Chapter 1 Installing The Hardware

Overview

This chapter provides detailed procedures for installing:

- SCSI host adapters
- backup devices and termination blocks
- SCSI Device Drivers

If you have already installed your hardware, proceed to Chapter 2.

Contents

8200 8mm Tape Drives

Upgrading Devices

Introduction

Backup Director software operates in a server on a local area network. The software supports a wide variety of third-party 4mm DDS DAT, DLT, 8mm tape drives, and optical disk drives. All supported devices communicate through a SCSI host adapter.

Supported Backup Devices

As a general rule, Backup Director's support of tape and optical drives is determined by the firmware revision of that drive. (Note that the firmware revision is important when determining support for a drive since features and functionality may vary from one revision to the next.)

Supported SCSI Host Adapters

Backup Director supports host adapters for Micro-Channel Architecture (MCA), EISA, and ISA/AT-style computers, but configuration options may vary depending upon the server used.

Autoloader Support

Palindrome Autoloader and Multi-Drive Autoloader software packages (purchased separately) allow you to use a tape or optical robotic librarian to completely integrate Backup Director operations for all backup and restore tasks.

> **TIP:** For a list of the most recent certified backup devices and host adapters, download **CDL40.ASC** from the Palindrome BBS. For a list of certified device drivers, download **TSTDRVR.ASC**.

Installing the SCSI Host Adapter and Backup Device

The following topics are covered in this section:

- installing the SCSI host adapter
- installing the backup device and SCSI cable
- terminating the SCSI bus
- installing and configuring the host adapter driver software

Requirements

To properly install your backup device, you should have the following:

- A Backup Director supported backup device, host adapter, and driver software appropriate for your type of machine.
- A SCSI connector cable.
- A termination block (unless you are certain that your drive is already internally terminated).
- A static-free work environment.
- The appropriate tools for accessing the adapter slots in your computer. (Typically

a phillips and flat-head screwdriver are sufficient.)

Installing the SCSI Host Adapter

1. Turn off the computer and all external peripherals such as printers or modems.

2. Disconnect the power cord from the computer.

3. Remove the computer cover using the instructions provided with your computer. Be sure to touch the computer's metal frame to discharge any static electricity you may have built up.

4. Choose an appropriate, unused expansion slot in the computer.

5. Each expansion slot has a corresponding opening on the back of your computer that is covered. Remove this slot cover and the single screw holding the slot cover in place.

   NOTE: Unless your backup device is connected to a host adapter with an attached bootable hard disk, Palindrome recommends disabling the on-board BIOS on the host adapter. Palindrome does not require the BIOS enabled on any host adapters. Bootable hard disks on the same SCSI bus require the BIOS to be enabled however.

6. Align the host adapter with the expansion slot ensuring that the mounting bracket aligns with the slot opening. Press the host adapter firmly (but gently) into the expansion slot until you feel that it is securely seated. Secure the mounting bracket with the slot cover screw (removed earlier).

   WARNING: Failure to mount your adapter correctly would cause numerous hardware errors and may result in the adapter not being recognized by your system.

7. Replace the cover on the computer but do not secure it yet. Secure it only after you are sure the host adapter has been installed properly and does not conflict with any other adapters you have installed in your machine.

Servers With More Than 16MB of Memory

If you have a server with more than 16MB of memory (and you are using a SCSI adapter that uses on-line DMA or AT Bus Mastering and therefore cannot access memory above 16MB [for example an Adaptec 1540]), you must use Palindrome's SCSI Driver (PALSDRV.NLM) with the ABOVE16MEG switch.

Installing a Single Backup Device

This section provides instructions on installing a single backup device. If you are installing multiple backup devices, proceed to the section, *Daisy Chaining Devices*.

NOTE: Do not connect the power cord at this time. Doing so may damage circuit board components when the SCSI cables are connected between the computer and the backup device(s).

1. Locate the SCSI cable shipped with the SCSI host adapter and plug one end into the host adapter at the back of the computer.

2. Plug the other end of the cable into either one of the 50-pin connectors on the back panel of the backup device enclosure.

3. Install the termination block on the other open 50-pin connector on the back of the backup device.

4. Connect the power cord to the backup device and plug it in.

5. Reconnect all of the peripherals and the power cord to the computer.

> **NOTE:** If you have an **internal** backup device, follow the installation instructions that came with the device.

