Sun microsystems

Sun StorEdge™ PCI Dual Ultra3 SCSI Host Adapter Installation Guide

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Preface

This *Sun StorEdge PCI Dual Ultra3 SCSI Host Adapter Installation Guide* is intended for experienced system administrators.

Before You Read This Book

In order to install and use the Sun StorEdge PCI Dual Ultra3 SCSI host adapter as described in this manual, you must read and understand the books listed in the following table.

Topic	Title	Part Number
Release	*Sun StorEdge PCI Dual Ultra3 SCSI Host Adapter Release Notes*	816-2157
Diagnostics	*SunVTS 4.x User Guide* *SunVTS 4.x Reference Manual*	Varies according to the SunVTS™ version being used. A different version of SunVTS is released with each release of the Solaris operating environment

Note – Download and read the *Sun StorEdge PCI Dual Ultra3 SCSI Host Adapter Release Notes* before installing the host adapter. The release notes describe how to download the driver and patches that must be installed on the host before the host adapter can be used. The release notes also list supported cables, platforms, and storage devices along with other essential information. See "To Access the Release Notes" on page x.

How This Book Is Organized

- Chapter 1 describes the Sun PCI Dual Ultra3 SCSI host adapter and explains how to install it on your system.
- Chapter 2 describes how to enable bootability through the host adapter.
- Appendix A provides general information about Ultra3 SCSI configuration rules.
- Appendix B contains the specifications for the low-voltage differential host adapter.
- Appendix C contains the Declaration of Conformity, regulatory, and essential safety information.

Using UNIX Commands

This document does not contain all the information you might need on how to use basic UNIX® commands and do system administration tasks 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*
- AnswerBook2™ online documentation for the Solaris™ operating environment
- Other software documentation that you received with your system

For how to access the Solaris documentation at Sun's web site, see "Accessing Sun Documentation" on page x.

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. Replace command-line variables with real names or values.	Read Chapter 6 in the *User's Guide*. These are called *class* options. You *must* be superuser to do this. To delete a file, type `rm` *filename*.

Accessing Sun Documentation

Sun's documentation is available for viewing and printing at Sun's web site.

To access Solaris usage documents listed under "Using UNIX Commands" on page viii and the SunVTS documents listed in "Before You Read This Book" on page vii," go to: `docs.sun.com`. To access the *Sun StorEdge PCI Dual Ultra3 SCSI Host Adapter Release Notes* at Sun's Network Storage documentation web site, do the steps in the following procedure.

▼ To Access the Release Notes

1. **Access the release notes at Sun's web site by starting at** `www.sun.com` **and clicking the links shown in the following substeps**

   a. **Go to:** `www.sun.com.`

   b. **Click** `Products & Services.`

   c. **Under** `Browse Products,` **click** `Storage.`

   d. **In the left navigation bar, under** `Storage Related,` **click** `Technical Documentation.`

   e. **Under** `PRODUCT DOCUMENTATION,` **click** `Adapters.`

2. **Alternately, you can go directly to this address:**

   `www.sun.com/products-n-solutions/hardware/docs/`
   `Network_Storage_Solutions/Adapters`

3. **In the** `Adapter Documentation` **table, click** `pdf` **in the row listing the** *Sun StorEdge PCI Dual Ultra3 SCSI Host Adapter Release Notes.*

Note – Viewing and printing documents in Adobe Portable Document Format (PDF) requires Adobe® Acrobat Reader, which is downloadable for free from: `www.adobe.com/products/acrobat/readstep.html.`

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`docfeedback@sun.com`

Please include the part number (816-2156-11) of this document in the subject line of your email.

Installing the Host Adapter

This chapter describes the Sun StorEdge PCI Dual Ultra3 SCSI host adapter and explains how to install it into a host.

Note – If you are unfamiliar with Ultra3 SCSI configuration guidelines, read Appendix A before performing the procedures in this chapter.

Overview

This low-voltage differential (LVD) Ultra3 SCSI device enables you to increase the available number of SCSI ports so you can add external LVD devices. The host adapter supports up to 15 targets on each SCSI bus. For details, see Appendix A.

Installing the Host Adapter

Before you start, read these instructions, and also read the installation instructions in the documentation that applies to the storage device to be connected to the host adapter.

> **Caution –** This host adapter is only for connection to an LVD or a single-ended device, and it does not work if connected to a high-voltage differential (HVD) device. Be sure to read the release notes for required information before installing the host adapter, including the lists of supported cables and storage devices. Downloading the release notes is described in "Accessing Sun Documentation" on page x

▼ To Prepare for Hardware Installation

1. **Read and observe the safety information at the back of this book.**

   See"Safety Agency Compliance Statements" on page 49.

2. **Install the Solaris 8 operating environment or later version on the host.**

3. **Install the Solaris 8 or later recommended patch cluster on the host.**

   See the *Sun StorEdge PCI Dual Ultra3 SCSI Host Adapter Release Notes* for how to download and install the Solaris recommended patch cluster.

4. **Install the driver packages and any required driver patches on the host.**

   See the release notes to find out what combination of driver packages and possible patches apply to the version of the Solaris operating environment that is installed on the host. Also see the release notes for how to download the driver and any required patches. If needed, see "To Access the Release Notes" on page x.

> **Caution –** If the driver and any required patches described in the release notes are not installed, you cannot use the host adapter.

5. **Install SunVTS on the host.**

   SunVTS is shipped on the Supplemental Software CD-ROM along with the Solaris operating environment CD-ROM. Read the user's guide listed in "Before You Read This Book" on page vii for how to install SunVTS.

6. **Bring the host with the host adapter down to the `ok` prompt at run level 0.**

   See how to shut down a host in the Solaris system administration documentation, if needed, for the commands that can be used with different configurations. The following screen example uses the `shutdown`(1M) command.

   ```
   # shutdown
   ...
   ok
   ```

   Caution – Do not disconnect the power cord from the system or from the wall outlet. This connection provides the ground path necessary to safely remove and install the printed circuit boards and components without damaging them.

7. **Choose a PCI slot for installing the host adapter.**

   To maximize performance, use the host system's 64-bit 66 MHz PCI slot for installing the host adapter.

8. **Unpack the host adapter.**

   You should have the following items:

   - Sun StorEdge PCI Dual Ultra3 SCSI host adapter (FIGURE 1-1)
   - Anti-static wrist strap

   Note – Leave the host adapter in the protective bag until you are ready to install it.

PCI connector

VHDCI connector port 2

VHDCI connector port 1
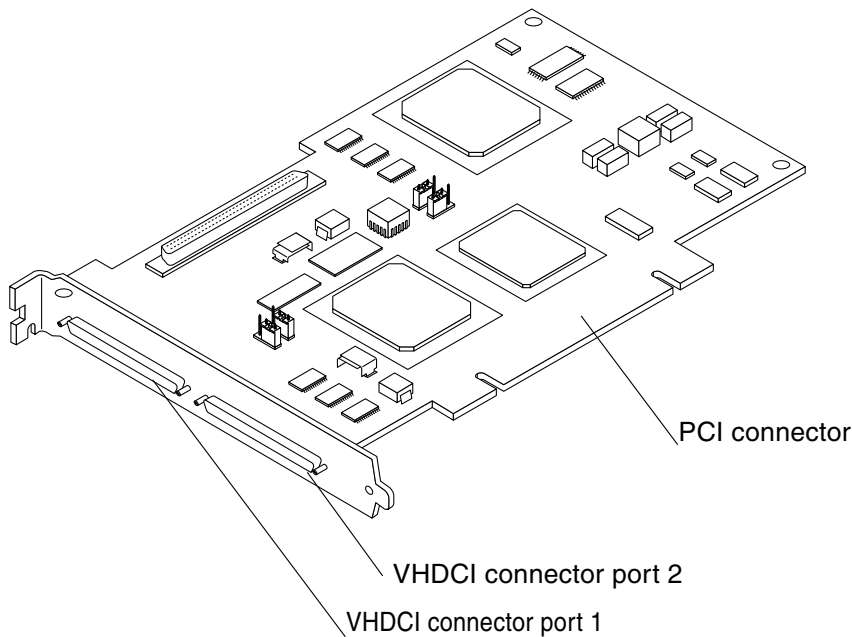
FIGURE 1-1   Sun StorEdge PCI Dual Ultra3 SCSI Host Adapter

The host adapter is shown in FIGURE 1-1. The Very High Density Cable Interconnect (VHDCI) connectors are for the VHDCI cables that are used to connect the host adapter to the storage device.

▼ To Install the Host Adapter

1. **Open the system.**

   Refer to your system documentation for information about how to open the system.

2. **Attach the wrist strap between your wrist and a metal part of the system chassis.**

3. **For systems with a standby-type power switch, disconnect the power cord.**

   Standby-type power switches have a ⏻ icon.

   The wrist strap between you and the chassis provides the ground path necessary to safely remove and install the printed circuit boards and components without damaging them.

4. **Remove the filler panel for the desired slot.**

   Refer to the system documentation for information about removing filler panels.

5. **Remove the host adapter from its protective bag.**

6. **Install the host adapter in the PCI slot in your system.**

   See Step 7 in "To Prepare for Hardware Installation" on page 2 for how to choose a slot. Also, refer to the system's hardware documentation for information about mounting details (mounting holes, standoff locking/unlocking, and screws to secure the card).

   Caution – Using excessive force can bend or damage the pins.

7. **Remove the wrist strap.**

8. **Close the system.**

9. **Connect the SCSI cable(s) to the host adapter and to the storage device(s).**

   Refer to your system documentation and the installation manual for the storage device for cabling instructions.

10. **If you have disconnected the power cable, reconnect it.**

11. **Power on the connected storage device(s) and then power on the host.**

12. **Bring the system down to the** ok **prompt at run level 0.**

    Note – If the host starts to reboot, interrupt the reboot process by pressing the Stop and A keys together.

13. **At the** `ok` **prompt, enter the** `probe-scsi-all` **command to verify that the system recognizes the host adapter.**

   The `probe-scsi-all` command displays the SCSI devices connected to the host, as shown in the following screen example.

