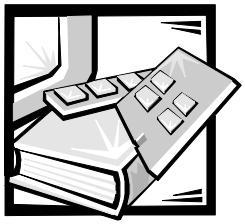

CHAPTER 3
Installing and Configuring SCSI Drivers

This section describes how to install and configure the Dell small computer system interface (SCSI) device drivers included with your Dell PowerEdge 2450 computer system. These device drivers are designed to work with the Adaptec AIC-7899 Ultra 160/m SCSI-3 controller on the system board.

Each channel of the AIC-7899 supports up to four internal SCSI hard-disk drives via a SCSI backplane board. Up to four hard-disk drives are supported in the PowerEdge 2450.

If you are using an optional Dell PowerEdge Expandable RAID Controller (PERC), see your Dell PowerEdge Expandable RAID Controller documentation for information on installing your SCSI device drivers.

For instructions on installing SCSI hardware devices such as hard-disk drives, tape drives, or CD-ROM drives, see, "Installing a Drive in the Peripheral Bay" in the *Installation and Troubleshooting Guide*. After the SCSI devices are installed, install and configure any SCSI device drivers to enable them to communicate with your operating system.

SCSI device drivers are provided for the following operating systems:

- Microsoft Windows NT Server 4.0 operating system
- Novell NetWare 4.2 and 5.0 operating systems

See Chapter 2, "Using the Dell OpenManage Server Assistant CD" for instructions on creating a diskette of drivers for your operating system. For instructions on configuring the SCSI device drivers, see the following subsections.

Driver Installation for Windows NT 4.0

This section provides the following information about installing the Dell drivers for the Microsoft Windows NT 4.0 operating system:

- Installing the integrated drive electronics (IDE) CD-ROM driver
- Installing and/or updating the SCSI drivers for Windows NT

- Removing a host adapter
- Swapping a host adapter
- Restoring a configuration if Windows NT fails to boot

Loading the CD-ROM Driver in Windows NT 4.0

To install the IDE CD-ROM driver for the CD-ROM drive, in Windows NT 4.0, perform the following steps:

1. Boot from the Microsoft Windows NT Server CD, and press <F6> when the first **Windows NT Setup** screen appears.

   This action disables automatic detection of devices.

2. Load the IDE CD-ROM driver.

   Type s to select the **Other** option. Insert the driver diskette into drive A, and select **IDE-CD-ROM ATAPI 1.2 PCI IDE Controller** from the list of drivers.

3. Press <Enter> and continue with the setup.

Installation Overview

This section provides the information that you need to install and use the Dell SCSI drivers for the 78*xx* series of SCSI controllers with Windows NT.

The Windows NT 4.0 driver diskette that you create for the Microsoft Windows NT Server operating system contains the files that you need for driver installation. The **scsi** subdirectory on the diskette contains the following files to be used with Windows NT:

- **adpu160m.sys** — Adaptec's 7899 Ultra 160/m driver for Windows NT
- **oemsetup.inf** — A file used by Windows NT Setup for driver installation
- **readme.txt** — A text file describing the Adaptec 78*xx* driver for Windows NT

If you are installing Windows NT for the first time, see the next section "Installing Windows NT and the Driver for the First Time" to begin driver installation. If Windows NT is already installed in your system, see the section "Using Windows NT to Install or Update the Driver" found later in this chapter.

Installing Windows NT and the Driver for the First Time

Windows NT 4.0 has SCSI drivers for the Adaptec 78*xx* series of SCSI controllers integrated into the operating system. When you load the operating system software, the drivers are automatically loaded. However, Dell recommends that you update the **adpu160m.sys** driver by using the diskette of drivers that you created from the *Dell OpenManage Server Assistant* CD. To install or update the **adpu160m.sys** driver for Windows NT 4.0, see the next subsection.

Using Windows NT to Install or Update the Driver

This section describes how to install or update the **adpu160m.sys** driver if Windows NT is already installed. If you are installing Windows NT for the first time, see the section "Installing Windows NT and the Driver for the First Time" found earlier in this chapter.