Setting the SCSI Address

If your host adapter is being used for other devices, be sure your SCSI address on your backup device is different than the SCSI address on your other device(s). Zero is the highest priority; 7 is the lowest.

On most backup devices the SCSI address is set by incrementing an external dip switch on the back panel of the drive.

> > Press the button labeled “+” to increment the SCSI address on the dip switch or the button labeled “-” to decrement it. (If using a single device on the SCSI bus, it is unlikely you will have to set the SCSI address.)

AutoLoader Setup

In an autoloader, the backup device and robotic arm each must have a unique SCSI ID.

If you are using a 4mm ADIC or Palindrome autoloader (such as the Palindrome FAST 2000C Turbo AutoLoader), the drive's SCSI ID must be set at 0, 1, or 2 to avoid conflicts with the robotic arm. Also be sure that the drive and autoloader are set to SCSI IDs other than the one used by the host adapter (which is typically **7**).

AutoLoaders with Multiple Devices

If your autoloader has more than one backup device, the backup devices' SCSI IDs must be set to the numbers immediately following the robotic arm's SCSI ID. For example, if the robotic arm SCSI ID is set to 2, the first drive must be set to 3, the second drive must be set to 4, etc.

Daisy Chaining Devices

Backup Director allows you to use multiple devices for backup and restore operations. To use these devices you may connect them to separate host adapters or daisy chain devices together off the same host adapter.

To daisy chain multiple backup devices, you will need to have SCSI cables to attach to your adapter and to each of your backup devices, and one termination block to terminate the last device on the bus.

1. Locate the SCSI cable (matching the connector on the SCSI host adapter) and plug it into the host adapter connector at the back of the computer.

2. Plug the other end of the cable into *either* of the 50-pin connectors on the back panel of one of the backup devices.

3. From this first backup device plug another SCSI cable into the remaining open connector and attach it to second backup device.

4. Continue attaching cables between backup devices.

5. Terminate the **last** backup device using a termination block on the open connector.

6. Connect the power cords to all of the backup devices and plug them in.

7. Reconnect all of the peripherals and the power cord to the computer.

Setting the SCSI Address

To ensure your multiple devices will work correctly with Backup Director, you must set a **unique** SCSI address for each device.

The SCSI address is set by either jumpers or dip switches on the backup device. Once configured, the assigned SCSI address will be “learned” by Backup Director when scanning the SCSI bus during device configuration.

On most backup devices the SCSI address is set by incrementing an external dip switch on the back panel of the drive.

> Press the button labeled “+” to increment the ID number or the button labeled “-” to decrement the ID number. Choose a different SCSI address for each backup device you are using. Zero is the highest priority; 7 is the lowest.

NOTE: Once you have configured devices in Backup Director, it assumes those devices will always be at that location (address). If you change the addresses on your backup devices, be sure to reconfigure your device using Device Manager.

Backup and Hard Disk Devices

Palindrome recommends that you keep your backup devices and hard disks on separate SCSI buses (i.e., connect your backup device to a separate host adapter).

Customers have found that backup devices are easier to maintain when kept on a separate SCSI bus.

SCSI Bus Termination

Why Must it Be Terminated?

SCSI is the acronym for Small Computer System Interface. It is a specification designed by ANSI (American National Standard for Information Systems). It provides the mechanical, electrical, and functional requirements for a small computer input/output bus and command sets for peripheral device types commonly used with small computers.

SCSI is an eight-bit, parallel I/O bus that provides a host computer with device independence within a class of devices. This means that different disk drives, backup devices, printers and communications devices can be added to a host computer without major modifications to the system hardware or software.

The first (usually the host adapter) and last device on the SCSI bus must be terminated. Terminators match electrical line impedances and effectively eliminate any appreciable signal reflection. Unterminated bus situations can corrupt both tape backup device commands and data being transferred between the computer and backup devices. So, for a system that has only a SCSI host adapter and a tape drive, both must be terminated.

NOTE: To minimize signal reflections, cables of different impedances should not be used on the same bus. Also, the length of your SCSI bus cable should not exceed 6 meters (19.8 feet). Remember to include the internal cable length in autoloaders as part of your total SCSI bus cable length.

Installing the Termination Block

Most internal backup devices come with terminators factory installed. Since these drives are already properly terminated, no further action is required.