   ```
   ok probe-scsi-all
   /pci@4,2000/pci@1/scsi@4
   Target 0
   Unit 0 DISK SEAGATE ST336605LSUN36G 0238
   /pci@4,2000/pci@1/scsi@5
   Target 0
   Unit 0 DISK SEAGATE ST336605LSUN36G 0238
   ```

   In the example, the first SCSI port (scsi@4) has one disk drive connected (target 0). The second SCSI port (scsi@5) also has one disk drive connected (target 0). In the illustration of the host adapter in FIGURE 1-1, the first SCSI port is labeled as Port 1; the second SCSI port as Port 2.

14. **Enable diagnostic mode by setting the** `diag-switch?` **variable to** `true`.

   ```
   ok setenv diag-switch? true
   ```

15. **Use the** `test` **command to ensure that the host adapter passes the OpenBoot PROM self-test.**

   The following example shows the `test` command entered with the first device path shown in Step 13.

   ```
   ok test /pci@4,2000/pci@1/scsi@4
   ```

16. **After completing the test, disable diagnostic mode by setting the** `diag-switch?` **variable to** `false`.

   ```
   ok setenv diag-switch? false
   ```

17. **Reboot the host using the** `boot -r` **command.**

   ```
   ok boot -r
   ```

18. **Go to "To Test the Installation With SunVTS" on page 7.**

    Use the SunVTS program to test a disk on the newly-attached disk array, to verify that the host adapter is properly installed.

▼ To Test the Installation With SunVTS

For details about running the SunVTS program, refer to the *Sun VTS 4.X User's Guide* and the *SunVTS 4.X Test Reference Manual.*

1. **Become superuser.**

```
% su
Password: password
#
```

2. **Bring up the SunVTS GUI.**

```
# /opt/SUNWvts/bin/sunvts
```

3. **From the System Map, select a disk drive that is in an array connected to the host adapter.**

4. **Start the disk test.**

5. **Verify that no errors have occurred by checking the SunVTS status window.**

6. **If no problems occur, stop SunVTS.**

    Your host adapter is ready to run applications.

Enabling the Host to Boot Through the Host Adapter

This chapter provides procedures for enabling *bootability*. Bootability in this document means the ability of a host to boot from a disk, when the boot disk resides in a disk array that is connected to the host through the Sun StorEdge PCI Dual Ultra3 SCSI host adapter. (See FIGURE 2-1.)

Note – The term disk array is used to refer both to disk subsystems with hardware RAID and to JBOD (just a bunch of disks) storage boxes.

Host with host adapter installed

Host adapter

Cable

Boot disk

Disk array
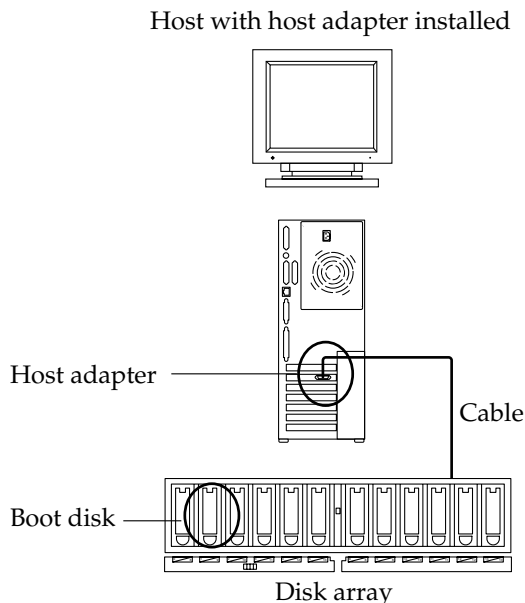
FIGURE 2-1 Host With Boot Disk on an Array Connected Through the Host Adapter

The procedures in this chapter can be followed to install the driver and any patches needed for the Sun StorEdge PCI Dual Ultra3 SCSI host adapter into the Solaris operating environment on the boot disk.

The driver is not available in the current version of Solaris[1]. Therefore, the host adapter cannot be recognized by the disk's operating system unless you enable bootability as described in this chapter.

Why Boot Through the Host Adapter

See the following examples of when booting the host through the host adapter is mandatory and when it is optional but preferable.

When You Must Boot Through a Host Adapter	Why You Might Prefer to Boot Through a Host Adapter
When the host is an enterprise-level system or other system that does not have its own directly-connected disks	Even when a host has a directly-connected disk, you might prefer to boot through the host adapter because the Ultra3 connection is faster.

---

1. See the release notes for which driver and patch combinations are needed for the version of the Solaris operating environment that is being used.

Enabling Bootability (Options)

TABLE 2-1 lists the bootability procedures and identifies which procedure to use based on your site's configuration.

TABLE 2-1 Enabling Bootability (Options)

Condition	Where to Go	Notes
A host must be available on the subnet to be used as a net install or boot server.	• "Enabling Bootability Using a Boot/Install Server" on page 12 • "To Enable Bootability Using a Boot/Install Server" on page 14	This method is easier and poses a smaller risk of data loss than the following method.
No host is available to use as a boot/install server, but you are able to connect a boot disk directly to the host (at least for the duration of the procedure).	• "To Partition the New Boot Disk the Same as the Temporary Boot Disk" on page 20	

Contact Sun support for help with other options that might be available if neither of the procedures in TABLE 2-1 apply.

Enabling Bootability Using a Boot/Install Server

This option installs the Solaris operating environment from a boot/install server onto the host with the host adapter. Any other host on the same subnet can be set up as a boot/install server.

Note – The procedure is identical whether the you are using a boot server or an install server.[1] Therefore, the convention used in this chapter is to refer to either type of server as the "boot/install server."

Installing a client from a boot/install server uses two images of the Solaris operating environment:

■ A boot mini-root (which is referred to from here on as the *boot image*)

■ A separate *install image* that gets copied onto the boot disk

---

Note – While you are setting up the boot/install server, you must either have the contents of the Solaris installation CD-ROM copied to a disk that is directly-connected to the boot/install server or have the Solaris installation CD inserted and mounted from an attached CD-ROM device.

The procedure "To Enable Bootability Using a Boot/Install Server" on page 14 is needed to make both images aware of the host adapter. At the start of the procedure, the system administrator downloads the driver and all required patches to an shared directory on the boot/install server.

The rest of the sequence followed in the procedure is illustrated in FIGURE 2-2.

1. The *boot image* is copied from a Solaris CD-ROM or from another location onto a disk that is attached to a boot/install server. ①

2. The driver packages are added to the boot image. ②

   You add the driver packages to the boot image so that the boot/install server can then send and receive data through the host adapter on the boot client.

---

1. For the distinction between these two types of server, see the Solaris system administration documentation.
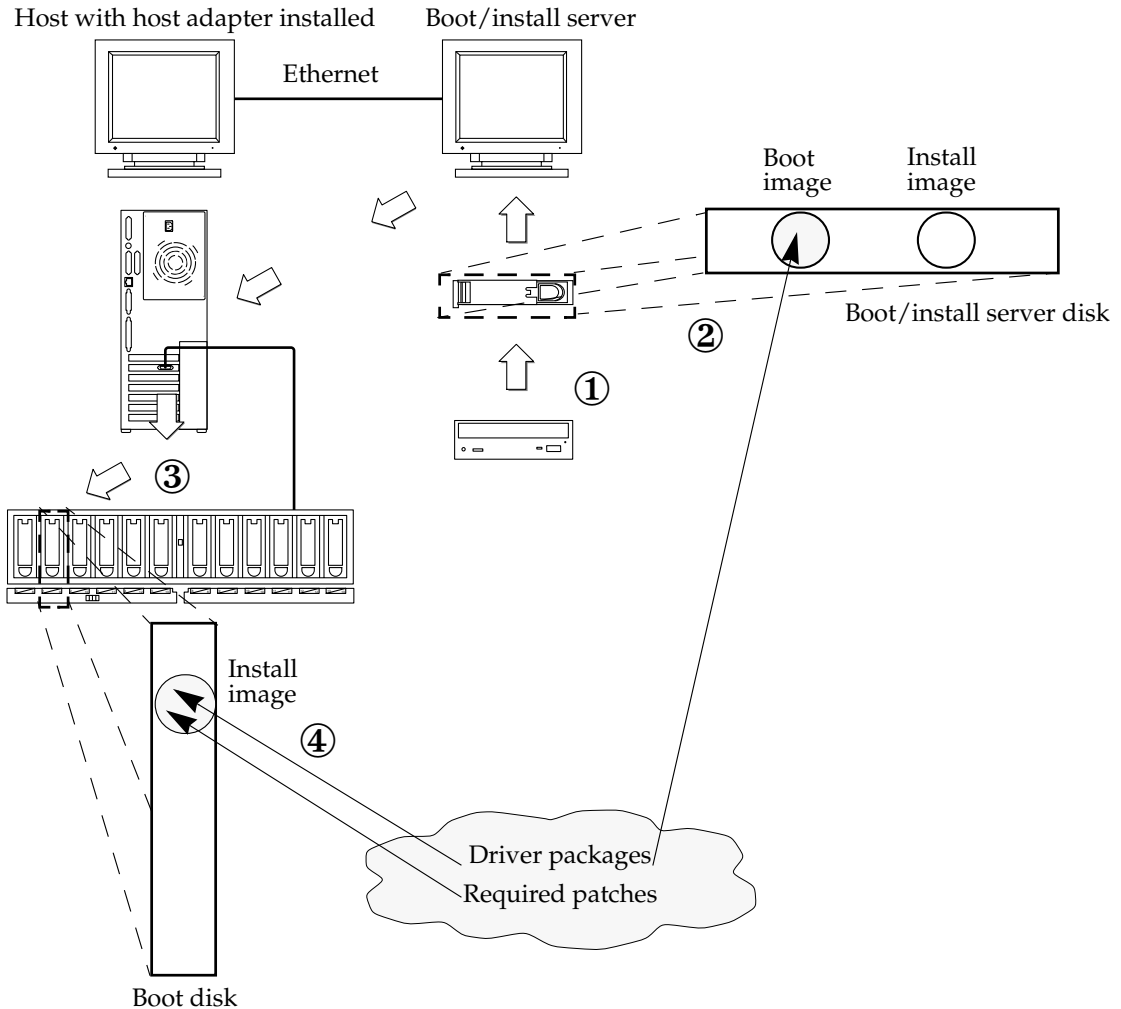
FIGURE 2-2   Installing Packages and Patches into the Boot and Install Images

3. The client boots from the boot/install server, the interactive suninstall(1M) application starts, and the system administrator provides configuration information requested at the prompts.

