Sun StorEdge™ A3500FC Controller Upgrade Guide

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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 Sun StorEdge A3000 or the Sun StorEdgeA3500 is uniquely identified, both types of systems are referred to as Sun StorEdge 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* (*If you are incorporating Solaris software commands in your document, delete this sentence.*)
- AnswerBook2™ online documentation for the Solaris™ operating environment
- Other software documentation that you received with your system

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

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-1   Related Documentation

Title	Part Number
Sun StorEdge A3500/A3500FC Task Map	805-4982-xx
Sun StorEdge A3500/A3500FC Controller Module Guide	805-4980-xx
Sun StorEdge A3500/A3500FC Hardware Configuration Guide	805-4981-xx
Sun StorEdge A3x00 Controller FRU Replacement Guide	805-7854-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 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

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```
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Introduction

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 and to a later version of the Solaris operating environment
- Verify installation of the Sun StorEdge RAID Manager software
- 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

The RAID Manager 6.22 software supports the Solaris 2.6 5/98, Solaris 7, and Solaris 8 operating environments.

Note – For Solaris 8 only, you must install Patch ID 108553-01 (or later rev level). Future releases of RAID Manager will include support for Solaris 8 without this patch.

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 upgrading 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 fiber-optic cable to a Sun StorEdge SBus or PCI FC-100 Host Adapter

■ Controller connection through the Sun StorEdge FC-100 Hub. Each hub is connected to the host through a fiber-optic cable to a Sun StorEdge SBus or PCI FC-100 host adapter

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

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

TABLE 1   Supported Hardware for SBus Configurations

Part Number	Description
540-4026	A3500FC—FC-AL controller for the Sun StorEdge A3500 array (with Sun StorEdge D1000 tray)
540-4027	A3500FC—FC-AL controller for the Sun StorEdge 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 fiber-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 the Sun StorEdge A3500 array (with Sun StorEdge D1000 tray)
540-4027	A3500FC—FC-AL controller for the Sun StorEdge 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 fiber-optic cable
X6732A	Sun StorEdge FC-100 hub

The following paragraphs describe a few of the supported configurations for FC-AL connections between a host (or hosts) and Sun StorEdge A3500FC controller modules. For information about other supported configurations, refer to the *Sun StorEdge A3500/A3500FC Hardware Configuration Guide.*

Direct Host Attachment

FIGURE 1 shows direct host attachment from the Sun StorEdge A3500FC 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 fiber-optic cables

Note – For the highest availability, install each HBA on a different SBus. For servers that can accept multiple SBuses per I/O board, install each HBA on a different I/O board.

Host   Sun StorEdge A3500FC controller module
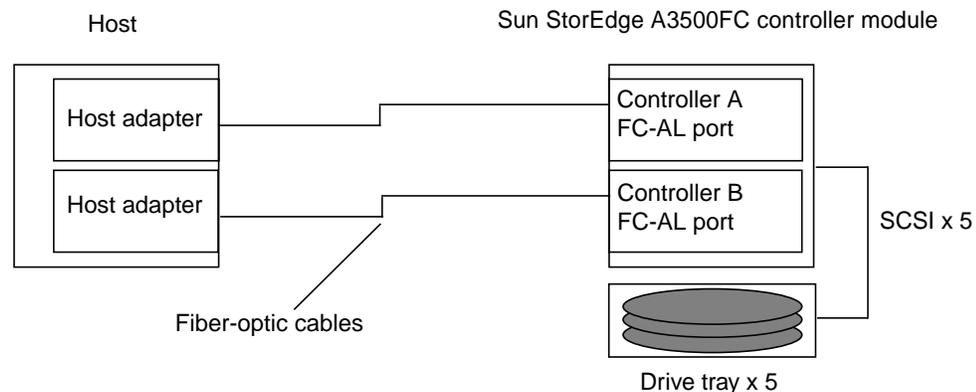
FIGURE 1   Direct Host Attachment—Single Array, Single Host

Host Attachment Through Hubs

The following paragraphs describe the following configurations:

- Single host connected to one controller module using hubs
- Single host connected to multiple controller modules using hubs

