of these patches. This step is required to ensure that no problems arise while executing the hardware patches on your current system. A reboot of the current operating environment is required to load and initialize the newly patched device drivers.

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6. **Install the Sun StorEdge RAID Manager 6.22 software.**

   Go to "To Install Sun StorEdge RAID Manager 6.22" on page 15.

7. **Verify installation of the software.**

   Go to “To Verify the Installation of Sun StorEdge RAID Manager” on page 18.

8. **At this point, the A3*x*00 arrays are visible and accessible as UltraSCSI devices.**

9. **Replace and install any system hardware or array hardware required for fibre channel connectivity**

   Go to “Installing Required Hardware” on page 20.

10. **Re-verify installation of the software with the newly installed FC-AL connection.**

    Return to Step 3 through Step 6 in “Verifying the Installation of Sun StorEdge RAID Manager” on page 18.

11. **Re-install layered volume management applications as described in the Installation Guide for each application (see Step 2 above).**

Caution – If the Sun Storage Volume Manager 2.6 software is installed on your system, a default feature known as Dynamic Multi-Pathing (DMP) is *active* by default. The Sun StorEdge RAID Manager software and the A3*x*00 RAID array do not support DMP. Redundant I/O pathing is maintained internally by the Sun StorEdge RAID Manager software. Therefore, you must disable the DMP feature in Volume Manager and reboot the system.

Refer to the *Sun StorEdge Volume Manager* 2.6 *Release Notes* (805-5708) and the *Sun StorEdge Volume Manager* 2.6 *System Administrator’s Guide* (805-5706) for detailed information about disabling the DMP feature in Volume Manager.

Upgrading to RAID Manager 6.22 and Upgrading Solaris

Following is the procedure for upgrading to the latest version of Sun StorEdge RAID Manager software and upgrading the Solaris operating environment.

Note – Perform this procedure *only* if you need to upgrade your Solaris operating environment. If there is no need to upgrade your operating environment, go to "Upgrading to RAID Manager 6.22 With No Change to Solaris" on page 9.

---

1. **Repair any hardware failures on the A3*x*00 arrays.**
2. **Prepare any layered volume management applications for upgrade.**
   - For Solstice DiskSuite, see the *Solstice DiskSuite 4.1 Reference Guide* (802-6724).
   - For Volume Manager, see the *Sun StorEdge Volume Manager 2.6 Installation Guide* (805-5707).
3. **Prepare Sun StorEdge RAID Manager for upgrade.**

   Go to "To Prepare for Upgrading Sun StorEdge RAID Manager" on page 13.
4. **Remove an earlier version of RAID Manager.**

   Go to "To Remove an Earlier Version of Sun StorEdge RAID Manager" on page 14.
5. **Install your new Solaris operating environment.**

   Refer to your *SPARC: Installing Solaris Software* and *SPARC: Hardware Platform Guide* for more information on upgrading Solaris. Return to this document to continue with the upgrade to Sun StorEdge RAID Manager 6.22 software.
6. **Install all required patches as outlined in the *Sun StorEdge RAID Manager 6.22 Release Notes* (805-7758).**

   It is important that you apply the latest device driver patches to your Solaris operating environment *before* downloading any RAID controller firmware or executing any hardware patches. This step is required to ensure that no problems arise while executing the hardware patches on your current system. A reboot of the current operating environment is required to load and initialize the newly patched device drivers.
7. **Install the Sun StorEdge RAID Manager 6.22 software.**

   Go to "To Install Sun StorEdge RAID Manager 6.22" on page 15.

8. **Verify installation of the software.**

   Go to “To Verify the Installation of Sun StorEdge RAID Manager” on page 18.

9. **At this point, the A3*x*00 arrays are visible and accessible as UltraSCSI devices.**

10. **Replace and install any system hardware or array hardware required for fibre channel connectivity.**

    Go to “Installing Required Hardware” on page 20.

11. **Re-verify installation of the software with the newly installed FC-AL connection.**

    Return to Step 3 through Step 6 in “Verifying the Installation of Sun StorEdge RAID Manager” on page 18.

12. **Re-install layered volume management applications as described in the Installation Guide for each application (see Step 2 above).**

Caution – If the Sun Storage Volume Manager 2.6 software is installed on your system, a default feature known as Dynamic Multi-Pathing (DMP) is *active* by default. The Sun StorEdge RAID Manager software and the A3*x*00 RAID array do not support DMP. Redundant I/O pathing is maintained internally by the Sun StorEdge RAID Manager software. Therefore, you must disable the DMP feature in Volume Manager and reboot the system.