4. After the system administrator provides all configuration information requested by the installation program, the installation of the Solaris operating environment begins.

5. The install image is copied to the client. ③

6. Before a reboot, while the client is still booted from the boot image mini-root, the driver packages and all required patches are copied from the boot/install server and then installed in the *install image*. ④

   You install the driver packages and patches into the install image so that the host can see the host adapter after a reboot.

7. The host boots from the boot disk through the host adapter.

▼ To Enable Bootability Using a Boot/Install Server

This procedure assumes you know how to install Solaris software over the network as described in the Solaris installation manuals. For more information, see the man(1) pages for the commands that are used in this procedure.

▼ To Set Up the Boot/Install Server

1. **Switch users to root on the host to be used as the boot/install server.**

```
% su
Password:
#
```

2. **Use the** setup_install_server**(1M) command from the** Tools **directory in the location where the Solaris software resides.**

   As shown in the following screen example, the setup_install_server command copies the boot image to a directory on the boot/install server. (The boot directory is named /boot_dir in the example.) The example shows the command being run from the Tools subdirectory on a mounted Solaris 8 installation CD-ROM.

```
# cd /cdrom/cdrom0/s0/Solaris_8/Tools
# ./setup_install_server -b /boot_dir
```

3. **Download the driver packages and the accompanying README file from Sun's download center into a public shared directory in the boot image.**

   This example uses the /public directory. Whatever directory you use must be shared. This example uses the share(1M) command with the name of the /public directory on the command line. See the Solaris system administration documentation and the share(1M) and dfstab(4) man pages, if needed, for other options on how to share a directory.

a. Make sure that the public directory where you plan to put the package is shared.

This example shows using the `share` command to share the `/public` file system, and the output of the `share` command showing that the `/public` directory was successfully shared

```
# share /public
# share
-                /spare    rw    "D2 dir"
-                /public   rw    "" /public
```

b. Refer to the instructions on how to download the Sun StorEdge PCI Dual Ultra3 SCSI QUS Driver in the release notes, and go to the download center at the location specified.

c. Download the `README` file.

d. Remove any previously-installed packages for this host adapter as instructed in the `README`.

e. Download the packages into the public shared directory.

In this example, the packages would be installed into `/public`.

f. Use the `uncompress`(1M) and `tar`(1M) commands to uncompress and expand the packages from the `tar` file, as instructed in the `README`.

⚠️ **Caution –** Do not use the version of the `pkgadd`(1M) command line that is given in the `README` to install the packages. After you do Step 4, you install relocatable versions of the packages using the command line given in Step 5.

---

g. Go to Step 4.

4. Download the required patch(es) and the accompanying `README` file(s) from `sunsolve.sun.com` into a public directory on the boot/install server.

a. See the release notes for a list of required patches.

b. **Make sure that the public directory where you plan to put the patches is shared.**

   This example shows using the share command to share the /public file system, and the output of the share command showing that the /public directory was successfully shared.

```
# share /public
# share
-                    /spare    rw    "D2 dir"
-                    /public   rw    "" /public
```

c. **Refer to the the instructions on how to download the Sun StorEdge PCI Dual Ultra3 SCSI QUS required patch(es) in the release notes, and go to the download center at the location specified.**

d. **Download the** README **file.**

e. **Remove any previously-installed related patches that may be specified in the** README**.**

f. **Download the patch(es) into the public directory following the instructions in the release notes.**

   In this example, the patch(es) would be installed into /public.

g. **Use the** uncompress**(1M) and** tar**(1M) commands to uncompress and expand the patch(es) from the** tar **file, as instructed in the** README**.**

Caution – Do not use the patchadd(1M) command line that is given in the README to install the patch(es). After you do Step 5, you install relocatable versions of the patch(es) using the command line given in Step 6.

h. **Go to** Step 5.

5. **Install the driver packages into the boot image.**

   The following example installs all packages previously downloaded into the public (/public) directory.

```
# cd /public
# pkgadd -R /boot_dir/Solaris_8/Tools/Boot -d .
```

6. **Install all required patches into the boot image.**

   The following example installs all patches that were previously downloaded into the public (`/public`) directory.

   ```
   # cd /public
   # patchadd -R /boot_dir/Solaris_8/Tools/Boot -d .
   ```

7. **Make sure the host name, its IP address, and its Ethernet address have been added to the name service (`/etc` files, NIS, or NIS+).**

8. **Run the `add_install_client`(1M) command to add the host with the host adapter as a boot/install client.**

   The example shows the `add_install_client` command followed by the name of the host `sunny` followed by its platform name, `sun4u`. (`sunny` is the client with the host adapter installed.)

   ```
   # add_install_client sunny sun4u
   ```

   Note – You can find the platform name by running the `uname` command with the `-m` option on the host that has the host adapter.

   ---

9. **Log out of the boot/install server.**

▼ To Set Up the Client

1. **Bring the client host (with the host adapter) down to the `ok` prompt at run level 0.**

   See the Solaris system administration documentation for the commands that can be used with different configurations. The following example uses the `shutdown`(1M) command.

   ```
   # shutdown
   ...
   ok
   ```

   Caution – Do not reboot the boot/install server.

   ---

2. **Boot the host from the net.**

```
ok boot net
```

The Solaris interactive installation program runs from the boot/install server.

3. **Respond to the prompts according to your configuration, as instructed in the Solaris installation guide.**

Make sure to specify the new boot disk as the destination for the operating environment installation.

4. **When prompted to choose between automatic reboot or manual reboot, click the Manual Reboot button, complete the remaining question, and start the installation.**

This question offering a choice between automatic and manual reboot is the last question before the installation starts.

5. **Mount the public directory which contains the driver packages and any needed patches onto the** /mnt **directory mount point.**

Enter the mount command followed by the hostname of the boot/install server, followed by a colon (:), followed by the name of the public directory followed by /mnt. The following example uses boot_install_server as the name of the boot/install server and /public as the name of the public directory.

```
# mount boot_install_server:/public /mnt
```

6. **Install the driver packages into the install image.**

The following example installs all packages previously downloaded into the /public directory.

```
# cd /mnt
# pkgadd -R /a -d .
```

7. **Install all required patches into the boot image.**

The following example installs all patch(es) that were previously downloaded into the /public directory.

```
# cd /mnt
# patchadd -R /a -d .
```

8. **Bring the system down to the** ok **prompt at run level 0.**

9. **Reboot the host from the newly installed operating environment.**

```
ok boot -r
```

Enabling Bootability Using a Directly-Connected Temporary Boot Disk

For this procedure to work, a boot disk must be directly connected (at least temporarily) to the host. The boot disk must have the following installed:

- The Solaris operating environment.
- The driver packages and all required patches

  See the release notes for how to download and install the driver packages and all required patches.

Note – The initial boot disk can be removed if it is not needed after the boot disk is enabled.

▼ To Enable Bootability Using a Directly-connected Boot Disk

To enable bootability using a directly-connected boot disk, perform the procedures described in TABLE 2-2:

TABLE 2-2   Enabling Bootability Using a Directly-Connected Boot Disk (Tasks)

Task	Procedure
Partition the new boot disk the same as the temporary boot disk.	"To Partition the New Boot Disk the Same as the Temporary Boot Disk" on page 20
Create a file system on each new partition.	"To Create File Systems on the New Boot Disk" on page 28
Install the boot block and copy the root file system on the new disk.	"To Copy the Boot Block and Root File System Contents onto the New Boot Disk" on page 29

TABLE 2-2   Enabling Bootability Using a Directly-Connected Boot Disk (Tasks)

Task	Procedure
Copy the install image from system disk to the new boot disk.	"To Copy the Contents of Non-root File Systems onto the New Boot Disk" on page 30
Replace the name of the temporary boot disk with the name of the new boot disk in the vfstab(4) file.	"To Update the vfstab File" on page 31
Redefine the boot disk and reboot.	"To Specify the New Boot Disk as the Boot Device." on page 32

> **Note –** The examples show disk 0 as the directly-connected boot disk, and disk 1 as the designated new boot disk that is connected through the host adapter.

▼ To Partition the New Boot Disk the Same as the Temporary Boot Disk

1. **Switch users to root on the host with the host adapter.**

```
% su
Password:
#
```

2. **If the driver and any needed patches are not already installed, download the driver package from Sun's download center and install it on the host, following the instructions in the** README **file that comes with the** driver.

   To download the driver, follow the instructions in the release notes.

3. **Reboot using the** reboot**(1M) command with the** -r **option.**

```
# reboot -- -r
```

4. **Log into the host as root.**

5. **Record the layout of the partitions (slices) on the system boot disk.**

   a. **Enter the** format**(1M) command.**

   If needed, see the format man page and the instructions on adding a disk and using the format command in the Solaris administration documentation.

Note – These examples use disk 0 as the temporary disk (c0t0d0) and disk 1 (c3t8d0) as the new boot disk.

```
# format
Searching for disks...done

AVAILABLE DISK SELECTIONS:
       0. c0t0d0 <SUN4.2G cyl 3880 alt 2 hd 16 sec 135>
          /pci@1f,4000/scsi@3/sd@0,0
       1. c3t8d0 <SUN36G cyl 24620 alt 2 hd 27 sec 107>
          /pci@1f,4000/pci@4/scsi@4/sd@8,0
       2. c3t9d0 <SUN36G cyl 24620 alt 2 hd 27 sec 107>
          /pci@1f,4000/pci@4/scsi@4/sd@9,0
       3. c3t10d0 <SUN36G cyl 24620 alt 2 hd 27 sec 107>
          /pci@1f,4000/pci@4/scsi@4/sd@a,0
       4. c3t11d0 <SUN36G cyl 24620 alt 2 hd 27 sec 107>
          /pci@1f,4000/pci@4/scsi@4/sd@b,0
       5. c3t12d0 <SUN36G cyl 24620 alt 2 hd 27 sec 107>
          /pci@1f,4000/pci@4/scsi@4/sd@c,0
       6. c3t13d0 <SUN36G cyl 24620 alt 2 hd 27 sec 107>
          /pci@1f,4000/pci@4/scsi@4/sd@d,0
Specify disk (enter its number):
```

b. Make a note of the device pathname of the new boot disk.

