



Getting Started

RAID Array 410 for Solaris 2.x

Installation Guide

Order Number: EK-SMRA1-IG. B01

Digital Equipment Corporation
Maynard, Massachusetts

Second Edition, May 1995

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About This Guide

This section identifies the audience of this guide and describes the contents (chapter by chapter) and structure. In addition, this section includes a list of associated documents and the conventions used in this guide.

This guide provides the following:

- Description of how to unpack and assemble the RAID Array 410 Subsystem
- Software installation of the Array and its RAID Manager Graphic User's Interface (GUI)

Intended Audience

This guide is intended for administrators of StorageWorks RAID Array 410 Subsystems. Installing the StorageWorks RAID Array 410 Subsystem and Manager for Sun requires a general understanding of UNIX system administration and SBus products installation procedures

Document Structure

This guide contains the following chapters:

Chapter 1: Unpacking

Unpacking describes how to unpack and place the SWXRA-Yx Office Expansion RAID Enclosure.

Chapter 2: Installing the StorageWorks RAID Array 410 Hardware

Chapter 2 prepares your array for first time use and connects your workstation and subsystem through the host adapter board. This chapter, along with your workstation and the associated StorageWorks RAID Array 410 Subsystem manuals, provides instructions for preparing and installing the host adapter and the subsystem enclosure

Chapter 3: Installing StorageWorks RAID Array 410 Manager for Sun on Solaris 2.x

This chapter describes the StorageWorks RAID Array 410 Manager for Sun and the steps for installing it and associated device drivers onto Sun systems running Solaris 2.3 or 2.4. The installation steps include organizing your system and existing files, setting up a RAID environment, and loading the RAID Manager packages onto your hard disk.

Appendix A: Installation Session Example

Appendix A contains a sample of an installation session to aid in quickly bringing the RAID Array 410 to a running, functional state.

Associated Documents

In addition to this guide, the following documentation is useful to the reader:

Table 1 Associated Documents

Document Title	Order Number
<i>SWXSC-AA Office Expansion RAID Enclosure User's Guide</i>	<i>EK-SMCPD-UG. A01</i>
<i>StorageWorks RAID Array 410 Manager V2.0 for Sun User's Guide</i>	<i>AA-QEPJB-TE</i>
<i>SWXRC-04 RAID Array Controller User Guide</i>	<i>EK-SMCS1-UG. B01</i>
<i>Release Notes</i>	<i>AA-QEPPB-TE</i>

Conventions

This guide uses the following documentation conventions:

Table 2 Style Conventions

Style	Meaning
boldface monospace type	To be input by the user
plain monospace type	Screen text
<i>italic type</i>	For emphasis, manual titles, utilities, menus, screens, and filenames
#	Represents the SunOS system prompt. Do not type it as part of information given here as to be input by the user.

Table 3 Supported Operating System References Conventions

This Reference to Operating Systems	Means These Versions of the Operating Systems
Solaris 2.x	Solaris 2.3 or 2.4

Revision Record

This Revision Record provides a concise publication history of this manual. It lists the manual revision levels, release dates, and reasons for the revisions. It also describes how the changes to affected pages are marked in the manual.

The following revision history lists all revisions of this publication and their effective dates. The publication part number is included in the Revision Level column, with the last entry denoting the latest revision. This publication supports the StorageWorks RAID Array 410 Subsystem.

Revision Level	Date	Summary of Changes
EK-SMRA1-IG. A01	December 1994	Original release. This release supports StorageWorks RAID Array 410 Manager V1.0 for Sun
EK-SMRA1-IG. B01	April 1995	Updated to support SWXRC-04 Firmware Release 2.5 and RAID Array 410 Manager V2.0 for Sun

Unpacking The SWXRA-Yx RAID Array 410 Subsystem

This chapter describes the site preparation and unpacking procedures for the SWXRA-Yx RAID Array 410 Subsystem.

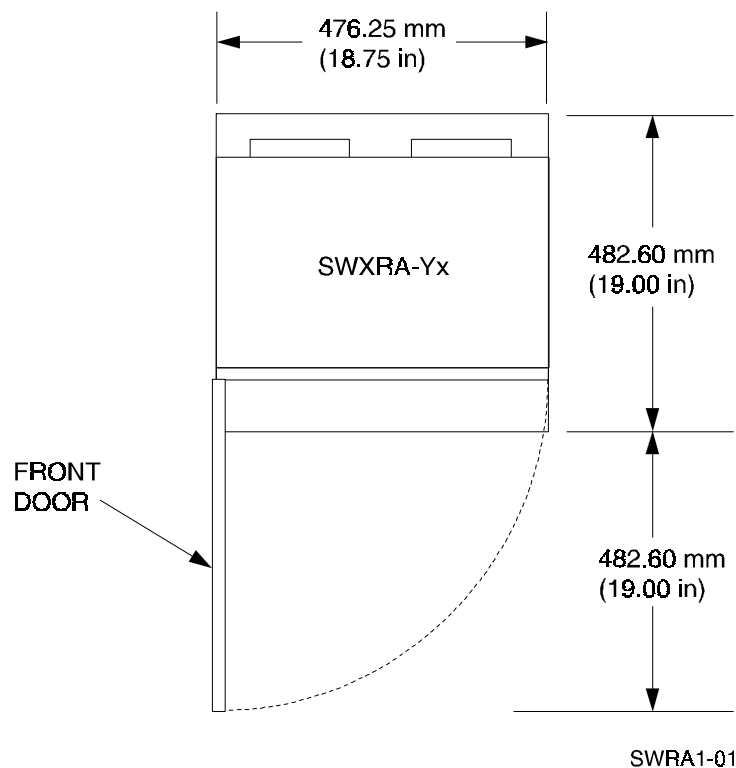
NOTE

Prior to performing these procedures, read the Release Notes that are included in the software kit.

1.1 Site Preparation

The SWXRA-Yx RAID Array 410 Subsystem is designed for installation in Federal Communications Commission (FCC) Class A environments. Before installing the SWXRA-Yx, make sure that adequate space is available in front of the enclosure for opening the front door (19 inches clearance) and around the enclosure for adequate airflow. See Figure 1–1 for specific space requirements.

