Chapter 11 Managing Devices

Overview

This chapter describes how to:

- Add and remove configured devices
- Test devices
- Troubleshoot soft errors
- Prioritize devices for specific operations

Contents

Introduction

The device tree displays the connected devices that were turned on at installation or when you most recently scanned the SCSI bus. To display any devices that may have been turned

on since you accessed Device Manager, open the Operations menu and select *Scan for Devices*. Any devices that were recently turned on appear in the window.

The device tree includes all devices on the SCSI bus of your Backup Director installation server, whether or not you have added them as configured devices. Configured devices appear with logical names beside the device drive icons.

Non-configured devices appear with the label "Not Configured." SCSI hard drives appear on the device tree, and the tree indicates their type, such as a CD-ROM or Direct Access Storage Device. However, SCSI hard drives are not available for Backup Director operations.

> **TIP:** You may want to collapse the adapter icon of any SCSI hard drive on the device tree. Collapsing the adapter icon will hide the non-configurable device and may help to avoid confusion later. Use the Tree/*Collapse* option.

Backup Director allows you to use different types of devices (optical and tape drives, for example) for your backup operations. These devices can be daisy-chained or attached to separate SCSI host adapters. Once you have installed the devices, you can then configure them for different operations, if necessary.

See the *Installation Guide* for more information about installing devices.

Device Manager Tool Bar

The Device Manager tool bar provides a short cut to commonly used operations:

Add Device–Add an unconfigured device

Remove Device–Remove a configured device

Scan for Devices–Search for any new devices on the bus.

Help–Open the Help menu.

Adding a Device

When you first install Backup Director, the program scans the SCSI bus to identify all connected devices. You can configure one or more devices during installation. At installation, you can only configure the drive of an autoloader. You must first install AutoLoader Software before configuring the autoloader (specifically, the robotic arm also known as a "media changer"). The remaining backup devices appear as "Not Configured" in the devices window.

To add a device

1.   Be sure that the device you want to configure is turned on.

> >   If the device was turned off, you must turn it on and scan the SCSI bus again. Open the Operations menu in Device Manager and choose the *Scan for Devices* option.

2.   Highlight the device icon, open the Operations menu, and select *Add Device*. The "Not Configured" status disappears from the tree.

> To add an autoloader, highlight the device icon, open the Operations menu and select *Add Device*. If there are multiple devices, add these first before adding the autoloader. Highlight the autoloader icon. Select *Add Device*. Notice that the device icon appears connected to the autoloader icon and no longer appears as an independent item on the tree.

Once you have added the device, its logical name is stored in the System Control Database. For more information about using an autoloader to perform operations, see the *AutoLoader Software Guide*.

> **TIP:** If you have multiple backup devices, see chapter 5 for information on enabling concurrency. See chapter 2 for a description of concurrent backup operations and concurrent jobs.

Assigning a Logical Name to a Device

Backup Director automatically assigns configured devices a logical name such as "DEFAULT_0_1". The first number refers to its adapter number and the second number refers to the device's SCSI ID. You may want to give a device a more descriptive logical name.

To change the logical name of a device

1. From the device window, highlight a device.

2. Open the Operations menu and select the *Edit Device* option. The Configure Device dialog box appears.

3. In the **Logical Name** parameter, type the name you want to call the device.

4. Choose **OK** to save the name.

Changing the SCSI Address

If you are moving a device to another SCSI card or the dip switch is accidentally turned off, Device Manager can no longer identify the device (it appears dimmed on the device tree). You can add the device again to the configuration list.

A better solution is to change the SCSI address so that you do not lose the device statistics that have accumulated for the device.

To change a device's SCSI address

1. Open the Operations menu and select *Scan for Devices*.

2. Highlight the device.

3. Open the Operations menu and select *Edit Device*. The Configure Device dialog box appears.

4. Enter the new host adapter, SCSI ID, and logical unit number information and choose **OK**.

Upgrading Devices

Upgrading your backup device can enhance the flexibility and performance of your Backup Director installation. If your new device uses a different media type, you can continue using the current media library. Backup Director simply adds the new media to the managed media sets.

> **NOTE:** If you are upgrading firmware, you must unload PALMEDIA.NLM from the server before adding the new firmware. If you do not, the SCSI bus "locks up." At the server console prompt, type **UNLOAD PALMEDIA**. After you have upgraded the firmware, return to the server console and type **LOAD PALMEDIA**. NetWare adds the PALMEDIA module.