Perform the following steps only if Windows NT 4.0 is already installed:

1. Click the **Start** button, point to **Settings**, and click **Control Panel**.
2. Double-click the **SCSI Adapters** icon.
3. Click the **Driver** tab and then click **Add**.
4. Click **Have Disk**.
5. Insert the Windows NT 4.0 driver diskette that you created into drive A.
6. In the **Copy Manufacturer's Files From:** field, type `a:\scsi\` and click **OK**.
7. Select **Adaptec AHA-294x/AHA-394x/AHA4944** or **78xx PCI SCSI Controller (NT 4.0)**. Then click **OK**.
8. If the following message appears, click **New** to replace the existing driver:

   ```
   The driver(s) for this SCSI Adapter are already on the system. Do you want to use the currently installed driver(s) or install new one(s).
   ```

9. If the following message appears, type `a:\scsi` in the dialog box and click **Continue**:

   ```
   Please enter the full path to Adaptec's installation files.
   ```

   These files are located in the **\scsi** directory on the Windows NT 4.0 Driver diskette.

   The driver is copied from the diskette to your system.

10. Click **Yes** when prompted to restart the system and remove the diskette from drive A.

After the system reboots, the new driver is active. Some drive letter assignments may have changed from the previous configuration.

If you need additional assistance, see the section "Troubleshooting for Windows NT" found later in this chapter.

Installation for Novell NetWare 4.2

This section provides the following information about installing and updating the Dell SCSI drivers for Novell NetWare 4.2:

- Automatic driver loading using **startup.ncf** and **autoexec.ncf**
- Booting a NetWare server from a SCSI drive, formatting media, and using removable media
- Troubleshooting error messages generated during initialization

Installation Overview

This subsection provides the information that you need to install and use the Dell SCSI drivers for Novell NetWare 4.2. The Dell SCSI drivers for NetWare support the Adaptec AIC-7899 SCSI controller.

Before you begin installation of the SCSI drivers for NetWare, you must create a diskette of drivers for NetWare 4.2. Chapter 2, "Using the Dell OpenManage Server Assistant CD" provides instructions for creating these diskettes.

The Dell SCSI drivers for NetWare are fully tested and approved for NetWare. The NetWare **scsi** subdirectory on the NetWare 4.2 drivers diskette that you create contains files to be used with NetWare 4.2. The files appear in the **scsi** subdirectory on the NetWare driver diskette.

NOTE: Your system must have a bootable version of DOS installed before you can complete the Novell NetWare installation.

Installing NetWare 4.2

This section describes how to install the system SCSI drivers at the same time you install NetWare 4.2. If NetWare 4.2 is already installed and you want to install or update the **adpu160.ham** and **aha2940.ham** drivers, refer to the NetWare *User's Guide* for installation instructions. Also, refer to the NetWare *User's Guide* for information about partitioning, creating a server name, and checking the Internetwork Packet eXchange (IPX) network number.

Before beginning, prepare your system with the Dell intraNetWare support diskette. Perform the following steps only if you are upgrading to NetWare 4.2 or installing it for the first time:

1. Make backup copies of all NetWare diskettes and use those backup copies as your working diskettes.
2. Boot the system to a DOS prompt.
3. Change to the CD-ROM drive prompt.

   The installation files are located in the root directory on the CD.
4. Type `install` and press <Enter>.
5. Select a language at the language selection screen and press <Enter>.

6. Select whether you want to perform a simple or custom installation and press <Enter>.

   If you select a simple installation, you can press <F1> to view the default settings for the installation.

7. If you are prompted to install NetWare symmetrical multiprocessing (SMP), select **No**.

   Even if you plan to install NetWare SMP, select **No** at this screen. The intraNetWare Support Pack 4 or later must be applied before NetWare SMP can be installed. The system now searches for existing device drivers and hardware.

8. Press <F3> to continue through the next few screens.

9. When a screen appears asking you to select a disk driver, press <Ins>.

10. Insert the backup copy of the NetWare 4.2 driver diskette that you created in step 1 into the diskette drive.

    If you have not already created this diskette, see Chapter 2, "Using the Dell OpenManage Server Assistant CD" for instructions.

11. Press <F3>, and type the path to the **adpu160.ham** driver for NetWare (for example, `a:\scsi`).

12. Select the **adpu160.ham** driver and press <Enter>.

    The system prompts you for a slot number for the device.

*NOTE: Specific help text for each driver appears in the middle of the screen as you scroll down the list. The **Loaded Drivers** window below the list of available drivers displays the names of drivers that are loaded and operational. For a new installation, this list is initially empty. For a selective installation, the list shows the drivers already running.*

13. Press <Alt><Esc> to switch to the console prompt, type `load a:\scsi\adpu160.ham`, and press <Enter>.

    A list of slot numbers is displayed separated by commas. Write down all slot numbers that are listed and press <Esc> to clear the command line. Press <Alt><Esc> to return to the installation screen.