Single Host, Single Array

FIGURE 2 shows host attachment through hubs from a single Sun StorEdge A3500FC array. 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

- (6) GBICs

- (4) 15m fiber-optic cables

Note – For the highest availability, install each HBA on a different SBus. For servers that can accept multiple SBuses per I/O board, install each HBA on a different I/O board.
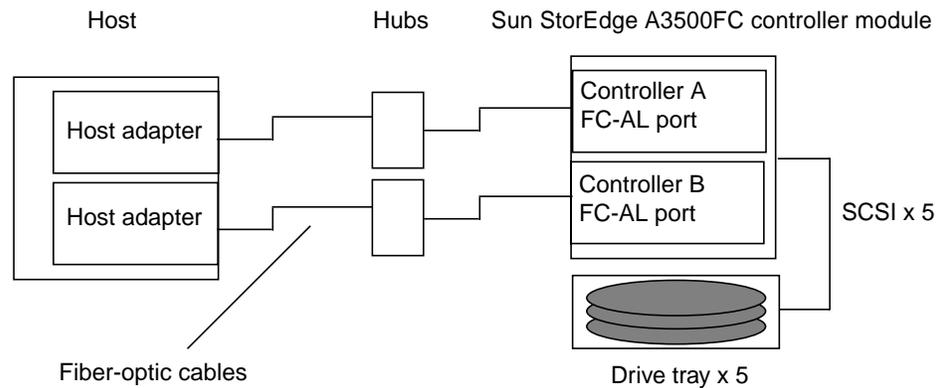
FIGURE 2   Host Attachment Through Hubs—Single Host, Single Array

Single Host, Multiple Arrays

FIGURE 3 shows host attachment through hubs from multiple Sun StorEdge A3500FC 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, install each HBA on a different SBus. For servers that can accept multiple SBuses per I/O board, install each HBA 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* and the *Sun StorEdge A3500/A3500FC Hardware Configuration Guide*.

StorEdge A3500FC controller module

Controller A
FC-AL port

Controller B
FC-AL port

SCSI x 5

Host

Hubs

Host adapter

Host adapter

B
A

A
B

Drive tray x 5

StorEdge A3500FC controller module

Controller A
FC-AL port

Controller B
FC-AL port

SCSI x 5

Fiber-optic cables

Drive tray x 5
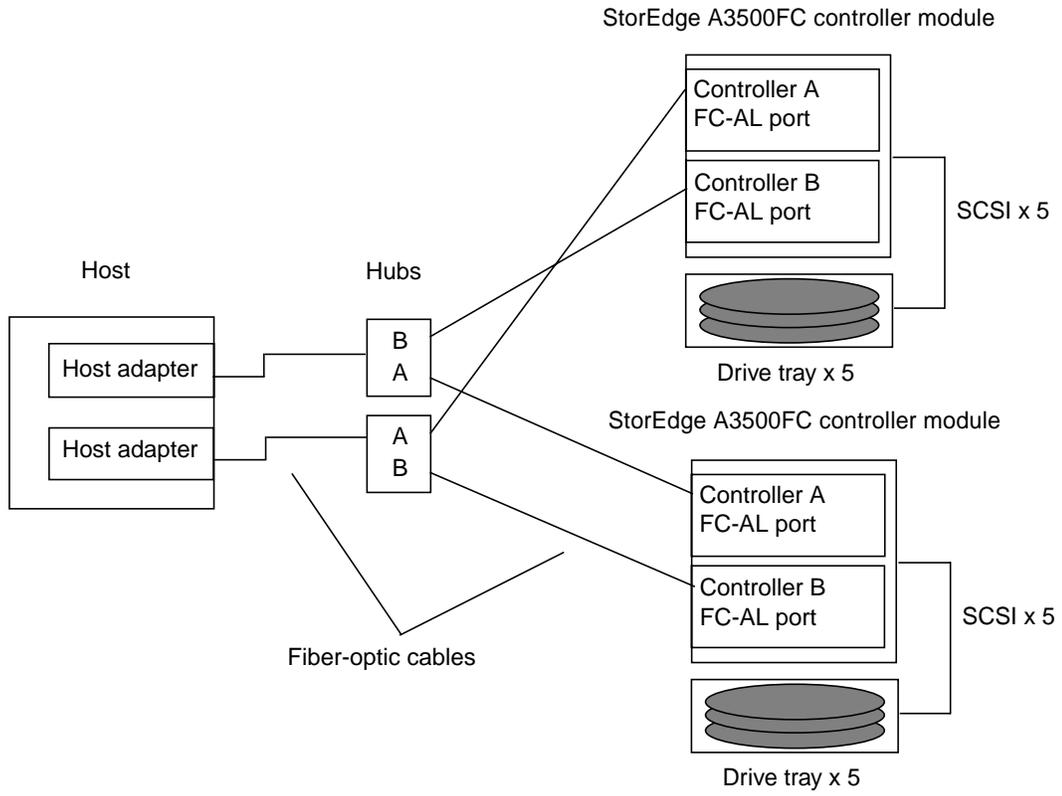
FIGURE 3   Host Attachment Through Hubs—Single Host, Multiple Arrays