To upgrade a device

1. Open the File menu and select *Scan for Devices*. The new device appears in the device tree.

2. Highlight the new device.

3. Open the File menu and select *Add Device*.

4. Edit the parameters for the new device if appropriate. For example, if you are adding an autoloader, edit the new device's slot configuration.

Upgrading to a Different Media Type

If the new device also entails a media type change (e.g., upgrading from 4mm to 8mm), you may want to configure the original device for restore operations only. Set the operational priorities using the Operations/*Edit Device* option. At the next rotation the program will continue to request the original media.

To use only the new media type for write operations, retire the original media from the managed media sets. The program will automatically request these media for restore operations if necessary.

Removing a Device

To remove a device from the configured device list

> > If you are removing a single tape drive, highlight the device icon, open the Operations menu, and select *Remove Device.*

> > If you are removing an autoloader and its device from the configured device list, highlight the autoloader icon, open the Operations menu and select *Remove Device*. Highlight the device icon and select *Remove Device*. If there are multiple drives in the autoloader, repeat this task for each device.

Once you have removed the device, its logical name is removed from the System Control Database. The device now appears in the device window as "Not Configured."

> **NOTE:** If a device on your device window appears dimmed, the device has been disabled. It may have been turned off or unplugged since you most recently scanned the SCSI Bus. Check the status of the device and scan the bus for devices.

Device Summary Report

Backup Director can print a list of devices currently configured for Backup Director operations. See chapter 7 for information about viewing and printing the Device Summary report.

Editing the Autoloader's Slot Configuration

There are two reasons for editing the slot configuration:

- You are reserving some of the slots, possibly for use by another drive.
- You are changing the location of the cleaning cartridge. By default, Backup Director uses the total number of slots designed for the device and does not assign a location to the cleaning cartridge.

To edit the slot configuration

1. Highlight the device icon of the autoloader you want to reconfigure.

2. Open the *Operation* menu and select *Edit Device*. The Configure Autoloader dialog box appears.

3. Enter the appropriate slots.

   > To specify the range of slots you want Backup Director to use, indicate the beginning and end of the range in the **First** and **Last** parameters.

   > To specify the cleaning cartridge's location, enter the slot number in the **Cleaning Required** parameter.

4. Choose **OK** to save your changes.

Loading Media into Autoloaders

If you are using an autoloader with an import/export door, you may need to perform an additional step when loading different media into the device.

To load media into the autoloader's door

1. Open the Operations menu and select *Import* Load the media into the autoloader. When you close the door, the device loads the media into the first available slot.

2. Open the Operations menu and select **Scan for Devices**. To confirm that the correct media is now mounted, highlight the device and select the Status tab. The tab displays the label of the media currently mounted in the device.

Testing Your Device

If you receive system messages indicating a media or hardware problem such as a failed write operation or excessive soft errors, you should perform a read/write test on your device. A read/write test identifies read, write, compare, and positioning failures. The short version takes approximately 15 to 20 minutes; the long version takes approximately 45 to 60 minutes. In most cases, the short test is sufficient. If you continue to have problems, run the long test.

> **TIP:** Dirty backup devices are responsible for most soft errors. Avoid soft errors by periodically reviewing the Statistics tab in Device Manager. The **Cleaning Required** check box on the Devices tab indicates that the device needs to be cleaned immediately.

> **WARNING:** To avoid losing data, never perform the read/write test with a tape that contains data.

Read/Write Test

To test the read/write tape heads

1. Insert blank media into the drive.

2. Highlight the device icon.

3. Open the Operations menu and choose *Test Device*. The Test Device dialog box appears.

4. Indicate which test (**Long** or **Short**) you want to perform.

5. Indicate whether you want to record the SCSI instructions that occur during the test. Selecting the **Device Trace** option creates an attached file that can be viewed through the System Message window. When this option is turned off, the program simply reports the percentage of read and write errors that occurred as system messages.

6. Specify any other parameters for this job.

7. Choose **OK** to submit the test job to the job queue. The results of the test are written as an attachment in the System Messages window. If the test indicates a relatively high percentage of soft errors, see the soft errors section below for troubleshooting recommendations.

Autoloader Test

In addition to being able to read and write data correctly, autoloaders must also retrieve media from the correct slot and load media into the device. The autoloader test determines whether the robotic arm performs correctly by checking the robotic arm's ability to locate, retrieve, and load media.