Refer to the *Sun StorEdge Volume Manager* 2.6 *Release Notes* (805-5708) and the *Sun StorEdge Volume Manager* 2.6 *System Administrator’s Guide* (805-5706) for detailed information about disabling the DMP feature in Volume Manager.

▼ To Prepare for Upgrading Sun StorEdge RAID Manager

Before you attempt to upgrade your current version of RAID Manager, read the following notes.

- Do not add or remove any new peripherals or devices to/from your system until you have completed upgrading to the latest version of RAID Manager software.
- Be sure to save a copy of the `/etc/osa/rmparams` file and the `/usr/lib/osa/bin/rmscript` file *before* starting the upgrade procedure. You can refer to these files after the upgrade and decide if you need to customize the new files with any changes you may have made. Do *not* copy the old files over the new files. This action will destroy new parameters and scripts that were installed with the latest version of Sun StorEdge RAID Manager software.
- If you are upgrading from Sun StorEdge RAID Manager 6.0, the RAID module numbers/names will change. In the newer versions of the software the module name is derived from the host machine where the Sun StorEdge RAID Manager software is installed. With Sun StorEdge RAID Manager 6.0 the modules were labeled "RAID Module XX." The newer versions label the modules "*<hostname>_XXX*." For example, if the host machine running the storage management software is named "hobo", the RAID module names will be "hobo_XXX."
- If you are upgrading from Sun StorEdge RAID Manager 6.0 or 6.1, LUNs created in these environments will not be able to use the new dynamic drive group/LUN features included in Sun StorEdge RAID Manager 6.22. In order to use the new features, you must first delete and recreate any LUNs created in earlier versions of RAID Manager.
- Refer to the *Sun StorEdge RAID Manager Release Notes* (805-7758) for information about preserving the device names of LUNs that have valid data; see Bug ID 4118532 in the section that discusses "Known Issues."

Perform the following steps to prepare for upgrading RAID Manager:

1. **Save a copy of the current `/kernel/drv/sd.conf` file.**
2. **Save a copy of the current `/etc/path_to_inst` file.**
3. **Save a copy of the current configuration**:
   a. **From any application, select File → Save Module Profile.**
   b. **Make sure all information is selected, and select OK.**
   c. **Save to a location that is separate from the storage management software to ensure it will not be removed during the software removal procedure.**

d. Preserve the device names of LUNs that have valid data; see the description for Bug ID 4118532 in the *Sun StorEdge RAID Manager Release Notes* (805-7758) under "Known Issues."

4. Exit the Sun StorEdge RAID Manager software.

5. Unmount any file systems and stop any I/O to the RAID modules connected to the host on which the Sun StorEdge RAID Manager software is being upgraded.

The system is now ready for removing an earlier version of RAID Manager software.

▼ To Remove an Earlier Version of Sun StorEdge RAID Manager

Use the `pkgrm` utility to remove an earlier version of Sun StorEdge RAID Manager from your Sun StorEdge A3*x*00 system. Based on the current version of RAID Manager software installed on your system, remove the packages in the order described in TABLE 3.

TABLE 3 Removing Earlier Versions of Sun StorEdge RAID Manager

RAID Manager Version	Remove These Packages

6.0	`SUNWosau`
	`SUNWosar`
	`SUNWosaab`
	`SUNWosamn`

6.1	`SUNWosau`
	`SUNWosar`
	`SUNWosaab`
	`SUNWosahb`
	`SUNWosaib`
	`SUNWosamn`
	`SUNWosafw`

6.1.1/6.1.1 Update 1/6.1.1 Update 2	`SUNWosau`
	`SUNWosar`
	`SUNWvtsse`
	`SUNWosamn`
	`SUNWosafw`

Note – Certain critical files remain after you remove the packages. Be sure to keep these files in order to make any system changes to the new version of RAID Manager software.

The `rmlog.log` file also remains after you have removed the packages with `pkgrm`. Although keeping this file should not cause any problems, you may want to delete it.

1. **Type the following command to remove each package as listed in** TABLE 3 **for your current version of RAID Manager software:**

Note – Ignore any dependency checks during removal of the packages.

```
# pkgrm package_name
```

2. **Follow the instructions on the screen to remove each package.**

Your A3*x*00 system is now ready for installation of the Sun StorEdge RAID Manager 6.22 software.

▼ To Install Sun StorEdge RAID Manager 6.22

You must have *root* privileges to install this software. Because this installation procedure may require a reboot of the operating system, make sure that other users are not on the system during the installation of this software.