Figure 1–1 Minimum Installation Clearance Measurement



1.2 Unpacking the SWXRA-Yx

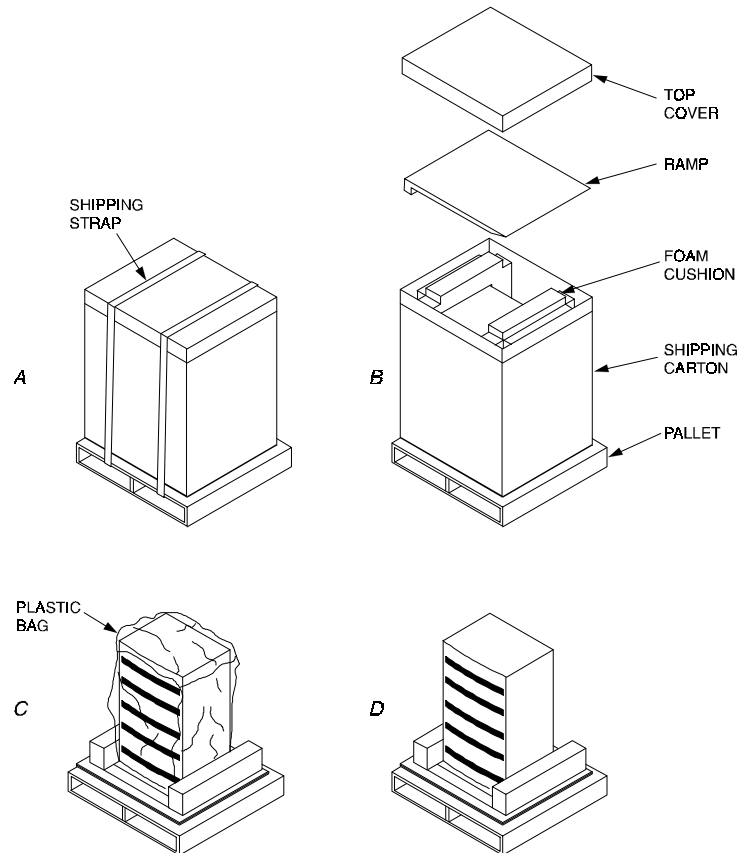
The SWXRA-Yx RAID Array 410 is packed in a corrugated carton attached to a wooden shipping pallet, as shown in Figure 1–2A. Unpack the SWXRA-Yx as follows:

NOTE

Before unpacking the equipment, inspect the shipping carton for signs of external damage. Report any damage to the local carrier and to your sales representative.

1. Remove the shipping straps (Figure 1–2A).
2. Remove the top cover (Figure 1–2B).
3. Remove the ramp from the top of the shipping carton (Figure 1–2B) and set it aside for subsequent use in moving the SWXRA-Yx off the pallet.
4. Remove the two foam cushions from the top of the SWXRA-Yx container (Figure 1–2B).
5. Remove the sealed cardboard box packed beside the subsystem unit. It contains cable and documentation.
6. Remove the cardboard carton surrounding the SWXRA-Yx(Figure 1–2B).
7. Remove the plastic barrier bag (Figure 1–2C).
8. Once the SWXRA-Yx is exposed (Figure 1–2D), examine the equipment for any apparent damage. Report any such problems immediately to your sales representative.

Figure 1–2 Unpacking the SWXRA-Yx RAID Array 410



SW300-09

1.3 Removing the SWXRA-Yx from the Pallet

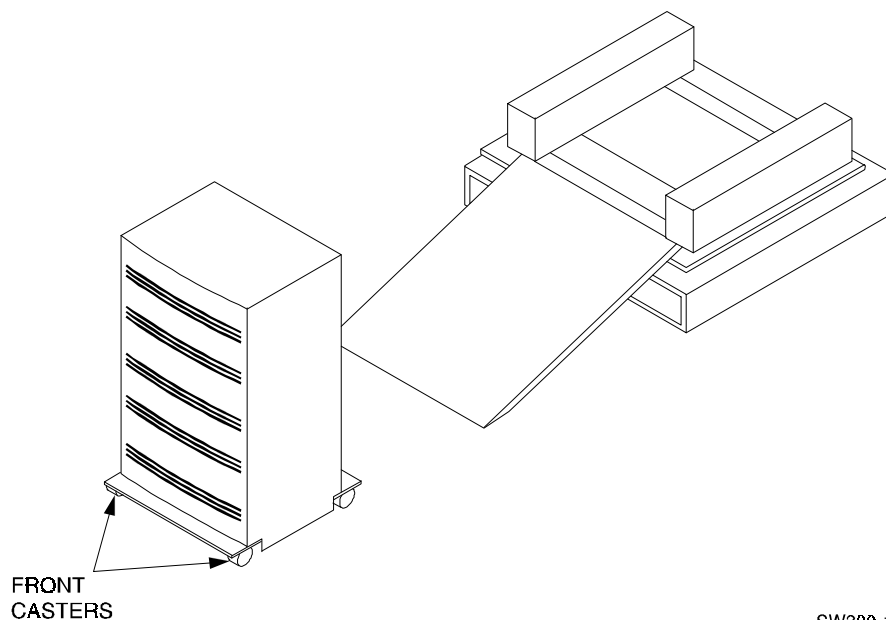
Use the following procedure to remove the SWXRA-Yx from the shipping pallet:

WARNING

Serious personnel injury may result if correct safety precautions are not taken during the removal procedure.

1. Attach the ramp to the shipping pallet by fitting the lip of the ramp into the groove on the pallet, as shown in Figure 1–3.
2. Lift the lock lever on each front caster to its *up* position so that the SWXRA-Yx enclosure can be moved.

Figure 1–3 Installation of Ramp on Shipping Pallet



WARNING

We recommend that three people be assigned to the task of unloading the SWXRA-Yx array from its shipping pallet. Failure to use sufficient personnel may result in personnel injury and equipment damage.

CAUTION

Do not drop the SWXRA-Yx array from a height of more than two inches, as serious structural damage can result.

3. Grasping the sheet metal base assembly, carefully lift the rear of the SWXRA-Yx enclosure over the “hump” in the center of the pallet and then roll the SWXRA-Yx enclosure off the pallet and down the ramp to the floor. If any further lifting of the SWXRA-Yx is required, grasp the sheet metal base assembly on the side and lift it carefully.
4. Retain the shipping container and all packing materials.

1.4 Placing the SWXRA-Yx RAID Array 410

Use the following procedure to move the SWXRA-Yx to its designated site:

WARNING

To prevent damage to the SWXRA-Yx and injury to personnel,
make sure to provide a clear path for the casters.

1. Roll the SWXRA-Yx enclosure to the desired location.
2. If required, engage the lock on each front caster to prevent the enclosure from moving.

Installing the StorageWorks RAID Array 410 Hardware

In preparing your array for first time use, you need to connect your workstation to the subsystem through the host adapter board. This chapter, along with your workstation and the associated StorageWorks RAID Array 410 Subsystem manuals, provides instructions for preparing and installing the host adapter and the subsystem enclosure.

NOTE

References in this manual to Solaris 2.x should be assumed to mean Solaris 2.3 or 2.4.

2.1 Getting Started

Thank you for purchasing a StorageWorks RAID Array 410 Subsystem. You received the following:

- StorageWorks SWXRA-Yx RAID Array 410 Subsystem: an SWXRC-04 RAID controller with 32MB of read/write-back cache, disk drives, a StorageWorks storage expansion enclosure, the SWXRC-04 RAID Controller User's Guide, the SWXSC-AA Office Expansion RAID Enclosure User's Guide, a cable for connecting the maintenance port of the controller to the serial port of a personal computer, and adapters for connecting to a serial port on a personal computer, video terminal, or computer system.
- StorageWorks SWSK-CA RAID Array 410 Manager for Sun platform kit: an SBus FWD (Fast Wide Differential) SCSI-2 Host Adapter, BN21K-05 SCSI cable, the StorageWorks RAID Array 410 Manager V2.0 for Sun software distribution media (CD-ROM), a PCMCIA card containing SWXRC-04 firmware release V2.5, and the StorageWorks RAID Array 410 for Sun Solaris 2.x Installation Guide.