For example, for disk 1, the new boot disk in this example, the device pathname shown is: /pci@1f,4000/pci@4/scsi@4/sd@8,0. You use this information later in Step 4 in "To Specify the New Boot Disk as the Boot Device." on page 32.

c. Specify the disk where the operating system is installed on the temporary boot disk.

The following screen example specifies disk 0.

```
Specify disk (enter its number): 0
```

d. Enter the `partition` **command to bring up the** PARTITION MENU**.**

```
format> partition
PARTITION MENU:
        0         - change '0' partition
        1         - change '1' partition
        2         - change '2' partition
        3         - change '3' partition
        4         - change '4' partition
        5         - change '5' partition
        6         - change '6' partition
        7         - change '7' partition
        select - select a predefined table
        modify - modify a predefined partition table
        name    - name the current table
        print   - display the current table
        label   - write partition map and label to the disk
        !<cmd> - execute <cmd>, then return
        quit
partition>
```

e. Enter the `print` **command to display the partition table for the specified disk.**

```
partition> print
Current partition table (original):
Total disk cylinders available: 3880 + 2 (reserved cylinders)

Part       Tag    Flag      Cylinders        Size            Blocks
  0        root    wm       0 - 1937       2.00GB    (1938/0/0) 4186080
  1        swap    wu    1938 - 2908       1.00GB     (971/0/0) 2097360
  2      backup    wm       0 - 3879       4.00GB    (3880/0/0) 8380800
  3 unassigned     wm       0                0        (0/0/0)         0
  4 unassigned     wm       0                0        (0/0/0)         0
  5 unassigned     wm       0                0        (0/0/0)         0
  6 unassigned     wm       0                0        (0/0/0)         0
  7        home    wm    2909 - 3879       1.00GB     (971/0/0) 2097360
```

In the example, the temporary boot disk has three slices defined: 0 (root), 1 (swap), and 7 (home) with sizes, 2.00GB, 1.00GB, and 1.00GB.

f. Record the layout (sizes and numbers) assigned to the slices on the temporary boot disk, and enter `quit` **when done.**

```
partition> quit
FORMAT MENU:
        disk       - select a disk
        type       - select (define) a disk type
        partition  - select (define) a partition table
        current    - describe the current disk
        format     - format and analyze the disk
        repair     - repair a defective sector
        label      - write label to the disk
        analyze    - surface analysis
        defect     - defect list management
        backup     - search for backup labels
        verify     - read and display labels
        save       - save new disk/partition definitions
        inquiry    - show vendor, product and revision
        volname    - set 8-character volume name
        !<cmd>     - execute <cmd>, then return
        quit
format>
```

As shown in the previous example, the `quit` command returns you to the `FORMAT MENU`.

6. **Specify one slice on the new boot disk for every slice on the temporary boot disk.**

The following examples specify the root slice 0 on the new boot disk to match slice 0 on the temporary boot disk.

a. **At the** `format>` **prompt, use the** `disk` **command to start laying out the new boot disk.**

Enter the `disk` command followed by the number of the disk to be formatted. The following screen example uses `disk 1`.

```
format> disk 1
selecting c3t8d0
[disk formatted]

FORMAT MENU:
        disk       - select a disk
        type       - select (define) a disk type
        partition  - select (define) a partition table
        current    - describe the current disk
        format     - format and analyze the disk
        repair     - repair a defective sector
        label      - write label to the disk
        analyze    - surface analysis
        defect     - defect list management
        backup     - search for backup labels
        verify     - read and display labels
        save       - save new disk/partition definitions
        inquiry    - show vendor, product and revision
        volname    - set 8-character volume name
        !<cmd>     - execute <cmd>, then return
        quit
format>
```

As shown in the previous example, the FORMAT MENU displays.

b. **Make a note of the device name of the disk.**

The disk's device name in the previous screen example is `c3t8d0`.

c. **Enter the** `partition` **command to bring up the** `PARTITION MENU`.

```
format> p
PARTITION MENU:
        0      - change '0' partition
        1      - change '1' partition
        2      - change '2' partition
        3      - change '3' partition
        4      - change '4' partition
        5      - change '5' partition
        6      - change '6' partition
        7      - change '7' partition
        select - select a predefined table
        modify - modify a predefined partition table
        name   - name the current table
        print  - display the current table
        label  - write partition map and label to the disk
        !<cmd> - execute <cmd>, then return
        quit
partition>
```

d. **Enter the number of the slice to be defined.**

Slice 0 is specified in the following example. As shown, the partition table for the new boot disk displays.

```
partition> 0
Current partition table (original):
Total disk cylinders available: 24620 + 2 (reserved cylinders)

Part        Tag    Flag     Cylinders         Size              Blocks
  0         root    wm       0 -     90      128.37MB     (91/0/0)         262899
  1         swap    wu      91 -    181      128.37MB     (91/0/0)         262899
  2       backup    wu       0 - 24619       33.92GB     (24620/0/0) 71127180
  3 unassigned      wm       0                    0       (0/0/0)               0
  4 unassigned      wm       0                    0       (0/0/0)               0
  5 unassigned      wm       0                    0       (0/0/0)               0
  6          usr    wm     182 - 24619       33.67GB     (24438/0/0) 70601382
  7 unassigned      wm       0                    0       (0/0/0)               0
Enter partition id tag[root]:
```

e. Enter the partition ID tag.

The following example shows a question mark (?) entered after the prompt. The list of accepted partition id tags displays. The example then shows the default partition id tag of root accepted by pressing the Return key.

```
Enter partition id tag[root]: ?
Expecting one of the following: (abbreviations ok):
        unassigned    boot            root            swap
        usr           backup          stand           var
Enter partition id tag[root]:
Enter partition permission flags[wm]:
```

f. Enter the partition permission flags.

The following example shows the default permission flags wm accepted by pressing the Return key.

```
Enter partition permission flags[wm]:
Enter new starting cyl[0]:
```

g. Enter the new starting cylinder.

The following example shows the default new starting cylinder of 0 accepted by pressing the Return key.

```
Enter new starting cyl[0]:
Enter partition size[262899b, 91c, 128.37mb, 0.13gb]:
```

h. Enter the partition size.

The following example shows the partition size of 2.00gb entered.

```
Enter partition size[262899b, 91c, 128.37mb, 0.13gb]: 2.00gb
partition>
```

i. **Enter the** `print` **command to display the updated partition table.**

The following example shows that the `root` tag, the `wm` permissions flag, and the partition size of `2.00GB` are assigned to slice 0.

```
partition> print
Current partition table (unnamed):
Total disk cylinders available: 24620 + 2 (reserved cylinders)

Part      Tag    Flag     Cylinders          Size            Blocks
  0      root    wm      0 -  1451       2.00GB    (1452/0/0)   4194828
  1      swap    wu     91 -   181     128.37MB    (91/0/0)      262899
  2      backup    wu        0 - 24619        33.92GB    (24620/0/0)
71127180
  3 unassigned    wm       0              0        (0/0/0)            0
  4 unassigned    wm       0              0        (0/0/0)            0
```

j. **Repeat Step d through Step i as needed until all slices are defined as they are in the temporary boot disk.**

k. **Enter the** `quit` **command to return to the** FORMAT MENU**.**

```
partition> quit

FORMAT MENU:
        disk       - select a disk
        type       - select (define) a disk type
        partition  - select (define) a partition table
        current    - describe the current disk
        format     - format and analyze the disk
        repair     - repair a defective sector
        label      - write label to the disk
        analyze    - surface analysis
        defect     - defect list management
        backup     - search for backup labels
        verify     - read and display labels
        save       - save new disk/partition definitions
        inquiry    - show vendor, product and revision
        volname    - set 8-character volume name
        !<cmd>     - execute <cmd>, then return
        quit
format>
```

7. **Label the new boot disk with the new partition table.**

a. **Enter the label command**

```
format> label
```

b. **Enter y[es] to continue.**

```
Ready to label disk, continue? y
```

c. **When the labeling is complete, enter q[uit] to quit the** format **program.**

```
format> q
#
```

▼ To Create File Systems on the New Boot Disk

● **Create a file system on each slice on the disk using the** newfs**(1M) command.**

Enter the newfs command followed by the device name of the slice. In this example, the device name for slice 0 of disk c3t8d0 is /dev/rdsk/c3t8d0s0.

```
# newfs /dev/rdsk/c3t8d0s0
newfs: construct a new file system /dev/rdsk/c3t8d0s0: (y/n)? y
/dev/rdsk/c3t8d0s0:     4194828 sectors in 1452 cylinders of 27 tracks, 107
sectors
        2048.3MB in 46 cyl groups (32 c/g, 45.14MB/g, 7488 i/g)
super-block backups (for fsck -F ufs -o b=#) at:
 32, 92592, 185152, 277712, 370272, 462832, 555392, 647952, 740512, 833072,
 925632, 1018192, 1110752, 1203312, 1295872, 1388432, 1480992, 1573552,
 1666112, 1758672, 1851232, 1943792, 2036352, 2128912, 2221472, 2314032,
 2406592, 2499152, 2591712, 2684272, 2776832, 2869392, 2958368, 3050928,
 3143488, 3236048, 3328608, 3421168, 3513728, 3606288, 3698848, 3791408,
 3883968, 3976528, 4069088, 4161648,
```

For more information, see the section on how to create file systems in the Solaris system administration documentation.