Note – Do not add any new peripherals or devices to your system until you have completed your Sun StorEdge RAID Manager upgrade.

1. **Load the Sun StorEdge RAID Manager CD into your CD-ROM drive, label-side facing up.**
2. **Become** `superuser` **by using the** `su` **command and entering your** `superuser` **password.**
3. **At the system prompt, type:**

```
# cd /cdrom/cdrom0/<product>
```

4. **At the system prompt, type:**

```
# pkgadd -d 'pwd'
```

Follow the instructions on the screen to choose and install the packages provided on the CD-ROM.

To install Sun StorEdge RAID Manager, choose the software packages from the software CD in the following order:

a. SUNWosafw

b. SUNWosamn

c. SUNWosar

d. SUNWosau

During pkgadd installation, information about tasks performed during installation is displayed followed by this prompt:

```
Do you want to continue with this installation?
```

For detailed information about the tasks performed during installation, see the *Sun StorEdge RAID Manager Installation and Support Guide for Solaris* (805-7756).

5. **Respond with** y **(yes).**

6. **After all packages are installed, quit** pkgadd**.**

7. **Restore custom settings from files saved during "To Prepare for Upgrading Sun StorEdge RAID Manager" on page 13.**

Note – You may want to edit the /etc/rc2.d/S20sysetup file to enable the savecore option in the event of a system crash. Refer to your Solaris software documentation for instructions on enabling this option.

---

8. **Shut down the system by typing:**

```
# /usr/sbin/shutdown -y -i0 -g1
```

9. **Reboot the system by typing:**

```
ok boot -r
```

When a message appears (`The system is ready message`) on your screen, do you see the `NVSRAM settings are correct` message?

No	Yes
Continue with Step 10.	Continue with "Verifying the Installation of Sun StorEdge RAID Manager" on page 18.

10. **If the message indicates that the NVSRAM settings were changed, do the following:**

    a. **Turn off the power to all RAID Modules and then on again.**

    b. **Shut down and reboot the system again by typing:**

```
# shutdown -y -i0 -g1
ok boot
```

    c. **After the system starts up again, continue with "Verifying the Installation of Sun StorEdge RAID Manager" on page 18."**

Verifying the Installation of Sun StorEdge RAID Manager

To ensure that the installation of the Sun StorEdge RAID Manager software was successful, test a few features to verify that the RAID arrays are connected correctly and are visible and accessible in your Solaris operating environment.

▼ To Verify the Installation of Sun StorEdge RAID Manager

1. **Verify that the software packages installed correctly by typing the following at the system prompt:**

```
# pkginfo | grep osa
```

2. **For each package, verify that it installed successfully by typing the following:**

```
# pkginfo -l package_name
```

A list showing package statistics will be returned by the previous command. The status field displays `completely installed` if the installation was successful.

3. **At the system prompt, type:**

```
# ps -ef | grep arraymon
```

A confirmation shows the array monitor (`arraymon`) as an active process, for example:

```
root  1724     1  0   Aug 02 ?        0:14 /usr/lib/osa/bin/arraymon
root  5520  5512  0 16:31:18 pts/6    0:00 grep arraymon
```

4. **At the system prompt, type:**

```
# ps -ef | grep rdaemon
```

A confirmation shows the `rdac` resolution/restart daemons as two active processes.

```
root  1764  1745  0   Aug 02 ?        0:00 /usr/lib/osa/bin/rdaemon 29 156 5
root  1745     1  0   Aug 02 ?        0:00 /usr/lib/osa/bin/rdaemon 29 156 5
root  5522  5512  0 16:31:40 pts/6    0:00 grep rdaemon
```

5. **At the system prompt, type:**

```
# /usr/lib/osa/bin/lad
```

A list of A3*x*00 controllers is displayed. If the Sun StorEdge RAID Manager software does not recognize any arrays during the boot process, the following message is displayed:

```
              No RAID Modules Found
```

If this message appeared on your screen, verify that the hardware is connected and is operational, follow the steps to reboot the system as described in "To Install Sun StorEdge RAID Manager 6.22" on page 15" (see Step 8 and Step 9 on page 17).

If problems persist after you have checked the hardware and restarted the system, contact your local Sun solution center or Sun service provider for further assistance.

6. **At the system prompt, type:**

```
# format
```

The `format` command displays a list of all configured Logical Units (LUNs) on the Sun StorEdge RAID Manager software that are visible and accessible in the Solaris operating environment. Verify that the device names are equivalent between the output of the RAID Manager `lad` command and the Solaris `format` command.