To test the autoloader

1. Highlight the autoloader icon.

2. Open the Operations menu and choose *Test Device*.

3. Indicate whether you want to perform the short or long autoloader test. The length of the test depends on the type of autoloader you have and the number of media the autoloader must retrieve and load. The short test loads each media once and the long test loads each media five times. The longer test is more likely to identify errors that occur sporadically.

4. Indicate whether you want to record the SCSI instructions that occur during the

read/write test.

5.   Specify any other parameters for this job.

6.   Choose **OK** to submit the test job to the job queue.

Reviewing Test Results

The results of a SCSI device trace or a hardware test are written to files attached to the System Messages database.

To view test results

1.   From the Control Panel in Control Console, select the Status tab and choose **System Messages**. The System Messages window appears.

2.   Highlight the system message that corresponds to the module (PALUTIL.NLM) and the job ID of the test. The full description of the system message appears below the system messages.

3.   Choose the **Details** button. The System Messages dialog box appears.

4.   Choose the **Attached** button. An window displaying the attached file appears. This displays the contents of a separate file such as a SCSI device trace report.

>   To print the attached file, open the Operations menu and select the *Print* option. The Print dialog box appears. Select printing parameters and choose **OK**.

5.   Choose **OK** to close the attached file window.

Cleaning Your Tape Drive

If you have an autoloader and AutoLoader Software loaded, the program automatically detects when the device needs to be cleaned. The AutoLoader Software loads the available cleaning cartridge and cleans the drive for you. The AutoLoader Software does not provide automatic cleaning for optical drives. If you have an optical drive or a standalone tape drive device, Backup Director can help you keep track of the cleanings you perform.

To record that the device has been cleaned

1.   Clean the device according to the manufacturer's instructions. See Appendix B, "Maintaining Your Tape Drive," for recommendations and cleaning schedules for various devices.

2.   Highlight the device icon representing the device you cleaned.

3.   From the device's Statistics tab, choose the **Record a Cleaning** button. The new date appears in the **Time of Last Cleaning** parameter and the **Bytes Read since Last Cleaning** is set to zero.

Media and Device Errors

This section helps you identify types of media errors that can occur.

There are four basic types of media messages:

- Tape positioning
- Soft errors
- Unrecoverable write error
- Unrecoverable read error

When any of these types of media errors are reported, follow the troubleshooting procedures outlined below.

> **NOTE:** The first read operation on a blank tape (rotation day) may result in a higher than normal soft error count. This is due to the debris that remains from the manufacturing process. Ignore the initial errors since subsequent reads should result in a significantly lower value.

Soft Errors Reported by Tape Drive

A soft error is an error that was corrected through some form of recovery action. If the tape heads encounter debris or a defect, they attempt to write the data on another location on the media. Soft errors are a normal part of writing and reading magnetic tape and are a drive's way of compensating for defects in the tape and debris that momentarily clog a read/write head.

Backup Director monitors the number of soft errors reported by tape drives. The program writes a "note" in the System Messages window to notify the users that an unusually high percentage of errors has occurred.

Occasional soft errors are common and do not necessarily indicate a problem. In fact, many drives will report a soft error on new or infrequently used tapes that may have collected dust or become untensioned while idle. However, a consistently high percentage of soft errors may indicate a problem with the tape or tape drive.

When the amount of data read or written is small, Backup Director allows a higher percentage of soft errors. This helps prevent false alarms, since a small number of soft errors would have a large effect on the percentage reported.

The note placed in the System Messages window has the following format:

Excessive soft errors reported, percentage = % writing session *xx* on *yy*

"xx" is the session, such as "CP57".

"yy" shows the label of the tape, such as "ADMIN:F:1".

The table below describes the read/write error thresholds used by Backup Director for different devices.

Read/Write Errors Threshold

Tape Drive
Read
Write

DC 600	2.00%	2.00%
4mm DDS DAT	0.55%	5.00%
DLT	3.00%	3.00%
8mm 2.2GB	3.00%	4.00%
8mm 5.0GB	6.00%	8.00%

Troubleshooting Media and Device Errors

Tape positioning, soft error, unrecoverable write error, and/or unrecoverable read error messages are typical errors caused by either media or the device. To determine the source of the problem, you must perform a series of up to three tests in order to identify the source of the errors. To verify your results, run the tests a second time using a second blank tape. Occasionally a new blank media (or even an entire box) will be defective and provide false results.