14. Enter the slot number for the driver and press <Enter>.

15. Press <Enter> to save the parameters and continue.

16. When you are prompted to select an additional disk driver, select **Yes**.

17. Repeat steps 13 through 17 for each driver as necessary.

18. Select **Continue the Installation** to create disk partitions and system volumes and to specify volume names following the procedures listed in the NetWare *User's Guide*.

19. To load the driver automatically at server start-up, make sure the **startup.ncf** file includes the **load** command line and correct slot number for your host adapter. Refer to the NetWare *User's Guide* for information about editing the **startup.ncf** file.

Installation for NetWare 5.0

This section provides information on installing the SCSI drivers for the Novell NetWare 5.0 operating system. Instructions assume that NetWare 5.0 is installed and operational.

Creating the NetWare 5.0 SCSI Driver Diskette

If you have not already done so, use the *Dell OpenManage Server Assistant* CD to create a NetWare 5.0 SCSI driver diskette. See Chapter 2, "Using the Dell OpenManage Server Assistant CD" for instructions on creating the diskette.

Uninstalling a SCSI Driver

If you are replacing an existing driver (for example, because it has become corrupted or an upgrade has become available), you must first remove the installed driver. To remove a driver, perform the following steps:

1. At the initial NetWare screen, press <Alt><Esc> to display the NetWare console screen.
2. At the server prompt, type `nwconfig` and press <Enter>.

   The **NetWare Configuration** screen appears, displaying the **Configuration Options** menu.
3. At the **Configuration Options** menu, highlight **Driver Options** and press <Enter>.
4. At the **Driver Options** menu, highlight **Configure disk and storage device drivers** and press <Enter>.
5. At the **Additional Driver Actions** menu, highlight **Unload an additional driver** and press <Enter>.
6. At the **Selected Disk Drivers** menu, highlight the driver that you want to uninstall and press <Enter>.
7. At the message `Driver` *`xxx`* `successfully unloaded`, press <Enter>.

   The **Additional Driver Actions** menu appears.

From the **Additional Driver Actions** menu, you can repeat steps 5 through 7 to uninstall an additional driver, start with step 5 of the next procedure to install a driver, or press <Esc> to exit.

Installing the SCSI Drivers for NetWare 5.0

To install NetWare 5.0 SCSI drivers from the NetWare 5.0 SCSI driver diskette that you created, perform the following steps:

1. At the initial NetWare screen, press <Alt><Esc> to display the NetWare console screen.
2. At the server prompt, type `nwconfig` and press <Enter>.

   The **NetWare Configuration** screen appears, displaying the **Configuration Options** menu
3. At the **Configuration Options** menu, highlight **Driver Options** and press <Enter>.
4. At the **Driver Options** menu, highlight **Configure disk and storage device drivers** and press <Enter>.
5. At the **Additional Driver Actions** menu, highlight **Load an additional driver** and press <Enter>.

   The software scans the system to determine what drivers are already installed.
6. When the **Select a driver** menu appears, insert the NetWare 5.0 SCSI driver diskette into the diskette drive and press <Insert> to install an unlisted driver.
7. Read the instructions on the screen and press <Enter> to continue.
8. At the **Select a driver to install** menu, highlight a desired driver and press <Enter>.
9. When you are prompted to confirm, highlight **Yes** and press <Enter>.
10. To accept the default server boot path that is displayed, press <Enter>. The software copies the driver to the selected location.
11. At the **Driver *xxx* Parameter Actions** screen, highlight **Select/Modify driver parameters** and press <Enter>.
12. At the **driver parameters** screen, type `1` for the integrated SCSI adapter or enter the slot number of the SCSI adapter card.

NOTE: The integrated SCSI adapter is always assigned to slot 1. If an adapter card is installed in slot 1, you must specify it as being in slot 2. An adapter card installed in slot 2 or a higher numbered slot is assigned its true physical slot number.

13. Press <F10> to save the parameters and exit.
14. At the **Driver xxx Parameter Actions** screen, highlight **Save parameter and load driver** and press <Enter>.
15. At the **NetWare Configuration** screen, confirm that the new driver has been added to the list that is displayed.

16. Repeat steps 3 through 15 for any additional drivers you want to install.

17. Press <Esc> three times. At the **Exit nwconfig?** dialog box, highlight **Yes** and press <Enter>.

If you need additional assistance, see the section "Troubleshooting for NetWare" found later in this chapter.