Required Patches

Refer to the *Sun StorEdge RAID 6.22 Manager Release Notes* for a list of the hardware and software patches that you must install before using the 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.

The patches listed in TABLE 3 are required for installing and replacing hardware for FC-AL connectivity.

TABLE 3   Patches for FC-AL Connectivity

Array and Tray Configuration	Patch ID	Description
Sun StorEdge A3500 array with Sun StorEdge D1000 drive tray	109232-10	Provides the NVSRAM file to upgrade to the Sun StorEdge A3500FC controller module
Sun StorEdge A3000 array with RSM drive tray	109233-01	Provides the NVSRAM file to upgrade to the Sun StorEdge A3500FC controller module

You can download the actual patches from the SunSolve Online[SM] Public Patch Page Web site:

    http://sunsolve.sun.com/

Be sure to 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 RAID Manager Software With No Change to the Solaris Operating Environment

The following procedure explains how to upgrade to the latest version of 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 RAID Manager Software and the Solaris Operating Environment" on page 11.

▼ To Upgrade RAID Manager Only

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 Sun StorEdge A3x00 arrays.**

2. **Disable any layered volume management applications for upgrade.**
   - For the Solstice DiskSuite™ application, see the *Solstice DiskSuite 4.x Reference Guide.*
   - For the VERITAS Volume Manager application, see the *VERITAS Volume Manager 3.x Installation Guide.*

3. **Prepare for upgrading to the latest version of RAID Manager software.**
   Go to "To Prepare to Upgrade RAID Manager" on page 14.

4. **Remove an earlier version of RAID Manager.**
   Go to "To Remove an Earlier Version of RAID Manager" on page 16.

5. **Install all required patches as outlined in the** *Sun StorEdge RAID Manager Release Notes.*

> **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 you execute 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.

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

   Go to "To Install RAID Manager 6.22" on page 16.

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

   Go to "To Verify the Installation of RAID Manager" on page 18.

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

8. **Replace and install any system hardware or array hardware required for Fibre Channel connectivity**

   Go to "To Install or Replace Hardware for FC-AL Connectivity" on page 20.

9. **Reverify installation of the software with the newly installed FC-AL connection.**

   Return to Step 3 through Step 6 in "To Verify the Installation of RAID Manager" on page 18.

10. **Enable any layered volume management applications as described in the installation guide for each application (see Step 2).**

> **Caution –** If the VERITAS Volume Manager 3.*x* software is installed on your system, a default feature known as dynamic multi-pathing (DMP) is *active* by default. The RAID Manager software and the Sun StorEdge A3*x*00 array do not support DMP. Redundant I/O pathing is maintained internally by the RAID Manager software. Therefore, you must disable the DMP feature in Volume Manager and reboot the system.

Refer to the *VERITAS Volume Manager 3.x Release Notes* and the *VERITAS Volume Manager 3.x System Administrator's Guide* for detailed information about disabling the DMP feature in Volume Manager.