Do this step to create a file system on the new boot disk for every slice on the temporary boot disk. When you are finished, go to "To Copy the Contents of Non-root File Systems onto the New Boot Disk" on page 30.

▼ To Copy the Boot Block and Root File System Contents onto the New Boot Disk

1. Install the boot block on the root (/) file system of the new disk.

The following example uses the installboot(1M) command to install the boot block. The boot block resides in the /usr/platform/*platform_name*/lib/fs/ufs/bootblk directory. The example shows invoking the uname command with the -i option between left single quotes on the command line to specify the platform name.

```
# /usr/sbin/installboot /usr/platform/`uname -i`/lib/fs/ufs/bootblk \
/dev/rdsk/c3t8d0s0
```

For more information, see the instructions on how to install a boot block in the Solaris system administration documentation.

2. Mount the root file system from slice 0 of the new boot disk onto the /mnt mount point.

```
# mount /dev/dsk/c3t8d0s0 /mnt
```

3. Use the ufsdump(1M) and ufsrestore(1M) commands to copy the contents of the root file system from the temporary boot disk to the root slice of the new boot disk (on the /mnt mount point).

```
# ufsdump 0f - /dev/rdsk/c0t0d0s0 | ( cd /mnt; ufsrestore rf -)
  DUMP: Writing 32 Kilobyte records
  DUMP: Date of this level 0 dump: Tue 19 Feb 2002 02:44:35 PM PST
  DUMP: Date of last level 0 dump: the epoch
  DUMP: Dumping /dev/rdsk/c3t8d0s0 (hba2-81:/) to standard output.
  DUMP: Mapping (Pass I) [regular files]
  DUMP: Mapping (Pass II) [directories]
  DUMP: Estimated 1818082 blocks (887.74MB).
  DUMP: Dumping (Pass III) [directories]
  DUMP: Dumping (Pass IV) [regular files]
 Warning: ./lost+found: File exists
  DUMP: 88.77% done, finished in 0:01
  DUMP: 1818046 blocks (887.72MB) on 1 volume at 1363 KB/sec
  DUMP: DUMP IS DONE
 #
```

4. Unmount the root file system on slice 0 from the `/mnt` **mount point.**

```
# umount /mnt
```

▼ To Copy the Contents of Non-root File Systems onto the New Boot Disk

1. Mount the file system onto the `/mnt` **mount point.**

This example shows the copying of the `/home` file system from slice 7 to the new boot disk.

```
# mount /dev/dsk/c3t8d0s7 /mnt
```

2. Use the `ufsdump`**(1M) and** `ufsrestore`**(1M) commands to copy the contents of the file system from the temporary boot disk to the new boot disk.**

```
# ufsdump 0f - /dev/rdsk/c0t0d0s0 | ( cd /mnt; ufsrestore rf -)
  DUMP: Writing 32 Kilobyte records
  DUMP: Date of this level 0 dump: Tue 19 Feb 2002 02:44:35 PM PST
  DUMP: Date of last level 0 dump: the epoch
 DUMP: Dumping /dev/rdsk/c3t8d0s0 (hba2-81:/) to standard output.
  DUMP: Mapping (Pass I) [regular files]
  DUMP: Mapping (Pass II) [directories]
  DUMP: Estimated 1818082 blocks (887.74MB).
  DUMP: Dumping (Pass III) [directories]
  DUMP: Dumping (Pass IV) [regular files]
Warning: ./lost+found: File exists
  DUMP: 88.77% done, finished in 0:01
  DUMP: 1818046 blocks (887.72MB) on 1 volume at 1363 KB/sec
  DUMP: DUMP IS DONE
#
```

3. Unmount the file system from the `/mnt` **mount point.**

```
# umount /mnt
```

4. Repeat Step 1 through Step 3 as needed until you have copied all the file systems' contents to the new boot disk. When finished, go to "To Update the `vfstab` **File" on page 31.**

▼ To Update the `vfstab` File

1. Mount the root file system from slice 0 of the new boot disk onto the `/mnt` **mount point.**

```
# mount /dev/dsk/c3t8d0s0 /mnt
```

2. Change directories to `/mnt/etc` **and open the** `vfstab`**(4) file for editing.**

The following example shows the file systems defined.

```
# cd /mnt/etc
# vi vfstab
...
/dev/dsk/c0t0d0s1        -           -           swap    -       no      -
/dev/dsk/c0t0d0s0        /dev/rdsk/c0t0d0s0       /       ufs     1       no -
/dev/dsk/c0t0d0s7        /dev/rdsk/c0t0d0s7       /home   ufs     2       yes -
```

3. Replace the name of the temporary boot disk with the name of the new boot disk, and then save and quit the file.

The following example shows the disk name `c0t0` changed to `c3t8` in the mount table entries for slices 0, 1, and 7.

```
/dev/dsk/c3t8d0s1        -           -           swap    -       no      -
/dev/dsk/c3t8d0s0        /dev/rdsk/c3t8d0s0       /       ufs     1 no        -
/dev/dsk/c3t8d0s7        /dev/rdsk/c3t8d0s7       /home   ufs     2 yes -
:wq
#
```

4. Unmount the file system from the `/mnt` **mount point.**

```
# umount /mnt
```

▼ To Specify the New Boot Disk as the Boot Device.

1. Bring the host with the host adapter down to the `ok` prompt at run level 0.

See the Solaris system administration documentation on shutting down a host for the commands that can be used with different configurations. The following screen example uses the `shutdown`(1M) command.

```
# shutdown
...
ok
```

2. Use the `nvalias` command to alias the device name of the disk to a short name for the disk.

The following example uses **/pci@1f,4000/pci@4/scsi@4/sd@8,0**, which was noted as the device path name for disk 1 in Step 5.

```
ok nvalias disk1 /pci@1f,4000/pci@4/scsi@4/sd@8,0
```

3. Use the `nvstore` command to store the new alias followed by the `reset all` command.

```
ok nvstore
ok reset-all
```

4. Define the new boot disk as the default `boot-device`.

a. Enter the `setenv` command followed by the `boot-device` parameter followed by the name of the new disk.

```
ok setenv boot-device disk1
```

b. Enter the `reset` command.

```
ok reset
```

5. Enter the `boot` command with the `-r` option so that the host adapter can be recognized located by the Solaris operating environment.

```
ok boot -r
```

Understanding Ultra3 SCSI

This chapter provides general information about Ultra3 SCSI configuration rules.

Target Devices

For Ultra3 SCSI performance of 160 Mbytes/sec, there can be a maximum of 15 devices connected to each port on the host adapter card.

The available target addresses (SCSI IDs) for each port on the host adapter cards are 0 through F.

Note – The SCSI ID of 7 is reserved for the host adapter card.

Bus Length

For point-to-point connection, the bus length can be up to 25 meters (78.74 feet). For multi-drop configuration, the maximum bus length is limited to 12 meters (39.37 feet).

The following table shows bus length for each type of SCSI bus.

TABLE A-1   Bus Restrictions

SCSI Type	Bus Width	Number of Devices	SCSI Bus Length[1]
Ultra3 SCSI	16 bits	point-to-point	25 meters (78.74 feet)
		multi-drop	12 meters (39.37 feet)

1. You must include the internal bus length of your system in your bus length calculations.

Cabling and Termination

Use the following cabling guidelines to ensure proper device cabling and termination:

- In order to maintain Ultra3 SCSI performance, all cables used must be Ultra3 SCSI compliant.
- The SCSI bus must be correctly terminated. Most Sun devices use autotermination. See the documentation that came with the device.

  The SCSI busses will be terminated using active terminators.

  The default jumper setting for the terminators on the Sun StorEdge PCI Dual Ultra3 SCSI Host Adapter are as follows.

  Jumper J4: 2-3 : Low order byte of port 2 (J2 connector)

  Jumper J5: 2-3 : High order byte of port 2 (J2 connector)

  Jumper J8: 1-2 : Low order byte of port 1 (J1 connector)

  Jumper J9: 1-2 : High order byte of port 1 (J1 connector)

  The jumper settings used for terminator enable and disable are:

  1-2 : Auto termination enable

  2-3 : Manual termination enable

  No Jumper: terminator disable.

  The device at the end of the bus must be terminated accordingly.

SCSI Symbols

One of the four following symbols is placed near a SCSI port to indicate which type of SCSI the port is using. The icon may appear alone or with descriptive text.

SE	LVD	LVD/MSE	HVD

Acronym	Meaning
SE	single-ended
HVD	high-voltage differential
LVD	low-voltage differential
MSE	multi-mode single ended

Specifications (Differential)

The chapter contains the specifications for the low-voltage differential host adapter.

Physical Dimensions

TABLE B-1   Physical Dimensions

Dimension	Measurement	
	Board With Bracket	**Board Without Bracket**
Length	7.4 inches (188 meters)	7.0 inches (176 meters)
Width	5.0 inches (128 meters)	4.25 inches (106 meters)
Height	.85 inches (21.59 meters)	.5 inches (12.7 meters)
Weight	5.2 oz (43.42 g)	N/A

Power Requirements

TABLE B-2   Power Requirements

Voltage	Maximum Current
5V ±5%	3A
3.3V ±9%	130 ma
12V ±5%	0.05A

Performance Specifications

TABLE B-3   Performance Specifications

Feature	Specification
PCI clock	66 MHz maximum
PCI data burst transfer rate	528 Mbytes/sec burst rate
SCSI synchronous transfer rate	160 Mbytes/sec (wide)
SCSI asynchronous transfer rate	<= 7 Mtransfers/sec (cable dependent)
Transfer block size	4 GByte maximum
PCI data/address lines	AD63-0
PCI modes	Master/slave
Capacitance per PCI signal line	<= 10 pF, except for CLK between 5 to 12 pF and IDSEL <= 8pF
SCSI interface	Low voltage differential
SCSI bus parity	Yes
SCSI cyclic redundancy check (CRC)	Yes
SCSI 8-bit bus devices	Yes
SCSI 16-bit bus devices	Yes

PCI Edge Connector Pin Definition

TABLE B-4   PCI Edge Connector Pin Definitions J1B (Top)