The SCSISelect Utility

The BIOS for the integrated Adaptec AIC-7899 SCSI controller includes the menu-driven SCSI*Select* configuration utility, which allows you to change SCSI controller settings without opening the computer. SCSI*Select* also contains SCSI disk utilities that let you low-level format or verify the disk media of your SCSI hard-disk drives.

SCSISelect Default Settings

Default settings for the integrated AIC-7899 SCSI controller are shown in Table 3-1. These default settings are appropriate for most Peripheral Component Interconnect (PCI) systems. Run SCSI*Select* only if you need to change any of the default settings.

NOTES: To change the configuration settings, you must run the SCSISelect Utility.

The term ***host adapter*** *is used throughout this file to refer to the integrated AIC-7899 SCSI controller.*

If the host adapter does not control the bootable hard-disk drive, you may want to disable its BIOS.

For situations in which you might want or need to change the settings, see the descriptions of each setting in the following subsections. To change any of the default settings or to format or verify a disk, see the section "Starting the SCSISelect Utility" found later in this chapter.

Table 3-1. AIC-7899 SCSI Controller Settings

Setting	Default
SCSI Bus Interface Definitions:	
Host Adapter SCSI ID	7
SCSI Parity Checking	Enabled
Host Adapter SCSI Termination	Enabled
Boot Device Options:	
Boot Channel	A First
Boot SCSI ID	0
Boot LUN Number	0

Table 3-1. AIC-7899 SCSI Controller Settings *(continued)*

Setting	Default
SCSI Device/Configuration:	
Sync Transfer Rate MB/Sec	160
Initiate Wide Negotiation	Yes (Enabled)
Enable Disconnection	Yes (Enabled)
Send Start Unit Command	Yes (Enabled)
Enable Write Back Cache	Yes
BIOS Multiple LUN Support	No (Enabled)
Include in BIOS Scan	Yes (Enabled)
Advanced Configuration:	
Reset SCSI Bus at IC Initialization	Enabled
Display <Ctrl><a> Message During BIOS Initialization	Enabled
Extended BIOS Translation For DOS Drivers > 1 GB	Enabled
Silent/Verbose Mode	Verbose
Host Adapter BIOS	Enabled
Domain Validation	Enabled
Support Removable Disks Under BIOS As Fixed Disks	Boot Only
BIOS Support For Bootable CD-ROM	Enabled
BIOS Support For Int 13 Extensions	Enabled
Support For Ultra SCSI Speed	Enabled

NOTE: For the full name of an abbreviation or acronym used in this table, see the "Glossary."

SCSI Bus Interface Definitions

The basic host adapter settings are the SCSI*Select* settings most likely to require modification:

- **Host Adapter SCSI ID** — Sets the host adapter's SCSI ID. The default setting is **SCSI ID 7**, which allows the host adapter to support narrow SCSI devices in addition to wide SCSI devices. Dell recommends that you leave the host adapter set to **SCSI ID 7**.
- **SCSI Parity Checking** — Determines whether the host adapter verifies the accuracy of data transfer on the SCSI bus. The default setting is **Enabled**. You should disable **SCSI Parity Checking** if any SCSI device connected to the host adapter does not support SCSI parity; otherwise, leave it enabled. Most SCSI devices

support SCSI parity. If you are unsure if a device supports SCSI parity, consult the documentation for the device.

- **Host Adapter SCSI Termination** — Sets termination on the host adapter. The default setting for the AIC-7899 host adapter is **Automatic**. Dell recommends that you leave this option set to the default.

Boot Device Options

The boot device options allow you to specify the device from which to boot your computer:

- **Boot SCSI ID** — Specifies the boot channel (A or B) for the dual channel Apaptec 7899 host adapter. The default is **A First**.
- **Boot SCSI ID** — Specifies the SCSI ID of the device from which you want to boot your system. SCSI IDs are set for the hard-disk drive according to the drive's location on the backplane board. The default setting for **Boot Target ID** is **0**.
- **Boot LUN Number** — Allows you to specify a particular logical unit number (LUN) from which to boot your boot device if your boot device has multiple LUNs and **Multiple LUN Support** is enabled (see the section "Advanced Configuration Settings" found later in this chapter). The default setting is **LUN 0**.