> **NOTE:** If you are unable to perform operations with a device, you may want to verify that Backup Director supports your firmware as well as the device. For the latest version of the Certified Device List, download CDL40.ASC from the Palindrome BBS.

Tests 1 and 2 use the *Verify* operation in Media Manager. When troubleshooting, use this operation to eliminate the possibility of any media errors, not to diagnose hardware errors. Refer to the Read/Write Error Thresholds table on the earlier in this chapter.

To check whether the drive needs cleaning (Test 1)

1.   Insert the suspect data tape into the drive.

2.   From Media Manager, run the *Verify* operation.

3.   Review any system messages for soft errors.

> >   If the soft errors are **below** the acceptable threshold level and **no fatal error** appears, clean the drive with an approved, data-grade cleaning tape.
>
> The cleaning process eliminates any debris which may cause intermittent errors. Before resuming normal operations, you may want to run another *Verify* operation as an added precaution.
>
> >   If the soft errors are **above** the acceptable threshold level or a **fatal error** appears, go to Test 2.

To determine whether to retire or forget media (Test 2)

1.   Insert a new, blank tape into the drive.

2.   From Resource Manager, create a custom backup job on approximately 10 to 50 MB of data and write this session to non-managed media. You do not need to track this session in the File History Database.

3.   From Media Manager, select the session on non-managed media and run the *Verify* operation.

4.   Review any system messages for any soft errors.

>   If the soft errors are **below** the acceptable threshold level and **no fatal error** appears, go to Step 5 in this test.

>   If the soft errors are **above** the acceptable threshold level or a **fatal error** appears, go to Test 3 to run a comprehensive test of the tape drive.

5.   Clean the drive with an approved, data grade cleaning tape to remove any debris.

6.   Insert the suspect data tape into the drive.

7.   Run the *Verify* operation.

8.   Check the System Messages window for any soft errors.

>   If the soft errors are **below** the acceptable threshold level and **no fatal error** appears, clean the drive to ensure that the drive functions properly.

>   If the soft errors are **above** the acceptable threshold level or a **fatal error** appears again, you must either forget or retire this tape (see the "*Forgetting Media*" and "*Retiring Media*" sections in Chapter 10, "Managing Media.").

To determine whether the drive is not working (Test 3)

1.   Remove the data tape and insert a new, blank tape into the drive.

2.   From Device Manager, highlight the device you are investigating and run the short read/write test (Operations/*Test Device*). This program runs for approximately 25 minutes.

3.   Check the System Messages window.

>   If the read/write test indicates **drive errors**, such as read or write errors, contact the vendor for information about returning the drive for repair.

>   If the read/write test indicates **normal drive operation**, investigate possible contamination of data tapes or changes in your system's operating environment.

Setting Device Priorities

This section is for users with more than one backup device and who want to reserve devices for a specific purpose.

Numbered device priorities are not absolute. During a backup operation, the program will use a device with a lower priority if it has eligible media. As long as the device is available for the operation, the program uses that device if it had the preferred or required media is

loaded on a device

> **NOTE:** If backup sessions are written to WORM (Write Once Read Many)devices, they will become permanent sessions, since you cannot erase data from WORM devices.

For restore operations, if two or more eligible media are loaded on configured devices, Backup Director uses the device with the highest priority.

Example

Let's assume you are replacing an older tape drive with a faster drive using different media. You want to gradually eliminate the need for the original drive.

Device	Backup	Restore
Old Tape Drive	N/A	2
New Tape Drive	1	1

Retire the media used by the original drive. You can then configure your original drive to perform restore operations only. At the next automatic job, the program prompts you for blank media with which to add to the existing media set.

Your new tape drive will be used for all backup and restore operations from the new media. You can use the original tape drive to restore from the original media type without having to create a temporary installation for the old device.

To edit operational priorities

1.   Highlight the device icon whose priorities you want to change.

2.   Open the Operations menu and select the *Edit Device* menu option. The Configure Device dialog box appears.

3.   In each parameter, **Backup** and **Restore**, set the value to a specific priority. The value **1** is the highest priority; **99** is the lowest.

>   >   To de-activate a device for an operation, you can select **N/A**. The device is no longer available for the selected operation.

4.   Choose **OK** to save your changes.

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