Pin	Description	Pin	Description	Pin	Description	Pin	Description
1	-12V	25	+3.3V	49	GND	73	GND
2	TCK	26	C_BE3	50	KEYWAY	74	AD[55]
3	GND	27	AD23	51	KEYWAY	75	AD[53]
4	TDO	28	GND	52	AD08	76	GND
5	+5V	29	AD21	53	AD07	77	AD[51]
6	+5V	30	AD19	54	+3.3V	78	AD[49]
7	INTB	31	+3.3V	55	AD05	79	+5V/+3.3V
8	INTD	32	AD17	56	AD03	80	AD[47]
9	GND (PRSNT1)	33	C_BE2	57	GND	81	AD[45]
10	RESERVED	34	GND	58	AD01	82	GND
11	GND (PRSNT2)	35	IRDY	59	3V/5V	83	AD[43]
12	KEYWAY	36	+3.3V	60	ACK64	84	AD[41]
13	KEYWAY	37	DEVSEL	61	+5V	85	GND
14	RESERVED	38	GND	62	+5V	86	AD[39]
15	GND	39	LOCK	63	RESERVED	87	AD[37]
16	CLK	40	PERR	64	GND	88	+5V/+3.3V
17	GND	41	+3.3V	65	C/BE[6]#	89	AD[35]
18	REQ	42	SERR	66	C/BE[4]#	90	AD[33]
19	3V/5V	43	+3.3V	67	GND	91	GND
20	AD31	44	C_BE1	68	AD[63]	92	RESERVED
21	AD29	45	AD14	69	AD[61]	93	RESERVED
22	GND	46	GND	70	+5V/+3.3V	94	GND
23	AD27	47	AD12	71	AD[59]		
24	AD25	48	AD10	72	AD[57]		

TABLE B-5 PCI Edge Connector Pin Definitions J1A (Bottom)

Pin	Description	Pin	Description	Pin	Description	Pin	Description
1	TRST	25	AD24	49	AD09	73	AD[56]
2	+12V	26	IDSEL	50	KEYWAY	74	AD[54]
3	TMS	27	+3.3V	51	KEYWAY	75	+5V/+3.3V
4	TDI	28	AD22	52	C_BE0	76	AD[52]
5	+5V	29	AD20	53	+3.3V	77	AD[50]
6	INTA	30	GND	54	AD06	78	GND
7	INTC	31	AD18	55	AD04	79	AD[48]
8	+5V	32	AD16	56	GND	80	AD[46]
9	RESERVED	33	+3.3V	57	AD02	81	GND
10	3V/5V	34	FRAME	58	AD00	82	AD[44]
11	RESERVED	35	GND	59	3V/5V	83	AD[42]
12	KEYWAY	36	TRDY	60	REQ64	84	+5V/+3.3V
13	KEYWAY	37	GND	61	+5V	85	AD[40]
14	RESERVED	38	STOP	62	+5V	86	AD[38]
15	RST	39	+3.3V	63	GND	87	GND
16	3V/5V	40	SDONE	64	C/BE[7]#	88	AD[36]
17	GNT	41	SBO	65	C/BE[5]#	89	AD[34]
18	GND	42	GND	66	+5V/+3.3V	90	GND
19	RESERVED	43	PAR	67	PAR64	91	AD[32]
20	AD30	44	AD15	68	AD[62]	92	RESERVED
21	+3.3V	45	+3.3V	69	GND	93	GND
22	AD28	46	AD13	70	AD[60]	94	RESERVED
23	AD26	47	AD11	71	AD[58]		
24	GND	48	GND	72	GND		

SCSI Connector Pin Definitions
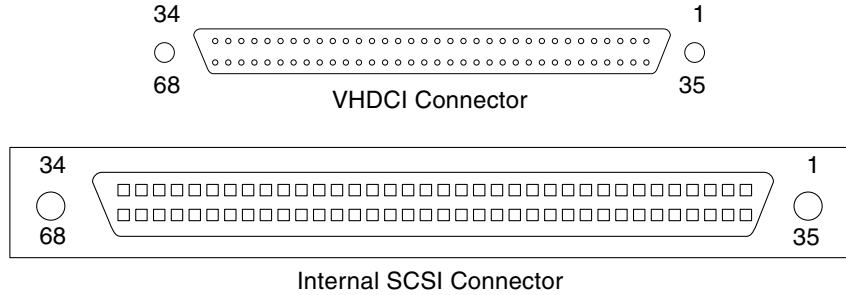
FIGURE B-1 VHDCI and Internal SCSI Connectors

TABLE B-6   SCSI Connector Pin Definitions

Pin	Description	Pin	Description	Pin	Description
1	+SD(12)	24	+RST	47	SD(6)-
2	+SD(13)	25	+MSG	48	SD(7)-
3	+SD(14)	26	+SEL	49	SDP-
4	+SD(15)	27	+C/D	50	Cable Sense (GND)
5	+SDP(1)	28	+REQ	51	TERMPWR
6	GND	29	+I/O	52	TERMPWR
7	+SD(0)	30	GND	53	OPEN
8	+SD(1)	31	+SD(8)	54	ATN-
9	+SD(2)	32	+SD(9)	55	GND
10	+SD(3)	33	+SD(10)	56	BSY-
11	+SD(4)	34	+SD(11)	57	ACK-
12	+SD(5)	35	SD(12)-	58	RST-
13	+SD(6)	36	SD(13)-	59	MSG-
14	+SD(7)	37	SD(14)-	60	SEL-
15	+SDP	38	SP(15)-	61	C/D-
16	DIFFSENS	39	SDP(1)-	62	REQ-
17	TERMPWR	40	GND	63	I/O-

TABLE B-6   SCSI Connector Pin Definitions

Pin	Description	Pin	Description	Pin	Description
18	TERMPWR	41	SD(0)-	64	GND
19	OPEN	42	SD(1)-	65	SD(8)-
20	+ATN	43	SD(2)-	66	SD(9)-
21	GND	44	SD(3)-	67	SD(10)-
22	+BSY	45	SD(4)-	68	SD(11)-
23	+ACK	46	SD(5)-		

Declaration of Conformity, Regulatory Compliance, and Safety Statements

This appendix contains the following information that applies to the Sun StorEdge PCI Dual Ultra3 SCSI Host Adapter.

Declaration of Conformity

Marketing Part Numbers: X6758A

Product Names: Sun StorEdge PCI Dual Ultra3 SCSI Host Adapters

EMC

USA – FCC Class B

This equipment complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This equipment may not cause harmful interference.

2. This equipment must accept any interference that may cause undesired operation.

European Union

This equipment complies with the following requirements of the EMC Directive 89/336/EEC:

EN55022 / CISPR22 (1995)		Class B	Compatible Electronics Report Nos: C70109J2, C70110K1
EN50082-1	IEC801-2 (1991)	4 kV (Direct), 8 kV (Air)	
	IEC1000-4-3	3 V/m, 80% AM at 1KHz	
	IEC801-4 (1988)	1.0 kV Power Lines, Signal Lines Not Applicable	

Safety

This equipment complies with the following requirements of the Low Voltage Directive 73/23/EEC:

EC Type Examination Certificates:

EN60950/IEC950 (1993)	TUV Rheinland Certificate # S9771525
EN60950 w/ Nordic Deviations	CB Scheme Certificate # (pending)

Supplementary Information

This product was tested and complies with all the requirements for the CE Mark.

/S/

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Regulatory Compliance Statements

Your Sun product is marked to indicate its compliance class:

- Federal Communications Commission (FCC) — USA
- Department of Communications (DOC) — Canada
- Voluntary Control Council for Interference (VCCI) — Japan

Please read the appropriate section that corresponds to the marking on your Sun product before attempting to install the product.

FCC Class A Notice

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference.
2. This device must accept any interference received, including interference that may cause undesired operation.

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Shielded Cables: Connections between the workstation and peripherals must be made using shielded cables in order to maintain compliance with FCC radio frequency emission limits. Networking connections can be made using unshielded twisted-pair (UTP) cables.

Modifications: Any modifications made to this device that are not approved by Sun Microsystems, Inc. may void the authority granted to the user by the FCC to operate this equipment.

FCC Class B Notice

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference.
2. This device must accept any interference received, including interference that may cause undesired operation.

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/television technician for help.

Shielded Cables: Connections between the workstation and peripherals must be made using shielded cables in order to maintain compliance with FCC radio frequency emission limits. Networking connections can be made using unshielded twisted pair (UTP) cables.

Modifications: Any modifications made to this device that are not approved by Sun Microsystems, Inc. may void the

authority granted to the user by the FCC to operate this equipment.

Safety Agency Compliance Statements

Read this section before beginning any procedure. The following text provides safety precautions to follow when installing a Sun Microsystems product.

Safety Precautions

For your protection, observe the following safety precautions when setting up your equipment:

- Follow all cautions and instructions marked on the equipment.
- Ensure that the voltage and frequency of your power source match the voltage and frequency inscribed on the equipment's electrical rating label.
- Never push objects of any kind through openings in the equipment. Dangerous voltages may be present. Conductive foreign objects could produce a short circuit that could cause fire, electric shock, or damage to your equipment.

Symbols

The following symbols may appear in this book:

Caution – There is a risk of personal injury and equipment damage. Follow the instructions.

Caution – Hot surface. Avoid contact. Surfaces are hot and may cause personal injury if touched.

Caution – Hazardous voltages are present. To reduce the risk of electric shock and danger to personal health, follow the instructions.

Caution – Applies AC power to the system.

Depending on the type of power switch your device has, one of the following symbols may be used:

Caution – Removes AC power from the system.

Caution – The On/Standby switch is in the standby position.

Modifications to Equipment

Do not make mechanical or electrical modifications to the equipment. Sun Microsystems is not responsible for regulatory compliance of a modified Sun product.

Placement of a Sun Product

Caution – Do not block or cover the openings of your Sun product. Never place a Sun product near a radiator or heat register. Failure to follow these guidelines can cause overheating and affect the reliability of your Sun product.

Caution – The workplace-dependent noise level defined in DIN 45 635 Part 1000 must be 70Db(A) or less.