SCSI Device/Configuration Settings

The SCSI device/configuration settings allow you to configure certain parameters for each device on the SCSI bus. To configure a specific device, you must know the SCSI ID assigned to that device. If you are not sure of the SCSI ID, see the section "Using the SCSI Disk Utilities" found later in this chapter.

- **Sync Transfer Rate** — Sets the maximum synchronous data transfer rate that the host adapter supports.

  The AIC-7899 host adapter supports rates up to 160 megabytes per second (MB/sec). The default for the AIC-7899 host adapter is **160 MB/sec**.

  If the host adapter is set to not negotiate for synchronous data transfer, the maximum synchronous transfer rate is the maximum rate that the host adapter accepts from the device during negotiation. (This is standard SCSI protocol.)

- **Initiate Wide Negotiation** — Determines whether the host adapter attempts 16-bit data transfer instead of 8-bit data transfer. The default is **Yes**.

NOTE: Some 8-bit SCSI devices may have trouble handling wide negotiation, which may result in erratic behavior or a hang condition. For these devices, set ***Initiate Wide Negotiation*** *to* ***No****.*

When this option is set to **Yes**, the host adapter attempts 16-bit data transfer. When this option is set to **No**, 8-bit data transfer is used unless the SCSI device itself requests wide negotiation. The effective transfer rate is doubled when 16-bit data transfer is used because the data path for wide SCSI is twice the size of normal 8-bit SCSI.

- **Enable Disconnection** (sometimes called disconnect/reconnect) — Determines whether the host adapter allows the SCSI device to disconnect from the SCSI bus. Enabling disconnection allows the host adapter to perform other operations on the SCSI bus while the SCSI device is temporarily disconnected. The default setting is **Yes**.

  Leave **Enable Disconnection** set to **Yes** if two or more SCSI devices are connected to the host adapter. This optimizes SCSI bus performance. If only one SCSI device is connected to the host adapter, set **Enable Disconnection** to **No** to achieve slightly better performance.

- **Send Start Unit Command** — Determines whether the start unit command is sent to the SCSI device during the boot routine. The default is **Yes**.

  Setting this option to **Yes** reduces the load on your computer's power supply by allowing the host adapter to start SCSI devices one at a time when you boot your computer. When this option is set to **No**, the devices are allowed to start at the same time. Most devices require you to set a jumper before they can respond to this command.

*NOTE: For many devices, if **Send Start Unit Command** is set to **Yes**, the boot routine time will vary depending on how long it takes each drive to start.*

- **Enable Write Back Cache** — Signals the completion of a write request as soon as the data is in cache. Actual writing to the disk occurs at a later time. The default setting is **N/C**.
- **BIOS Multiple LUN Support** — Provides support for peripherals that contain multiple SCSI devices, such as autoloading tape drives and CD-ROM changers.

*NOTE: The setting for **BIOS Multiple LUN Support** must be **Enabled** if a tape autoloader is connected.*

- **Include in BIOS Scan** — Enables you to set whether the system BIOS scans this device during system start-up. The default is **Yes**.

Advanced Configuration Settings

The advanced host adapter settings should not be changed unless absolutely necessary. These values are set by Dell, and changing them may cause conflicts with the SCSI devices.

- **Reset SCSI Bus at IC Initialization** — Enables the SCSI bus to be reset when the controller is initialized. The default is **Enabled**.
- **Display <Ctrl><a> Message During BIOS Initialization** — Determines whether the `Press <CTRL><A> for SCSISelect (TM) Utility!` message appears on your screen during system start-up. The default setting is **Enabled**. If this setting is disabled, you can still run the SCSI*Select* utility by pressing <Ctrl><a> after the host adapter BIOS banner appears.
- **Extended BIOS Translation For DOS Drives > 1 GB** — Determines whether extended translation is available for SCSI hard-disk drives with capacities greater than 1 gigabyte (GB). The default setting is **Enabled**.

NOTICE: Back up your hard-disk drive before you change the translation scheme. All data is erased when you change from one translation scheme to another.

The standard translation scheme for SCSI host adapters provides a maximum accessible capacity of 1 GB. To support hard-disk drives larger than 1 GB, the 78*xx* series host adapters include an extended translation scheme that supports hard-disk drives as large as 8 GB, with a maximum partition size of 2 GB under the DOS operating system.

It is not necessary to enable the **Extended BIOS Translation** setting if you are using another operating system, such as Novell NetWare.