Upgrading RAID Manager Software and the Solaris Operating Environment

The following procedure explains how to upgrade to the latest version of RAID Manager software and upgrade the Solaris operating environment.

▼ To Upgrade RAID Manager and 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 RAID Manager Software With No Change to the Solaris Operating Environment" on page 9.

1. **Repair any hardware failures on the Sun StorEdge A3*x*00 arrays.**

2. **Disable any layered volume management applications for upgrade.**
   - For the Solstice DiskSuite™ application, see the *Solstice DiskSuite 4.x Reference Guide.*
   - For the VERITAS Volume Manager application, see the *VERITAS Volume Manager 3.x Installation Guide.*

3. **Prepare for upgrading to the latest version of RAID Manager software.**

   Go to "To Prepare to Upgrade RAID Manager" on page 14.

4. **Remove an earlier version of RAID Manager.**

   Go to "To Remove an Earlier Version of RAID Manager" on page 16.

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 upgrading to RAID Manager 6.22 software.

6. **Install all required patches as outlined in the** *Sun StorEdge RAID Manager 6.22 Release Notes.*

   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 for loading and initializing the newly patched device drivers.

7. **Install the RAID Manager 6.22 software.**

   Go to "To Install RAID Manager 6.22" on page 16.

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

   Go to "To Verify the Installation of RAID Manager" on page 18.

   At this point, the Sun StorEdge 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 "To Install or Replace Hardware for FC-AL Connectivity" on page 20.

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

    Return to Step 3 through Step 6 in "To Verify the Installation of RAID Manager" on page 18.

11. **Enable any layered volume management applications as described in the installation guide for each application (see Step 2).**

Caution – If the VERITAS Volume Manager 3.*x* software is installed on your system, a default feature known as dynamic multi-pathing (DMP) is *active* by default. The RAID Manager software and the Sun StorEdge A3*x*00 array do not support DMP. Redundant I/O pathing is maintained internally by the RAID Manager software. Therefore, you must disable the DMP feature in Volume Manager and reboot the system.

Refer to the *VERITAS Volume Manager 3.x Release Notes* and the *VERITAS Volume Manager 3.x System Administrator's Guide* for detailed information about disabling the DMP feature in Volume Manager.

Preparing to Upgrade RAID Manager

Before you attempt to upgrade your current version of RAID Manager, note the following:

- Do not add or remove any new peripherals or devices 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 have made. Do *not* copy the old files over the new files. This action destroys new parameters and scripts that were installed with the latest version of RAID Manager software.

- If you are upgrading from RAID Manager 6.0, the RAID module numbers and/or names will change. In the newer versions of the software the module name is derived from the host machine where the RAID Manager software is installed. With 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 RAID Manager 6.0 or 6.1, any LUNs created in these earlier versions cannot use the new features in RAID Manager 6.22 for dynamic drive groups and LUNs. LUNs created with RAID Manager 6.0 or 6.1 /appear to have capacity mis-match problems whenever a failed drive is replaced. Therefore, Sun recommends deleting and recreating LUNs that were created with these earlier versions of RAID Manager.

Note – Be sure to back up your data before deleting any LUNs.

- 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 "Known Issues").

▼ To Prepare to Upgrade 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 $\rightarrow$ Save Module Profile.**

   b. **Make sure all information is selected, and select OK.**

   c. **Save the information to a location that is separate from the storage management software to ensure that 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 under "Known Issues" in the** *Sun StorEdge RAID Manager Release Notes*.

4. **Exit the RAID Manager software.**

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

   The system is now ready for you to remove an earlier version of RAID Manager software.

Removing an Earlier Version of RAID Manager

Use the `pkgrm` utility to remove an earlier version of RAID Manager from your Sun StorEdge A3x00 system. Based on the current version of RAID Manager software installed on your system, remove the packages in the order described in TABLE 4.

TABLE 4   Removing Earlier Versions of RAID Manager

RAID Manager Version	Packages To Be Removed

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 `/usr/lib/osa/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.