Keep in mind that as long as the LUNs have not been moved between controllers, any output about devices from the `lad` command and the `format` command should be the same.

7. **Refer to the** *Sun StorEdge RAID Manager Release Notes* **(805-7758) for information about preserving the device names of LUNs that have valid data.**

Installing Required Hardware

Finally, you are now ready to install new components or replace existing components on your A3*x*00 system for FC-AL connectivity.

- Install a FC-AL connection between the host system and the RAID arrays with a Sun StorEdge Sbus or PCI FC-100 Host Adapter (HBA).
- Replace existing A3*x*00 UltraSCSI controllers with A3*x*00 FC-AL controllers.
- Bring the A3*x*00 UltraSCSI controllers online as FC-AL devices.

▼ To Install and Replace Hardware for FC-AL Connectivity

1. **Bring the host system down to the OK prompt to begin hardware conversion by typing:**

```
# init 0
```

Note – If the `EEPROM setting auto-reboot?` is set to `true` (default), the system boots automatically when the system is powered on again. A reconfiguration reboot is required for Solaris to recognize the new FC-AL devices. To stop the boot process when the host is powered on again, run a `L1-A` command to the host.

---

2. **If any hardware must be installed on the host, power it off now.**
3. **Power off the A3*x*00 array that you want to convert from UltraSCSI to FC-AL.**
4. **Disconnect the SCSI Differential cables between the host and the A3*x*00 array.**

   Refer to the *Sun StorEdge A3500/A3500FC Controller Module Guide* (805-4980) for instructions on disconnecting SCSI differential cables and installing SCSI differential terminators (see Step 5).

5. **Install the SCSI Differential terminators on the back side of the A3*x*00 controller module (the same area from which you removed the SCSI host connection cables).**
6. **Replace or install any hardware components on the host, such as a Sun StorEdge Sbus or PCI FC-100 host adapter card.**

   For detailed instructions on replacing or installing host adapter cards, refer to the following manuals:

- *Sun StorEdge SBus FC-100 Host Adapter Installation and Service Manual* (802-7572)
- *Sun StorEdge PCI FC-100 Host Adapter Installation Manual* (805-3682)

7. **Remove both controllers from the A3*x*00 controller module.**

   Refer to the *Sun StorEdge A3500/A3500FC Controller Module Guide* (805-4980) for instructions on removing and replacing controllers.

8. **Place the new A3*x*00FC controllers in the controller module, making sure the replacement controllers have one of the following part numbers:**
   - 540-4026 A3500FC controller for A3500 array (with D1000 tray)
   - 540-4027 A3500FC controller for A3000 array (with RSM tray)

9. **Power on the A3*x*00 array and verify that the controllers are in an operational state by checking the LEDs for each controller.**

   Acceptable operational states are:
   - Active / Active
     - LED patterns on each controller alternate between 0x00 then 0x80.
   - Active / Passive
     - LED patterns on one controller alternate between 0x00 then 0x80 (the Active controller).
     - LED patterns on the alternate controller alternate between 0x6E then 0xEE (the Passive controller).

   If the operational states displayed on the LEDs are different from those described here, contact your local Sun solution center or Sun service provider for assistance.

Note – For supported host connection options, see "Supported Hardware Configurations" on page 3.

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10. **Connect the new A3*x*000FC array to the host with the fibre optic cables.**

    Refer to the *Sun StorEdge A3500/A3500FC Controller Module Guide* (805-4980) for instructions on connecting the fibre optic cables between the host system and the RAID arrays.

11. **Reboot the system by typing:**

```
ok boot -r
```

12. **When the** `The system is ready message` **appears on your screen, do you see the** `NVSRAM settings are correct` **message?**

No	Yes
Continue with Step 13.	You have successfully completed installing / replacing the hardware required for FC-AL connectivity. Continue with Step 14.

13. **If the message indicates that the NVSRAM settings are not changed, do the following:**

    a. **Refer to Appendix B in the** *Sun StorEdge RAID Manager Installation and Support Guide for Solaris* **(805-7756) for information about NVRAM settings.**

    b. **Contact your local Sun solution center or Sun service provider if you continue to have problems with installing or replacing hardware for FC-AL connectivity.**

14. **Refer to the** *Sun StorEdge RAID Manager Release Notes* **(805-7758) for information about preserving the device names of LUNs that have valid data; see Bug ID 4118532 in the section that discusses "Known Issues."**