SELV Compliance

Safety status of I/O connections comply to SELV requirements.

Power Cord Connection

Caution – Sun products are designed to work with single-phase power systems having a grounded neutral conductor. To reduce the risk of electric shock, do not plug Sun products into any other type of power system. Contact your facilities manager or a qualified electrician if you are not sure what type of power is supplied to your building.

Caution – Not all power cords have the same current ratings. Household extension cords do not have overload protection and are not meant for use with computer systems. Do not use household extension cords with your Sun product.

Caution – Your Sun product is shipped with a grounding type (three-wire) power cord. To reduce the risk of electric shock, always plug the cord into a grounded power outlet

The following caution applies only to devices with a Standby power switch:

Caution – The power switch of this product functions as a standby type device only. The power cord serves as the primary disconnect device for the system. Be sure to plug the power cord into a grounded power outlet that is nearby the system and is readily accessible. Do not connect the power cord when the power supply has been removed from the system chassis.

Lithium Battery

Caution – On Sun CPU boards, there is a lithium battery molded into the real-time clock, SGS No. MK48T59Y, MK48TXXB-XX, MK48T18-XXXPCZ, M48T59W-XXXPCZ, or MK48T08. Batteries are not customer replaceable parts. They may explode if mishandled. Do not dispose of the battery in fire. Do not disassemble it or attempt to recharge it.

System Unit Cover

You must remove the cover of your Sun computer system unit to add cards, memory, or internal storage devices. Be sure to replace the top cover before powering on your computer system.

Caution – Do not operate Sun products without the top cover in place. Failure to take this precaution may result in personal injury and system damage.

Laser Compliance Notice

Sun products that use laser technology comply with Class 1 laser requirements.

> Class 1 Laser Product
> Luokan 1 Laserlaite
> Klasse 1 Laser Apparat
> Laser KLasse 1
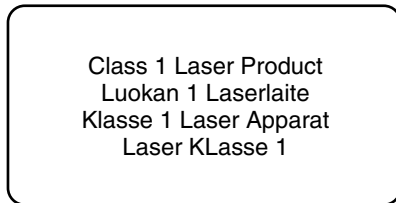
CD-ROM

Caution – Use of controls, adjustments, or the performance of procedures other than those specified herein may result in hazardous radiation exposure.

Einhaltung sicherheitsbehördlicher Vorschriften

Auf dieser Seite werden Sicherheitsrichtlinien beschrieben, die bei der Installation von Sun-Produkten zu beachten sind.

Sicherheitsvorkehrungen

Treffen Sie zu Ihrem eigenen Schutz die folgenden Sicherheitsvorkehrungen, wenn Sie Ihr Gerät installieren:

- Beachten Sie alle auf den Geräten angebrachten Warnhinweise und Anweisungen.
- Vergewissern Sie sich, daß Spannung und Frequenz Ihrer Stromquelle mit der Spannung und Frequenz übereinstimmen, die auf dem Etikett mit den elektrischen Nennwerten des Geräts angegeben sind.
- Stecken Sie auf keinen Fall irgendwelche Gegenstände in Öffnungen in den Geräten. Leitfähige Gegenstände könnten aufgrund der möglicherweise vorliegenden gefährlichen Spannungen einen Kurzschluß verursachen, der einen Brand, Stromschlag oder Geräteschaden herbeiführen kann.

Symbole

Die Symbole in diesem Handbuch haben folgende Bedeutung:

Achtung – Gefahr von Verletzung und Geräteschaden. Befolgen Sie die Anweisungen

Achtung – Hohe Temperatur. Nicht berühren, da Verletzungsgefahr durch heiße Oberfläche besteht.

Achtung – Gefährliche Spannungen. Anweisungen befolgen, um Stromschläge und Verletzungen zu vermeiden

Achtung – Setzt das System unter Wechselstrom

Je nach Netzschaltertyp an Ihrem Gerät kann eines der folgenden Symbole benutzt werden:

Achtung – Unterbricht die Wechselstromzufuhr zum Gerät.

Achtung – (Stand-by-Position) - Der Ein-/Wartezustand-Schalter steht auf Wartezustand. Änderungen an Sun-Geräten.

Nehmen Sie keine mechanischen oder elektrischen Änderungen an den Geräten vor. Sun Microsystems, übernimmt bei einem Sun-Produkt, das geändert wurde, keine Verantwortung für die Einhaltung behördlicher Vorschriften

Aufstellung von Sun-Geräten

⚠ **Achtung –** Um den zuverlässigen Betrieb Ihres Sun-Geräts zu gewährleisten und es vor Überhitzung zu schützen, dürfen die Öffnungen im Gerät nicht blockiert oder verdeckt werden. Sun-Produkte sollten niemals in der Nähe von Heizkörpern oder Heizluftklappen aufgestellt werden

⚠ **Achtung –** Der arbeitsplatzbezogene Schalldruckpegel nach DIN 45 635 Teil 1000 beträgt 70Db(A) oder weniger.

Einhaltung der SELV-Richtlinien

Die Sicherung der I/O-Verbindungen entspricht den Anforderungen der SELV-Spezifikation.

Anschluß des Netzkabels

⚠ **Achtung –** Sun-Produkte sind für den Betrieb an Einphasen-Stromnetzen mit geerdetem Nulleiter vorgesehen. Um die Stromschlaggefahr zu reduzieren, schließen Sie Sun-Produkte nicht an andere Stromquellen an. Ihr Betriebsleiter oder ein qualifizierter Elektriker kann Ihnen die Daten zur Stromversorgung in Ihrem Gebäude geben.

⚠ **Achtung –** Nicht alle Netzkabel haben die gleichen Nennwerte. Herkömmliche, im Haushalt verwendete Verlängerungskabel besitzen keinen Überlastungsschutz und sind daher für Computersysteme nicht geeignet.

⚠ **Achtung –** Ihr Sun-Gerät wird mit einem dreiadrigen Netzkabel für geerdete Netzsteckdosen geliefert. Um die Gefahr eines Stromschlags zu reduzieren, schließen Sie das Kabel nur an eine fachgerecht verlegte, geerdete Steckdose an.

Die folgende Warnung gilt nur für Geräte mit Wartezustand-Netzschalter:

⚠ **Achtung –** Der Ein/Aus-Schalter dieses Geräts schaltet nur auf Wartezustand (Stand-By-Modus). Um die Stromzufuhr zum Gerät vollständig zu unterbrechen, müssen Sie das Netzkabel von der Steckdose abziehen. Schließen Sie den Stecker des Netzkabels an eine in der Nähe befindliche, frei zugängliche, geerdete Netzsteckdose an. Schließen Sie das Netzkabel nicht an, wenn das Netzteil aus der Systemeinheit entfernt wurde.

Lithiumbatterie

⚠ **Achtung –** CPU-Karten von Sun verfügen über eine Echtzeituhr mit integrierter Lithiumbatterie (Teile-Nr. MK48T59Y, MK48TXXB-XX, MK48T18-XXXPCZ, M48T59W-XXXPCZ, oder MK48T08). Diese Batterie darf nur von einem qualifizierten Servicetechniker ausgewechselt werden, da sie bei falscher Handhabung explodieren kann. Werfen Sie die Batterie nicht ins Feuer. Versuchen Sie auf keinen Fall, die Batterie auszubauen oder wiederaufzuladen.

Gehäuseabdeckung

Sie müssen die obere Abdeckung Ihres Sun-Systems entfernen, um interne Komponenten wie Karten, Speicherchips oder Massenspeicher hinzuzufügen. Bringen Sie die obere Gehäuseabdeckung wieder an, bevor Sie Ihr System einschalten.

Achtung – Bei Betrieb des Systems ohne obere Abdeckung besteht die Gefahr von Stromschlag und Systemschäden.

Einhaltung der Richtlinien für Laser

Sun-Produkte, die mit Laser-Technologie arbeiten, entsprechen den Anforderungen der Laser Klasse 1.

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Class 1 Laser Product
Luokan 1 Laserlaite
Klasse 1 Laser Apparat
Laser KLasse 1
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CD-ROM

⚠ **Achtung –** Die Verwendung von anderen Steuerungen und Einstellungen oder die Durchfhrung von Prozeduren, die von den hier beschriebenen abweichen, knnen gefhrliche Strahlungen zur Folge haben.

Conformité aux normes de sécurité

Ce texte traite des mesures de sécurité qu'il convient de prendre pour l'installation d'un produit Sun Microsystems.

Mesures de sécurité

Pour votre protection, veuillez prendre les précautions suivantes pendant l'installation du matériel :

- Suivre tous les avertissements et toutes les instructions inscrites sur le matériel.
- Vérifier que la tension et la fréquence de la source d'alimentation électrique correspondent à la tension et à la fréquence indiquées sur l'étiquette de classification de l'appareil.
- Ne jamais introduire d'objets quels qu'ils soient dans une des ouvertures de l'appareil. Vous pourriez vous trouver en présence de hautes tensions dangereuses. Tout objet conducteur introduit de la sorte pourrait produire un court-circuit qui entraînerait des flammes, des risques d'électrocution ou des dégâts matériels.

Symboles

Vous trouverez ci-dessous la signification des différents symboles utilisés :

⚠ **Attention –** risques de blessures corporelles et de dégâts matériels. Veuillez suivre les instructions.

⚠ **Attention –** surface à température élevée. Evitez le contact. La température des surfaces est élevée et leur contact peut provoquer des blessures corporelles.

⚠ **Attention –** présence de tensions dangereuses. Pour éviter les risques d'électrocution et de danger pour la santé physique, veuillez suivre les instructions.

⚠ **Attention –** Votre système est sous tension (courant alternatif).

Un des symboles suivants sera peut-être utilisé en fonction du type d'interrupteur de votre système:

◯ **Attention –** Votre système est hors tension (courant alternatif).

⏻ **Attention –** L'interrupteur Marche/Veilleuse est en position « Veilleuse ».

Modification du matériel

Ne pas apporter de modification mécanique ou électrique au matériel. Sun Microsystems n'est pas responsable de la conformité réglementaire d'un produit Sun qui a été modifié.