The major steps for installing all of the components of the StorageWorks RAID Array 410 Subsystem, include the following:

1. Installing the host adapter.
2. Installing the StorageWorks RAID Array 410 Subsystem.
3. Performing the software installation process, which loads the device drivers and RAID manager software (Chapter 3 of this guide).
4. Applying the mandatory patch to the SWXRC-04 controller(s).

NOTE

Installing the StorageWorks RAID Array 410 Subsystem and Manager for Sun requires a general understanding of the following:

- SPARC systems
- Solaris 2.x
- Basic hardware installation procedures
- Or, contact your service representative for installation assistance.

Before starting your installation, follow these steps:

- Verify the availability of user-supplied hardware and software.
- Inventory the contents of the StorageWorks RAID Array 410 Subsystem platform kit.
- Inventory the contents of the StorageWorks RAID Array 410 Subsystem.
- Follow your normal procedures to back up your system files.

2.1.1 Verifying User Supplied Hardware and Software (System Requirements)

The StorageWorks RAID Array 410 Subsystem requires the following user-supplied hardware and software:

- SPARCstation (except SPARCstation 1), SPARCserver, or SPARCcenter host
 - A CD-ROM drive
 - An available SBus slot
 - 10 MB of disk space for installation and regular use
 - The associated system hardware manual
- Appropriate tools to service your computer
- The Solaris 2.x operating system.

2.1.2 Verifying The StorageWorks RAID Array 410 Platform Kit and Subsystem Components

The Storage Works RAID Array 410 Platform SWSK-CA Kit provides the following components:

- This guide.
- The StorageWorks for RAID Array 410 Manager V2.0 for Sun User's Guide.
- The StorageWorks for RAID Array 410 Manager V2.0 for Sun Release Notes.
- The QW-3CLAA-AA Digital License Agreement.
- An SBus FWD SCSI-2 Host Adapter.
- A BN21K-05 SCSI cable, five meters long, with a right-angle high-density 68-pin connector on one end and a straight high-density 68-pin connector on the other.
- StorageWorks RAID Array 410 Manager for Sun distribution media on one CD-ROM disk.
- A PCMCIA program card containing SWXRC-04 firmware release V2.5

The StorageWorks RAID Array 410 Subsystem SWXRA-YA provides the following components:

- The SWXSC-AA Office Expansion RAID Enclosure User's Guide.
- The SWXRC-04 RAID Controller User's Guide.

- The StorageWorks RAID Array 410 Office Expansion RAID Enclosure
- A cable, plus adapters, for connecting the maintenance port of the controller to the serial port of a personal computer, video terminal, or computer system.
- Power Cable.
- Keys.
- RAID Array 410 Controller Firmware License Keys.

NOTE

Retain the Firmware License Key information in a safe place. It may be required to reinitialize the RAID Array Controller.

2.1.3 Backing up Your System

Follow your normal procedures to back up your system before installing the subsystem and RAID Manager.

2.2 Preparing and Installing the SBus SCSI-2 Host Adapter

The SBus SCSI-2 host adapter is an SBus-to-SCSI fast 16-bit differential host adapter. You connect your computer to the StorageWorks RAID Array 410 Subsystem through the host adapter and a connecting cable.

You need the following before you begin:

- The SBus SCSI-2 host adapter board (use precautions to protect the board from static discharge)
- Your computer system hardware manual
- Appropriate tools to service your computer
- The BN21K-05 SCSI cable, five meters long, with a right angle high density 68-pin connector on one end and a straight high density 68-pin connector on the other

Refer to your system manual for additional reference information on installing a host adapter.

2.2.1 Preparing to Install the Host Adapter

Before performing the installation of the host adapter in your Sun system, take precautions to protect the board from electrostatic discharge. Then perform the following steps:

NOTE

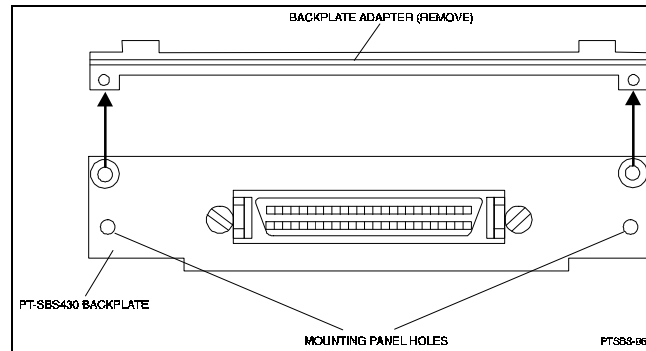
The installation procedure varies depending upon which model of the SPARC system you are using. Watch for model specific deviations throughout this procedure.

1. Power down the SPARCstation and attached peripherals.
2. Open your system. Refer to your system manual for assistance in completing this procedure.

2.2.2 Installing the Host Adapter in 600MP SPARC Server and SPARCstations 10 and 20

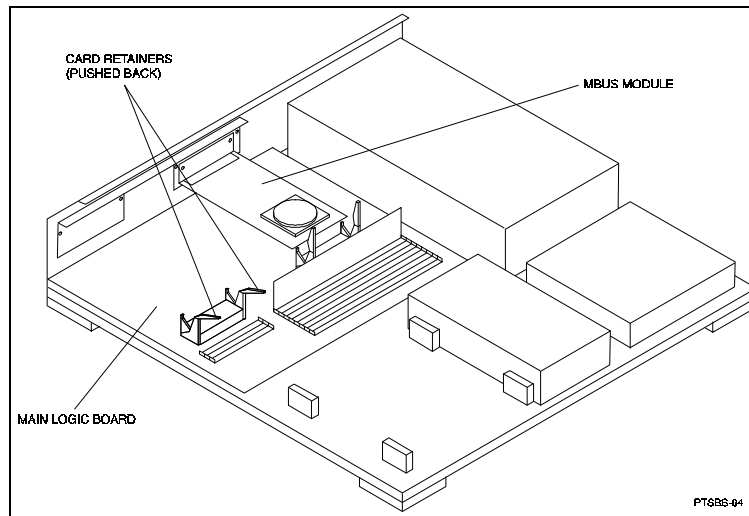
1. Unscrew two small phillips-head screws to remove the back plate adapter, shown in Figure 2-1, from the Sbus to FWD SCSI-2 host adapter.

Figure 2-1 Backplate Adapter



2. Locate the lowest numbered, available SBus slot in your Sun system. Refer to your system manual for Sbus slot numbering. Use this slot to install the host adapter, so that device addresses will not change if you add a board later.
3. Push back both retainers on the selected SBus slot in your Sun system, as shown in Figure 2-2.