External backup devices typically *do not* come with terminators factory installed and require an external termination block to properly terminate the SCSI bus. The SCSI termination block should have been provided with your hardware.

Before installing the Backup Director software, you must ensure that the SCSI bus is properly terminated. The SCSI bus must be terminated at both ends for proper backup device operation. Since the SCSI host adapter is shipped with terminating resistors already installed, you simply need to terminate the SCSI bus at the backup device.

To install the termination block, attach it to the unused 50-pin SCSI connector on the back panel of the backup device. The SCSI cable is then attached to the other remaining SCSI connector.

After installing the software, if you see messages indicating that Backup Director cannot communicate with the drive or occasional read-write errors, remove the termination block.

The intermittent messages may be the result of “double termination” if your drive is already internally terminated. Removing the external termination block may leave the drive properly terminated.

NOTE: If you have more than one peripheral on the same SCSI bus, only the host adapter and last device should be terminated. The SCSI bus should never have more than two terminators installed.

Installing the SCSI Host Adapter Driver

The following are general instructions for installing your host adapter's device driver and ASPI module. More detailed instructions can be found with your host adapter's documentation.

NOTE: Device drivers for NetFRAME and Tricord servers and IBM PS2 SCSI host adapters, are copied to the installation directory during installation of the client software. See Chapter 3 for information on installing these drivers.

To install the device driver and ASPI module

1. Copy the device driver from the diskette to the SYS:\SYSTEM directory, using the DOS COPY command. For example, from the DOS prompt type:

COPY B:\<DEVICE DRIVER> MYSERV\SYS:\SYSTEM

where B: contains the software diskette your driver is on.

2. Load the device driver software. For example, from the server console prompt type:

LOAD AHA1740 (or equivalent)

3. Edit your AUTOEXEC.NCF file so that it contains the LOAD command(s) described above.

4. After you have updated your AUTOEXEC.NCF file, save the changes so that the driver(s) will be loaded automatically when your server boots.

For EISA and MCA machines, you must also install configuration files and initialization parameters, respectively.

Hardware Installation Notes

Hardware Installation Checklist

Before powering your system, please be sure the following items are completed and checked:

- The host adapter is firmly seated in the host computer's adapter slot.
- SCSI devices are properly installed and cabled.
- The correct SCSI addresses are selected on all attached SCSI devices. Be sure there is a unique address for each device.
- The correct operating modes are selected on all attached SCSI devices (as described in the documentation supplied with the SCSI device).
- Be sure both ends of the SCSI bus are terminated. Use the termination block provided with your hardware (unless you know the drive is already internally terminated) to terminate the backup device.

After installing your backup device and host adapter, be sure to turn on your backup devices before powering up your server.

SCSISCAN.NLM

To ensure the backup device is properly installed, copy SCSISCAN.NLM from the \TOOLS directory on the last Backup Director installation diskette to your server and run it from your server console prompt.

SCSISCAN displays all SCSI devices on your SCSI bus. If all of your devices do not display, use the checklist above to ensure you have installed your backup device properly.

8500 8mm Tape Drives

For any FAST 5000 (or other Exabyte 8500) 8mm tape drive, the default transfer mode is asynchronous; meanwhile the default transfer mode of the many host adapters is synchronous.

This may cause a conflict if the tape drive is ever disconnected or powered off and then powered on again while the server is still running since the tape drive will default to asynchronous transfer and the adapter will fail to renegotiate transfer mode. The next tape operation will then fail and lock the workstation or server console screen.

If the tape operation is hanging, you must down the workstation or the server. To avoid potential conflicts, always power on the tape drive prior to powering on your workstation or server.

8200 8mm Tape Drives

Due to its older technology, standard 8200 8mm tape drives lack positioning commands (used by SMS) that are available in newer tape drives. If using the standard 8200 tape drive, you will notice a performance impact, especially when recovering from error conditions.

Upgrading Devices

If you upgrade or change your backup device(s), be sure to configure the new device(s) using Device Manager. Backup Director recognizes the device after scanning the SCSI bus.

If a new device also entails a media type change (e.g., upgrading from 4mm to 8mm), you may want to retire all media sets associated backup device or change the Library ID. This procedure allows you create a new media library and retires the previous media type.

You can still restore data on the older media type by keeping the older device configured. To only restore data from the older device, set the operational priorities in Device Manager so the device is used as a restore only device.

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