When you partition a hard-disk drive larger than 1 GB, use the DOS **fdisk** utility as you normally would. Because the cylinder size increases to 8 MB under extended translation, the partition size you choose must be a multiple of 8 MB. If you request a size that is not a multiple of 8 MB, **fdisk** rounds up to the nearest whole multiple of 8 MB.

- **Silent/Verbose Mode** — Displays the host adapter information during system start-up. The default is **Verbose**.
- **Host Adapter BIOS** — Enables or disables the host adapter BIOS. The default setting is **Enabled**.

NOTE: Several SCSISelect options are not valid unless the host adapter BIOS is enabled.

If you are booting from a SCSI hard-disk drive connected to the host adapter, the BIOS must be enabled. You should disable the host adapter BIOS if the peripherals on the SCSI bus (for example, CD-ROM drives) are all controlled by device drivers and do not need the BIOS.

- **Domain Validation** — Instructs the host adapter not to accept a negotiated speed until a validation test is successfully performed. After determining the speed that a target device is capable of, the host adapter sends a **Write Buffer** command to the target device. The data transfer occurs at the full speed initially. The initiator reads and tests the data, and identifies any parity or cyclic redundancy check (CRC) errors. If the test fails, the initiator lowers its speed and repeats the test. In this manner, a compatible speed will be found and locked in before user data transfers begin. The default is **Enabled**.
- **Support Removable Disks Under BIOS As Fixed Disks** — Controls which removable-media drives are supported by the host adapter BIOS. The default setting is **Boot Only**. The following choices are available.

NOTICE: If a removable-media SCSI device is controlled by the host adapter BIOS, do not remove the media while the drive is on or you may lose data. If you want to be able to remove media while the drive is on, install your removable-media device driver and set this option to Disabled.

  - **Boot Only** — Only the removable-media drive designated as the boot device is treated as a hard-disk drive.

- **All Disks** — All removable-media drives supported by the BIOS are treated as hard-disk drives.
- **Disabled** — No removable-media drives are treated as hard-disk drives. In this situation, software drivers are needed because the drives are not controlled by the BIOS.

- **BIOS Support For Bootable CD-ROM** — Determines whether the host adapter BIOS provides support for booting from a CD-ROM drive. The default setting is **Enabled**.
- **BIOS Support For Int 13 Extensions** — Determines whether the host adapter BIOS supports disks with more than 1024 cylinders. The default setting is **Enabled**.
- **Support For Ultra SCSI Speed** — Determines whether the host adapter supports the fast transfer rates (20–40 MB/sec). The default setting is **Enabled**.

Starting the SCSISelect Utility

You can start the SCSI*Select* utility by pressing <Ctrl><a> when the following prompt appears briefly during start-up:

```
Press <CTRL><A> for SCSISelect™ Utility!
```

The first menu displays the **Configure/View Host Adapter Settings** and **SCSI Disk Utilities** options.

Using SCSISelect Menus

SCSI*Select* uses menus to list options that you can select. To select an option, press the up- and down-arrow keys to move the cursor to the option; then press <Enter>.

In some cases, selecting an option displays another menu. You can return to the previous menu at any time by pressing <Esc>. To restore the original SCSI*Select* default values, press <F6>.

Using the SCSI Disk Utilities

To access the SCSI disk utilities, select **SCSI Disk Utilities** from the menu that appears when you start SCSI*Select*. When the option is selected, SCSI*Select* immediately scans the SCSI bus (to determine the devices installed) and displays a list of all SCSI IDs and the device assigned to each ID.

When you select a specific ID and device, a menu appears, displaying the **Format Disk** and **Verify Disk Media** options.

NOTICE: The Format Disk option destroys all data on the hard-disk drive.

- **Format Disk** — Runs a utility that allows you to perform a low-level format on a hard-disk drive. Most SCSI disk drives are formatted at the factory and do not need to be formatted again. The Adaptec Format Disk utility is compatible with the majority of SCSI disk drives.

- **Verify Disk Media** — Runs a utility that allows you to scan the media of a hard-disk drive for defects. If the utility finds bad blocks on the media, it prompts you to reassign them; if you select **Yes**, those blocks are no longer used. You can press <Esc> at any time to exit the utility.

Exiting SCSISelect

To exit SCSI*Select*, press <Esc> until a message prompts you to exit. (If you changed any 78*xx* series host adapter settings, you are prompted to save the changes before you exit.) At the prompt, select **Yes** to exit, and then press any key to reboot the computer. Any changes that you made in SCSI*Select* take effect after the computer boots. (You can select **No** at the prompt if you are not ready to exit SCSI*Select*.)