Figure 2-2 The SBus Card Retainers

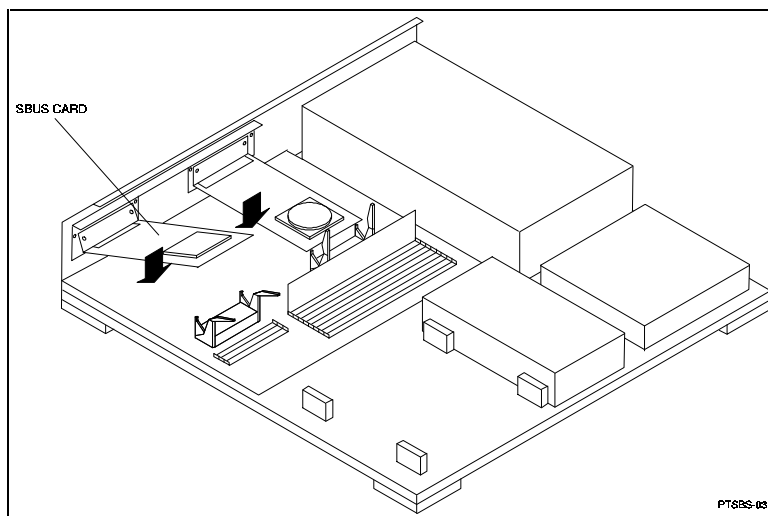


CAUTION

The plastic board retainer on the host adapter fits against the cover and holds the SBus card in place. It is not a handle; it can break if you use it to insert or remove the board.

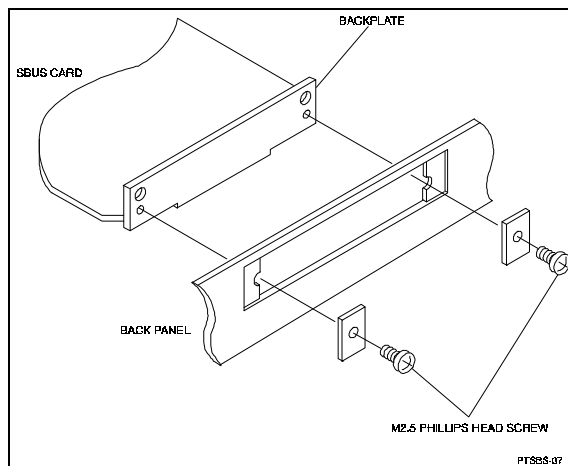
- Align the host adapter connector with the SBus slot socket and gently push the connector into the socket by pressing on the corners of the board, as shown in Figure 2–3.

Figure 2–3 The SBus Card Connects by Gently Pressing on the Corners of the Board



- Screw the backplate of the SBus card to the system unit back panel as shown in Figure 2–4.

Figure 2–4 The SBus Card Mounting Plate in a 600MP SPARCserver or a SPARCstation 10 or 20



- Push the SBus slot retainers forward onto the SBus host adapter board, locking it into place.
- Tighten any screws that you loosened, and close the system.

2.2.3 Installing the Host Adapter in All Other Systems (except 600MP SPARCserver and SPARCstations 10 and 20)

1. Slide the board at an angle into the top of the Sun system back panel, as shown in Figure 2-5.
2. Hook the host adapter mounting plate (shown in Figure 2-5) upward into the back panel of the system unit. As you swing the board down towards the card retainers, the back panel tabs will align the SBus card vertically and horizontally in the back panel cutout.
If the card does not swing into position easily, adjust the horizontal position of the SBus card so that the notches on the card line up with the tabs on the back panel, as shown in Figure 2-6.

Figure 2-5 The SBus Card Mounting Plate Hooked Into the System Unit Back Panel SBus Card Retainers

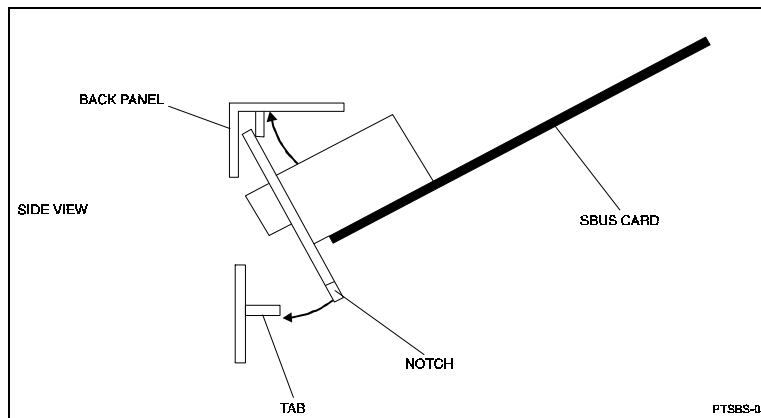
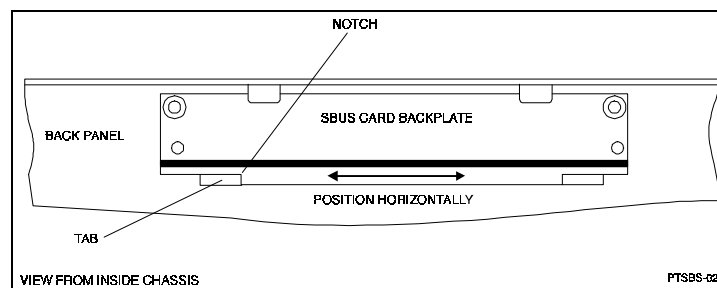


Figure 2-6 How the Notches on the SBus Card Line up with the tabs on the System Unit Back Panel



3. Align the host adapter connector with the Sbus slot socket and gently push the connector into the socket by pressing on the corners of the board, as shown in Figure 2-6.
4. Push the Sbus slot retainers forward onto the Sbus host adapter board, locking it in place.
5. Tighten any screws that you loosened, and close the system.
6. Reconnect any cables from the peripheral devices.

2.3 Installing the Subsystem

1. Using the keys provided, unlock the RAID Array Enclosure.
2. Install the new PCMCIA card, supplied in the platform kit, in the controller. Instructions for installing the card are contained in *RAID Array Controller (SWXRC-04) Program Card Installation Notes (EK-SMCS1-PN)* which is included with the card.
3. Install any additional disk StorageWorks Building Blocks (SBBs) up to a maximum of 24 SBBs. Begin with the lowest uninstalled row and add SBBs from left to right. Holding the SBB in both hands, insert it into the guide slots and firmly push it into the shelf until the mounting tabs snap in place.
4. Install the BN21K-05 5 meter cable between the host system and the array subsystem.
 - Route the right angle end connector end of the cable under the SWXRA-Yx Subsystem enclosure and up through the front access hole nearest to the controller connector. Install the connector with the cable dressed to the right, by firmly pushing it onto the controller's mating connector. Secure it by tightening the 2 screws on the cable connector.

Similarly connect the (other end) straight connector to the host system S-bus adapter.