Positionnement d'un produit Sun

Attention – pour assurer le bon fonctionnement de votre produit Sun et pour l'empêcher de surchauffer, il convient de ne pas obstruer ni recouvrir les ouvertures prévues dans l'appareil. Un produit Sun ne doit jamais être placé à proximité d'un radiateur ou d'une source de chaleur.

Attention – Le niveau de pression acoustique au poste de travail s'élève selon la norme DIN 45 635 section 1000, à 70 dB (A) ou moins.

Conformité SELV

Sécurité : les raccordements E/S sont conformes aux normes SELV.

Connexion du cordon d'alimentation

Attention – les produits Sun sont conçus pour fonctionner avec des alimentations monophasées munies d'un conducteur neutre mis à la terre. Pour écarter les risques d'électrocution, ne pas brancher de produit Sun dans un autre type d'alimentation secteur. En cas de doute quant au type d'alimentation électrique du local, veuillez vous adresser au directeur de l'exploitation ou à un électricien qualifié.

Attention – tous les cordons d'alimentation n'ont pas forcément la même puissance nominale en matière de courant. Les rallonges d'usage domestique n'offrent pas de protection contre les surcharges et ne sont pas prévues pour les systèmes d'ordinateurs. Ne pas utiliser de rallonge d'usage domestique avec votre produit Sun.

Attention – votre produit Sun a été livré équipé d'un cordon d'alimentation à trois fils (avec prise de terre). Pour écarter tout risque d'électrocution, branchez toujours ce cordon dans une prise mise à la terre.

L'avertissement suivant s'applique uniquement aux systèmes équipés d'un interrupteur VEILLEUSE:

Attention – Le commutateur d'alimentation de ce produit fonctionne comme un dispositif de mise en veille uniquement. C'est la prise d'alimentation qui sert à mettre le produit hors tension. Veillez donc à installer le produit à proximité d'une prise murale facilement accessible. Ne connectez pas la prise d'alimentation lorsque le châssis du système n'est plus alimenté.

Batterie au lithium

Attention – sur les cartes CPU Sun, une batterie au lithium (référence MK48T59Y, MK48TXXB-XX, MK48T18-XXXPCZ, M48T59W-XXXPCZ, ou MK48T08.) a été moulée dans l'horloge temps réel SGS. Les batteries ne sont pas des pièces remplaçables par le client. Elles risquent d'exploser en cas de mauvais traitement. Ne pas jeter la batterie au feu. Ne pas la démonter ni tenter de la recharger.

Couvercle

Pour ajouter des cartes, de la mémoire, ou des unités de stockage internes, vous devrez démonter le couvercle de

l'unité système Sun. Ne pas oublier de remettre ce couvercle en place avant de mettre le système sous tension.

⚠️ **Attention –** il est dangereux de faire fonctionner un produit Sun sans le couvercle en place. Si l'on néglige cette précaution, on encourt des risques de blessures corporelles et de dégâts matériels.

Conformité aux certifications Laser

Les produits Sun qui font appel aux technologies lasers sont conformes aux normes de la classe 1 en la matière.

Class 1 Laser Product
Luokan 1 Laserlaite
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Laser KLasse 1
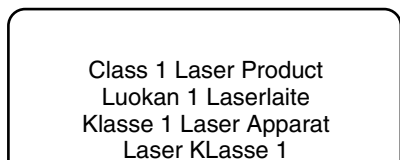
CD-ROM

⚠️ **Attention –** L'utilisation de contrôles, de réglages ou de performances de procédures autre que celle spécifiée dans le présent document peut provoquer une exposition à des radiations dangereuses.

Normativas de seguridad

El siguiente texto incluye las medidas de seguridad que se deben seguir cuando se instale algún producto de Sun Microsystems.

Precauciones de seguridad

Para su protección observe las siguientes medidas de seguridad cuando manipule su equipo:

- Siga todas los avisos e instrucciones marcados en el equipo.
- Asegúrese de que el voltaje y la frecuencia de la red eléctrica concuerdan con las descritas en las etiquetas de especificaciones eléctricas del equipo.

- No introduzca nunca objetos de ningún tipo a través de los orificios del equipo. Pueden haber voltajes peligrosos. Los objetos extraños conductores de la electricidad pueden producir cortocircuitos que provoquen un incendio, descargas eléctricas o daños en el equipo.

Símbolos

En este libro aparecen los siguientes símbolos:

⚠️ **Precaución –** Existe el riesgo de lesiones personales y daños al equipo. Siga las instrucciones.

⚠️ **Precaución –** Superficie caliente. Evite el contacto. Las superficies están calientes y pueden causar daños personales si se tocan.

⚠️ **Precaución –** Voltaje peligroso presente. Para reducir el riesgo de descarga y daños para la salud siga las instrucciones.

▎ **Precaución –** Aplica la alimentación de CA al sistema.

Según el tipo de interruptor de encendido que su equipo tenga, es posible que se utilice uno de los siguientes símbolos:

◯ **Precaución –** Elimina la alimentación de CA del sistema.

⏻ **Precaución –** El interruptor de Encendido/En espera se ha colocado en la posición de En espera.

Modificaciones en el equipo

No realice modificaciones de tipo mecánico o eléctrico en el equipo. Sun Microsystems no se hace responsable del cumplimiento de las normativas de seguridad en los equipos Sun modificados.

Ubicación de un producto Sun

⚠ **Precaución –** Para asegurar la fiabilidad de funcionamiento de su producto Sun y para protegerlo de sobrecalentamien-tos no deben obstruirse o taparse las rejillas del equipo. Los productos Sun nunca deben situarse cerca de radiadores o de fuentes de calor.

⚠ **Precaución –** De acuerdo con la norma DIN 45 635, Parte 1000, se admite un nivel de presión acústica para puestos de trabajo máximo de 70Db(A).

Cumplimiento de la normativa SELV

El estado de la seguridad de las conexiones de entrada/salida cumple los requisitos de la normativa SELV.

Conexión del cable de alimentación eléctrica

⚠ **Precaución –** Los productos Sun están diseñados para trabajar en una red eléctrica monofásica con toma de tierra. Para reducir el riesgo de descarga eléctrica, no conecte los productos Sun a otro tipo de sistema de alimentación eléctrica. Póngase en contacto con el responsable de mantenimiento o con un electricista cualificado si no está seguro del sistema de alimentación eléctrica del que se dispone en su edificio.

⚠ **Precaución –** No todos los cables de alimentación eléctrica tienen la misma capacidad. Los cables de tipo doméstico no están provistos de protecciones contra sobrecargas y por tanto no son apropiados para su uso con computadores. No utilice alargadores de tipo doméstico para conectar sus productos Sun.

⚠ **Precaución –** Con el producto Sun se proporciona un cable de alimentación con toma de tierra. Para reducir el riesgo de descargas eléctricas conéctelo siempre a un enchufe con toma de tierra.

La siguiente advertencia se aplica solamente a equipos con un interruptor de encendido que tenga una posición "En espera":

⚠ **Precaución –** El interruptor de encendido de este producto funciona exclusivamente como un dispositivo de puesta en espera. El enchufe de la fuente de alimentación está diseñado para ser el elemento primario de desconexión del equipo. El equipo debe instalarse cerca del enchufe de forma que este último pueda ser fácil y rápidamente accesible. No conecte el cable de alimentación cuando se ha retirado la fuente de alimentación del chasis del sistema.

Batería de litio

⚠ **Precaución –** En las placas de CPU Sun hay una batería de litio insertada en el reloj de tiempo real, tipo SGS Núm. MK48T59Y, MK48TXXB-XX, MK48T18-XXXPCZ, M48T59W-XXXPCZ, o MK48T08. Las baterías no son elementos reemplazables por el propio cliente. Pueden explotar si se manipulan de forma errónea. No arroje las baterías al fuego. No las abra o intente recargarlas.

Tapa de la unidad del sistema

Debe quitar la tapa del sistema cuando sea necesario añadir tarjetas, memoria o dispositivos de almacenamiento internos. Asegúrese de cerrar la tapa superior antes de volver a encender el equipo.

⚠ **Precaución –** Es peligroso hacer funcionar los productos Sun sin la tapa superior colocada. El hecho de no tener en cuenta esta precaución puede ocasionar daños personales o perjudicar el funcionamiento del equipo.

Aviso de cumplimiento con requisitos de láser

Los productos Sun que utilizan la tecnología de láser cumplen con los requisitos de láser de Clase 1.

Class 1 Laser Product
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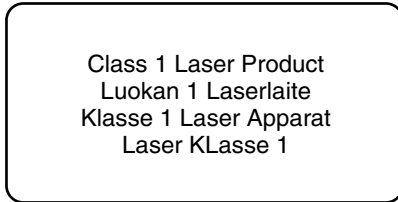
CD-ROM

⚠ **Precaución –** El manejo de los controles, los ajustes o la ejecución de procedimientos distintos a los aquí especificados pueden exponer al usuario a radiaciones peligrosas.

GOST-R Certification Mark
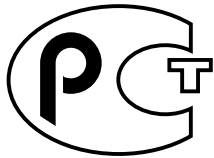
Nordic Lithium Battery Cautions

Norge

Caution – Litiumbatteri —
Eksplosjonsfare.Ved utskifting benyttes kun
batteri som anbefalt av apparatfabrikanten.
Brukt batteri returneres apparatleverandøren.

Sverige

Caution – Explosionsfara vid felaktigt
batteribyte. Använd samma batterityp eller en
ekvivalent typ som rekommenderas av
apparattillverkaren. Kassera använt batteri
enligt fabrikantens instruktion.

Danmark

Caution – Litiumbatteri — Eksplosionsfare
ved fejlagtig håndtering. Udskiftning må kun
ske med batteri af samme fabrikat og type.
Levér det brugte batteri tilbage til
leverandøren.

Suomi

Caution – Paristo voi räjähtää, jos se on
virheellisesti asennettu. Vaihda paristo
ainoastaan laitevalmistajan suosittelemaan
tyyppiin. Hävitä käytetty paristo valmistajan
ohjeiden mukaisesti.