Using SCSI Devices

The subsections that follow provide procedures and tips on the following topics:

- Formatting media
- Using removable media
- Verifying status
- Using drives that are tested and approved for NetWare
- Using the NetWare tape backup utility
- Setting up a CD-ROM drive with NetWare 4.2

Formatting Media

NetWare's **nwconfig.nlm** program lets you optionally format a hard-disk drive for use with NetWare. If you are using SCSI drives, the program allows you to low-level format several SCSI drives simultaneously. The NetWare format procedure is not the same as using **fdisk** or **format** under DOS.

NOTICE: You should not use NetWare to format a hard-disk drive that contains partitions for other operating systems because that information may be destroyed.

Using Removable Media

The **adpu160.ham** driver module fully supports removable-media disk drives, including magneto-optical drives. Removable media is treated as a standard SCSI hard-disk drive, with some exceptions:

- The driver only recognizes and registers media with 512 bytes per sector.
- NetWare allows you to mount or dismount the media and lock or unlock the media.

These removable media options are supported by NetWare's **monitor.nlm** program.

To set up the removable media, perform the following steps:

1. Load **monitor.nlm** to display the various options.
2. Select **Disk Information**.

   All system hard-disk drives appear.
3. Select the removable-media device.

   Drive status options appear as shown in Table 3-2.

Table 3-2. Drive Status Options

Menu Option	Default Value
Volume Segments on Drive[1]	Select for a list
Read After Write Verify[1]	Hardware Level
Drive Light Status[1]	Not supported
Driver Operating Status[1]	Active
Removable Drive Mount Status[2]	Mounted
Removable Drive Lock Status[2]	Not Locked

[1] *Valid for both removable and nonremovable SCSI drives.*

[2] *Valid for removable media only.*

Verify Status

The **Read After Write Verify** option is set to **Hardware Level** by default. This option cannot be specified in the **startup.ncf** or **autoexec.ncf** file. However, the default can be set on the command line. Refer to the NetWare *User's Guide* for information about using the **load** command-line options.

The available options are defined in Table 3-3.

Table 3-3. Read After Write Verify Options

Option Setting	Function
Disabled	All writes to SCSI disk drives are executed with the **SCSI Write** command (**0Ah** or **2Ah**).
Hardware Level	All writes to SCSI disk drives are executed with the **SCSI Write and Verify** command (**2Eh**) or (if this command is not supported by the drive) with the **SCSI Write** command (**0Ah** or **2Ah**), followed by the **SCSI Verify** command (**2Fh**).
Software Level	Not supported.

Mount Status

Mounting causes a drive to come online as a NetWare storage device. Dismounted drives are inactive and cannot be accessed.

Before you eject the current media, dismount it. When the mount status is **Dismounted**, eject the media. However, NetWare does not allow you to dismount media that are locked.

To insert your new media, wait for the drive to spin up, and then select the **Removable Drive Mount Status** option.

Lock Status

If your removable-media device supports the lock/unlock feature, you can lock the media. The media must be in the **Not Locked** state before you can eject it.

Using Drives Tested and Approved for NetWare

To be fully certified as NetWare "Yes, Tested and Approved," a drive and host adapter must both pass a qualification process that takes place before you see the product. The goals of NetWare testing are to simplify installation and provide the highest quality disk subsystem.

Adaptec 78*xx* series host adapters and their drivers are fully tested and approved for NetWare. This means that you can purchase a NetWare drive (certified as "Yes, Tested and Approved") from a vendor, connect it to your computer system or host adapter, partition it, and create a volume without any compatibility concerns.

NOTE: Dell recommends using only Dell-tested drives.

Adaptec's **adpu160.ham** driver module is flexible enough to allow you to connect SCSI drives that are tested and approved for NetWare as well as standard SCSI drives to a single host adapter. The driver registers each hard-disk drive accordingly.

Drive registration is a user-transparent process; no user interaction is required. You can tell that the drive has been detected as NetWare-tested and NetWare-approved if the message `NetWare Yes Tested and Approved` is included in the drive description string that appears when you run **monitor.nlm** (disk options).

Using the NetWare Tape Backup Utility

Included with NetWare is a server-based tape backup utility called **sbcon.nlm**. This allows backup of server hard-disk drives to a server tape drive. The **sbcon.nlm** utility supports Adaptec host adapters. To load the backup utility, perform the following steps:

1. Load the SCSI adapter driver by entering:

   `load [`*`pathname`*`]\aha160.ham [`*`options`*`] slot=x`

   The ASPI layer (**nwaspi.cdm**) is automatically loaded.