5. Install the power cable. Connect the female end of the power cable to the RAID Array power controller located at the lower left front corner of the array. Plug the power cable into a 110/220 VAC line voltage source (the power supply automatically senses the voltage level and will work with either voltage).
6. If you have purchased a second SWXRC-04 controller, it should be installed at this point in the procedure. Dual redundant controllers offer automatic, intelligent failover of attached storage devices in the event of a controller failure. Up to four SCSI targets and 36 SCSI devices can be supported by the two controllers in a dual-redundant configuration

In a dual-redundant configuration, one terminal can set both controller configurations. Installation procedures for the second controller can be found in Chapter 9 of the *SWXRC-04 RAID Controller User's Guide (EK-SMCS1-UG)*. After installation of both controllers, use the CLI to define the controllers' parameters in the following order from a terminal connected to the original controller:

Check the cache and battery conditions of the original controller using the following command:

```
SWXRC> show this_controller full
```

- Cache condition should be GOOD

If the Cache condition is BAD call your salesperson for unit service or replacement of the Cache module.
- Battery condition should be GOOD

If the battery condition is LOW, allow the battery to charge with the subsystem power on for at least 6 hours. The battery must be fully charged to protect the data in the Write Back Cache. If the battery condition is still listed as LOW after 6 hours of charging, call your sales person for unit service or replacement of the batteries.

Switch the terminal connection to the second controller and repeat the previous command to check the condition of the cache and battery of the second controller. Then return the terminal connection to the original controller.

Set the controllers SCSI target Ids to the desired values. For example:

```
SWXRC> set this_controller id=0,1
```

Then set the value of the preferred Ids for this controller.

```
SWXRC> set this_controller preferred_id=0
```

Any Ids not preferred by this controller will be serviced by the other controller.

Enter the following command to copy configuration parameters to the other controller – the one the terminal is not connected to:

```
SWXRC> set failover copy=this_controller
```

```
SWXRC> restart other_controller
```

```
SWXRC> restart this_controller
```

Enter the following commands to verify the preceding parameters were set:

```
SWXRC> show this_controller full
```

```
SWXRC> show other_controller full
```

Both controllers should indicate that they are in a dual-redundant configuration.

7. Prior to loading any software as described in Chapter 3, power on the RAID Array for a minimum of 6 hours. The Write-Back Cache Module contains a battery that may have discharged since the time it was factory-installed. If you attempt to initiate any RAID commands when the battery is not charged, unspecified results may occur. The battery will be fully recharged in the time specified.

Installing the StorageWorks RAID Array 410 Manager for Sun on Solaris 2.x

This chapter describes the StorageWorks RAID Array 410 Manager for Sun and the steps for installing it and associated device drivers onto Sun systems running Solaris 2.3 or 2.4. The installation steps include organizing your system and existing files, setting up a RAID environment, and loading the RAID Manager packages (diskettes or CD-ROM) onto your hard disk.

NOTE

Prior to installing the RAID Manager, ascertain that the Write-Back Cache battery is fully charged. This is accomplished by supplying power to the RAID Controller for a minimum of 5-6 hours.

References in this manual to Solaris 2.x should be assumed to mean Solaris 2.3 or 2.4.

The # symbol represents the system prompt

3.1 Installing the RAID Manager for Sun on Solaris 2.x

The procedures for installing the RAID Manager for Sun on 2.x require you to be familiar with adding and removing *packages*. See the “*Adding and Removing Packages*” section in the *Solaris System Configuration and Installation Guide* for more information about *packages*.

Installing the RAID Manager on Solaris 2.x requires the following major steps:

- Organizing Your System and Existing RAID Manager Files (Section 3.1.1)
- Setting up your RAID management environment (Section 3.1.2)
- Loading RAID Array 410 Manager packages onto hard disk (Section 3.1.3)
- Applying the Mandatory Controller Patch (Section 3.1.4)

3.1.1 Organizing Your System and Existing RAID Manager Files

Perform the following procedures prior to installing:

1. Back up your system according to your normal procedure.
2. Check for a previously installed RAID manager package by typing:

```
# pkginfo DECSwm410
```

3. If you locate a previously installed RAID Manager package, do one of the following:
 - Delete the existing RAID manager package using the following command:

```
# pkgrm DECswm410
```
 - Save the existing RAID manager package by redefining RAIDHOME410 to a different directory (see Section 3.1.2).

3.1.2 Setting up your RAID Management Environment

To set up your RAID Management Environment, follow these steps:

1. Select a system user with superuser privileges (for example: root) as the RAID administrator.
2. Log in as the RAID Administrator.
3. To find a file system (for example: /usr) with at least 10 MB free space, type:

```
# df -k
```

NOTE

If you have RAID Array 110 files on your system, you must create a separate directory for the RAID Array 410 files to prevent inadvertent overwriting of similarly named files.

4. Create a directory in which to install the RAID Array 410 Manager software. For example, type:

```
# mkdir /usr/swm410
```
5. See your Solaris 2.x documentation to determine the steps to edit the administrator's start-up script. For example a c-shell user would append to *.cshrc* the following lines in the order shown:

```
setenv RAIDHOME410 /usr/swm410
setenv LD_LIBRARY_PATH /usr/openwin/lib
```

Enter one of the following:

- a. If MANPATH is already defined in *.cshrc*, then enter the following:

```
setenv MANPATH ${MANPATH}:${RAIDHOME410}/man
```

- b. Otherwise enter the following:

```
setenv MANPATH /usr/man:$RAIDHOME410/man
```

A c-shell user then initializes RAIDHOME410 and MANPATH for the current shell session by entering:

```
# source $HOME/.cshrc
```

NOTE

The “base directory” (referred to when you load the RAID Array 410 Manager Software onto Hard disk) is the same as RAIDHOME410.

3.1.3 Loading the RAID Manager Packages onto Hard Disk

You will need approximately 10 MB of permanent space on your hard disk to install and use the RAID Manager.

The RAID Manager software consists of *DECptisp* (driver) files and *DECswm410* (the RAID manager) files. Install the *DECptisp* files first.

Loading the RAID array 410 Manager packages requires the following major steps:

- Mounting the CD-ROM
- Loading *DECptisp*
- Rebooting your computer
- Loading *DECswm410*
- Rebooting your computer

NOTE

An example installation session is shown in Appendix A.

3.1.3.1 Mounting the CD-ROM

1. Check whether the volume management daemon (*vold*) is currently running. Type:

```
# ps -ea | grep vold
```

2. Follow the steps below for "vold currently running" or "vold not currently running," as applicable:

If *vold* is currently running, then:

- a. Insert the CD-ROM into the CD-ROM drive.
- b. Use the *mount* command to check that the volume manager has automatically mounted the CD-ROM, by typing:

```
# mount
```

NOTE

The system may take a few seconds to mount the CD-ROM. If the *mount* command does not indicate that the CD-ROM has been mounted, wait a short interval and then repeat the command.

- c. Change to the *Solaris_2* directory, type:


```
# cd /cdrom/stgwns_ra410_manager_v20/solaris_2
```
- d. Go on to Section 3.1.3.2 to load *DECptisp* or 3.1.3.3 to load *DECswm410*.