▼ To Remove an Earlier Version of RAID Manager

1. Type the following command to remove each package as listed in TABLE 4 **for your current version of RAID Manager software:**

```
# pkgrm package-name
```

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

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

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

Installing RAID Manager 6.22 Software

You must have *root* privileges to install RAID Manager 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 RAID Manager upgrade.

▼ To Install RAID Manager 6.22

1. Load the RAID Manager CD-ROM into your CD-ROM drive, with the 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'
```

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

   To install RAID Manager, choose the software packages from the software CD-ROM 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.*

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

7. **After all packages have been installed, quit** pkgadd**.**

8. **Restore custom settings from files saved during the procedure "Preparing to Upgrade 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.

   ---

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

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

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

```
ok boot -r
```

11. **When a message appears (**`The system is ready`**) on your screen, see if the message that appears indicates that the NVSRAM settings are correct.**

   - If no, go to Step 10.
   - If yes, go to "Verifying the Installation of RAID Manager" on page 18.

12. **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. **Go to "Verifying the Installation of RAID Manager" on page 18."**

Verifying the Installation of RAID Manager

To ensure that the installation of the 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 RAID Manager

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

```
# pkginfo | grep osa
```

2. **Verify that each package was installed successfully by typing the following:**

```
# pkginfo -l package-name
```

A list showing package statistics appears. 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 Sun StorEdge A3x00 controllers is displayed. If the 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 and reboot the system as described in Step 10 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) under the 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* **for information about preserving the device names of LUNs that have valid data.**

Installing Required Hardware

You are now ready to install new components or replace existing components on your Sun StorEdge 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 Sun StorEdge A3*x*00 UltraSCSI controllers with Sun StorEdge A3500 FC-AL controllers.

- Bring the Sun StorEdge A3*x*00 UltraSCSI controllers online as FC-AL devices.

▼ To Install or 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 the Solaris operating environment 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. **Power off any hardware that must be installed on the host.**

3. **Power off the Sun StorEdge A3*x*00 controller module that you want to convert from UltraSCSI to FC-AL.**

Note – Do *not* power down the entire A3*x*00 rack.

4. **Disconnect the SCSI differential cables between the host and the Sun StorEdge A3*x*00 array.**

   Refer to the *Sun StorEdge A3500/A3500FC Controller Module Guide* 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 Sun StorEdge 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*
   - *Sun StorEdge PCI FC-100 Host Adapter Installation Manual*

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

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

8. **Place the new Sun StorEdge A3*500*FC controllers in the controller module, making sure that the replacement controllers have one of the following part numbers:**
   - 540-4026   Sun StorEdge A3500FC controller for the Sun StorEdge A3500 array (with D1000 drive tray)
   - 540-4027   Sun StorEdge A3500FC controller for the Sun StorEdge A3000 array (with RSM drive tray)

9. **Power on the Sun StorEdge A3x00 controller module 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 Sun StorEdge A3500FC controllers to the host with the fiber-optic cables.**

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

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

    ```
    ok boot -r
    ```

12. **Install one of the following NVSRAM patches:**
    - Patch 109232-01 — for a Sun StorEdge A3500 array with Sun StorEdge D1000 drive trays
    - Patch 109233-01 — for a Sun StorEdge A3000 array with RSM drive trays

13. **In the Maintenance and Tuning dialog box, use the firmware download procedure to load the correct NVSRAM file to both Sun StorEdge A3500FC controllers.**

    Use TABLE 5 to determine the correct NVSRAM file.

    TABLE 5   NVSRAM Files and Product IDs

	Sun StorEdge D1000 Drive Tray	RSM Drive Tray
NVSRAM File	39781DN.DL	39782DN.DL
Product ID	StorEdge A3500FCd	StorEdge A3500FCr

14. **Verify that the product ID is correct as specified in** TABLE 5**.**

15. **Cycle the power on the Sun StorEdge A3500FC controller module by powering it off. Then, power on the two power supplies in the rear of the controller module.**

16. **Refer to the** *Sun StorEdge RAID Manager Release Notes* **for information about preserving the device names of LUNs that have valid data; see the description for Bug ID 4118532 under "Known Issues".**