2. Refer to the Novell NetWare documentation for additional instructions on loading the server backup software. Refer to the *NetWare Server Backup User's Guide* to load the **tsa** and **sbcon** modules.

Setting Up a CD-ROM Drive With NetWare 4.2

To use a CD-ROM drive with NetWare 4.2, perform the following steps:

1. Ensure that the CD-ROM driver for NetWare 4.2 (**idecd.cdm**) is loaded. If necessary, load the driver by entering the following command line:

   ```
   load [pathname]\idecd.cdm slot=x
   Load cdrom.nlm by entering the following command line:
   ```

2. Load **cdrom.nlm** by entering the following command line:

   ```
   load [pathname]\cdrom.nlm
   ```

3. Enter the following line at the prompt and then note the number and name of the CD that appears:

   ```
   cd device list
   ```

4. Enter the number or volume name of the CD at the command line:

   ```
   cd mount [number]
   ```

   or

   ```
   cd mount [name]
   ```

The CD-ROM drive is now ready to be accessed as a volume.

Troubleshooting for Windows NT

The boot manager for Windows NT contains recovery logic to allow you to return to the last known good configuration. If you have changed your host adapter configuration and Windows NT no longer boots, perform the following steps to recover it:

1. Undo any hardware changes that you have made to the computer since it was last operational.

2. Reboot the computer. Watch the display carefully during start-up. If the following message appears, press the spacebar, type `l` at the next screen, and then follow the instructions on the screen to continue booting with the last known good configuration:

   ```
   Press spacebar NOW to invoke the Last Known Good menu
   ```

3. When your computer is operational again, check all of the hardware and software configuration changes that you want to make. Look specifically for conflicts with parts of the existing system configuration that are not being changed.

   If you cannot determine the source of the error, see, "Getting Help" in the *Installation and Troubleshooting Guide* for instructions on contacting Dell for technical assistance.

Troubleshooting for NetWare

Any error that occurs while the driver is initializing prevents it from loading. If an error does occur, the driver causes the computer to beep and then display the following numbered error message:

xxx message

The *xxx* indicates the error code and *message* is a line of text describing the error. The error codes are divided into three categories:

- 000-099 — Non-host-adapter specific
- 100-299 — Host-adapter specific
- 300-999 — Reserved

Specific error codes, such as those in the following subsections, appear only if you have installed the host adapters and drivers that generate them.

Non-Host-Adapter Specific Error Codes

The following error codes alert you to error conditions caused by factors not related to the host adapter:

`000 Failed ParseDriverParameters call`

A call to NetWare's ParseDriverParameters routine has failed for some unknown reason. The command line contains errors, or you pressed <Esc> at the port or slot prompt.

`001 Unable to reserve hardware, possible conflict`

The driver failed in its attempt to reserve the host adapter's hardware settings (that is, direct memory access [DMA] and interrupt request [IRQ] settings). Another card in your system may be causing a conflict with the host adapter.

`002 NetWare rejected card Failed AddDiskSystem call`

The driver failed in its attempt to register the host adapter with NetWare. The file server may not have enough memory.

`003 Invalid command line option entered > option`

An invalid option was entered on the command line. The invalid option that was entered is also displayed.

`004 Invalid command line, please enter correctly`

The driver was unable to understand the command line options that you entered. Be sure that you have entered these options correctly.

Host-Adapter Specific Error Codes

The following error codes alert you to error conditions caused by factors related to the host adapter:

`200 No host adapter found for this driver to register`

No Adaptec 78*xx* host adapter was found in your computer for the driver to register. Be sure that the host adapter is properly configured and properly seated in the slot.

`203 Invalid 'device' setting`

You have entered an invalid slot setting on the command line. You can only enter slot numbers for valid host adapters. If you load without the slot option, you will be prompted to enter a valid value.

`204 Invalid 'verbose' setting, use 'y'`

You can only enter `y` for this option (verbose=y).

`205 Invalid 'removable' setting, use 'off'`

You can only enter off for this option (removable=off).

`206 Invalid 'fixed_disk' setting, use 'off'`

You can only enter off for this option (fixed_disk=off).

`208 SCSI present but not enabled/configured for PCI`

A host adapter is present, but its bus or device entry has not been enabled.