If *vold* is not currently running, then:

- a. Insert the CD-ROM into the CD-ROM drive.
- b. Mount the CD-ROM. For example, type:


```
# mount -F hsfs -r /dev/dsk/c0t6d0s2 /cdrom
```
- c. Change to the *Solaris_2* directory, type:


```
# cd /cdrom/solaris_2
```
- d. Go on to Section 3.1.3.2 to load *DECptisp* or 3.1.3.3 to load *DECswm410*.

3.1.3.2 Loading DECptisp

To install the SCSI host adapter driver files, *DECptisp*, follow these steps.

Type:

```
# pkgadd -d .
```

An install options menu appears. Enter Q at any prompt if you want to quit this installation process.

3. Select *DECptisp*. The *pkgadd* program displays copyright information, the base directory path, and files with *setuid* and/or *setgid* permissions, and prompts you to specify whether to install these.
4. Press the **Y** key to install the files. The *pkgadd* program confirms installing these files, informs you that it will execute scripts with super user privileges, and prompts you to specify whether you want to continue.
5. Press the **Y** key to continue with the installation. The *pkgadd* program confirms installing PT-SBS440A SCSI-2 Fast Host Adapter Driver as <DECptisp> files, displays the status of the installation, and then the install options menu.
6. Press **Q** to exit *pkgadd*. The *pkgadd* program prompts you to reboot your computer system. To reboot, do the following:

Type:

```
# touch /reconfigure
```

This forces a reconfiguration boot. Then type,

```
# cd
```

```
# shutdown -y -i6 -g0
```

Then wait for the *Console Login* prompt.

3.1.3.3 Loading DECswm410

1. After rebooting the system, mount the CD-ROM drive performing all the instructions in Section 3.1.3.1.
2. Type:

```
# pkgadd -d .
```

3. Enter your base directory path (this is the same as RAIDHOME410 that you defined in Section 3.1.2). For example, type:

```
/usr/swm410
```

4. Press the **Y** key to install the conflicting files. The *pkgadd* program checks for *setuid*/*setgid* programs and prompts you to specify whether to install them.
5. Press the **Y** key to continue with installation. The *pkgadd* program confirms installing StorageWorks RAID Array 410 Manager for Sun as <DECswm410> files, and displays the status of the installation. The install options menu appears.
6. Press **Q** to exit *pkgadd*. The *pkgadd* program prompts you to reboot your computer system. To reboot, do the following:

Type:

```
# touch /reconfigure
```


This forces a reconfiguration boot. Then type,

```
# cd
# shutdown -y -i6 -g0
```

Then wait for the *Console Login* prompt.

3.1.4 Applying the Mandatory Controller Patch

Before using the SWXRC-04 controller with Solaris 2.X, a patch must be applied to the controller. A patch is applied to the controller using the CLCP controller utility program. The patch can be applied in several ways. Select the method below which is most convenient.

- 1) Connect to the SWXRC-04 RAID controller maintenance port via a serial port on the SPARC system.

To connect to the serial port of the SPARC system, use the supplied cable (17-04074-01) and one of the 9-to-25 pin converters to connect to the SPARC serial port. **cd** to the directory, *\$RAIDHOME410/patch*. Then use the shell script, *patch.sh*, to load the patch. *patch.sh* is invoked as follows,

```
#sh patch.sh <serial port name>
```

where <serial port name> selects the desired port, probably */dev/term/a* or */dev/term/b*. The following output will result:

```
#sh patch.sh /dev/term/a
Working...
.
.
.
done
```

- 2) Connect to the SWXRC-04 RAID controller maintenance port via a serial port on a personal computer with Windows 3.1.

Copy the file *\$RAIDHOME410/patch/patch.txt* to an MS-DOS formatted floppy disk and transfer this file to your PC. To connect to the serial port of the personal computer, use the supplied cable (17-04074-01). From the Windows Program Manager select "Terminal" from the Accessories Group. From the Terminals screen select the "Text Transfers" from the "Settings" menu. Select "Character at a time" and "1/10th delay between characters". Select "Communications" from the "Settings" menu and choose "9600 baud", "8 data bits", "1 stop bit", "no parity", and the appropriate COM port. (Probably COM1:) Next, select "Send text file" from the "Transfers" menu. Use the file navigator to choose *patch.txt*.

- 3) Connect to the SWXRC-04 RAID controller maintenance port via a video terminal.

Connect to the serial port of a video terminal using the supplied cable (17-04074-01) and the 9-to-25 adapters as necessary. Set the terminal characteristics as 9600 baud, 8 bits, 1 stop bit, no parity. Invoke the CLCP utility program from the CLI,

```
CLI> run clcp
```

and use the contents of the file *\$RAIDHOME410/patch/patch.txt* as data for the CLCP program.

After the patch has been applied, a controller restart is necessary for the patch to take affect. This can be accomplished with the CLI command "RESTART THIS" or by pressing and releasing the flashing green LED on the controller.

If the RAID Array 410 is configured with dual-redundant controllers, then the patch must be applied to BOTH controllers.

Please see the SWXRC-04 RAID Array Controller User's Guide for more information about the CLCP utility or about how to connect to the controller's maintenance port.

3.2 Starting the RAID Array Manager GUI

The StorageWorks RAID Array 410 Manager for Sun provides a graphical user interface (GUI) to configure and interactively monitor the RAID Array 410 subsystem and a daemon (background process) which constantly monitors the array for changes in status.

Some of the GUI's capabilities include:

- Creates RAID 0, RAID 1, RAID 0+1, and RAID 5/3 Logical Units (LUNs)
- Examines and modifies LUN parameters
- Examines and modifies Controller parameters
- Monitors the addition and removal of disk drives from the array
- Creates hot-spare drives for automatic LUN reconstruction
- Examines and modifies RAID monitor daemon parameters

The RAID monitor daemon is used to automatically monitor the array and to provide notification of any significant subsystem events. Use the RAID monitor daemon as the primary means of monitoring the array. **Using the GUI to constantly monitor the array is unnecessary.**

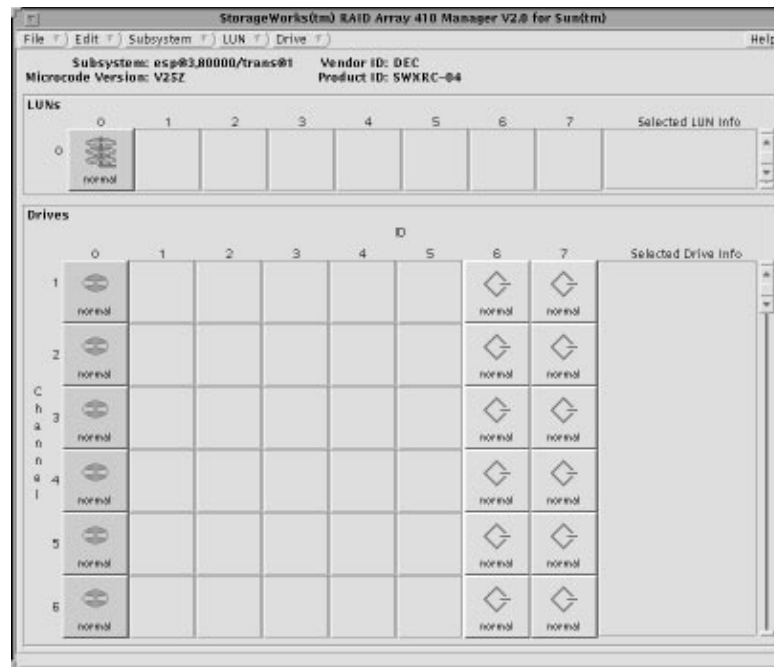
The RAID Array Manager GUI, *raidcf410*, requires an OpenWindows 3.x windowing environment. To start *raidcf410*, type the following from a window:

```
# $RAIDHOME410/bin/raidcf410
```

The manager base window appears as shown in Figure 3-1.

Figure 3–1 StorageWorks RAID Array 410 Manager Base Window**NOTE**

This display shows an example with one rank of drives in channels 1 through 6 and a set of dual-redundant controllers. Your display will show drives and controllers in locations that represent your system configuration.



Congratulations!

**You have completed the installation of your
RAID ARRAY 410.**

3.3 Post-Installation Tasks

After completing the procedures in this Guide, you need to perform the following procedures using the StorageWorks RAID Array 410 Manager V2.0 for Sun User's Guide:

- Create one or more LUNs
- Set up the RAID Monitor daemon
- Label the new LUN(s)
- Optimize UNIX filesystem performance



Installation Session Example

This appendix contains an example of an installation session. Use the data provided here as a example to assist you in creating your unique installation.

```
# df -k
Filesystem      kbytes  used  avail  capacity  Mounted on
/dev/dsk/c0t0d0s0  14368  12691   247    98%      /
/dev/dsk/c0t0d0s6  95855  76040  10235   88%     /usr
/proc            0        0        0     0%     /proc
fd                0        0        0     0%     /dev/fd
/dev/dsk/c0t0d0s4 105844   4750  90514    5%     /var
swap             97296    16   97280    0%     /tmp
/dev/dsk/c0t0d0s7 395454 123621 232293   35%    /export/home
/dev/dsk/c0t0d0s5 166163  75323  74230   50%    /opt
/dev/dsk/c0t0d0s3 121027  93864  15063   86%    /usr/openwin
# mkdir /usr/swm410
# mount
/ on /dev/dsk/c0t0d0s0 read/write/setuid on Fri May 26 14:49:28 1995
/usr on /dev/dsk/c0t0d0s6 read/write/setuid on Fri May 26 14:49:28 1995
/proc on /proc read/write/setuid on Fri May 26 14:49:28 1995
/dev/fd on fd read/write/setuid on Fri May 26 14:49:28 1995
/var on /dev/dsk/c0t0d0s4 read/write/setuid on Fri May 26 14:49:28 1995
/tmp on swap read/write on Fri May 26 14:49:31 1995
/export/home on /dev/dsk/c0t0d0s7 setuid/read/write on Fri May 26 14:49:31
1995
/opt on /dev/dsk/c0t0d0s5 setuid/read/write on Fri May 26 14:49:31 1995
/usr/openwin on /dev/dsk/c0t0d0s3 setuid/read/write on Fri May 26 14:49:31
1995
/cdrom/stgwrks_ra410_manager_v20 on /vol/dev/dsk/c0t6/stgwrks_ra410_manager_v20
read only on Fri May 26 14:50:12 1995
# cd /cdrom/stgwrks_ra410_manager_v20/Solaris_2
# pkgadd -d .
```

The following packages are available:

- 1 DECptisp PT-SBS440A SCSI-2 Intelligent Fast/Wide HA Driver for Solaris 2.3 and 2.4 (sparc) 810P022221
- 2 DECswm410 StorageWorks 410 Manager V2.0 for Sun (sparc) 2.0.0,REV=0.95.05.25

Select package(s) you wish to process (or 'all' to process all packages).
(default: all) [?,??,q]: 1

Processing package instance <DECptisp> from </cdrom/stgwrks_ra410_manager_v20/Solaris_2>

PT-SBS440A SCSI-2 Intelligent Fast/Wide HA Driver for Solaris 2.3 and 2.4 (sparc) 810P022221

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252.227-7013, or in FAR 52.227-19, or in FAR 52.227-14 Alt. III, as

```
# applicable
#
# Portions of this software are proprietary to and embody the confidential
# technology of Digital Equipment Corporation. Possession, use, or copying of
# this software and media is authorized only pursuant to a valid written
# license from Digital or an authorized sublicensor.
#
## Processing package information.
## Processing system information.
## Verifying disk space requirements.
```

```
Do you want to continue with the installation of this package [y,n,?] y
## Checking for conflicts with packages already installed.
## Checking for setuid/setgid programs.
```

The following files are being installed with setuid and/or setgid permissions or are overwriting files which are currently setuid/setgid:

```
  /etc/driver_classes <setuid ?>
  /etc/driver_classes <setgid ?>
  /kernel/drv/classes <setuid ?>
  /kernel/drv/classes <setgid ?>
```

```
Do you want to install these setuid/setgid files [y,n,?,q] y
```

This package contains scripts which will be executed with super-user permission during the process of installing this package.

```
Do you want to continue with the installation of this package [y,n,?] y
```

Installing PT-SBS440A SCSI-2 Intelligent Fast/Wide HA Driver for Solaris 2.3 and 2.4 as <DECptisp>

```
## Executing preinstall script.
## Installing part 1 of 1.
/kernel/drv/ptisp.2.3
/kernel/drv/ptisp.2.4
/usr/man/man7/ptisp.7
[ verifying class <sbs440> ]
Modifying /etc/driver_classes
Modifying /kernel/drv/classes
[ verifying class <sed> ]
## Executing postinstall script.
```

Installation of <DECptisp> was successful.

The following packages are available:

```
  1 DECptisp PT-SBS440A SCSI-2 Intelligent Fast/Wide HA Driver for Solaris 2.3
    and 2.4 (sparc) 810P022221
  2 DECswm410 StorageWorks 410 Manager V2.0 for Sun (sparc)
  2.0.0,REV=0.95.05.25
```

```
Select package(s) you wish to process (or 'all' to process all packages).
(default: all) [?,??,q]: q
```

*** IMPORTANT NOTICE ***

This machine must now be rebooted in order to ensure sane operation. Execute shutdown -y -i6 -g0 and wait for the "Console Login:" prompt.

```
#
# System was rebooted
#
# mount
```

```
/ on /dev/dsk/c0t0d0s0 read/write/setuid on Fri May 26 14:58:37 1995
/usr on /dev/dsk/c0t0d0s6 read/write/setuid on Fri May 26 14:58:37 1995
/proc on /proc read/write/setuid on Fri May 26 14:58:37 1995
/dev/fd on fd read/write/setuid on Fri May 26 14:58:37 1995
/var on /dev/dsk/c0t0d0s4 read/write/setuid on Fri May 26 14:58:37 1995
/tmp on swap read/write on Fri May 26 14:58:39 1995
```

```
/export/home on /dev/dsk/c0t0d0s7 setuid/read/write on Fri May 26 14:58:40
1995
/opt on /dev/dsk/c0t0d0s5 setuid/read/write on Fri May 26 14:58:39 1995
/usr/openwin on /dev/dsk/c0t0d0s3 setuid/read/write on Fri May 26 14:58:40
1995
/cdrom/stgwks_ra410_manager_v20 on /vol/dev/dsk/c0t6/stgwks_ra410_manager_v20
read only on Fri May 26 14:59:19 1995
# cd /cdrom/stgwks_ra410_manager_v20/Solaris_2
# pkgadd -d .
```

The following packages are available:

- 1 DECptisp PT-SBS440A SCSI-2 Intelligent Fast/Wide HA Driver for Solaris 2.3 and 2.4 (sparc) 810P022221
- 2 DECswm410 StorageWorks 410 Manager V2.0 for Sun (sparc) 2.0.0,REV=0.95.05.25

Select package(s) you wish to process (or 'all' to process all packages).
(default: all) [?,??,q]: **2**

Processing package instance <DECswm410> from </cdrom/stgwks_ra410_manager_v20/Solaris_2>

```
StorageWorks 410 Manager V2.0 for Sun(sparc) 2.0.0,REV=0.95.05.25
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#
```

```
Enter path to package base directory [?,q] /usr/swm410
Using </usr/swm410> as the package base directory.
## Processing package information.
## Processing system information.
    2 package pathnames are already properly installed.
## Verifying package dependencies.
## Verifying disk space requirements.
## Checking for conflicts with packages already installed.
```

The following files are already installed on the system and are being used by another package:

- /etc/format.dat
- /kernel/drv/sd.conf

Do you want to install these conflicting files [y,n,?,q] **y**
Checking for setuid/setgid programs.

This package contains scripts which will be executed with super-user permission during the process of installing this package.

Do you want to continue with the installation of this package [y,n,?] **y**

Installing StorageWorks 410 Manager V2.0 for Sun as <DECswm410>

```
## Installing part 1 of 1.
/usr/swm410/bin/popup.Z
/usr/swm410/bin/popup_d.Z
/usr/swm410/bin/raid_mon_d.Z
/usr/swm410/bin/raidcf410.Z
[ verifying class <bin> ]
/usr/swm410/man/man8/raid_mon_d.8.Z
/usr/swm410/man/man8/raidcf410.8.Z
[ verifying class <man> ]
/usr/swm410/etc/admin_info.Z
/usr/swm410/etc/blank.bm.Z
/usr/swm410/etc/controller.bm.Z
/usr/swm410/etc/drive.bm.Z
/usr/swm410/etc/help.bm.Z
/usr/swm410/etc/lun.bm.Z
/usr/swm410/etc/notice_scroll.cf.Z
```

```

/usr/swm410/etc/raidcf.bm.Z
/usr/swm410/etc/raidcf.cf.Z
/usr/swm410/etc/raidcf.custom.Z
/usr/swm410/etc/raidcf.hp.Z
/usr/swm410/etc/raidcf1.bm.Z
/usr/swm410/etc/raidcf2.bm.Z
/usr/swm410/etc/swxrc_controller_spec_dialog.cf.Z
/usr/swm410/etc/swxrc_lun_param_dialog.cf.Z
/usr/swm410/etc/swxrc_lun_spec_dialog.cf.Z
/usr/swm410/etc/swxrc_raid_admin_info_dialog.cf.Z
[ verifying class <etc> ]
/kernel/drv/trans.Z
[ verifying class <trans> ]
Checking for backup copy of /kernel/drv/trans.conf ...
[ verifying class <transconf> ]
Checking for a backup of /kernel/drv/sd.conf ...
[ verifying class <sdconf> ]
Checking for a backup of /etc/format.dat ...
[ verifying class <format> ]
/etc/rc3.d/S21raidmon_d <symbolic link>
[ verifying class <mond> ]
/usr/swm410/patch/patch.sh.Z
/usr/swm410/patch/patch.txt.Z
/usr/swm410/patch/readme.txt.Z
[ verifying class <patch> ]
## Executing postinstall script.

```

```

Uncompressing files:
/usr/swm410/bin/popup.Z
/usr/swm410/bin/popup_d.Z
/usr/swm410/bin/raid_mon_d.Z
/usr/swm410/bin/raidcf410.Z
/usr/swm410/man/man8/raid_mon_d.8.Z
/usr/swm410/man/man8/raidcf410.8.Z
/usr/swm410/etc/admin_info.Z
/usr/swm410/etc/blank.bm.Z
/usr/swm410/etc/controller.bm.Z
/usr/swm410/etc/drive.bm.Z
/usr/swm410/etc/help.bm.Z
/usr/swm410/etc/lun.bm.Z
/usr/swm410/etc/notice_scroll.cf.Z
/usr/swm410/etc/raidcf.bm.Z
/usr/swm410/etc/raidcf.cf.Z
/usr/swm410/etc/raidcf.custom.Z
/usr/swm410/etc/raidcf.hp.Z
/usr/swm410/etc/raidcf1.bm.Z
/usr/swm410/etc/raidcf2.bm.Z
/usr/swm410/etc/swxrc_controller_spec_dialog.cf.Z
/usr/swm410/etc/swxrc_lun_param_dialog.cf.Z
/usr/swm410/etc/swxrc_lun_spec_dialog.cf.Z
/usr/swm410/etc/swxrc_raid_admin_info_dialog.cf.Z
/usr/swm410/patch/patch.sh.Z
/usr/swm410/patch/patch.txt.Z
/usr/swm410/patch/readme.txt.Z
/kernel/drv/trans.Z
/etc/init.d/raidmon_d.Z
/usr/swm410/etc/admin_info

```

Adding driver /kernel/drv/trans

Installation of <DECswm410> was successful.

The following packages are available:

- 1 DECptisp PT-SBS440A SCSI-2 Intelligent Fast/Wide HA Driver for Solaris 2.3 and 2.4 (sparc) 810P022221
- 2 DECswm410 StorageWorks 410 Manager V2.0 for Sun(sparc) 2.0.0,REV=0.95.05.25

Select package(s) you wish to process (or 'all' to proces all packages).
(default: all) [?,??,q]: **q**

*** IMPORTANT NOTICE ***

This machine must now be rebooted in order to ensure sane operation. Execute shutdown -y -i6 -g0 and wait for the "Console Login:" prompt.

```
#  
# System was rebooted  
#  
# cd $RAIDHOME410/patch  
# cd /usr/swm410/patch  
# sh patch.sh /dev/term/a  
Working...
```

```
.  
. .  
. .  
. .  
. .  
. .  
. .  
. .  
done
```